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2024

THE IMPACT OF INNOVATION

NAVIGATING THROUGH MULTIDISCIPLINARY RESEARCH



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International Cataloguing in Publication Data (CIP) (Brazilian Book Chamber, SP, Brazil)

S498i

Seven Editora.

The Impact of Innovation Navigating Through Multidisciplinary Research [recurso eletrônico] / Seven Editora. – São José dos Pinhais, PR: Seven Editora, 2024.

Electronic data (1 PDF).

Includes bibliography.
ISBN 978-65-6109-088-9

1. Scientific research. 2. multidisciplinarity. 3. science. I. Title.

CDU 001.89

Indexes for systematic catalogue:

1. CDU: Scientific research 001.89

Cataloguing at source: Bruna Heller (CRB10/2348)

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CNPJ: 43.789.355/0001-14
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Crossref https://doi.org/10.56238/sevened2024.031-084
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Crossref doi ***https://doi.org/10.56238/sevened2024.031-086***

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THE USE OF CANCELLATION AS A FORM OF COERCION FROM A BEHAVIORAL ANALYTICAL PERSPECTIVE

https://doi.org/10.56238/sevened2024.031-001

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ABSTRACT

The objective of this work is to analyze, from the functional analysis of behavior, occurrences of the so-called "digital cancellation", defined as withdrawal of support for a certain public figure because of the disapproval of some attitude, speech and/or positioning of the person in digital media. It is hypothesized that this phenomenon is an attempt at coercive control. Based on this, three cases of "cancellation" of digital influencers were analyzed: Bruno Aiub, Gabriela Pugliesi and Leonardo de Lima Borges Lins. The analysis methodology was the contingency analysis associated with the theoretical discussion of behavioral basis, through which the following contingencies of the cases of "cancellation" were identified: the variation of the consumer public; the content of comments on publications; and legal and financial measures. Such contingencies served as analyzers of the consequences of the behaviors of the "canceled". From this analysis, it is concluded that there is inconsistency in the application of aversive consequences, as well as the continuity of behaviors similar to the "canceled" in two of the three cases analyzed. Thus, "digital cancellation" can be understood as a coercive action, controlled by consequences other than behavioral change, with unpredictable results in the behavior of those who are canceled and with the incidence of side effects that maintain the behavioral pattern targeted by the "cancellation".

Keywords: Cancellation. Cancel Culture. Behavior Analysis. Punishment. Coercion.

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INTRODUCTION

The digital medium is a large, if not the main, source of dissemination and consumption of content, access to news, and a place for the creation of interpersonal relationships for many individuals (Federal Government, 2022). In the midst of this space, some people achieve a privileged level of recognition on social networks. These, known as content producers, digital influencers, *web celebrities,* among other names, are users with notoriety arising from the creation of audiovisual content itself or prominent professionals in certain areas who reach millions of people with their productions, comments and positions, establishing partnerships with major brands and developing a financial activity at least partially linked to the digital environment (Karhawi, 2017). The recognition comes as a consequence of a great exposure of their private lives and constant contact with the public.

Thanks to this exposure, the attitudes, comments, positions, and opinions of influencers become constantly observed and the target of possible judgments. In this way, behaviors received as inappropriate or wrong by Internet users can be commented on, judged and responded to. In recent years, this dynamic has intensified and a term has begun to circulate inside and outside the networks: cancellation. "Digital cancellation" or "cancel culture" are recent phenomena and occur in different forms. Mechanisms present in the network such as the *block* function (blocking the possibility of interaction with a user), silencing users or terms to prevent the viewing of posts, direct and public contact with sponsoring companies and employers of users, and the possibility of large numbers of messages allow new forms of interaction between people. Due to the topicality of the theme, research on the subject is scarce, and despite some definitions found from previous studies, none completely met the demands of this research. Among our findings, we have the study by Silva (2021), who defined cancellation as the exposure of a fact that can generate public rejection, if deemed inappropriate. Da Silva (2021), in turn, used journalistic articles from *BBC News Brasil* and *The Telegraph*, along with a definition from the online dictionary *Dicio*, in an attempt to get closer to a possible characterization. In this vein, the *Macquarie dictionary* (2019) elected the English term *cancel culture* as the word of the year 2019, being defined as:

> attitudes within a community that call for or provoke the withdrawal of support from a public figure, such as cancellation of an acting role, prohibition from playing an artist's music, removal from social media, etc., usually in response to an accusation of a socially unacceptable action or comment (Macquaire Dictionary, 2019, S/N)

We will use this definition to characterize digital cancellation, since it meets the demands of this research because it is a comprehensive, neutral term that is consistent with

the processes informally observed in the experience as users of digital social media. We add that this type of withdrawal of support by followers is built on joint movements that seek the participation of other people. Therefore, methods of exposing and sharing canceled behavior are common to the practice of canceling.

Behavior analysis is a psychological and scientific approach aimed at the study of behavior that comprises human action from its relationship with the environment. From this perspective, behavior does not have a sense of the common sense of a simple doing, but of the relationship of the organism with the world around it (Tourinho, 2003). This theory is also interested in the fact that there is a controlling relationship between behavior and environment. Control refers to how antecedent variables and consequences produced by a given action influence the probability of incidence of certain behaviors in the future. Behavior analysis can be understood in different methodological strands: radical behaviorism, the philosophical basis of behavioral science; experimental behavior analysis; the production of experimental knowledge based on behavioral philosophy, which uses the control of variables; and applied behavior analysis, that is, the production of knowledge and practices applied to humans with the objective of solving problems and increasing quality of life, through training and behavior modification techniques (Tourinho, 2003).

Therefore, the hypothesis of this research is that cancellation can be interpreted in the light of behavior analysis, and can be investigated as an attempt to punish unwanted behaviors (Sidman, 2009). Thus, it is intended to analyze here both the variables suffered by the user targeted by the cancellation and the stimuli that control the act of users to cancel an influencer or unknown user in order to understand the results of the cancellation. To address digital cancellation, this research is based, in its analysis, on the perspective of radical behaviorism. For this, the analysis of behavior will be briefly presented through concepts of stimulus, response, reinforcement, punishment, aversion, escape and avoidance.

Based on these concepts, our objective is to investigate emblematic situations in which digital cancellation occurred explicitly, trying to understand the history of acquisition of the behaviors of the people involved, what are the actions of the cancelers, what are the environments in which these individuals were inserted during the occurrence of the behaviors, the consequences suffered by those who are canceled, as well as their behaviors after cancellation. For this, the methodology we used was functional analysis, an investigation method that, through the analysis of behavioral responses, consequences, acquisition history and contexts, allows us to understand the function of behaviors and how they relate to the environment, that is, through functional analysis we will seek to

understand the contingencies that preceded canceled behaviors, what are the consequences arising from the cancellation and the occurrence of behaviors similar to the canceled, with the objective of understanding how the cancellation operated on the behavior of these individuals.

We hope that this work will contribute to the field of issues related to digital media, as it is an environment rich in human interactions and that is of interest to Psychology. From this article, we see the opportunity to build new knowledge that allows expanding the field of research, favoring the academic environment, but also promoting answers that help in the practice of the psychologist in situations like this, in addition to contributing to the users of the networks who experience such situations in their daily lives.

METHODOLOGY

According to Skinner (1954/2003), human beings are constantly acting on the environment through behaviors that are contingent on reinforcements or punishments. The consequences experienced by individuals influence the probability of the occurrence of a certain behavior in the future. Thus, it is understood that operant behavior is predominantly controlled by its consequences. Within the consequences of operant behavior there is reinforcement and punishment. Reinforcement is the contingency that increases the probability of a behavior occurring and keeps it strengthened in the body's repertoire. Positive reinforcement adds a desirable element, such as gaining followers; in the negative, the removal of an aversive stimulus occurs, such as the blocking of a divergent user. The concept of punishment refers to the contingencies that make the occurrence of the punished behavior less likely, and can be positive, when there is an addition of an aversive stimulus (such as cursing), or negative, when there is the withdrawal of a reinforcing stimulus (such as loss of followers).

In addition, Sidman (2009) argues that punishment, unlike reinforcement, can be understood without associating it with effects generated in the individual's behavior. He defines punishment as the behavior, on the part of the punisher, of sequencing an action with the removal of a reinforcing stimulus or the addition of an aversive stimulus. However, there is no certainty of the effects of punishment on the punished individual, since it only teaches what not to do. It is also necessary to understand the concept of aversive control, defined by Sidman (2009) as the use of punishment, positive or negative, in an attempt to control the behavior of others. The author states that negative reinforcement can be used for similar purposes, rewarding the individual from punishment and threats. Negative reinforcement is also related to the avoidance and avoidance responses, since escape is

understood as the attempt to withdraw the stimulus, and avoidance is understood as the avoidance of a possible aversive stimulus not yet present.

During life, an individual builds the behavioral repertoire that indicates patterns and actions and this repertoire is structured in contingencies. Within behavioral analysis, there are three levels of causality that act on behavior: the phylogenetic represents innate characteristics of the individual, such as hunger when needing food; the ontogenetic is related to the behavioral repertoire obtained through learning, contingent on the individual's life history; and the cultural is related to the acquisition of behaviors arising from the cultural practices of the group in which the individual is inserted.

Silva, Santos, and Paz (2021) state that generalized social reinforcers such as likes and positive comments can strengthen the occurrence of certain positions according to the user's behavioral repertoire. Here is a contextual observation: certain ideals, phenomena and behaviors are rejected by a large part of society, either by a historical formation that makes a certain event aversive, or by ethical or moral ideals contrary to certain values. The causes are varied, but the aversive character related to forms of discrimination, prejudice, ideals of hatred, among other behaviors, can produce responses of flight and avoidance in the form of silencing, blocking, among other behaviors.

In view of the growing participation of digital media in people's lives and, consequently, the growing search for answers related to phenomena resulting from this, Psychology is demanded as an area of knowledge whose knowledge and methods can be applied to the digital world. These are situations that dialogue with themes such as personality formation, social repertoire and mental health. In a similar vein, Moreira (2023) argues about how current media, such as social networks, promote a change in the construction of individuals' subjectivity. When dealing with digital cancellation, several connected themes emerge, such as: the ability to deal with disagreements, the power of social reinforcement in digital media, the functionality of punishment systems without behavioral alternatives, and the emergence of vigilante actions amid the inefficiency of legal methods.

METHODOLOGY

We carried out the analysis based on the interlocution of B.F Skinner's (1979) concepts of punishment and Murray Sidman's (2009) concept of coercion with acts of cancellation of digital influencers from different platforms, based on published news that evidenced their repercussion on and off networks. We selected cases widely reported nationally, in which it was possible to access descriptions of the behaviors or captures of the

behaviors themselves; We analyzed the fluctuation of followers and the number of views of publications on the user's digital platforms and comments received during the cancellation episode, looking for the presence of possible aversive consequences (drop in follower gain, follower loss, drop in view gain, aversive comments), and reinforcing consequences (follower gain, increase in view gain, positive comments). The platform used to access audience variation data was Social Blade (2023), a platform that makes data on social media accounts public. The intention was to observe the consequences that occurred in the digital environment after the so-called canceled behaviors. Seeking broad contextual observation, the method of contingency analysis will be used, which can also be called functional analysis. In this method, relevant and significant stimuli are analyzed (antecedent environmental events and characteristics, the behaviors related to these stimuli and the consequences generated by these behaviors), seeking to understand the effects and functions of such stimuli on the individual's behaviors. At the same time, we verified whether there were patterns in this behavior, its acquisition history, the maintaining contexts, as well as the strengtheners and weakeners of these patterns (Neno, 2016).

The cases chosen were the following: a) Bruno 'Monark' Aiub, video producer and podcast host; b) Gabriela Pugliesi, digital influencer; c) Leonardo 'Leo' de Lima Borges Lins, comedian. For this delimitation, the possibility of access to cases of cancellation through recordings of speeches or case news, the possibility of investigating consumer audience numbers such as followers and views of posts, publications related to cancellation for analysis of public comments, situations where those canceled would have contact with the consequences of their actions were considered. These needs limited the selection of cases, such as the notorious case of cancellation of singer Karol Conká in her participation in the reality show Big Brother Brasil occurred without her immediate contact with the consequences of her behavior. These limitations were due to the decision to construct a solid definition of cancellation and a well-structured analysis methodology, possibly being the foundation of research for other cases.

The extraction of the data submitted to the analysis took into account the environment in which the canceled behavior occurred, the canceled behavior, the consequences of the behavior, and cases of similar behaviors that occurred after publication. Regarding the environment and behavior, video records of the analyzed behaviors were analyzed. In cases of unavailability of videos, news that described the cases were accessed. For the consequences, we analyzed the following categories of analysis: (1) changes in numbers referring to consumers of influencers' content, that is, the number of followers on social networks and the number of views on publications; (2) the fifteen

comments with the most interactions made on canceled or cancellation-related posts; and (3) legal and financial measures related to the canceled behavior, which have been reported. For the analysis of the behavioral repertoire, behaviors similar to the canceled behavior were searched in publications of the research subjects.

RESULTS

BRUNO 'MONARK' AIUB CASE

In February 2022, during an interview with deputies Kim Kataguiri and Tabata Amaral, in a dialogue about the limits of freedom of expression, Bruno defended the possibility of the existence of a Nazi political party recognized by Brazilian law: "I'm crazier than all of you, I think the Nazi had to have the Nazi party recognized by law [...] if the guy wants to be an anti-Jew, I think he had the right to be" (sic) (Jornalismo TV Cultura, 2022). The next day he published a video on his X account (formerly Twitter) with an apology (G1, 2022):

> Oh guys, I wanted to make this video just to apologize.
> Because I made a mistake, that's the truth. I was too drunk, and I went
> defend an idea that is an idea that happens in other places in the world.
> world, in the United States for example, but I went to defend this idea
> In a very dumb way, I was drunk, I spoke in a very
> Insensitive to the Jewish community and fuck, I ask for forgiveness you know?
> for my insensitivity, but I also ask for a little
> understanding, it's been four hours of conversation, I was drunk, I went
> Insensitive yes, make a mistake in the way I expressed myself, it implies that I
> I'm defending abominable things, it's shit, err as fuck. I
> I don't know, I ask for your understanding and I apologize to all of you
> Jewish community, sorry, I didn't want to be insensitive, it wasn't
> My intention, okay? I invite even the greatest representatives
> of this community to come talk to me, explain to me more
> about the whole story. Thank you.4

The comments section of this post finds several critical responses. As for the category variation in the number of consumers of content broadcast, Bruno did not have any loss or gain of followers out of the normal in February in X. In the following month, he had a small loss (of 1251 followers) and in April, a substantial gain of 30115 followers. The YouTube channels Flow Podcast and Cortes do Flow, had inverse changes; Flow podcast gained an average of 80,000 subscribers in the three months leading up to the cancellation, 30,000 in the month of the cancellation, and approximately 63,000 in the three months following the cancellation. Cortes do Flow gained an average of 46,000 subscribers in the months leading up to the cancellation, gained 70,000 subscribers in February and an

average of 63,000 in the months following the cancellation. Both YouTube channels decreased their view gains and only the Flow podcast had a negative balance[4].

Table 1 - Variation in the audience Bruno.

Month	Followers X @monark	Flow channel subscribers	Flow Cuts channel subscribers	Flow channel views	Flow Cuts channel views
November 2021	+14.363	+80.000	+40.000	+17.145,636	+20.994,681
December 2021	+1.709	+90.000	+50.000	+18.585,027	+29.172,710
January 2022	+5.566	+70.000	+50.000	+16.423,914	+21.513,863
February 2022	+3.976	+30.000	+70.000	-31.623,453	+12.387,772
March 2022	-1251	+40.000	+50.000	+10.282,428	+26.198,792
April 2022	+30.115	+40.000	+80.000	+13.170,206	+35.479,956
May 2022	+11.506	+50.000	+60.000	+16.151,996	+31.261,695

Source: Prepared by the authors with data from the Social Blade platform.

As for the publication contingencies category, we analyzed the 15 most liked comments on the publication with Bruno's apologies on *X*. The post received 1309 republications, 28.6 thousand comments and 37.5 thousand likes. All the comments with the most likes were interpreted as aversive to Bruno. The most relevant, with more than 64 thousand likes, says: *"@monark you're tarnishing the image of potheads, please stop smoking marijuana immediately thank you"* (*sic*). It was made by rapper Matuê; the second most relevant, made by Ricardo Taves, with 42,500 likes, says

> As a Jew I do not accept your forgiveness and I will not understand anything. Or Alcohol has many effects, but Nazism is unjustifiable in any ethyl or hallucinogenic state. If you get drunk in your business, your problem, but when messing with a topic like these none A waiver will suffice.

These comments were made by figures with many followers. The other 13 most relevant comments have fewer likes than Bruno's original post, and maintain an average of 16,353 likes.

[4] We kept the spelling used by users

Table 2 - Comments on Bruno's publication.

Comments	Number of tanned.
you are tarnishing the image of the potheads, please stop smoking weed immediately thank you	64.100
As a Jew I do not accept your forgiveness and I will not understand anything. Alcohol has many effects, but Nazism is unjustifiable in any alcoholic or hallucinogenic state. If you get drunk in your business, that's your problem, but when dealing with a topic like these, no excuse will suffice.	42.100
Monark apologized the most lame apologies in the universe: - he was drunk - it was 4 hours of conversation - ah but they defend it in the United States - please be understanding with me - Jews, please explain to me why Nazism is bad GO FUCK YOURSELF, MONARK! Damn it	29.300
No, Monark. Lynching is what happened in Barra da Tijuca, against Moise Kabagambe. You're just an adult who thinks you're a kid and can't be held accountable for the shit you say. "I was drunk", well, do me a favor! Accept your B.O., boy!	26.300
He talked shit and it wasn't the first time, fuck yourself there and endure the consequences... Casimiro would say:	17.200
my friends get drunk on the ride and the most they do is get close to my ear and say "tlg q I consider you very right" monark becomes a nazi...	12.200
Monark, unfortunately, has objective data that indicate that the spread of a discourse translates into the attitudes that the people who defend/listen to them will commit. It's not guesswork, there is data about that. More than knowing who is a Nazi, it is necessary to prevent Nazi ideas from spreading	10.400
If your ass catches fire, I hope the firefighter goes on vacation	6.700
It is not a lynching. People are just expressing their opinions, are you against free speech, Monark?	6.300
Look Monark, in all my years filling my ass with cachaça and drugs I never defended Nazism. I don't think it's okay to blame these things.	6.200
Understanding your asshole.	6.100
I have never seen anyone get drunk and start supporting Nazism. You were/are more than lucid in your words. Don't play the poor thing. If Brazil were a serious country, you would be in prison. NAZISM IS NOT FREEDOM OF EXPRESSION. NAZISM IS A CRIME!	5.800
He was wrong again. You can't use these arguments. You can't be drunk to deal with a serious matter. And you can't blame the drink. Nor ask for understanding. Reflect more a little and redo.	4.400
What drink is this that you drink and leave as a Nazi defender? The face doesn't even tremble.	4.100
"I was drunk" po buddy so if you run over someone drunk you just have to make a little video that everything is fine	4.100

Source: Prepared by the authors with data from @monark's post on the X website (Aiub, 2022.)

Bruno was fired from the *Flow podcast* after the case and had his 50% partnership in the company bought by his partner Igor Coelho (G1, 2022). Regarding similar behaviors, he created a new *podcast* on the *Rumble* platform, titled *MonarkTalks.* The program began to have freedom of expression as its central theme, similar to the dialogue of his canceled behavior. About the cancellation, Bruno said in an interview with the Cara a Tapa podcast (2022) that he regrets apologizing, that he regrets how he made the statement but not its content:

> I didn't apologize for my idea, from what I think, I still believe in this, I still believe in the premise of the States' First Amendment United [...] but I apologized for the way I delivered this idea to the population, to the public [...] I shouldn't apologize, I should explain my point but the problem is that when you apologize

You validate the narrative that you really did what they were doing imputing even if it was not true.

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Along with this, Bruno made a post on his Instagram profile (2022) satirizing the cancellation, along with a photo lying on a beach chair accompanied by the writing: "Not everything was canceled, thank God"

FUNCTIONAL ANALYSES OF THE BRUNO CASE

History linked to canceled behavior.

Background	Behaviour	Consequences
Work with content production for the internet; Political values Libertarians; Controversial topics attract a large number of views.	Incite and talk about Controversial topics in seus podcasts	Discussion and promotion of topics of interest to you (positive reinforcement); Aversive responses to your comments (punishment positive); Audience gain. (reinforcement positive; Earning Compensation monetary (positive reinforcement).

Canceled behavior.

Background	Behaviour	Consequences
Presence of friends Kim Kataguiri and Igor Coelho in the conversation; Topic of conversation about freedom of expression.	To state that he defends the possibility of the creation of a Nazi party in the Brazil.	Continuation of the conversation (positive reinforcement); Negative comments from public. (positive punishment); Loss of sponsors (negative punishment); Public pressure to retract. (positive punishment); Termination of the Flow Podcasts company (negative punishment)

Request for exculpatory charges

Background	Behavior Consequences	Consequences
Negative comments from the public; Loss of sponsors; Public pressure for retraction.	Video post; Apology.	Aversive comments; Apology. (positive punishment); Likes and shares of the post (positive reinforcement).

Similar behaviors.

Background.	Behaviour.	Consequences.
Aversive comments; Liberal political values; Gain followers on *X*.	Incite and talk about controversial topics in their podcasts.	Gain of consumer public (positive reinforcement); Discussion and promotion of topics of interest. (positive reinforcement); Aversive responses to your comments (positive punishment).

GABRIELA PUGLIESI CASE

The digital influencer organized a party at her home in April 2020, in the midst of the Covid-19 pandemic, and videos of the party were published on her Instagram account. The next day, she used the same network by posting an apology video, now unavailable, in which she spoke about the case (G1, 2020). After the pronouncement, a three-month hiatus followed on her social network, when she made another statement regarding what happened, apologizing and talking about how she dealt with the situation in the meantime. This new publication has several negative comments. Regarding the variation in the number of content consumers, Gabriela has Instagram as her main network, in which there were both posts that led to cancellation and the posting of apologies. The loss of followers was considerable, resulting in a drop of 129,363 in the month of cancellation (April) and 113,246 in the month Gabriela returned to the network (July). As for publication contingencies, Instagram does not have a tool to search for comments on publications. Among the 56,525 comments, there was no publication that stands out in terms of the number of likes, but more comments interpreted as aversive were observed. Still, there are comments that supported Gabriela. This publication had 326 thousand likes as of the date we analyzed it in August 2023 (Pugliesi, 2020). Table 3 - Audience variation Gabriela,

Month	Instagram Followers @eusougabriela
January 2022	+48.378
February 2022	+33.810
March 2022	+320.320
April 2022	-129.362
May 2022	-129.362
June 2022	-129.362
July 2022	-113.246

Source: Prepared by the authors with data from the Social Blade platform.

Gabriela lost several partnerships with companies such as *HOPE, Baw, LBA, Body For Sure, Desinchá, Evolution Coffee, Rappi, Mais Pura and Liv Up*. Companies that have worked with the influencer have also spoken out, including *Kopenhagen, Ambev and Fazenda Futuro*. The specialist agency *BRUNCH* states that the financial loss may have been close to three million reais (Forbes, 2020). More broadly, the behavioral class of producing content for the internet ceased through the distancing of the user from the networks; more specifically, we do not see behavior similar to that canceled in the Gabriela case, which can be understood as an extinction. Among posts on her *feed* and highlights on Instagram, there were no more cases that disrespected the quarantine. There is even a publication about his vaccination against Covid-19 on July 13, 2021.

Functional Analyses Gabriela case

History linked to canceled behavior

Background	Behaviour	Consequences
I work with content production.	Share your daily life and lifestyle on your social networks.	Gain of followers (positive reinforcement); Earning Compensation monetary (positive reinforcement); Discussion and promotion of topics of interest to them (positive reinforcement).

Canceled behavior.

Background.	Behaviour.	Consequences
Beginning of the Covid-19 pandemic; Party with friends.	Publish a video disrespecting the isolation rules in the fight against the Covid-19 pandemic.	Aversive comments (positive punishment); Loss of audience (negative punishment); Loss of sponsorships (negative punishment).

Request for exculpations.

Background	Behaviour	Consequences
Aversive comments; Loss of audience; Loss of sponsorships.	Publication of an apology about the Happened; Beginning of a hiatus on social networks.	Distancing from Aversive comments (negative reinforcement).

LEONARDO 'LEO' DE LIMA BORGES LINS CASE.

In May 2023, a video published on the comedian's YouTube channel was removed by the São Paulo Court of Justice (TJSP). He confirmed the fact and made publications about "countdown" to remove the content. The video was a capture of a stand up comedy show that took place in Curitiba in 2022. In an excerpt of the video there was a racist joke: "[...] blacks can't get a job, but at the time of slavery they were born employed and thought it was bad" (Veja, 2023). On May 18, Leonardo made a post on X containing an image with the writing in capital letters: "05/16/2023 15:00 A COMEDY SHOW IS REMOVED FROM THE INTERNET AT THE BEHEST OF THE PUBLIC PROSECUTOR'S OFFICE" (Lins, 2023). The comments section has positive reviews and comments, and on Instagram there are mostly positive and compassionate comments. The publication was later deleted (Lins, 2023). On that day, he published a video on YouTube entitled "Léo Lins - want to know what a process of the public prosecutor's office is like?". The cover or thumbnail of the video contains the phrase "READING THE PROCESS LIVE", also in capital letters (Lins, 2023). As the cover of the video suggests, it consists of a reading of the lawsuit filed by the TJSP, related to the video with racist content. The comment session received positive and compassionate responses. In the category variation of consumer public. The month of May 14 represented a drop in views on the comedian's YouTube channel, however, the number of followers on Instagram and X and YouTube had an exponential increase. June and July brought a considerable increase in views on the YouTube channel.

Table 4 - Variation in Leonardo's consumer public.

Month	Registered Youtube @leolinsstanup	YouTube Views @leolinsstandup	Followers X @LeoLins	Instagram Followers @leolins
February 2023	+10.000	+1.338.226	-698	+32.848
March 2023	+10.000	+1.738.361	-1.195	+67.216
April 2023	+10.000	+1.622.260	-1.689	+44.270
May 2023	+40.000	+373.969	+12.143	+153.265
June 2023	+60.000	+3.403.395	+2.120	+89.302
July 2023	+50.000	+3.579.746	+1.490	+171.351

Source: Prepared by the authors with data from the Social Blade platform.

Regarding the publication contingencies, the YouTube video has 922 thousand views and 116 thousand likes and the selected comments have an average of 1,521 likes. All 15 comments seem reinforcing. X's publication had 3.3 million views and 21.9 thousand likes. Among the 15 most liked comments, 12 were apparently aversive, with an average of 1,127 likes and 3 comments were apparently reinforcing, with an average of 469 likes. The Instagram post had 110 thousand likes and 13.4 thousand comments and, among the 15 most liked, eight apparently aversive with an average of 1,611 likes and seven apparently reinforcing with an average of 2,416 likes.

Aversive	Tanned	Amplifiers	Tanned
That's why I made the L.	5444	But isn't that censorship? Oh yes, it's not about what you say it's about who talks	722
Come make a banner of yours here in the hood and tell me about the one from work of the slave.	3278	Put it on Rumble, because I haven't watched it yet!	380
If the comedy show is racist, xenophobic, ableist he is kind of a CRIME so the MP is right. The game continues.	829	make a show only with jokes mocking the white hetero man, It seems that it is the only category that you have the right to mock... kkkkk	307
Have you thanked Lula for the sanction of Law 14.532, an 'anti-joke' law? Bolsonaro warned that censorship would reach everyone, but while it was only with others, cool, you made the L for that!	801		
Bully deserves to know what, right?.. Bunch of Zé Ruela, making jokes with a minority is easy, in school there was always a bully doing that, it's a bunch of fools applauding around. All cowardly, soft ass. He is only male at mom's house. Bully deserves you know what, right?	662		
Do you make the L and have you claimed how?	619		
We have been warning for 4 years. But you called us bolsominion etc	574		

I will repeat: For lack of warning it was not! (it's too late now). That's why you can't stay out of politics and continue living a normal life, because censorship will reach everyone. All of this is result of what was already happening to other people, but you didn't give a damn. There are comedian arrested for months already, but why care, right?	445 342		
Take a bunch of distracted people! Make the L immediately! Hahahahaha.	202		
I missed the time when you were free to make your aggressive jokes and he as President of the Republic never censored you or persecuted you ???? Make the L	193		
While it happened with bolsonarists it seemed funny, right?! Good harvest of your sowing, you f#gave the whole country putting these dictators in power	137		

Source: Prepared by the authors with data from @leolins's post on the X website (Lins, 2023).

Table 6 - Comments on the publication Youtube Leonardo

Reinforcing Comments	**Tanned**
I'm gay, atheist, northeastern, brown, poor and I support you, Leo! Being a minority doesn't make me stupid! Keep up your work of freedom!	5100
He calls himself a comedian/comedian"... Dude, how ridiculous coming from a body that represents the Brazilian justice... Pqp. Léo Lins, your audience is with you.	3400
The guy is a GENIUS! He released the show in the form of reading the process. Far above average. I laughed more with this video because I heard the jokes with a more "serious" tone than when I watched the show (which had already made me laugh my ass off). Laughed at the same show 2 times. Hauahauahauaha. Go ahead, Leo!	2000
Is it serious that Leo used the public prosecutor's office to redo the show without causing a problem? What a genius!	2000
A Comedian being taken seriously and corrupt politicians being taken as a joke!	2000

A message to his colleagues: Those who support the guillotine forget that Robespierre was also beheaded. He who empowers oppression will soon end up being oppressed. As sure as night succeeds day. Go ahead, Leo.	1600
Politicians being taken as a joke and comedians being taken seriously. This is Brazil	1200
The guy is a skull! He reposted the show that was censored reading the lawsuit against the show itself. Too good!!	814
The comedians being taken seriously while telling jokes, and the politicians being taken in the joke while stealing our money kkkkk The guys returned the script to Leo Lins to re-record the show on youtube 100% within the law, after all it is a public document. AHHAHAHHA	750 718
The guy read the process and reproduced half of the jokes from the show that were taken off the air kkkkkkkk GENIUS KKKKKKKKKKKKK	711
The video was so good that even the Public Prosecutor's Office watched it. It was so good that the Honorable Judge made a summary of the best moments. This is our Brazil!	700
Leo Lins is so good that even reading a process makes it interesting and makes 50 min pass as 5, these are difficult times.	679
I'm a proud Northeasterner "and this judge has to understand that a comedian can see us, politicians can't..."	648
The guy simply re-recorded the show itself by reading the process. Genius	509

Source: Prepared by the authors with data from @leolins's post on the X website (Lins, 2023).

Table 7 - Comments on Instagram publication Leonardo.

Comments understood as aversive.	Number of tanned.	Comments understood as reinforcing.	Number of tanned.
No dear, a video containing r4c1st4s offenses that was removed from the internet, this is far from humor!	2457	still not believing	2597
Show that you offend people with disabilities. I thought it was very FAIR!	2164	There is no such thing, man	2212
Those who commit crimes have to get used to a judicial decision	955	And there are still comedian finding it good!! How horr0r	5325
Racism is not humor and much less funny! He will study and learn to be a humorist with intelligence, he has a list of consecrated, successful comedians who give a show making the audience laugh without attacking, humiliating people.	996	Brazil is downhill, and the worst thing is to have a LOT of people thinking this is normal. Besides, we're together brother, let's move on	2186
Racism is NOT freedom of speech, hate speech is NOT a joke. It is not a matter of opinion, of finding it funny or not, it is a complex conflict between the right of those who speak and the rights of offended groups. What the Public Prosecutor's	1054	It is the beginning of the end. Incredible.	1771

Office did is NOT censorship, it is the response to a valid legal conflict. There are several other conflicts of this nature, such as when someone suffers contempt, injury/defamation and the justice system has to answer about the limit between who/what is said and the impact of this on someone's social life/life. Leaving here my humble contribution because the debate here is very bad and uninformed.			
A show of racism is not humor, it is a crime.	2726	And they still say that we live in a free and democratic country..!!	1524
Racism, pedophilia and xenophobia are not humor.	794	It's easy to solve this there... You just have to support Lula and you can make jokes with everyone, your videos will not be canceled and you still earn some money with Rouanet	1373
The guy says "blacks can't get a job, but at the time of slavery they were born employed and they also thought it was bad" and this is considered humor? Do you call the removal of this censorship? Even if you don't have a great deal of historical knowledge, what kind of job was that? Without a salary, being beaten, eating badly? Thinking about the context then it only gets worse. Years of slavery, of a type of heinous crime committed with the consensus of the time, which has brutal consequences in our society to this day. Finding this funny is sadistic, to say the least	2143		

Source: Prepared by the authors with data from @leolins's post on the Instagram website (Lins, 2023).

There was a judicial order to exclude the video and prohibit the publication of derogatory or humiliating content related to race, gender, culture, origin, gender, among others (Carta Capital, 2023). Regarding similar behaviors, Leonardo maintained a behavioral pattern similar to the canceled behavior. He does comedy shows in Brazil and the United States, also having comedy content available to subscribers on Only Fans, on this network he posts excerpts from recordings of his shows, in one of them the comedian says "There's a joke here mega exclusive to you! If I post this video, on the same day my name comes out on the gossip pages!" (sic.). Publications with fatphobic jokes and that mention the cancellation itself exist, in one of them Leonardo asks "governors, city hall, NGOs and cancelers in general" to stop making "boycotts and repudiation notes" and then shows a theater full of spectators, stating "look what happens" (Lins, 2023).

Functional analyses Leonardo case

History linked to canceled behavior

Background	Behavior Consequences	Consequences
Interest in Jokes derogatory humor; Political-social values.	Do *stand-up shows*	Audience gain (comedy reinforcement using positive humor) Gain in monetary remuneration (positive reinforcement) Discussion and promotion of topics of your interest. (positive reinforcement)

Canceled behavior.

Background	Behaviour	Behavior Consequences
Interest in derogatory humor jokes; Political and social values; Existence of a consumer public; Gain of monetary remuneration.	Making a racist joke.	Gain in monetary remuneration (positive reinforcement); Discussion and promotion of topics of your interest. (positive reinforcement)

Similar behaviors

Background	Behaviour	Consequences
Prohibition of publications with discriminatory content; Legal determination to exclude the video.	Posts with similar content to the canceled behavior.	Existence of a consumer public (positive reinforcement); Gain in monetary remuneration (positive reinforcement); Discussion and promotion of topics of interest (positive reinforcement);

DISCUSSION

With this information collected, the present work continues to correlate these cases with knowledge of behavior analysis, with the objective of understanding the possible effects of cancellation on the behavior of canceled individuals.

Historically, punitive and coercive methods have been questioned by behavior analysts. Skinner (1954) understands punishment as a questionable technique, arguing that, in the long run, it is disadvantageous for the punished organism and for the punisher, since the reduction in the frequency of the punished behavior does not seem to be permanent, but momentary. Among the effects caused by punishment in the behavioral repertoire, we highlight the immediate decrease in the punished behavior, without delving into the antecedents that control the behavior and the emergence of an incompatible behavior conditioned by the recurrent punishment of another behavior. It is also necessary to take into account the occurrence of public and private responses such as guilt, shame or

fear on occasions similar to that of the punished behavior and the negative reinforcement of behaviors that reduce or avoid the aversive stimulus.

This momentary effect can be observed mainly in the Bruno case, in which, after distancing from social networks, behaviors similar to those punished appear. At the same time, the increase in the occurrence of behaviors similar to the behavior punished in the Bruno and Leonardo cases can occur through a reinforcement of the avoidance of some negative consequences, such as producing specific content for a certain audience, which can prevent the occurrence of aversive comments.

In line with this, Sidman (2009) elucidates other side effects of punishment. In addition to the target behavior and the consequence, the environment in which this relationship occurs plays a major role in the behavioral repertoire. Thus, behavior such as making a racist joke or defending the existence of a Nazi party may not be punished in certain environments and reinforced in others, so that they may continue to occur in some circumstances, where issues such as the public or interlocutors do not result in punishing them. The Bruno and Leonardo cases show an occurrence of behaviors similar to those punished, but in different environments.

In addition, positive punishment opens space for reinforcement, so that the removal of the aversive stimulus of punishment is a form of negative reinforcement. In a case of escape from an already present stimulus, a way of learning how to act moved by aversion occurs. However, other consequences can maintain the behavior, such as children who play dangerous games hidden from their parents or drivers who respect the speed of the road only near electronic radars. In cases of avoiding the stimulus even before its presence, contact with a certain environment related to punishment can be completely avoided (Sidman, 2009).

The Gabriela case can be related to these concepts. The avoidance with a three-month hiatus from social networks avoids any contact with aversive contingencies; Even if the behavior of disrespecting the pandemic remains (we are not affirming, but conjecturing), the behavior of sharing it has been punished, so that there is an escape from aversion even with the occurrence of the previously punished behavior. Thus, even with changes in behavior on social networks, behavioral change does not necessarily occur in other environments.

However, the relationships between behavior, environment and consequence on the internet undergo modifications in the mechanisms of the network. Fischer (2023), in a journalistic investigation, observed a significant change in the functioning of social networks in the 2010s. The birth of these channels in Silicon Valley was permeated by a libertarian

worldview, a political revolution based on free networks for the expression of ideas; These ideals became problematic when networks reached global levels of reach and moved by a free, space-supported business model for advertising.

This financial model made the time online of users directly proportional to the profits obtained. Thus, the application of recommendation and content delivery algorithms aimed at greater audience retention were applied. In general, algorithms prioritize content related to controversial topics and related to strong feelings, such as fear and anger. Along with this, the delivery of content is done quickly and directly, often biased and even false. The feelings driven by these publications increase the retention of attention and, consequently, the time spent by users on the network, in addition to the repeated recommendation of similar content to users.

Thus, the act of canceling does not occur completely spontaneously, as do canceled behaviors. Behaviors that can be canceled for their controversial content are reinforced through the number of hits; Canceling behaviors can be reinforced both by participating in a cause or fighting a problem, but also by likes, shares, and concurring responses. Both canceling behavior and cancellable controversial behaviors flow together with an algorithm guided by access and screen time.

Among the cases analyzed, it is necessary to consider the effectiveness of the action of loss of audience, support and consumption. The Gabriela case is a more functional example in a dynamic in which the behavior of sharing the break of quarantine is not part of its ordinary content and presented a loss of audience; the Bruno and Leonardo cases have actions that, despite being rejected by certain users, do not escape a standard of the content produced, not generating loss of the public already accustomed to these actions. Without the withdrawal of the public, the cancellation leverages and publicizes the events; critically exposing ordinary content, such as a comedy show by Leonardo or a speech from a *podcast* by Bruno, to an audience that already consumes this material can be ineffective in exposing something that is considered wrong.

The legal and financial consequences are in a murkier place for analysis, as they apply to crimes such as defending the existence of a Nazi party and racist comments and should be punished. Understanding whether the acts of cancellation allowed sponsoring companies or justice authorities to have access to these events was not our goal, but it is worthy of analysis in the future. Finally, we highlight the apparent ineffectiveness of behavior change through cancellation; The lack of control of contingencies, the low opportunity and reinforcement of different behaviors, and the limited fight against behavior and not its structure of acquisition of the repertoire do not seem to have the desired effect. In addition,

the "exile" made as a mode of cancellation makes it impossible to reinforce desirable behaviors and can have very harmful side effects. The lack of contact with dissenting and moderate people can limit interaction with more extreme individuals and the Bruno and Leonardo cases show a displacement of audience and content closer to their cancellation cases.

CONCLUSION

Within the proposal of a methodological bridge between the analysis of behavior and the concept of cancellation, together with a rich method both quantitatively and qualitatively, the present research intended to analyze, from the functional analysis, three cases of cancellation that contemplated people with notoriety and a large audience in the digital environment. Analyzing the canceled behaviors, antecedents, contingencies, consequences, and behaviors after the cancellation, we observe the function of their actions and the effects of the consequences they suffered. With this observation, it was possible to relate the events to the theoretical contributions of behavior analysis, to understand possible behavioral processes experienced by individuals and to raise hypotheses about the results of cancellations.

Our initiative was to build a methodological path, but the study was limited in terms of racial and gender profile and users with less digital presence (fewer followers). However, the methodological structure made available allows for future investigations that can explore other facets of cancellation, analyze cases of repeated cancellations suffered by the same person, investigate cases of cancellation of people who are not influencers, politicians, traditional media workers, among others.

We reiterate that, despite the evidence of an inefficiency of cancellation as a modifier of the behavioral repertoire of individuals, manifestations contrary to problems such as racism, anti-Semitism and disrespect for public health may not be guided by behavioral change. This work, although not agreeing with such positions, did not aim to qualitatively analyze the political, stigmatizing, prejudiced positions, attacks on minorities and other problems, but sought to understand the possible side effects of such actions on the individuals who manifest them, believing that this understanding can contribute to better results in political and social struggles.

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FINANCIAL EDUCATION IN HIGH SCHOOL: ADMINISTRATIVE AND PEDAGOGICAL IMPACTS ON THE DEVELOPMENT OF MANAGEMENT AND DECISION SKILLS

https://doi.org/10.56238/sevened2024.031-002

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ABSTRACT

This study analyzes the impact of the teaching of Financial Education in High School, highlighting its importance for the development of administrative and financial skills. From the OLITEF simulation, it was verified the students' difficulty in dealing with abstract financial concepts, such as compound interest and inflation, suggesting the need for more practical and contextualized methodologies. A significant difference in performance between genders was also observed, with male students presenting better results compared to female students. As pedagogical implications, it is recommended the integration of Financial Education into the school curriculum in an interdisciplinary way, in addition to the adoption of active methodologies, such as simulations and case studies, which can promote meaningful learning and better prepare students to manage their personal finances and to work in administrative contexts.

Keywords: Financial Education. Middle school. Administrative Skills. Gender Differences. Active Methodologies.

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INTRODUCTION

Financial Education has become increasingly essential in the contemporary world, particularly for young people who are about to enter adulthood and face financial responsibilities. In High School, the development of financial skills is essential to enable students to make more conscious decisions about their personal finances, but also to prepare them for the challenges of administration and management, whether in an individual, business or society as a whole context. The increasing complexity of financial markets, coupled with the need for an economically educated population, makes the teaching of these concepts a vital tool for citizenship and for the development of critical and managerial skills.

It is observed how Financial Education goes beyond theoretical curricular content, being a crucial point for the development of an active and responsible posture in relation to the use and planning of resources. When young people understand concepts such as inflation, compound interest, and the nature of different types of investments, they not only start to better manage their personal finances, but also develop analytical and managerial skills, essential for exercising leadership and decision-making roles in different contexts. However, despite its importance, the teaching of Financial Education faces considerable challenges, especially when it comes to more abstract topics, which require students to have in-depth mathematical reasoning and a long-term vision.

This article aims to investigate the relationship between the teaching of Financial Education in High School and the development of administrative skills among students, using the results of the OLITEF simulation as a basis for analysis. The proposal is to identify the main challenges faced by students when trying to understand financial concepts that are fundamental to administration, such as planning, risk analysis and resource management. The research also seeks to discuss how overcoming these difficulties can contribute to a more robust and effective training, preparing young people not only for adult life, but also for a more conscious and qualified performance in the labor market and in the business context.

The inclusion of Financial Education in the High School curriculum is not just an educational initiative; It is a response to the demands of an increasingly interconnected and interdependent world, where ill-informed financial decisions can have significant consequences. Therefore, understanding the obstacles and potentialities of financial education can help in the development of more efficient pedagogical strategies, which not only teach students to solve financial mathematics problems, but also inspire them to

become effective managers of their own lives and, in the future, of organizations and communities.

THEORETICAL FRAMEWORK

THE IMPORTANCE OF FINANCIAL EDUCATION FOR THE TRAINING OF LEADERS AND MANAGERS

Financial education is an essential component in the training of leaders and managers, especially in the context of high school, where young people begin to develop critical skills for financial decision-making. The ability to manage financial resources effectively is essential not only for personal life, but also for future professional performance. The literature points out that financial education contributes significantly to the formation of citizens who are more aware and prepared to face the economic challenges of the contemporary world (RECH, 2024; GONÇALVES et al., 2022).

Financial knowledge allows future leaders and managers to understand the importance of financial and budget planning. According to Gonçalves et al. (2022), financial education should be approached in an interdisciplinary way, integrating concepts that help students build their life projects. This is corroborated by Silva and Selva (2020), who highlight the need for a financial education program in schools, emphasizing that this training is crucial for understanding mathematical concepts applied to everyday life, such as interest and investments. Implementing sound financial education in the school curriculum not only prepares students for the management of their personal finances but also empowers them to make more informed decisions in administrative and business contexts (GONÇALVES, 2021).

In addition, financial resource management is a skill that is directly reflected in leadership skills. Santos (2019) argues that effective resource management, including budget allocation and financial decision-making, is vital to the success of any organization. Financial education, therefore, is not only a matter of technical knowledge, but also of developing critical skills that are essential for leadership. The training of competent managers requires a deep understanding of the financial dynamics that affect organizations, which can be achieved through well-structured financial education (RITTA AND SILVA, 2017).

Finally, the integration of financial education in high school is a strategy that can contribute to the formation of leaders and managers who are more prepared for the challenges of the labor market. The research by Carvalho and Scholz (2018) emphasizes that financial education should be a priority in schools, as a lack of knowledge in this area

can lead to harmful financial decisions. Therefore, by promoting comprehensive financial education, educational institutions not only prepare students for personal life, but also for future leadership in corporate and social environments (OLIVEIRA, 2024).

FINANCIAL EDUCATION AND ADMINISTRATION: THE RELATIONSHIP BETWEEN MANAGERIAL COMPETENCIES AND FINANCIAL LITERACY

The relationship between financial education and administration is a topic of increasing relevance, especially in the context of the training of young people in high school. Financial literacy, which encompasses not only knowledge but also attitudes and behaviors toward money, is critical to developing essential managerial competencies such as strategic planning, resource management, and risk analysis. Financial education, therefore, can be seen as a pillar that supports the formation of analytical skills applicable to management.

Financial literacy is defined as the combination of awareness, knowledge, skills, attitudes, and behaviors necessary to manage and make financial decisions effectively (CRUZ, 2023). This definition is corroborated by Potrich et al. (2015), who highlight that financial literacy involves not only financial knowledge, but also the ability to apply this knowledge in practical situations, which is crucial for effective resource management. Financial education, on the other hand, focuses more on imparting knowledge about finance, but it is financial literacy that enables individuals to make informed and responsible choices (BOGONI et al., 2018).

In the administrative context, managerial competencies, such as strategic planning and resource management, are directly impacted by financial literacy. According to Cruz (2023), financial education can positively influence financial behavior, allowing future managers to perform more accurate risk analysis and develop more effective financial strategies. The ability to plan and manage financial resources is essential for any leader, and financial literacy provides the necessary tools for this task. In addition, Brito's (2024) research emphasizes that training in financial literacy is crucial for building attitudes and behaviors that promote a healthy and sustainable financial life.

In addition, the relationship between financial education and management is evidenced in the need for an integrated approach that considers both technical knowledge and behavioral skills. According to Zuliani et al. (2020), financial education should be viewed as a preventative measure that empowers individuals to make more informed financial decisions, which is essential for effective management in any organization. Financial education training, therefore, not only prepares students to manage their

personal finances but also enables them to take on leadership roles in business environments, where critical analysis and decision-making are key (SILVA et al., 2021).

In short, financial education and financial literacy are interdependent and play a crucial role in the formation of managerial skills. The integration of these areas into the school curriculum can result in a generation of leaders and managers who are better prepared to face the financial challenges of the future, promoting a culture of responsibility and effectiveness in resource management (ROCHA, 2023).

CHALLENGES IN TEACHING ABSTRACT FINANCIAL CONCEPTS IN HIGH SCHOOL

The challenges in teaching abstract financial concepts, such as compound interest and inflation, are significant in the context of High School. These concepts are fundamental for the formation of a solid foundation in management, both on a personal and business level. The difficulty in understanding these topics can be attributed to several factors, including the abstraction of concepts, the lack of practical contextualization, and the lack of teaching methodologies that make these contents more accessible and relevant to students.

One of the main obstacles faced by students is the abstract nature of financial concepts. Compound interest, for example, involves a mathematical understanding that can be challenging for many students. The research by Silva and Menezes (2021) highlights that abstract concepts in various disciplines, including mathematics and science, often become an intellectual challenge for high school students. This difficulty is exacerbated by the lack of connection between theory and practice, which can lead to students' demotivation and disinterest in learning about finance.

In addition, inflation, an economic concept that directly affects purchasing power and financial management, is often presented in a theoretical way, without proper contextualization in everyday situations. The lack of practical examples and the absence of an approach that relates these concepts to students' daily lives can result in superficial and limited understanding. The literature suggests that the use of active methodologies, such as gamification and the use of visual tools, can help make these concepts more tangible and understandable (FELICIANO, 2023; QUEIROZ et al., 2019). These approaches can facilitate learning by promoting more meaningful interaction with the content, allowing students to visualize and experience concepts in a practical context.

The National Common Curriculum Base (BNCC) reinforces the importance of contextualization and interdisciplinarity in teaching, including Financial Education as one of the essential competencies for the integral formation of students (BRASIL, 2017). The

BNCC suggests that the teaching of financial concepts should be approached in a practical way and connected to the students' reality, promoting not only theoretical learning, but also the development of skills applicable to everyday life. Integrating topics such as compound interest and inflation into the curriculum in an interdisciplinary way contributes to the construction of skills that are valued both in personal life and in the job market, encouraging students to become more aware citizens and prepared to face economic challenges (BRASIL, 2017).

The importance of overcoming these challenges is evident, as understanding concepts such as compound interest and inflation is essential for effective management. The ability to calculate interest and understand its financial implications is crucial for making informed decisions, both on a personal and business level. According to Rocha and Paz (2023), financial education should be integrated into the school curriculum so that students can apply these concepts in their lives, developing skills that will be valuable in the future. Therefore, it is imperative that educators adopt strategies that make finance education more accessible and relevant, preparing students for the financial challenges they will face.

In short, the challenges in teaching abstract financial concepts in high school are significant but not insurmountable. The adoption of methodologies that promote practical contextualization and active interaction with the content can facilitate students' understanding and interest in financial topics. This approach not only improves financial literacy but also prepares students for effective management of their personal and professional finances in the future.

PEDAGOGICAL STRATEGIES FOR THE INTEGRATION OF EDUCATION AND ADMINISTRATION

The integration of financial education with management in high school is a crucial aspect for the development of practical and theoretical skills that students need to manage their personal finances and understand administrative principles. For this, the adoption of effective pedagogical strategies is essential. Methods such as case studies, simulations, and problem-solving activities have been shown to be particularly effective in facilitating financial learning by allowing students to apply financial concepts in practical contexts.

Case studies are a powerful pedagogical tool that allows students to analyze real or hypothetical situations in which financial and administrative concepts are applied. According to Silva et al. (2022), the use of case studies in teaching financial education helps students develop a deeper understanding of the concepts, as they are challenged to

think critically about how to apply knowledge in real-world situations. This approach not only encourages analytical reasoning but also fosters discussion and collaboration among students, which is essential for meaningful learning.

Simulations also play an important role in financial education. They allow students to experience resource management in a controlled environment, where they can make financial decisions and observe the consequences of those decisions without the risk of actual losses. Freitas and Rosa (2019) highlight that simulations help to demystify complex concepts, such as compound interest and inflation, making them more accessible and understandable. This practice is especially relevant in an administrative context, where the ability to predict and analyze financial outcomes is crucial.

Additionally, problem-solving activities that involve the direct application of financial concepts are essential for developing practical skills. Sousa et al. (2022) argue that financial education should be approached in a transversal way, integrating with other disciplines and allowing students to see the relevance of financial concepts in various areas of knowledge. This approach not only enriches learning but also prepares students to face financial challenges in their personal and professional lives.

The National Common Curriculum Base (BNCC) reinforces the importance of financial education as an essential competence for the integral development of students, promoting interdisciplinarity and the connection of financial content with real situations (BRASIL, 2017). The BNCC recommends that the teaching of Financial Education be articulated with other areas of knowledge, such as Mathematics and Human Sciences, in order to develop practical skills and socio-emotional competencies (BRASIL, 2017). In this way, by integrating financial education with management, students not only learn theoretical concepts but also develop critical skills for making informed financial decisions, as is suggested by the aforementioned pedagogical methods, such as case studies and simulations.

The combination of these pedagogical strategies not only improves students' understanding of financial concepts but also empowers them to apply this knowledge in administrative contexts. Financial education, therefore, should be seen as an essential component in the training of young leaders and managers, equipping them with the necessary skills to make informed and effective financial decisions (GONÇALVES, 2021; SOARES, 2024).

In summary, the integration of financial education with management in high school can be significantly improved through pedagogical methods such as case studies, simulations, and problem-solving activities. These approaches not only facilitate the

learning of financial concepts but also prepare students for the administrative challenges they will face in the future, promoting a more holistic and practical education.

METHODOLOGY

This study is characterized as a quantitative, descriptive and exploratory research, focused on the analysis of the results of the Financial Education simulation applied to high school students, as part of the OLITEF (Treasury Direct Financial Education Olympiad). The methodology is based on the collection of data regarding the students' performance in a mock test composed of 35 multiple-choice questions, with varying degrees of difficulty (easy, medium and difficult), each assigned to a different score (3 points, 4 points and 5 points, respectively). Data collection was carried out after a series of preparatory classes and the simulation was used to measure the level of understanding of the main financial concepts addressed.

The sample of this study was composed of 112 students from the first year of high school at the Federal Institute of Mato Grosso, Campo Novo do Parecis Campus, distributed in four classes, A, B, C and MSI. All students participated in the preparatory classes, which focused on the development of knowledge in Financial Education, including topics such as inflation, simple and compound interest, financial planning, and investments. After the conclusion of the classes, the mock test was applied as an evaluation tool to measure the comprehension of the contents. Each question was classified according to its level of difficulty, in order to evaluate not only the success rate, but also the students' ability to deal with situations that required greater critical thinking and applied knowledge.

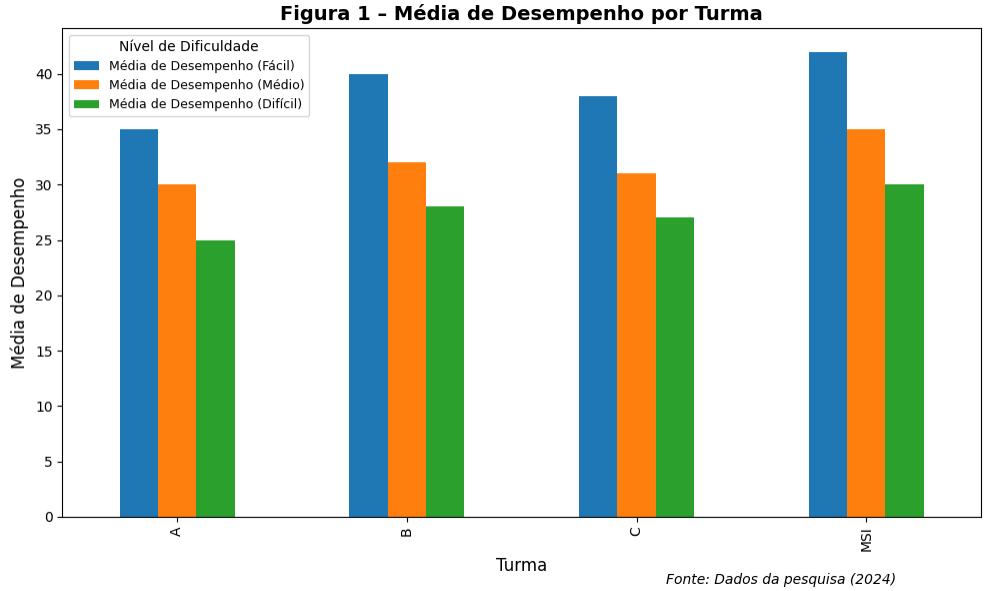
For data analysis, descriptive statistics were used, with the calculation of means, mode, and frequency distribution to evaluate performance by class, gender, and type of question. In addition, a correlational analysis was performed to identify possible relationships between student performance and variables such as the level of difficulty of the questions and gender. Correlational analysis allows you to assess the strength and direction of relationships between two or more variables, providing valuable insights into how these factors may be interconnected. In this study, we used Pearson's correlation coefficient to measure the linear relationship between quantitative variables, such as students' grades and the level of difficulty of the questions.

For example, we sought to verify whether there is a significant correlation between the performance in the most difficult questions and the gender of the students, which could indicate differences in the level of understanding of the contents according to gender. In addition, correlational analysis was used to explore whether performance on easy questions

is related to performance on more complex questions, suggesting consistent or inconsistent learning patterns. Correlation values close to +1 or -1 indicate a strong relationship, positive or negative, respectively, while values close to 0 suggest no correlation. These results allow us to identify areas where there is a need for more targeted pedagogical interventions, depending on the strength and direction of these correlations.

The data were organized in electronic spreadsheets, and the analysis was done using Microsoft Excel software for basic calculations, as well as visualization tools to create graphs. These graphs were used to illustrate the main results obtained, as shown in Figure 1, which shows the average performance per class, distributed according to the difficulty of the questions. All the graphs presented in the work follow the ABNT standards for visual reference, clearly identifying the legend, the title of the figure and the source of the data.

Figura 1 – Média de Desempenho por Turma



Fonte: Dados da pesquisa (2024)

Source: Survey data (2024)

Ethical aspects were also considered in this research. All participants and their legal representatives were informed about the objectives of the initiative, maintaining the anonymity of the participants and ensuring that all information was used exclusively for academic research purposes. This research complies with the ethical principles of research with human subjects and meets the legal requirements required for research in an educational setting.

With this methodology, it is expected not only to measure the performance of students, but also to understand the specific challenges they face when learning Financial Education, thus contributing to the improvement of pedagogical methods and the development of financial and administrative skills essential for adult and professional life.

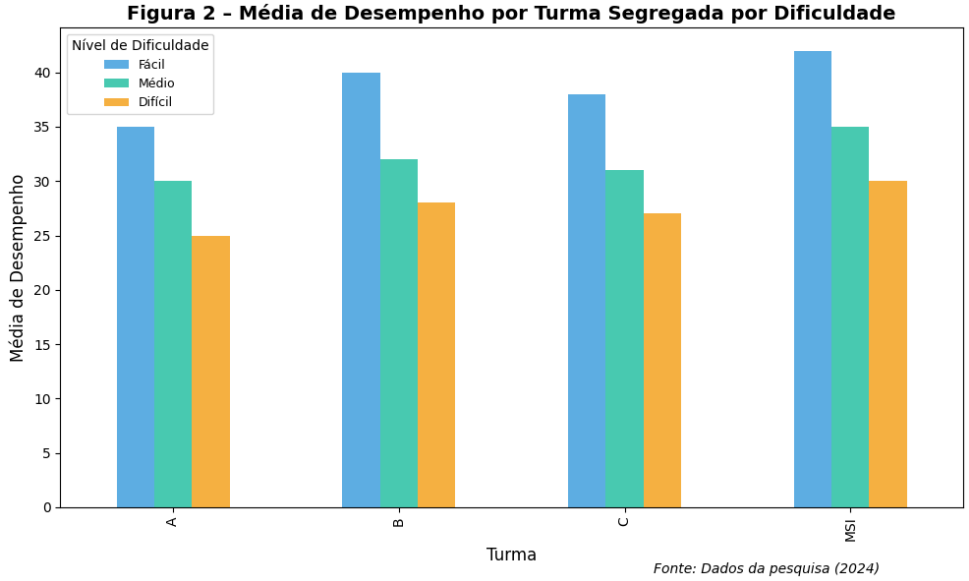
RESULTS

The results obtained from the application of the OLITEF simulation offer a detailed view of the performance of high school students in learning the fundamental concepts of Financial Education. From the descriptive analysis of the data, it was possible to identify significant differences in performance by class, by gender and by type of question, as well as to observe important patterns that suggest opportunities for targeted pedagogical interventions.

PERFORMANCE BY CLASS

The analysis of the average results by class showed that **the MSI Class** obtained the best average overall performance, with 38.68 points, followed by **Class B** with 36.94 points, **Class A** with 34.99 points and **Class C** with 33.43 points. These differences between classes can be attributed to factors such as student engagement during preparatory classes and differences in the dynamics of each class. Figure 2 illustrates the average performance of the four classes, segmented by the level of difficulty of the questions (easy, medium, difficult).

Figura 2 – Média de Desempenho por Turma Segregada por Dificuldade



Source: Survey data (2024)

PERFORMANCE BY QUESTION TYPE

The practice questions were classified into three levels of difficulty: **easy**, **medium** and **difficult,** with corresponding scores of 3, 4 and 5 points, respectively. It was observed that the easy questions had the highest rate of correct answers, with an average of **85%** of correct answers, while the medium and difficult questions had correct answer rates of **62%** and **39%,** respectively. These results indicate that, although students demonstrate a good

level of understanding in the most basic concepts, there is an increasing difficulty as the complexity of the topics increases, especially with regard to the concepts of compound interest and inflation.

PERFORMANCE BY GENDER

A comparative analysis between the genders revealed interesting differences in student performance. The average of **male students** was **38.09 points**, while the average of female students was **33.77 points**. These results suggest a difference in performance that may be related to several factors, including differences in engagement, self-efficacy in relation to Mathematics, or even the pedagogical style adopted during the preparatory classes. However, it is important to emphasize that the sample size is small and limited, so these differences should be interpreted with caution and not generalized.

ANALYSIS OF THE MOST DIFFICULT CONCEPTS

The results also showed that questions related to **compound interest** and **inflation** were the ones with the highest error rates, suggesting a consistent difficulty among students in understanding these more abstract concepts. **Question 9**, which addressed the impact of inflation on purchasing power, had only **9.82%** of correct answers, being the question with the lowest rate of correct answers in the simulation. **Table 1** presents an overview of the questions with the lowest rate of correct answers, highlighting the main topics and the percentage of correct answers.

Table 1 – Questions with the Lowest Answer Rate

Issue Number	Theme	Hit Rate (%)
9	Inflation	9,82
15	Simple Interest	12,5
17	Compound Interest	15,25
30	Investment Security	18,45

Source: Survey data (2024)

DISCUSSION

The discussion of the results obtained in this research reveals important points of reflection on the teaching of Financial Education in High School and the challenges faced by students in learning complex financial concepts. The data indicate a significant asymmetry between the understanding of the most basic concepts, such as those explored in easy questions, and the understanding of the more abstract concepts, such as compound interest and inflation, which proved to be the greatest sources of difficulty.

COMPARISON OF RESULTS WITH THE LITERATURE

The results of this research reinforce the critical importance of **financial education** in the formation of leaders and managers, especially in high school. As indicated in the theoretical framework, financial education goes beyond the transmission of knowledge about personal resource management, also acting as a catalyst for the development of essential managerial skills (RECH, 2024; GONÇALVES et al., 2022). In this research, it was found that many students had difficulties in abstract financial concepts, such as inflation and compound interest, which reinforces the need for a more practical and contextualized educational approach, as suggested by Silva and Selva (2020) and Carvalho and Scholz (2018).

GENDER DIFFERENCES IN PERFORMANCE

One of the key findings of this research was the **differences in performance between genders**. It was found that male students presented, on average, a higher performance than female students. This difference is consistent with the literature, which highlights the influence of psychological and cultural factors on students' self-efficacy in relation to financial and mathematical topics (GONÇALVES, 2021; CARVALHO and SCHOLZ, 2018). As argued by Santos (2019), cultural barriers can limit female students' confidence in their financial capabilities, reflecting in lower performance on topics that require complex quantitative reasoning, such as compound interest and risk analysis.

Therefore, it is critical that the pedagogical approach is adjusted to reduce these disparities, fostering a learning environment that encourages active participation and the development of female students' confidence. The adoption of methodologies that encourage collaboration and practice, such as case studies and financial simulations, can be particularly effective in reducing the performance gap, as suggested by Oliveira (2024). In this way, the goal is not only to improve the technical knowledge of the students, but also to promote a sense of belonging and competence that is crucial for their future performance as leaders and managers.

ANALYSIS OF THE MOST DIFFICULT TOPICS

The results of the survey also highlighted that **topics such as inflation and compound interest** represented the greatest challenges for students, presenting the lowest success rates. These concepts, which involve a significant level of abstraction, seem to be particularly difficult for high school students, as indicated in Table 2. According to Rocha and Paz (2023), abstract financial concepts such as these require a more practical

approach to facilitate understanding, a point that was evidenced in this research by the low rates of correct answers in questions related to these topics.

Table 2 – Topics of Greatest Difficulty and Pedagogical Suggestions

Theme	Hit Rate (%)	Pedagogical Suggestion
Inflation	9,82	Economic simulations and impact analysis
Simple Interest	12,5	Practical examples with everyday situations
Compound Interest	15,25	Use of electronic spreadsheets for visualization
Investment Security	18,45	Case studies on public and private investments

Source: Survey data (2024)

The literature points out that the lack of practical contextualization is one of the reasons for these difficulties. Silva and Menezes (2021) highlight that, in order to overcome the barrier of abstraction, it is essential that students are exposed to active teaching methodologies, such as simulations and the use of concrete examples from everyday life. The use of technologies, such as **financial simulators** and **spreadsheets**, can provide a more tangible and engaging learning experience, allowing students to see, in practice, how inflation affects purchasing power or how compound interest influences investments over time.

PEDAGOGICAL IMPLICATIONS AND PROPOSALS FOR IMPROVEMENT

Based on the results and the analysis of the theoretical framework, it becomes evident that there are several **pedagogical implications** that need to be considered to improve the teaching of financial education in high school. First, the educational approach should emphasize not only technical concepts, but also the development of critical and analytical skills, which are essential for the formation of future leaders and managers (RITTA and SILVA, 2017). As pointed out by Zuliani et al. (2020), financial education should be a preventive practice, focused on empowering students to make informed and safe financial decisions in the future.

One improvement proposal involves the **integration of active methodologies**, such as **case studies**, where students can apply financial knowledge in real or simulated situations. This approach promotes a deeper understanding of concepts and encourages the development of critical thinking, as discussed by Silva et al. (2022). In addition, the use of **financial simulations** allows students to make choices and understand their

consequences without the real financial risks, helping them to build a mindset oriented towards analysis and effective resource management (FREITAS and ROSA, 2019).

It is also essential to invest in **the training of teachers**. Well-prepared teachers are essential to ensure that financial concepts are taught in an effective and contextualized manner. Continuous training and access to modern teaching resources can help educators to transmit content in a way that engages and motivates students (GONÇALVES, 2021). Fostering an inclusive and encouraging learning environment is also crucial, particularly to reduce gender achievement gaps, as noted in the survey.

Finally, it is suggested the use of an interdisciplinary approach, where the concepts of financial education are integrated with other disciplines, such as Mathematics and Social Sciences. This not only reinforces financial learning but also shows students the relevance of these concepts in diverse real-life contexts (SOUSA et al., 2022). By adopting these improvement proposals, it is hoped that it will be possible to not only increase students' financial literacy but also prepare them to take on leadership and management roles in a more confident and informed manner.

CONCLUSION

This study investigated the relationship between the teaching of Financial Education in High School and the development of administrative and financial skills, using the simulated OLITEF as a basis for the analysis of student performance. From the results obtained, it was evident that Financial Education plays a crucial role in the training of young leaders and managers, providing not only technical knowledge, but also critical skills for conscious and responsible decision-making, both in personal and professional contexts.

The results revealed a significant disparity in student performance in more complex topics, such as inflation and compound interest. These concepts require a level of abstraction that has proven challenging for many students, corroborating the existing literature on the difficulties in teaching abstract financial concepts (SILVA and MENEZES, 2021). The lower rates of correct answers in these topics reinforce the need for more applied and practical teaching methodologies, which promote a tangible and relevant understanding of these concepts. Thus, it is essential to adopt approaches that facilitate active learning, such as financial simulations and the use of interactive tools, which can help make concepts less abstract and more related to students' daily lives.

Another important aspect observed was the difference in performance between genders, with male students presenting better results in relation to female students. This finding suggests that cultural barriers and self-efficacy issues may be limiting students'

potential in relation to Mathematics and Financial Education (GONÇALVES, 2021). To face this challenge, it is necessary to implement pedagogical actions that not only improve technical knowledge, but also stimulate students' self-confidence, promoting equity in learning and ensuring that everyone has the same opportunities for development.

The pedagogical implications of this research are clear: Financial Education needs to be integrated into the curriculum in an interdisciplinary way, aligning with other disciplines, such as Mathematics and Social Sciences, to offer students a more holistic and contextualized view of financial concepts. In addition, the continuous training of teachers is essential so that they can use innovative and contextualized methods, capable of engaging students and fostering more meaningful learning (GONÇALVES, 2021).

It is also suggested the adoption of active methodologies, such as case studies and simulations, which promote the practical application of financial knowledge, preparing students not only to manage their personal finances, but also to act in an informed manner in administrative and organizational contexts. These methods have been highlighted as effective in promoting critical skills, which are fundamental for the formation of future leaders and managers.

Finally, despite the limitations of this research, such as the size and diversity of the sample, the results obtained provide important subsidies for future investigations and interventions in the field of Financial Education. It is suggested that future research explore the impact of different pedagogical interventions and how these can contribute to reducing gender performance inequalities and improving the understanding of financial concepts. In short, by strengthening the teaching of Financial Education in High School, we are not only preparing students for adult life, but also promoting the formation of individuals who are more aware, critical, and prepared to face the economic challenges of the contemporary world.

ACKNOWLEDGMENTS

Deep gratitude is directed to the Federal Institute of Mato Grosso (IFMT) for the invaluable support in all stages of this research. We are grateful for the infrastructure, the continuous encouragement and the support offered, which were fundamental for the realization and success of this study. In addition, IFMT is recognized for supporting the publication of this article, contributing significantly to the dissemination of results and the advancement of knowledge in the area of Financial Education.

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THE SARS-COV-2 PANDEMIC AND THE IMPACT ON MEDICAL PRACTICE

https://doi.org/10.56238/sevened2024.031-003

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ABSTRACT

The COVID-19 pandemic represented an economic, social, and health crisis, requiring health systems to respond to the great pressure of care, due to the large number of infected people, collapsing in several places. In view of this situation, the moral dilemmas, which are common in the practice of medical professionals, have become more exacerbated, for example, when allocating a place for a patient in intensive care, in the face of scarcity. This study is a literature review on productions that addressed ethical dilemmas in the most acute period of the pandemic, concluding that there is a need for permanent education institutions and collective decision-making spaces for ethical decisions, based on moral judgments.

Keywords: Bioethics. Medical ethics. COVID-19. Doctor.

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INTRODUCTION

According to Dantas (2008), the study of ethics involving the exercise of health professions, in particular medicine, has received increasing attention in recent decades, all over the world, especially after the advent of the SARS-CoV-2 pandemic. Favoring the maintenance of this ethic, the Brazilian Society of Bioethics has been established in Brazil since the 1990s, with a plural and multidisciplinary character.

According to Brasil (2001), the study of ethics/bioethics is essential for the training of medical professionals, which should include ethical and humanistic dimensions, developing in the student "capacity for moral judgment" and values oriented towards citizenship. However, during the COVID-19 pandemic, these professionals were in charge of making delicate decisions, this was put in check by the media, since according to some authors, it may have been motivated by structural prejudices in society.

Throughout the text we will see a time frame from the beginning of 2020 to April 2022, on the integration of bioethics in the practice of medicine during the pandemic, this period being chosen due to the need to raise production during the most acute period of the health emergency.

GUIDING QUESTIONS:

A. What scientific evidence exists on the incorporation of bioethical principles in physicians' decision-making in the care of patients with COVID-19;
B. What factors favor or hinder the incorporation of these principles into the reality of care

OBJECTIVES

A. To characterize the scientific production in the period between 2020 and 2022 about the incorporation of the principles of bioethics in medical practice during the COVID 19 pandemic;
B. Discuss the implication of the main results in light of the Charter of the Declaration of Human Rights 1948 (UN)

METHOD AND METHODOLOGY

It is a bibliographic review based on the definition of Marconi and Lakatos (2005) that aims to study a focus or a subject, not only citing parts of these texts, repeating what is already written, but rather, to be able to have a critical view of what is written, it is a scientific activity that helps to discover and understand reality.

The research was elaborated from the following stages: a) choice of the theme and research questions; b) definition of objectives; c) determination of inclusion and exclusion criteria for the search for scientific studies; d) bibliographic survey in the selected virtual databases; e) interpretation and analysis of the data found; and, f) presentation of the results. The Virtual Health Library (VHL) and the National Center for Biotechnology Information (NIH) of PUBMED were chosen as the starting point for the search for scientific studies related to the theme studied. Through this database, it was possible to access other databases. The Health Sciences Descriptors (DeCS) selected were "Covid-19", "Medical", "Bioethics" and "Professional Practice", which were cross-referenced in order to enable a refinement of the search, using the Boolean operator "*and*".

The search for scientific studies in the databases referred to above was carried out between April and June 2024. The inclusion criteria for studies established for the review were:

- Scientific articles, theses, master's dissertations, monographs;
- Publications with full text available in the consulted databases;
- Publications in Portuguese, English and Spanish;
- Publications from the last two years, from 2020 to April 2024, from the beginning of the SARS-CoV-2 pandemic in the world.

The exclusion criteria included the following intellectual productions: preliminary notes, partial reports (ongoing research), interviews, reviews, opinion articles, conferences and manuals.

In the first search, the descriptor "Covid-19" was used in isolation, resulting in 452,221 publications in the VHL, and 358,065 in the NIH. For the second search, the descriptor was used. "Medical" were located in 8,873 publications in the VHL and in the NIH. In the third search, using the descriptor "Bioethics", 693 publications were found in the VHL, and 181 in the NIH. In the fourth search, the descriptor "Professional Practice" was applied and no publications were identified in the VHL, and 5,534 were seen in the NIH. In the fifth search with the descriptor "Covid-19" associated with the term "Doctor", 853 were identified in the VHL, and 2,068 in the NIH. In the sixth search with the descriptor "Doctor" next to the term "Bioethics", fourteen publications were detected. In the seventh search using the descriptor "Bioethics" associated with the terms "Professional Practice", no publication was found. In the eighth search, the descriptor "Covid-19" was applied and associated with the term "Bioethics", and 89 publications were found. In the ninth search, the descriptors "Covid-19" were used, and the descriptors "Doctors" and "Bioethics", and no publication was identified. In the tenth search, the descriptors "Covid-19" were used, with

the descriptors "Physicians", "Bioethics" and "Professional Practice", and no publications were discovered, as shown in Chart I and Chart II.

With the application of the inclusion and exclusion criteria, of the 132 productions found, 101 were excluded, because they did not meet the previously established parameters, 25 articles were paid, 13 were repeated and 17 were unavailable on the VHL website. And of the 49 productions found on the NIH website, 32 were excluded because they did not meet the previously established parameters, 3 articles were paid, 1 was repeated, and 9 were unavailable. As a result, 9 articles remained as a final sample for interpretation and analysis. This material then underwent a floating exploratory reading to verify its adequacy to achieve the objectives proposed by the present investigation. Then, a critical reading of the same material was carried out, seeking the analytical contribution of the text to the research in question.

To enable the interpretation of the material found, the selected references were organized in a synoptic table according to the following information: title of the article, language, author, title and area of knowledge, year, journal of publication, objectives, methodology and results (Chart III and Chart IV). Then, the data were analyzed descriptively without disregarding some quantitative aspects, when available, and discussed in the light of the pertinent bibliography. As this is a bibliographic research, it was not necessary to submit to an Ethics Committee. There are no conflicts of interest associated with the publication of this article.

Chart I - *Table demonstrating the search strategy in the databases for inductive words, taken from the VHL.*

Quest	Structure	Search syntax	Result
#1	"Covid-19" Filters: Articles, Theses and Dissertations, Portuguese, English and Spanish, 2020 to April 2022.	mh:(covid19) AND (fulltext:("1" OR "1") AND la:("en" OR "es" OR "pt") AND type:("article" OR "monography" OR "thesis")) AND (year_cluster:[2020 TO 2022])	157.869
#2	"Doctor" Filters: Articles, Theses and Dissertations, Portuguese, English and Spanish, 2020 to April 2022.	mh:(médico) AND (fulltext:("1" OR "1") AND la:("en" OR "es" OR "pt") AND type:("article" OR "monography" OR "thesis")) AND (year_cluster:[2020 TO 2022])	8.100

#3	"Bioethics" Filters: Articles, Theses and Dissertations, Portuguese, English and Spanish, 2020 to April 2022.	mh:(bioética) AND (fulltext:("1" OR "1") AND la:("en" OR "es" OR "pt") AND type:("article" OR "monography" OR "thesis")) AND (year_cluster:[2020 TO 2022])	693
#4	"Professional practice" Filters: Articles, Theses and Dissertations, Portuguese, English and Spanish, 2020 to April 2022.	mh:(prática profissional)AND (fulltext:("1" OR "1") AND la:("en" OR "es" OR "pt") AND type:("article" OR "monography" OR "thesis")) AND (year_cluster:[2020 TO 2022])	0
#1 AND #2	“Covid-19” AND "Médico"	(mh:(médico)) AND (mh:(covid-19)) AND (fulltext:("1") AND la:("en" OR "es" OR "pt") AND type:("article" OR "monography")) AND (year_cluster:[2020 TO 2022])	853
#2 AND #3	"Medical" AND "Bioethics"	(mh:(médico)) AND (mh:(bioética)) AND (fulltext:("1") AND la:("en" OR "es" OR "pt") AND type:("article" OR "monography")) AND (year_cluster:[2020 TO 2022])	14
#3 AND #4 AND	"Bioethics" AND "Professional Practice"	(mh:(bioethics)) AND (mh:(professional practice))	0
#1 AND #3	“Covid-19” AND “Bioética”	(mh:(covid-19)) AND (mh:(bioética)) AND (fulltext:("1") AND la:("en" OR "es" OR "pt") AND type:("article" OR "monography")) AND (year_cluster:[2020 TO 2022])	89
#1 AND #2 AND #3	“Covid-19” AND "Médico" AND “Bioética”	(mh:(covid-19)) AND (mh:(médico)) AND (bioética) AND (fulltext:("1") AND la:("en") AND type:("article")) AND (year_cluster:[2020 TO 2022])	0
#1 AND #2 AND #3 AND #4	"Covid-19" AND "Medical" AND "Bioethics" AND "Professional Practice)	(MH:(COVID-19)) AND (mh:(medical)) AND (mh:(bioethics)) AND (mh:(professional practice))	0

Chart II - *Table demonstrating the search strategy in the databases for inducing words, taken from the NIH.*

Search	Structure	Search syntax	Result
#1	"Covid-19" Filters: Articles, Theses and Dissertations, Portuguese, English and Spanish, 2020 to April 2022.	("covid 19"[MeSH Terms]) AND ((ffrft[Filter]) AND (fft[Filter]) AND (2020/1:2022/4[pdat]) AND (english[Filter] OR portuguese[Filter] OR spanish[Filter]))	126,263
#2	"Doctor" Filters: Articles, Theses and Dissertations, Portuguese, English and Spanish, 2020 to April 2022.	("physicians"[MeSH Terms]) AND ((ffrft[Filter]) AND (fft[Filter]) AND (2020/1:2022/4[pdat]) AND (english[Filter] OR portuguese[Filter] OR spanish[Filter]))	9,938
#3	"Bioethics" Filters: Articles, Theses and Dissertations, Portuguese, English and Spanish, 2020 to April 2022.	("bioethics"[MeSH Terms]) AND ((ffrft[Filter]) AND (fft[Filter]) AND (2020/1:2022/4[pdat]) AND (english[Filter] OR portuguese[Filter] OR spanish[Filter]))	181
#4	"Professional practice" Filters: Articles, Theses and Dissertations, Portuguese, English and Spanish, 2020 to April 2022.	("professional practice"[MeSH Terms]) AND ((ffrft[Filter]) AND (fft[Filter]) AND (2020/1:2022/4[pdat]) AND (english[Filter] OR portuguese[Filter] OR spanish[Filter]))	5,534
#1 AND #2	“Covid-19” AND "Médico"	("covid 19"[MeSH Terms] AND "physicians"[MeSH Terms]) AND ((ffrft[Filter]) AND (fft[Filter]) AND (2020/1:2022/4[pdat]) AND (english[Filter] OR portuguese[Filter] OR spanish[Filter]))	2,068
#2 AND #3	"Medical" AND "Bioethics"	("physicians"[MeSH Terms] AND "bioethics"[MeSH Terms]) AND ((ffrft[Filter]) AND (fft[Filter]) AND (2020/1:2022/4[pdat]) AND (english[Filter] OR portuguese[Filter] OR spanish[Filter]))	12

#3 AND #4 AND	"Bioethics" AND "Professional Practice"	("bioethics"[MeSH Terms] AND "professional practice"[MeSH Terms]) AND ((ffrft[Filter]) AND (fft[Filter]) AND (2020/1:2022/4[pdat]) AND (english[Filter] OR portuguese[Filter] OR spanish[Filter]))	25
#1 AND #3	“Covid-19” AND “Bioética”	("covid 19"[MeSH Terms] AND "bioethics"[MeSH Terms]) AND ((ffrft[Filter]) AND (fft[Filter]) AND (2020/1:2022/4[pdat]) AND (english[Filter] OR portuguese[Filter] OR spanish[Filter]))	47
#1 AND #2 AND #3	“Covid-19” AND "Médico" AND “Bioética”	("covid 19"[MeSH Terms] AND "physicians"[MeSH Terms] AND "bioethics"[MeSH Terms]) AND ((ffrft[Filter]) AND (fft[Filter]) AND (2020/1:2022/4[pdat]) AND (english[Filter] OR portuguese[Filter] OR spanish[Filter]))	2
#1 AND #2 AND #3 AND #4	"Covid-19" AND "Medical" AND "Bioethics" AND "Professional Practice)	("covid 19"[MeSH Terms] AND "physicians"[MeSH Terms] AND "bioethics"[MeSH Terms] AND "professional practice"[MeSH Terms]) AND ((ffrft[Filter]) AND (fft[Filter]) AND (2020/1:2022/4[pdat]) AND (english[Filter] OR portuguese[Filter] OR spanish[Filter]))	0

RESULTS AND DISCUSSION

i. The content of the ten scientific articles that met the previously established inclusion criteria was analyzed. To facilitate the interpretation and presentation of the results, Chart III and Chart IV were prepared containing the following data: title, language, author, title and area of knowledge, year, journal of publication, research objectives, methodological aspects and main results of each study.

ii. The ten articles analyzed were published between 2020 and 2024, with two publications available in trilingual mode (English, Spanish, and Portuguese), one in Spanish, seven in English. Regarding the journal of publication, the "Bioethics Journal" stood out with the publication of two articles referring to the theme of bioethics in the context of COVID-19. Regarding authorship, articles published by

two or more authors stood out. In the articles that explained the authors' titles, it is noted that the majority are physicians.

With regard to methodological aspects, most articles with a qualitative approach were observed, as they deal with subjective and personal subjects. As stated by Neves (1996), the qualitative study uses a set of different interpretative techniques that aim to describe and decode the components of a complex system of meanings. Aiming to translate and express meaning of the phenomena of the social world. The critical reading of the selected articles demonstrated that the qualitative approach was adequately aligned with the objects of study, allowing the achievement of the proposed objectives.

A major obstacle found in the research is the lack of use of the Health Sciences Descriptors (DeCS) "Professional Practice", although there are articles with this theme, the descriptor was not applied to these articles, especially in the VHL.

Chart III - Characteristics of the articles published on the theme of Bioethics in medical professional practice in the context of COVID-19, found on the VHL platform.

Title/Language	Author/ Degree	Year	Magazine	Objectives	Methodology	Result
Bioethics and the allocation of resources in the covid-19 pandemic (Portuguese, English and Spanish)	**Authors:** Storto, GG; Arita, STAR; Santos, MS; Yay, JS. **Titration:** No specification of the title.	2021	Bioethics Journal	The objective of this literature review is to understand and compile the main extraordinary protocols based on ethical, legal, and scientific criteria – and, above all, on human rights – established to guide the allocation of resources during the first six months of the pandemic in Brazil.	This research included studies carried out both in Brazil and in other countries, including recommendation articles and clinical practice manuals produced due to the pandemic, as well as review articles, medical consensuses, and theses. Articles that dealt exclusively with the allocation of scarce resources or bioethics were excluded.	The bioethical guidelines aimed at the pandemic recommend that it is up to the State to guarantee full and equitable access to health, as provided for in the Federal Constitution, especially in periods of crisis. Studies corroborate this premise and affirm that there should be ICU beds, ventilators, personal protective equipment (PPE) and all the necessary material to care for everyone who needs care in

						public institutions.
Relational autonomy: lessons from COVID-19 and twentieth-century philosophy (English)	**Authors:** Gómez-Vírseda, C; Usanos, RA. **Titration:** No specification of the title.	2021	With Health Care Philos	To show how six different philosophical branches—namely, philosophy of nature, philosophical anthropology, existential phenomenology, discourse ethics, hermeneutics, and cultural anthropology—incorporated the category of relation throughout the twentieth century.	Hypothetical-deductive. Our hypothesis is that medical ethics has not definitively incorporated the concept of relations into the core of the decision-making process. To achieve a successful onboarding, we proceed in four steps.	As a result of this ability, Dasein is said to be a "being in the world." Therefore, the question of being must begin with the analysis of Dasein. A first approach to this question states that "the essence of this being is in its 'being' [being relative to]" (Heidegger 1962, p. 67). In other words, your existence, your way of being in the world, is open. He is an open being.
Recommendations of the Uruguayan Society of Intensive Care Medicine on bioethical aspects in the Covid-19 pandemic (Spanish)	**Authors:** Giordano, A; Canale, A; Pontet, J; Reyes, N; Cacciatori, A; Correa, H; Núñez, LA. **Degree:** 7 Doctors.	2021	Medical Journal of Uruguay	Perform a bioethical analysis to guide the care of critically ill patients. Specific objectives: 1) To analyze the fundamental bioethical principles in this context, 2) To support physicians in making difficult decisions, 3) To	SUMI generated a collective work environment whose work method was deliberative. The documentation uses the literature review and existing protocols.	The work proposes a documented theoretical analysis of the bioethical principles involved in the context of the Pandemic, on the scenarios of health demand and on the foundations for a change of ethical

				make explicit the criteria for allocating resources, 4) To define lines of action in the face of a possible "health disaster" scenario.		criteria in a scenario of saturation of the system.
Covid-19 and ageism: ethical evaluation of the distribution of health resources (Portuguese, English and Spanish)	**Authors:** *Soares, TA; Corradi-Perini, C; Macedo, CPL; Ribeiro, URVCO.* **Degree:** 2 specialists, 1 Master, 1 PhD.	2021	Bioethics Journal	The objective is to think about the bioethical implications of this type of discrimination with regard to the principles of justice and human dignity, considering the global health scenario and the current COVID-19 pandemic.	Documentary research was carried out on the themes of covid-19, ageism and allocation of resources in health. The critical analysis of the literature found, national and international, founded this theoretical essay.	Thus, arguments that use as justification the low probability of recovery of the elderly infected by the coronavirus do not take into account one of the main characteristics of aging: heterogeneity in terms of functionality and health status.
Fair and equitable subject selection in concurrent COVID-19 clinical trials (English)	**Autores:** Jansen, MO; Angelos, P; Schrantz, SJ; Donington, JS; Madariaga. MLJ; Zakrison, TL. **Title:** 2 Physicians, 3 Specialist Physicians and 1 General Surgeon.	2020	J Med Ethics	In response to this experience, we propose several guidelines that aim to reinforce fair and equitable subject selection for concurrent COVID-19 trials.	The application method introduces technological and language-related barriers that can hinder the fair selection of subjects. These barriers include speaking a non-native language, lack of access to technology, and lower levels of health literacy.	As a result, investigators and treating physicians must decide which patient has priority in receiving investigative resources, raising questions about how to select patients equitably and fairly.

Chart IV - Characteristics of articles published on the topic of Bioethics in medical professional practice in the context of COVID-19, found on the NIH platform.

Title/Language	Author/ Degree	Year	Magazine	Objectives	Methodology	Result
Work of a paediatric bioethics centre during the COVID-19 pandemic first phase (English)	**Autores:** Brierley J, Aylett S, MacNiven A, Dittborn M. **Degree: 4** PHD in pediatrics.	2021	Arch Dis Child	Decisions with an ethical component have been controversial during the COVID-19 pandemic, whether it's leaked intensive care unit (ICU) rationing documents, transferring people to nursing homes to 'protect the National Health Service', or the duty to treat patients despite inadequate personal protective equipment. To counter criticism of ethics itself and to help those planning ethical support, we describe the practical work of a bioethics team at a children's hospital in supporting children, families, and physicians during this unprecedented time.	Three phases of activity: (i) preparation: we composed several documents to support/guide the hospital teams and, together with colleagues, we provided them to the regional inpatient, community and hospice environments. We adapted existing mechanisms to combat moral injury to the workforce; (ii) Activity (March-June 2020): Was highest in our rapid response service, where children/families find treatment decisions difficult with medical teams. Education provided 'pandemic webcasts' on broader decision-making and concerns about children's health. Staff support was essential, especially for those allocated to overburdened local adult ICUs. The survey ascertained the opinions of young people about the pandemic; (iii)	Our bioethics team's role during the pandemic included: case reviews via videoconference, many involving innovative therapy for critically ill children with COVID-19/Paediatric-Inflammatory-Multisystem-Temporally Associated SARS-CoV-2 Syndrome together with their parents; processes to protect the health team from moral damage and research/education activities focused on the specific pediatric ethics that emerged during the pandemic.

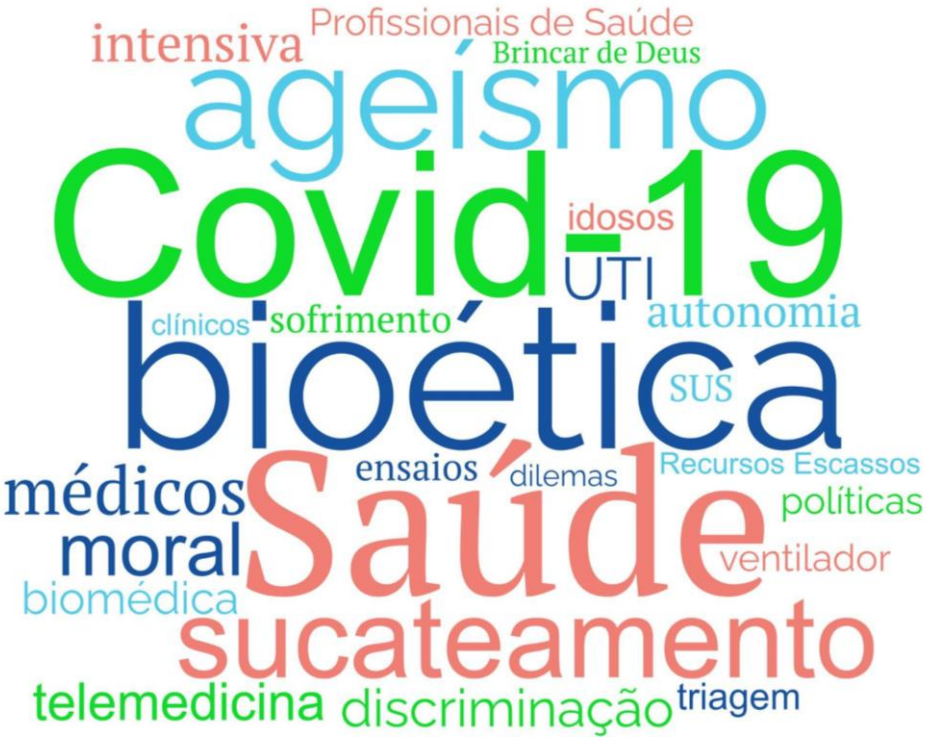
					reflection: focused on (a) research on future relocation to adult services and minimization of moral distress/injury.	
Priority-setting dilemmas, moral distress and support experienced by nurses and physicians in the early phase of the COVID-19 pandemic in Norway(Inglês)	**Autores:** Miljeteig, I., Forthun, I., Hufthammer, K. O., Engelund, I. E., Schanche, E., Schaufel, M., & Onarheim, K. H. **Titration:** No specification of the title.	2021	Nursing Ethics	Describe dilemmas of priority setting, moral distress and support experienced by nurses and doctors in all medical specialties in the early phase of the COVID-19 pandemic in western Norway.	A hospital-based cross-sectional survey was conducted from April 23 to May 11, 2020.	Among the 1,606 respondents, 67% experienced prioritization dilemmas in the previous two weeks. Health care workers who were directly involved in COVID-19 care, were redeployed, or worked in psychiatry/addiction medicine experienced it more often.
Ventilator Triage Policies During the COVID-19 Pandemic at U.S. Hospitals Associated With Members of the Association of Bioethics Program Directors (English)	**Authors:** Antommaria AHM, Gibb TS, McGuire AL, Wolpe PR, Wynia MK, Applewhite MK, Caplan A, Diekema DS, Hester DM, Lehmann LS, McLeod-Sordjan R, Schiff T, Tabor HK, Wieten SE, Eberl JT; **Titration:** No specification of the title.	2020	Ann Intern Med	Characterize the development of ventilator screening policies and compare the content of the policies.	Mixed-methods content research and analysis. U.S. hospitals associated with the members of the Association of Bioethics Program Directors. Characteristics of institutions and policies, including screening criteria and members of the screening committee.	Sixty-seven program directors responded (response rate, 91.8%); 36 (53.7%) hospitals did not yet have a policy and 7 (10.4%) hospitals could not be shared. The 29 institutions offering policies were distributed relatively evenly across the 4 U.S. geographic regions (range 5-9 policies per region). Among the 26 unique policies analyzed, 3 (11.3%) were produced by state health departments.
Who Gets the Last Bed? A Discrete-Choice Experiment Examining General Population Preferences for Intensive Care Bed	**Autores:** Street AE, Street DJ, Flynn GM **Titration:** No specification of the title.	2021	Med Decis Making	Explore key patient attributes important to members of the Australian general population when prioritising patients for the	A discrete choice experiment run online asked respondents (N = 306) to imagine that the number of COVID-19 cases had increased and	A latent class model with 3 classes was found to be the most informative. Two classes valued active decision-making and were slightly more likely to choose patients with care

Prioritization in a Pandemic (English)				final intensive care unit (ICU) bed in a pandemic overcapacity setting.	that they were lay members of a panel tasked with allocating the final ICU bed. They had to decide which patient was most deserving for each of the 14 pairs of patients. The patients were characterized by 5 attributes: age, occupation, caregiver status, health before infection, and prognosis. Respondents were randomly allocated to one of 7 sets of 14 pairs. Multinomial, mixed logit, and latent class models were used to model the observed choice behavior.	responsibilities over those without. One of these classes placed a stronger value on prognosis, with a decreasing likelihood of bed allocation for those aged 65 years and older. The other placed a high value on prognosis and age, with a decreasing likelihood of bed allocation for those aged 45 and older and a slight preference in favor of frontline health workers.

After reading the articles, we observed that in relation to the techniques used for data collection, the one that stood out the most were semi-structured and structured interviews. As exposed by Manzini (2004) in his study, the interview is a process of social interaction, the data are of a social nature, and this needs to be taken into account in the interpretation of the results. Like Minayo (1994), who understands qualitative study as one that works with the universe of meanings, motives, aspirations, beliefs, values and attitudes. In view of the above, the choice of semi-structured and structured interview formats is considered appropriate to achieve the objectives established in the articles.

According to the analysis of the articles, we noticed how the medical professional has difficulty in making decisions, mainly based on the current ethical aspects, which can often act in an ageistic manner, taking only chronological age as a motivation for the distribution of respiratory devices. As predicted by the methodology, content analysis was carried out according to Laurence Bardin, where the units of meaning emerged, which were grouped in order to form a word cloud with these elements, elaborated from Wordclouds(R). In the

image below (Image 1), the longer the word, the more this unit appeared during the analysis:



The schematic representation of this cloud reveals that the core of the researched scientific production covered the theme of bioethics and COVID-19, establishing interfaces with important aspects such as: scrapping, ageism and health, among other subjects less frequently addressed, namely: telemedicine, politics, suffering, playing God.

In addition, the following analytical categories were established after the floating reading of the articles selected for study: 1) Medical practice and bioethical dilemmas experienced in the COVID-19 pandemic: reflections on scientific production in the period from 2020 to 2024; and, 2) Interfaces, gaps and challenges of scientific production in bioethics and their implications for *praxis* in the light of the Charter of the Declaration of Human Rights.

CATEGORY 1 – MEDICAL PRACTICE AND BIOETHICAL DILEMMAS EXPERIENCED IN THE COVID-19 PANDEMIC.

This category addresses the scientific production on the dilemmas experienced by physicians, in various scenarios, during the COVID-19 pandemic. The articles addressed bioethical dilemmas in a tangential way, but more specifically deal with the consequences of the decision, with regard to the psychic suffering in the professional due to the decision

process, and this can be exemplified by the recurrent discussion that the professionals attributed to this aspect the practice of "playing God". The COVID-19 pandemic has ignited numerous bioethical debates and, according to Gómez-Virseda and Usanos (2021), has put into question many principles and assumptions of bioethics, demanding new moral responses.

The bioethical current of principlism addresses in its principles central moral norms to judge the ethics of an action, focusing on the moral principles that supported the act. The principle of autonomy is related to self-determination or self-government (REGO, PALÁCIOS and SIQUEIRA-BATISTA, 2009).

Sometimes, as seen in the articles, the user's autonomy is put in the background under the argument that he does not have enough knowledge to decide about his therapy and ends up being taken exclusively by health professionals, ignoring the subject's desires and perspectives and a moral obligation to respect the user's autonomy (REGO, PALÁCIOS and SIQUEIRA-BATISTA, 2009).

Among the ethical questions, ageism emerged in several publications because the user's age is one of the main indicators for deciding on the granting of intensive care unit beds and ventilators, as this population is considered by many to be more vulnerable and dependent. The term was proposed in 1969 by Robert Neil and can be represented by "ageism", and means discrimination carried out solely on the basis of age. This may indicate the lack of medical health protocols for the allocation of scarce resources, even more so in a scenario of an emerging disease, which prioritizes issues beyond age group and biologicism, but bringing bioethical issues to these protocols.

Such a scenario was evident during the pandemic with the health crisis of lack of beds for elderly patients demonstrated in Italy during the pandemic, a country with a large part of the elderly population. This is stated in the review carried out by Storto et al (2021), in which it is stated that protocols pointed out that it is ethically justifiable to "prioritize the most affected and the youngest".

The COVID-19 pandemic has opened up the ageism that is present in society's daily life in a less noticeable way, as criteria such as chronological age were overvalued by some professionals and protocols. In this sense, we can verify the statement made by Soares et al (2021): "the pandemic exposes ageism, which has always been present in social reality, but, like other existing discriminatory practices, it manifested itself in most cases in a veiled way.".

In this sense, we can still verify in the selected articles statements regarding age discrimination in health care during the pandemic:

> "It is common, for example, for surgeries to be contraindicated for the elderly without considering the real chances of success of the procedure. Chronological age also appears to influence medical professionals in decisions about non-cardiac resuscitation order." (Soares et al, 2021, p. 243)

In addition, in a global context, protocols were constructed, in which the age criterion exerted a strong influence on the allocation of scarce beds, as we can see:

> "The first protocol for the allocation of scarce resources in the covid-19 pandemic was issued by the Società Italiana di Anesthesia, Analgesia, Rianimazione and Intensive Care (Siaarti). One of the measures proposed to limit admission to intensive care was chronological age – together with the presence of comorbidity and functional status (...). (Soares et al, 2021, p 244)
> "Chronological age continued to be used as a criterion in policies enacted in other European countries, such as Switzerland, and in the United States, especially in protocols for prioritizing resources and triage for intensive care, often arbitrarily, without standardizing age cutoff points." (Soares et al, 2021, p 244)

On the other hand, it is important to highlight, given its national relevance and its function of ethical standardization for the medical category, Resolution 2,156/2016 of the Federal Council of Medicine, which established that age could not be a criterion of discrimination for the decision of admission and discharge in intensive care units. Such a position is consistent with the Universal Declaration of Human Rights, which emphasizes the right to life and non-discrimination for any condition, in this sense, including age.

In addition, another important aspect to be addressed is the gap in the transversal approach to ethics and bioethics in the curricula of undergraduate medical courses. In this sense, the lack of preparation in medical practice is a reflection of a lack of training since graduation.

The National Curriculum Guidelines for Medicine (CNE, 2014) indicate that the graduate must have a general, humanistic, critical, reflective and ethical education, with a commitment to the defense of citizenship and human dignity. Such determinations corroborate the Constitutional Charter of 1988, which places the right to health as a right of all. The challenge presented is more than the construction of isolated disciplines of Bioethics, but that such contents and debates appear longitudinally throughout the medical training curriculum.

In the pandemic scenario, the psychic suffering of the physician was evident during the pandemic, with concerns about his own health and that of those close to him, dealing with a disease in discovery and aggravated by the bioethical dilemmas, many of them arising from the scarcity of vacancies in intensive care units and the scrapping pointed out in the articles.

In addition, the articles point out that in times of pandemic it is ethically justifiable that it is necessary, due to the high demand and limited capacity to provide assistance to health systems, the rationing of resources.

> "The scrapping of public health services undermines the system's capacity in human and material aspects, being a structural problem that the population has faced for decades, without receiving sufficient attention from the body politic. During the pandemic, this deficit became even more evident, as public health spending grew minimally in Brazil compared to other countries, such as Italy and Spain, and the expansion of beds was insufficient to meet the growing demand" (STORTO et al, 2021, p. 826)

> "(...) in order to inhibit any possibility of scarcity, it is up to the State to offer resources, including financial, social, and psychosocial support, as well as meeting basic needs, such as food, water, and other essential items, with an emphasis on vulnerable populations." (STORTO et al, 2021, p; 826)

The articles expose the wound, but do not give the remedy for a multifactorial issue and that there was not, due to multifactorial issues, but mainly due to the exhaustion of health systems and shortage of professionals, the right to life fully guaranteed and fairly for all, as prescribed in the Universal Declaration of Human Rights.

element. The alternatives are in the service, but not with a deeper impact such as in professional training, requiring structural changes in the context of medical training at its various levels and a proactive role of ethics committees, with a role of discussion, reflection and improvement, as opposed to a punitive view.

The Charter of the Declaration of Human Rights can bring elements that help moral judgment, as an important factor to aid decision-making. The Universal Declaration of Human Rights was adopted and approved by the United Nations Assembly on December 10, 1948. The Declaration states that all men are born free and equal and that they shall not be subjected to discrimination on account of race, color, sex, language, religion, political or other opinion, national or social origin, property, birth, or any other condition. Life is seen as a right of every human being and must be preserved, therefore, a dilemma arises in the context of the pandemic, in which the right to live collides with the scarcity of public and private resources, necessary for the maintenance of life.

Bioethics is essential for medical practice and is essential for the maintenance of life, and should be observed by health professionals. Bioethics allows moral judgments to be made based on systems of balancing principles, by adopting them as *prima* facie, without hierarchy between them. Bioethics has a role in shaping medical practice for the most appropriate decision-making, after the analysis of several factors and their considerations, considering that the professional, not only during the pandemic, is faced with ethical

dilemmas, whether due to patient issues or those imposed by the health system itself, such as the absence of equipment and medications.

The interface between Bioethics and professional performance can occur in three dimensions: programmatic, which is what we have instituted the Medical Ethics Committees, clinical protocols and guidelines and which shows that the implementation of these assumptions is weakened in practice, as we have, several times, documents at the level of scientific excellence, but in practice there is a lack of structuring of the reality of the service for this to actually be implemented.

> In this sense, we bring the statement of the UN Human Rights Committee: "The UN Human Rights Committee states that the promotion of care that prioritizes the right to life requires a regulatory structure in hospitals and health institutions, reinforcing the importance of establishing prior conducts and reorganizing the system and the sectors that receive investments." (STORTO et al, 2021)

Another issue is how the procedures are described and how the situations occur in real life, with overcrowding, deficit of professionals and other issues that move the plane away from ideas of actions and, in addition, a third, which is the lack of institutional culture for discussing bioethics within the culture of permanent education and permanent and inclusive instances in institutions and which comes from the initial training of health professionals, by not carrying out a transversal discussion about ethics during the completion of the teaching itinerary, going through the residency, seen at most as isolated disciplines in the curriculum.

In addition to these factors, the socioeconomic aspect presented by the studies should be presented, which directly reflect on health care, accentuating the social determination of the health-disease process.

Although equity is one of the principles of the Unified Health System and this has a role in the defense of ethical issues, if a right and individual autonomy is observed, Brazil is a developing country, with an exacerbation of inequity and the pandemic was a factor in increasing poverty, depriving the population of basic needs such as work, food and full access to health.

Technological and industrial dependence on developed countries was one of the facts that worsened the health crisis for countries like Brazil, experiencing a shortage of personal protective equipment and vaccines, as well as equipment such as mechanical ventilators and essential drugs for intensive care.

The human dimension of the practice of decoding ethical aspects in the dynamics of the professional routine must be taken into account, in this sense presented as this occurs on a daily basis, that is, how professionals, based on their own constructions, outline their

decisions, in the midst of the absence of decision support bodies, and another element of this same dimension is the illness of the professionals themselves, whether due to the issues of precarious work or even the constant experience in scenarios of scarcity that lead them to make quick decisions.

The perception of a given regulation varies, even, for each professional, performing its own balance, being able to demonstrate in practice how health professionals interpret the code of ethics and implement it at the bedside, on the pandemic front and in their consultations. This aspect imposes limits and points out weaknesses in the application of regulations, when not carried out through constant reflections on ethics and praxis.

CONCLUSION

Autonomy, especially in the hands of the medical profession, is a characteristic of the profession, however, this fact requires that we advance in moral education and in in-depth discussions of bioethics in undergraduate courses and in continuing education in health services. Professionals on the front line dealt with several dilemmas without the necessary instruments to make moral decisions and using, several times, their own concepts and values, emphasizing that the pandemic was an aggravation of a reality present throughout their professional lives.

In this context, it is essential to oppose the erasure of the subject and practice the shared decision with the other members of the care team, with the user and with their families. Considering that autonomy can be seen from several perspectives, one of them being the autonomy of the individual, who has the right to choose his or her therapies, except in the case of death, and of the professionals, who must limit the choices of users, within a context of clarification.

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ORGANIZATIONAL CULTURE AND CLIMATE: DRIVERS OF THE PRODUCTIVE ECOSYSTEM

https://doi.org/10.56238/sevened2024.031-004

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ABSTRACT

This qualitative literature review article aims to understand which intervention strategies in organizational culture and climate are likely to be implemented to foster common well-being and productivity, as a whole, in organizations. Likewise, to understand that culture and climate, as the 'soul of organizations', are *drivers* of this productive ecosystem that effectively produce measurable effects in qualitative and quantitative aspects, and how the perspectives of work in society over time move from labor and manufacturing activities with long and unhealthy working hours with workers in precarious conditions, aiming to culminate in the integration of the employee's life areas such as the leisure and study and life at work. It was concluded that behavioral reinforcers such as social, symbolic, work-related and financial in the organizational context as well as adaptability, identity, environmental perspective and integration and review and update processes with stages of

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thawing, change and refreezing are steps for intervention in the culture and climate in organizations.

Keywords: Culture. Climate. Organizational change. *Organizational Drivers*.

INTRODUCTION

Organizational culture and climate are intrinsic aspects of any and all forms of human productive structuring. Organizations, regardless of their size, niche or segment of activity, whether public, private or non-governmental, interact internally with the areas, departments or sections that compose them in their respective production processes and also with the ecosystem or external environment – market, government and society, the *stakeholders*.

These production processes are structured in *inputs* of: raw material or tangible and/or intangible inputs, processing, transformation and value addition. These, with *outputs* of products, services or information to the market and customers and the proper feedback for improvement or maintenance of the system or process.

In this context of relations with the outside, there is interdependence and exchanges that improve organizations in their policies and strategies for attracting, developing, retaining and retaining talent through promotions or functional progressions. In addition, the implementation of a culture appropriate to the achievement of the organization's mission, vision and values, striving for an internal climate conducive to the productivity and psychological safety of employees, using perspectives and references from success stories or *benchmarking* (here understood as the 'best market practices').

Organizational culture and climate must be optimized and updated frequently as *drivers*[9] of an informational or productive system. In this sense, Organizational culture and climate act as *software*[10] that aims at the modernization, productivity and profitability of organizations (formatting or behavioral standardization, in a word) so that individual and collective subsistence is made possible, as well as the maintenance or expansion of their *market share* in the markets, in this context of plural and globalized economy.

The research of Canela, Lima and Santiago (2016) reverberates with criticism of the view that people are seen as costs and the treatment of them as resources. Because they are crucial for business success, the understanding and management of the organizational culture and climate are the objective of this literature review research with a predominantly qualitative bias to understand each of these constructs or factors, as well as their importance for productive interventions in organizations, in books and articles indicated or on the *internet*.

[9] According to Microsoft Learn, *drivers* is a software component that allows the operating system and a device to communicate with each other.
[10] According to IBM, *software* development refers to a set of computer science activities dedicated to the process of creating, designing, implementing, and supporting *software*. Software itself is the set of instructions or programs that tell a computer what to do. It is hardware-independent and makes computers programmable.

This article, a qualitative literature review and narrative writing, aims to understand which intervention strategies in organizational culture and climate can be implemented in order to foster common well-being and productivity, as a whole, in organizations.

ORGANIZATIONAL CULTURE AND CLIMATE: *SOUL* OF ORGANIZATIONS

Organizations are open and living systems having in themselves not only their physical and visible, tangible part or composition; but especially their 'soul' – intangible – as a product of the mission effectively embodied in each of their members. It is noteworthy whether or not it is planned 'the soul of the company', as it is what consolidates the identity of this organization, being essential for its effectiveness in the group – the purpose, this soul or *Soul* of the organizations. This soul must be germinated in the company's own mission as a greater purpose. It is understood that it is the essence of an organization. Consequently, work becomes noble and of high value, which results in the consolidation of values and principles to be followed.

Along the same lines, Tula *et al.* (2023) and Santos *et al.* (2024) ensure that the climate is the soul of the company and that this same climate needs to be taken care of in order to guarantee maximum employee productivity. The responsibility of climate management by managers is essential because the organizational climate is evaluated and experienced based on the perceptions of each member of the organization, which influence each other.

Wilson (1994 *apud* ARAÚJO & GARCIA, 2015), author of the important work *Innovative reward systems for the changing workplace,* published in October 1994, highlights four reinforcers of behaviors, such as social, symbolic, work-related and financial behavior in the organizational context, namely:

1. Social: linked to recognition and non-material or financial rewards, they explicitly or implicitly indicate the *behavior* expected by the organization's strategic leadership;
2. Symbolic: these are strategies for pleasing public awards in the organization's internal environment, such as tickets to *concerts*, tourist packages or even congresses and/or sporting events;
3. Work-related: promotions and functional progressions, participation in special projects in which expertise is evident, raising to another *status* of recognition by the organization and with the groups of which it is a part;
4. Financial: these are financial bonuses for the results achieved as a whole by the organization, such as PPR (Profit Sharing Program) or PPL (Profit Sharing

Program) or even bonuses granted specifically to certain employees for their commitment and performance in the organization's results.

Araújo and Garcia (2015) argue that punishments also act as behavioral reinforcers whose characteristics are fear and repression, as well as "financial and privilege restrictions" (ARAÚJO & GARCIA, 2015, p.47). In this sense, the importance of the management of the organizational climate and culture as drivers of beliefs and values, as well as attitudinal and behavioral ones, is clear: *drivers* of the business productive ecosystem or of the 'desired' behavior, the possible *Soul* of organizations.

ORGANIZATIONAL CULTURE AND CLIMATE: A DEFINITION

According to Chiavenato (2009), culture is in the DNA of organizations and companies. However, the author points out that social culture, in which every human being is immersed and is part of, influenced and influenced, represents a set of beliefs, habits, customs and values, including here all philosophical, political, academic, literary production and from the way of speaking, dressing and eating. However, from the author's point of view, "organizational culture has nothing to do with this" (Chiavenato, 2009, p.164), about Organizational Culture itself, 'the soul of organizations' (TULA *at al.*, 2023; SANTOS *et al.*, 2024).

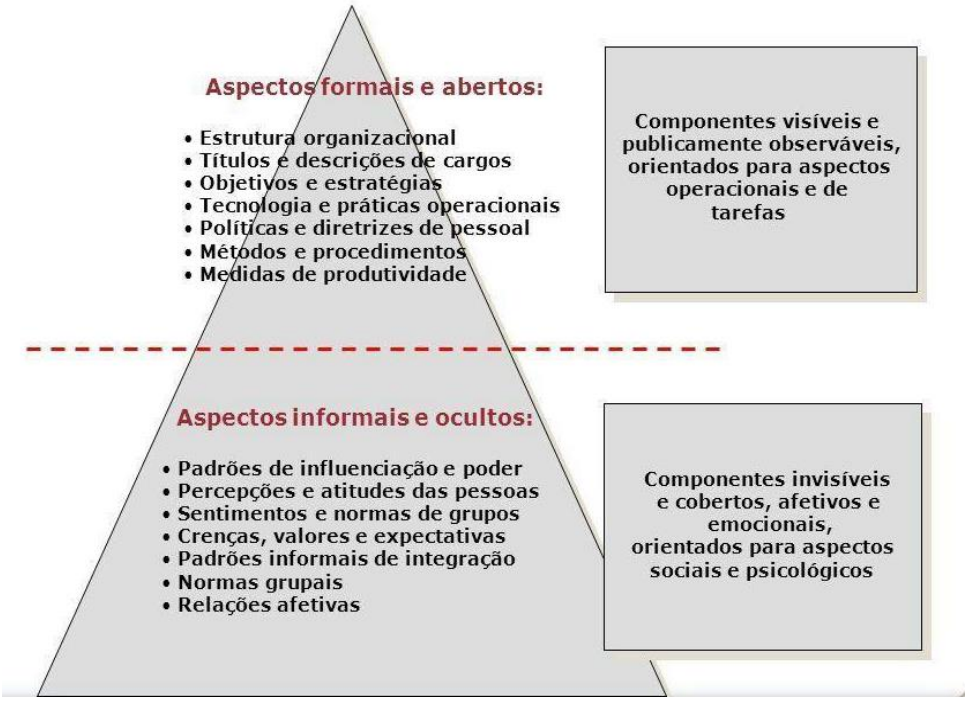
In this line, as an argument of authority, it is affirmed that culture distinguishes, in essence, one organization from others. This is what happens as in an ethnographic reading, the habits, customs, beliefs and values of a certain group of people or even of a country.

> Organizational or corporate culture is the set of habits and beliefs, attitudes and expectations, shared by all members of the organization. It refers to the system of meanings shared by all members that distinguishes an organization from others. It constitutes the institutionalized way of thinking and acting that exists in an organization. (CHIAVENATO, 2009, p.165).

Still under the view of Chiavenato (2015), organizational culture is a customary way of acting and thinking, being common to all members of the corporation, also explaining that culture is any formal and informal norm that guides or directs attitudes (less frequent or habitual) and behavior (more frequent, habitual) in the day-to-day work to achieve the convergence of individual objectives, the collective and organizational in the productivity and prosperity of all.

In this context, using the metaphor of the *iceberg* (Figure 1). The open, known and formal part of the organizational culture is described (visible characteristics with emphasis on tasks and operations), while hidden there are informal, non-formal and invisible aspects or nuances (emotional and affective characteristics).

Figure 1. The *Organizational* Culture Iceberg



Source: Chiavenato, 2009; 2015.

Culture, on the other hand, is composed or segmented into parts or layers that balance and consolidate it to put into effect the values of the founders, the source of this same organizational culture, constituting the most basic and initial assumptions of an organization (Table 1).

Table 1. Basic and initial assumptions of an organization

Artifacts	Behavior patterns	Values and beliefs	Basic assumptions
Buildings / Facilities	Tasks	What they say or do	Beliefs or values
Technologies	Processes	Philosophies	Perceptions
Goods	Standards	Objectives	Feelings
Services	Regulations	Goals	Conceptions
Physical Environment	Relations	Strategies	Paradigms

Source: Adapted from Chiavenato, 2015.

As for the organizational climate, the author indicates, respectively, that the climate is a psychic atmosphere of each organization, and the meeting of the needs of employees (satisfaction) is linked to morale (mood and confidence), which can be warm or not, positive or negative, satisfactory or unsatisfactory (CHIAVENATO, 2009, 2015).

ORGANIZATIONAL CULTURE AND CLIMATE: INTERVENTION PROPOSAL

Labor relations, throughout the social and industrial development of humanity, have been radically transformed in terms of the breaking of paradigms such as slavery, unhealthy child labor and excessive working hours. Silva (2009) presents aspects in relation to work –

power, wealth, communication and free time – in each of the eras/societies classified below in Table 2.

Table 2. Aspects in relation to each era/society

Epochs/Societies / Factors	Industrial	Industrial	Intellectualization and Diversity	Teleworking and Logistics Integration
Work	Physical Labor, Fatigue	Robotization, Standardization	Ownership of the means of production and communication	Knowledge, Creativity, Innovation
Power	Land tenure, Servitude	Ownership of the means of production, Formal work	Financial speculation	Quality of Life, Relativized Values
Wealth	Subsistence	Investments and job creation	Globalization and interactivity	Selectivity, Interactivity
Communication	Limited to location	Mass Communication	More free time, diversification of activities	Integration of work with leisure and studies, Temporal and spatial flexibility
Free time	No reference	Long working hours	Intellectualization and Diversity	Teleworking and Logistics Integration

Fonte: Adapted from Silva, 2009.

In view of the above, a long and slow process of transformation is evidenced that aims to culminate in a perception of work as integration into life. In this way, common development and well-being are provided, in a perspective diametrically opposed to the Judeo-Christian culture, which sees and lives work as an original form of punishment, purification or atonement. As can be seen from the biblical writings, about the product or consequence of man's sin: "By the sweat of your face you will eat your bread, until you return to the ground; because you were taken from it; for dust you are and to dust you shall return." (BIBLE, 1978, Genesis 3:19, p. 5).

The specialist in Corporate Education Kira Tarapanoff, according to the studies of Silva (2009), highlights that the continuity of organizations, one of the principles of accounting, or survival of organizations, permeates continuous learning with the creation of new knowledge, innovation or creation. Especially, Peter Senge (1990) is cited here, for whom survival depends exclusively on learning before the competition to effectively maintain the competitive differential.

In this sense, education in general is seen as a complementary strategy of *the Learning Organization,* because the construction of knowledge is a proposal for intervention by itself at the core, in the 'soul of the company' (TULA *at al.*, 2023; SANTOS *et al.*, 2024),

and we add climate and culture here, since knowledge is developed or created, retained or shared by humans in the context of Knowledge Management (KM), as well as culture and climate in the organizational ecosystem.

For Chiavenato (2015), organizations are complex controlled environments that must be monitored in order to achieve motivation and productivity. The aforementioned author points out that for the change in the climate and culture of companies to take place, it is necessary to have the capacity for innovation. Thus, there are four areas listed and described without which there is no change in climate and culture:

1. **Adaptability**: ability to meet demands and 'solve problems' with promptness, flexibility and innovation;
2. **Identity**: knowledge of the organization's history, as well as sharing the organization's goals and objectives;
3. **Environmental perspective**: accurate perception of the environment for the possibility of investigating by observing, analyzing, concluding or inferring hypotheses, limits and possibilities;
4. **Integration**: of employees and other participants to change the culture and favor, which leads to the improvement of the organizational climate.

Change is understood as the modification from one state to another and this rich process brings interruptions, disturbances, ruptures and transformations in the internal environment of the organization. (CANELA, LIMA AND SANTIAGO, 2016). In summary, according to our author, adaptation, renewal and revitalization are or should be watchwords and constants in organizational dictionaries.

Organizational change has three distinct moments or stages (Figure 2), namely: unfreezing, change and refreezing:

1. **Thawing**: From the current model of behavior so that the next phase can occur or be implemented;
2. **Change**: moment in which the business collective adopts new mental models or *mindset* promoting new attitudes, behaviors and values in professional practice, and
3. **Refreezing**: individual and/or collective moment of sedimentation, consolidation of new behavioral and attitudinal patterns, culminating in a change in organizational climate and culture.

Figure 2. Moments or stages of organizational change



Source: Chivenato, 2015.

CONCLUSION

This literature review study was able to bring the perception that organizational culture and climate act as tools, *drives* or modus *operandi devices* in internal relations in companies, within the constitution of the 'soul of organizations'. The continuous and thorough management of the organizational climate or atmosphere, as well as the applicability or experience of the culture on a daily basis are preponderant factors within the structure and survival of companies and their productive ecosystem.

It was identified that there is a process of change in labor relations in societies in the timeline. A process that transitions from a more categorical, manual and manufacturing work to an activity that integrates all areas of life: work, studies, leisure and even spiritual, as it aims at a purpose that is not limited to the 'what' and 'how', but to the 'why' of things

The relations of work, power, wealth, communication and free time have worked and work as master and invisible lines that permeate changes in society and organizations. In this context, survival is only ensured with the 'learning to learn' in a constant way, not only of individuals, but in a systemic way.

Factors such as adaptability, identity, environmental perspective and integration are watchwords and the day for organizational learning and its maintenance in a global and multicultural context. The much-needed change from time to time only takes place through a constant review of organizational direction and performance.

Thawing, changing, and refreezing may seem simplistic for proposals for effective change in the culture and climate of organizations. However, in the volatile, uncertain, complex and ambiguous world (VUCA) in which we live and in a political, economic, social, technological, legal and environmental context (PESTLE) such as the current one, these are collective and urgent challenges.

Finally, this study is a relevant tool to assist in identifying an organization's strengths and areas for improvement. Understanding the perception of the organization as a whole generates major impacts on the entire ecosystem.

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ATRAZINE AS AN ENDOCRINE DISRUPTOR AND ITS EFFECTS ON MALE REPRODUCTIVE HEALTH

https://doi.org/10.56238/sevened2024.031-005

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ABSTRACT

Atrazine has been widely used in Brazilian agriculture, especially in corn and soybean crops. Due to its widespread use, this literature review is relevant to systematize the main studies that evaluate the impact of atrazine as an endocrine disruptor leading to changes in fertility quality, especially in males. In several tests and studies carried out with the exposure of animals to atrazine, negative effects related to changes in factors that are essential for male fertility were observed. Therefore, inhibition of the hypothalamic-pituitary-testicular axis, decreased reproductive cells's metabolic activity, reduced testosterone levels, reduced lactate dehydrogenase (LDH) enzyme, negative effects on spermatogenesis and morphological changes in the gonads and sperm are results of atrazine toxicity on the male reproductive system that contribute to infertility. In general, it is concluded that atrazine has a potential endocrine disruptor effect, leading to changes in the form of hormone production, especially in hormones related to male sexual reproduction. For this reason, assessing the risks of exposure to this toxin at different stages of life and over several generations, combined with knowledge of its pathophysiological mechanism on the male reproductive system, is essential to preserve the reproductive health of future generations.

Keywords: Atrazine. Endocrine disruptor. Male Infertility.

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INTRODUCTION

Progress in agricultural development and population growth are intrinsically linked. According to projections by the Food and Agriculture Organization (FAO), by 2050 the world population will exceed 9.5 billion people, so requiring a substantial increase in the food supply. However, in 2023, the FAO classified 733 million people as suffering from food vulnerability. This raises concerns for the future since, in addition to population increase, there is likely to be increased per capita consumption and per capita income, climate change, as well as restrictions to the expansion of the agricultural frontier and continuing increase in cities. Together, these may result in the inability of agriculture to meet future food demands (FAO, 2024).

Accordingly, and with the aim of increasing agricultural production, the use of herbicides to control weeds is a common practice. And, due to their increasing deployment, studies evaluating the impact of these agricultural inputs on human health have also grown (Centanni, *et al.*, 2023; Mohammed *et al.*, 2023; Zhao *et al.*, 2024; Gomes-Andrade *et al.*, 2024).

Among the widely used herbicides, atrazine (IUPAC name: 6-Chloro-N2 ethylN4(propan-2-yl)-1,3,5-triazine-2,4-diamine) a compound from the class of triazines, is considered to be one of the most commonly used on corn and sugar cane crops. However, this massive consumption has largely overlooked the broad toxicity of this compound to both the environment and living organisms (Vizioli *et al.*, 2023; Chang *et al.*, 2022).

Considered a persistent pollutant due to its low absorption characteristics, long half-life in soils and moderate solubility, atrazine is commonly found as a contaminant of surface or groundwater and in agricultural soils (Vizioli *et al.*, 2023; Puvvula *et al.*, 2021). As a result, a number of pathways exist by which atrazine and its metabolites can be absorbed by living organisms. These include ingestion, inhalation and direct contact. Accordingly, due to the risks posed to health and the ecosystem, Atrazine was banned in the European Union in 2004 due to the extensive contamination of water (Sass & Colangelo, 2006).

Even though pesticides have greatly increased the quantity of food produced, there are studies that question the real need for their use. Numerous authors advocate organic farming to maintain the health of the soil, people and ecosystems, rejecting the use of pesticides and methods they consider to be environmentally harmful (Javier, 2022; Brito *et al.*, 2023; Martínez-Alfaro & Zuñiga-Orozco, 2024).

However, despite the growing interest in sustainable and organic agriculture, the Grow in the use of pesticides in arable fields remains widespead, especially for herbicides, which are continuing to be widely used in countries with large agricultural frontiers, such as

Brazil and the United States (EPA, 2020; Chang *et al.*, 2022).

Thus, human exposure to pesticides in their occupational or natural environment has been reported widely in the scientific literature and, following the growth of this exposure, the occurrence of exposure-related diseases has begun to manifest. as a result, there is now considerable scientific interest in the possible relationships between contact with these environmental contaminants and the emergence of a gamut of pathologies (Centanni *et al.*, 2023, Puvvula *et al.*, 2021; Ge *et al.*, 2021).

A growing number of studies have sought to evaluate atrazine toxicity to organic systems, with the impacts it may have on fertility being one of the most studied (Gomes-Andrade *et al.*, 2024; Rotimi & Adeyemi, 2023; Rotimi, Ojo & Adeyemi, 2024; Rodriguez-Robledo *et al.*, 2022). The association with infertility is mainly due to the action of atrazine as an endocrine disruptor (Rotimi & Adeyemi, 2023; Gomes-Andrade *et al.*, 2024; Zhao *et al.*, 2024). Research using animal models has shown that atrazine inhibits the function of the hypothalamic-pituitary-testicular axis (Rotimi, Ojo & Adeyemi, 2024), causing testicular atrophy and degeneration, thus impairing spermatogenesis (Govers *et al.*, 2019; Abarikwu *et al.*, 2024a, Pandey *et al*. 2021), so reducing sperm concentration and motility (Hassanin *et al.*, 2024; Leet *et al.*, 2022, Pandey *et al*. 2021), and resulting in gonadal inflammation (Abarikwu *et al.*, 2024b), and oxidative stress (Mohammed *et al.*, 2023). There has been warning of the risks of chronic exposure (Galoppo *et al.*, 2020), as well as accumulation of metabolites in seminal plasma (Rodríguez-Robledo *et al.*, 2022), which can produce transgenerational effects that may impair fertility in subsequent generations (Thorson *et al.*, 2020; Tan *et al.*, 2021). This current review addresses the effects of atrazine as an endocrine disruptor and its effects on the male reproductive system.

MATERIAL AND METHODS

A qualitative bibliographic review was developed using an analytical interpretation of the studied phenomenon. Such a qualitative perspective underpins the broad, and integrated, approach to the study topic and the correlation of various factors and events with analysis and perception of the internal dynamics of the processes involved.

This type of scientific product also contributes to the development of critical internal and external analysis and, consequently, drives scientific dissemination from both a theoretical and methodological standpoint (Botelho 2011; Lakatos & Marconi, 2003).

To obtain relevant studies, a comprehensive search for articles between 2020 and 2024 was carried out in Scopus with the title filter “atrazine”, to find studies that had conducted research with this pesticide. For the keywords, the following filters were used:

“fertility”, “infertility”, “reproduction”, “sperm” and “endocrine”.

Studies selected were chosen according to the following criteria, that the paper:

- Was an original article (review articles, conference abstracts, editorials and book chapters were excluded);
- Concerned Atrazine exposure;
- Dealt with male reproduction.

Finally, the selected articles were analyzed, and a database was constructed containing the relevant information from each article. This was them used to produce the contented presented here.

RESULTS

The Scopus search returned 75 records. Of these, 16 articles were selected as fully melding the selection and filtering criteria, the other 51 were excluded.

The studies were selected and organized as the Table 1:

Table 1

Concentration	Population Study	Duration	Effects	Study
50 mg/kg	Mices	3 days	↓ Body Weight in the testis = Estradiol and DHT concentration in the testis ↓ Seminal vesicle weight = Epididymis eight ↑ Estradiol concentration in the epididymis ↓DHT concentration in the epidydymis	Abarikwu et al. (2024a)
25mg/kg	Mices	30 days	Absolute testis weight was not affected ↓ TNF-α in the testis ↑ IL-6 level ↓ nitric oxid concentration ↓ myeloperoxidase activity Dead cells in the epithelium of the tetis Seminiferous tubules degenerated Desquamates germ cells mostly round spermatids in the lumen Few inflammatory cells in the interstitial areas	Abarikwu et al. (2024b)
	Mouse Sertoli cell		↓ Metabolic activity = Mitochondrial function and reactive oxygen species	Gomes-Andrade et al.

0.3, 3, 30, 300, 3000 µg/L	line	24 hours	production ↓ Lactate dehydrogenase expression in mouse Sertoli cells	(2024)
50 mg/kg bw of atrazine 20 mg/kg body weight of resveratrol	Male albino rats	2 months	↓ Ability of male rats to fertilize ↓ Serum level of testosterone hormone	Hassanin et al. (2024)
20 µM, 100 µM, 250 µM of atrazine 20 µM, 100 µM, 200 µM of Diaminochlorotriazine	Egg-laying quail	144 hours	↓ Reduced the Viability of Granulosa Cells (GCs) ↑ Steroid Hormone Disruption in GCs ↑ Apoptosis in GCs	Xiao-Wei et al. (2024)
0.7, 7.0, 70 µg/L ATZ	O. bonariensis larvae	4 weeks	↑ Testicular germ cell number	Carririborde et al. (2023)
Exporure to environmental pollutants where the mother was living when the clid was born	Samples from newborn	Birth between January 1, 2021 and December 31, 2021	No significant tap-water contamination associated with TSH concentration	Chamot et al. (2023)
0.02 ng/mL	Mices	3 weeks	No effect on litter size, litter weight, sex ratio or mortality rates or across generations No significant body weight change and no difference in testis, seminal vesicle, liver or gonadal fat weights No gross morphological changes in testis No significant change of motile sperm No significant difference in gene expression No effect on seminiferous tubule measurements No effect in the number of proliferating cells or Sertoli Cells	Kolaitis et al. (2023)
120 mg/kg b.w.	Wistar-albino rats	21 days	↓ Weight change, testicular weight and relative testicular weight ↓ Total sperm count ↓ Testosterone level ↓ Testicular protein concentration and levels of glycogen ↓ Spermatogenic activity	Rotimi & Adeyemi (2023)
120 mg/kg	Rats	7 days	↓gonadal hormonal concentrations, semen quality parameters and testicular function indices ↑oxidative stress ↓ antioxidant potencial ↓ sperm quality	Rotimi, Ojo & Adeyemi (2024)

			↑ inflammatory markers in brain, testis and epididymis ↑degeneration histo-architecture in brain, testis and epididymis	
5.4 µg/L	Largemouth Bass (Micropterus salmoides)	6 months	↓ Sperm motility and count ↓ Gonadosomatic index	Leet et al. (2022)
5, 10, 15 and 20mg/l	Crayfish Procambarus	28 days	↑ Mortality ↑ Reproductive hormones of females	Nassar et al. (2022)
	clarkii		↓ Total protein content of the ovary and haemolymph ↓ Testosterone levels in the testis No significant difference in the total protein content of males	
NA	Human sperm	NA	Atrazine's metabolite found in four of the six samples	Rodríguez-Robledo et al. (2022)
2, 10, 70, and 100 mg/kg b.wt/day	Male Rats	21 days	↑ Body weight ↓ Testis weight, epididymis, adrenal and seminal vesicle Delayed sexual maturation ↓ Serum testosterone levels ↑ Serum estradiol levels ↓ Sperm count and motility Testis histology alterations ↓ Fertility potential	Pandey et al. (2021)
ATZ of 0.2 ppm	Caiman latirostris	70 days	Effects on thyroid histoarchitecture	Galoppo *et al*. (2020)
5 mg/kg bw/day	Mice	12 week cohort 26 weekcohort	No effect on the sex ratio of pups, birth weight and survival No difference on body weight, tissue weight and morphology ↓ Epididymal sperm concentration in the 12 week cohort No difference in the epididymal sperm concentration in the 26 week cohort No effect on daily sperm concentration	Harper et al. (2020)
100 mg/kg/day 6.25 and 12.5 mg/kg/day	Mice	21 days	No significant changes in body and testis weight Affected penile morphology and testis descent	Tan et al. (2021)
25 mg/kg BW/day	Rats	12 months	Transgenerational lean pathology in nearly a third of the animals	Thorson et al. (2020)

DISCUSSION

ATRAZINE EFFECTS ON ENDOCRINE SYSTEM

Subfertility and infertility related to decreased sperm quality have increased in recent decades. Hypotheses related to lifestyle, environmental factors, and occupational exposure to endocrine disruptors have been proposed and discussed (Thorson *et al.*, 2020).

Across the analyzed period, an increasing number of studies sought to evaluate the toxicity of atrazine on organic systems, with its impact on fertility being one of the most studied aspects. However, the mechanisms by which atrazine interacts toxically with the human reproductive system appear to be non-uniform, with several pathways potentially involved (Gomes-Andrade *et al.*, 2024; Rotimi & Adeyemi, 2023; Rotimi, Ojo & Adeyemi., 2024; Rodriguez-Robledo *et al.*, 2022). Among these, atrazine as an endocrine and metabolic disruptor is already well characterized (Rotimi & Adeyemi., 2023). However, few studies have evaluated long-term contact, especially prenatal exposure to atrazine, see study carried out by Tan et al. (2021) for exceptions. This has been interpreted as cause for concern, as individuals subjected to chronic exposure may have their health impacted more severely (Harper, Finger & Green, 2020).

Analysis of prolonged exposure to atrazine is relevant since recent research indicates that endocrine disruptors from this toxin can bioaccumulate in seminal plasma (Rodríguez-Robledo *et al.*, 2022). This provides new avenues for future investigations into the association between endocrine disruptors bioaccumulated in seminal plasma and infertility. A Spanish study with six semen samples donated by healthy men, identified atrazine metabolites in the seminal plasma of four individuals (Rodríguez-Robledo *et al*., 2022).

In addition to the detrimental effects on the neuroendocrine system, such as inhibition of the function of the hypothalamic-pituitary-testicular axis, research has also implicated atrazine in the toxification of the gonads, adrenal glands, thyroid axis (including epigenetic changes) (Thorson *et al.*, 2020; Rotimi, Ojo & Adeyemi, 2024; Zhao *et al.*, 2024). Additionally, Rodríguez-Robledo *et al*. (2022) and Galoppo *et al.,* (2020) have described possible associations with atrazine and its bioaccumulation in the body.

In the environment, atrazine can interact with other contaminants and so have its toxic effect augmented, increasing its capacity to negatively impact human health. As an example of this, a study carried out in the city of Campinas, in the interior of the Brazilian state of São Paulo, analyzed the interaction of atrazine with microplastics in aquatic environments. The presence of microplastics in water was found to be capable of acting as sorption agents, and so capable of increasing the effective concentration of atrazine. The study also reported that atrazine has a greater tendency to remain soluble in water;

however, the presence of microplastics reduces this capacity by absorbing it onto the surface of the plastic particles. Thus, the presence of microplastics in water increases the risk of contamination by atrazine, especially because it can be bioaccumulated by humans (Dias *et al.*, 2023).

In another study of atrazine as a water contaminant, Chamot *et al.* (2023) analyzed the effects of this compound on thyroid-stimulating hormone (TSH) newborn children in France. They reported no significant changes in TSH levels compared between groups exposed and not exposed to water contaminated with atrazine. However, in this study, more than half of the samples were below the quantification limit.

Studies involving humans are the exception, as most evaluations of the effects of atrazine on TSH are performed on animals, such as mice and crocodilian. This can make it difficult to extrapolate the results to humans (Gomes-Andrade *et al.*, 2024; Harper, Finger & Green, 2020). However, studies of vertebrate animals exposed to atrazine during embryonic development, have reported that the disruption of the thyroid axis profoundly impacts metabolism and reproduction (Galoppo *et al.*, 2020). Additionally, since thyroid hormone signaling is strongly conserved among vertebrates, it has been suggested that atrazine produces adverse effects in other vertebrates, including humans. Findings of studies of the exposure of broad-snouted caiman eggs to atrazine warn of the impacts that long-term contact can cause (Galoppo *et al.*, 2020).

In the context of environmental exposure and persistence, atrazine's action as an endocrine and metabolic disruptor, this compound causes a decrease in the metabolic activity of reproductive cells, impaired glycolytic function, reduced expression of the enzyme lactate dehydrogenase (LDH), and effects the production and secretion of gonadal androgens (Gomes- Andrade *et al.*, 2024; Rotimi & Adeyemi, 2023; Abarikwu *et al.*, 2023; Hassanin *et al.*, 2024).

ATRAZINE EFFECTS ON REPRODUCTIVE SYSTEM

By decreasing the expression of LDH, atrazine impairs the glycolytic function of Sertoli cells, directly compromising the nutritional support of spermatogenesis, since this enzyme is responsible for the conversion of pyruvate into lactate, a substrate to nourish germ cells in spermatogenesis (Gomes-Andrade *et al.*, 2024). Indeed, the action of atrazine is sufficiently potent that, at very low concentrations in human biofluids, and at the legal limit in drinking water, atrazine is capable of inhibiting the glycolytic function of Sertoli cells (Gomes-Andrade *et al.*, 2024).

However, the study by Gomes-Andrade *et al.* (2024) used the immortalized murine

cell line TM4. This is an important methodological limitation, as such cells do not represent the complexity of Sertoli cells in vivo. In addition, the tissue microenvironment and cell-cell interactions that influence the dynamics of Sertoli cells was absent under the deployed experimental.

Another fundamental element in the spermatogenesis process is testosterone, a steroid hormone secreted by Leydig cells, which binds to receptors in Sertoli cells, regulating the function of the epididymis in the storage, maturation, concentration, motility and protection of sperm (Rotimi & Adeyemi, 2023).

A plausible and widely accepted mechanism for how atrazine acts to reduce serum testosterone, is the inhibition of the enzyme 3β-hydroxysteroid dehydrogenase (3β-HSD). This is enzyme expressed in the Leydig cells, which are the site of several steps in the steroidogenic cascade that results in the formation of testosterone. As a result, low levels of serum and intratesticular testosterone trigger reproductive disorders that affect spermatogenesis (Abarikwu *et al.*, 2023).

Work on mice by Harper, Finger and Green (2020) found that exposure to atrazine affects the gene expression of steroids in the testes, this occurs because the herbicide produces in a significant increase in the expression of the Cyp19a1 gene, which codes for aromatase, the enzyme responsible for converting androgens into estrogens. The study also reported a reduction in sperm concentration, which may be related to hormonal imbalances. In rats and mice, exposure to atrazine can affect sperm cell count, testicular weight, sperm viability and mortality, and also reduce testosterone levels, negatively influencing male fertility (Zhu *et al*., 2021; Rotimi & Adeyemi, 2023).

Using an endocrine approach Hassanin *et al.* (2024) and Mohammed *et al.* (2023) found that rats subjected to atrazine via gastric tube had reduced fertilization capacity. This was accompanied by decreased serum testosterone levels, upregulated caspace 3 mRNA levels, increased iNOS mRNA expression, destruction of seminiferous tubules, damage to germinal epithelium, congested and dilated blood vessels, and reduced Leydig cells.

Regarding mitochondria and production of reactive oxygen species (ROS), several studies report a marked increase in oxidative stress and inflammatory markers when exposed to atrazine (Rotimi & Adeyemi, 2023; Abarikwu *et al.*, 2024b; Mohammed *et al.*, 2023). A study carried out by Xiao-Wei Li *et al.* (2024) with granulosa cells from female quail, found that exposure to atrazine decreases cell viability and proliferation, increases oxidative stress and inhibits mitochondrial function-related gene expression. However, a study by Gomes- Andrade *et al.* (2024) observed no changes in either mitochondrial membrane potential or production of reactive oxygen species in Sertoli cells at all atrazine

concentrations tested, even though there was a reduction in the metabolic activity of these cells, suggesting that toxic concentrations of atrazine do not specifically affect mitochondrial function or cause oxidative stress in these cells.

As can be seen from the material cited above, collectively, studies have demonstrated that atrazine alters the expression of molecular markers associated with the development and function of germ cells that can be influenced by low testosterone levels. With the suppression of testosterone and defects generated in Sertoli and Leydig cells, atrazine affects fertility directly by inhibiting spermatogenesis and/or decreasing the quality of sperm produced (Anlar *et al.*, 2021; Abarikwu *et al.*, 2023; Rotimi & Adeyemi, 2023; Hassanin *et al.*, 2024; Mohammed *et al.*, 2023, Pandey *et al*. 2021).

Additionally, it can also significantly alter the morphology of the spermatozoon. Studies have reported damaged spermatogonia, irregular contours of the primary spermatocyte nuclei, round spermatids with loss of the acrosomal cap, and a reduced number of spermatozoa in the lumen (Hassanin *et al.*, 2024; Mohammed *et al.*, 2023).

Morphological changes in the reproductive organs, frequently observed with atrazine exposure, are directly related to its toxic effects on fertility. Studies have reported atrazine produces morphological and functional damage to testicular structures, including gonadal atrophy, damage to the seminiferous tubules, and disruption of the germ lines (Rotimi & Adeyemi, 2023, Pandey *et al*. 2021). In addition, abnormal morphology of the urogenital mating bulge (MUMP) in rats, as well as reduction in its size and the occurrence of hypospadias, have been associated with atrazine toxicity (Govers *et al.*, 2019).

Research conducted with male mice (Abarikwu *et al.*, 2024a) indicate that exposure to atrazine can cause acute and irreversible effects on the testes, including damage to Sertoli and germ cells, plus changes in hormone levels, and testicular inflammation. In addition, when the mother mouse is contaminated with atrazine during gestation and lactation, male offspring can develop testicular alterations, resulting in sexual immaturity, histological alterations, subfertility, and cryptorchidism (Govers *et al.,* 2019; Nassar, Mohamed & Said, 2022; Pandey *et al*. 2021, Riera *et al.,* 2022).

Prenatal exposure of rats to 100 mg/kg of atrazine produced changes in anogenital distance, testicular descent, and significantly reduces the size of the glans penis in Offspring. This highlights the cumulative effects, as well as their transgenerationality (Tan *et al.*, 2021).

Whether atrazine exposure can produce a reduction in absolute and relative body weight and reproductive organs has been a topic of discussion between authors. In a study developed by Rotimi and Adeyemi (2023), Wistar rats treated with atrazine (120mg/kg)

showed a reduction in the weight of the body, testis and epididymis, as well as a decrease in sperm concentration and semen quality. Mohammed *et al.* (2023), Pandey *et al*. (2021) and Abarikwu *et al.* (2024b) corroborated these findings, emphasising the role of atrazine in reducing body mass. However, other studies did not find significant differences in the absolute and relative weight of rats exposed to atrazine compared to controls, suggesting the need for further investigations on the impact of the substance on total body mass and reproductive organs (Govers *et al*., 2019; Harper, Finger & Green, 2020).

Furthermore, a study conducted in Australia on prenatal exposure of rats to 5 mg/kg atrazine did not reveal significant weight gains or differences in the absolute and relative weights of seminal vesicles, testes, and fat pads. However, it did show decreased epididymal sperm concentration in 12-week-old males, suggesting that atrazine exposure may have more pronounced effects in younger males (Harper, Finger & Green, 2020).

While transgenerational effects of atrazine are also of concern, a study using a concentration of 0.02 ng/ml atrazine (considered the conservative average in Australian waters) did not show significant changes in the timing of puberty onset, body weight, testicular morphology, or percentage of motile sperm in two generations of rats (Thorson *et al.*, 2020; Kolaitis *et al.*, 2023).

Other studies, such as those by Carriquiriborde *et al.* (2023) and Leet *et al.* (2022) on fish, suggest that atrazine may affect the health of testicular germ cells, so interfering with reproductive capacity. In addition, research with the freshwater shrimp Procambarus clarkii, found that atrazine caused disturbances in the distribution of spermatogonia and necrosis in the testicular structure, in addition to decreasing testosterone levels (Nassar, Mohamed & Said, 2022).

Sperm motility is one of the main parameters used to assess fertility and reproductive capacity. A reduction in total sperm count, as well as a decrease in motility and the presence of sperm with compromised morphology, including head defects, tail division and membrane ruptures, were observed in rats exposed to atrazine (Rotimi & Adeyemi, 2023; Hassanin *et al.*, 2024). This pattern of impairment was also identified in fish, as demonstrated by Leet *et al.* (2022).

However, it is also important to note that a study of rats by Kolaitis (2023) did not find any significant change in sperm parameters. Sperm are highly sensitive to hormonal changes and, probably, the concentration of atrazine used in this study was insufficient to generate changes in sperm parameters. Therefore, research on the effects of atrazine continues to be a relevant and necessary field to understand its implications on the reproductive health across a variety of different organisms.

In summary, atrazine has significant potential to cause morphological and functional changes in sperm and reproductive structures due to its role as an endocrine disruptor. This makes continuous monitoring and more in-depth studies on its consequences for fertility and reproductive health in different species.

FINAL CONSIDERATIONS

Atrazine is an environmental toxin which many studies have associated with male infertility. Its toxic impact on the reproductive system of animals occurs because the compounds is causes endocrine dysregulation that leads to changes in hormone concentrations, contributing to alterations in spermatogenesis, metabolic and glycolytic activity of Sertoli and Leydig cells, and histopathological changes in the parenchyma of reproductive organs. In addition, it acts as an inflammatory agent and triggers oxidative stress in the reproductive system.

The toxicity of atrazine on the male reproductive system has been widely discussed and investigated, with studies addressing such aspects as inhibition of the hypothalamic-pituitary- testicular axis, decreased metabolic activity of reproductive cells, impairment of the glycolytic function of Sertoli cells, reduction of enzyme lactate dehydrogenase, decreased serum and intratesticular testosterone, as well as negative effects on spermatogenesis, and morphological changes in the gonads and sperm as potential pathways for male infertility.

However, some studies have noted difficulties in extrapolating the results obtained from some animal models to humans due to differences in metabolism, lifespan and

reproductive system. This also highlights the need for further studies evaluating chronic exposure to atrazine.

Finally, a preventive and dynamic approach to minimize exposure to this toxic compound and a reassessment of regulatory guidelines on the legal limits of atrazine in the environment are essential to preserve the reproductive health of future generations.

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RESTORATIONS WITH CERAMIC LAMINATES AND THE INDICATIONS AND CONTRAINDICATIONS OF THIS TREATMENT: LITERATURE REVIEW

https://doi.org/10.56238/sevened2024.031-006

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ABSTRACT

The search for restorations with ceramic laminates has been one of the main topics in dentistry today, since these restorations can reestablish aesthetics while having an extensive longevity. Therefore, ceramic laminates can positively influence the self-esteem of patients, promoting satisfaction in relation to their smile. The aim of this study was to review the literature, showing the indications and contraindications of restorations with ceramic laminates and the reasons that induce success or failure in this type of treatment, as well as its limitations. In view of the above, it is important to know the parameters to be evaluated before planning a treatment with ceramic laminates, in order to achieve clinical success.

Keywords: Dental laminates. Ceramic. Dental Aesthetics.

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INTRODUCTION

The constant search for the improvement of aesthetics in Dentistry is one of the factors that most contributes to the elaboration and improvement of materials and techniques. Among the materials, ceramics are an excellent option in the search for naturalness, due to their ability to imitate dental tissues (AZER *et al.,* 2011; LEE; CHOI, 2018; MORIMOTO *et al.,* 2016).

As a result of this reality, among ceramic materials, laminates stand out for their aesthetics, color stability, and biocompatibility with periodontium. Therefore, they end up being the choice of many professionals and patients (MARCHIONATTI *et al.,* 2017).

The growing relevance of personal image in modern society makes the demand for this type of treatment increasingly common, since the smile is one of the first characteristics observed in interpersonal contact. In this way, the lack of harmony in the smile can directly affect people's self-esteem, causing aesthetic and, consequently, emotional problems. In this scenario, restorative treatment with ceramic laminates can directly interfere with patients' quality of life (MARTIN; CONCEIÇÃO *et al.*, 2007).

According to Hilgert (2009), when there is a need to change the color or shape of the buccal and incisal surfaces of anterior teeth and premolars, the use of ceramic laminates can provide the desired result, especially on darkened substrates; In this way, a balance can be achieved between the ability to mask the substrate and the final aesthetic result, increasing the thickness of the restoration, or using ceramics with greater opacity.

In this context, the objective of this integrative review is to highlight important aspects to be considered prior to the planning of treatment with ceramic laminates, emphasizing the indications and contraindications.

METHODOLOGY

This is an integrative review (WHITTEMORE; KNAFL, 2005), which from the study of the literature aims to bring to light a particular subject (BROOME, 2000).

The data collection of this work was carried out from a selection of national and international articles. The search was carried out using the PubMed and Google Scholar platforms. In Portuguese and English, the descriptors used for the research were: dental laminates; Ceramics; Dental Aesthetics; Dental Veneers; Ceramics; Esthetics, Dental. The inclusion criteria established were: literature reviews, doctoral theses, and laboratory and clinical trial articles published between 2000 and 2022, with emphasis on works published between 2010 and 2022. The exclusion criteria were: articles prior to 2000 and course completion papers.

RESULTS

The development of materials that seek to preserve as much healthy dental tissue as possible and enlighten patients about the advantages of this preservation, has made ceramic laminates obtain great relevance in Dentistry. This is due to the possibility of performing esthetic restorations with less wear compared to total crowns (HILGERT, 2009).

In this way, the preparations are less invasive, aiming at the maintenance of the tooth structure, especially the enamel, since when adhesion is performed on this substrate, a more effective and long-lasting microretention is obtained. Therefore, it has been observed that enamel preservation significantly reduces the failure rate (BLUNCK *et al.,* 2020, GRESNIGT; ÖZCAN; KALK, 2011). Dentin exposure should be avoided, since the modulus of elasticity of this substrate is lower compared to that of porcelain, resulting in greater chances of fracture (CALAMIA; CALAMIA, 2007).

On the other hand, it is worth mentioning that the thickness of ceramic laminates is directly related to the ability to mask the substrate, that is, the greater the thickness, the greater the masking capacity. On the other hand, the thicker the material, the more invasive the preparation (ȘOIM *et al.,* 2018). It is also necessary to consider that the greater the thickness of the ceramic, the less color change caused by the resin cement (TURGUT; BAGIS, 2013).

Still with regard to this context, it is important to emphasize that, although ceramic laminates can be cemented in regions with the presence of aged resin, the degradation of polymers can impair the adhesion of resin cements on these surfaces. However, with the evolution of surface conditioning methods and bonding agents, it is possible to mitigate this factor (GRESNIGT; KALK; ÖZCAN, 2013, p. 824).

When considering these aspects, it is necessary to consider that the improvement of ceramic materials has made it possible to carry out increasingly satisfactory restorations. Understanding the particularities of each system enables the best option according to the clinical situation (TURGUT; BAGIS, 2013). Factors such as translucency, substrate color and the forces applied in the restoration region should be considered when choosing the system (LIM; YU; LEE, 2010). Among the systems commonly used for the manufacture of ceramic laminates, we have conventional feldspar ceramics and reinforced vitreous ceramics (MORIMOTO *et al.,* 2016).

Conventional feldspar ceramic has excellent translucency, that is, it is ideal for cases where high characterization is required. However, the mechanical resistance of this system is low. Thus, conventional feldspar ceramic laminates are indicated in cases of less

invasive preparations, with great aesthetic demand and where there is no need for flexural strength (PINI *et al.,* 2012).

On the other hand, reinforced vitreous ceramics have better mechanical properties compared to conventional feldspar ceramics. This is due to the increase in load particles that provide better resistance to fracture, bending and erosion. Charge particles also promote optical effects such as opacity and opalescence, however, these systems can be translucent, and the chemical composition and percentage of crystals will dictate the degree of opacity of the material. Therefore, reinforced vitreous ceramic laminates are indicated in cases where there is a greater need for masking and risk of bending (PINI *et al.,* 2012).

The interaction between the dental substrate, the ceramic and the cement will dictate the aesthetics of the treatment, that is, by modifying only one of these factors, the final result can be significantly altered (PORDEUS; BATISTA *et al.,* 2022) in addition, it is necessary to evaluate the patient's occlusal relations before treatment with ceramic laminates, both dynamic and static occlusion. If it is observed that the occlusion is not adequate, the malocclusion should be treated. It is also added that the treatment with ceramic laminates must include an anterior and lateral guide. (DA CUNHA *et al.,* 2014).

Furthermore, the condition of the periodontium should be investigated, as treatments with ceramic laminates should be performed in cases where periodontal health is present. It should be noted that if the patient has gingival health prior to treatment and the margins of the restorations have an adequate finish, ceramic laminates will cause minimal responses and in some cases, no response at all. If the interface between the cement and the filling is not adequate, periodontal tissues can be impaired. It is necessary to consider that the patient's oral hygiene after treatment also plays a fundamental role in the health of the periodontium (PEUMANS *et al.,* 2000; STRAZZI-SAHYON *et al.,* 2020).

Such considerations indicate that, in order to achieve success in the treatment, one must have knowledge about the factors that influence the result of restorations with ceramic laminates, as well as the indications and limitations of this type of procedure.

INDICATIONS

Staining and Darkening of Teeth

The use of ceramic laminates as a treatment for teeth with aesthetically unsatisfactory colors has been shown to be effective, however, it should be noted that ceramic laminates should be used in cases where in-office and home whitening do not present satisfactory performance (CHRISTENSEN, 2006). Severe darkening due to the use

of tetracycline, for example, is a condition that illustrates these circumstances well and is commonly treated with ceramic laminates (FAUS-MATOSES *et al.,* 2017).

DIASTEMA

Diastema is a spacing between the teeth, with no point of contact between them. Diastemas can compromise the aesthetics of the smile, especially in the upper teeth (LEVY-BERCOWSKI; ABREU, 2019). Ceramic laminates are among the possibilities for the treatment of diastemas (DA CUNHA *et al.,* 2014).

DENTAL ANATOMY

Treatment with ceramic laminates can be performed in order to change the shape, contour, volume and size of the teeth (PINI *et al.,* 2012). It is important to emphasize that the aesthetic impairment in some patients is due to too much gingival exposure and, therefore, gingival plastic surgery should be considered as a possibility of treatment (CHRISTENSEN, 2006).

CONTRAINDICATIONS

Great coronary destruction

A large coronary destruction prevents the treatment with ceramic laminates from being carried out properly, because in addition to needing a large surface due to the reduced thickness, the ceramic laminates must be cemented, ideally, to the enamel. Therefore, when this substrate is insufficient, the success rate decreases significantly (BLUNCK *et al.,* 2020; GRESNIGT; KALK; ÖZCAN, 2013; PINI *et al.,* 2012).

EXTENSIVE RESTORATIONS

The importance of having a considerable amount of enamel as a substrate for treatment with ceramic laminates makes extensive restorations unsuitable for this type of restoration. Thus, in these cases, treatment with total crowns should be considered (BLUNCK *et al.,* 2020; CHRISTENSEN, 2006).

MALOCCLUSION

Occlusal problems are among the factors that most increase the chances of treatment failure with ceramic laminates. Therefore, the patient must have an ideal occlusion (DA CUNHA *et al.,* 2014; LI *et al.,* 2014). It is worth mentioning that, in some

cases, orthodontic treatment can establish satisfactory aesthetics, and treatment with ceramic laminates is not necessary (CHRISTENSEN, 2006).

PERIODONTAL DISEASE

Periodontal condition is a determining factor in the long-term success of treatment with ceramic laminates. Before any restorative procedure, it is essential to have periodontal health (DA CUNHA *et al.,* 2014).

BRUSSELS

The probability of fracture and detachment of ceramic laminates in patients with bruxism is significantly higher compared to patients who do not have this parafunctional habit. However, it was found that the use of myorelaxant plaques can reduce the failure rate of this treatment. That said, when bruxism is suspected, the patient should be advised to use this device (GRANELL-RUÍZ *et al.,* 2014).

DISCUSSION

Restorations with ceramic laminates, as they denote minimally invasive preparations, are a very conservative treatment possibility, restoring aesthetics and function, thus it is a treatment option considered successful (DA CUNHA *et al.,* 2014).

Beier *et al.* (2010) observed 152 restorations with ceramic laminates for 10 years and reported that the survival rate was 93.5%. The main reason for treatment failures was ceramic fractures, which corresponded to 44% of failures. Another relevant data observed was that bruxism increased the risk of failure by 7 times. It is also noteworthy that marginal discolorations were frequently more observed in smoking patients, in addition, the restorations were performed by experienced professionals, who respected the ideal occlusal parameters, and the patients were in periodontal health. (BEIER *et al.,* 2010).

Another study, which followed 323 restorations with ceramic laminates over a period of 3 to 11 years, found fracture in only 4% of cases and a subtle marginal pigmentation in 39.3% of cases. It is interesting to note that 97.1% of the patients considered the result satisfactory and 98% of the cases had marginal integrity (GRANELL-RUIZ *et al.,* 2010).

It is then observed that among the factors that gave so much prominence to the treatment with ceramic laminates, longevity is one of the most relevant, however, in order to be successful in the long term, a plan must be prepared, respecting the indications (PINI *et al.,* 2012; SHONO; NAHEDH, 2012).

Still, even with the remarkable longevity achieved in the treatment with ceramic laminates, the oral cavity is a hostile environment, that is, dental materials will suffer effects such as fatigue and degradation. These harms will inevitably cause the aging of materials (GRESNIGT; KALK; OZCAN, 2013).

Restorations with ceramic laminates should be performed with common sense, observing the contraindications of the treatment. The professional must follow the research to be aware of the innovations in the techniques and materials used, always aiming at the improvement of treatments and the well-being of patients.

CONCLUSION

Ceramic laminates provide excellent results, as they represent a predictable, conservative and long-lasting treatment. Their ability to restore the aesthetics and function of the teeth makes these restorations often the option chosen as a therapeutic option. However, it is crucial that the professional has knowledge about the indications, limitations and factors that influence the outcome of the treatment.

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MEXICAN INTEROCEANIC CORRIDOR: TOWARD A LIKELY SOCIALLY INCLUSIVE AND SUSTAINABLE REGION IN SOUTHWESTERN MEXICO

https://doi.org/10.56238/sevened2024.031-007

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ABSTRACT

Mexican Interoceanic Corridor or Tehuantepec's Transisthmian Corridor (along with the Mayan Train) represents one the two largest iconic and challenging Mega Projects implemented in Southwestern Mexico, funded by Mexican Government, in the same so-called “Macrosouth region” or just Macrosouth, here on, (integrated by three economic subregions, namely, South-Pacific, Southern and South-western regions). Despite both projects ultimately aim to foster economic growth in such a region, the former aims to stimulate growth through an increased tourism flow from the wealthy Mayan Riviera zone toward the Gulf of Mexico's long-lagged region by railroad through the Mayan Train recently inaugurated by President Lopez Obrador,vid AMLO(Dec 22, 2023).Although the main focus of our attention here, namely, the Interoceanic Corridor, given its geoeconomic and geo strategic relevance for the country since it is expected to skyrocket Mexican exports and commercial activity through this facility and thus fostering economic growth throughout the Corridor stripe and spread it out throughout its neighboring regions such as those above referred in the coming years given its previlegious geographic location under the global context in which Mexico is currently immersed.

Accordingly, the article aims to assess and highlight the socio economic relevance of the Mexican Corridor megaproject and its likelihood to achieve by this means simultaneously economic growth and people's well-being in this region as an expected consequence of the intensive commercial thorugh its operation and industrial activity generated by the production of ten industrial parks to be implemented along the Corridor (backed by a host of full-fledged refurbished and renewed productive infrastructure around it) such as railway itself and road transport and port facilities along the end lines of the Corridor stripe (and the entire Macroregion) focused on supporting the expected massive commercial flow of merchandise and concomitant export boom back and forth through the Atlantic and Pacific oceans, shortly. Furthermore, all these significant public investments, unlike prior neoliberal investment priorities in the past, these new investments are nurtured upon a framework of a socially inclusive and sustainable strategy tailored by the Mexican government for the Corridor zone to promote simultaneously economic growth and people’s well-being in the Transismithian stripe in the years to come. However, the challenge for the Mexican state, through its policymakers, is to achieve such an equilibrium between economic growth and population well-being in this region under a sustainable environmental context.

Accordingly, in short, the purpose of this article is to explore the likelihood of Mexico attaining the above-referred equilibrium and implementing a socially inclusive strategy within a long-time deprived and lagged region from the rest of the country such as the Transisthmian Corridor stripe and its neighboring regions, such as the South-Pacific and Gulf of Mexico, in the foreseeable future along with its likely perspectives and socioeconomic and environmental implications.

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Keywords: Socially inclusive development. Sustainable development. Balanced regional development. Development pole.

INTRODUCTION

BRIEF HISTORICAL BACKGROUND

Given its historical geostrategic and geo-economic importance, Mexico's Tehuantepec isthmus has been a greedy territory for centuries since colonial times. Ever since Hernan Cortés' "Cartas de Relación" (Third letter) dated **(May 15, 1522),** to the King of Spain, Charles the Fifth, explored the possibility of a communication route between the Atlantic and Pacific oceans, according to Maria Carmen Martinez.**vid,Martinez, M. María Carmen (Jun23, 2023).** Although Cortés's early interest is widely recognized as the first, numerous unsuccessful projects have explored this possibility throughout the XVI-XXI centuries, as identified by some scholars such as **Velazquez, Emilia et Al.(2009).**

However, by mid-XIX (Dec14, 1854), Mexico signed with the US government the so-called **McLane-Ocampo Treaty,** which entailed the US that in case of war or another emergency from the latter country, Mexico would allow free passage to US military troops through the **Tehuantepec Isthmus** as well as through other strategical crossing points through Mexican territory. Fortunately for Mexico, the US Senate did not ratify it, and thus, it was not eventually put into force, **vid, Salmerón, Pedro(Ago, 2009).**

By 1884, an American engineer, **James B. Eads (1884)**, proposed **The Tehuantepec Interoceanic Railway Project**, consisting of constructing a transoceanic rail line between Salina Cruz and Coatzacoaldos by a six-track railway with three locomotives pulling ships across the isthmus in about 13 hours. However, the system was designed to carry vessels of up to 10,000 tons into a wheeled cradle. Nevertheless, this project was rejected because the new ships rapidly became heavier. Until at the beginning of last century, President **Porfirio Diaz** officially inaugurated the current Transismic Railway (Ferrocarril Transismico de Tehuantepec), which started its formal operation in **January 1907, vid,Vargas, Martin (2019).**

Despite its successful starting operation, which only lasted less than two decades, albeit unfortunately for Mexico, this facility soon started to decline when the Panama Canal was opened in 1914, coupled with the beginning of the Mexican Revolution, which lasted almost two decades and implied a million dead people. From this year on until our time, this railroad activity became virtually irrelevant compared to its first decades of operation.

Finally, last year and after almost barely four years of intense work and fast implementation of the whole project, President Lopez Obrador inaugurated, the so-called “Z-Line”, of the Transismic Raywal system which connects Salina Cruz with Coatzacoalcos ports, vid, **AMLO(Dec22, 2023),** as already been mentioned.

Accordingly, the corridor is expected to be a faster and cheaper option than the Panamanian Canal (since it will take only 6 hours, to cover the 303 km of this Corridor´s stripe which besides the referred railroad is backed up by three international airports (Minatitlán, Ixtepec y Huatulco), and a gas pipeline and optic fiber facilities along the corridor) to facilitate industrial expansion and communication.

That is why this interoceanic facility is expected to become an important magnet for investments, with tax incentives, a free trade zone, customs areas, tariff reduct0ions, a single window for procedures, as well as the development of housing areas (urban development programs for its major municipalities) and nature reserves. And capable of moving yearly, by 2050, an estimated 1.4 million containers between the two referred ports and in this way boosting regional growth and jobs in the region, with an expected economic impact of 1.6% of Mexican GDP and 50.0 thousand million US dollars in investments and able to produce about 550 thousand jobs through the commercial and industrial activity once it is reached the full operation of the 10 industrial parks being implemented along the Corridor route, according to some government sources, **vid, Apolinar, Héctor (Jan 27, 2024).**

Notwithstanding, it is important not to overlook the fact that under the current globalization context, the launching of a completely renewed **Interoaceanic Corridor** called the attention and economic interest of investors which has triggered and given rise to an apparent struggle among diverse hegemonies and economic superpowers to invest their capital into this project since several years ago, **vid, Ávila Romero, Agustín(Abr12,2018)**.

Mainly the US and China, just to mention the two major ones, who are competing to take full advantage of this new strategic facility which represents undoubtedly a cheaper, and faster alternative as an interoceanic crossing point than Panama's Canal. Below we will highlight some comparative advantages of the Mexican corridor vis-a-vis the Panamanian canal. Nonetheless, before proceeding with our discussion, it is essential to have a general geographic idea where the **Transisthmian Stripe and the Interoceanic Corridor** are located, as shown in **Fig.1** below:

Figure 1: Mexico's Interoceanic Corridor

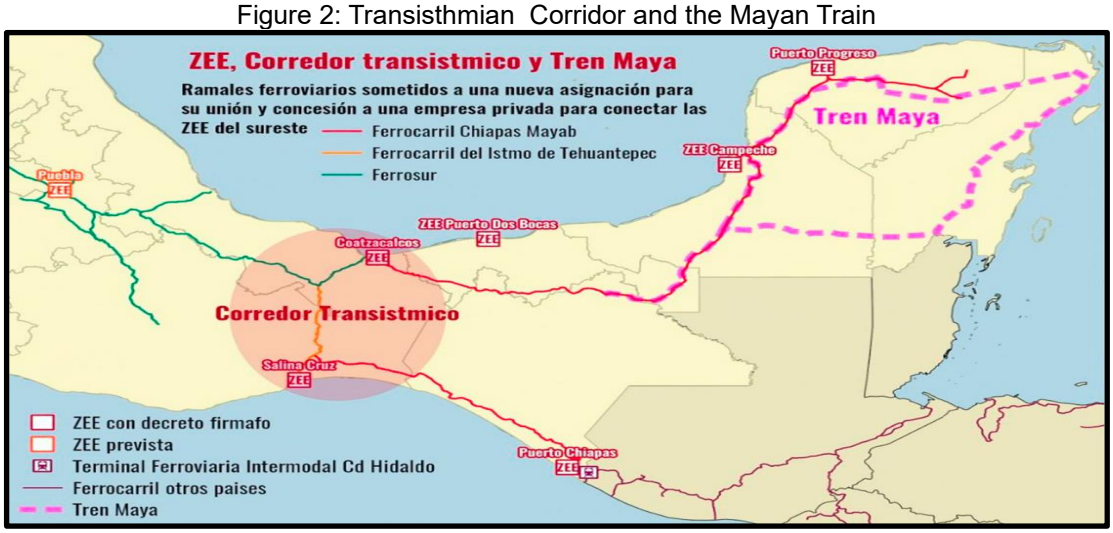


Source: Mexican government.

The above illustration clearly shows the two connecting ports, **Coatzacoalcos** and **Salina Cruz**, on both extreme sides of the **Transisthmian stripe**, which depicts the isthmus railroad track connection between these two ports. The Northern one on the Atlantic Ocean side, and the Southern one on the Pacific side.

However, **Figure 2** below**,** provides a more comprehensive and strategic geographical view showing simultaneously the **Transismic Corridor** along with the **Mayan Train** trail, which runs from the **Mayan Peninsula (Mayan Riviera)** down to the Gulf of Mexico´s region and its interconnection with the **Corridor railway** at **Coatzacoalcos port** in the **Gulf of Mexico.** Notice as well that both railroads are being immersed in the South-Southwestern region. This situation clearly emphasizes the geoeconomic and geostrategic relevance for the entire country in the coming years once both railroads reach their full operation.

Figure 2: Transisthmian Corridor and the Mayan Train



Source: https://www.google.com.mx/search?q=ruta+transismico+y+tren+maya&sxsrf=AJOqlzXUzMRb0ErGlqA9RYovWkQOSOLw5w%3A1676931432856&source=hp&ei=aPHzY8nDMpLwkPIPtci_0Ak&iflsig=AK50M_UAAAAAY_P_ePBDuptm-L6-_UDiiLOL78YPitsy&oq=ruta+transismico+y+tre+&gs_lcp=Cgdnd3Mtd2l6EAEYADIHCCEQoAEQCjIHCCEQoAEQCjIHCCEQoAEQCjILCCEQFhAeEPEEEB06BQguEIAEOggILhCABBDUAjoLCC4QgAQQxwEQ0QM6BQgAEIAEOggILhDUAhCABDoLCC4QgAQQxwEQrwE6CAgAEIAEEMsBOgoIABCABBAKEMsBOgcIABANEIAEOgkIABAeEA0Q8QQ6CAgAEBYQHhAKOgsIABAIEB4QDRDxBDoJCAAQFhAeEPEEUABY-mtgv4kBaABwAHgAgAHEAYgBmhOSAQQ4LjE1mAEAoAEB&sclient=gws-wiz#imgrc=WCUAQniZnEi9tM&imgdii=JXxeq1evGcE0uM

Thus, the preceding illustration depicts the **Corridor stripe** and the **Mayan Train railway**, and its connection with the Mayan Train running from the Mayan Peninsula (Mayan Riviera) at Coatzacoalcos port in the state of Veracruz México (more than 1500 km) in the Gulf of Mexico on the Atlantic Ocean, paralleling showing its interconnection with the Transisthmian Train in **Coatzacoalcos** and from this port down to **Salina Cruz** port in the Pacific ocean (309 km). At the same time, along the railroad track, a land road connecting these two ports (**"Transisthmian road"**).

Figure 3: Transisthmian Corridor and the Transisthmian Stripe.
To get an even closer idea of the Transismic Corridor alone (303 km) and its two connection ports, Salina Cruz on the Pacific side and Coatzacoalcos, on the Atlantic side, we present Figure 3 below:



Source: https://lacuarta.mx/wp-content/uploads/2023/04/IMG-20230401-WA0058.jpg

Where it can be seen along the train trailway (yellow) and the transisthmian road (in red) connecting the 309 km Corridor route, between Coatzacoalcos and Salina Cruz ports. Which has two deep-sea ports, a railway, highways, three airports (Minatitlán, Ixtepec, and Huatulco), as well as a gas pipeline and na optic fiber network along the transisthmian stripe. With all this productive infrastructure the Corridor is expected to become na important magnet for foreign or domestic investments, with tax incentives, a free trade zone, customs areas, tariff reductions, a one-stop window for paperwork government red tapes, as well as the development of residential areas and protected natural reserves.

TOWARD A SOCIALLY INCLUSIVE STRATEGY ON THE CORRIDOR: SOME REFLECTIONS

Notwithstanding all these public investments it comes out paramount at this point to underscore the fact that this project entailed not merely a reshaping, strengthening, and modernization of the old Isthmus railroad along with a host of productive infrastructure and commercial services and facilities along the **Transisthmian stripe**, which physically comprises a trail of barely 300 km between Atlantic and Pacific, focused on increasing its commercial and transportation capability and logistics, to facilitate a massive operation of merchandise from port to port.

In addition to a full-fledged reinforcement and reshaping of the old railroad infrastructure and roads throughout the neighboring South-Pacific, Gulf of Mexico, and South Western regions aiming to support a heavy industrial activity around the ten planned industrial parks throughout this **Corridor** to support the expected intense economic activity and massive cargo and people along the stripe and later on throughout the rest of neighboring regions once this facility reaches its full operation.

However, together with all these mega federal investments focused primarily on the reinforcement of productive infrastructure along the **Corridor stripe** as previously mentioned, Mexican strategy has also considered the reinforcement of productive and social urban projects around the major Isthmus municipalities, aiming to upgrade people's living standards and well-being conditions based upon a socially inclusive and sustainable regional economic strategy named **"Programa de Desarrollo para el Istmo de Tehuantepec"** according to official sources, such a Rafael Marin Mollinedo, former General Coordinator of this project, **Vid, Marin Molinedo, R. (May 2019)**. Backed by the Multimodal Logistics Platform derived from current Mexico´s national economic strategy pursued by President Lopez Obrador **vid, AMLO(2019).** Which aims to implement the "Development Pole" concept along the Corridor stripe connecting two important regions, namely, the South-Pacific and the Gulf of Mexico **vid**, **PODEBIS(Polos de Bienestar,2023).**

The rationale behind this strategy entails the concept of **"Growth Poles"** aimed to combine public and private investments and are specifically built around an already-existing resource (Transisthmian Corridor as an interoceanic commercial facility) along the Isthmus of Tehuantepec, **vid, Speakman, John et Al.(2013)**

In other words, **a growth pole** is comprised of multiple simultaneous investments coordinated throughout many sectors to support self-sustaining industrialization in a country, **vid, Perroux, Francois(Jul, 1963), but** we deem paramount a close supervision and involvement of the State, not just merely a "stakeholder" but "major stakeholder" but to

guarantee its socially inclusive impact or at least fostering a sound balance between growth and population's well–being as desirable by Mexican authorities, especially when focused to a strategical but deprived and lagged Mexican region as the Isthmus stripe and not to repeat the aftermath of Mexican's maquiladora experience in northern Mexico **vid**, **Luis-Pineda, O.(1998)** and **Luis-Pineda, O.(1998bis)**.

On this line of thought it is important to underscore that unlike the classical neoliberal profit-oriented strategy adopted by most peripheral economies market-oriented economies, such as Mexico and Latin America, the current Mexican Government has primarily emphasized a socioeconomic and inclusive economic strategy framework throughout this region nurtured from the Mexican national economic strategy **(Plan Nacional de Desarrollo (PND**). In such a way that Tehuantepec's Corridor region abides by this strategy. Accordingly, the above-referred regional strategy focused on the Isthmus stripe called **"Programa de Desarrollo para el Corredor Transísmico,"** according to its former Corridor Project's spokesman and General Director, Rafael Marin Mollinedo, early mentioned as a result of its evident geostrategic relevance for the Transismic Region and Mexico, **vid, Circuitotinto.org (Dec7, 2019)**.

Under such virtue, in addition to the above-referred strengthening of the productive capacity along the Corridor, the referred strategy comprises a full range of social and urban infrastructure focused on upgrading people's living standards in major municipalities along the Transisthmian stripe. Such as

- Strengthening educational infrastructure: schools and universities
- Promotion technological research and development: innovation ecosystem,
- Furnishing energy infrastructure: gas pipelines, oil pipelines, and non-renewable sources.
- Promotion of public health, education, and nutrition programs.
- Strengthening public services infrastructure: water, electricity, energy, drainage, and solid waste treatment.
- Promoting housing infrastructure and urban equipment.
- Fostering agricultural, fishing, and agro-industrial sector infrastructure.

EMPHASIZING PRODUCTIVE PROMOTION AND INDUSTRIAL INFRASTRUCTURE AND FOREIGN INVESTMENT ATTRACTION

As already pinpointed, such strategy comprises a wide range of critical aspects of productive, logistics, transportation, communication, and social infrastructure across the entire region, such as strengthening railroads, roads, port facilities, and airports and a

refurnishing social infrastructure of the major municipalities along the Transisthmian stripe aimed to attract foreign and domestic investments across the Corridor. Among others:

- Tax exemption for four years of operation
- Wideband internet connection along the stripe
- Energy supply along the isthmus zone: Pipeline gas furnishing from port to port (Coatzacoalcos to Salina Cruz) along the Corridor's stripe.

The rationale behind all these measures results evidently explainable since they will allow the strengthening of the Corridor's productive capacity along this region. Accordingly, the ten planned industrial parks are strategically located along crucial municipalities of **Veracruz** and **Oaxaca** across the **isthmus stripe**. The bottom line of this new productive infrastructure is to cover a range of industrial branches and services, such as high technology, agro-industry, etc. Seeking to add aggregate value to the foreign or domestic inputs and merchandise processed within Mexican territory along the Corridor. Items which can be later reexported as final consumer goods to foreign markets through the Corridor to Europe, the US, Central and South America, and Asia via either the Gulf of Mexico or the Pacific Ocean.

NEARSHORING-OFFSHORE AND OTHER CORRIDOR'S COMPARATIVE AND COMPETITIVE ADVANTAGES OF MEXICO TO ATTRACT FOREIGN INVESTMENT

Given the Corridor's geostrategic location and its recent launching, this facility has become a mammoth magnet for foreign direct investments, as shown since several years ago, in 2022, by the attraction of 32,447 USdlls from January to September of that year, according to some Mexican government sources, **vid Morales, Roberto (Nov22, 2022).**

Capital flows which come from the US**(**39.1%), Canada (9.5%), Spain (7.1%), Argentina (4.9%), and Japan(3.9%), respectively. Although the attraction of foreign investment for the Southwestern region is not new since it has been for a long time in the eyes of the transnational capital, **vid, Ávila Romero, Agustín. (2018)**.

NEARSHORING VS OFFSHORING

Nearshoring as opposed to **offshoring or off-shore** production model, entails nowadays an excellent opportunity for Mexico, in particular for the **Trans-isthmic corridor**, as no doubt can place the country and the Corridor not only as one the essential players in North America but as well as one of the main headquarters of Asian companies. However, according to some business experts, Mexico could lose these advantages if Mexico doesn't

make the necessary domestic structural changes, as pointed ouit by some analysts, **vid, Reynold, Verónica (Dec 14, 2022).**

Notwithstanding, **nearshoring** despite all the apparent advantages as economic growth and job opportunities, should not be considered a “panacea” by itself because it implies a double-edged sword for Mexico and for most developing economies since, on one edge, fosters economic growth through new investments flowing into a specific region and thus increasing job opportunities for its population.

However there is no guarantee whatsoever that such an economic boom generated from foreign or domestic investments will render social inclusion and better living standards for the labor force and inhabitants of this long-time-ago poor-lagged region withought a decisive state´s involvement to garantee the implementarion a socially inclusive strategy oriented to foster a balanced economic strategy to balance growth and social well-being and not greater wealth polarization within the region and other externalities such as environmental impacts and natural resources depletion as already happens in northern Mexico with the assembly industry along northern US-Mexican border states aquiladora de exportación) as mentioned earlier, **vid,** Impacto socioeconomico de la Industria Maquiladora de Exportación en México**, vid Luis-Pineda, O.(1998bis).**

Well-being under a balanced and socially inclusive economy should be translated not only in terms of economic growth in the region and more job opportunities for people with more competitive wages and better social and urban conditions for major municipalities along the Transismic stripe, to begin with, as expected by the federal government’s strategy, without neglecting the implementation of sustainable, productive exploitation of the region's vast natural resources and full respect of local population’s rich cultural wealth and idiosyncrasy from foreign or domestic investors, **vid AMLO-PND(2019).**

In this regard, the Mexican State should implement severe public policies to prevent or minimize the onslaught of real estate speculators and all kinds of land predators near the Corridor’s trail from Veracruz to Salina Cruz and the rest of the railways in the Southwestern region seeking at all cost monopolizing private property or water resources from poor families living aside the Corridor at starving levels to deprive them from these valuable resources for pennies, v**id, Santos Celdo(Ago, 2023)**.

Rather, organize these people via collective productive cooperatives or support local MSE (medium and small enterprises) through federal funding to enable them to export their products or merchandise within the rest of Mexico or abroad, taking full advantage of the Corridor facilities and thus enhancing their living standards vis a vis the Corridor´s economic

boom (through a socially inclusive regional strategy) as already conceived by the federal government**.**

Under this context, it is utmost important for Mexico not to repeat the bitter experience of the **off-shore productive experience in a developing economy**, such as the case of the Assembly industry (the so-called Maquiladora industry) in Northern Mexico, where Mexican government (in neoliberal times) irresponsibly fostered foreign investment aimed to industrialize this region throughout a stripe of more than 3,000 km along the US-Mexico border, allocating assembly plants, of mostly American-owned capital conveniently throughout its major US-Mexico's border municipalities (such as Tijuana, Mexicali, Juarez, Nuevo Laredo, Nogales, Matamoros, etc.) to stimulate US economy 'competitiveness' in the world market during the Cold War period, taking full advantage of his southern poor neighbor comparative advantages such as Mexican cheap labor force and close vicinity to US market along with a host of other facilities granted by Mexican authorities such as tax exemptions and an 'ad hoc' regulatory system to facilitate its operation in Mexican territory with marginal integration to Mexican domestic industry and no technological transference to Mexico.

All of these facilities were granted under the acquiescence of Mexico´s government, with the illusion of foreign currency and job generation in the Northern region. However, the resulting outcome of such a policy was growth (cheap formal jobs and foreign currency). Still, it featured a lack of a socially inclusive strategy from the Mexican government around major maquiladoras's municipalities since its operation has been functioning as a virtual industrial enclave into Mexican territory, inflicting around people and border towns a host of externalities through time **vid, Luis-Pineda, O.(1998).**

Recapping, the Mexican assembly industry experience, it is an important lesson for Mexico and should be carefully considered all the capital flows into the region from the maquila industry, although undoubtedly contributed to fostering an economic boom along Mexico's Northern states (Baja California, Sonora, Chihuahua, Coahuila, Nuevo León, and Tamaulipas) through formal jobs and foreign currency inflows for Mexico. These have been achieved at a very high socioeconomic and environmental cost and other myriad externalities for such a region and Mexico.

However, it is worthwhile mentioning some additional consequences of this strategy, such as the aggravation of the pre-existing unbalanced, socially exclusive, and unsustainable development in the country, as well as the exacerbation of the North-South socio-economic asymmetry in Mexico. Like the existence of a dual economy in the country since a long time ago, as recognized by some scholars, as Manuel Gollás, **vid, Gollás,**

Manuel (1982). That explain our concern to strive for a socially inclusive strategy for Mexico in the years to come which entailed a fully reorientation of such economy model prevailing in the neoliberal time, **vid Luis-Pineda, O.(2008).**

EXPANDING THE RAILROAD INFRASTRUCTURE SYSTEM OF THE CORRIDOR THROUGH THE CONNECTION TO THE MAYAN TRAIN ROUTE AND THE ISTHMUS RAILWAY TO CENTRAL AMERICA

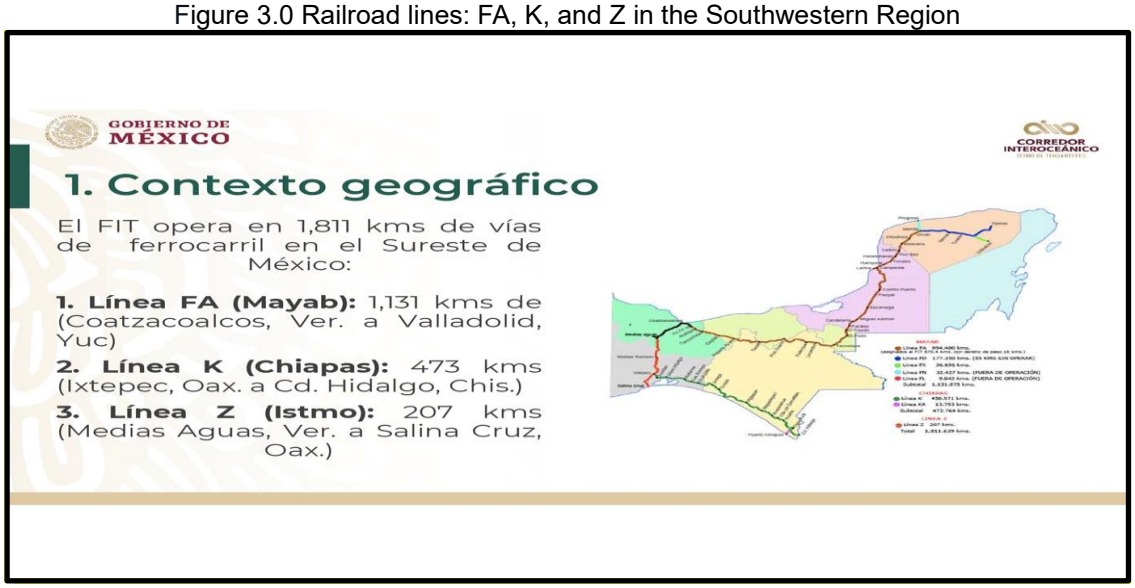
With an evident intention from the current Mexican government to expand the Corridor's railroad capabilities to facilitate the expected unprecedented cargo and passenger and massive traffic among the three economic regions, South-Pacific, Southern, and Gulf of Mexico, the government is implementing the operation of a total of three railroad lines through these regions which are described as follows:

1)Z-line(Isthmus line): Backbone or initial route, from Coatzacoalcos, Veracruz, to Salina Cruz, Oaxaca.

2)FA-line (Mayab line): It seeks to connect Coatzacoalcos to Palenque, Chiapas, along the Mayan Train route. And from this place to connect Mérida in Yucatan, in the Southwestern region. Total trail distance of 1,131 km. The longest one. But the FA-line from Coatzacoalcos to Palenque, 310 km has just been inaugurated by President AMLO, **vid, CNMX. MX(Sep13, 2024).** This line becomes actually an extension branch of the Transisthmian railway starting from Salina Cruz port and crossing four states, namely, Oaxaca, Veracruz, Tabasco and Chiapas. Connecting in this case Coatzacoalcos port to Palenque, Chiapas.

3) K-line (Chiapas line): It goes from Ixtepec in Oaxaca state on the isthmus stripe near Salina Cruz to Cd. Hidalgo in the state of Chiapas. Border town near Guatemala. The line is intended to serve as a connecting railway for both cargo and passengers from Guatemala and Central America into Mexico through the Corridor´backbone railway. (Trail distance of 473 km). Still pending to be inaugurated by Mexican government.

Figure 3.0 Railroad lines: FA, K, and Z in the Southwestern Region



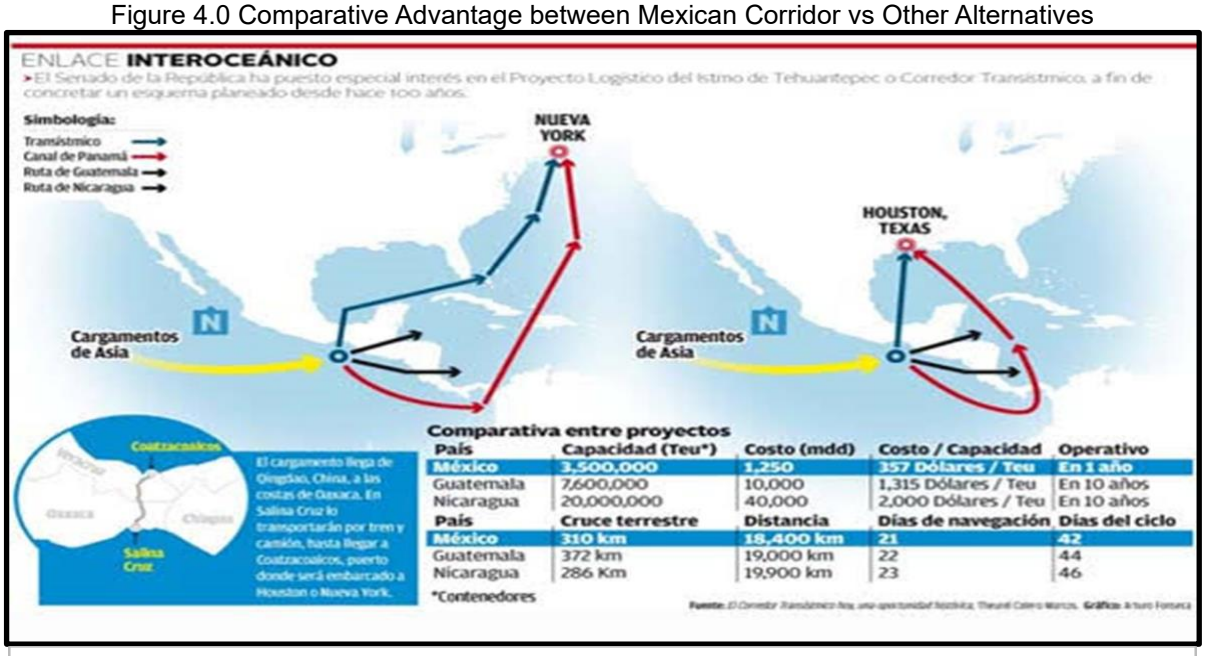
Source: https://amf.org.mx/wp-content/uploads/2020/08/2.%20Infraestructura%20de%20transportes%20para%20el%20Istmo%20y%20el%20Sureste%20%28CIIT%29.pdf

The bottom line of all of these infrastructure investments from Mexico is evidently focused on supporting a massive flow of freight and people throughout the above-mentioned regions through these new railway lines in the coming years. With all this new and refurbished infrastructure, it is intended to facilitate the interconnection and interaction among the following three economic regions: **South-Pacific** (Guerrero, Oaxaca, and Chiapas), **Southeast** (Yucatán, Quintana Roo, and Campeche), and the **Gulf of Mexico** (Tabasco, Veracruz, and Tamaulipas). That will be seamlessly interconnected and reached through the Isthmus Corridor, which will become the backbone railway connector among all of them and the natural exit gate to the Atlantic and Pacific oceans in the near future.

CORRIDOR COMPARATIVE ADVANTAGE VIS-A-VIS PANAMÁ CANAL AND OTHER NEARBY INTEROCEANIC PROJECTS

Firstly, to illustrate the Corridor advantages vis a vis alternatives nearby connecting facilities between the Atlantic and Pacific oceans such Panamá Canal, Guatemala y Nicaragua routes) to major world markets it results in convenient to have a glance to **Figure 4** below:

Figure 4.0 Comparative Advantage between Mexican Corridor vs Other Alternatives



Fuente: Legiscomex digital Enlace: https://www.legiscomex.com/documentos/mexico-corredor-transistmico-virginia-perez-actualizacion

As can be easily seen from the precedent chart, which shows a summary of statistical indicators comparing the other interoceanic crossing alternatives versus the Mexican Corridor. At first glance, there are better competitive advantages for the Mexican Corridor in freight costs (Mill.Us$dls), cost/capacity ($/Teu), land crossing distance (km) between the Atlantic and Pacific, and navigation time (days). Altogether, these indicators show better competitive advantages for the Mexican Corridor against its competitors toward nearby world markets, such as the US's East Coast, etc.

Secondly, but not least important, is the fact that Mexico is subscribed to the USMCA Treaty (United States-Mexico-Canada) and the fact that it represents the first US trade partner to surpass China and Canada as a trade partner under such a treaty. As such, the Corridor becomes of utmost relevance for Mexico since it will speed up and facilitate its trade toward both the Atlantic and Pacific US coasts, as well as its interconnection with the US Southern border through the traditional Mexico-US railway system, which now will be reinforced by the trade with Asia and Europe via the Corridor.

Thirdly, and lastly, in front of the unfortunate current clogging occurring through the Panamanian Canal, given that the canal is drying and its crossing becomes extremely difficult and costly, which altogether implies a substantial delay and expensive for the massive ship traffic between the two oceans.

Thus, the Mexican Corridor becomes the best option among all the transoceanic crossing alternatives located in America. Given the fact that the Panamian Canal's current drying out and concomitant long awaiting crossing time for cargo ships using it and its losing

comparative advantage as a crossing facility between Atlantic and Pacific oceans which altogether becomes an unmissable opportunity for Mexico,**Vid, Vanguardia(Feb23,2024).**

Therefore the **Mexican canal** becomes right now of utmost important given that around 6% of the global flow of cargo crosses through the **Panamian Canal**, making the Mexican canal an unbeatable alternative, **vid, AFP(Ago,2023).** And it is expected to move 1.4 million containers per year, and expected to become a cheaper and faster alternative than the Panamanian Canal, according to Forbes, **vid, Forbes(nov9,2022).**

SOCIAL PEACE CLIMATE BACKED BY IN SITU NAVY SURVEILLANCE ALONG THE CORRIDOR STRIPE

To guarantee a climate of social peace and seamless operation in the Corridor area, the Mexican government, and thus facilitate productive and commercial operations along the Corridor, the current Lopez-Obrador administration has wisely decided to hand over its operation control to the Mexican Navy from the ports administration, highways, and industrial parks. Through this mechanism, it is expected that productive and commercial operations across the corridor and region take place and are accomplished by the provisions of the aforementioned official strategy and minimize deviations temptations from people in charge of its operation and the official strategy implementation from its objectives.

The rationale behind this decision is based on Mexico's historical background, already mentioned above. But also for currently having a president like never before in history, a nationalist government that emphatically endeavors and is beein committed to eradicate corruption from the public system and enhencing well-being for the vast majority of Mexicans with President Lopez Obrador´s slogan **“primero los pobres”** (**“poor people first”)**.

Thus combatting long time abuses and corruption practices committed by past administrations (Salinas, Zedillo, DelaMadrid For, Calderon, Peña Nieto). Who irresponsibly granted concessions at large of most important state-owned enterprises (oil, gas, energy, railroads, mine industry, etc). Particularly, Mexican railroad system to a US-Multinational Kansas railroad during President **Ernesto Zedillo’s** administration following the “IMF recommendations” nurtured from the **Washington Consensus**´hegemonic policies (“recipes”), **vid ElMostrador(Oct11, 2004)**, which disastrously impacted Mexican economy, featuring anti-development policies for the country. Recipes which inconceivably were repeated and implemented in most major Latin American countries, as pointed out by other scholars such as Martínez, Rangel Rubi et al.**, Vid. Martínez Rangel, Rubi et al(2012).**

For instance the concession for a section of the trans-isthmic railway of barely 100 km (from Cosoleacaque to Medias Aguas in the state of Veracruz) to a Mexican company "Grupo México", allied to transnational capital, who recently attempted to hinder the completion of this Corridor but eventually accepted (under strong political pressure) to sign an agreement with Mexican government to release this short trail of the Transismic railroad, **vid Contralinea(Jun1, 23)**.

Thus enabling Mexican authorities to proceed with the completion of the Corridor, despite strong opposition from this powerful industrial enterprise which incidentally was one of the major owners of the entire Mexican railway system thanks to large concessions graTnted by past corrupt regimes who ruled Mexico. But to have an idea of how important is the current Mexican railway system distributed throughout the Macrosouth region, we depict the following illustration which depict the three railway system in this macroregion.



Fuente: Infobae
Enlace: https://www.infobae.com/mexico/2023/01/17/gobierno-de-amlo-inicio-operaciones-de-seguridad-donde-correra-el-tren-transistmico-el-ultimo-megaproyecto/?outputType=amp-

As we can easily observe from the above chart, which shows a host of square stations painted in “green” representing checkpoints stations in charge of navy personnel supervising the “in situ” operation of the four lines Z, FA, K, and Dos Bocas refinery railway. All of them located in the Southwestern region where it is reported the traveling distance between two connecting stations in kilometers along with the number of navy supervising

personnel assigned to each line, according to its priority and distance, for instance, the **Z-line** (307 km, Coatzacoalcos-Salina Cruz, 1,827 personnel), **FA-line**(328 Km, Coatzacoalcos-Palenque, 720 personnel), **K-line** (1,455 km, Ixtepec- Cd. Hidalgo, 1,455 personnel) and Dos Bocas Refinery-Ramón Ayala (95 Km, 360 personnel).

The rationale of this close and "in situ" supervision is evidently to guarantee a peaceful operation climate for the commercial flow and industry operation along the four railroad lines for the coming years in such a way as to **facilitate** a smooth operation not only along the Trans-isthmic Corridor but through the rest of the megaprojects currently implemented the Southwestern region, such the Mayan Train and Dos Bocas refinery, among other important projects taking place in this region, to be accomplished according to the expected official strategy and minimize deviations from the objectives set either by corruption, violence or social unrest.

Furthermore, this measure seeks likewise to contribute to tempering the migration onslaught problem coming from Central and South America who ordinarily crosses the Corridor's region on their long journey to the Northern border Mexican states and the United States in search of the so-called "American dream" who utilize the "Beast train" coming from Guatemala's border into Mexican territory. Unfortunately, many of these people, who easily mimic the local population, remain instead in the Isthmus stripe and other places across the entire Southwestern region, looking for jobs or a way of living with socioeconomic and urban implications among its major municipalities, **Vid, Wolf,Sonja (coord)(2020)**.

A BRIEF OUTLOOK ON GLOBAL, DOMESTIC, AND SOUTHWESTERN REGION ECONOMIC OUTLOOK AND PERSPECTIVES ON MEXICAN CORRIDOR

Before concluding this paper, it is worthwhile mentioning some critical socioeconomic remarks from the world, domestic and Southwestern region.

Amidst an economically troubled world, affected on one side by the recent Covid pandemic and its dramatic implications on death tolls and concomitant recession at the world level derived by highly indebted countries attempting to struggle against the Covid and reactivation of their damaged economies, for instance, Latin America, **Vid,CEPAL(Jun, 2022).** Along with other macroeconomic impacts of Covid-19 at the world level, **Vid, Warwick McKibbin et. Al.(May, 2021)**.

Later on, the global struggle to minimize the effect of the oil and gas shortage and other agro-commodities as fertilizers (supply commodity chains) derived from the Russian-Ucranian war and which affected both developed and peripheral economies, as pointed out since 2022 by some scholars like Ruth Edam and Divine Forchar, given Russia major

leadership in such critical commodities, affecting not only to US, Canada, UK, and European countries who punished Russia and were affected by its counter reaction offensive generated inflation, supply chains disruption impacting the world over, **vid, Endam, Ruth et Al.(Mar25,2022)**.

Under such global scenario, the Mexican economy has successfully so far come out from both woes with positive economic results as opposed to most Latin American countries, thanks to the domestic strategy adopted by President Lopez-Obrador, far from IMF recipes, throughout the country during the last five years, oriented, primarily on strengthening the domestic market and socially inclusive context through significant mega investments in productive infrastructure throughout the nation. As is shown by the recent drop of 8.9 million people who leave poverty by 2022, from the 55.7 poor million existing in 2020 to 46.8 million reported by 2022, among other important social achievements, and the extreme poverty dropped from 10.8 to 9.1 million people,**Vid, Headtopics(Ago11, 2023).**

On the other hand, the Mexican GDP annual rate will reach by the end of the current year an estimated 4% and is expected to attain a similar figure by 2024, according to the Mexican government. There have also been a host of social measures implemented to increase people's aggregate demand in the country, such as an 88% increase in minimum wage in Mexico during the current administration. And thus increasing people's purchasing power for the first time in modern Mexico,**vid,TradingEconomics(2024)**

Altogether, Mexican economy evolution has been observing an increasing trend, during the last five years, despite a drop of 8% during 2020 due to the pandemic recession, **Vid, Mexicocomovamos (Jul31, 2023) .**Despite many people in Mexico and abroad believing that the country would be incapable of recovering from past pandemic effects. Such as the famous Moody firm, **vid Moodys (Sep1, 2023).** Now they are discussing of a new "Mexico´s economic take-off," **vid, Paez, Alejandro et Al.(Ago18, 23).**

In respect to the rest of Latin American countries, Mexican economy performance shows positive outlook so far in 2023. Given its solid behavior, Mexico's leadership is now hoping that a robust economy will prove vital against the likely worsening of conditions, as it. With growth rates through April 2023,comfortably in positive territory, the country's performance thus far in 2023 has been somewhat of a surprise, having repeatedly defied economists' expectations with its sheer resilience and positive data releases. Given this solid performance, moreover, Mexico's leadership is now hoping that a robust economy will prove vital against the likely worsening of conditions, as it anticipates "rolling up its sleeves to withstand the spillover effects from the slowdown"(even a potential US recession), as

pointed out by Valerie Hernández, a financial analyst from Internationalbanker.com,**Vid, Hernandez, Valerie (Ago9, 2023).**

MEXICAN CORRIDOR AND SOUTHWESTERN REGION´S PERSPECTIVES

As regard to the Shouwestern region situation, it is been recognized from long time ago that is a "rich region (blessed by its vast natural resources) but unfortunately "immersed into poverty" as pointed out by Ernesto Correa, **vid,Correa, E.(Ago3, 2014)**. Region wich also has permanently "lagged behind" from North and Center regions as pinpointed by some scholars like Fariza, Ignacio, **vid Fariza, Ignacio (Sep15, 2017)**.

As well as it has been far away from a socially inclusive framework for a long time ago although striving for a betterment of its socioeconomic conditions as recognized by Roberto Candelas, **vid, Candelas, Roberto(2018)** to unexpectable embrace mammoth public investments such as the Corridor, Mayan Train, and Dos Bocas refinery already been inaugurated by Lopez Obrador since two years ago, **vid,AMLO(Jul1,2022)**

Such mega investments on productive infrastructure are already producing an unprecedented economic boom into the Macrosouth subregions. As shown by the behavior of their subregions such as Tabasco, Campeche, and Oaxaca, with one time lagged economies now are growing at a faster rate than even the wealthiest Northern states such as Nuevo Leon, Coahuila, Chihuahua, and Sonora **Vid, Comovamos (Jul, 2023)**.

Lastly, given the expected massive job creation through the Corridor for the near future, the entire Corridor is expected to become and "employment wall" for the immigration coming into Mexico from Central and South America. **Vid,Hernández,Julio(Jun30,2022).**

General Conclusions and Recommendations

To begin with, we must bare in mind that this analysis offers a preliminary overview of a very complex situation which involves a socioeconomic deprived and lagged region based on circumstances and elements that are currently being developed without neglecting its historical background. Under this premise, we can advance the following preliminary conclusions:

- Firstly, it is been expected an economic boom along the involved municipalities where the Transismic Corridor crosses. A bonanza, which will no doubt permeate throughout the entire South-Pacific South and Gulf regions for their close geographical vicinity and economic interdependence.
- Secondly, the forthcoming increasing cargo and passengers traffic between the two multimentioned ports will entail concomitant economic growth and greater job

opportunities for local population by the increasing volume of merchandise movement between such ports along the Corridor stripe.

- As a result of the two above events, it is expected an increase in economic activity along the Corridor and a concomitant boom around major municipalities where the **Transisthmian Corridor** crosses. Which in turn is likely to spread throughout the rest of the neighboring regions as the South-Pacific (Guerrero, Oaxaca and Chiapas) and the Gulf of Mexico's region(Veracruz, Tamaulipas, and Tabasco) by their close geographical proximity and economic interdependence.

In social matters, and along with the economic bonanza it is easily to foresee some social implications associated with the unexpected bonanza along major municipalities:

- The traditional lack of urban infrastructure and basic services, such water supply, energy, housing, and other basic services, such as school, hospital services, food supply, will be unable to cope with the incoming population lured by high job demand along the Corridor, impacting not only major municipalities but as well small villages located around them. Population will be expected to grow from people coming from other places outside the Southwestern region such from Center and Northern Mexico as well from Guatemala and Central America, as already is being happening.
- Another social externality which cannot overlooked here is the fact that given the Corridor geostrategic location, has also been profited by drug trafficking cartels and local gangs for their criminal activities along the stripe, are now also been lured by its new economic bonanza and might exacerbate their activity and produce generate more social insecurity for local residents in the region, and even endangered the whole megaproject in the coming years, if not prevented and severely curtailed by Mexican state,**vid, CFR.org Editors(Aug5,2024)**.
- In short, as a result of the sudden economic bonanza, there is expected a rising people inflow into the region lured by such bonanza wich rapidly exceed the Corridor's economic and social absorptive capacity and thus generating social and urban stress and chaos among its major municipalities in the short and medium run. And thus creating "ghettos" all around such major municipalities along with a host of socioeconomic externalities and generating, if not restricted by Mexico, an uneven socially non-inclusive regional development along with another socioeconomic externalities.

In environmental matters, and concomitant to the economic bonanza we also foresee some environmental implications around the region's major municipalities:

- As a consequence of the forthcoming rapid population increase versus limited urban infrastructure and drainage capacities, waste disposal, increasing energy demand and water treatment facilities in the region. Water and energy shortage is expected as well as pollution problems among major municipalities since current rivers and other water resources are expected not to be sufficient to cope with the expected increase demand not only for the rising residential demand but also from the increasing industrial activity around the 10 industrial parks being implemented along the Corridor stripe.

Recommendations

Based on the previous conclusions, we deem of utmost importance to advance some reflections and recommendations aimed at contributing to reinforce the spirit that drives the inclusive development strategy implicit in the economic strategy conceived for the Transismic Corridor for the coming years:

- Under the fact that the region is its rich cultural heritage and focused their attention on the looting of the exploitation of its natural resources and take advantage of its comparative advantages and such as gold, silver and its wind wealth such as Iberdrola made by a Spanish company As almost the old Transismico railway and the wind industry but that have been socially exclusive because they have not translated into better well-being for the isthmus population.
- However, the new investments will generate an income for the region's population, both for the producers of goods and services in the region and for the regional workforce participating in this production process.
- The prevailing economic asymmetry between the North and South puts Mexican workers from the South at a great disadvantage with respect to labor hands costs in the US and Canada. In the absence of severe socioeconomic policy protecting domestic labor hand, they will be overexploited by foreign and domestic private investors alike, taking advantage of their poverty and unemployment, as already has happened in Northern Mexico with export maquiladora industry case from mostly US capital-owned “maquiladoras” under the off-shore production model.
- Under a region immersed in social conflicts derived from the past but also spurred on by the overlooking of post-revolutionary and neoliberal governments who have ignored it rich cultural heritage and barely focused their attention on

plundering and over-exploitation of its natural resources and taking advantage of its comparative advantages and such as gold, silver and its wind wealth such as the case Iberdrola (a Spanish TNT, Iberdrola, who build an Eolic energy enterprise located in La Ventosa largest Eolic Plant in Mexico with fully disregard to local people's well-being under the neoliberal acquiescence during those years, and thus creating a socially non-inclusive project with no benefits for the region´s poor people who owned this lands since the benefits accrued for this foreign firm never spilled over lands owner and isthmus population´s well-being, as cheap energy and job opportunities, for instance.

v) Although the expected new investments from current Mexican government are expected to generate an economic boom in the region's population, from both producers of goods and services in the region, as well as for the regional workforce participating in this production process.

vi) The economic asymmetry between the North and South puts workers from the South at a disadvantage. That they will be overexploited by foreign investors, as happened in the north of the country with the export maquiladora industry (assembly industry) office-shore production

vii)The challenge for Mexico in the years to come is to ensure that the implementation of the strategy designed for this region is not delayed by the interests of investors, both domestic and foreign, and ignore the growth and well-being of the majority of the population that has remained behind for centuries and I consider that it is time that they are taken into account. Here are some pertinent recommendations:

vii) In order not to repeat the aftermath's Maquiladora experience and prevent labor overexplotation from incoming investors entering the region. It is highly recommended, to liberate labor price within the Transismic stripe so that foreign investors pay at least wage levels similar or close to those prevailing in developed economies with similar labor qualifications and thus increase regional aggregate demand and the regional's population purchasing power and living standards vis a vis the expected higher living costs associated to the new investments entering now into the region, with the price rise increase in food, shelter, energy, water, all kind of basic services as a result of a higher industrial and services demand around the region's major municipalities.

viii) Lasty but not least, organize and prioritize financial support for local producers (SME) through financial packages designed by Mexican authorities in order to enable them to sell their domestic products and services not only within the region but take advantage of the Corridor facility to export them abroad.

Bottom line is not only to foster local production for domestic consumption but to generate added value into them and promoting productive chains among SME's to boost an economic growth and bonanza withing the Corridor stripe but to facilitate the achievement of a "multiplier effect" from the federal investment already being made from Mexico into this region which also would positively impact or reach the isthmus's neighboring states, such as Guerrero, Chiapas and Veracruz. Without overlooking the opportunity to productively chain the regional domestic SME output to the large enterprises to be located at the Isthmus Corridor stripe as potential input suppliers (and not to repeat the aftermath Maquiladora Assembly experience on this regard of lack of official support and technological transference to Mexican SME located around the American Assembly industry in northern Mexico)

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VISUAL PROCESSING ANALYSIS AND MACHINE LEARNING IN THE EARLY DIAGNOSIS OF ASD USING EYE TRACKING

https://doi.org/10.56238/sevened2024.031-008

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ABSTRACT

This non-clinical study explores the effectiveness of holistic processing in facial recognition and the application of eye-tracking systems in the diagnosis of Autism Spectrum Disorder (ASD). Three approaches are adopted: Composite Faces, Part-to-Whole and Flip Effect, highlighting the importance of holistic analytics for efficient facial recognition.
The research utilizes camera-based eye-tracking systems, which are notable for their non-invasive approach and accuracy in detecting specific eye movements. OGAMA® software and data mining tools such as Orange Canvas are used to analyze eye metrics. The methodology includes the identification, storage, and processing of oculometric variables using supervised learning algorithms to predict behavioral patterns in individuals with ASD. The experiments carried out demonstrated the effectiveness of the proposed methodology. Reference data were used to validate the findings, and machine learning techniques were employed to differentiate individuals with ASD, with Neural Networks standing out as the most effective algorithm.
It is concluded that the combination of eye tracking with data mining offers valuable insights for the diagnosis and understanding of ASD, opening up new possibilities for research in holistic processing and contributing significantly to the fields of psychology, medicine and assistive technologies.

Keywords: Eye Tracking Systems. Assistive Technologies. Data Mining. Autism Spectrum Disorder.

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INTRODUCTION

The advancement of computational technologies has had a significant impact on several areas of scientific research, especially in the study of neuropsychiatric disorders such as Autism Spectrum Disorder (ASD). This disorder, which affects millions of people around the world, is characterized by a variety of symptoms related to communication and social behavior. In addition, the significant variability of symptoms between individuals makes diagnosing ASD an ongoing challenge for clinicians and researchers (SMITH and JONES 2018; DOE et al. 2019).

In recent years, there has been a growing interest in the development of computational tools that aid in the early detection and more accurate diagnosis of ASD. Among these tools, the use of Artificial Neural Networks stands out, which, combined with visual programming techniques in software such as Orange Data Mining, allow complex data analysis without the need for advanced programming skills. These tools have the potential to democratize access to technology, facilitating its use by health professionals and researchers from different areas (Tec 2023; Aut 2023; AHMED et al. 2022).

One of the main focuses of this approach is facial image analysis, with the goal of studying the holistic processing of human faces, a skill that is often challenging for individuals with ASD. Holistic processing refers to the ability to interpret the face as a whole, rather than focusing on individual features such as the eyes or mouth. This difference in visual processing can be a valuable indicator for the early diagnosis of ASD (ADAMS and TAYLOR 2022; LEE and HARRIS 2021).

Technologies such as eye-tracking have been widely used in these studies, monitoring the eye movement patterns of individuals while observing visual stimuli. This type of analysis allows us to identify how individuals with ASD process facial information differently from neurotypicals, revealing patterns of attention and visual fixation that may be characteristic of the disorder. These insights are fundamental for understanding the visual behavior of individuals with ASD and, consequently, for the development of more effective diagnostic tools (AHMED et al. 2022; KOLLIAS et al. 2021; DUAN et al. 2019).

The importance of this type of research is amplified by global statistics related to autism. According to the World Health Organization, there are about 76 million autistic people in the world, representing approximately 0.62% of the global population. In Brazil, a recent study estimated that one in every 367 children is diagnosed with ASD. These numbers underscore the urgency of improving the diagnostic and intervention tools currently available (et al. 2011).

With this investigation, it is expected not only to contribute to the advancement of the field of ASD studies, but also to offer a practical and accessible computational tool that helps in the analysis of holistic facial processing. In addition, the use of technologies such as artificial neural networks and eye-tracking can open up new perspectives for early and personalized interventions, improving the quality of life of individuals diagnosed with ASD (ADAMS and TAYLOR 2022; NGUYEN et al. 2021).

The integration between computational methods and behavioral analysis represents a promising advance for a more comprehensive understanding of ASD, in addition to facilitating early diagnosis and more effective interventions, which are fundamental for the healthy development of individuals with autism.

METHODOLOGY

In this section, we detail the methodology used to process the data obtained through eye tracking. The approach is divided into four essential steps to achieve our research objectives.

DESCRIPTION OF THE STEPS

Step 1: Identification of Fixings and Saccades in Response to Visual Stimuli In this step, fixations and saccades on human faces are identified through recognizable visual stimuli, aiming to investigate holistic processing in children with ASD. Areas of Interest (AOI), such as eyes, mouth, and nose, are defined to analyze primary metrics, such as gaze duration and fixation sequences, which are essential factors in understanding participants' visual attention. Previous studies highlight the use of deep learning and machine learning techniques to achieve high accuracy in the early diagnosis of ASD (AHMED et al., 2022).

Step 2: Data Collection and Storage: Crucial variables, such as gaze position, distance, speed, and time of fixations, are collected using the OGAMA® software. The secondary metrics generated, such as the number of fixations per second and the average duration of fixations, are analyzed to understand distinct patterns of eye movement in individuals with ASD. Systematic reviews on the application of eye-tracking technology in combination with machine learning reinforce the importance of this approach (KOLLIAS et al., 2021).

Step 3: Data Processing with Supervised Learning: Supervised learning algorithms, such as Decision Trees and SVM, are used to process the secondary variables. These algorithms are designed to identify patterns and establish significant correlations between variables, which facilitates the detection of diagnostic features of ASD. Related

studies highlight the relevance of continuously replicating and improving technology-based diagnostic approaches (DUAN et al., 2019).

Step 4: Prediction of New Data: Trained machine learning models are applied to predict behavioral characteristics of new datasets, being instrumental in identifying telltale signs of ASD. This process allows for more accurate diagnoses and early interventions, as pointed out by research in the area of advanced diagnostic technologies (NGUYEN et al., 2021).

EXPERIMENTO

Eye Tracking Methodology: Setup and Analysis

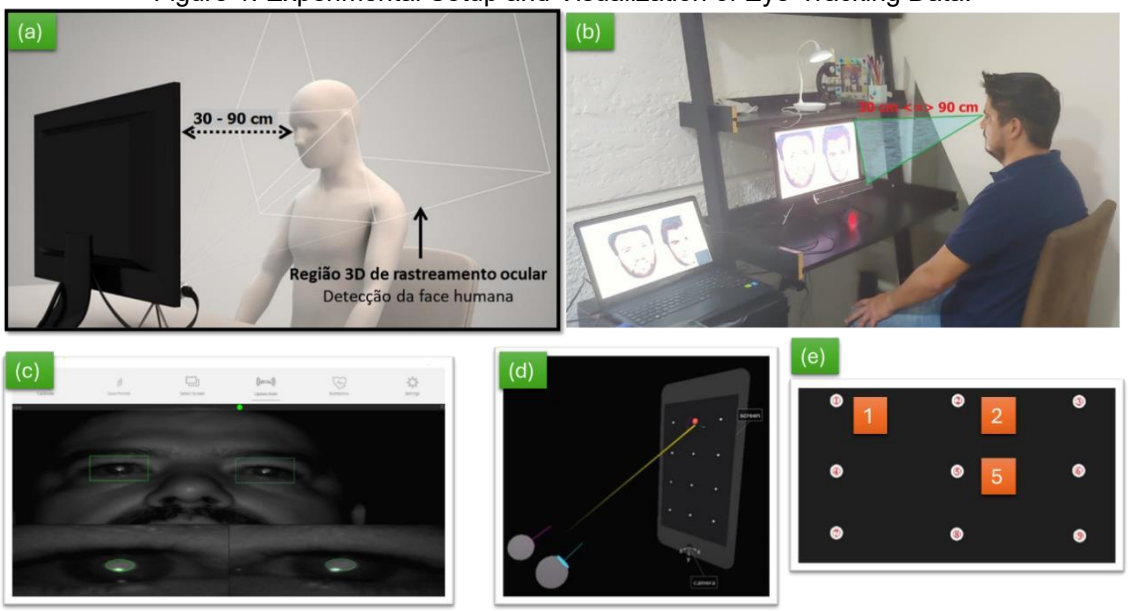
The study used the OGAMA® - Open Gaze and Mouse Analyzer software, developed by the University of Berlin, Germany, together with the Gazepoint GP3 eye tracker, which operates with a frequency of 60 Hz and includes an integrated API/SDK (Gazepoint Research Inc., Vancouver, USA). The recordings were made on a computer equipped with a 2.4GHz Intel® i7-5500U processor, 8 GB of RAM, Windows 10 Home Single Language operating system, 1 TB of hard disk and NVIDIA® GeForce graphics card.

The display device was a 19.5-inch LG-20M37AA-B monitor with a 16:9 aspect ratio, 5,000,000:1 contrast, 5 ms response time (GTG), 200 cd/m² brightness and 1366 x 768 pixel resolution. The monitor's vertical and horizontal refresh rates were 56 to 75 Hz and 30 to 61 kHz, respectively, providing a wide viewing angle of 90° horizontal and 65° vertical.

The experiment environment was set up to simulate normal lighting conditions, with participants accommodated in standard chairs that allowed free movement of the head, trunk and limbs. Due to the variability in the volunteers' biotypes and behaviors, an individual calibration was necessary. To do so, participants were instructed to visually follow nine white dots that appeared sequentially on a black screen, as illustrated in Figure 1, facilitating accuracy in capturing eye-tracking metrics.

This methodology and experimental setup were essential to ensure the accuracy and reproducibility of the eye-tracking data, which were fundamental for the subsequent analysis of the participants' visual behavior.

Figure 1. Experimental Setup and Visualization of Eye-Tracking Data.



(a) Laboratory Configuration Diagram - Illustrates the spatial arrangement between the participant and the monitor within the optimal distance parameters for eye tracking.

(b) Photo of the Real Test Environment - Shows a participant performing the test, providing real context for the application of the eye tracking system.

(c) Tracking Interface Capture – Displays the eye-tracking software interface in action, capturing the participant's eye movements.

(d) Graphical Representation of Eye Movement - Graphical demonstration of eye movements captured during the test.

(e) Calibration Screen - Shows the screen used for eye tracking calibration, with numbered points that the user must follow with the eye.

Data Processing with the Orange Canvas Software for Data Mining

In this study, data mining was performed using the Orange Canvas software. The development of the algorithm is illustrated in Figure 2, showing the complete flow from data loading to final analysis. The process starts with the data stored in the "File" component, where the collected data is in CSV format. To identify the most relevant attributes, the "Rank" component is used to assign scores to the attributes based on various methods, highlighting the most significant ones for the study.

Figure 2: Machine Learning Process Flowchart: Figure 2 illustrates the detailed workflow employed in the machine learning process used in this study. At the beginning of the process, the "Algorithm Training Data" is introduced and proceeds through various processing steps, including the application of algorithms such as SVM (Support Vector Machines), Logistic Regression, and Neural Networks. This flow culminates in the "Decision Test Output Responses", where the results are evaluated through various metrics and visualizations, such as the ROC Curve and the Confusion Matrix. Simultaneously, the "Prediction Data" is processed to generate "Prediction Output Responses", offering a practical view of the model's predictive capabilities.

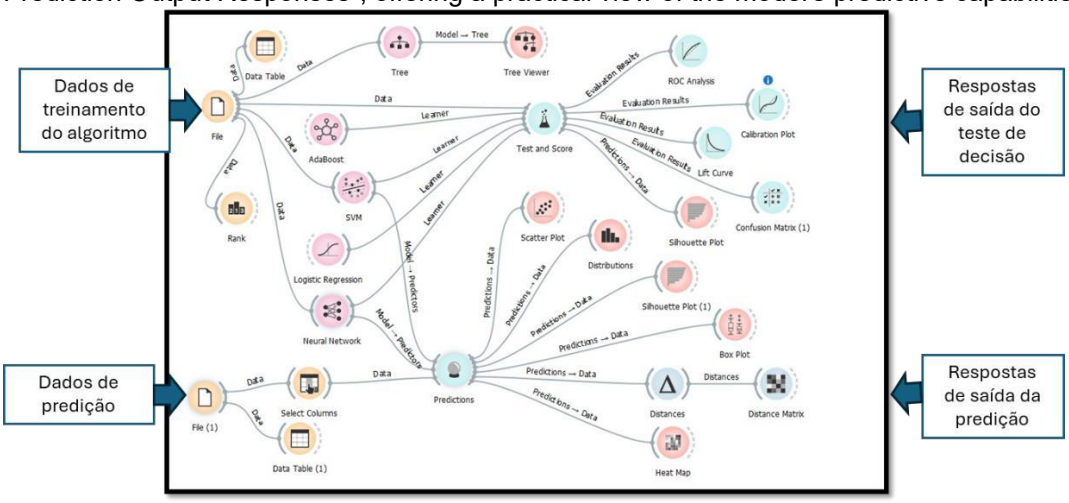
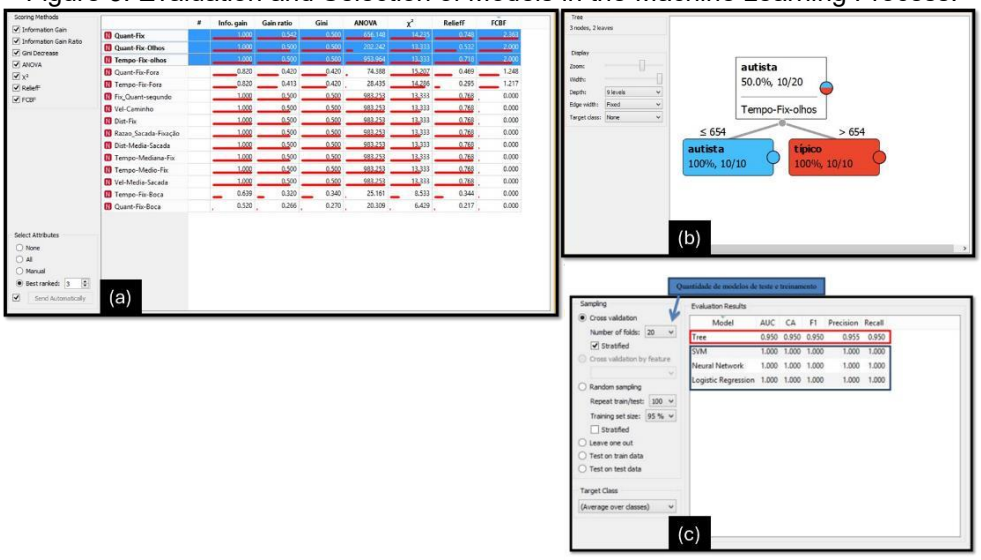


Figure 3a shows the process of classifying the attributes using the FCBF (Fisher Score) method, which evaluates the relevance of each attribute. The validation of these choices is made through the "Tree" component, as shown in Figure 3b, where the attribute 'Eye Fixation Time' was identified as the most relevant, representing the time that the volunteers spent looking at the eyes in the images studied.

Figure 3: Evaluation and Selection of Models in the Machine Learning Process.

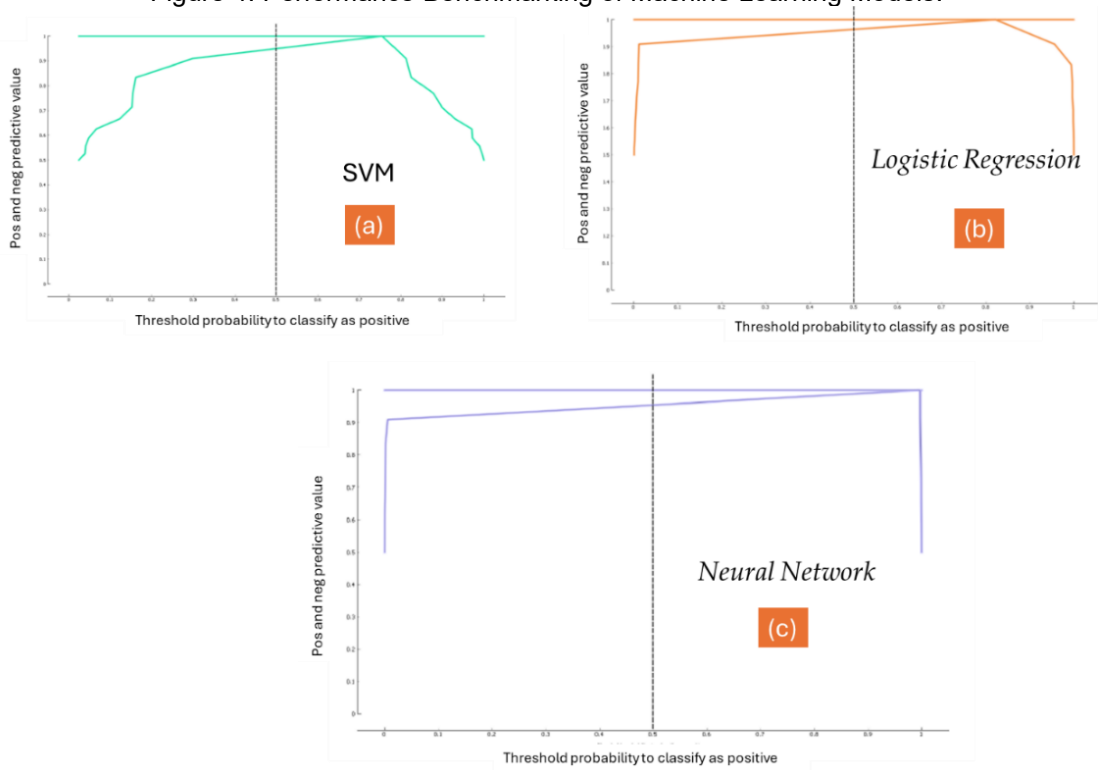


Part (a) of Figure 3 shows a detailed attribute selection table with various scoring methods applied to different variables. Each method, such as Gain Ratio, Gini Index, ANOVA, among others, is used to assess the importance of attributes in the context of the predictive model.
Part (b) of the figure illustrates a decision diagram, where the results of the application of the model are presented in terms of categorization of cases into 'autistic' and 'typical', with details on the count and percentage of cases in each node.

Part (c) displays the evaluation results of various machine learning models, including SVM, Neural Networks, and Logistic Regression. Performance metrics such as AUC, accuracy, and recall are shown, highlighting the effectiveness of each model in the tested dataset.

The "Test and Score" component, seen in Figure 3c, analyzes the performance of classification algorithms, including Tree, SVM, Logistic Regression, and Neural Network. This analysis is performed using the Cross-Validation technique to ensure that the models are robust against unknown data. The analysis revealed that while the "Tree" algorithm performed poorly, the other three algorithms performed comparatively better.

Figure 4: Performance Benchmarking of Machine Learning Models.



Part (a) - SVM (Support Vector Machine): This graph shows the variation of the positive predictive value of the SVM model as a function of the probability threshold for classification as positive. The curve demonstrates how the model classification fits the data when modifying the threshold.
Part (b) - Logistic Regression: This graph displays a characteristically stable curve with a significant jump in positive predictive value as the classification threshold increases, evidencing a clear binary distribution of the model's predictions.
Part (c) - Neural Network: The curve in this graph reflects the rapid response of the neural network in positively rating the data, with an abrupt drop after a specific threshold, highlighting the sensitivity of the model to variations in the classification threshold.
These graphs are essential to understand the effectiveness and operational characteristics of each machine learning model employed in the study, allowing a direct comparative analysis between the methods in relation to the adjustment of thresholds for the positive classification.

Finally, Figure 4 compares the effectiveness of the algorithms based on metrics such as precision, sensitivity, specificity, and accuracy. The areas under the ROC curves of the different models are used to evaluate the predictive effectiveness of each. The Neural Network model proved to be superior, reaching the largest area under the curve, which

indicates its superiority as a choice for this study. The detailed results of this comparison are presented in Table 1, which offers a quantitative view of the performance of each algorithm in the tested metrics. The data in the table provide a solid basis for analyzing the strengths and weaknesses of each method evaluated.

Table 1 – Comparison of the Results of the Tested Algorithms

Algorithm	Precision	Sensitivity	Specificity	Accuracy
Tree	95,8 %	89,9 %	79,7%	--
RNA	92,0 %	92,0 %	70,0 %	0,93
SVM	88,5 %	93,1 %	86,2 %	0,89
Logistic regression	73,3 %	97,7 %	97,2 %	0,89

RESULTS AND DISCUSSION

PRESENTATION OF INITIAL RESULTS AND VISUAL ANALYSIS METHODOLOGY

In this section, the data collected during Stage 1 of the proposed methodology are presented, recorded in Table 2 and visualized in Figure 5. These data were obtained through tests carried out by the first author of this article. Each slide corresponds to a test image represented in Figure 5a. However, it was not possible to carry out tests with other individuals due to pending approval by the Health Research and Ethics Committee.

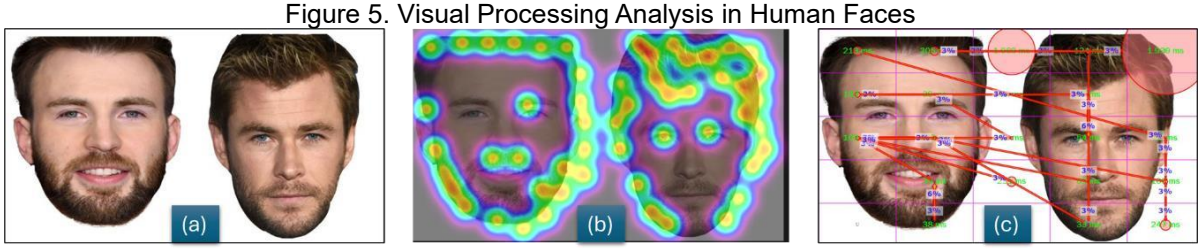
Due to this limitation, a methodology was chosen that can be easily replicated in other contexts. To validate the experimental results, data from previous studies addressing similar techniques were used. Research such as those by DUAN et al. (2019), JIANG AND ZHAO (2017), CARETTE et al. (2018, 2019), YANEVA et al. (2018, 2020), FALCK-YTTER et al. (2013), THAPALIYA, JAYARATHNA AND JAIME (2019), and EMAN AND EMANUEL (2019) provided a solid foundation for the analysis and interpretation of the data.

Table 2 - Data collected from the Experiment: The data includes several metrics such as number of fixations, duration, frequency per second, and balcony movements between points of visual interest. This information is crucial to understanding how individuals visually process information, directly impacting interface design and visual advertising strategies.

	Metric	Slide 01	Slide 02	Slide 03	Slide 04	Slide 05	Slide 06	Slide 07	Slide 08	Slide 09	Slide 10
First	No. of Fixings	54,0	46,0	42,0	38,0	42,0	46,0	34,0	36,0	37,0	50,0
Second	Clamping (Quant/sec)	3,6	3,1	4,2	3,8	4,2	4,6	3,4	3,6	3,7	5,0
Third	Average Fixation Duration (ms)	87,9	86,8	104,3	105,8	67,5	97,6	91,9	125,1	93,4	78,9
4th	Median Fixation Duration (ms)	34,0	35,0	66,0	35,5	34,0	34,0	49,0	34,5	35,0	35,0
5th	Draws/Fixture Ratio	315,9	266,1	437,7	401,9	282,3	449,7	312,1	449,4	344,8	393,7

6th	Average Balcony Length (px)	83,1	111,3	55,4	60,5	66,8	93,0	248,0	90,4	56,3	55,6
7th	Average Balcony Speed (px/s)	0,8	0,8	1,1	1,2	1,0	1,6	5,1	0,9	0,8	0,9
8th	Length of Fastening Connections (px)	4403,7	5006,7	2272,0	2238,1	2738,7	4185,2	8182,7	3164,5	2026,7	2726,3
9th	Path Speed (px/s)	293,2	333,8	227,1	223,7	272,8	419,1	817,7	315,7	202,2	272,1
10th	Time to First Fixation in AOI (ms)	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0
11th	Time to First Fixation on Target AOI (ms)	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0
12th	Time to Second Fixation on AOI 'Target' (ms)	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0
13th	Analysis Time (ms)	15020,0	15000,0	10006,0	10003,0	10040,0	9986,0	10007,0	10023,0	10021,0	10019,0
14th	Data Loss (quantity)	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
15th	Samples of Off-Monitor Fixings (quantity)	36,0	27,0	19,0	16,0	28,0	20,0	21,0	16,0	62,0	0,0
16th	Data Loss (%)	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
17th	Off-monitor fixtures samples (%)	3,9	3,0	3,3	2,1	4,5	3,2	4,1	2,8	10,2	0,0

Figure 5. Visual Processing Analysis in Human Faces



Part (a): Shows two images of human faces side by side for direct visual comparison. This type of presentation is commonly used to demonstrate variations or similarities between facial features in facial recognition or analysis studies.
Part (b): Displays a heatmap representation of visual attention applied to the same faces. The colors in the heatmap range from blue to red, indicating areas of least to most focus of attention, respectively. This visualization is useful for understanding which facial features capture the most attention and how this can influence visual processing.
Part (c): Presents the same faces with vectors and markers superimposed that detail the points of visual attention and lines of sight. This analysis is crucial for studies investigating how different regions of faces are perceived and what gaze patterns are common among observers.

Figure 5 illustrates visual exploration maps of static images. These maps were generated from the data collected during Stage 2, using the camera and the OGAMA

software. In the images, the areas with a redder tone (Figure 5b) indicate regions of greater intensity of attention, while the cooler colors (bluish tones) indicate areas of lower fixation frequency.

Figure 5c shows in detail the path of the fixings and balconies, highlighting the points on which the volunteer focused his attention over time. The numbers in the figures represent the time when each fixation occurred, providing a detailed temporal analysis of the areas of interest (AOI). These AOIs are represented by a purple grid with five columns and five rows, where each rectangle indicates a distinct AOI.

This setup allows for a deep understanding of the visual dynamics and attention patterns of the participants during the experiment. All the data collected are detailed and can be seen in Table 4.

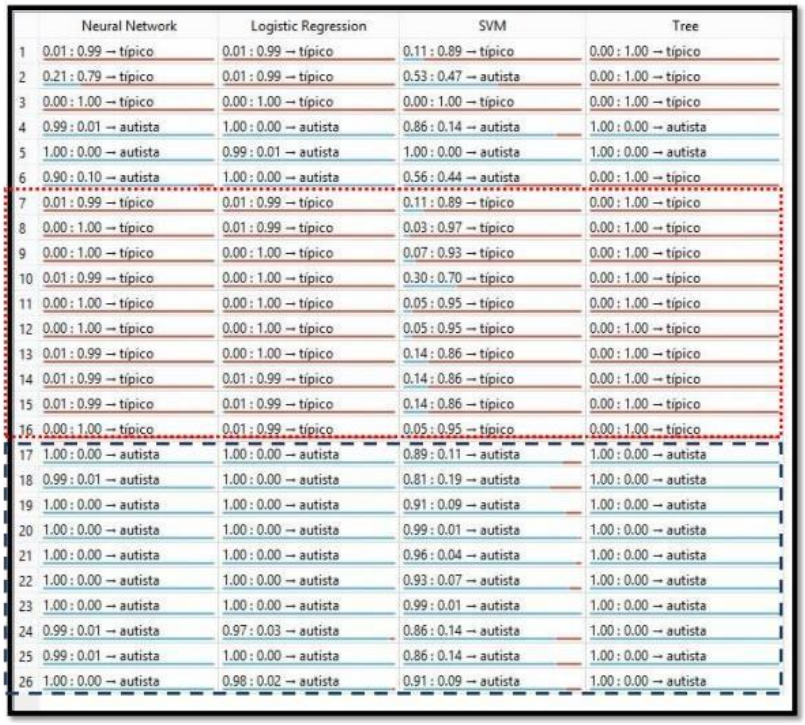
This study advances by proposing new methodologies to analyze eye fixation data, potentially using advanced machine learning techniques or integrating biometric data to deepen the understanding of emotional and cognitive reactions to visual stimuli. Exploring the variation in fixation patterns between different images or in response to varying visual stimuli can reveal valuable insights for the usability of user interfaces and the design of educational content. Correlating these metrics with other behavioral or demographic data can significantly enrich the analysis and accuracy of the results.

DATA PREDICTION ANALYSIS AND RESULTS USING UNSUPERVISED SYSTEM

In this section, the results obtained in STEP 3 and STEP 4 of section 2 are presented, where a prediction of the collected data was made. It is important to note that a clinical study with volunteers was not carried out. Instead, information from a base previously established by Eman and Emanuel (2019) was used for model training. Data from 20 individuals were analyzed, divided equally between the group with Autism Spectrum Disorder (ASD) and the control group (CT). In the prediction phase, data from six more individuals without group identification were included, three from each. The results of this process can be seen in Figure 6.

Detailed analysis of the data was performed using Orange software for data mining, and it was identified that the Neural Network was the most effective algorithm for classifying individuals. More details about the performance of this algorithm can be found in the dissertation by Nogueira Filho (2020), which explores the results through various graphs such as Scatter Plot, Distributions Plot, Silhouette Plot, Box Plot, Distance Matrix, and Heat Map. In addition, the dissertation provides the images used in the tests, offering a complementary visual context to the analysis presented.

Figure 6: Comparison of Prediction Results from Machine Learning Models



	Neural Network	Logistic Regression	SVM	Tree
1	0.01 : 0.99 → típico	0.01 : 0.99 → típico	0.11 : 0.89 → típico	0.00 : 1.00 → típico
2	0.21 : 0.79 → típico	0.01 : 0.99 → típico	0.53 : 0.47 → autista	0.00 : 1.00 → típico
3	0.00 : 1.00 → típico	0.00 : 1.00 → típico	0.00 : 1.00 → típico	0.00 : 1.00 → típico
4	0.99 : 0.01 → autista	1.00 : 0.00 → autista	0.86 : 0.14 → autista	1.00 : 0.00 → autista
5	1.00 : 0.00 → autista	0.99 : 0.01 → autista	1.00 : 0.00 → autista	1.00 : 0.00 → autista
6	0.90 : 0.10 → autista	1.00 : 0.00 → autista	0.56 : 0.44 → autista	0.00 : 1.00 → típico
7	0.01 : 0.99 → típico	0.01 : 0.99 → típico	0.11 : 0.89 → típico	0.00 : 1.00 → típico
8	0.00 : 1.00 → típico	0.01 : 0.99 → típico	0.03 : 0.97 → típico	0.00 : 1.00 → típico
9	0.00 : 1.00 → típico	0.00 : 1.00 → típico	0.07 : 0.93 → típico	0.00 : 1.00 → típico
10	0.01 : 0.99 → típico	0.00 : 1.00 → típico	0.30 : 0.70 → típico	0.00 : 1.00 → típico
11	0.00 : 1.00 → típico	0.00 : 1.00 → típico	0.05 : 0.95 → típico	0.00 : 1.00 → típico
12	0.00 : 1.00 → típico	0.00 : 1.00 → típico	0.05 : 0.95 → típico	0.00 : 1.00 → típico
13	0.01 : 0.99 → típico	0.00 : 1.00 → típico	0.14 : 0.86 → típico	0.00 : 1.00 → típico
14	0.01 : 0.99 → típico	0.01 : 0.99 → típico	0.14 : 0.86 → típico	0.00 : 1.00 → típico
15	0.01 : 0.99 → típico	0.01 : 0.99 → típico	0.14 : 0.86 → típico	0.00 : 1.00 → típico
16	0.00 : 1.00 → típico	0.01 : 0.99 → típico	0.05 : 0.95 → típico	0.00 : 1.00 → típico
17	1.00 : 0.00 → autista	1.00 : 0.00 → autista	0.89 : 0.11 → autista	1.00 : 0.00 → autista
18	0.99 : 0.01 → autista	1.00 : 0.00 → autista	0.81 : 0.19 → autista	1.00 : 0.00 → autista
19	1.00 : 0.00 → autista	1.00 : 0.00 → autista	0.91 : 0.09 → autista	1.00 : 0.00 → autista
20	1.00 : 0.00 → autista	1.00 : 0.00 → autista	0.99 : 0.01 → autista	1.00 : 0.00 → autista
21	1.00 : 0.00 → autista	1.00 : 0.00 → autista	0.96 : 0.04 → autista	1.00 : 0.00 → autista
22	1.00 : 0.00 → autista	1.00 : 0.00 → autista	0.93 : 0.07 → autista	1.00 : 0.00 → autista
23	1.00 : 0.00 → autista	1.00 : 0.00 → autista	0.99 : 0.01 → autista	1.00 : 0.00 → autista
24	0.99 : 0.01 → autista	0.97 : 0.03 → autista	0.86 : 0.14 → autista	1.00 : 0.00 → autista
25	0.99 : 0.01 → autista	1.00 : 0.00 → autista	0.86 : 0.14 → autista	1.00 : 0.00 → autista
26	1.00 : 0.00 → autista	0.98 : 0.02 → autista	0.91 : 0.09 → autista	1.00 : 0.00 → autista

This figure illustrates the detailed prediction results using different machine learning algorithms. The table shows the classification of individuals as 'typical' or 'autistic' based on the probabilities calculated by each model. The results are presented in a matrix that compares the performances between Neural Networks, Logistic Regression, SVM and Decision Trees, highlighting the accuracy and effectiveness in the correct identification of the ASD and CT groups.

CONCLUSION

This study explored the effectiveness of holistic processing and the use of eye tracking in the diagnosis of Autism Spectrum Disorder (ASD), utilizing data mining and machine learning methods. The results indicate that the combination of eye tracking and data analysis can offer valuable insights for the understanding and diagnosis of ASD, opening up new possibilities for more effective interventions and more accurate diagnoses.

The research highlighted the relevance of fixation points and the amount of images used to ensure the robustness of the results and the statistical validity of the inferences. The fixation patterns revealed significant differences in the way individuals with ASD process visual information, which is crucial for developing more accessible interfaces and educational techniques adjusted to their needs.

The study also presented new approaches to the analysis of fixation data, using advanced machine learning techniques to integrate biometric data, which can enrich the understanding of emotional and cognitive responses to visual stimuli.

Figure 6 illustrates the effectiveness of different machine learning algorithms in classifying individuals as 'typical' or 'autistic'. Table 1 highlights the probabilities calculated by each model, demonstrating the superiority of the Neural Network in the precise

classification of the ASD and CT groups. This result confirms the potential of using advanced data analysis techniques in the field of ASD diagnosis.

We conclude that the proposed methodology not only contributes to new perspectives for diagnosis and intervention in ASD, but also reinforces the importance of technology in advancing medical and educational research. Thus, this study reiterates the value of integrating computational and analytical technologies in improving the quality of life of individuals with ASD.

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DEVELOPMENT OF COMPETENCIES FOR INNOVATION: A COMPARATIVE STUDY BETWEEN BRAZIL AND GERMANY

https://doi.org/10.56238/sevened2024.031-009

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ABSTRACT

This article investigates the key factors for the development of innovation skills among young leaders in the industrial sector, through a comparative analysis between educational institutions in Brazil and Germany. The objective is to identify good practices and essential factors applied in German institutions that can be adapted to the Brazilian context, to improve the qualification of professionals with a more innovative mindset. The research analyzed public policies, innovation indicators and the syllabuses of 35 courses, mapping trends and practices aimed at the formation of strategic skills. The results highlight the relevance of education for the development of innovation and the need to prioritize skills such as problem-solving, critical thinking, creativity, data analysis, business strategy, and innovation management modeling. This study offers contributions by proposing ways to improve the training of young leaders in Brazil, based on the best practices observed in Germany, strengthening the competitiveness and innovation capacity of Brazilian industry.

Keywords: Leadership training. Skills. Innovation.

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INTRODUCTION

Innovation is an essential factor for the economic development and competitiveness of most nations. Its capacity depends not only on the existence of public policies and investments in research and development (R&D), but, crucially, on the formation of qualified human capital, capable of leading and implementing transformations in various sectors of the economy. In this sense, it is essential to develop skills focused on innovation, especially among young leaders who work and will work in the Brazilian industry.

However, most of these young Brazilian leaders were not encouraged, during their school education, to value innovation in their decision-making. Faced with the rapid changes in the current scenario, these leaders need to learn, with agility, how to adapt and how to transform the environment around them effectively.

The qualification of workers in the industry is a crucial aspect for Brazil, since the shortage of qualified labor tends to intensify with the increase in the pace of economic expansion. This represents one of the main obstacles to the growth of productivity and national competitiveness.

Germany is considered one of the main global references in innovation, both for its strong industrial tradition and for the structuring of public policies aimed at the development of highly qualified human capital. (PORTULANS INSTITUTE, 2021).

On the other hand, in the Brazilian context, the trajectory in relation to innovation is more recent. Although Brazil has implemented public policies aimed at promoting innovation, such as the 2004 Innovation Law (Law No. 10,973), which brought incentives for scientific and technological research, the country still occupies a modest position in global innovation indicators. Despite the advances in recent years, Brazil has significant gaps in terms of the qualification of human capital for innovation, especially compared to leading countries such as Germany. Brazilian public policies aimed at innovation lack more robust incentives, just as the educational system is not yet fully aligned with the needs of the industry.

Given this scenario, the survey seeks to answer the following question: what are the key factors in the development of innovation-oriented competencies that can serve as inspiration for the training of young Brazilian leaders, with a professional focus on the industry, in order to strengthen their competitiveness?

The main objective of this study is to examine the experiences, good practices and key factors in the development of skills for innovation in Germany and Brazil, identifying aspects that can positively impact the training of young leaders and serve as inspiration for

the development of skills of young people who work and will work in the Brazilian industry, drawing a parallel between these two countries.

The research analyzed public policies aimed at innovation, educational indicators related to innovation, menus and courses offered to young leaders in educational institutions, mainly in Germany, complementing the study with the analysis of Brazilian institutions.

With this study, it is expected to stimulate reflection on the subject in the Brazilian context, in addition to offering concrete subsidies that can contribute to the promotion of innovation among young industry leaders in the country.

METHODOLOGY

This study was developed from a detailed bibliographic research, contemplating several databases of academic relevance. For the collection of materials, Google Scholar was used; the Institutional Repository of the University of Brasília (UnB) and the Support Center for Technological Development of UnB (CDT/UnB); the CAPES Journal Portal and the *Social Science Research Network* (SSRN). The research was carried out in Portuguese, English and German, in order to cover the main literatures and approaches related to the central theme of innovation and competence. The keywords used, considering linguistic variations, are shown in Chart 1 below.

Table 1. Combination of keywords used in the search

Language	Search Terms
Portuguese	*innovation; Innovation competence*
English	*innovation; innovation competence*
German	*Innovation*; *Innovation Competence*

Source: Prepared by the authors, 2023.

The searches were conducted from September 2021 to March 2023, and the literature collected included scientific articles, dissertations, theses, and other academic documents relevant to the understanding and deepening of the topic investigated.

The results of this research were organized into different stages of analysis, starting with the selection of Germany as a reference due to its high indicators of innovation and excellence in the qualification of human capital. To carry out this comparative evaluation, the Brazilian and German contexts were investigated, focusing on their public policies aimed at innovation and the qualification of human capital. In addition, the rankings of these countries in internationally recognized innovation rankings were examined.

In the second stage, educational institutions in Germany and Brazil were mapped, with the objective of identifying, in their curricula, trends and practices aimed at the

development of young leaders with a focus on innovation. This survey allowed a comparative analysis to be carried out between the approaches of both countries with regard to the training of leaders for the industrial sector.

RESULTS

With regard to Brazilian public policies, Law No. 10,973 of 2004 stands out, which inaugurated a regulatory framework aimed at encouraging innovation and scientific and technological research. Other important milestones include the Legal Framework for Innovation, Law No. 13,243 of 2016 and Decree No. 10,534 of 2020, which instituted the National Innovation Policy (PNI). The latter aims to guide, coordinate and articulate the strategies and actions to foster innovation, promoting greater synergy between government agencies and the productive sector. The PNI has four main objectives, which are:

1. To stimulate research, development and innovation by companies, Institutes of Science and Technology (ICT) and private non-profit entities, with a view to increasing the productivity and competitiveness of the economy, the generation of wealth and social well-being;
2. Promote the coordination and alignment of public policy instruments, programs and actions related, directly or indirectly, to the promotion of innovation;
3. To foster the transformation of knowledge into innovative products, processes and services;
4. Develop the human capital necessary to increase the levels of innovation in the economy.

This study focused specifically on the objective related to the development of human capital. The PNI outlines six axes, with emphasis on the Education Axis, which involves 43 actions aimed at stimulating interest in the areas of exact and agrarian sciences, health, technology and engineering; as well as the revision of higher education curricula and the approximation of academic training to the demands of the national productive sector; incentive to increase the number of graduates in higher education in the areas of exact and agrarian sciences, health, technology and engineering; and encouragement of scientific and technological exchange.

In terms of innovation policies in Germany, the country has a strong tradition and seeks to promote research, technological development, and innovation in various sectors of the economy. These policies aim to boost the country's competitiveness and economic growth and are directly related to the education and qualification of professionals. According to Sérvulo Vicente Moreira, already in the eighteenth century, Germany was implementing

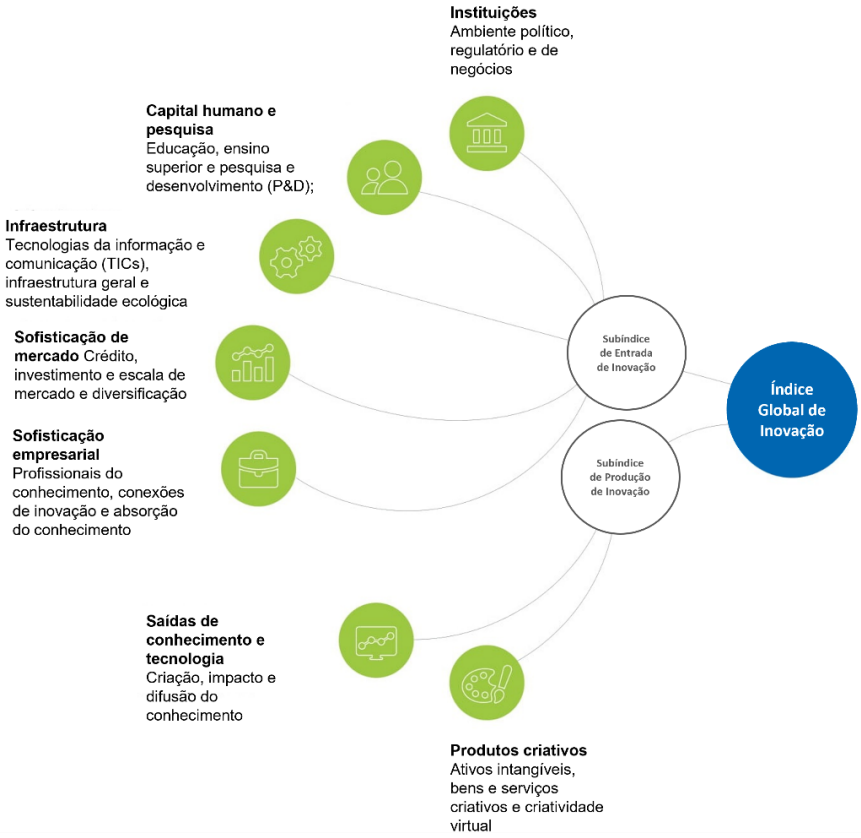
initiatives to bring educational institutions closer to the needs of industry. In this century, Germany made some changes to its doctoral programs, aligning theoretical teaching with practice. Initially, it was due to the shipbuilding industry and gradually they were replicated to other sectors. In addition, the country is known for investing significantly in Research and Development (R&D). The government strongly encourages companies to invest in research and development activities through a range of measures, such as subsidies, tax incentives, and funding programs. Some institutions known for their dedication to research and innovation: *Fraunhofer* Society; *Helmholtz Society*; *Leibniz* Association; *Max Planck Institute*, in addition to universities and other forms of institutions (MOREIRA, 2015).

When it comes to education, Germany values vocational training as a key element for innovation. The German education system focuses on technical and professional training, in order to ensure that there is a highly qualified workforce to meet the demands of the industry. And this also includes initiatives to attract scientists from all over the world to compose their staff in research institutions, universities and industry, valuing the diversification of professionals with different experiences and knowledge.

Other initiatives also stand out, such as Intellectual Property protection, which includes patents, copyrights, among others, to encourage creation and innovation.

As for the innovation indexes, the Global Innovation Index (GII) and the Industrial Survey of Technological Innovation (PINTEC) stand out, which served as tools to measure the degree of innovation of the two countries and compare them. The GII uses a methodology based on seven sub-indices, with pillars and indicators, as represented in Figure 1, which illustrates the structure of the index criteria.

Figure 1. Structure of the Global Innovation Index (GII) criteria



Source: *Global Innovation Index,* 2021 (https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2021.pdf) Accessed on Oct 3, 2024. Translated by the authors.

In this research, the analysis focused on two main pillars: human capital and research, which evaluates indicators of education, higher education, and research and development (R&D); and business sophistication, which measures the performance of knowledge professionals, innovation connections and the capacity of companies to absorb knowledge.

In the human capital and research pillar, Germany stands out as the second among the 132 countries analysed, according to the report published in 2022 (Figure 2).

Figure 2. Classification according to pillars

País/Economia	IGI geral	Instituições	Capital humano e pesquisa	Infraestruturas	Sofisticação do mercado	Sofisticação empresarial	Produtos de conhecimento e tecnologia	Produtos criativos
Suíça	1	2	6	4	7	5	1	1
Suécia	2	18	3	2	10	1	3	8
Estados Unidos	3	16	12	25	1	2	2	12
Reino Unido	4	24	8	6	3	13	7	2
Singapura	5	1	2	8	6	3	10	18
Finlândia	6	3	5	1	12	4	4	16
Países Baixos	7	6	13	14	15	8	8	9
Alemanha	8	22	4	23	14	16	9	7
Brasil	49	99	56	58	50	39	52	46

Source: *Global Innovation Index, 2022*. Accessed on Mar 4, 2023

In this pillar, the indicators of education, higher education and research and development were analyzed, which are defined according to Table 2 presented below.

Table 2. Education, higher education, and research and development (R&D) indicators

Indicator	
Education	Government spending on education, government funding per high school student, school life expectancy, Program for International Student Assessment (PISA) scale, and high school student-teacher ratio.
Higher education	Higher education enrollment rate and number of graduates in the fields of science and engineering.
Research and Development (R&D)	Number of researchers involved in the conception or creation of new knowledge, gross expenditure on R&D, average score of the three best universities in the country.

Source: Prepared by the authors, 2023.

The results of this pillar highlight the need for Brazil to increase its investments in basic education, universities and the reformulation of engineering curricula. Although these aspects are not the main focus of this study, they provide opportunities for future investigations.

In the business sophistication pillar, three sub-indicators were considered, which are presented in Chart 3.

Table 3. Professional indicators of knowledge, innovation connections and knowledge absorption.

Indicator	
Knowledge workers	Employment of people in knowledge-intensive services, percentage of employed women with advanced education, among others.
Innovation connections	Industry-business collaboration, foreign investment in R&D, number of *joint ventures* and strategic alliances, number of patents.
Knowledge Absorption	Researchers from the business sector involved in the design or creation of new knowledge, products, processes, methods and systems, as well as in the management of these projects, disaggregated by the sectors in which they are employed, importation of high technology, charges for the use of intellectual property.

In the knowledge absorption sub-indicator, it is important to highlight the relevance of collaboration between educational institutions and industries/companies. This exchange of knowledge is one of the engines for innovation in the country. Whereas, the more qualified this professional is, the better and more connections there will be between university and company.

It is worth mentioning that, still on the pillars of human capital and research and business sophistication, Brazil showed a drop in all indicators comparing 2022 with 2023, although it has shown a positive evolution in the overall classification in the last four years.

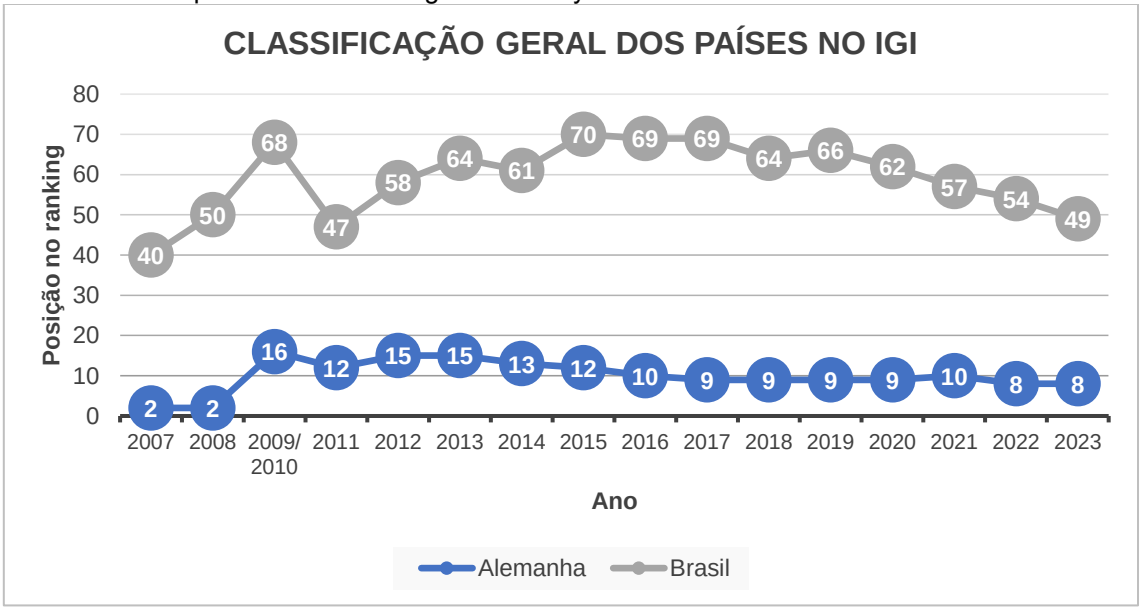
Table 1. Comparison between indicators from Germany X Brazil

Pillar	Indicator	Classification	
		Germany	Brazil
Human capital and research	Education	23	68
	Higher education	8	90
	Research and Development (R&D)	7	35
Business sophistication	Knowledge workers	21	41
	Innovation connections	10	60
	Knowledge absorption	26	32

Source: Prepared by the authors, 2023 (Based on *Global Innovation Index*, 2023).

Since the index began to be produced in 2007, Brazil has performed better in the first two years of the index's preparation. From 2012 onwards, Brazil began to show a drop in its ranking and from 2020 onwards there was a constant improvement in its performance, as illustrated in Graph 1. However, there is still a need to increase investment in various sectors, and education to qualify its professionals is a priority sector to boost innovation and competitiveness of Brazilian industry.

Graph 1. Overall ranking of Germany and Brazil of the innovation index.

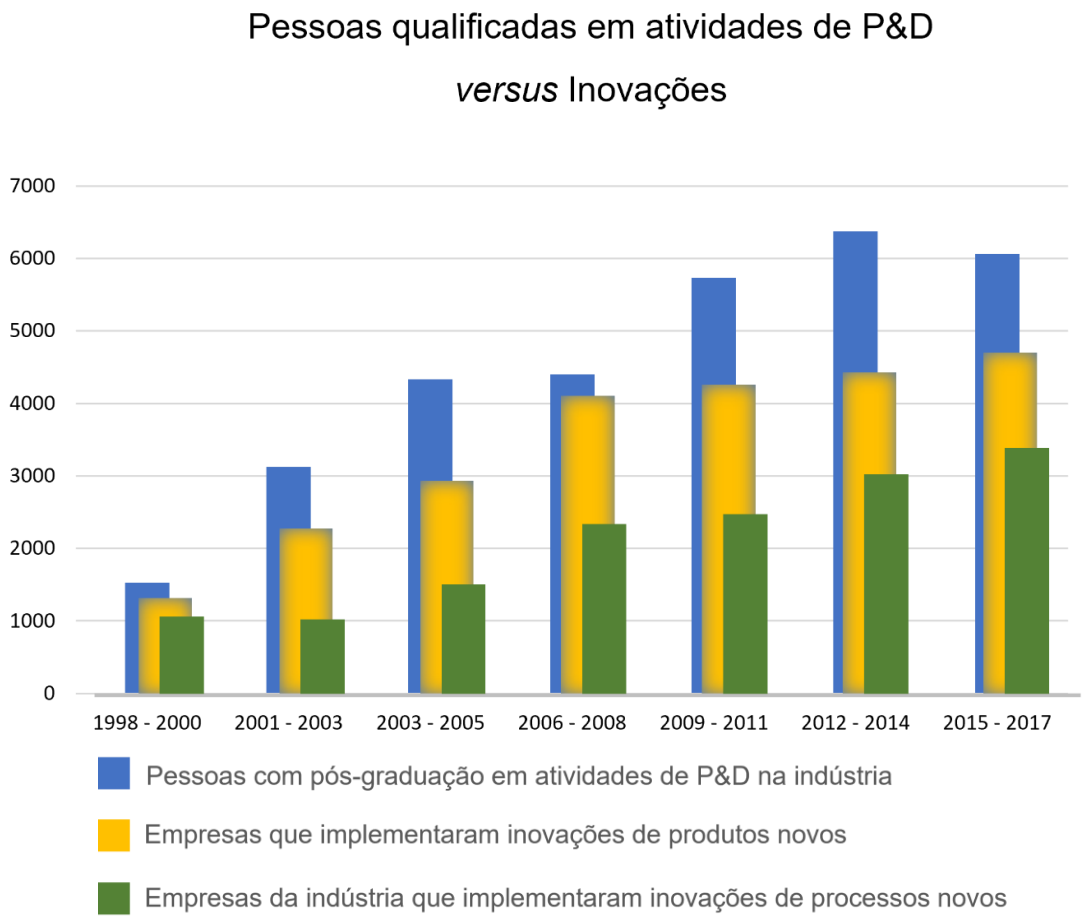


Source: Chart prepared by the authors, 2023 (Based on *Global Innovation Index*, 2023).

Still on innovation indexes, data from the Industrial Survey of Technological Innovation (PINTEC) were analyzed. This report presents, among several variables, the total number of people with graduate degrees involved in internal R&D activities in Brazilian industry, specifically companies that have implemented innovations. Graph 2 shows, in a

historical sequence of recent years, a relationship between the companies that implemented innovation and the staff of qualified people engaged in R&D, that is, people with postgraduate degrees involved in internal R&D activities of these companies, who implemented innovations of new products and processes for the national market.

Graph 2. Total number of people with graduate degrees engaged in internal R&D activities in industry versus total number of companies in the industry.



Source: Prepared by the authors, 2023 (Based on PINTEC 2000 to 2017).

The analysis of PINTEC data reveals that, from the beginning of the research in 1998 until the penultimate edition of 2014, there was a steady increase in the number of people with postgraduate degrees employed in R&D activities in industry, as well as in the number of companies that implemented innovations in products and processes. However, in the last edition, from 2015 to 2017, there was a slight decrease in the number of professionals with postgraduate degrees, although the growth in the number of companies that adopted innovations was maintained. The article "*Human capital, intensity of innovation in industry and economic growth in Brazil*", by Reis and Gomes (2017), presents results that prove a correlation between human capital (number of postgraduates) and intensity in innovations (new products and processes for the national market), as well as demonstrated

the relationship between the human capital variable (number of postgraduates) and real GDP. With this, the authors conclude that human capital is the fundamental input of R&D, and R&D is indispensable for the generation and intensity of innovations, and innovations stimulate and dynamize the process of economic growth.

After collecting the results on the innovation indexes, a mapping of higher education institutions in Germany and Brazil was carried out, focusing on the development of professional skills focused on innovation.

For this stage of the research, the *Times Higher Education* (THE) ranking, the *Financial Times* ranking and the "*studieren.de" website were used*. Through these rankings, an analysis was made of the courses, disciplines and respective syllabuses of German and Brazilian educational institutions, of greater prominence, with a focus on developing skills focused on innovation, in addition to the good practices developed by them. The details of these rankings and the results of this analysis are presented below.

The *Times Higher Education ranking* got its start in 2004 and annually provides a list of universities. In 2023, more than 1,500 universities from 104 countries were considered. The ranking is based on 13 performance indicators, subdivided into 4 pillars: teaching, research, knowledge transfer and international perspective. One of the pillars that deserves to be highlighted in this *ranking*, which is in line with this research, is the knowledge transfer pillar, which analyzes the results linked to the industry. This indicator assesses an institution's ability to support industry with innovations, inventions, and consultancies, and the extent to which companies are willing to pay for research, as well as an institution's ability to attract funding in the market.

In this *ranking*, it is noted that, in all, 51 German institutions were considered in the result. Among the top 100 highest ranked are 9 German universities. When analyzing the courses and menus offered by these 9 institutions, 2 stand out for their performance in the area of innovation. They are: *Technical University of Munich* and *RWTH Aachen University*. Regarding Brazilian institutions, 61 institutions were considered. It is important to mention that the first two universities ranked are in positions below number 200, they are: University of São Paulo (ranked between positions 201 to 250) and University of Campinas (ranked between positions 401 to 500). The rest of the Brazilian institutions classified occupy positions from number 600 onwards. When checking the courses offered by the two institutions, in both were found courses aimed at innovation, which were considered in this analysis.

The second ranking surveyed for the selection of educational institutions was that of the *Financial Times*, published in May 2023 with the best-ranked schools in offering

Executive Education. Out of 75 schools evaluated by the magazine, 6 are German or have partnerships with German schools. By examining the 6 institutions, 4 were selected, which have a curriculum aimed at innovation skills: *ESMT Berlin, ESCP Business School, Henley Business School and WHU – Otto Beisheim School of Management*. As for the national institutions, 4 are Brazilian or have partnerships with Brazilian schools. After studying these institutions, the four presented at least one course focused on the innovation mindset, which are: Fundação Dom Cabral, Fundação Getúlio Vargas, *IESE Business School* and INSPER.

The third tool used to investigate educational institutions in Germany was the website "studieren.de". In the research, institutions and courses that develop innovation-oriented personal competencies and skills were identified, and in this analysis the following institutions were detected: *BSP Campus Hamburg, Friedrich-Alexander-Universität, Hochschule Ansbach, Hochschule Fresenius, Hochschule Pforzheim, OTH Amberg-Weiden, SRH Fernhochschule, TAE Esslingen, Universität Hamburg* and *Universität Oldenburg*.

When analyzing all the *rankings* and sources researched, a total of 22 educational institutions were evaluated in depth, 17 of which were German institutions and the curriculum of 26 courses; and 5 Brazilian institutions and the curriculum of 9 courses, as shown in Chart 4.

Table 4. Total of educational institutions and courses selected with a focus on the development of skills for innovation.

	Institution	**Course**[4]
1	*BSP Campus Hamburg*	Business model innovation
		Business Innovation and Entrepreneurship
2	*ESCP Business School*	Identity. Innovation. Impact
		Innovation
3	*ESMT Berlin*	*Innovation Sprint*
		Design Thinking and Corporate Change
		Leading Digital Transformation
4	*Friedrich-Alexander-University*	Advanced Materials and Processes
		Leading Digital Transformation
5	*Henley Business School*	MSc in Entrepreneurship and Innovation
6	*Ansbach University of Applied Sciences*	Innovation and Entrepreneurship
7	*Hochschule Fresenius*	Business development and digital innovation
8	*Pforzheim University of Applied Sciences*	Strategic Innovation Management

[4] The titles of the courses were freely translated by the authors from their original titles, which were English and German.

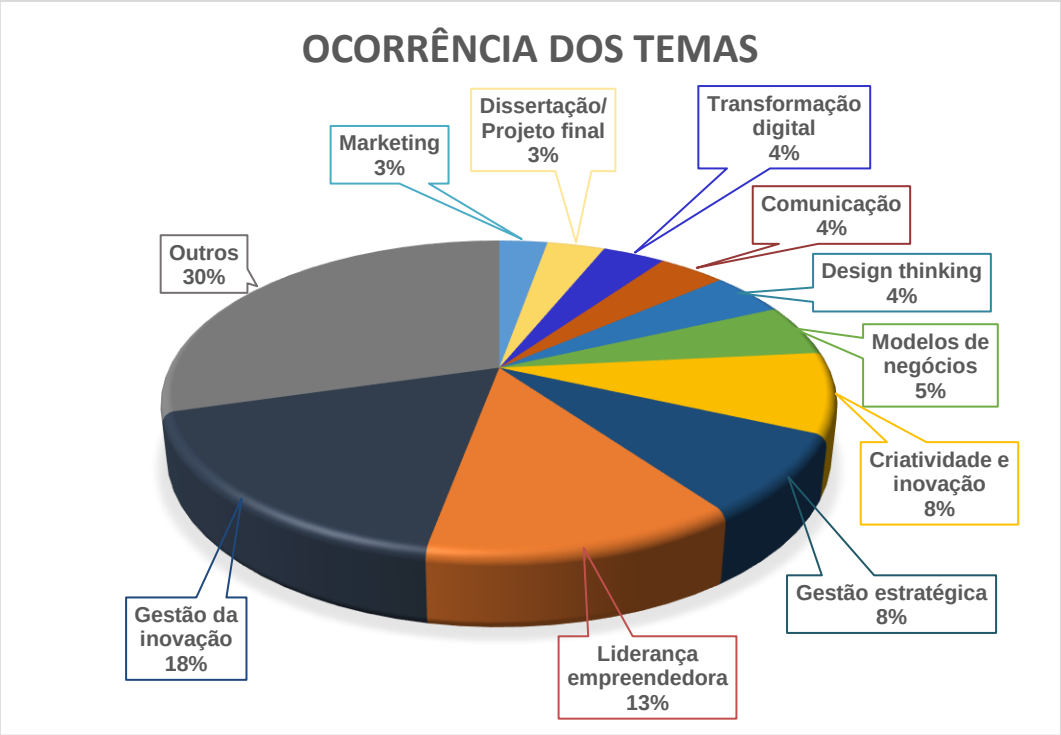
9	IESE Business School	Management Development Program
10	*OTH Amberg-Weiden*	Digital Entrepreneurship
11	*RWTH Aachen University*	Master of Management and Engineering in Technology, Innovation, *Marketing* and Entrepreneurship
12	*SRH Distance Learning University*	Innovation and research for the future
13	*TAE Esslingen*	Growth through innovative digital business models
		Innovation and creativity in construction and development
		Agile expert
		Creativity techniques for innovative solutions
14	*Technical University of Munich*	Executive MBA in Innovation and Business Creation
		Master in Management and Innovation
15	*University of Hamburg*	Innovation, Business and Sustainability
16	*University of Oldenburg*	Innovation and Entrepreneurship Management
17	*WHU – Otto Beisheim School of Management*	Innovative tools to digitally transform entrepreneurship
18	Dom Cabral Foundation	Data Specialist and Digital Manager
		Innovation: From narrative to results
19	Fundação Getulio Vargas	Strategic Innovation
		Organizational Innovation Management
20	INSPER	Entrepreneurship and innovation
		Strategic Innovation
		Entrepreneurship and Innovation Journey
21	State University of Campinas	Strategic management of technological innovation
22	University of São Paulo	Entrepreneurship

Source: Table prepared by the author herself, 2023

The analysis of these institutions and the course syllabi allowed us to identify recurrent thematic groups. In Graph 3 it is possible to verify the groups of themes and the recurrence in which they appeared in the analysis.

When evaluating the syllabus, similarities and differences were identified in the course offerings between Brazilian and German institutions. German institutions have more clearly defined blocks of major themes, with an emphasis on the development of innovation-oriented competencies such as leadership, innovation management, creativity, strategic management, and business models.

Graph 3. Occurrence of the themes



Source: CAVICHIOLI, 2023

In relation to Brazilian institutions, it was possible to verify less convergence between the courses and the themes offered by them, and the themes are very fragmented. Although central themes correspond to German institutions, such as leadership, innovation management and strategic management, several other themes appear and in smaller incidence, such as *startup*, ESG/Governance, sustainability, finance, marketing, among others.

Moving on to a deeper analysis, the key factors that presented the greatest occurrence and impact on the development of skills for innovation of professional managers and young leaders were found. They are: strategy and business models, leadership and entrepreneurship, innovation management, creativity and agile methods for ideation and rapid prototyping of ideas. Communication skills also appear with some frequency, being worked on in a transversal way in most courses. Although it is not always highlighted as a keyword in the course descriptions, this competence is stimulated through various practices adopted by the educational institutions analyzed.

Other topics such as marketing, digital transformation, finance, and sustainability had some occurrence, but not enough to affirm that they have an impact on the qualification of professionals for the innovative bias.

The graph also includes two items: 1) "dissertation/final project", which is not related to the development of specific competencies, but rather to the final activity of the courses; and 2) "others", which covers various topics that are poorly connected, such as

organizational culture, software engineering and startup management, which were not considered relevant to the key factors sought by this research.

Regarding the most relevant topics in this research, the factors that are understood to be key for the formation of competencies with a focus on innovation were classified into 5 blocks, which are detailed in Chart 5.

Table 5. Selection of topics for innovation skills training

Key Topics	Innovation Skills Training
Design Thinking e Design Sprint	Methods and approaches that enable the improvement of ideas, tools that encourage innovative, courageous and exploratory thinking, so that they can be prototyped and tested in an agile way, while still using systematic tools for ideation. These methods were cited as important for the improvement of the organization's entire value chain and are methods such as *Design Thinking* and *Design Sprint.* Of the 35 courses analyzed, 14 of them presented topics on ideation tools and rapid prototyping.
Entrepreneurship	The role of entrepreneurship and leadership for an innovative mindset. Guiding a company or a business in new directions, driving the launch of new products or services requires the professional to have a holistic corporate vision, know how to identify business opportunities, behave proactively and be able to create adequate conditions to implement ideas. For this, it was identified in the analysis of the courses, content for knowledge of traditional models of people management and new leadership models such as lateral leadership, transformational leadership, empowering leadership, shared leadership and the democratic enterprise. Leadership and entrepreneurship appeared predominantly in 20 courses.
Creativity	It is an element of fundamental importance for the development of an innovative *mindset*, because through creativity it is possible to expand the mind to find new and different solutions to problems. Disruptively understand the difficulties of the moment or context in which the organization finds itself. The theme was presented in 15 of the 35 courses analyzed.
Strategic Management and Business Modeling	Ability to critically analyze strategic actions, understand how to disseminate new ideas inside and outside your company, and develop innovative, sustainable and scalable business models are highly required to constitute value to the organization's business. In this topic, it is encouraged to understand the language of data, in order to benefit from this knowledge and make it effective for the development of innovative strategic ideas. The theme appears in 25 courses out of the 35 analyzed.
Innovation Management	Of the 35 courses surveyed, 24 mention this theme. Here we suggest a deepening of the concepts of innovation, its types, knowledge of theories and approaches to innovation management in

	organizations and characteristics, which differ from innovation management. In addition, tools are proposed to identify sources of innovation, influencing factors of innovation management, concept and application of open innovation. Managing innovation is a process that, if done systematically, can lead to the development of new products, services and processes, can open the mind to new ways of serving existing markets.

Source: Prepared by the authors, 2023.

In order to complement the research, in addition to the analysis of the institutions, their courses and their respective syllabus, three studies were taken into account for a test of consistency of the factors raised. These studies deal with skills of the future, which are: one from FORBES magazine (August 2022), which presents the 10 most sought-after skills for the next 10 years; another from *the Institute for the Future* (2020), in which the ten skills for the workforce of the future stand out; and, finally, the most important skills for workers in 2023, according to a report by the World Economic Forum (2023). In Chart 6 below, these skills are listed, separated by entity.

Table 6. Skills of the future

Forbes	***Institute for the Future***	**World Economic Forum**
Digital literacy	*Sense-making* (dar sentido)	Analytical thinking
Data literacy	Social intelligence	Creative thinking
Critical thinking	Innovative and adaptive thinking	Resilience, flexibility, and agility
Emotional intelligence	Intercultural competence	Motivation and self-knowledge
Creativity	Computational thinking	Curiosity and continuous learning
Collaboration	New media literacy	Technological literacy
Flexibility	Transdisciplinarity	Reliability and attention to detail
Leadership	*Design mindset*	Empathy and active listening
Time management	Cognitive load management	Leadership and social influence
Curiosity and continuous learning	Virtual collaboration	Quality Control

Source: table prepared by the authors, 2023 (Based on FORBES, 2022; *INSTITUT FOR THE FUTURE,* 2020; WORLD ECONOMIC FORUM, 2023).

When faced with these three studies, it was interesting to note that many of the skills listed connect with the key factors found in the research. Curiosity and continuous learning, creativity, innovative and adaptive thinking, and creative thinking are directly related to the topic of creativity.

Design mindset, analytical thinking, and critical thinking are associated with the topic of *Design Thinking*, as the method seeks to stimulate exploratory thinking and analytical reasoning through methods.

Leadership and social influence, emotional intelligence, social intelligence, resilience, flexibility, and agility are skills that are directly linked to the topic of leadership.

The skills focused on data knowledge, such as digital literacy, data literacy, new media literacy, technological literacy and computational thinking, are close to the topic of strategy and business models, since this topic encourages knowledge and data analysis for a strategic diagnosis of the organization and how to implement new ideas.

Finally, communication was also a skill pointed out in the studies through empathy, active listening and collaboration.

DISCUSSION

The results presented raise important reflections on the relevance of the development of innovation-oriented competencies in young leaders and professionals working in the industry in Brazil, with a comparative analysis between Brazil and Germany.

The choice of Germany as a reference is justified by its global leadership role in innovation and the implementation of effective public policies aimed at the development of qualified human capital. And at this point, it is clear that Brazil's initiative to give due importance to the development of human capital for innovation was recent. However, the country lacks more government incentive to foster the training of human resources for the industry of the future, through concrete proposals. This is exemplified through the results raised on innovation indexes, in which it was possible to identify the influence and relevance of qualified human capital for the growth and development of innovations in companies.

The other highlight in this study were the findings in the mapping of higher education institutions in Germany, which demonstrated a clear emphasis on the development of strategic skills, such as leadership, innovation management, creativity and business models. This approach reveals a well-structured educational system to prepare professionals to meet the challenges of the innovation-based global economy.

The analysis of the syllabi of the Brazilian courses revealed a lower convergence of the themes compared to the German institutions. In the Brazilian institutions analyzed, the themes are more fragmented and have less focus on core competencies such as innovation and leadership. This reinforces the need for a clearer strategic vision, not only on the part of the government, but also of educational institutions and organizations themselves for the development of innovative leaders in Brazil.

From the key factors identified in this study — strategy and business models, leadership, entrepreneurship, innovation management, creativity, and agile methods — it is

clear that there is a strong intersection with the skills of the future pointed out in the three publications: FORBES magazine, *Institute for the future*, and the World Economic Forum report. The connection between the competencies raised and skills such as curiosity, continuous learning, analytical thinking and leadership suggests that global trends for the development of innovative professionals are being required.

These results indicate the need for concrete actions to improve the training of young leaders in Brazil. By fostering the development of these skills, Brazil can, in the long term, ensure a more competitive industrial environment prepared for the challenges of the future.

CONCLUSION

This study sought to investigate and identify experiences, good practices and the key factors of the development of skills for innovation, which impact young talents in the industry in Brazil, using as reference and inspiration the findings in educational institutions in Germany and Brazil, with a focus on the training of young leaders.

The results demonstrated the relevance of education for the development of innovation and the importance of developing a diverse set of skills to stimulate innovation in people, organizations and governments, through public policies.

Through a detailed analysis of the courses and menus of the selected educational institutions, it was found that the training of young talents should prioritize a set of skills, which were organized into five themes: problem solving (*design thinking* and *design sprint*), entrepreneurship, creativity, strategic management and business modeling, as well as knowledge of innovation management.

In addition, skills such as communication and cooperation between peers and people from different hierarchical levels are good practices perceived in the survey, which can be strengthened and stimulated in young Brazilian leaders, with the aim of improving the training process and fostering the creation of an environment favorable to innovation.

Finally, the study demonstrated that the key factors and good practices, which were detailed and structured in the research, can be incorporated into the Brazilian context, making professionals better prepared to collaborate with the innovative process of companies and, thus, contributing to and boosting national competitiveness.

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DEMOCRATIC EDUCATION: IMPLICATIONS FOR THE TEACHING WORK

https://doi.org/10.56238/sevened2024.031-010

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ABSTRACT

The school curriculum plays a fundamental role in the citizenship formation of students, directly influencing their skills and social values. Through formal education, the curriculum contributes to the development of critical, reflective and participatory skills, necessary for conscious action in society. Citizenship education involves not only theoretical knowledge, but also the construction of practices and attitudes that promote democratic coexistence and respect for diversity. Thus, education focused on citizenship must consider cultural, ethical, and political aspects, promoting the active engagement of students. The general objective of this article is to analyze how the school curriculum contributes to the citizenship formation of students. The specific objectives are: - to identify the pedagogical practices present in the curriculum that foster citizenship; - verify the presence of content that encourages critical thinking and social participation; - evaluate the importance of interdisciplinarity in the construction of a citizen education. The research problem that guides this study is: How does the school curriculum contribute to the citizenship formation of students? The methodology used was bibliographic, based on a literature review of works that deal with the relationship between school curriculum and citizenship. The results indicate that a curriculum that integrates democratic principles, social values and practices of mutual respect favors the development of critical and participatory citizens. The discussion reinforces the need for an interdisciplinary approach that contemplates the diversity and multiple realities of students. It is concluded that the school curriculum must be constantly reviewed and adapted to meet social demands and train individuals capable of acting ethically and responsibly in society, fully exercising their rights and duties as citizens.

Keywords: School Curriculum. Citizenship Education. Democratic Education. Teacher Training.

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INTRODUCTION

The school curriculum is an essential tool for the construction of citizenship in students, because, in addition to transmitting technical and scientific knowledge, it is responsible for promoting values, attitudes and social practices that enable a conscious and active performance in society. In this sense, the curriculum goes beyond the simple organization of content, playing a fundamental role in the formation of critical, reflective and participatory citizens. Formal education, when well structured, contributes to the development of skills that favor democratic coexistence, respect for diversity and understanding of individual and collective responsibilities. Citizenship education, therefore, involves not only the mastery of theories and concepts, but also the application of such knowledge in practical contexts, promoting an ethical and solidary interaction between individuals.

The general objective of this article is to investigate how the school curriculum can contribute to the citizenship formation of students, based on the premise that education has a transformative social role. The research proposes to identify the pedagogical practices incorporated in the curriculum that favor education for citizenship, in addition to verifying the presence of content that encourages critical thinking and the active participation of students in society. Another relevant aspect is to evaluate the importance of interdisciplinarity as a strategy to integrate different areas of knowledge in the construction of an education focused on citizenship.

The central question that guides this study is: How does the school curriculum contribute to the citizenship formation of students? By answering this question, the article seeks to understand which are the most effective curricular elements in the promotion of citizenship and how these contents and practices can be improved or expanded within the school context.

The methodology adopted was of a bibliographic nature, based on a literature review that discusses the relationship between school curriculum and citizenship formation. Works and articles that deal with pedagogical practices aimed at the development of citizen awareness were analyzed, as well as the relevance of a curriculum that contemplates contemporary social demands.

The results of this study indicate that a curriculum that integrates democratic principles, ethical values and practices of mutual respect is capable of forming more critical and participatory citizens, ready to face the challenges of a plural society in constant transformation. The discussion points to the need for an interdisciplinary approach, which

allows the integration of different knowledge and realities, in order to make education more inclusive and effective in the promotion of citizenship.

It is concluded that the school curriculum must be dynamic and constantly evolving, following social and cultural changes, in order to prepare students not only for the job market, but, above all, for life in society. The formation of ethical, responsible individuals who are aware of their rights and duties as citizens is a goal that should guide the elaboration and implementation of school curricula aimed at building a more just and democratic society.

THE SCHOOL CURRICULUM AND CITIZENSHIP EDUCATION

CONCEPT OF SCHOOL CURRICULUM

The concept of school curriculum is not fixed and static, but a historical, theoretical and ideological construction that reflects the social, cultural and political demands of each era. According to Franco et al. (2020), the school curriculum has been shaped by different currents of thought over the years, from the most traditional and conservative conceptions to the most critical and progressive approaches. The primary function of the curriculum goes beyond the simple transmission of knowledge; It is also responsible for forming conscious citizens capable of acting critically in society. In this sense, the curriculum must be understood as a strategic tool, whose decisions about what to teach and how to teach reflect the society that one wishes to build.

The historical-critical approach to the curriculum, discussed by Malanchen (2021), points out that the school curriculum can be both an instrument of emancipation and domination, depending on the pedagogical perspective adopted. Historical-critical pedagogy, for example, defends a curriculum that goes beyond the reproduction of knowledge established by capital, promoting an emancipatory education that enables students to resist forms of exploitation and oppression. This perspective criticizes the apparent neutrality of the curriculum, emphasizing that curricular choices always carry ethical, political, and ideological values, which makes education a field of dispute between different social forces.

Martins and Pasqualini (2020) emphasize that the school curriculum also has ontological, epistemological, ethical-political, and pedagogical dimensions. These dimensions must be considered in the elaboration of any curricular proposal, since they directly influence the way the contents are presented and understood by the students. The ontological dimension concerns the conception of human beings and society that the curriculum proposes; the epistemological refers to the choice of knowledge and forms of

knowledge that will be taught; the ethical-political dimension deals with the values and principles that guide educational practices; and, finally, the pedagogical, which is related to teaching methods and approaches. By adopting a historical-critical approach, these dimensions are intertwined with the goal of building a more just and democratic education.

Dourado and Santos (2023) add to the discussion the concept of an integrated curriculum, which seeks to overcome the fragmentation of knowledge and promote a more holistic education of students. This curricular proposal aims to connect different areas of knowledge in an interdisciplinary way, promoting a broader and more complex view of the world. The integrated curriculum also aims to bring theory closer to practice, providing students with opportunities to apply the knowledge acquired in real and meaningful situations. Thus, the school curriculum is not only a set of disciplines and contents, but a political-pedagogical project that defines the integral formation of the student and his insertion in society.

Over the decades, the school curriculum has been the object of several reformulations, and its construction reflects the ideological disputes present in each historical context. Through it, paradigms are perpetuated or broken, promoting sometimes the maintenance of the current order, sometimes social transformation. Therefore, understanding the concept of school curriculum implies recognizing its dynamic and multifaceted character, capable of directly influencing the education of subjects and, consequently, the future of society (Franco et al., 2020; Malanchen, 2021; Martins & Pasqualini, 2020; Dourado & Santos, 2023).

THE IMPORTANCE OF THE CURRICULUM IN EDUCATION

The importance of the curriculum in education is unquestionable, since it is the foundation on which the entire educational process develops. The curriculum defines what will be taught, how it will be taught, and implicitly what it will be taught for. According to Franco et al. (2020), the school curriculum is more than a simple document that organizes content; It is a historical and ideological construction, which carries with it the marks of disputes and social transformations. Thus, the curriculum directly influences the formation of students' identities, values and knowledge, shaping society by forming citizens who will be able to act critically and consciously. For this reason, its importance transcends the simple organization of teaching, touching directly on the social and political role of education.

Within this perspective, the curriculum acts as a central pedagogical tool in the mediation between formal knowledge and the students' reality. Malanchen (2021) highlights

that, in historical-critical pedagogy, the curriculum is seen as a means of forming emancipated individuals, capable of questioning social structures and resisting the impositions of capital. It should not be limited to transmitting already established knowledge, but provide students with the conditions to reflect on their reality and on the contradictions present in it. Education, therefore, cannot be fully realized without a curriculum that challenges forms of oppression and stimulates the intellectual autonomy of students.

In addition, Martins and Pasqualini (2020) emphasize that the importance of the curriculum in education also lies in its various dimensions: ontological, epistemological, ethical-political, and pedagogical. Each of these dimensions plays a fundamental role in the development of a coherent and effective curricular proposal. The ontological dimension deals with the vision of human beings and society that the curriculum proposes, determining the type of education that students will receive. The epistemological dimension refers to the selection of knowledge that will be transmitted, and the way in which this knowledge will be organized and articulated among themselves is fundamental to ensure quality education. The ethical-political dimension deals with the values that guide pedagogical practices, while the pedagogical dimension refers directly to teaching methods and strategies. When these dimensions are articulated in an integrated way, the curriculum becomes a powerful instrument to promote social transformation.

In turn, Dourado and Santos (2023) argue that the integrated curriculum emerges as an innovative proposal to face the challenges of contemporary education. This approach aims to overcome the fragmentation of knowledge and provide a more complete and coherent education, connecting different areas of knowledge and promoting interdisciplinarity. The integrated curriculum aims not only to transmit content, but to train a student capable of applying what he or she has learned in a practical and meaningful way, in different contexts. By doing so, he expands the possibilities of learning and strengthens the development of skills that are essential for life in society.

The importance of the curriculum in education, therefore, is intrinsically linked to its ability to shape critical, conscious citizens capable of interacting in an active and transformative way in their environment. Through a well-structured curriculum, education can not only reproduce knowledge, but also transform it, so as to prepare students for contemporary and future challenges. The curriculum is, therefore, a strategic tool for building a more just, democratic, and inclusive society (Franco et al., 2020; Malanchen, 2021; Martins & Pasqualini, 2020; Dourado & Santos, 2023).

CITIZENSHIP EDUCATION: DEFINITION AND RELEVANCE

Citizenship education is a concept that goes beyond the simple transmission of school knowledge. It involves the construction of values, attitudes, and practices that enable individuals to act critically, consciously, and actively in society. According to Rodrigues (2022), citizenship education should be understood as a dynamic and continuous process, in which subjects appropriate theoretical and practical tools to intervene in their realities, contributing to social transformation. Citizenship education, therefore, is not limited to the assimilation of formal contents, but encompasses the internalization of democratic, ethical, and social values that are essential for coexistence in a plural society. This includes developing skills such as critical thinking, respect for diversity, and engaging in social practices that promote equity and justice.

Halaszen and Gomes (2022) highlight that citizenship education is closely linked to the use of educational technologies and methodologies that promote the active participation of students in the construction of knowledge. The adoption of geocollaborative technologies in geographic education, for example, has proven to be an effective tool for fostering citizenship, by enabling students to get directly involved with issues related to the space in which they live. These technologies allow students to develop a deeper understanding of the impact of human actions on the environment and social organization, promoting citizenship education that goes beyond the classroom and extends to active participation in their communities. In this way, technology becomes a means to strengthen geographic education and promote citizenship through collaborative practice and engagement with real social problems.

In the context of formal education, citizenship training is also a response to the authoritarian and conservative tendencies that often permeate the educational system. Lima, Brzezinski, and Menezes (2020) discuss the growing militarization of schools in Brazil and question whether this model really contributes to citizenship education. They argue that an education focused on citizenship formation must, above all, promote freedom of thought, autonomy and the development of a critical consciousness, elements often stifled in excessively militarized educational environments. Citizenship, as defined by the authors, is more than obedience to rules and norms; it requires the ability to reflect on these norms and to actively participate in their construction and transformation. Thus, a truly citizen education must prepare students to question, propose and participate in the democratic process, and not just to passively obey pre-established hierarchical structures.

The relevance of citizenship education in the current context is undeniable. With the increase in social inequalities, intolerance and political polarization, citizenship education

presents itself as one of the main ways to combat these trends and promote social cohesion. Citizenship training aims to prepare individuals who are able to deal with the complexities and challenges of a society in constant transformation, developing skills that allow them to act responsibly and ethically in their social contexts. In addition, by providing education based on democratic values and respect for diversity, citizen education contributes to the construction of a more just and equitable society, in which all individuals have the opportunity to fully exercise their rights and duties.

The process of citizen formation, as addressed by Rodrigues (2022), Halaszen and Gomes (2022), and Lima, Brzezinski and Menezes (2020), is therefore fundamental for the construction of a more participatory and democratic society. By empowering students to act critically and critically in their communities, citizen education contributes to the creation of a stronger and more equitable social foundation, in which individuals not only understand their responsibilities as citizens, but also feel empowered to act for the greater common good.

PEDAGOGICAL PRACTICES AND CITIZENSHIP

PEDAGOGY FOCUSED ON CITIZENSHIP

Pedagogy focused on citizenship is an educational approach that seeks to form individuals aware of their rights and duties, capable of acting critically in society. This pedagogy goes beyond the simple transmission of content and involves the development of values such as justice, solidarity, equality, and respect for differences. Bittar (2021) argues that a citizen pedagogy, inspired by Paulo Freire, is essential to promote the emancipation and awareness of subjects, providing them with the necessary tools so that they can question social structures and fight for transformations. In this sense, decolonial pedagogy and human rights are central themes for the construction of an education that not only transmits knowledge, but also prepares students for the full exercise of their citizenship.

Sabbi (2020) reinforces the idea that a radical and inclusive pedagogy is necessary to build a more conscious citizenship. He highlights that education must be able to break down the barriers of exclusion and marginalization, integrating all individuals in an educational process that values their uniqueness and promotes the active participation of all. Pedagogy focused on citizenship, in this context, is not restricted to the classroom, but permeates all spheres of social life, promoting the engagement of individuals in the social and political issues that affect their communities. It is an education that does not conform to passivity, but instigates students to be agents of change, enabling them to contribute to the construction of a more just and equitable society.

Vedana (2021) adds that the Pedagogy of Liberation, proposed by Paulo Freire, is one of the main theoretical and practical contributions to the construction of a pedagogy focused on citizenship. This pedagogy argues that the educational process should be liberating, allowing individuals to develop their autonomy and critical capacity. In the field of Food and Nutrition Education (FNE), for example, the Pedagogy of Liberation has been used as a basis to promote the autonomy of the subjects, encouraging them to reflect on their eating practices and to make conscious decisions regarding their health and well-being. Education, in this way, becomes a space of awareness and empowerment, where individuals learn to recognize their potential and fight for their rights, including the right to health and adequate food.

Dos Santos and Junior (2023) discuss the relationship between citizenship, participation, and human rights, highlighting that a pedagogy focused on citizenship must be based on normative and methodological principles that promote quality education. They argue that education for citizenship cannot be detached from the struggle for human rights, as both concepts are intrinsically linked. Citizen education, in this sense, must be transversal and interdisciplinary, addressing issues of social justice, gender equality, cultural diversity, and environmental sustainability. This approach contributes to the formation of individuals capable of actively participating in the decisions that affect their lives and of fighting for the construction of a more democratic and inclusive society.

Pedagogy focused on citizenship, therefore, is a pedagogy of transformation, which places the subject at the center of the educational process and enables him to act consciously and critically. It challenges traditional teaching practices, which often reproduce inequalities and exclusions, and proposes an education based on emancipation, participation and respect for human rights. In this way, this pedagogy not only promotes intellectual development, but also the ethical and political formation of subjects, preparing them to face the challenges of an ever-changing society (Bittar, 2021; Sabbi, 2020; Vedana, 2021; dos Santos & Junior, 2023).

CRITICAL AND PARTICIPATORY CONTENT IN THE CURRICULUM

Critical and participatory content in the curriculum plays a central role in the formation of active and conscious citizens. Unlike a traditional approach that prioritizes memorizing information and complying with strict guidelines, critical content encourages reflection, analysis, and problematization of reality. This is essential for the construction of a more democratic society, because, as Bittar (2021) highlights, a pedagogy focused on citizenship must be based on practices that break with colonial and oppressive structures.

To this end, critical content enables students to question the status quo, understand the multiple layers of power and exploitation, and position themselves as subjects who transform their own realities.

The implementation of critical content in the curriculum, according to Sabbi (2020), is also directly linked to the idea of inclusion. Inclusion cannot be understood only as a physical process of integration of different students in the school environment, but must involve the inclusion of their realities, perspectives and experiences in the content taught. Critical content creates space for different voices and experiences to be valued, breaking with the homogeneous and traditional curriculum that often ignores the needs and realities of historically marginalized groups. In this sense, a participatory curriculum paves the way for a more inclusive education, where cultural, social, and economic differences are respected and incorporated as an essential part of the teaching-learning process.

Participatory contents, in turn, are those that directly involve students in the process of knowledge construction, breaking with the traditional conception that the teacher is the holder of knowledge and the student, a passive receiver. Vedana (2021) argues that this participatory logic is fundamental for the emancipation of subjects, as it allows them not only to understand the world around them, but also to contribute to its transformation. In the context of Food and Nutrition Education (FNE), for example, the participatory curriculum promotes a critical reflection on food practices and their social, ecological, and economic implications, leading students to develop a critical and autonomous awareness of their choices. This type of education nurtures the ability of individuals to consciously interact with their context and to make decisions based on principles of justice and equality.

Another important point raised by Dos Santos and Junior (2023) is that critical and participatory content should not be isolated from other areas of knowledge. On the contrary, they must be present in a transversal and interconnected way to various disciplines, such as history, geography, social sciences, physical education and even mathematics. By introducing issues related to citizenship, social participation, and human rights in different subjects, the curriculum becomes interdisciplinary, allowing students to understand social challenges and problems holistically. For example, a geography class may include discussions about environmental justice and territorial inequality, while a history class may address the issue of civil rights and struggles for racial and gender equality. This integration of critical content in all disciplines ensures that citizenship education is continuous and comprehensive, preparing students to face the challenges of contemporary society in an informed and critical way.

In addition, the curriculum that values critical and participatory content encourages the practice of dialogue, which is fundamental for democratic education. Dialogue, in this context, is not just an exchange of information, but a process in which everyone involved has the opportunity to express their opinions, listen to each other, and build knowledge collaboratively. Bittar (2021) points out that, inspired by Paulo Freire, the act of dialoguing is an act of liberation, where both teachers and students are actively involved in the construction of knowledge, breaking with traditional hierarchies that place the teacher as the only transmitter of knowledge. This dialogic process is essential for building critical awareness, as it allows students to engage meaningfully in learning, question and reflect on the content, and actively participate in decisions that affect their lives and education.

Another relevant aspect of critical and participatory content is its ability to promote social action. It is not enough just to develop a critical understanding of the problems; It is necessary to encourage students to act on them. Sabbi (2020) points out that a truly citizen-oriented curriculum should include opportunities for students to get involved in community actions, social projects, and other activities that connect them directly with the social issues they study in the classroom. Through these practical experiences, students have the chance to apply the knowledge acquired in real contexts, developing not only cognitive skills, but also ethical and social skills. Participation in social projects or community actions, for example, allows students to understand the impact of their decisions and actions on the collective, promoting a sense of social responsibility and belonging to the community.

Finally, a curriculum based on critical and participatory content prepares students for life beyond school. Vedana (2021) argues that school education cannot be dissociated from practical life and contemporary social demands. By encouraging critical reflection and active participation, the curriculum empowers students to become full citizens, capable of dealing with the challenges and complexities of globalized society. They become able to intervene in issues such as social inequality, environmental injustice, digital exclusion, among other problems that affect the daily life of modern societies. This type of training, therefore, goes beyond preparing for the job market, promoting an education that values the integral development of human beings and their capacity for social transformation.

Thus, the incorporation of critical and participatory content in the curriculum is not only a pedagogical choice, but an action that aims to transform education into a space of liberation and engagement. These contents enable students to develop a deep understanding of //their realities and act as agents of change, prepared to face

contemporary challenges consciously and proactively (Bittar, 2021; Sabbi, 2020; Vedana, 2021; Dos Santos & Junior, 2023).

THE ROLE OF THE TEACHER IN CITIZENSHIP EDUCATION

The role of the teacher in citizenship education goes far beyond the simple transmission of school content. It is a fundamental agent in the promotion of values, attitudes and practices that contribute to the development of a critical awareness and a participatory posture of students in the face of social issues. Galvão and Casimiro (2023) highlight that the teacher, today, needs to play a transformative role within the school environment, acting as a mediator and facilitator of the process of building knowledge and citizenship. The teacher is no longer seen as the sole holder of knowledge, but as a guide who encourages students to question, reflect and act on the problems that affect their lives and their communities. In this sense, the role of the educator is directly linked to the formation of individuals who can fully exercise their citizenship, understanding their rights and duties, as well as actively and consciously participating in the construction of a more just and democratic society.

Citizenship education requires teachers to incorporate into their pedagogical practice a series of skills and competencies that go beyond mastering the content of their discipline. According to Torisu and Ferreira (2022), it is essential that teachers, including those in areas such as mathematics, take ownership of cross-cutting themes that enable dialogue on relevant social, political, and cultural issues. By integrating these topics into the curriculum, the teacher contributes to the formation of citizens who understand mathematics not only as an exact science, but as a tool that can be used to understand economic, social and environmental problems. Thus, by addressing topics such as sustainability, social inclusion or human rights, the teacher broadens the students' horizons, encouraging them to reflect on the impact of science on their lives and on society.

The teacher also plays a central role in building a school environment that values respect for differences and diversity. Galvão and Casimiro (2023) emphasize that the school is a privileged space for democratic coexistence, and the teacher has the responsibility to promote a culture of respect and empathy among students. For this, it is necessary for the educator to develop pedagogical strategies that favor dialogue and collective work, while stimulating the students' ability to put themselves in the other's shoes and respect different points of view. This pedagogical posture is fundamental for citizenship education, as it prepares students to deal with the diversities they will encounter outside school, promoting the development of values such as tolerance, solidarity and social justice.

In addition, the role of the teacher in citizenship education involves encouraging the active participation of students in decision-making processes, both inside and outside the school. A teacher who is committed to citizenship not only encourages the intellectual development of their students but also encourages them to get involved in political and social issues that affect their communities. By promoting debates, social intervention projects and collaborative activities, the teacher provides students with the opportunity to experience citizenship in a practical way, developing skills that are fundamental for the exercise of full citizenship, such as critical thinking, the ability to argue and collective action. Torisu and Ferreira (2022) point out that, by inserting transversal themes in their pedagogical practice, teachers create an environment in which students can engage more actively in discussions and actions that promote the common good.

In the context of citizenship education, the teacher must also be an example for students, not only in terms of technical knowledge, but mainly in their ethical and civic posture. Galvão and Casimiro (2023) state that teachers must be consistent in their actions, demonstrating, through their daily practice, the values they want to transmit to students. By acting with responsibility, respect and justice, the teacher inspires students to adopt similar attitudes, thus promoting a citizenship education that goes beyond books and classes, reaching life in society. Therefore, the role of the teacher in the formation of citizenship is inseparable from his ethical conduct and his ability to demonstrate, in practice, the principles he defends in the classroom.

Finally, the teacher must be prepared to deal with the challenges of a society in constant transformation, where new social and cultural demands arise quickly and intensely. Torisu and Ferreira (2022) suggest that the continuing education of teachers is crucial for them to be able to adapt to changes and incorporate new themes and approaches that are relevant to the citizenship education of students. The teacher must be open to revisiting their pedagogical practices, updating themselves on new methodologies and technologies and, above all, be willing to learn together with their students, recognizing that the construction of knowledge is a collaborative process. In this sense, the teacher becomes an eternal learner, capable of evolving and adapting to better meet the needs of his students and society.

Thus, the role of the teacher in citizenship education is multifaceted and dynamic, involving everything from the transmission of critical content to the promotion of a culture of respect and active participation. More than that, the teacher is a transforming agent, capable of inspiring his students to be full citizens, aware of their responsibilities and

capable of contributing to the construction of a more just, inclusive and democratic society (Galvão & Casimiro, 2023; Torisu & Ferreira, 2022).

INTERDISCIPLINARITY AND CITIZENSHIP EDUCATION

Interdisciplinarity is a central element in the promotion of an education focused on citizenship formation. It goes beyond the mere integration of content from different disciplines, promoting an approach that values the construction of knowledge based on the interconnection between areas of knowledge and their respective social practices. According to De Sousa and Santos (2020), interdisciplinarity offers a viable path to face the challenges of citizenship education in public schools, as it allows students to understand the complexity of social problems and how they affect different aspects of their lives. This approach promotes a holistic view of reality, essential to form critical and conscious citizens, capable of understanding that society's problems cannot be solved in isolation, but require an integrated and multidimensional understanding.

Presotto and Dalla Costa (2023) highlight that the National Common Curriculum Base (BNCC) reinforces the need for the teaching of various subjects, such as mathematics, to be addressed in an interdisciplinary way so that it contributes more effectively to the citizenship education of students. By integrating mathematics with other areas of knowledge, such as social sciences, geography, and economics, students are able to perceive the practical application of mathematics in understanding and solving everyday problems, such as social inequalities, the distribution of resources, and environmental sustainability. Interdisciplinarity, in this context, not only broadens the understanding of academic content, but also fosters a critical attitude towards global and local challenges, stimulating in students a sense of social responsibility and the willingness to actively participate in the construction of collective solutions.

The concept of interdisciplinarity, as pointed out by Zinderski Guirado and Santos Da Silva (2021), is crucial for emancipation in teacher training processes. When teachers are trained with an interdisciplinary mindset, they are able to transpose this practice into the classroom, facilitating an education that goes beyond the rigid boundaries between disciplines. This enables a more critical and deeper view of reality, which is transmitted to students, stimulating in them the ability to question, reflect and act on the problems they observe in their social context. Emancipation, in this sense, is related to the ability of students to develop a critical awareness of the world around them, understanding how different areas of knowledge can contribute to the resolution of complex and global problems, such as environmental, political, and economic issues.

The interdisciplinary approach also contributes to the development of scientific literacy, as argued by Camas, Lambach and Souza (2021). Scientific literacy, understood as the ability to understand and use scientific knowledge in everyday contexts, is fundamental for the formation of critical and participatory citizens. In this sense, interdisciplinarity enables students to understand science not as a set of isolated knowledge, but as a social practice that interacts with other spheres of human life. The articulation between scientific disciplines and humanities, for example, can provide a broader and more critical view on issues such as the climate crisis, technology and its ethical implications, and the impact of public policies on health and social well-being. By integrating these discussions into an interdisciplinary approach, the school curriculum becomes more relevant and aligned with the needs and challenges of contemporary society.

One of the main benefits of interdisciplinarity in citizenship education is the ability to promote the integration between theory and practice. De Sousa and Santos (2020) point out that, in public schools in Fortaleza-CE, interdisciplinarity has proven to be an effective tool to bring students closer to the social realities that surround them. By working with interdisciplinary projects, students are encouraged to apply the knowledge acquired in the classroom to analyze and propose solutions to concrete problems in their communities, such as violence, social exclusion, and environmental degradation. This integration between theory and practice is fundamental for citizenship education, as it allows students to see themselves as agents of transformation in their own realities, developing skills such as autonomy, critical thinking, and the ability to collaborate.

Zinderski Guirado and Santos Da Silva (2021) also highlight that interdisciplinary education strengthens the idea that knowledge is dynamic and constantly under construction. By deconstructing the traditional barriers between disciplines, interdisciplinarity allows students to understand the process of knowledge production as something that involves different perspectives and knowledge. This is especially important for citizenship education, as it promotes an attitude of openness to dialogue and respect for different forms of knowledge and experience. Citizen education, in this sense, is deeply connected with the ability to understand and value diversity, be it cultural, social or epistemological. Interdisciplinarity, by bringing this diversity to the center of the educational process, contributes to the formation of individuals who are more tolerant, respectful, and engaged with the construction of a more equitable and inclusive society.

Another relevant point is that interdisciplinarity contributes to the formation of a global citizenship, as highlighted by Presotto and Dalla Costa (2023). In an increasingly

interconnected and globalized world, it is critical for students to develop the ability to understand local problems from a global perspective. Interdisciplinarity provides the tools necessary for students to understand how issues such as inequality, poverty, and climate change are intertwined and affect different regions of the world in distinct ways. By providing a global and integrated view of reality, interdisciplinary education prepares students to act as global citizens, committed not only to the well-being of their local communities, but also to building a more just and sustainable world.

Camas, Lambach, and Souza (2021) reinforce that interdisciplinarity is also a strategy to combat the fragmentation of knowledge, which often results in a superficial understanding of the complex problems faced by society. By integrating different areas of knowledge, interdisciplinary education allows students to develop a more complete and deeper view of reality, favoring the construction of more effective and innovative solutions to social problems. The fragmentation of knowledge, characteristic of a rigid disciplinary approach, can limit students' ability to understand the totality of the challenges they face, restricting their possibilities for action and transformation. Interdisciplinarity, on the other hand, broadens the horizons and possibilities of social intervention, promoting an education that is at the same time critical, creative, and transformative.

In short, interdisciplinarity plays a fundamental role in citizen education, by promoting an education that integrates different knowledge and practices, brings theory closer to practice and broadens the understanding of social problems in a global and local perspective. By breaking with the traditional boundaries between disciplines, interdisciplinarity contributes to the formation of critical, autonomous, and engaged citizens, capable of acting responsibly and consciously in the construction of a more just, inclusive, and sustainable society (De Sousa & Santos, 2020; Presotto & Dalla Costa, 2023; Zinderski Guirado & Santos da Silva, 2021; Camas, Lambach & Souza, 2021).

CONCLUSION

The conclusions of an article on the role of the school curriculum and pedagogy in citizenship formation highlight the need for an educational approach that goes beyond the simple transmission of technical knowledge. Education, in this sense, should be understood as a process deeply linked to the formation of critical, autonomous and participatory subjects, capable of acting actively and consciously in society. Throughout this article, it has been discussed how the school curriculum, critical and participatory contents, interdisciplinarity and the role of the teacher are intertwined in the construction of an education that promotes full citizenship.

The school curriculum, as pointed out by several authors, is a powerful tool for citizenship education, as long as it is structured in such a way as to promote the development of critical skills. The mere transmission of content, devoid of social and political context, limits students' ability to meaningfully engage in the issues that affect their lives and their communities. By integrating critical and participatory content, the curriculum enables students to appropriate knowledge in an active way, understanding the connections between knowledge and their realities, and developing the capacity for reflection and action on the world around them.

In addition, interdisciplinarity emerges as one of the essential pillars for an education focused on citizenship. By breaking down the boundaries between disciplines, interdisciplinarity allows for a broader and deeper understanding of social problems, promoting an integrated view of reality. This approach is fundamental for the formation of citizens capable of dealing with the complexity of contemporary challenges, such as social inequality, the environmental crisis, and technological transformations. The ability to connect different areas of knowledge, as advocated by authors such as De Sousa and Santos (2020), Presotto and Dalla Costa (2023), and Camas, Lambach and Souza (2021), is essential for students to develop a critical and global vision, which is fundamental for building innovative and effective solutions to society's problems.

Another central aspect addressed in this article is the role of the teacher in the formation of citizenship. The teacher is much more than a transmitter of knowledge; He is a mediator, a facilitator of the learning process and an example of active citizenship for students. By integrating critical content and cross-cutting themes into their pedagogical practice, teachers create an environment conducive to the development of citizen awareness. In addition, the teacher has the responsibility to promote an inclusive and democratic environment, where dialogue, respect for differences and active participation are encouraged. Citizenship education depends, to a large extent, on the teacher's ability to foster these skills in their students, showing, through their daily practice, how citizenship can be exercised in an ethical and responsible manner.

The importance of an education that promotes citizenship is directly related to the construction of a more just, democratic and inclusive society. In a world marked by deep inequalities and increasingly complex global challenges, education needs to prepare individuals not only for the job market, but, above all, for the exercise of citizenship. This implies an education that promotes critical reflection on social, political, and economic structures, and that encourages students to actively engage in the search for solutions to the problems that affect their lives and their communities.

Throughout this article, it has also been emphasized that citizenship education is not an isolated process, but that it involves collaboration between different actors and areas of knowledge. Interdisciplinarity plays a key role in this regard, allowing students to develop an integrated understanding of social problems and be able to act on them effectively. Likewise, the role of the teacher is essential to ensure that the school environment is a space for the development of citizenship, where students can appropriate knowledge in a critical and participatory way.

Contemporary challenges require a new educational approach, one that is able to prepare students to face the complexities of the modern world in a critical, creative, and collaborative way. This means that the school curriculum must be constantly reviewed and adapted, so that it meets social demands and promotes the formation of citizens aware of their rights and duties. An education focused on citizenship must be inclusive, respect diversity, and be deeply connected with the social and political realities of students.

Finally, this article points to the urgent need to value the role of the teacher as a transforming agent in education. Teachers, when trained and prepared to act in an interdisciplinary and critical way, have the power to transform not only the lives of their students, but also society as a whole. By promoting citizen education, teachers help to build a solid foundation for the development of a more just, equitable, and democratic society, where all individuals have the opportunity to fully exercise their citizenship and contribute to the collective well-being.

Therefore, the role of the curriculum, interdisciplinarity, critical content and the teacher in citizen education is fundamental for the construction of an education that goes beyond technical content, promoting social transformation and the development of conscious, critical and participatory citizens. This requires a collective and continuous effort to ensure that educational practices are aligned with the principles of social justice, equity, and democratic participation.

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PREVALENCE OF E-SMOKING AMONG YOUNG UNIVERSITY STUDENTS

https://doi.org/10.56238/sevened2024.031-011

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ABSTRACT

INTRODUCTION: Electronic smoking has become a growing concern among young university students due to its popularity and potential health risks. OBJECTIVE: To evaluate the prevalence and factors associated with the use of electronic cigarettes. METHODS: this is a cross-sectional study in which young people aged between 18 and 40 years of both sexes were chosen to participate and who could answer a questionnaire via google form. RESULTS: They reveal that 56.8% of the participants use electronic cigarettes at least once a month, and 21.6% more frequently. The main motivation for use was identified as self-desire and fad, with the influence of friends also being significant. Respiratory problems were reported by 15.2% of users after starting use. CONCLUSION: study concludes that there is an urgent need for awareness campaigns and highlights the essential role of physiotherapy in the treatment of respiratory problems associated with the use of electronic cigarettes. Keywords: electronic smoking, young university students, prevalence, respiratory health, physical therapy.

Keywords: Smoking. Electronic smoking. Prevalence.

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INTRODUCTION

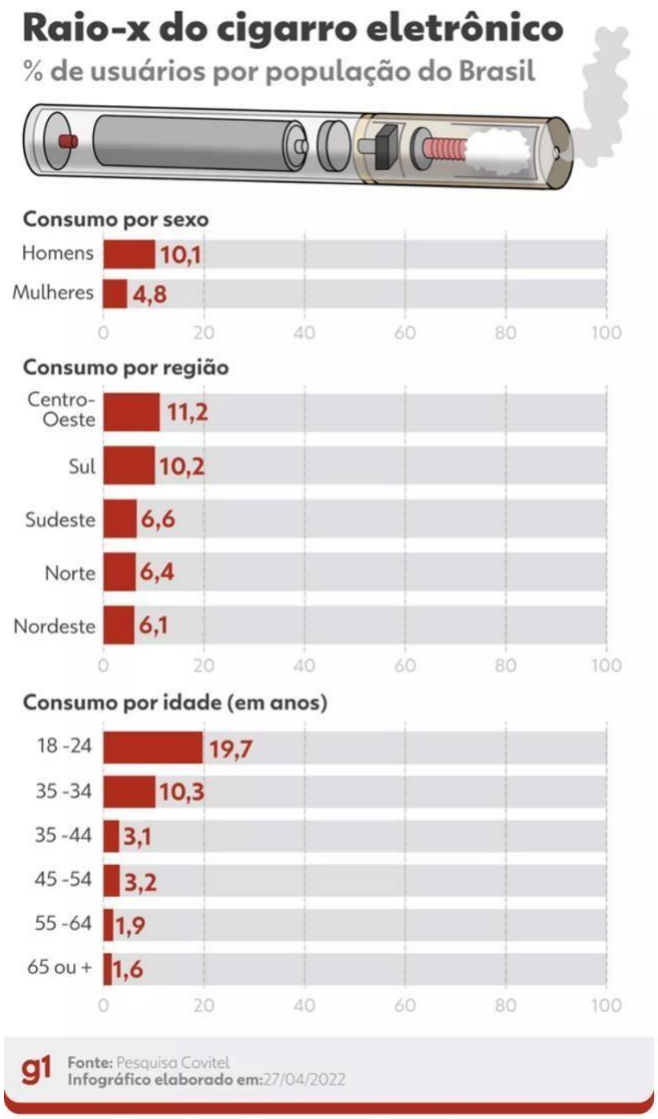
The electronic cigarette appeared at the end of the twentieth century, initially developed by Herbert A. Gilbert, presenting an appearance similar to that of conventional cigarettes. With technological advances, these devices have been modified, acquiring different characteristics and incorporating various substances that, when heated, are considered carcinogenic and toxic. Studies indicate that current devices may contain nickel and ethylene oxide, as well as flavoring and psychoactive compounds from cannabis (JARDIM, José; VICENTE, Rosangela, 2022).

Electronic smoking devices, known as vapers, pods, e-cigarettes, and e-ciggys, are battery-powered devices. When vaporized by users, they do not generate butts or ashes, which has contributed to their global popularity and increased consumption, especially due to their low cost (BISPO, Samylle, 2022).

According to the World Health Organization (WHO) and the Pan American Health Organization (PAHO), the use of vapers can induce addiction, due to the presence of nicotine, with several negative consequences for health. These effects include anomalies in babies exposed during pregnancy, impairment of learning and mental health of young people, increased likelihood of cardiorespiratory diseases, lung alterations, and injuries resulting from malfunction of devices.

Despite the popularity of electronic cigarettes, the National Health Surveillance Agency (ANVISA) has prohibited its commercialization and dissemination since 2009, through the Collegiate Board Resolution RDC 46. This is due to the absence of scientific data proving benefits compared to traditional cigarettes and reports of health problems associated with frequent users, resulting from the decrease in the body's defenses.

The identification of the harms of electronic cigarettes has generated positive impacts on public health. According to the WHO, these devices are a significant cause of preventable death. The organization has reported a decrease in the number of e-cigarette users over the past two decades, with the majority of users being women. In addition, it is observed that most consumers of electronic cigarettes are young people of high school and higher age.



Covitel reported that e-smoking is more prevalent among young people aged 18 to 24, with the male consumption rate more than double that of women. The incidence is especially high in the Center-South and South regions of the country. In addition, electronic cigarettes have been identified as a "gateway" to the consumption of conventional cigarettes. During the COVID-19 pandemic, there was an increase in the use of e-cigarettes, concomitant with a significant decrease in the practice of physical activities.

Physical therapy aims to preserve and recover the functions of the human body's systems. Professionals in the field use various techniques and methodologies to achieve effective results, especially in the face of the adverse conditions often found in smokers (BARBOSA et al., 2023).

According to the Center for Tobacco Research, based at the Ohio State University Comprehensive Cancer Center and the Southern California Keck School of Medicine, the use of electronic cigarettes, marijuana or traditional cigarettes can

present symptoms as early as one month of use. Among the interviewees, increases in wheezing, dyspnea, and symptoms of inflammation in the bronchi were reported. Over the years, the consumption of these products can pose serious health risks to smokers.

HYPOTHESIS

The prevalence of e-cigarette use among young university students in Brazil has increased significantly, surpassing the prevalence of traditional smoking in this age group. This trend reflects a shift in consumption preferences for nicotine products.

STUDY QUESTION

What is the prevalence of electronic cigarette use among young university students and what are the main factors that lead to this choice?

OBJECTIVE

GENERAL OBJECTIVE

To evaluate the prevalence of e-cigarette use among young university students.

SPECIFIC OBJECTIVES

- To analyze the frequency and motivations that lead young university students to use electronic cigarettes.
- To investigate the age group and social class of e-cigarette users.
- Identify and highlight the potential health consequences associated with e-cigarette use.

To explore how the work of physiotherapy professionals can contribute to the treatment of health problems resulting from the use of electronic cigarettes.

METHODOLOGY

TYPE OF STUDY

This study is a field research with a cross-sectional approach. It was conducted through the collection of primary data, using an online questionnaire created in Google Forms. This approach provides a comprehensive and snapshot view of the prevalence and factors associated with e-cigarette use among young college students.

LOCATION OF COLLECTION DATA

Data collection was carried out online through a form on Google Forms. The questionnaire was shared via email and social networks, which facilitated access and participation by young university students.

SELECTION CRITERIA

For the selection of participants, young university students of both sexes who are enrolled in Higher Education Institutions were considered. The age range of the participants was diverse, covering different ages within the group of university students.

INCLUSION CRITERIA

The criteria for inclusion of the participants were:

- Young university students aged between 19 and 40 years.
- Of both sexes.
- Who fully answer the questionnaire via Google Forms.
- That they sign the TCL electronically.

EXCLUSION CRITERIA THE FOLLOWING WERE EXCLUDED FROM THE STUDY:

- Young people who use any type of illicit drug.

College students who are exclusively enrolled in online courses.

ETHICAL PROCEDURES

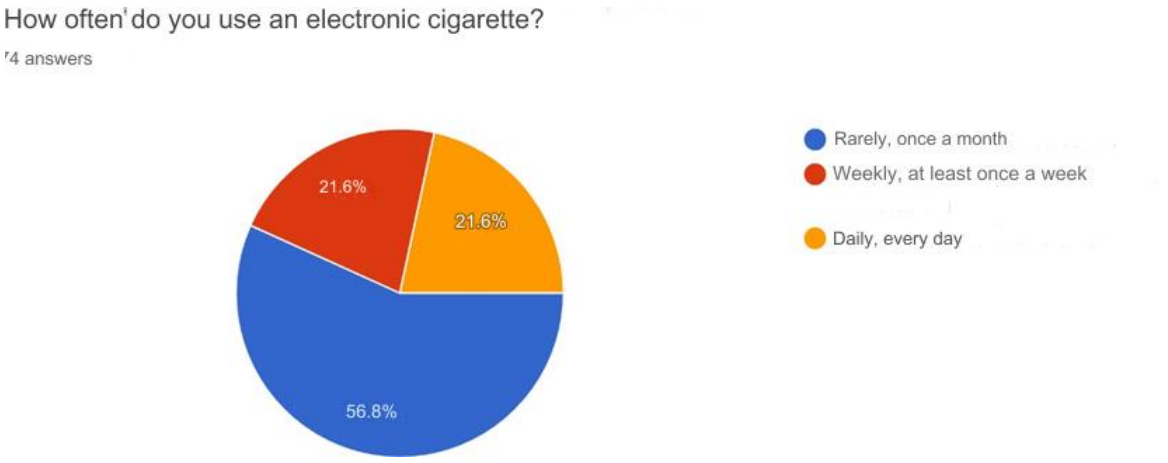
The present research is based on the ethical principles established by the National Health Council, according to resolutions No. 466/2012 and 510/2016. All participants, who are volunteers, are guaranteed the confidentiality of information and anonymity, with respect to their rights and duties.

PROCEDURES AND INSTRUMENTS FOR DATA COLLECTION

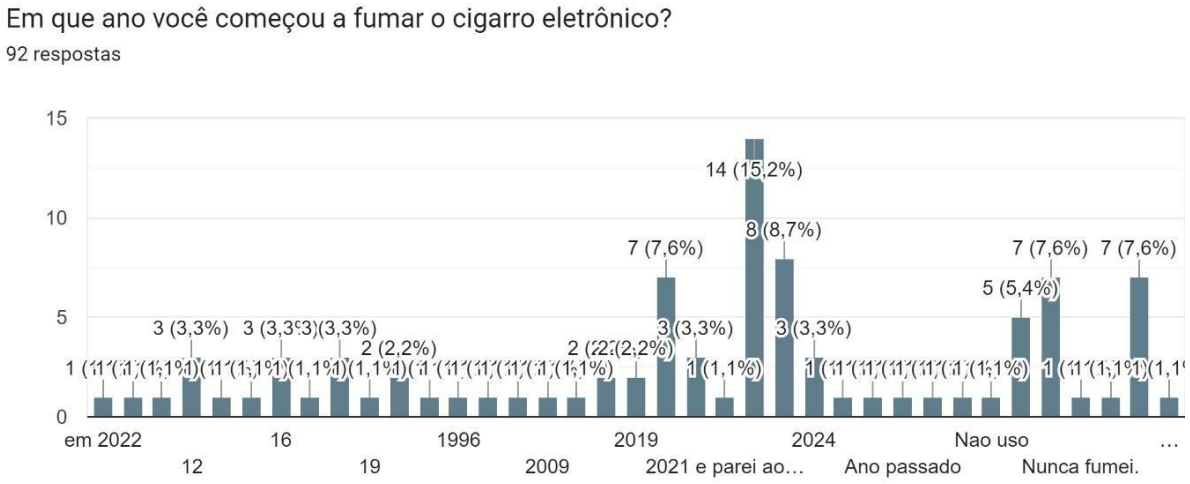
The questionnaire adopted a quantitative research method, performing an analysis of the collected data to standardize and group the information. The form was applied online, with most of the questions in a closed format, in order to obtain more direct answers.

DATA ANALYSIS

A survey was conducted with more than 90 individuals who are attending higher education. The results showed that 56.8% of the participants use electronic cigarettes at least once a month, while 21.6% use them at least once a week or daily. In addition, a distinction was observed in the beginning of the use of the device in the years 2020, 2022 and 2023, respectively.

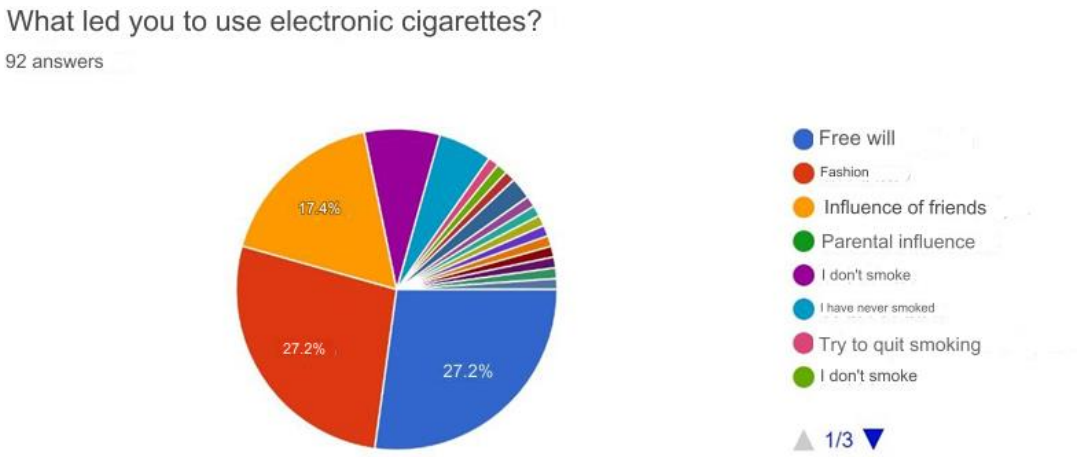


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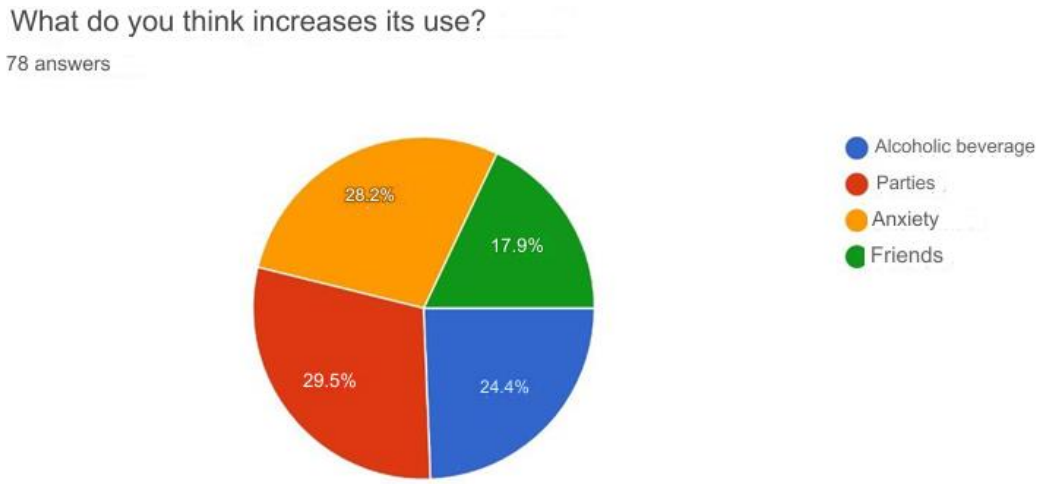


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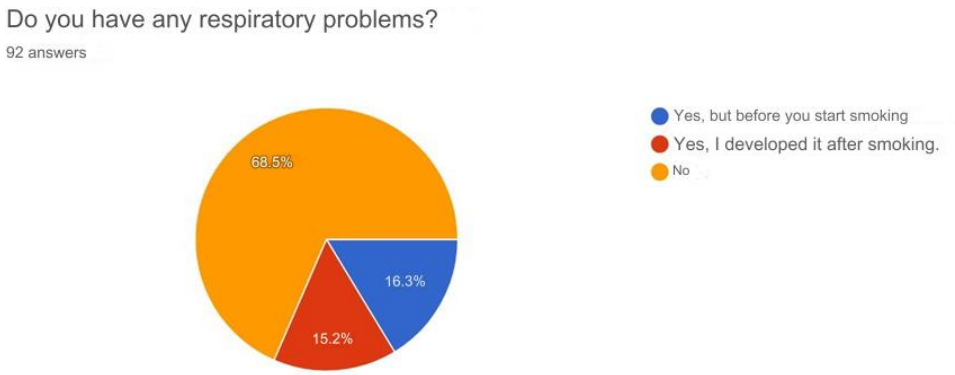
Among the reasons that led to the beginning of the consumption of electronic cigarettes, self-will and fad stand out, both with 27.2%, followed by the influence of friends, which corresponds to 17.4%. In addition, it was possible to associate the increase in use with factors such as parties, anxiety, alcohol consumption, and the presence of friends. More than half of the participants do not have any diagnosed respiratory problems; However, 16.3% reported symptoms before smoking started, and 15.2% developed respiratory problems after starting to use e-cigarettes.



Source: Google form

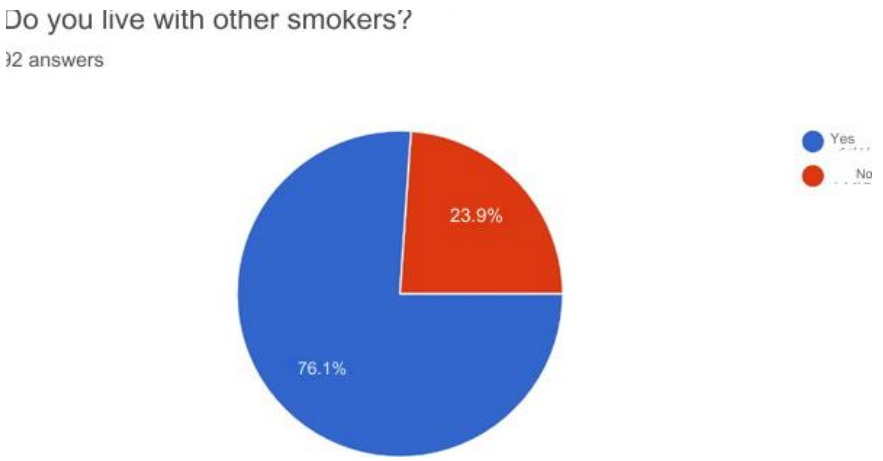


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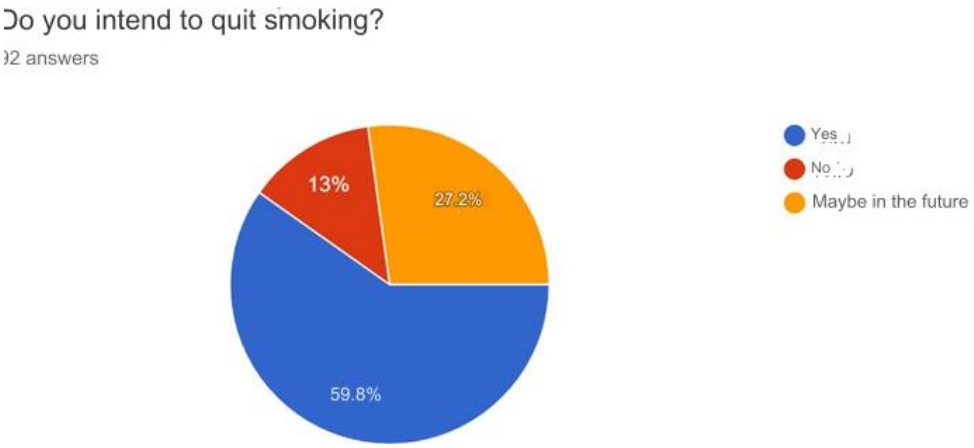


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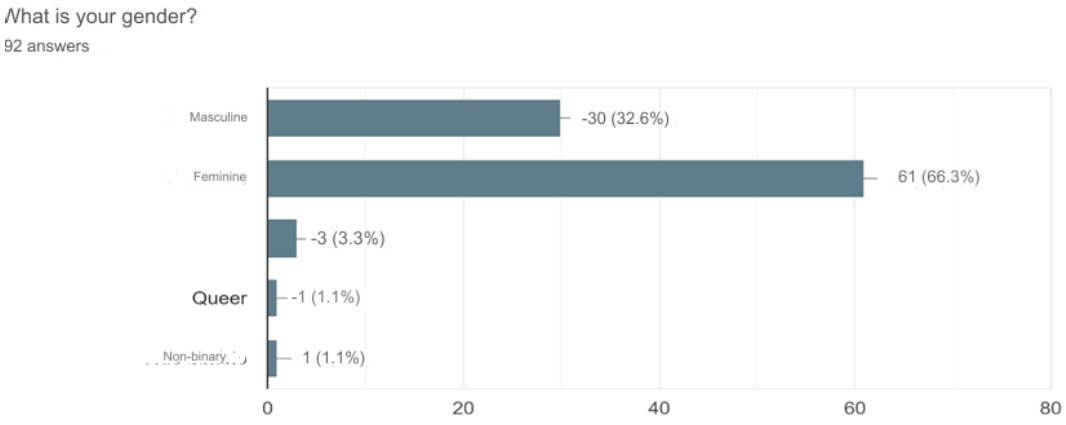
In addition, more than one-seventh of the participants reported living with smokers, and more than half of them expressed an intention to quit vaping or at least consider not using more in the future. It is important to note that, among the participants, 66.3% identified themselves as female, 32.6% as male and 5.5% as belonging to another gender. Most candidates have a monthly income between 1 and 3 minimum wages.



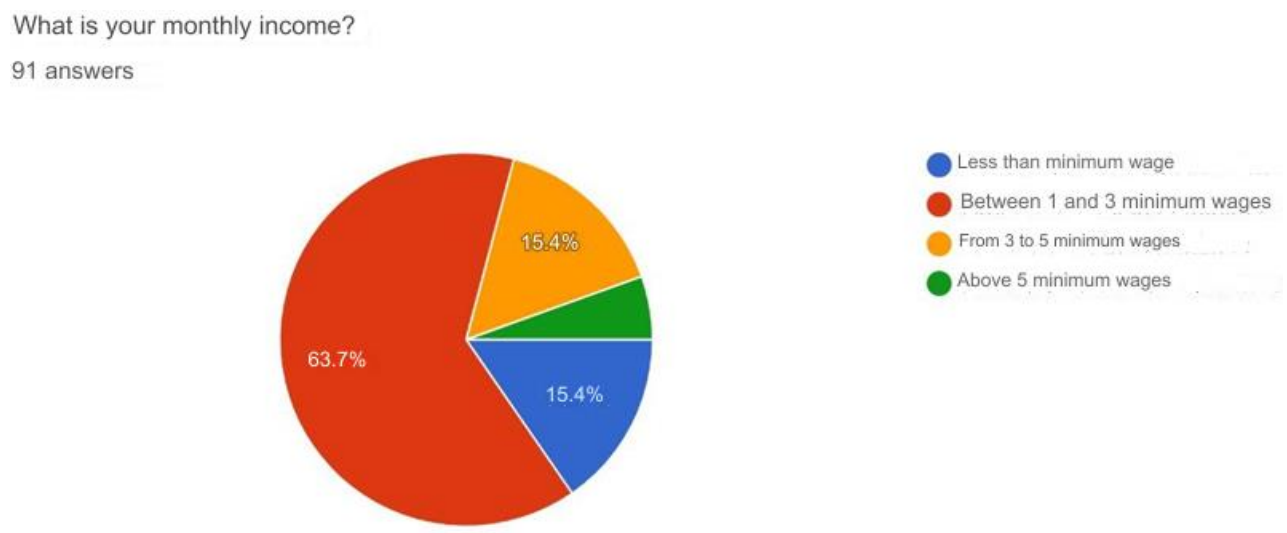
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DISCUSSION

This research confirmed that the use of e-cigarettes is quite common among young university students, a trend also observed in other studies (JARDIM & VICENTE, 2022; BISPO, 2022). The growing replacement of conventional cigarettes with electronic cigarettes can be attributed to the misconception that vapers are less harmful to health. E-cigarettes are often more attractive to young people due to the absence of butts and ashes, as well as the variety of flavors that make it more inviting (BISPO, 2022).

The data collected indicate that fashion, influence of friends and parties are the main factors that lead young people to start using electronic cigarettes. These elements are in line with the existing literature, which suggests that social acceptance and group living exert a strong influence on risk behavior among adolescents and young adults (CASTRO, 2016; NOBRÉGA, 2023). Alcohol consumption and anxiety were also identified as complementary reasons, suggesting that e-cigarettes can be used as a way to relieve daily stress, in a similar way to other substances such as alcohol (Q&A: Vape and other e-cigarettes , 2023).

A worrying aspect identified was the development of respiratory problems after the start of electronic cigarette use. Approximately 15.2% of the participants reported respiratory symptoms that appeared after starting to use these devices. The scientific literature associates the prolonged use of electronic cigarettes with lung problems, such as wheezing and inflammation of the bronchi, corroborating the findings of this study (NOBRÉGA, 2023). These symptoms underscore the urgent need to raise awareness of the risks associated with vaper use, which are often underestimated by users (JARDIM & VICENTE, 2022).

The predominance of female participants (66.3%) is remarkable and may be related to cultural and social factors. Studies indicate that women tend to use e-cigarettes more than men, often considering them a "less dangerous" alternative to traditional cigarettes or more acceptable in certain social circles (CASTRO, 2016). This may be linked to the fact that devices are often made available in more discreet and personalized versions, attracting this audience (BISPO, 2022).

The desire to stop using electronic cigarettes, expressed by more than half of the participants, suggests a growing awareness of the health risks. This data indicates that public health campaigns targeting young people can be effective, especially when they provide clear information about health dangers (Q&A: Vape and Other E-Cigarettes, 2023). In addition, the role of physiotherapists in the treatment and prevention of respiratory complications associated with the use of e-cigarettes should be strengthened. Respiratory physiotherapy, with its pulmonary rehabilitation techniques, can be crucial in the recovery of compromised lung functions (NOBRÉGA, 2023).

The data from this study reinforce the need for public policies that restrict access to these devices and promote education about their health risks. The increase in the use of vapers among young university students makes it urgent to create preventive programs aimed at this population, with the participation of health professionals, such as physiotherapists, who can provide guidance on the risks of use and assist in the treatment of diseases related to electronic cigarettes (JARDIM & VICENTE, 2022; BISPO, 2022).

CONCLUSION

The survey revealed that the use of e-cigarettes is very common among young university students, being driven by social trends and the influence of friends. Respiratory problems are frequent among users, with some developing new conditions after starting use. The intention to discontinue the use of these devices indicates a growing awareness of the associated risks. The results highlight the importance of public health strategies and the key role of physiotherapists in the management and prevention of health problems related to the use of e-cigarettes.

ACKNOWLEDGMENTS

We would like to express our sincere gratitude to everyone who contributed to the realization of this research. In particular, we thank:

- To our team, for their collaboration, support and valuable ideas during all stages

of the project. Dedication and joint work were fundamental to the success of this research.

- To the advisor Elias Porto, for the meetings, guidance and feedback that were essential for the development of this work.
- To the participants of the research, whose willingness to share their experiences was crucial for obtaining the data and building our conclusions.
- To our family and friends, for being by our side in every challenge faced. Their unconditional support and encouragement were instrumental in our motivation and perseverance. This achievement is undoubtedly a shared accomplishment, and we are eternally grateful for his presence in our lives.

We thank everyone who, in some way, contributed to the realization of this project.

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SOFTWARE MATURITY LEVEL AND THE TRAINING OF QUALIFIED PERSONNEL IN SOFTWARE TECHNOLOGIES AT IFBA

https://doi.org/10.56238/sevened2024.031-012

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ABSTRACT

The Brazilian Digital Games Industry has grown significantly over the past few years, resulting in the approval, by the Federal Senate, of Bill PL 2.796/2021, which creates the legal framework for the electronic games industry. Educational programs aimed at the development of games in Brazil are a necessity for the training of talents and promotion of innovation for this segment. Being a high-risk business, digital game development requires metrics that can assess the development of the technology. In this context, the objective of this work was to present a correlation between the level of readiness of software technology and the process of digital game development, as well as to analyze IFBA courses that increase the supply of qualified personnel in digital game development. For this, bibliographic and documentary research procedures were used. 4 technology readiness level (TRL) scales applied to software developed by American and Brazilian government agencies were identified, all adapted from the TRL scales and requiring adjustments for application in the various software technologies. The DG-STRL scale, by Ferreira and Ribeiro, correlates the stages of digital game development with the TRL for software technology, being an instrument focused on the sector. It was observed that the IFBA offers game development courses at the level of continuing education, undergraduate and specialization, contributing to the training of talented developers, capable of competing on a global scale.

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Keywords: Level of Technological Readiness. Software. Research and Development. Digital Games.

INTRODUCTION

The use of software technology (ST) currently gives this type of technology a fundamental and ubiquitous role in our society, as it permeates almost every aspect of everyday life. ST is present both in the way individuals communicate and relate, as well as in the way they consume information, work and have fun. It is undeniable that ST has had a profound impact on all sectors and layers of society (VAN DIJCK, 2013).

TS has revolutionized communications, allowing, for example, instant communication on a global scale through the most diverse platforms: email, social networks, instant messaging and videoconferences (VAN DIJCK, 2013). It also brought people from different parts of the world together, shortening geographical distances and expanding the development of social and professional networks. The internet and other ST have democratized access to information, making it possible for practically anyone, anywhere to access a vast and varied amount of knowledge, although there are still places and communities where its use deserves better attention in terms of this access. The democratization of this access has profoundly impacted the way humanity learns, educates itself, and stays informed about global events, social and cultural issues.

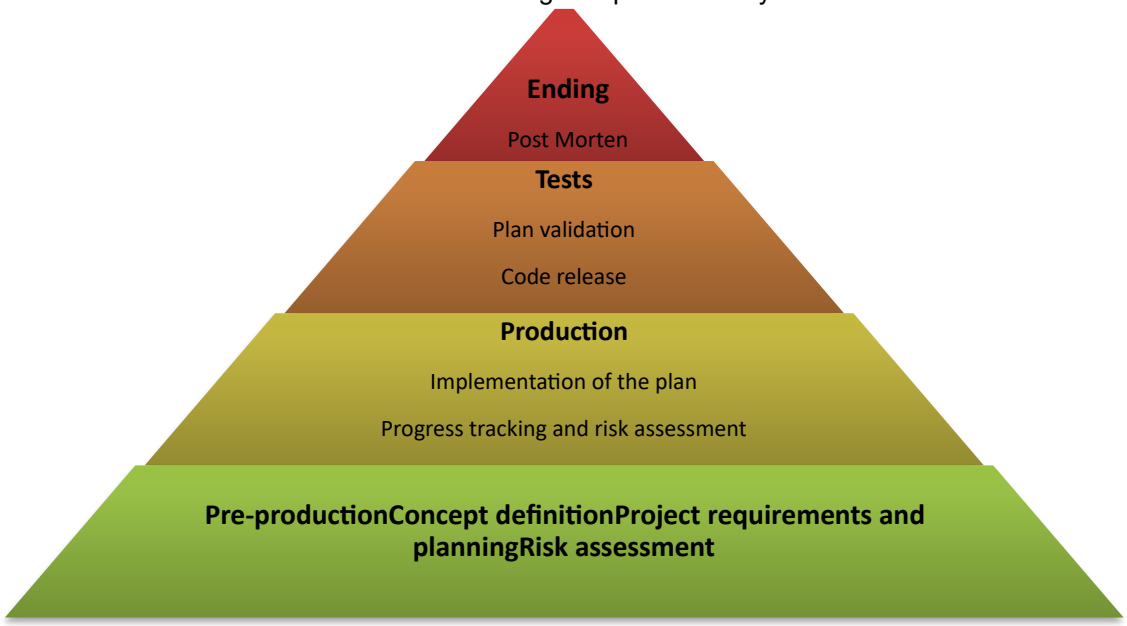
By redefining traditional business models and industries, such as in the automation of industrial processes, it is observed that companies from the most varied sectors are incorporating ST aiming at: a) increasing their efficiency, b) reducing costs, and c) improving the customer and user experience. SWTs have also encouraged innovation and entrepreneurship, as they provide new opportunities for individuals and businesses to create and launch new products and services in the market. In this sense, the growing use of software development tools, access to cloud computing resources, and the emergence of new industries around technologies such as artificial intelligence, blockchain, augmented reality, and digital game development can be highlighted (HARARI, 2020).

Battaiola (2000) considers that the digital game is composed of three parts: a) plot, which defines, in addition to the theme, the sequence of events, the objectives of the game, in short, the plot; b) motor, it is the mechanism that controls the actions (player) and reactions (environment) of the game, as well as their consequences; c) interactive interface, with the function of communicating between the player and the game engine, enabling the entry of the player's actions and the audiovisual responses to changes in the environment.

For Chandler (2012, p. 3), "the production process begins with the definition of the initial concept of the game and ends with the creation of a gold master version of the final code, with the rest happening between these two points". Also according to the author, there is a basic structure to support the production process of a game, which must be

considered, regardless of the budget available, the size of the team involved or the scope of the game, and this process is divided into four main stages: a) pre-production, b) production, c) testing, and d) finalization, as shown in Figure 1.

FIGURE 1 - Basic game production cycle



Source: adapted from Chandler, 2012, p. 4.

The computer industry, and most notably the Brazilian Digital Games Industry (IBJD), has grown significantly over the past few years, becoming a dynamic and influential sector in both the country's economy and culture, with ramifications in the most diverse areas of knowledge. According to Fleury, Nakano and Sakuda (2014), the economic activity related to the IBJD presented, in the early 2010s, the possibility of higher growth rates when compared to the average of the economy in general. For the aforementioned authors, the IBJD has a strong relationship with the knowledge economy due to its characteristics: a) low-cost reproduction, b) productive flexibility, c) base on intangible assets, d) great modularity, e) economies of scale of demand and scope of supply (FLEURY; NAKANO; SAKUDA, 2014).

Another very important point for the development of the IBJD is the support given to the sector by the Brazilian government, through initiatives such as tax incentives, subsidies and financing programs aimed at promoting innovation and growth in the sector. One of the most assertive actions was the approval by the Federal Senate, on March 13, 2024, of Bill (PL) 2.796/2021, which creates the legal framework for the electronic games industry (BRASIL, platform Gov.br, 2024). The Executive Secretary of the Ministry of Culture, Márcio Tavares, stated that "Games now have a legal instrument that will strengthen the

production chain, the development of this very important industry. 75% of Brazilians play games" (BRASIL, plataforma Gov.br, 2024, p.1).

The development of digital games stands out as a sector of the economy with great potential for growth and high-level job creation. This sector appears in the current economic scenario as a dynamic industry, with constantly redefined standards of competition and competitiveness, greatly globalized and focused on well-structured market systems. Estimates for the year 2023 pointed to a world market that would move around US$ 184 billion, consisting of around 3.31 billion players (NEWZOO, 2024). Newzoo is a game market analysis and intelligence company, and according to a survey produced by it, "the global gaming market will generate annual revenues of US$ 205.4 billion in 2026" (NEWZOO, 2024, p. 17).

Brazil has followed this global potential of the digital games segment. Also according to data released by Newzoo (2024), in 2023, Brazil has more than 100 million players, representing 3% of the world's users, placing Brazil among the 10 largest consumers on the planet. These data point to a significant contribution of the IBJD to the Brazilian economy, generating revenue through game sales, in-game purchases, as well as advertising and exports. As the digital games sector advances, it creates job opportunities in the most varied fields, such as programming, art, design, marketing, and management (PESQUISA GAME BRASIL, 2024, p. 32-37).

The 2024 Game Brasil Survey[5], celebrating its 11th edition, points out that 73.9% of Brazilians usually play video games on the most diverse platforms (PESQUISA GAME BRASIL, 2024), constituting a very rich market for the development and supply of games. The Brazilian gaming market continues to expand, driven by factors such as: a) "an increase in the base of new couples who live with children or are fathers and mothers" (PESQUISA GAME BRASIL, 2024, p. 20), representing 69.5% of the Brazilian gamer consumer, b) the adoption of smartphones, the preferred platform for 61% of women (PESQUISA GAME BRASIL, 2024), c) the growth of the middle class with disposable income for entertainment purposes, representing 64.8% of gamers (PESQUISA GAME BRASIL, 2024).

Also according to data from the 11th Edition of the Game Brasil Survey, a large number of individuals, 85.4% of those who responded to the survey, assume that

[5] The Game Brasil Survey is developed and produced by a partnership between Blend New Research, ESPM, Go Gamers and Sioux Group. The entire survey is developed with proprietary questionnaires with topics that involve the gamer audience and its entire ecosystem, in Brazil and Latin America in key countries such as Argentina, Chile, Colombia and Mexico. The consulting company Go Gamers is the business unit responsible for the development, production and publication of the survey annually within the official channels pesquisagamebrasil.com.br and gogamers.gg.

"electronic games are among their main forms of entertainment" (GAME BRASIL SURVEY, 2024, p.23). There are several factors that interfere in consumption behaviors and in the choice of use of multiple platforms for games: Computer, Console and Smartphone. The data in this edition of the PGB also indicate that practically 3 out of 4 Brazilians (73.9%) usually use digital games, and, of these, 50.9% represent the female audience, data influenced "mainly by smartphones, which historically is a platform with a greater presence of the female audience" (PESQUISA GAME BRASIL, 2024, p. 17).

Another interesting data, presented by Pesquisa Game Brasil in 2024, highlights that approximately 52.4% of the individuals interviewed, when asked about professions in the Brazilian games market, believe that this sector "offers good opportunities for work and career" (PESQUISA GAME BRASIL, 2024, p. 31). Considering these data, as well as the five public policy objectives to foster the Brazilian Digital Games Industry (IBJD), members of the Report "Proposition of Public Policies Directed to the Brazilian Digital Games Industry" (FLEURY; NAKANO; SAKUDA, 2014), notably Goal 2: Empower Human Resources to create, manage, and operate world-class companies (SAKUDA; FORTIM, 2018), the importance of investing in training courses aimed at the development of the IBJD is verified.

Educational programs aimed at the development of games in Brazil are a necessity for the training of talents and, consequently, the promotion of innovation for IBJD. Firstly, the promotion of these programs meets a growing demand for skilled professionals in the gaming industry. With its expansion, there is an increasing need for game developers, with the skills and knowledge necessary for the overall growth and maturation of the Brazilian digital games sector, including the adoption of criteria for evaluating the level of readiness of software technology.

The Federal Institute of Education, Science and Technology of Bahia (IFBA), fulfilling its role as an Institution of Science and Technology (ICT), identifying this gap in professional training, in the context of the IBJD, began to invest in Course Implementation Projects focused on the theme of digital games, notably after 2018 (IFBA, 2018a, 2018b, 2019a, 2021). This action is essentially linked to the fulfillment of a specific objective: "Increase the supply of qualified human resources in line with the needs of the sector" (SAKUDA; FORTIM, 2018, p. 221).

By investing in the education and training of future game developers, the IFBA works by laying the local foundation for continued growth, innovation, and competitiveness in the global digital gaming market. By providing students with hands-on training, access to industry-standard tools and technologies, and opportunities for networking and

collaboration, IFBA has created an environment conducive to the development of creativity and innovation. This, in turn, leads to the development of high-quality games and the emergence of talented game developers who can compete on a global scale.

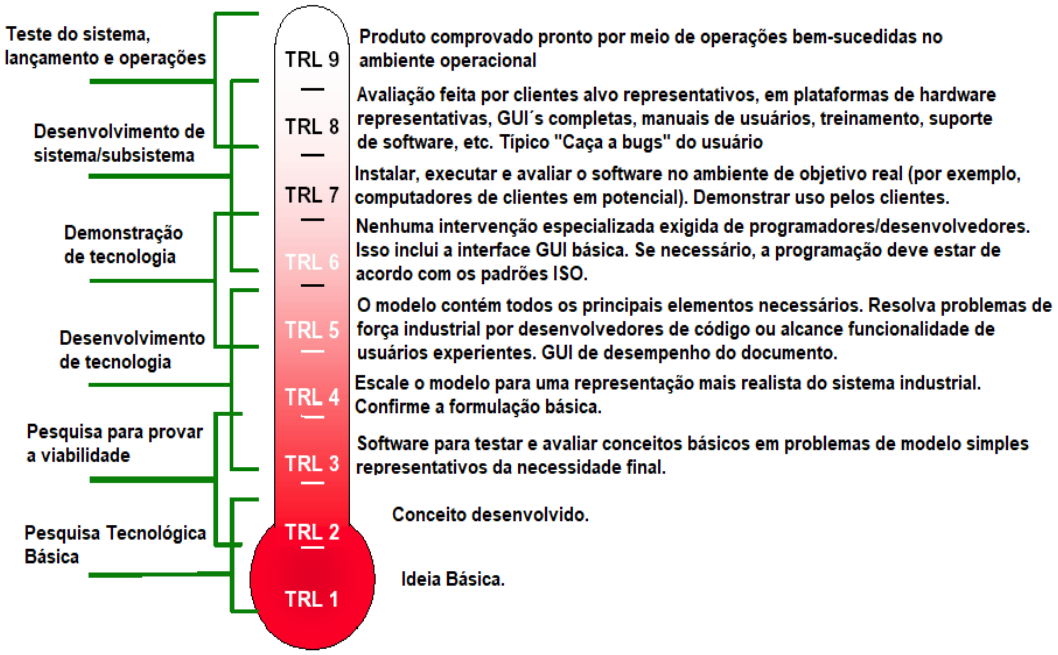
In the professional training and digital game production environments, project management techniques are used to monitor the development of this technology, its launch deadlines and available budget. However, no tools were found that associate the analysis of the level of technological readiness with this development process, which could favor the completion of the product until its commercialization. Considering that, normally, the volume and diversity of resources involved in these development processes require well-defined points of adjustment and controls, in addition to a constant risk analysis, it became necessary to find a solution to this demand.

A widely used method to assess the level of readiness of a given technology, the *Technology Readiness Level* (TRL), has become an important metric for decision makers. Ferreira and Ribeiro (2024) point out that the concept of measuring technological maturity levels was proposed in a 1969 report by the *National Aeronautics and Space Administration* (NASA). This original concept of TRL was formulated mostly in terms of hardware, and this creates some difficulty for the analysis of software technology maturity.

Marson (2018), exemplifying the use of TRL applied to the development of a product, presents the following description of the 9 TRL levels: 1) Research of basic principles; 2) Formulation of the concept of the technology or possible application; 3) Development of experimental or theoretical proof of concept; 4) Validation in a laboratory environment; 5) Validation in an environment close to reality; 6) Demonstration of prototype in an environment close to the real one; 7) Demonstration of prototype in operational environment; 8) Product qualification through testing and demonstration and, 9) Product operation in an operational environment (MARSON, 2018, p. 1).

Armstrong (2010) stated that, mainly due to the critical performance functionalities, large and complex systems began to have their development processes gradually more dependent on software, which increased the importance of the application of TRL for software development (ARMSTRONG, 2010). This fact motivated the performance of interpretative studies of the methodology in order to meet the peculiarities of technologies in specific sectors, such as software development, creating TRL equivalences, for example, such as the Software Technology Readiness Level (STRL) (EMBRAPII, 2020). Figure 2 shows a version adapted to TRL for software development.

FIGURE 2 - Software-adapted TRL scale



Source: Adapted based on NASA (2017, p. 265) and Veras (2018, p.7).

Considering the context of the IBJD, this research aims to present a correlation between the level of readiness of software technology and the process of digital game development, as well as to analyze IFBA courses that increase the supply of qualified personnel in digital game development.

This work is justified by contributing to the discussion on the training of qualified professionals by an ICT, professionals destined to a sector in full expansion, that of the IBJD. In addition, it contextualizes this training with the software technology readiness level (STRL), one of the most used metrics for evaluating technologies in this sector, which, as highlighted by Ferreira and Ribeiro (2024), has a high economic return and great growth potential for Brazil (FERREIRA, RIBEIRO, 2024). It is believed that this reflection will contribute both to the professional training of developers for the IBJD, and to the evaluation of the level of readiness of software technology, more specifically when the software is a digital game.

METHODOLOGY

This is an exploratory research with descriptive aspects, aiming to identify the STRL scales used as a reference in software technology readiness assessments in the Brazilian context, to present the professional training proposals for the IBJD of the IFBA, and to correlate the process of development of digital games and the STRL. As highlighted by Gil (2002), when used together, exploratory and descriptive research bring with them the development of perceptions or an improvement of concepts (exploratory), in addition to

establishing connections or presenting particularities (descriptive) existing in a given object of study.

The research also presents a qualitative approach, based on bibliographic and documentary research, based on inferences of the authors based on the literature and institutional documents, presenting: the STRL scales; the stages of the digital game development process, and the professional training proposals implemented by the IFBA.

To build the theoretical framework about STRL, the databases available on the CAPES Journal Portal (CAPES, 2024), and on the Brazilian Digital Library of Theses and Dissertations (IBICT, 2024) were consulted, using descriptors such as: Software *Technological Readiness Level*), without temporal or territorial delimitation. Regarding professional training, a documentary research was carried out, with a search and selection of documents related to national public policies aimed at the IBJD, as well as the IFBA Course Pedagogical Projects (PPC) related to the IBJD.

The research focused on the PPC selected for the composition of the research corpus, namely: a) Higher Education Course in Technology in Digital Games (STJD) (IFBA, 2018a); b) Higher Education Course in Technology in Digital Games Distance Modality (STJD-EAD) (IFBA, 2018b); c) Specialization Course in Development of Applications and Games for Mobile Devices (EDAGDM) (IFBA, 2019); d) Initial and Continuing Training (FIC) of Digital Game Programmer for Mobile Devices (PJDDM) (IFBA, 2021). How the II IBJD Census systematizes data on the objectives aimed at the sector in Brazil (SAKUDA; FORTIM, 2018), these PPC were analyzed in the light of these objectives.

Regarding the organization and treatment of the data, it was decided to adopt the guidelines of the content analysis proposed by Bardin (2016), aiming to interpret the qualitative material objectively and systematically.

RESULTS AND DISCUSSION

This section is divided into four subsections. In the first, the courses offered by IFBA focused on the Development of Digital Games (DJD) are presented. The characterization of the basic cycle of production of digital games, without intending to exhaust the theme, makes up the second subsection. The concept of Software Technology Readiness Level (STRL), with the identification of the main scales used, is addressed in the third subsection. Finally, in the last subsection, we have the presentation of the DG – STRL, a proposition based on the correlation between the STRL scale and the stages of development of a digital game.

THE IFBA: COURSES FOCUSED ON THE DEVELOPMENT OF DIGITAL GAMES

The following courses offered by the IFBA were identified with the theme of digital game development and aimed at the professional training of developers of these games: 1) Specialization in Development of Applications and Games for Mobile Devices (EDAGDM), a lato sensu postgraduate course approved in 2019; 2) Superior Technology in Digital Games (STJD), undergraduate course approved in 2018 in the face-to-face and distance modalities; 3) Initial and Continuing Training (FIC) course for Digital Game Programmers for Mobile Devices, approved in 2021.

A common feature of all these courses offered by IFBA is the emphasis given to the development of digital games for the platform made up of Mobile Devices, that is, portable devices such as: smartphone, notebook, tablet, etc. This decision is appropriate, since these devices make up the preferred platform for 62.7% of Brazilian players (PESQUISA GAME BRASIL, 2024).

The lato sensu EDAGDM graduate course is presented as an "innovative course that integrates the various areas of knowledge, through an interdisciplinary and contextualized methodology" (IFBA, 2019a, p. 16), which is aimed at the production of "applications and digital games for mobile devices, meeting various demands, such as entertainment, education, people training, marketing, simulation and rehabilitation" (idem, p. 18). The graduate of this course works "from the analysis of the customer's needs, planning of the application's resources, development, implementation of architecture, tools and resources, to the realization and configuration of tests" (idem, p. 34).

In the Pedagogical Course Project (PPC) of the STJD course (in the face-to-face and distance modalities), the commitment to the training of professionals (technologists and entrepreneurs) in the area of DJD is affirmed, enabling them in the development of games, systems, animations directed to various areas of knowledge always "in an integrated way, following the standards of quality and productivity learned during their training" (IFBA, 2018b, p. 60). Also according to the PPC, the proposed professional training, in addition to being innovative, unprecedented in the region and state of Bahia, and being offered by a federal institution of education, "is in line with the definition of the National Catalog of Higher Technology Courses recommended by the Ministry of Education" (idem, p. 61). Such training guarantees the graduate the performance in the segment of digital entertainment, computer graphics, allowing him, among other things, the DJD in the areas of "entertainment, adventure, simulation, animations for campaigns, soundtracks and short films" (idem, p. 62). The multiplicity of performance profiles in the DJD, explored and proposed by the STJD course, directs professional training, such as: 1) Game design:

where the developer will act in the conception of the game, from its elaboration to the detailed description of each aspect present in the game, such as: "objectives, plot, characters, scenario and all the mechanics of the game" (idem, p. 62); 2) Digital Game Programmer: the professional responsible for programming and coding the game, integrating the stages of the game, giving rise to the prototypes and the final product.

The FIC course in Digital Game Programmer emphasizes the performance of developers "in the processes of development/maintenance of digital games, meeting norms and standards of quality, usability, interactivity, integrity and information security" (IFBA, 2021, p. 9). It is a short course (220 hours), very focused on practice, and which is intended "for students and/or workers with High School Attending or Complete, interested in the area of Digital Games or professionals who work in the area and seek improvement" (idem, p. 9). Its Curricular Matrix was organized into two modules: I-Basic Module, with the aim of dealing with contents considered fundamental to the student's follow-up of the course, and II-Specific Module, aimed at the qualification itself.

It is observed that the courses aimed at the DJD of the IFBA are presented, to a greater or lesser extent, in line with several of the goals pointed out in the IBJD censuses. Several correlations between the goals pointed out in the public policies for the development of the IBJD and the characteristics found in the PPCs of the IFBA courses were identified and presented in Ferreira et al. (2023).

THE BASIC CYCLE OF DIGITAL GAME PRODUCTION

The first stage of this cycle, known as pre-production, is critical due to the responsibility of defining what the game will be like, how much time will be needed for its creation process, in addition to the sizing of human and financial resources. It is also at this stage of a game's production cycle that two technical documents that are very relevant to the success of the digital game come into play: the High Concept Document (HCD) and the Game Design Document (GDD). They record the following information about the game: a) concept, b) planning, c) characteristics, d) requirements and, e) limitations. It is in the first of them, the HCD, that the general concept of the game is briefly described, presenting only its main characteristics, as well as the initial idea of its design.

Some questions need to be answered in this cycle, such as: 1) Has the initial concept of the game been defined? 2) Have the platform and gender been specified? 3) Has the technology been evaluated against the desired feature set? 4) Has the basic design documentation been completed? 5) Has the basic technical documentation been

completed? 6) Has the budget been completed? and, 7) Has the initial schedule been completed?

In production, the second stage of this cycle, those involved in the development of the game start the production of *assets* (constituent elements of a game) and its code. The boundary between this stage and its predecessor is usually very tenuous, for this reason some of the items related to the game in development may still be in the pre-production stage. Even if the process is all planned in the previous step, "surprises" should be expected, such as the addition, change, or even removal of some feature or *asset*.

To evaluate the evolution of ST development, in this case, the game, also in this phase several questions are asked, such as: 1) Is there a defined process for the control of unbridled growth? 2) Is the risk assessment taking place regularly throughout production? 3) Is there a game plan that progress tracking can be based on? 4) Is there a set process for the producer to track the progress of all tasks? 5) Does each task have clearly defined exit criteria? and, 6) Are all stakeholders in agreement on what the exit criteria will be?

Another critical phase of this process is known as the testing stage. In it, the game undergoes a full functioning check, until it does not present any fatal bugs, or fatal errors. It is worth mentioning that the tests take place from the production stage, verifying the new features and new features added to the game. After full implementation of the game's assets and features, the development team's focus will be directed to fixing bugs and creating new builds (compiled and executable versions of the game). This step can be subdivided into two parts: the validation of the plan and the release of the code.

Several questions are asked to direct and monitor the development process at this stage: 1) Has the test plan been updated for the quality department? 2) Were the testing stages considered in the schedule? 3) Has the bug tracking software been made available to the testers and development team? 4) Have all areas of the game been tested? 5) Did the development team submit a final candidate for the code release? and, 6) Is there enough time in the schedule for the quality department to complete the test plan on the code release candidate?

In the post-production phase (completion), after the code is released and its manufacture is approved, the game's production process needs to be closed. This phase is composed of two elements: the archiving plan and learning from experience. The first of these involves creating strategies and implementing a system to store, organize, and manage all assets, code, and documentation created during the game's development lifecycle. In the second, the *post-mortem* is made, a retrospective analysis carried out by the development team after the completion of the digital game project. Then the process is

considered finished, presenting some deliverables, including: 1) Game Files: all the files necessary to run the game (graphics, audio, videos, scripts) and any other essential content; 2) Installation Instructions: A guide with clear instructions on how to install and launch the game on different platforms (personal computer, console, mobile devices); 3) System Requirements: Minimum and recommended system requirements to run the game, including hardware and software specifications, and, 4) Contact Information: Contact details of the game's support team or developers so that players can contact in case of any issues or questions.

In the basic development cycle of a digital game, especially those whose risks are high, there is usually an iterative, repetitive production process, with the execution of several production cycles. Therefore, iteratively assessing the level of readiness of this type of technology requires the adoption of reliable metrics, such as the STRL scale.

AS ESCALAS DE *SOFTWARE TECHNOLOGY READINESS LEVELS (STRL)*

Through the bibliographic survey, it was found that Mankins (2009) classified the sequence of stages or stages of development of a technology, using the TRL scale as a metric, described in nine levels of technological readiness. It is found that, generally:

- The procedures related to TRL levels 1 to 3 are carried out in research institutions, notably higher education institutions (Academia);
- TRL levels 4 to 6 include the so-called "Valley of the Death of Innovation", as most projects are unable to advance from these stages, which require greater volumes of financing, infrastructure to *scaleup* and several other inputs, towards the higher TRLs;
- The space occupied by the productive sector figures mainly in the TRL levels from 7 to 9, since the actors in this sector make use of the technology created, transforming it into finished products, for launch on the market.

The levels indicated above are the basis for the TRL scales, including software technology. An STRL scale is an extension of the TRL concept specifically applied to the development of software technology. While TRL focuses on assessing the readiness stage of a technology in general, STRL focuses on the specific assessment of the readiness of software technologies. Like the TRL, the STRL is a numbered scale ranging from 1 to 9, where each of the levels represents a different stage in the software development life cycle, as shown in Exhibit 1.

TABLE 1 - Levels of readiness of software technology.

STRL	Characteristics
1	Emphasizes the concept of TS: The idea for the software is conceived, but has not yet been formally analyzed or documented.
2	Focus on TS analysis: At this level, the TS concept is analyzed, initial requirements are identified, and a high-level architecture can already be outlined.
3	Emphasis on design: At this stage, the TS requirements are detailed and specified, and the software design is elaborated, and may even include low-fidelity prototyping.
4	TS implementation starts: The software is implemented according to the specified design.
5	Testing of TS components begins: Each individual component of the software is tested to ensure that it functions correctly.
6	The components tested in the previous phase begin to be integrated: The different components of the software are integrated and tested together.
7	After integration, system testing begins: The complete software is tested as an integrated system in a representative environment.
8	After validation in a representative environment, the operation and maintenance phase begins: The software is operational and maintained, and can be adjusted as needed.
9	The last step addresses TS's reliability and maturity: The software is fully developed, tested and in regular operation, demonstrating stability and reliability under real operating conditions

Source: Adapted from Persons and Mackin (2020, p. 115-118).

To identify STRL scales, the following reports were considered: a) *Software Technology Readiness Assessments Managing Technology Risks in Space System Acquisitions* (The Aerospace Corporation) (NASA, 2013); b) *Beyond Technology Readiness Levels for Software: U.S. Army Workshop Report* (*Software Engineering Institute*) (DoD, 2009); c) *Technology Readiness Assessments Guide* (*U.S. Government Accountability Office*) (GAO, 2020); d) EMBRAPII Operations Manual (2020). With the analysis of these documents, four STRL scales were identified.

One fact that stood out during the process of identifying STRL scales was the relevance given to the topic by the American government. The diversity of ST, implemented in hardware, software, or both, has given ST significant relevance, to the point that it has become the subject of publications by the *Department of Defense* (DoD, 2009), the *National Aeronautics and Space Administration* (NASA, 2013), and the *Government Accountability Office* (GAO, 2020). In Brazil, the Brazilian Company for Industrial Research and Innovation (EMBRAPII, 2020), which adopts the TRL scale to monitor the development of its projects, presented some equivalences to the TRL standard, including software development (*Software Technology Readiness Level*, STRL). Using the ABNT NBR ISO 16290 standard as a basic reference for TRL definitions (ABNT, 2015), EMBRAPII established relationships and characterized the technological maturity of software, STRL.

For the DoD (2009), the TRL scale should have comprehensive definitions for any technology, while interpretations or extensions for specific technologies, such as ST, should be the subject of experts in this field of technology (GRAETTINGER et al., 2002). Also according to the DoD, the maturity of the technology is a useful metric in the decision-

making process of selecting new technologies for development and maturation in an environment of demonstration of advanced technology, technologies that will eventually be transferred to the tactical programs of the DoD (2009). Similarly, NASA (2013) also developed its STRL scale in nine levels of readiness, considering: Level definition; Hardware Description; Description and Software, and, Exit Criteria of each level.

Also noteworthy is the prominent role given to the GAO (2020) when it states that it is "establishing a methodology to assess technological maturity based on best practices that can be used throughout the federal government" (PERSONS, MACKIN, 2020, p. 2). However, according to Persons and Mackin, (2020, p. 66), the GAO also recognizes that "organizations can adapt them to accommodate their own application", since the characterization and conceptualization of SW are not all inclusive, they vary according to technology and application.

Considering the frequent technological development and criticality involved in the construction process of these new technologies, the GAO proposed Three Steps to Evaluate Critical Technologies: Step 1 – Confirm the TRL definitions and discuss the necessary evidence; Step 2 – Evaluate the information; Step 3 – Prepare a classification or opinion (PERSONS, MACKIN, 2020). This denotes an attempt to seek a generalization to a technology area with very specific requirements, as the U.S. government continues to pursue consistent and iterative methods to assess the readiness of technology as part of its investment decision-making process, aiming to self-assess its own technology and help filter out the most promising technologies.

As in the other scales, EMBRAPII's proposal for the evaluation of the readiness of software technology seeks to characterize each of the nine levels by adopting the following criteria: a) the scale of the object; b) the fidelity of the object; c) the environment in which the technology is under development, and d) a description for software (EMBRAPII, 2020). Ferreira and Ribeiro (2024) briefly presented the definitions and descriptions of the STRL levels of these four scales.

DG–STRL: CORRELATION BETWEEN THE STRL SCALE AND THE STAGES OF DEVELOPMENT OF A DIGITAL GAME

A variant of the STRL scale, called DG-STRL (Digital Game – STRL), was proposed by Ferreira and Ribeiro (2023). Aimed specifically at assessing the level of readiness of the TS of digital games, this proposal was inspired by the scale proposed by EMBRAPII, correlating the levels with the steps that make up a basic structure to support the production process of a digital game.

The starting point of the proposal is the pre-production stage, a stage in which the initial concept of the game is defined, as well as its objective, its mission and its final appearance. Ferreira and Ribeiro (2023) propose the correlation of this stage with STRL 1, the level responsible for the basic idea of the technology. Still in this stage of the DJD, the genre and platform of the hardware are defined, the evolution of the game concept (materialization of the digital game world) occurs. The beginning of the character design and gameplay process fits into STRL 2, when the concept of JD was defined, as well as the determination of the platform, genre and its mechanics.

In STRL 3, a preliminary version of the software is expected, materialized in a proof of concept (a simple model, representative of the ultimate need) to test and evaluate the original idea of the game. It is also at this stage of pre-production that the developer (or the development team) begins the validation of new gameplay features, culminating in the initial prototype. In this sequence, prototyping scales, and it is common to use several prototypes at the same time, each of them working from different perspectives of the same JD. As STRL 4 highlights the scalability of a TS model, seeking a more realistic representation of it, the completion of the pre-production stage confirmed the basic formulation of the technology.

The next step of DJD is called production. It deals with the implementation of everything that was planned during the pre-production stage, aiming at the game until it is ready for its commercialization. Although there is no precise point between the end of pre-production and the start of production, at this point in the DJD process they should already be well defined, among other things: a) the idea of the JD, b) the way the JD will be developed, c) who will do each task, d) how long it will take to carry it out. Thus, the correlation of STRL 5 for games with what was exposed in STRL 5 for TS in general is observed, since for this level a model already defined and approved with the main aspects of the game is expected, thus having a prototype more faithful to the digital game project.

Another characteristic of the production stage is that the previously created prototype must be incremented, adding gameplay features, such as: a) how the controller should work; b) how the score will be; c) how the dialogues occurred, d) adjust any other attribute until the next playable version. Similarly, a TS at STRL level 6 is expected to achieve fidelity in the TS demo as it tests a representative prototype of the game.

A preponderant condition to reach the STRL 7 level is to have, at this point, a prototype capable of effectively demonstrating the proposal of the digital game, presenting it close to its final version. Once the testing stage begins, builds are created (compiled version of a program, in this case it is a playable version), versions of the game that provide

its developer with a demonstration and tests of the functionalities, features and assets of JD in production. Usually, the testing stage begins when the release of the alpha version of the digital game approaches. Defects and *crash bugs*, in the various elements of the game are sought and mitigated to ensure that they are fixed before the final delivery of the game. The STRL 8 level is notable for representing the end of the TS production process, which correlates it to the end of this stage of the development of the digital game.

Once the testing stage is over, the release of the game code continues, signaling to everyone that this content is definitive, that the *bugs* have been fixed and the final version can be replicated. Finally, the product can be packaged and sold, indicating that the digital game has already been verified, that everything that had been planned and produced was completed correctly, starting the post-production stage.

In post-production, some important measures are implemented: all the game's codes and assets are organized in a product closure kit and this kit is archived for future reference. As expected for TS STRL 9 level, at this stage of readiness, the technology is ready for the market.

Thus, considering the current scenario of digital game development and the context of the IBJD, it is believed that the adoption of DG - STRL will contribute to the process of evaluating the level of readiness of software technology, more specifically, digital games.

CONCLUSION

The educational programs aimed at the development of digital games are a positive point for the IBJD. By investing in the education and qualified training of future developers of these games, Brazil lays the foundation for continued growth, innovation, and competitiveness in the global gaming market. The expansion of IBJD creates a growing demand for qualified professionals, that is, professionals with a background in design, programming and digital game art.

By offering specialized courses in digital game development, institutions such as IFBA meet this demand, helping to fill this skills gap in the national labor market, in addition to contributing to the overall growth and maturity of IBJD, favoring the diversification of the Brazilian economy, and reducing dependence on traditional sectors, promoting economic resilience and sustainability.

The courses offered by the IFBA offer students: a) practical training; b) access to industry-standard tools and technologies; c) networking and collaboration opportunities, and, d) an environment conducive to the development of creativity and innovation. This

context fosters the development of high-quality digital games, as well as training talented developers capable of competing on a global scale.

The process of developing a software technology is a set of organized and structured activities that aim to create, improve or meet a specific demand from the development of software. There are several methodologies and approaches used in the process of developing a ST. Considering that this process can vary according to a specific context and project requirements, DJD intrinsically becomes a risky business, with unique characteristics that make it quite challenging to assess the level of readiness of the technology.

Both GAO (2020) and EMBRAPII (2020) highlight that the TRL scale is a primary reference for the other technological maturity scales. Considering the characteristics of ST, these institutions advise that for specific cases of technology readiness assessment, such as ST, the descriptions of scales made available by these bodies require interpretation and eventual adaptations, and may even culminate in customized supplements. In this way, it is believed that the proposed correlation between STRL levels and digital game development stages contributes to the analysis of TS readiness (in this case, a digital game), providing a method to assess the TS readiness level in the context of digital game development.

The DG-STRL scale allows for a more comprehensive understanding of how TS readiness, specifically in the case of digital gambling, progresses throughout the different stages of the game development process, ultimately assisting in the assessment and enhancement of TS readiness culminating in the successful commercialization of digital gambling.

FUTURE PERSPECTIVES

As future perspectives, the students intend to conduct a survey of articles that discuss the application of STRL in different areas of ST, such as software development, software technological innovation, software project management and evaluation of emerging software technologies. Another important point for future studies is the evaluation of the impact of the use of STRL on decision-making, seeking to identify how STRL can influence decision-making in organizations, governments, and industries, helping to prioritize investments, resource allocation, and software technology development strategies.

Specifically, considering the digital game development process, a viable proposal is to identify which specific milestones and activities should be considered to measure the level of TS readiness during the definition phase of the initial concept of a digital game. Also another planned study aims to identify which indicators can be used to measure the level of

technological readiness of the software during the code implementation and initial testing phase of a digital game.

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TERRITORIAL CONSTITUTIONAL RIGHTS OF INDIGENOUS PEOPLES AND QUILOMBOLAS IN BRAZIL

https://doi.org/10.56238/sevened2024.031-013

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ABSTRACT

The territorial rights of indigenous peoples and quilombolas in Brazil have gone through several stages of effectiveness and fulfill an elementary function in the construction of a more just and democratic society. This article analyzes the current status of these rights, highlighting advances, permanences and contradictions in the Brazilian legal and political system. From an interdisciplinary approach, which unites concepts of Constitutional Law, Human Rights, Anthropology and History, the normative and constitutional bases of these rights are investigated, as well as the impact of political and social pressures on their guarantee. In addition, institutional initiatives aimed at the protection of these rights are examined, with a focus on promoting social justice and the recognition of cultural diversity. Through a qualitative methodology, based on bibliographic and documentary research, this study aims to contribute to a deeper understanding of the transformations of the territorial rights of these communities. The results denote that the demarcation and regularization of indigenous and quilombola lands face significant obstacles, with political and social obstacles. Despite institutional initiatives, obstacles persist, compromising the realization of these rights and the promotion of social justice.

Keywords: Territorial rights. Indigenous peoples. Quilombolas. Social justice. Cultural diversity.

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INTRODUCTION

The territorial rights of indigenous peoples and quilombolas in Brazil are consolidated as a vital element in the construction of a society that aims to be just, democratic and inclusive, evidencing the continuous trajectory of recognition and safeguarding of the cultural identities and forms of existence of these ancestral communities.

Since the promulgation of the Magna Carta of 1988, such rights have been the subject of intense debates, marked by clashes and metamorphoses that testify to both significant achievements and persistent challenges. The guidelines enshrined in the current constitutional text mark a historical milestone for the country, evidencing a break with the colonial legacy and the search for a democratic legal order.

The *Brazilian Lex Maxima* instituted the right of these communities to perennial possession and exclusive enjoyment of the lands they occupy ancestrally, thus conferring a solemn recognition of their unique and secular relationship with their territories. However, despite the advances made, the materialization of these issues faces a myriad of difficulties.

In this context, the relevance of analyzing the changes and permanence of the territorial rights of indigenous peoples and quilombolas in the homeland is justified, with a view to understanding the challenges faced and the strategies adopted for their implementation. The general objective of this study is to reflect on the *status* of these rights, highlighting the progress, gaps and antinomies evident in the legal framework and *in Brazilian political* praxis.

To this end, the following specific objectives were established: To identify the normative bases and legal and constitutional assumptions related to the territorial rights of indigenous peoples and quilombolas; analyse the impact of political and social pressures on the guarantee of these rights; and to verify institutional initiatives in the protection of territorial rights, with a focus on promoting social justice and the recognition of cultural diversity.

Through an interdisciplinary approach, amalgamating concepts of Constitutional Law, Human Rights, Anthropology and History, this article is established on a qualitative and exploratory methodological basis, developed through bibliographic and documentary research, with incursions into the current legislation.

HISTORICAL-NORMATIVE BASES OF THE TERRITORIAL RIGHTS OF INDIGENOUS PEOPLES AND QUILOMBOLAS

The preliminary section of this study delves into the complex panorama of the territorial rights of indigenous peoples and quilombolas in Brazil. Exploring the panorama of

history and legislation, the core of such rights is examined, from the colonial periods to the present day.

Then, it focuses on the legal-constitutional foundation, essential for understanding the framework that sustains these communities in the contemporary Brazilian democratic context. The historical-normative dive is essential for the apprehension of the challenges and achievements faced by these populations, as well as for the guidance of public policies that promote social justice and the recognition of cultural diversity.

It is important to highlight that issues such as disagreements in land demarcation and regularization, conflicts with economic interests, political and social pressures, in addition to the fragility of the institutions responsible for the protection of these rights, have strained the full guarantee of these rights. In the course of time, transformations in the legal and political scenario are envisioned.

Legislative measures, such as the demarcation of indigenous and quilombola lands, the creation of environmental reserves and adherence to international conventions, preponderate in this process. However, advances are often accompanied by setbacks, such as the paralysis of demarcation processes, the relaxation of environmental regulations, and the repeated violation of the human rights of these communities (Penna, 2023).

HISTORICAL CONTEXT

The historical path of indigenous peoples and quilombolas in Brazil dates back to the early days of colonization, marked by violence, exploitation and marginalization of these ancestral communities. Since the arrival of the first European colonizers to Brazilian lands, indigenous peoples have been subjected to a systematic process of dispossession of their lands, cultural persecution and genocide.

> Since the beginning of the colonization of Brazil, the Indigenous have been treated with tutelary racism, that is, as incapable of managing their lives, as if cultural difference were synonymous with incapacity for the acts of civil life. So the solution found at the time, by the colonizers, was to integrate him into civilization in order to make him assimilate the dominant culture, abandoning his traditions so that he could be considered a Brazilian citizen. Only then could he manage his life, without the assistance of a state agency (Penna, 2023, p. 654).

The imposition of the sesmaria regime and the advance of the agricultural frontier embodied constant threats to the survival and autonomy of these communities, which bravely resisted colonial clashes (Santos Júnior, 2019). With the institution of the slave system, the presence of quilombos became an active resistance to oppression and unbridled exploitation.

The quilombolas represent the descendants of runaway slaves and other ethnic-racial groups that inhabited the quilombos during the time of slavery in the country. They have a unique identity, which underlies their social and cultural structures developed throughout history, which distinguishes them from other social strata (Silva, 2022).

Fugitives from the mills and farms, they established autonomous communities in remote areas, where they maintained their ways of life and cultural traditions, even under constant threat of persecution and violence by the colonial authorities. These groups, often composed of people of diverse ethnic origins, were decisive in the fight against slavery and in the search for freedom and dignity.

Quilombola communities in Brazil are recognized as traditional peoples, whose rights have historically been disregarded, leading them to a precarious condition due to various structural violations. The concept of quilombola communities, the result of a cultural and historical construction, is influenced by various symbolic representations within the social context to which they belong (Costa; Edmundo, 2021).

However, even after the abolition of slavery in 1888, indigenous and quilombola communities continued to go through major setbacks to preserve their lands and cultures. The expansion of capitalism and the intensification of economic exploitation have resulted in new forms of expropriation and marginalization of these communities, which have been forced to resist increasingly intense pressures on their traditional territories (Rapozo *et al*., 2019).

From the second half of the twentieth century, social and political movements gained strength, claiming the recognition and protection of the territorial rights of indigenous peoples and quilombolas. The promulgation of the Federal Constitution of 1988 emerges as a beacon in this sense, by enshrining the right of these communities to permanent possession and exclusive usufruct of their ancestral lands (Souza; Prioste, 2017).

However, despite legal and constitutional advances, threats to the sovereignty and autonomy of these communities persist, reflecting the continued need for struggle and resistance to guarantee their territorial rights. It is essential to understand this phenomenology and the repercussion that the dynamics interpose, having in the short and medium and long term, in the preservation of the experience and rights of such traditional communities.

LEGAL-CONSTITUTIONAL FOUNDATION IN THE BRAZILIAN DEMOCRATIC PANORAMA

In the Brazilian legal-constitutional sediment, the patenting of the territorial rights of indigenous peoples and quilombolas, as an imperative of social justice and recognition of cultural diversity, has been raising debates and reflections both in spaces of academic discussion, as well as in the political and social spheres of the country.

The Political Charter promulgated in 1988, after the democratic reopening of the country, was consolidated as a historical milestone by enshrining these rights in an explicit and comprehensive way, reflecting the desires of a heterogeneous and diverse society.

Since its chapter 1, the conceptual bases of citizenship and the republican assumption are established and, throughout its *corpus*, it is an intransigent safeguard of equality and freedom and the overcoming of discrimination, inscribed as fundamental objectives of the Federative Republic of Brazil.

> Article 1 - The Brazilian Nation adopts as a form of Government, under the representative regime, the Federative Republic, proclaimed on November 15, 1889, and is constituted, by perpetual and indissoluble union of its former Provinces, in the United States of Brazil. (Brazil, 1988).

In addition to this, Article 4 states that Brazil is a country that governs international relations, by the principles of the prevalence of self-determination of peoples, repudiation of racism and cooperation among peoples for the development of humanity, with special emphasis offered by its sole paragraph to the Latin American peoples, *verbis*:

> Article 4 The Federative Republic of Brazil is governed in its international relations by the following principles:
> I - national independence;
> II - prevalence of human rights; III - self-determination of peoples;
> IV - non-intervention;
> V - equality between States; VI – defense of peace;
> VII - peaceful resolution of conflicts;
> VIII - repudiation of terrorism and racism;
> IX - cooperation among peoples for the progress of humanity; X - granting of political asylum.
> Sole Paragraph. The Federative Republic of Brazil will seek the economic, political, social and cultural integration of the peoples of Latin America, aiming at the formation of a Latin American community of nations (Brasil, 1988).

In its meaning, Article 5 states: "**Article 5** - All are equal before the law, without distinction of any kind, guaranteeing to Brazilians and foreigners residing in the country the inviolability of the right to life, liberty, equality, security and property, in the following terms: [...]". According to this provision, there should be no type of differential treatment, in the

sense of inferiorizing or mitigating the rights of any minority groups in the country (Brasil, 1988).

The doctrine perceives as minorities numerically inferior demographic groups, made up of individuals who stand out for distinctive characteristics in relation to the majority of the country's population. Defining minorities is challenging, as their identity cannot be limited only to ethnic, religious, linguistic, or cultural criteria. It is necessary to consider its legal status in the light of contemporary developments (Séguin, 2002).

It is credible to argue that the concept of minority brings linked to itself, in terms of social and political rights and guarantees, the bias of vulnerability, thus lacking special protection in the face of the dissimilarities that arise in relation to society (Penna, 2023). What is really important is to ensure that these segments have the right to express their uniqueness, and, for this reason, they must be approached in a different way, receiving special protection from the State that integrates them.

> Minorities and vulnerable groups are not synonymous expressions, but due to the fact that their members are in the same factual situations of discrimination, intolerance and fragility on the part of a portion of society, the conceptual differentiation becomes irrelevant and the jurisdictional protection that can be offered to these excluded becomes irrelevant (Bastos, 2011, p. 66).

Thus, indigenous peoples and quilombolas in Brazil are confronted with a situation of multidimensional vulnerability, encompassing legal, sociopolitical and economic dimensions. As ethnic minorities, their representativeness is limited, reflected in legislative gaps and restrictions on effective participation in the spheres of power. Furthermore, they cross socioeconomic inequalities, which perpetuate their marginalization and social fragility (Rodrigues, 2023).

Articles 215 and 216 of the Major Law contemplate the protection of Brazilian cultural heritage, covering artistic, cultural and historical manifestations of the different groups that form Brazilian society:

> Article 215. The State shall guarantee to all the full exercise of cultural rights and access to the sources of national culture, and shall support and encourage the appreciation and dissemination of cultural manifestations.
> Paragraph 1 - The State shall protect the manifestations of popular, indigenous and Afro-Brazilian cultures, and those of other groups participating in the national civilizing process.
> Paragraph 2 - The law shall provide for the establishment of commemorative dates of high significance for the different national ethnic segments.
> [...]
> Article 216. Brazilian cultural heritage is the assets of a material and immaterial nature, taken individually or as a whole, bearers of reference to the identity, action, and memory of the different groups that form Brazilian society, which include:
> [...] (Brazil, 1988).

Such provisions enshrine the importance of preserving and valuing the country's cultural legacy, promoting its dissemination and public access, safeguarding the cultural and ethnic diversity of the nation, which includes indigenous and Afro-descendant peoples.

However, preliminary legislations, such as the Civil Code of 1916 and the Statute of the Indian of 1973, had a bias towards indigenist assimilation, in which the civil capacity of the indigenous would only be recognized through their integration into the dominant society, abandoning their culture and tradition and gradually adopting the customs established therein.

Due to its progressive nature, the 1988 Constitution, regarding the rights of indigenous peoples in Brazil, established a new relationship between the State, Brazilian society and these communities. In contrast to laws prior to its enactment, the text began to guarantee respect and protection for the culture of native peoples.

In it, the rights of the indigenous people are addressed in a specific chapter - Title VIII, On Social Order, Chapter VIII, On the Indians - which contains provisions that guarantee respect for social organization, customs, languages, beliefs and traditions. However, one of the most significant aspects is the recognition of the territorial rights of the indigenous peoples, considered as "original rights", that is, prior to the very formation of the Brazilian State, taking into account the history of oppression to which they were subjected during the colonial period (Brasil, 1988).

The right to the territory and its uses and customs was guaranteed to the indigenous peoples: "**Art. 231**. The Indians are recognized for their social organization, customs, languages, beliefs and traditions, and the original rights over the lands they traditionally occupy, and it is up to the Union to demarcate them, protect and ensure respect for all their assets" (Brasil, 1988).

Article 232, on the other hand, dealt with the guarantee to indigenous peoples of the procedural capacity: "**Article 232:** The Indians, their communities and organizations are legitimate parties to file a lawsuit in defense of their rights and interests, with the Public Prosecutor's Office intervening in all acts of the process. (Brazil, 1988).

In the same vein, the descendants of quilombos were guaranteed, by virtue of article 68 of the Act of Transitory Constitutional Provisions, the territory they occupied and a new advent of consideration of the ethnic, cultural and legal plurality of Brazilian society emerges:

"**Article 68.** The remnants of the quilombo communities that are occupying their lands are recognized as the definitive property, and the State must issue them the respective titles" (Brasil, 1988).

> [...] the main objective of article 68 of the ADCT is to ensure the possibility of survival and flourishing of groups endowed with their own culture and ethnic identity, linked to a past of resistance to oppression, which, deprived of the territory in which they are settled, would tend to disappear, absorbed by the surrounding society. For the quilombolas, the inhabited land, much more than a patrimonial asset, is an integral element of their own collective identity, as it is vital to keep the members of the group united, living according to their customs and traditions. (Sarmento, 2008, p.06).

Decree 4887, of November 20, 2003, was enacted with the objective of regulating the aforementioned article, indoctrinating the procedure for identification, recognition, delimitation, demarcation and titling of lands occupied by remnants of quilombo communities (Brasil, 2003).

Its purpose was to establish rules for delimiting, identifying, demarcating and titling the lands occupied by the quilombolas. The National Institute of Agrarian Reform - INCRA is responsible for carrying out these actions, while the Palmares Foundation is in charge of certification (Brasil, 2003).

Therefore, the Decree understands in a functional way the process of land regularization, aiming to materialize the human and fundamental rights of quilombola communities, especially with regard to quilombola property and possession, which fulfills a crystalline function in the realization of other fundamental and human rights, such as the right to life, liberty, housing, work, food, among others.

Based on the international perspective of Human Rights, Ribeiro (2021, p. 123) states, regarding the territorial rights of the populations circumscribed here, that:

> It is argued that the internal reconfigurations observed in territorial rights were influenced by the dynamics of production and reevaluation of international normative standards, through the circulation of ideas among international organizations, state agents, activists, intellectuals and movements dedicated to indigenous, ethnic-racial and socio-environmental causes. As an effect of the socialization of norms and theoretical perspectives, there is a formal break between the national legal system and the integrationist paradigm and the creation and re-semanticization of theoretical and political-normative categories, expanding the list of groups holding specific territorial rights.

The discussion brought to light by the excerpt from the study reconstructed above points out that international norms for the protection of socially vulnerable groups result from the institutional recognition that certain issues concerning these populations must be incorporated into the international human rights agenda, such as the norms that establish and safeguard the territorial rights of the groups focused here.

Thus, through the institutionalization of protection standards by international organizations, the need to ensure their effectiveness at the level of States emerges. Thus, as intricate as the mechanisms for conforming and accepting these standards at the

international level, are the institutional and socio-political engenderments aimed at internalizing the rights they aim to protect (Ribeiro, 2021).

It is worth noting the Convention on Biological Diversity, also known as the Convention on Biodiversity, a multilateral international treaty ratified by Brazil through Decree No. 2,519 of March 16, 1998. This convention confers on traditional communities the right to their knowledge, that is, the framework of knowledge related to their culture and traditions, among other aspects (Brasil, 1998).

The universe of this knowledge must be linked to biodiversity, aiming to establish respect, preservation, maintenance, innovations and practices of local and indigenous communities. In addition, the benefits arising from it and its practices must be shared equally among the members of the community (Brasil, 1998).

Despite all this, the setbacks that stand in the way of the full realization of these rights are still numerous. The lack of land demarcation and regularization, conflicts with economic interests, political and social dichotomies, and the fragility of the institutions responsible for protecting these rights are obstacles that demand urgent and effective measures (Santos *et al.*, 2021).

POLITICAL AND INSTITUTIONAL CONTEXT OF THE IMPLEMENTATION OF SOCIAL POLICIES

It is essential to admit that the traditional territories located within the Brazilian territory, belonging to traditional communities, specifically those discussed here, in addition to all the symbolic aspect inherited from their ancestors, constitute the link that connects them with the world, allowing them to live in the present, revere the past and preserve the entire historical structure for future generations (Penna, 2023).

The historical construction of the territorial rights of indigenous peoples and quilombolas in Brazil is marked by an uninterrupted clash in antagonism to the political and social pressures that threaten their existence and autonomy. These communities are going through strenuous impasses aimed at preserving their territories and traditional ways of life.

Political pressures, daily riddled with economic and ideological interests, manifest themselves under diversified guises, from the violent expulsion from their lands to the criminalization of their cultural practices and forms of social organization.

> The difficulty of government agencies and institutions in charge of the development of projects, of promoting initiatives to meet the demands and claims of the subjects of this Brazilian national policy is already known. This represents one of the obstacles to the realization of rights, such as conflicts of interest that recurrently contradict the expectations of terreiro peoples and traditional communities. This operational difficulty of public institutions and conflicts with economic agents are two

> sides of the same coin. Divergences of interests often play against the realization of rights that are guaranteed, but need many struggles to be realized (Lucinda, 2017, p. 229).

The dichotomy highlighted above often impedes the realization of the rights of the communities described, evidencing a persistent conflict that compromises the effectiveness of national policies aimed at protecting and promoting these minorities. According to the scenario constituted, it is imperative to adopt more effective social policies, committed to the promotion of social justice and the recognition of cultural diversity.

Financial contributions and better management of land demarcation and regularization programs, strengthening of the institutions assigned to the safeguarding of these rights, combined with the expansion of dialogue and the participation of these communities at decision-making levels that affect their lives become essential. In fact, the inexcusable commitment of the State and the cooperative throughout society to respect the human rights and dignity of these communities is fundamental.

IMPACT OF POLITICAL AND SOCIAL PRESSURES ON THE RIGHT TO TERRITORIALITY

Today, political and social pressures continue to pose a constant threat to the territorial rights of indigenous peoples and quilombolas. The intensification of economic exploitation, especially in the agricultural and mining sectors, has resulted in increasingly frequent and violent conflicts over their lands.

In addition to this phenomenology, the rise of discriminatory and racist discourses and practices has contributed to the increase in violence and marginalization of these communities.

> Indigenous peoples in Latin America, since colonial times, have suffered from numerous and continuous violations of their rights, including and most intensely the collective right to their ancestral lands. Aggregated without the recognition of their particularities or separated in disregard of the unequal conditions to which they are exposed, indigenous peoples bear the precariousness of weighing difference and equality (Gonçalves; Espinoza, 2020, p. 72).

Given this scenario, it is essential that effective measures be adopted to protect the territorial rights of indigenous peoples and quilombolas. This includes the demarcation and regularization of lands, the strengthening of institutions responsible for the protection of these rights, and the promotion of dialogue and participation of these communities in decisions that affect their lives and in the development of public policies.

It is necessary to actively combat hate speech and racial discrimination, promoting a culture of respect for diversity and human rights, with a view to ensuring the survival and

dignity of these communities and the construction of a diverse, but fair and inclusive societal ideal.

Institutional initiatives play a crucial role in protecting and promoting the territorial rights of indigenous peoples and quilombolas in Brazil. Both in the public and private spheres, several organizations and institutions have developed projects and programs aimed at the preservation and realization of these rights.

Penna (2023, p. 659) points out that:

> [...] Public policies cannot be confused with public service provision. The concept of public policies is much broader than that of public service. The concept of public policy is closely related to the fulfillment of fundamental rights, which aim to achieve the objectives of the Democratic Rule of Law.

In the public sphere, the government agencies responsible for the demarcation and regularization of lands stand out, such as the National Indian Foundation (FUNAI) and the Palmares Cultural Foundation (FCP). These institutions play a fundamental role in identifying and protecting the traditional territories of these communities, guaranteeing them legal certainty and territorial autonomy.

Consequently, policies for sustainable development and the strengthening of family farming must be implemented with the objective of promoting the socioeconomic inclusion of these populations and ensuring their subsistence, since "environmental agendas are also added to the common claim for land, since the protection of nature and the realization of the territorial rights of indigenous peoples are intertwined in a visceral way" (GONÇALVES *et al.*, 2020, p.315).

In the private sector, several non-governmental organizations (NGOs), foundations and companies have developed projects and partnerships aimed at promoting the territorial rights of indigenous peoples and quilombolas. These initiatives include programs to support environmental and territorial management, strengthen education and health in communities, and encourage the development of sustainable economic activities, such as ecotourism and agroecological production.

In addition, training and empowerment programs for community leaders have been implemented with the aim of strengthening the participation of these communities in the defense of their rights and interests.

From their mobilization for recognition and access to ethnically configured territories, new political-organizational forms emerge. These collectives try to adapt to the normative issues of Brazilian law, resulting in continuous changes driven by needs, projects, struggles,

and territorial claims, while at the same time processes of judicialization of conflicts persist (Rodrigues, 2023).

Despite the advances provided by these initiatives, there are still significant challenges to be addressed in protecting the territorial rights of indigenous peoples and quilombolas. The lack of financial resources, government bureaucracy and the resistance of economic sectors interested in the predatory exploitation of natural resources represent obstacles to the realization of these rights.

The indigenous or quilombola territorial demarcation implies the accreditation of a political space for the realization of difference and the idealization of a future of ethnic perpetuity, within a plural society, in which equality is not restricted to the inferiorization and pauperization of differences, but which can enable emancipation and for the effective and equitable exercise of differences that, together, they constitute the cultural diversity of a national society (Neves, 2012).

In fact, it is essential that the Brazilian State and civil society continue to invest in policies and projects that guarantee the protection and promotion of the territorial rights of these communities, ensuring them the fundamental right to land and self-determination.

FINAL CONSIDERATIONS

The territorial constitutional rights of indigenous peoples and quilombolas in Brazil represent an issue of undoubted relevance for the construction of a society based on equity and inclusion. Within the scope of this study, the analysis focused on the current state of these rights, considering their historical evolution, the legal and political vicissitudes over time, and the challenges faced by these communities.

In the course of the research, it was found that, despite the progress made since the promulgation of the 1988 Constitution, the territorial rights of these ethnic groups still face significant obstacles. Although the Brazilian Magna Carta has stated the importance of safeguarding these rights, their realization has been obstructed by a myriad of factors, including conflicts of economic interest, institutional fragility, and political and social pressures.

It is concluded, therefore, that even evolving over time, legislation and public policies aimed at protecting the territorial rights of indigenous peoples and quilombolas lack refinement and strengthening. It is essential that the Brazilian State promotes the demarcation and fair regularization of the lands of these communities, ensuring full respect for their cultural identity and ancestry.

In addition, it is proposed to carry out new research that deepens the understanding of the social, legal and political dynamics involved in the realization of the territorial rights of these ethnic groups. Research on the means of overcoming obstacles and ensuring the full realization of these rights is essential to foster a more just, inclusive and respectful society towards Brazil's cultural and ethnic diversity.

Therefore, in view of the panorama outlined here and the gaps identified, the need for public policies and affirmative measures that reinforce and safeguard the territorial constitutional rights of the peoples in question is reaffirmed, with a view to putting into effect the principles of effective equity.

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SOCIAL ASSISTANCE POLICY AND SOCIAL WORK: REFLECTIONS ON WORKING CONDITIONS

https://doi.org/10.56238/sevened2024.031-014

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ABSTRACT

This article addresses the interlocution between social work and social assistance policy, a privileged field of action for social workers. The objective is to critically reflect on the working conditions of social workers within the scope of the Unified Social Assistance System (SUAS), in view of the transformations that have occurred in the world of work in recent decades, from the process of productive restructuring and the organization of the political and ideological system through neoliberal policy. It is a bibliographic and documentary article, based on the available legislation on the subject, the production of some authors and the analysis of data from the SUAS 2023 Census. Among the results, it is highlighted that social work is a profession inserted in the socio-technical division of labor, being negatively affected by the dictates of neoliberal policy, which orders regressive forms of labor rights, once conquered, to the detriment of precarious and fragile bonds and working conditions, reflecting on the quality of services provided to users. A paradox in the social assistance policy is highlighted: social workers are required to guarantee the social rights of users, while they do not have adequate and/or sufficient working conditions.

Keywords: Social assistance. Social services. Neoliberal policy. Work.

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INTRODUCTION

The social assistance policy reaches a major regulatory milestone when it is inserted as an integral part of the tripod of Brazilian social security, alongside the health and social security policy, as of the Federal Constitution of 1988. Since then, social assistance has followed a path in search of recognition as a public policy, hence its regulation in 1993 through the Organic Law of Social Assistance – LOAS, which implemented the Unified Social Assistance System – SUAS, and subsequent regulations, namely: Basic Operational Norm of Human Resources of the Unified Social Assistance System – NOB -RH/ SUAS (2006); the National Typification of Social Assistance Services (2009) and the Basic Operational Norm of the Unified Social Assistance System – NOB/SUAS (2012).

That said, it is important to highlight the contradictions intrinsic to the reformulations of the national social protection model, and it is essential to study the workforce used by the State in the implementation of social policies, among which are the professional categories, such as social work. Thus, the article in question discusses the interlocution between social work and social assistance policy, a privileged field of action for social workers. The main objective is to critically reflect on the working conditions of social workers in the SUAS, in view of the transformations that have occurred in the world of work in recent decades, correlated with the incorporation of the neoliberal project in Brazil and in the world.

The interest in the theme is due to its relevance and topicality, occupying a place at the center of the debate on social policies and the work category. It seeks to theoretically understand the demands and challenges posed to the social workers who make up the reference teams of the social assistance services. Ultimately, the article aims to contribute to the debate on the working conditions of social workers in the social assistance policy, as well as the limits and strategies that these professionals find to achieve their rights and duties as workers in this policy.

Of a bibliographic and documentary nature, the research focused on theoretical productions and legislation in the field of social assistance and social work. The treatment of the data favored works by authors who were closest to the proposed object, electing those considered references in the field of discussion. In addition, quantitative data available in the last Suas Census (2023) concerning the work management category were used.

The article will be divided into three sections. The first section will consist of the introduction of the research, with brief notes on the subject, describing the objectives of the study, the relevance, the methodology and the purpose. The second section corresponds to a critical reflection on the performance of the social worker in the social assistance policy,

discussing their working conditions in the face of the incorporation of the neoliberal proposal. And finally, the third section will be dedicated to final considerations.

The objective of this work is not to exhaust the discussions about the phenomenon, however, in view of the above and the content expressed in the following pages, it is intended that this investigative process reaches contributions to the collection of social work and other areas of the social sciences, in addition to arousing reflections on the subject studied.

SOCIAL POLICIES, THE STATE NEOLIBERAL AND SOCIAL ASSISTANCE POLICY

According to Behring and Boschetti (2008), we cannot measure an exact date for the emergence of the first social policies, but we can affirm that the appearance converges with the rise of the capitalist system. In this way, it is possible to infer that social policies are within a contradictory and complex web, presenting themselves as a solution pointed out by the State to attenuate the expressions of the social question, in the midst of the dispute between meeting the interests of capital (guaranteeing the necessary conditions for its maintenance) and the working class (producer of surplus value).

> A social question apprehended as the set of expressions of the inequalities of mature capitalist society, which has a common root: social production is increasingly collective, labor becomes more broadly social, while the appropriation of its fruits remains private, monopolized by a part of society. (Iamamoto, 2015, p. 27).

Therefore, we can say that the social question is the result of the exploitation of capital over labor, and therefore, the bourgeois State does not have a real interest in solving the root of the problem of the social question, as this would alter the relationship of exploitation between capital and labor, therefore, it directs its action in a fragmented and fragile way through social policies.

Significant changes in the world of work occurred in the 1970s, until then the previous decade known as the "golden years" of capital, the current protection model consisted of the *Welfare State*, belonging to the Beveridge Plan, of 1942, with the premise of implementing a universal social security system, without the need for prior contribution. However, in the mid-1960s, capital justifies not being able to maintain the high rates of profit due to the considerable amount of unemployed population, increasingly demanding the attention of the State through public policies to meet its basic needs, generating a series of questions regarding the continuity of social policies financed by the State.

Thus, the Welfare *State crisis* that began in the 1970s was characterized by a period of high fiscal deficit, State indebtedness and stagnation of profits, corroborating the

implementation of a set of measures with the intention of overcoming the crisis. Among these measures, the productive restructuring and the reorganization of the political and ideological system through neoliberal macroeconomic policy stand out. According to Sitcovsky (2010, p. 167-168):

> This process is responsible for directing the role of the State, which, instead of public social policies that guarantee the reproduction of the labor force, adopts the perspective of the minimum State for the social and maximum for capital, with the latter assuming the deregulation of the labor force, associated with a lack of responsibility for the 'social question'. This process of transformation of the pattern of State intervention in the 'social question' gives rise to a type of intervention that advocates the participation of the so-called third sector or part of civil society.

It can be seen, therefore, that the measures used to overcome the economic crisis reverberate negatively in the working class, the minimal State for the social leads to the reduction of jobs, increase in unemployment rates, emergence of underemployment, emphasis on outsourcing and various forms of work without the guarantee of rights. It is credible to say that neoliberal ideology promotes the "liquidation of social rights, the privatization of the State, the scrapping of public services and the systematic implementation of a macroeconomic policy harmful to the mass of the population [...]" (Netto, 1999, p. 107).

In order to advance with the proposed study, it is initially of fundamental importance to understand the historical context of the implementation of the social assistance policy in Brazil, especially from the 1990s onwards, a period of intensification of the so-called crisis of capital, of a structural nature, a remnant of the economic recession that began in the 1970s, implying new forms of organization and expansion of capitalism.

In Brazil, the neoliberal policy was implemented during the government of Fernando Collor de Melo (1990-1992), as a strategy to reduce the functions of the State and expand the market through the maneuver of economic opening, triggering the privatization process in the country. Neoliberalism, as the system became known, is configured as a setback to the social rights conquered by the working class in the 1980s, materialized by the Federal Constitution of 1988, constituting an obstacle to its incorporation.

It is important to highlight that the Federal Constitution of 1988 consists of the concreteness of the democratic achievements arising from the political struggles of various sectors and social classes. Emphasizing that such achievements were the result of disputes between different projects, and were sometimes complex and contradictory (Sousa, 2013), given that the country was already feeling neoliberal influences, as a result of the game of forces that prevailed in the country at that time.

The Magna Carta established a new system of social protection through social security, universalizing social rights, considering social security, health and social assistance as a public issue and the responsibility of the State to guarantee them to the population, as Article 194 points out "social security comprises an integrated set of actions initiated by the public authorities and society, aimed at ensuring the rights related to health, social security and social assistance" (Brasil, 1988). The central policy of this article corresponds to the social assistance policy, so we will direct the analysis to its conjuncture. Social assistance emerges as a public policy, a duty of the State and a right of all citizens, with the target audience being those who are in a situation of social vulnerability, striving to ensure protection at all stages of life, carrying out actions that achieve the full development of individuals, through the provision of services, programs, projects and assistance benefits. Another historical gain took place in 1993 with the enactment of Law No. 8,742 entitled Organic Law of Social Assistance – LOAS, inserting itself as a regulator of social assistance policy through the proposition of norms and criteria, in addition to structuring the management of the policy through the Unified Social Assistance System – SUAS. More advances occurred from several norms, namely: Basic Operational Norm of Human Resources of the Unified Social Assistance System – NOB -RH/ SUAS (2006); the National Typification of Social Assistance Services (2009) and the Basic Operational Norm of the Unified Social Assistance System – NOB/SUAS (2012).

> [...] assistance as a social right by the 1988 Constitution and regulation by the Organic Law of Social Assistance (LOAS) in 1993, meant, for assistance, the end of the crossing of the desert, since such recognition, having an unquestionable political and social meaning, presents itself as the privileged occasion to overcome its current understanding as a moral duty to help, and understand it as a legal duty to guarantee social benefits and services (Boschetti, 2000, p. 140).

Although social assistance in its normative documents brings in itself a discourse of access to social rights and citizenship, it is necessary to consider its functionality in the capitalist system, while it enables the achievement of rights, it plays a primordial role in the reproduction of the order of capital, through the process of consumption inherent to the nature of income transfer programs, For example, the Bolsa Família, by allocating assistance actions to alleviate poverty and extreme poverty of the population. This process is noticeable when we analyze the social assistance budget, which describes in its content that 90% of the policy's resources are allocated to income transfer programs (Silva, 2020). Such social security resources, when mostly applied to income transfer programs instead of destined to social assistance services, configure social assistance as a compensatory social policy.

Despite the constitutional advance, social assistance suffers great impacts with the adoption of neoliberal measures, reaching the users of the policy, but also its workers. The flexibilization of work and the deregulation of the State have contributed to the deepening of the precariousness of work, processes that equally affect the relationships and work of higher education professionals working in public and private institutions, among which we highlight social workers, generating lower wages, precariousness of bonds, job insecurity, increase in productivity, lack of career progression, illness, among many other manifestations resulting from the growing exploitation of the salaried workforce (Raichelis, 2011).

THE WORK OF THE SOCIAL WORKER IN SUAS

The contemporary transformations that have occurred in the world of work, and more specifically, in Brazil from the 1990s onwards, with the government's adherence to the neoliberal project, awaken changes in the way the State manages and the execution of social policies, provoking new requirements, demands and challenges to the work of social workers in the scope of public policies. including social assistance.

The social assistance policy consists of a relevant socio-occupational space in which social service professionals are inserted. In such a way that almost half of the professionals in the category carry out their activities in social assistance. According to a survey carried out by the Federal Council of Social Service – CFESS regarding the Profile of Social Workers in Brazil in 2021, about 49.79% of professionals work in social assistance policy, whether in the preparation, coordination and execution of programs and projects of the policy.

Another important means of measurement corresponds to the SUAS Census, characterized as an instrument that generates information regarding the supply of social assistance services, providing means of evaluating the social assistance policy, as well as providing data for the analysis of professional categories. In line with the last Suas Census carried out in 2023, the number of social workers inserted in social assistance equipment, in the Social Assistance Reference Centers - CRAS and Specialized Social Assistance Reference Centers - CREAS, corresponds to 29,910 professionals, equivalent to 28.8% of the total number of higher education professionals working in social assistance equipment throughout Brazil.

The data presented are in line with the materialization of the SUAS in the national territory, corroborating the expansion of jobs for social workers and other categories working in the area. Simultaneously and contradictorily, the precariousness of the conditions in

which this work is carried out deepens in the process, since social service professionals are included in the condition of salaried workers, thus subordinated to a process of alienation, reduction of their technical autonomy and intensification of work (Raichelis, 2010).

The reorganization of capital as a result of the process of productive restructuring and the implementation of the neoliberal program, brings with it the aggravation of the social question, in this way, the daily life of professionals is altered, whether in labor relations or in the requests made to the social service by the user population. At this time, social assistance requires more and more professionals to meet such demands.

> The premise is that the current socio-historical framework is not reduced to a background so that one can later discuss professional work. It crosses and shapes the daily professional practice of the Social Worker, affecting their working conditions and relationships, as well as the living conditions of the population that uses social services. (Iamamoto, 2015, p. 19).

Demands recognized as new expressions of the social issue, directing professionals to experience "new forms" of work, felt in precarious forms of employment, through temporary contracts, outsourcing, turnover of professionals, insecurity due to the absence of stable contracts, low wages, precarious or often absence of continuing education, in addition to the scarcity of adequate physical and material conditions for the execution of work. At this moment, a paradox in the social assistance policy stands out: social workers are required to guarantee the social rights of the users of the policy, while they do not have adequate and/or sufficient working conditions.

Therefore, the management of work and workers in the SUAS, its effectiveness and the scope of rights, presents itself as one of the greatest challenges in the social assistance policy. The main advance in normative terms corresponds to the institution of the Basic Human Resources Norm of the Unified Social Assistance System - NOB-RH/SUAS, in 2006, by establishing reference teams for social assistance equipment, which should be composed of professionals admitted through public competition, in addition to propositions in the sense of materializing a policy of permanent training of human resources, requirements regarding material, technical and ethical working conditions, as well as establishment of guidelines for the implementation of Career Plans, Positions and Salaries within the scope of the SUAS.

> The implementation of Suas requires new forms of regulation, organization and management of work and, certainly, the expansion of the number of workers with functional stability is an essential condition, along with continuous training and qualification processes, from entry via public competition, definition of positions and careers and evaluation and progression processes, characterization of profiles of teams and services, in addition to compatible remuneration and safety at work. (Raichelis, 2010, p. 761).

By way of illustration of the precariousness of work in social assistance policy, when it comes to employment relationships, data from the Suas Census (2023) show that of the professionals who work in the Social Assistance Reference Centers - CRAS across the country, only 28% are statutory, while in the Specialized Social Assistance Reference Centers - CREAS the total number of professionals with a statutory contract corresponds to 39.8%. Numbers that contradict the norms established for the policy in the NOB-RH/SUAS, by prioritizing unstable work relationships, outsourcing, in addition to hiring linked to political "agreements", traces of the densification of the neoliberal project in Brazil. The flexibility in the forms of hiring to the detriment of the public exam promotes greater turnover of social workers, and consequently, the discontinuity of family monitoring actions, making it impossible to offer critical, continuous social work that unveils the real needs of users, as well as the respective access to rights.

In view of the above, we can infer that social workers are exposed to precarious working conditions on a daily basis, while they do not have absolute autonomy in their intervention, considering that they are subjected to institutional power relations, in view of their incorporation into the socio-technical division of labor (Faleiros, 1997).

Therefore, actions aimed at overcoming the dismantling of current working conditions are essential, one of them consists of proposing strategies of struggle and political organization of the professional category of social work with the working classes. On this issue, it is interesting to note that Raichelis (2010) observes that neoliberal ideology operates several mechanisms to divide the category of workers from their collective entities, as it recognizes that the process of collective action is strong, transformative and creates methods for the improvement of working conditions.

However, it remains to be clarified that this is not the struggle of just one category. However, the process of political organization is a struggle from which social work cannot exempt itself, as it would be emptying its object of critical study and historical content.

FINAL CONSIDERATIONS

The consolidation of the social assistance policy as a social security policy, the responsibility of the State and the right of the citizen, presents itself as a great challenge, considering the current scenario of fiscal adjustment, which weakens social policies.

The neoliberal macroeconomic policy emerges as a measure to overcome the economic crisis that began in the 1970s, having as its prerogative the minimum State for the social and maximum for capital. The transformations that have occurred in the world of work in recent decades, from the process of productive restructuring and the organization of the

political and ideological system through neoliberal policy, have triggered a series of dismantlings, strongly affecting the working class, which has come to live with the debasement of social rights conquered historically, as well as the increase in expressions of the social question.

Inserted in the socio-technical division of labor, the social service professional is negatively affected by the dictates of the neoliberal policy, which orders regressive forms of labor rights, once conquered, to the detriment of precarious and fragile bonds and working conditions, reflecting on the quality of services provided to users.

The social assistance policy is a privileged field of action for social workers, and from the standardization of the Organic Law of Social Assistance – LOAS and other norms, the social service was required to work with the users of the policy, offering programs, projects and social assistance services. With regard to work management, the main advance concerns the implementation of the Basic Human Resources Norm of the Unified Social Assistance System - NOB-RH/SUAS, in 2006, considering elements of qualification, protection of work and workers, as well as the material conditions necessary for the development of actions.

However, contrary to the legal direction, the flexibilization of work and the deregulation of the State have contributed to the densification of the precariousness of work, also affecting social services. The lowering of wages, insecurity due to the absence of stable contracts, absence of perspective regarding career progression, illness, temporary contracts, turnover of professionals, in addition to the scarcity of adequate physical and material conditions for the execution of the work, are some reflections of the working conditions that affect the social workers inserted in the social assistance policy. A paradox in the social assistance policy is highlighted: social workers are required to guarantee the social rights of users, while they do not have adequate and/or sufficient working conditions.

In view of the above, the proposal of strategies of struggle and political organization of the professional category of social work with the working classes becomes an essential condition in the attempt to overcome the terrible working conditions in force. It is important to clarify that the struggle is not just for a professional category. The way out, certainly, is collective.

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EVOLUTION OF DENTIN ADHESIVES: LITERATURE REVIEW

https://doi.org/10.56238/sevened2024.031-015

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ABSTRACT

The aesthetic demand has culminated in the improvement of restorative dentistry through new products, such as dentin adhesives, so commonly used in current restorative procedures. The quality of the union of the restorative material with the dental substrate is essential for the longevity of the treatment; In this way, dentin adhesives with different compositions are marketed, aiming to achieve optimal adhesion. The present study aimed to review the literature on the evolution of dentin adhesives, since research can bring to light innovations that overcome the limitations of contemporary adhesive systems. This article shows the evolution of dentin adhesives, their efficacy, and clinical relevance. Knowing new dentin adhesives, techniques and care required before and during the application of the chosen adhesive contributes to increasing the durability of adhesive restorations, in order to ensure satisfactory results in the union between the resin and the dental substrate, avoiding the repetitive restorative cycle.

Keywords: Dentin Adhesives. Nanotechnology. Composite Resins.

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INTRODUCTION

Adhesive systems are indispensable materials in everyday dental life, used mainly in composite resin restorations and ceramic cementations (MALETIN *et al*., 2023). The dental adhesive has the function of promoting the union between the resinous material and the dental substrate, which is crucial for the longevity and clinical success of current restorative procedures (CARDOSO *et al*., 2023).

Given the importance of the bond between materials and the dental substrate, it is essential to understand the evolution, innovations, and techniques associated with adhesive systems (**PERDIGÃO *et al*. 2020).** Constant technological innovations, such as the emergence of self-etching adhesives, as well as the inclusion of nanoparticles, can transform the effectiveness of dental treatments, however, they require new research and discussions (CARDOSO *et al*., 2023).

Some authors have revolutionized aesthetic and restorative dentistry (KULSHRESTHA, 2023); such as Hagger (1951), who developed the first dental adhesive called "Sevriton Cavity Seal", composed of glycerophosphoric acid dimethacrylate (GPDM), with chemical bonding to the calcium found in the tooth structure, which bonded acrylic resins to the tooth structure; Buonocore (1955), who advocated the acid etching of enamel with 85% phosphoric acid, considered a pioneer in adhesive dentistry; followed by Bowen (1965), who developed the monomer Bis-GMA (bisphenol glycidyl methacrylate), still used in most of today's composite resins. Furthermore, a milestone in adhesive dentistry was the study by Nakabayashi and Masuhara (1982), describing the adhesion process, as the replacement of minerals removed from hard dental tissues by resin monomers, in such a way that the polymer became micromechanically interconnected to the dental substrate, forming what is called a hybrid layer, by the infiltration of monomers into the matrix of demineralized dentin collagen (KOKOL, 2020).

The formation of a hybrid layer between the adhesive and the dentin is crucial for the survival of composite resin restorations (BRESCHI *et al*., 2023); this layer is formed in two steps: the first step includes the conditioning of the dentin, usually with phosphoric acid (35–37%) for 15 seconds (conditioning and washing adhesive systems), which removes calcium phosphates, leading to the formation of micropores in the dentin substrate and exposure of the collagen scaffold; and, the second step involves penetrating the adhesive monomers into the exposed network of collagen fibrils, providing micromechanical retention (REY *et al*., 2022). These monomers, which contain hydrophilic and hydrophobic groups, penetrate the embouchures and bind to collagen fibers, controlling moisture (NAKABAYASHI *et al*. 1982; YOSHIHARA *et al*. 2021).

The first phosphonated adhesive was Clearfil-Bond (Kuraray Noritake Dental Inc., Tokyo, Japan, 1976), the phosphate group has an acidic character and gives it the ability to chemically bond to mineralized dental substrates and metal oxides, through an ionic bond to calcium (PASHLEY *et al*., 2023); in 1991, Prisma Universal Bond 3 was launched by Caulk (LD Caulk Co.), in addition to new adhesives with high success rates due to increased bond strength (ALAM *et al*., 2023).

The introduction of 10-methacryloyloxydecyl dihydrogen phosphate (MDP) into self-etching adhesive systems is particularly noted for its ability to bond with hydroxyapatite, contributing to stable and durable adhesion (FEHRENBACH et al., 2021).

Currently, researchers face challenges to develop dentin adhesives that not only bind to the dental substrate, but also contain antibacterial, remineralizing, and enzyme inhibitory properties that increase its longevity (MARTINS *et al*., 2014; FERNANDES, 2021).

The advances in nanotechnology in the area of health, biomaterials, and biotechnology have been eloquent in recent decades, giving rise to the creation of a new field of study, called nanomedicine (ROSA *et al*., 2023). In 2010, self-etching adhesive systems were introduced to the market by the Voco Company that contain nanofiller (12 nm) these components increase the penetration of monomers in the hybrid layer and their mechanical properties (HUANG *et al*., 2022).

In the area of restorative dentistry, the use of nanotechnology and dental biomaterials aims to optimize the physical properties and contribute to the quality of restorative and preventive materials such as nanocomposites, nano-adhesives, nano-CIV, nano-varnish and nano-sealants (FREIRE *et al*., 2019; LIMA *et al.,* 2021). The incorporation of nanoparticles in the adhesive systems improved the penetration into the tubules of the dentinary, increasing the contact area and reinforcing the mechanical properties of the restorations (ARDILA *et al.,* 2023).

The objective of this study was to compile data regarding the implications of the evolution of dentin adhesives in dentistry, and their impact on the durability and results of adhesive procedures.

MATERIAL AND METHODS

Considering the planned objectives, a broad search of scientific articles was carried out centered on the proposed theme: "Advances in adhesive systems and their different compositions". This research involved exploring multiple relevant websites and platforms, known for disseminating quality scientific information about the field of dental adhesives. Among the main sources consulted, Google Scholar, the PubMed database, the *Scientific*

Electronic Library Online (SciELO) and Elsevier stood out. The electronic search and selection of articles began in April 2024, with the collection of data and information relevant to the topic. The selection of articles was meticulously carried out, ensuring that the contents found corresponded to the questions formulated.

To refine the search, specific inclusion criteria were established, consisting of the choice of articles that presented full texts, as well as course, master's, and doctoral conclusion papers, published between 2007 and 2024. There was no distinction between languages, allowing a more comprehensive approach to the topic. With this systematic approach, the research aimed not only to compile information, but also to critically analyze the advances in adhesive systems, contributing to the understanding of the different compositions and their applications in modern dentistry.

RESULTS AND DISCUSSION

Among the possible causes of adhesive bond failure, inadequate acid conditioning, lack of operator experience, and incorrect technique execution and selection can be mentioned (SANCHES *et al*., 2023). Acid etching in the enamel generates the removal of minerals by creating microporosities that allow infiltration by resinous and hydrophobic monomers present in the adhesive, forming resin tags, providing effective adhesion and longevity of the restoration (VAN MEERBEEK *et al*., 2020).

Several researchers indicate a modification in the application protocols of adhesive systems, aiming to reduce the degradation of the adhesive interface (PEUMANS *et al*., 2021). This ranges from the force applied during the use of the adhesive system to the adoption of chlorhexidine to the dentin substrate after acid etching, aiming to improve the conditions of infiltration of the adhesive into the dentin and to increase the resistance of collagen fibrils to enzymatic degradation (BOURGI *et al*., 2024). Medeiros *et al*. (2019), highlight the importance of chlorhexidine after acid etching of the dentin, to achieve a longer-lasting adhesion between the dentin and the composite resin; however, for Boaru *et al*. (2023), pretreatment with chlorhexidine does not affect the quality of the hybrid layer, regardless of the conditioning protocol.

According to Rodrigues (2021), in dentin, adhesion is hindered by the organic composition of the substrate, the moisture of the dentin tubules, and the presence of *smear plug* (dirt inside the dentin tubules). According to Froehlich *et al*., (2021) and Oliveira *et al*., (2010), etching with phosphoric acid in dentin should completely remove the dentin smear layer, as well as promote the demineralization and exposure of collagen fibers, allowing

efficient hybridization, where the conditioned dentin is kept moist, with the presence of water in the collagen fibers, the keeps them expanded, preserving the interfibrillary spaces.

At present, adhesive systems can be classified according to the adhesion strategy to dental tissues, being conventional adhesives, which require prior conditioning of surfaces with 37% phosphoric acid, or self-etching adhesives, which do not require prior acid conditioning and adhesion to dental tissues through *acid* primers (AHMED *et al*., 2020; RODRIGUES *et al.,* 2021).

According to Silva *et al*., (2022), conventional adhesives need the demineralization of enamel and dentin with the application of phosphoric acid generally used at a concentration of 37% as a step independently and prior to the *primer* and adhesive, creating more porosities on the enamel surface, increasing both the adhesion area and the wettability of the substrate.

Furthermore, Al-Ani *et al*. (2022) report that despite the difficulty of the technique, the conventional 3-step adhesive was considered the gold standard for adhesion and proved to be superior to the 2-step adhesive, a fact justified by Pashley, *et al*. (2020), given that, in dentin, adhesion presents difficulties, such as the organic composition of the substrate, the moisture contained in the dentin tubules and the presence of the *smear layer*, removed in the presence of acid; thus, acid etching creates an ideal surface for adhesion, making it long-lasting and reliable (KUBO *et al.* 2021)element.

In the literature, the introduction of the monomer The monomer 10-methacryloyloxydecyl dihydrogen phosphate (MDP) monomer is used in dentin adhesives due to its ability to form stable chemical bonds with calcium ions from hydroxyapatite, playing an important role in self-etching adhesive systems and in some conventional ones (Takahashi *et al*., 2021). Although self-etching adhesives have been developed to optimize work time, simplifying the adhesion technique to dentin, since the technique does not require the prior and isolated application of phosphoric acid, for Van Meerbeek *et al*. (2020), the technique is less effective in creating microporosities in tooth enamel, resulting in inferior adhesion. However, **Yoshihara *et al*. (2018), reports that** the acidic character of its *primer* and partial demineralization creates a porosity on the surface, sufficient to obtain the micromechanical embryonic of the resin monomers, ensuring hybridization, in addition, they do not remove the *smear layer* and, therefore, have less postoperative sensitivity (LIU *et al*., 2022).

According to Lorenzetti *et al*., (2019) and Yoshihara *et al*., (2021), the universal adhesive can be used as a self-etching or conventional adhesive, where selective acid conditioning of enamel can also be employed to enhance the quality of the bond and tends

to reduce the risk of sensitivity after the procedure. Some nanoparticles were increased because they improved the physical, mechanical and optical properties of the resin composites, improving the penetration into the dentin tubules, increasing the contact area and, consequently, the mechanical resistance of the restorations; however, in addition to the benefits, the authors report that nanomaterials they can be absorbed through the skin and trigger inflammation of the alveoli, myocardial infarction, and other inflammations (TAY *et al.,* 2022)

According to Lima *et al*., (2021), the applicability of nanotechnology and dental bionanomaterials aims to improve physical properties and improve tooth restoration, thus, nanocomposites, dental nanoadhesives, nano-CIV (glass ionomer cement), nano-varnish and nano-sealants were researched and developed. According to Huang *et al*., (2022), nanocomposites can be categorized into composite resins and dental adhesives, in addition, for the elaboration of nanocomposites there are three main challenges: the prevention of the formation of secondary caries, a good adhesive system and the prevention of fracture of the restoration (good mechanical strength, toughness and ductility). Composite resins have a matrix with nano-fillers, some examples of nanoparticles that can be used as fillers for resins, we can mention: hydroxyapatite (HA), silicon oxide (SiO2), zirconium oxide (ZrO2), carbon nanotubes and titanium oxide (TiO2) (LIMA *et al*., 2021; DUNCAN *et al*., 2022). Increasing certain nanomaterials can enhance the success of restorative procedures by promoting improvement in the physical, mechanical, and optical properties of resin materials; in addition, dental adhesives that have nanoparticles can improve penetration into the dentin tubules, increasing the contact area and, consequently, the mechanical strength of the restorations (ALHARBI *et al*., 2023).

Further research is needed to elucidate the innovations of adhesive systems, as well as their effectiveness and clinical applicability.

CONCLUSION

It is concluded that the appropriate selection of the adhesive system and the correct execution of the technique reduce the risk of postoperative sensitivity and increase the quality of adhesive strength in the long term. In addition, adhesives employing nanoparticles optimize the adhesive's penetration into the dental substrate, increasing the contact area and bond efficiency. The evolution of adhesives, as well as the use of nanotechnology and low molecular weight molecules, promotes the longevity of restorations. However, challenges remain, such as the complexity of the adhesion process, the need to remove the *smear layer*, and the effectiveness in demineralizing dentin.

Nanotechnology has the potential to improve the properties of composites and adhesives, however, there are concerns regarding biocompatibility; Therefore, it is essential to continuously develop and improve adhesive systems for the challenges that still persist in dental practice, always aiming to improve the oral health of patients.

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PSYCHOMETRIC PROPERTIES AND FACTOR STRUCTURE OF TRIARCHIC PSYCHOPATHY MEASURE (TRIPM) IN PORTUGUESE ADOLESCENTS

https://doi.org/10.56238/sevened2024.031-016

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ABSTRACT

Psychopathy is a personality structure characterized by a set of dysfunctional traits, impulsive and irresponsible behavior, poor and arrogant personal style in social interactions, and lack of prosocial emotions. Although it cannot be diagnosed in adolescents, its presence has been referenced in this population. Its association with antisocial and criminal behavior in young people has been demonstrated. It is therefore important that psychopathic traits be identified as early as possible to predict and control future criminal behavior. However, the specific evaluationinstruments for this population are scarce. The aim of the present study is the validation, for this population, of an instrument for the evaluation of psychopathy, the Triarchic Psychopathy Measure (TriPM). The TriPM was applied to a validation sample of 793 young or Portuguese adolescents. Confirmatory factorial analysis (CFA) was performed, and the results found were considered satisfactory, $\chi 2(1350) = 5980.77$, $p < .001$, RMSEA = .067 (95% C.I. = [.064 - .068]),CFI = .915, TLI = .910, and SRMR = .080.

Keywords: Psychopathy. Boldness. Disinhibition. Meanness. Adolescents.

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INTRODUCTION

Over the past 200 years, the scientific, medical, and legal communities have independently, or in unison, sought to understand the behavior of certain individuals who are systematically engaging in inappropriate and antisocial behavior (ASB) and who cause harm to others (Warren & South, 2006). There has been an evolution of the concept of psychopathy overthe years (Villar-Torres et al., 2014), though the scientific community diverges regarding the nuclear characteristics of this personality structure (Drislane & Patrick, 2017). Overall, clinical tradition tends to describe psychopathy as a combination of traits that are inferred and associatedwith socially deviant behaviors (Araújo et al., 2021).

Cleckley (1941) established several basic criteria to define psychopathy, based in affective and interpersonal components, which did not necessarily include the antisocial component. Thus, the characteristics that are generally present in these individuals are (i) superficial charm and high intelligence; (ii) absence of delusions or other symptoms of irrationalthinking; (iii) absence of nervousness or other psychoneurotic manifestations; (iv) lying or falseness; (v) absence of remorse or shame; (vi) inappropriately motivated ASB; (vii) unreliability; (viii) poor judgment or difficulties in learning from experience; (ix) pathological egocentrism; (x) poverty in affective manifestations; (xi) fanciful and uninviting behavior; (xii) loss of insight; (xiii) lack of reciprocity in affective relationships; (xiv) suicide threats rarely consumed; (xv) impersonal and poorly integrated sex life; (xvi) failure to follow a life plan.

In sum, for Cleckley (1941), it is a deeply rooted, emotional personality structure, but masked by an appearance of mental health. Unlike individuals with other personality structureswho appear to be effectively disturbed, individuals with psychopathy tend to be confident and psychologically well-adjusted (Drislane & Patrick, 2017). Thus, it is in the work of Cleckley (1941) that modern conceptions of psychopathy are based (Durand, 2019; Patrick, 2010, Paiva etal., 2022), and it has motivated the development of later studies (e.g., Conradi et al., 2016; Hansen et al., 2013; McCord & McCord, 1964).

McCord and McCord (1964) helped define this personality structure by identifying a set of characteristics, particularly, their inability to love or a lack of feelings of guilt. Hare (1970), byhis side, characterized individuals with psychopathy as manipulative, possessing superficial and insincerity charm, able to convince others to execute acts that are detrimental to their interests, and well as an inability to show empathy or genuine concern for others. It is also important to emphasize the existence of antisocial or unethical, but not necessarily criminal, behaviors (Hare et al., 1991). Consequently, there has been an intense debate about the role of ASB in describing the construct of psychopathy (Simões et al.,

2017). According to the two-factor model proposed by Hare et al. (1991), ASB are defined as being inherent to psychopathy. On the other side, the three-factor model, proposed by Cooke and Michie (2001), and Cook et al. (2004), suggests that ASB is a consequence of this personality structure. To circumvent this difference, Hare (2003) proposed a new four-factor model that included the three factors proposed by Cooke and Michie (2001) and added a fourth, which corresponds to indicators of ASB.

In sum, while some authors suggest that ASB is intrinsic to psychopathy (e.g., Patrick, 2010), others suggest that this behavior is a consequence of more basic psychopathic traits (PT)(Drislane & Patrick, 2017), such as chronic ASB (Bulla et al., 2021), narcissism, impulsivity, callous-unemotional (Zwieten et al., 2013), irresponsibility, absence of remorse or guilt, manipulative style (Bulla et al., 2021), or lack of empathy (Durand, 2019; Hare & Neumann, 2008).

Despite this diversity of conceptions (Weidacker et al., 2017), there is a current consensusthat the term psychopathy refers to a personality structure marked by a set of dysfunctional traits,impulsive and irresponsible behavior (Somma et al., 2016; Araújo et al., 2021), a deficient and arrogant personal style (Bulla et al., 2021), lack of pro-social emotions (Kahn et al., 2016), and difficulties in establishing and maintaining intimate relationships (Conradi et al., 2016; Dotterer et al., 2017). In short, the study of psychopathy can be considered the basis for understanding themost disruptive behavior (Dotterer et al., 2017).

ASSESSMENT OF PSYCHOPATHY

Much of the literature on psychopathy has focused on the debate about the usefulness andstability of the construct over the lifetime of the individual, particularly during adolescence (Dolan & Rennie, 2007). The main concerns pertain to the validity of current assessment instruments and their suitability for the developmental pattern (Maurer et al., 2018).

The concept of psychopathy proposed by Cleckley (1941) had a profound impact on the scientific community, due to the strong predictive value of ASB in general, and its association with violent, impulsive, and aggressive behavior. Cleckley's work is a reference and gave rise to one of the main instruments for the categorical assessment of psychopathy, developed and reviewed by Hare (2003): the Psychopathy Checklist-Revised (PCL-R). Its application involves asemi-structured interview, the duration of which may exceed 120 minutes. This instrument includes questions that cover, in detail, various areas of a person's life (e.g., school and professional history, life goals, financial situation, health,

personal and family interpersonal relationships, sexual life and behavior, substance use, ASB in childhood and adulthood, and othermore general issues) (e.g., Shane & Groat, 2018). To triangulate the collected information, or clarify any questions that may arise, other sources may be used. This can be a time-consuming and costly process. In the end, through the joint analysis of the interview and the data form, it is sought to answer 20 items, scored on a three-point scale (i.e., 0 = not applicable, 1 = partially applicable, 2 = totally applicable). Since the PCL-R assesses traits rather than states, to answer the questions raised, one must consider the normal functioning of the individual (e.g., life story) and not his or her current state (Hare, 2003). With a total score of 40 points, Hare (2003) defined30 points as the cut-off point, after which the individual is considered a psychopath (Hansen et al., 2013).

Though the PCL-R is one of the most used instruments for the assessment of psychopathysuccessive studies prove its validity (Shane & Groat, 2018; Yoon et al., 2021). But the PCL-R has some limitations, particularly: (i) long, time-consuming instrument of difficult application; (ii) difficulties in obtaining information; (iii) gender bias in the formulation of the items, which tend to reflect masculine behaviors; (iv) the role of ASB as a central characteristic of psychopathy; (v) subjectivity of some issues, such as superficial charm or proneness to boredom; (vi) use in mostly forensic populations (Simões et al., 2017).

Nonetheless, the PCL-R has originated other instruments, such as the Psychopathy Checklist – Youth Version (PCL-YV) (Simões et al., 2017), the Child Psychopathy Scale (CPS)(Lynam, 1997), the Youth Psychopathic Traits Inventory (YPI) (Andershed et al., 2002) or the Antisocial Process Screening Device (APSD) (Frick & Hare, 2001).

From a dimensional perspective, the Triarchic Psychopathy Model (TriPM) (Patrick et al.,2009) integrates the historical and contemporary findings of psychopathy. On the one side, models such as those operationalized by the PCL-R emphasize emotional deficits and ASB. On the other, the models influenced by Cleckley (1941), such as the Psychopathic Personality Inventory-Revised (PPI-R), emphasize the absence of fear and negative affect (Lilienfeld et al., 2012). The triarchic model interprets these inconsistencies and differentiates the personality structure into three major dimensions: boldness, meanness, and disinhibition (Patrick et al., 2009). More specifically, it reconciles different models, balancing the importance of antisocialpersonality traits such as impulsivity and aggressiveness, related to characteristics of social dominance, and immunity to stress (Shou et al., 2017). It is important to note that a personalitytrait is a stable way for an individual to get to know and perceive him or herself, and to understand, experience, and relate to others (Lindberg et al., 2016).

TriPM is a self-report questionnaire composed by 58 items, which operationalizes and maps the main psychopathy traits (PT) as continuously distributed among the general population.Although the sum of all TriPM items allows for the calculation of a total value of psychopathy, and this value obtained presents a significant correlation with total values from other self-report psychopathy inventories (Drislane et al., 2014; Sellbom & Phillips, 2013), the TriPM is mainly intended for the study of the dimensions of psychopathy, taking into consideration its three subscales.

Boldness subscale includes more of the adaptive characteristics of psychopathy (Durand, 2019), such as social dominance, low anxiety, desire for adventure, low levels of fear, excitement, and appetite for risk, and immunity to negative effects such as stress and anxiety (Evans & Tully, 2016). *Boldness* is goal-oriented and interpreted as an adaptive demonstration ofcourage, reflecting a high tendency to detect threat signals (Drislane et al., 2014). Thus, *Boldness*presents strong and positive, correlations with instruments that evaluate courage and bravery, andmoderate, but negative, correlations with instruments that evaluate negative affect (Shou et al., 2017). *Disinhibition* subscale comprises purer externalizing factors (e.g., impulsivity, affect deregulation, anger, hostility, focus on immediate gratification). Contemporary psychopathy assessment instruments reflect substantial variations regarding *Disinhibition*, particularly throughsubscales designed to measure Factor 2 of the PCL-R (Hare, 2003) (i.e., impulsive and irresponsible characteristics of psychopathy). *Meanness* subscale comprises secondary externalizing items (e.g., lack of empathy and appropriate intimate relations, insensitivity, and cruelty) (Patrick et al., 2009), proneness to exploit others, and sensation seeking (Fanti et al., 2016).

Research comparing TriPM subscales with other psychopathy inventories for adults and youth showed that *Disinhibition* and *Meanness* were strongly represented in the same inventories(Dotterer et al., 2017). However, regarding *Boldness*, this result was not found, except with the Youth Psychopathic Traits Inventory (YPI) (Dotterer et al., 2017). *Disinhibition* indices are strongly associated with the behavioral deviance component of psychopathy, as indicated by the increase in the subscales related to impulsiveness, carelessness, irresponsibility, sensation seeking, and ASB (Patrick, 2010).

Meanness scores are strongly associated with the affective component of psychopathy, particularly in scales involving cold-heartedness, insensitivity, machiavellianism, manipulation, or absence of remorse (Fanti et al., 2016). In addition, *Meanness* is also a strong predictor of the scores of the Self-Report Psychopathy Scale-III (SRP-III) subscales, Levenson's Self-Report Psychopathy (LSRP) (Levenson et al., 1995), YPI and APSD (Frick & Hare, 2001), as well as oftotal scores on those inventories (Drislane

& Patrick, 2017). Similarly, *Disinhibition* and *Meanness* contributed to the variation of total psychopathy scores in adult psychopathy inventories (Kelley et al., 2018; Yoon et al., 2021). This corroborates the idea that disinhibitory, interpersonal, and affective characteristics must be present in this personality structure (Patrick etal., 2013). However, this pattern was not observed in youth psychopathy inventories, since *Disinhibition* contributes more than *Meanness* to predict total scores. This suggests that the operationalization of psychopathy assessment instruments varies throughout life, with greateremphasis on the disinhibitory characteristics of the youth conceptions (Pechorro et al., 2012).

More recently, the contribution of *Boldness* to psychopathy has been intensely debated (Yoon et al, 2021). Some authors (e.g., Miller & Lynam, 2012) argue that its association with indices of adaptive functioning prevents it from being considered a central element of psychopathy. Conversely, others, on the other hand, believe that adaptive characteristics corroborate Cleckley's (1941) characterization of psychopathy, as a personality structure maskedby apparent emotional stability (Lilienfeld et al., 2012). This emotional stability also differentiates psychopathy from other externalizing conditions associated with negative affect and comorbidity of internalized psychopathology, such as antisocial personality disorder (Patricket al., 2013). A strong association was found between boldness and some indices of maladaptive functioning (e.g., manipulation, callousness, erratic lifestyle, dishonesty, grandiosity, lack of guilt), as well as with indices of adaptive functioning (e.g., superficial charm, absence of stress, social dominance, well-being, achievement) (Dotterer et al., 2017). These results corroborate theidea that *boldness* encompasses some interpersonal characteristics of psychopathy that are associated with the clinical factor of the PCL-R, comprising items of superficial charm and grandiosity (Patrick et al., 2013). Thus, as operationalized by TriPM, *Boldness* cannot be seen aspurely adaptive, especially if it is accompanied by high indices of *Meanness* or *Disinhibition* (Yoon et al., 2021).

TriPM is short and easy to apply, its access is free, and it can be applied to large groups,and has already been translated into various languages, namely, Portuguese (Paiva et al. 2022), Chinese (Shou et al., 2017), German (Kelley et al., 2018), Greek (Fanti, et al., 2016), Italian (Kelley et al., 2018), Spanish (Patrick & Drislane, 2015), Dutch (Patrick & Drislane, 2015), or Swedish (Kelley et al., 2018), among others. Regarding the adolescent population, to date, and asyou know, only the Italian version has been translated and validated (Somma et al., 2016).

PSYCHOPATHY IN ADOLESCENCE

According to Berger (2003), adolescence begins at about 12/13 years and ends when the individual reaches the age of majority (i.e., 18 years). However, other authors argue that it may extend to 20/21 years (e.g., Leenarts et al., 2017). It is a phase in which individuals seek to assertthemselves and establish their identity alongside their family and/or peer group. Therefore, oppositional behaviors and rebelliousness, marked by a greater or lesser degree of aggressivity, are normative and frequent (Araújo, 2024). However, and not infrequently, these may assume contours of some severity (Dolan & Rennie, 2007).

The presence of PT among young people with behavioral problems is associated with a more severe pattern of ASB (Araújo, 2024; Paiva et al., 2022). Several studies have shown thatyoung people with high levels of psychopathy exhibit precocious ASB associated with high levels of delinquency and recidivism when compared to adolescents with more moderate PT (Leenarts et al., 2012; Nijhof et al., 2011). Some authors suggest that ASB tend to start early, reaching their peak in late adolescence or early adulthood (Rodríguez et al., 2016). Thus, it is believed that the severity of ASB will increase up to ten times during this developmental period(Araújo, 2024; Zwieten et al., 2013). The severity of these behaviors can be enhanced by exposure to peer groups, especially if they exhibit equally deviant tendencies (Zwieten et al., 2013).

The influence that the interaction with peer groups exerts on the delinquent behavior of anadolescent depends on the level of his or her own PT, as well as the traits evidenced by his or her peers (Larsson, 2012). Thus, the more increased these traits are, the higher the tendency to influence (Nijhof et al., 2011) and the lower the likelihood of being influenced (Larsson, 2012).The study of PT in adolescents has gained increasing relevance as a research topic (Pechorro etal., 2012). Studying psychopathy in this age group can help professionals and researchers understand the different patterns of severe ASB as well as better understand the etiology of thispersonality structure in adulthood (Somma et al., 2016).

Moreover, the consequences of the behavioral manifestation of high PT are widely described (e.g., Paiva et al., 2022). Thus, to reduce its effects, it is crucial to identify and evaluatethese traits as early as possible (Decuyper et al., 2013; Nijhof et al., 2011). As such, adequate psychological assessment tools adapted to this population are essential (Somma et al., 2016). In sum, all the research developed to date demonstrates the social and scientific relevance of this study. Therefore, the main objective is to test, in Portuguese adolescents, the factor structure of the TriPM, an instrument initially developed by Patrick et

al. (2009) for adults, and later adapted for adolescents, like what was developed by Somma et al. (2016), among Italian adolescents.

METHOD

PARTICIPANTS

The instruments were administered to 793 individuals. The majority (*n* = 408) were female, with ages between 10 and 21 years (*M* = 16.8, *SD* = 2.88), and a mean of 10.3 schooling years (*SD* = 2.50). Participants were recruited from various schools (i.e., primary and secondary),universities, and other institutions. Dynamic e-mails were also sent to members of the PortugueseSociety of Psychiatry and Psychology of Justice, as well as to individuals who attended recreational institutions, to cover a wider range of ages and schooling years. All participants, native and fluent Portuguese speakers, completed the questionnaires voluntarily andanonymously, without financial compensation involved.

INSTRUMENTS

Sociodemographic Questionnaire (QS)

The QS aims to assess some sociodemographic characteristics of participants (e.g., sex,age, years of schooling).

Triarchic Psychopathy Measure (TriPM)

The TriPM, developed by Patrick et al. (2009), is a self-report questionnaire that assesses personality dimensions. It consists of a total of 58 items, subdivided into three subscales: (i) *meanness* (19 items), which evaluates the tendency towards cruelty, aggression or sensation seeking; (ii) *boldness* (20 items), which reflects the relationship between social dominance, low anxiety and adventure seeking; (iii) *disinhibition* (20 items), which relates to the tendency towards impulsivity, irresponsibility, anger or opposition (Durand, 2019; Patrick, 2010). The items are evaluated by the participants on a four-point Likert scale, ranging from 0 (false) to 3 (true) (Evans & Tully, 2016; Patrick, 2010). The validation for adolescents of Somma et al. (2016) showed that the TriPM has good psychometric qualities, namely good internal consistency(*Cronbach*'s α = .89 [*Boldness*], .90 [*Meanness*], and .89 [*Disinhibition*]), good reliability and good construct validity. In the current study, the values were .74 (*Boldness*), .85 (*Meanness*), and.83 (*Disinhibition*).

Antisocial Process Screening Device – Self-Report (APSD-SR)

The APSD-SR was developed by Frick and Hare (2001), and adapted to the Portuguesepopulation by Pechorro (2013) to assesses psychopathic personality traits in the adolescent population. It consists of 20 items evaluated by participants on a 3-point Likert scale, with response options ranging from 0 (false) to 2 (often true). Some studies present a two-factor structure of the APSD-SR (e.g., Frick et al., 1994; Oshukova et al., 2015): (a) callous- unemotional, which reflects the interpersonal and affective dimensions of psychopathy, such as absence of guilt and lack of empathy, and (b) impulsivity, which reflects behavioral problems andimpulse control deficits. However, other studies (e.g., Frick et al., 2000) report the existence of three factors: (a) *Callous-Unemotional* (CU), which reflects the interpersonal dimensions of psychopathy; (b) *Conduct Problems* (I-CP), which is subdivided into two: (i) *Narcissism* (Nar), reflecting the emphasis on personal needs and (ii) *Impulsivity* (Imp), which reflects the behavioralproblems and impulse control deficits. Research has shown that the APSD-SD has good psychometric qualities, particularly good internal consistency (*Cronbach's* α = .75 [ASPD Total] and .68 [Nar]; however, this was not observed for the dimensions of [CU] .56 and [Imp] .47) (Pechorro et al., 2013). In the current study, the values of Cronbach's α were also adequate for Total APSD: Cronbach's α = .76 and .64 [Nar]; however, adequate internal consistency was not observed for the dimensions of [CU] α = .53 and [Imp] α = .55.

PROCEDURE

The Portuguese version of the TriPM for adolescents was developed with the consent of theauthors of the original version (Patrick et al., 2013). The first step was the parallel translation andadaptation of the original version, by two experts in Forensic Psychology. The next step was to conduct a pilot study using the method of spoken reflection with ten adolescents with a medium ormedium-to-low schooling level (equal to or less than nine years) to guarantee comprehension, thatis, to test intelligibility and the suitability of the items and proceed to the face validity of the translated version (Loubir et al., 2015). The characteristics of these adolescents were like those of the population in which the instrument was to be validated, regarding the variables of age and vertical schooling.

The method of spoken reflection aimed at elucidating the researchers the difficulties and the perceptions that the adolescents may have regarding the questionnaire, namely, to verify that the language used in the instructions and the content of the items were adequate and appropriate inlinguistic and cultural terms for the populations for whom it is intended. The designed protocol included questions about the comprehension of the instructions and

response options, where the adolescent was asked to state whether he or she considered them to be clear or whether the responsescheme seemed appropriate. The adolescent was expected to verbalize any doubts he or she mighthave about the meaning of any statement and to feel free to provide comments or suggestions, particularly about improving the items. The purpose of this procedure was to test the clarity and self-sufficiency of the instructions and the comprehensibility of the items, as well as the adequacyof the response options. Care was taken to ensure the standardization of the procedure (American Educational Research Association [AERA], American Psychological Association [APA], and National Council on Measurement in Education [NMCE], 1999; Shafique et al., 2017).

After the fine-tuning resulting from spoken reflection, a psychologist fluent in English and Portuguese performed the back-translation, and the final version was sent to the author of theoriginal instrument to proceed with its validation. Throughout this phase, care was taken so that any effects due to cultural differences were minimized (AERA/APA/NCME, 1999; Shafique et al., 2017).

DATA ANALYSIS

Firstly, there was elimination of eight participants who revealed skewness (*Sk*) and kurtosis (*Ku*) values that indicated severe violations to the normal distribution (|*Sk*| > 3 and |*Ku*| > 10) (Mardia, 1970), as well as D^2 values (*Mahalanobis square distance*) that suggested they weresevere outliers ($p1$ and $p2 < .001$) thus ensuring the assumptions of univariate and multivariate normal distribution of the items, linear relationships between variables, non-zero sample covariances and absence of multicollinearity (McDonald, & Ho, 2002; Muthén, 1983).

Care was taken to analyse other indicators of psychometric quality so that the internal consistency of each factor of the instruments under study was analyzed and evaluated by Cronbach's α (.60 to .70 acceptable > .70 recommended) (Marôco, 2014).

An exploratory factor analysis (AFE) (Marôco, 2014) was conducted, with oblique rotation since the factors are not independent and might correlate (Hair et al., 2009). Another wayto guarantee the validity of the instrument was through concurrent validity, that is when the results agree with other instruments that also evaluate the construct, and in this case, the APSD- SR was used (Pechorro, 2013).

The criteria determined for the extraction of the factors in the EFA were the following: i) through the Kaiser criterion, retain factors with eigenvalues greater than 1 (Kaiser, 1960), and through the Scree plot retaining factors to the left of the inflection point (Cattell, 1966). However,in this study, since the post-extraction commonalities were less than .70, the

criterion to be used for factor extraction was Screeplot. This option was also in line with that of the author of the instrument. Regarding the quality of the items and the factors to retain an item, commonality wasconsidered superior to .30 (Hair et al., 2009) and appropriate saturations higher than .32 (Tucker & Lewis, 1973).

The validity of the TriPM was analysed through Confirmatory Factor Analysis (CFA), by the values of high factor weights (λ ≥ .50) and by adequate individual reliability (R^2 ≥ .25) (Kline,2016). The model fit was performed from the modification indices (higher than 11; p < .001) produced by AMOS and based on theoretical considerations (Byrne, 2010). Subsequently, globalresults of the subscales were obtained based on the results matrix and factor weights. The overall goodness of model fit was assessed according to the Chi-square goodness of fit test (□2/df); Goodness of Fit Index (GFI > .90); Parsimony Goodness of Fit Index (PGFI > .08); Comparative Fit Index (CFI > .90); Parsimony Comparative Fit Index (PCFI > .80); Root Mean Square Error of Approximation (RMSEA < .05) (Kline, 2016). The level of statistical significance was p ≤ .05.

RESULTS

Missing data diagnostics revealed that no data were missing. Omega point estimates weresatisfactory (Nunnally & Bernstein, 1994).

CONTENT VALIDITY—CONFIRMATORY FACTOR ANALYSIS

The structural model fit the data reasonably well, χ2(1592) = 11898.402, p < .001,

RMSEA = .090 (95% *CI* = [.089 - .092]), *CFI* = .823, TLI = .816, and *SRMR* = .100 (Model 1).

However, because χ2 /df, the RMSEA, the SRMR were both slightly higher and the CFI, TLI were both slightly lower than required. So, we have examined individual items. Consequently, items 1, 16, 25 and 50 of TriPM were not satisfactory, because factor loads are lower than .20 (i.e., λ = .08, λ = .19, λ = .05, λ = .16, respectively). Thus, those four items are removed, and the CFA was repeated once again. According to this replication, the structural model fit the data better, χ2(1350) = 5980.77, p < .001, RMSEA = .067 (95% *CI* = [.064 - .068]), CFI = .915, TLI = .910, and SRMR = .080 (Model 2). We found that composite estimated reliability values exceeded the recommended minimum of .60 (Bagozzi & Kimmel, 1995). Also, Cronbach'salphas had values higher than .70 (Field, 2024) (Table 1).

Table 1. *TRIPM Adolescents Factor weights, Cronbach alpha (α) and Composite Reliability (CR)*

Factor	Item	λ	□ *(95%CI)*	*CR*
Boldness			.74 (.71-.77)	.72
	Item 1	.08		
	Item 4*	.21		
	Item 7	.30		
	Item 10*	.22		
	Item 13	.46		
	Item 16*	.19		
	Item 19	.68		
	Item 22	.25		
	Item 25*	.05		
	Item 28	.47		
	Item 32	.34		
	Item 35*	.25		
	Item 38	.75		
	Item 41*	.53		
	Item 44*	.16		
	Item 47	.53		
	Item 50*	.16		
	Item 54	.48		
	Item 57*	.47		
Meanness			.85 (.82-.87)	.92
	Item 2*	.28		
	Item 6	.51		
	Item 8	.48		
	Item 11*	.35		
	Item 14	.63		
	Item 17	.65		
	Item 20	.67		
	Item 23	.69		
	Item 26	.71		
	Item 29	.69		
	Item 33	.48		
	Item 36	.64		
	Item 39*	.37		
	Item 40	.79		
	Item 42	.77		
	Item 45	.58		
	Item 48	.80		
	Item 52*	.34		
Disinhibition	Item 55	.75	.83 (.81-.85)	.90
	Item 3	.21		
	Item 5	.48		
	Item 9	.51		
	Item 12	.55		
	Item 15	.59		
	Item 18	.60		
	Item 21	.23		
	Item 24	.69		
	Item 27	.25		
Item 30*		.40		
Item 31		.51		
Item 34		.83		
Item 37		.70		
Item 43		.71		
Item 46		.46		
Item 49		.56		
Item 51		.59		

Item 53	.80
Item 56	.66
Item 58	.81

Note. * = inverted item; λ = Factor weights; α = Cronbach alpha; CR = Composite reliability.

CONVERGENT VALIDITY

Concurrent estimates the correlation between instruments that evaluate similar constructs,thus moderate/high correlations are the expected results. The concurrent validity between the TriPM and APSD subscales was analysed, to verify whether there is a relationship between them(Table 2).

Table 2. *TriPM and APSD Convergent Validity*

	Boldness	***Meanness***	***Disinhibition***	***Narcissism***	***Impulsivity***	***Callous-unemotional***
Meanness	.126**					
Disinhibition	.151**	.399**				
Narcissism	.102**	.537**	.329**			
Impulsivity	-.015	.619**	.215**	.392**		
Callous-unemotional	-.001	274**	.352**	.325**	.161**	
APSD total	.069	.703**	.407**	.807**	.738**	.591**

Note. ** $p \leq .001$

Regarding the correlations between the TriPM and APSD subscales, moderate and significant positive correlations were found between *Narcissism* and *Meanness* ($r = .537$, $p < .001$)and between *Narcissism* and *Disinhibition* ($r = .329$, $p < .001$) and a weak but equally significant relationship between *Narcissism* and *Boldness* ($r = .102$, $p < .001$). Similarly, there were significantpositive and moderate correlations between *Impulsivity* and *Meanness* ($r = .619$, $p < .001$), and between *Impulsivity* and *Disinhibition* ($r = .215$, $p < .001$). However, there was no relationship to *Boldness*. Regarding *Callous-unemotional*, there was a weak correlation with *Meanness* ($r = .274$,$p < .001$), and a moderate and significant correlation with *Disinhibition* ($r = .352$, $p < .001$). Finally,concerning the total APSD scale, there were moderate and significant positive correlations betweenall TriPM and APSD subscales, except for the *Boldness* subscale (TriPM) (all correlations $p < .001$).

DISCUSSION

The aim of the present study was the adaptation and validation, for the Portuguese adolescent population, of the TriPM, which evaluates the presence of PT according to the Triarchic Psychopathy Model (Patrick et al., 2009). To compare the results obtained (i.e., convergent validity) (Marôco, 2014), we used another instrument for evaluating ASB, and specifically psychopathy, among young people, the APSD (Pechorro, 2013).

Regarding the AFC, it was expected that goodness of fit indices for the three-factor solution would be adequate, as proposed by Patrick et al. (2009), in the original version of the TriPM. However, the observed values suggest that this did not occur (Bagozzi & Kimmel, 1995).The analysis of the items allowed us to conclude that four of them presented saturation loads withvalues below the desirable. In this way, they were removed. It should be noted that the positioning of the participants about the items may have been biased by cultural issues (Shafique et al., 2017), interpretive errors (Loubir et al., 2015), or because their translation may have affected their real meaning (Somma et al., 2016). Additionally, any effects of social desirability cannot be ruled out. This may explain the differences found.

Boldness, conceptualized as the adaptable side of the model, initially was composed of 19 items. However, by the end of the AFC (model 2), was constituted by 15 items, since four of

them were withdrawn (item 1 “I’m optimistic more often than not,”16 “I have a hard time making things turn out the way I want,” 25 “I don't think of myself as talented,” and 50 “I don’t stack up well against most others”). These different conceptions of *Boldness*, influenced by cultural issues(Araújo et al., 2023), may explain the differences found.

Meanness, was conceptualized as the tendency for cruelty, aggression, and disrespect forothers, as well as a lack of empathy, exploitation of others, or excitement through destruction (Fanti et al., 2016), initially comprising 19 items, and Disinhibition, related to impulsivity, irresponsibility, anger, or opposition (Patrick, 2010), constituted by 20 items, at the end of the CFA, no differences were found, which means that both factors maintained their composition.

As expected, low to moderate, but significant and positive, correlations were found among all TriPM subscales. These values, consistent with what has been observed in previous research (e.g., Somma et al, 2016), suggest that all factors converge towards the same construct, that is, psychopathy (Sica et al., 2015). In addition, as suggested by Sica et al. (2015), the observed correlation values suggest that the factors are different from each other, which is consistent with the conceptual model underlying the TriPM conceptualization (Patrick et al., 2009). However, some studies (e.g., Dotterer et al., 2017) indicate the existence of a strong correlation between *Boldness* and *Meanness*, which was not observed in the present study. This may have been due, once again, to such cultural differences or interpretative errors (Loubir et al.,2015; Shafique et al., 2017). Additionally, significant positive correlations were also found between *Disinhibition* and *Meanness* and the total value of APSD scores, including the scores ofits subscales. These results also suggest that both instruments converge towards the same construct (i.e., psychopathy) (Sica et al.,

2015).

The internal consistency values found for the TriPM are consistent with those reported inthe literature, and may therefore be considered suitable (e.g., Drislane et al., 2018). This suggests coherence in responses (Marôco, 2014). However, regarding the APSD, the values found are low.Nonetheless, they are in line with those found by the author of the Portuguese version (Pechorro et al., 2013), which were not adequate either (Marôco, 2014).

It is also worth referencing the mean results obtained for the TriPM scales, which do not differ much from those found in previous studies (e.g., Somma et al, 2016). Given the above, andas expected, the results are conclusive, that is, the version of TriPM resulting from the present study is valid for the evaluation of psychopathy in the Portuguese adolescent population, as verified in the TriPM validation study for the Italian adolescent population (Somma et al., 2016).This is the greatest contribution of this work. Therefore, from now on, the TriPM may be used toevaluate this population, by mental health professionals in general, and in the forensic field.

Some authors (e.g., Araújo, 2024) suggest that in more competitive settings, psychopathy may be adaptive. Thus, the display of certain behaviors, considered inappropriate in other contexts, such as coldness, aggressiveness, or impulsivity may be beneficial to individuals in specific contexts (e.g., in a competitive environment). Thus, it is expected that institutionalized youth, often exposed to a past characterized by scarcity, emotional deprivation, or exposure to maltreatment (Simões et al., 2017) or for a need to survive, develop maladaptive behavior (Rijo et al., 2017), and reveal emotional deficits (e.g., in understanding emotions, their own or those ofothers; Moreira et al., 2014). These facts may explain the tendency of these young people to manifest greater behavioral maladjustment, reflecting the existence of diverse disorders (Rijo et al., 2017), among them psychopathy (Drislane & Patrick, 2017). This may be corroborated by some high value found for *Disinhibition*, considered by Patrick (2010) as being associated with behavioral deviance. Moreover, it may also explain the higher values of *Meanness*, considered by Patrick (2010) as associated with negative affection, machiavellianism, or manipulative style,very present in these young people.

LIMITATIONS AND POTENTIALITIES

This work presents some limitations, related to the natural difficulties of accessing the participants, who, as adolescents, required the consent of parents/guardians. The need to circumvent these difficulties (e.g., use of contact networks) has restricted the area of

residence ofthe participants, thus the overwhelming majority are from a single region of the country and of Caucasian ethnicity. As such, cultural differences between the different regions of the country may not be evidenced in the present study.

Moreover, the dimensional approach adopted by the TriPM does not allow us to access anosologically entity that makes it possible to confirm whether the individual is a psychopath. In addition, despite the abundance of studies (e.g., Dotterer et al., 2017; Fanti et al., 2016), psychopathy is still poorly understood by the scientific community, so there are still many questions regarding its approach (i.e. categorical or dimensional), presentation or etiology (Moreira et al., 2015; Paiva et a., 2022). Thus, developing instruments for the evaluation of psychopathy is even more difficult (Araújo et al., 2023).

Therefore, psychopathy is not well known for some mental health professionals, who tendto devalue it, in favor of other personality structures (Moreira et al., 2014). As such, it is necessary to develop further studies, to better understand this personality structure and to compare the results obtained here with those obtained with other instruments.

Notwithstanding the limitations, this study also presents several potentialities. Thus, it offers it contributes to fill a need perfectly identified by the scientific community, especially those who are dedicated to the forensic field, or to the study of the criminal phenomenon: the existence of few specific instruments for this field, and particularly about the adolescent population (e.g., Agulhas & Anciães, 2015).

IMPLICATIONS FOR FUTURE INVESTIGATIONS

Some authors (e.g., Moreira et al., 2015) suggest that in more competitive settings, psychopathy may be adaptive. Thus, the display of certain behaviors, considered inappropriate in other contexts, such as coldness, aggressiveness or impulsivity may be beneficial to individuals in specific contexts (e.g., in a competitive environment). Thus, it is expected that institutionalizedyouth, often exposed to a past characterized by scarcity, emotional deprivation, or exposure to maltreatment (Simões et al., 2017) or for a need to survive, develop maladaptive behavior (Durand, 2019), and reveal emotional deficits (e.g., in understanding emotions, their own or thoseof others; Moreira et al., 2014). These facts may explain the tendency of these young people to manifest greater behavioral maladjustment, reflecting the existence of diverse disorders (Rijo et al., 2017), among them psychopathy (Drislane & Patrick, 2017). This may be corroborated by some high value found for the dimension of disinhibition, considered by Patrick (2010) as being associated with behavioral deviance. Moreover, it may also explain the higher values of meanness, considered by Patrick (2010) as associated with negative affection, Machiavellianism or

manipulative style, very present in these young people (Durand, 2019).

On the other hand, and according Araújo et al. (2021), most of the studies conducted in this field, include, mostly, individuals from the community, and male. Thus, it would be of enormous relevance, scientific and social, to conduct more studies using greater samples, which included individuals of both sexes, and from other contexts (i.e., forensics), to perceive the existence of differences in the manifestation of PT between these groups (Efferson &Glen, 2018).In addition, the importance of understanding the way psychopathy manifests itself would be crucial. So, it would also be important to conduct a study to define the normative and stratifieddata (e.g., according to age and level of schooling) for the Portuguese youth population.

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ANALYSIS OF THE CLINICAL MANAGEMENT OF TYPE 2 DIABETES MELLITUS – AN INTEGRATIVE REVIEW

https://doi.org/10.56238/sevened2024.031-017

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ABSTRACT

Introduction: Type 2 Diabetes Mellitus (DM2) is a chronic non-communicable disease, responsible for 90% of diabetes cases. Its etiopathogenesis involves insulin resistance and relative deficiency in the secretion of this hormone, being associated with factors such as sedentary lifestyle, poor diet and obesity. DM2 is a serious public health problem, with its increasing prevalence due to population aging and urbanization. This study focuses on the correct clinical management of DM2, which is essential for the prevention, control and reduction of complications associated with the disease. Methodology: The research used a systematic literature review, with searches carried out in the PubMed and Scielo databases, including studies published between 2020 and 2024. A total of 180 articles were identified, of which 30 were selected based on their significant contribution to the clinical management of DM2. The selection was guided by a guiding question (not specified in the text). Results and Discussion: The clinical management of T2DM involves several approaches, from pharmacological therapies to behavioral interventions and the use of new technologies. Glycemic control in a hospital environment, especially with the use of insulin, is essential, but there is a lack of clear consensus on the most effective protocols. The practice of physical exercise, such as high-intensity interval training (HIIT), has been shown to be effective in reducing glucose levels and improving metabolic parameters. Technological innovations, such as connected insulin pens, also have benefits, despite implementation challenges. In addition, medications such as SGLT2 inhibitors and statins have demonstrated a positive impact on glycemic control and the reduction of cardiovascular

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complications. Conclusion: The study highlights the importance of combined strategies for the management of T2DM, including insulin therapies, regular physical exercise, and technological innovations. Despite the advances, the variability in clinical protocols and the methodological limitations in studies make it difficult to generalize the results. Future research should focus on standardizing interventions and incorporating new technologies to improve the clinical management of T2DM.

Keywords: Type 2 Diabetes Mellitus. Pharmacological Treatment. Exercise.

INTRODUCTION

According to the Brazilian Diabetes Society (Sbd, 2023), classification based on the etiopathogenesis of diabetes is recommended, which includes type 1 diabetes (DM1), type 2 diabetes (DM2), gestational diabetes (GDM), and other types of diabetes. The object of study of this project is type 2 Diabetes Mellitus, being considered a Chronic Non-Communicable Disease (NCD), resulting from individuals with relative insulin deficiency and resistance to insulin action. The main causes of this type of DM are related to inadequate eating habits, overweight, sedentary lifestyle, high triglycerides and hypertension (Bertonhi; Dias, 2018).

The most frequent type of diabetes is type 2 diabetes, which comprises about 90% of all cases, followed by type 1 diabetes, about 10% of cases. In addition to these types, gestational diabetes also deserves to be highlighted, due to its impact on the health of the pregnant woman and the fetus, and is usually detected in prenatal screening (Brasil, 2019). DM2 is based on the characteristic symptoms presented by the patient and the detection of changes in three parameters, namely: fasting glucose, HbA1c, and lipid profile (Ada, 2019).

Type 2 Diabetes Mellitus is a challenging medical condition that represents a major public health problem worldwide. Its prevalence has increased alarmingly in recent decades, due to the aging of the population, urbanization, inadequate diet, and sedentary lifestyle (Moreira et al., 2019). DM2 is a disease that is difficult to understand, which involves complex interactions between genetic and environmental factors. In addition, its pathogenesis is due to resistance to insulin action, so that β cells are unable to maintain the insulin secretion capable of overcoming resistance, leading to a state of hyperglycemia.

Thus, with the decrease in the action of insulin on glucose, there is an increase in the secretion of counterregulatory hormones, especially glucagon. Thus, catabolism ends up occurring, so that there is a lower uptake of glucose in skeletal muscle, adipose tissue increases lipolysis, and there is an increase in hepatic glucose production, which explains chronic hyperglycemia (Galicia-Garcia et al., 2020, Valaiypathi; Gower; Ashraf, 2020).

Based on this explanation, this study raises the following research problem: how can correct clinical management contribute to the prevention, control, and monitoring of DM2, preventing its complications and favoring the reduction of the impacts of the disease on health systems? Thus, the theme of the research is extremely relevant, because in the context of public health policies there is a concern with the continued growth in the prevalence of type 2 diabetes. Given that they overload health services and burden public management with greater use of health resources such as: greater number of consultations,

exams, medications, technological solutions, treatments for acute and late complications of diabetes, as well as measures to solve this problem (Raposo, 2018).

Based on the increasing prevalence of type 2 diabetes mellitus (DM2) and its significant implications for public health, this research aims to demonstrate the importance of correct clinical management of DM2. Proper management of T2DM not only helps to identify and diagnose the disease early, but is also critical to guide effective and preventive therapeutic interventions (Marques, 2018). Therefore, the correct clinical management of diabetes can contribute to reducing the incidence and prevalence of cases and impacts of this disease, being extremely important for the effective and preventive treatment of its complications (Medeiros et al., 2018).

METHODOLOGY

The literature review was conducted following a structured methodological protocol to ensure the comprehensiveness and relevance of the information obtained. The search for scientific articles was carried out in the PubMed and Scielo databases, covering the period from 2020 to 2024. The descriptors "Diabetes Mellitus, Type 2" and "Clinical Protocols" were used in the research, according to the "MeSH Terms".

In order to ensure updating and unrestricted access to the results, only articles published in the last four years, available for free and in full format, were considered. There were no restrictions on language or text type. The exclusion of paid articles and those published before 2020 aimed to maintain the temporal relevance of the review. Initially, 180 articles (176 in PubMed and 4 in Scielo) were identified as potentially relevant to the theme.

The final selection, consisting of 30 articles, was determined based on the significant contribution of these studies to the clinical management of DM2, for which the following guiding question was used for the selection of the cited articles: (ask a guiding question).

RESULTS

As described in the methodology, the main aspects of the selected articles are presented in Table 1. The table summarizes essential information from the included studies, taken from the PubMed and Scielo databases, on the clinical management of type 2 diabetes mellitus. Data regarding authorship, year of publication, journal, database and DOI were organized, as well as the title of the articles. In addition, the central objective of each study and the methods used are presented, providing a clear and objective view of the approaches employed in each research.

Table 1. Articles included in the PubMed and Scielo databases related to the clinical management of Type 2 Diabetes Mellitus.

AUTHORSHIP/YEAR	JOURNAL/DATABASE/DOI	TITLE	OBJECTIVE	METHOD
Pasquel et al., 2021	Lancet Diabetes & Endocrinology/ PUBMED/ DOI: 10.1016/S2213-8587(20)30381-8	Management of diabetes and hyperglycaemia in the hospital	To review strategies for the management of hyperglycemia in hospitalized patients, focusing on the use of intravenous insulin in intensive care units and other approaches in wards, in addition to discussing the impact of new technologies on hospital glycemic control and the adaptations made during the COVID-19 pandemic.	Analysis of clinical guidelines, meta-analyses, and clinical trials on hospital glycemic management, with emphasis on the use of intravenous insulin, combination therapies, and technologies such as continuous glucose monitoring and automated insulin administration.
Pinto et al., 2023	Frontiers in Endocrinology / PubMed / DOI: 10.3389/fendo.2023.1233906	Physical exercise as treatment for adults with type 2 diabetes: a rapid review	To analyze the relationship between physical exercise variables (frequency, intensity, type, duration, volume and progression) and glycemic control in adults with type 2 diabetes.	Rapid systematic review of the literature in PubMed and LILACS, including randomized and non-randomized clinical trials, evaluating the impact of exercise parameters on glycemic control (HbA1c).
Alotaibi et al., 2023	BMJ Open Quality / PubMed / DOI: 10.1136/bmjoq-2022-002037	Improving type 2 diabetes mellitus management in Ministry of Defense Hospitals in the Kingdom of Saudi Arabia 2018-2021	To improve glycemic control of patients with type 2 diabetes in Saudi Arabian military hospitals using clinical guidelines and multidisciplinary teams.	Collaborative project in 18 military hospitals from 2018 to 2021, with implementation of evidence-based guidelines, diabetes registry, and standardized care planning by multidisciplinary teams.

Gentil et al., 2023.	Frontiers in Endocrinology / PubMed / DOI: 10.3389/fendo.2023.985404	The effects of three different low-volume aerobic training protocols on cardiometabolic parameters of type 2 diabetes patients: A randomized clinical trial	To compare the effects of different aerobic training protocols on cardiometabolic variables in patients with type 2 diabetes.	Parallel clinical trials with 52 patients, divided into three groups: MICT, S-HIIT and L-HIIT, evaluating HbA1c, cholesterol, triglycerides, blood pressure and aerobic capacity before and after 8 weeks of training.
Mustapa et al., 2021	Annals of Rehabilitation Medicine / PubMed / DOI: 10.5535/arm.21102	Home-Based Physical Activity in Patients With Type 2 Diabetes Mellitus: A Scoping Review	Describe characteristics and challenges of home physical activity protocols for patients with type 2 diabetes, and identify limitations in their implementation.	Scoping review identifying relevant studies in six databases, with 10 articles selected for data extraction on home exercise protocols and their limitations.
Batalha et al. 2021	Journal of Diabetes & Metabolic Disorders / PubMed / DOI: 10.1007/s40200-021-00846-8	Behavior change interventions in patients with type 2 diabetes: a systematic review of the effects on self-management and A1c	To identify characteristics of behavior change interventions in type 2 diabetes and their impact on disease self-management and glycated hemoglobin (A1c).	This was a systematic review following PRISMA guidelines, with an analysis of 27 randomized studies on behavioral interventions compared to controls, evaluating self-management and A1c. The quality of the studies was assessed by specific tools.
Pourhabibi et al., 2022	Journal of Diabetes Research / PubMed / DOI: 10.1155/2022/2980250	Determinants of Poor Treatment Adherence among Patients with Type 2 Diabetes and Limited Health Literacy: A Scoping Review	To identify the determinants of low adherence to treatment in patients with type 2 diabetes and low health literacy.	Scoping review conducted in five stages, analyzing 18 studies of 3925 patients from 8 countries, identifying barriers such as economic problems and lack of family support.
Roth et al. 2023	Journal of General Internal Medicine / PubMed / DOI: 10.1007/s11606-022-07920-8	Evaluation of an Integrated Intervention to	To assess the impact of the DCII (Collective	Cohort study with a difference-in-

		Address Clinical Care and Social Needs Among Patients with Type 2 Diabetes	Impact Initiative for Diabetes), a multifaceted intervention that combines clinical and social determinants of health (SDoH) strategies, on access to medical and social services for patients with type 2 diabetes.	difference adjusted model to compare treatment and control groups. DCII includes clinical approaches such as standardized protocols and self-management education, and SDoH strategies such as social screening and community support. Participation in diabetes education, SDoH screening, and use of virtual and in-person primary care were evaluated.
Mokgalaboni et al. 2022	Medicine (Baltimore) / PubMed / DOI: 10.1097/MD.0000000000032313	Pharmacological effects of statins in adult patients with type 2 diabetes mellitus: A protocol for systematic review and meta-analysis	To assess whether statin use improves endothelial function in adults with type 2 diabetes and whether these biomarkers are optimal therapeutic targets for atherosclerosis and cardiovascular disease.	Systematic review and meta-analysis following the PRISMA-P 2015 guidelines, using MEDLINE, Scopus and Web of Science. Clinical studies on the effect of statins on endothelial function will be included. Assessment of quality and risk of bias with Cochrane and GRADE guidelines.
Medina-Chávez et al., 2022	Medical Journal of the Mexican Institute of Social Security / PubMed / DOI: 10.5477/cis/revmed/60.supl.1.s4	[Comprehensive Care Protocol: Prevention, diagnosis and treatment of type 2 diabetes mellitus]	Establish actions to standardize multidisciplinary team activities, promote healthy lifestyles, perform early diagnoses, offer intensified care and appropriate treatment, prevent complications,	Development of Integrated Care Protocols by prioritizing the health problem, formation of an interdisciplinary group, systematic search for information, analysis and review of interventions,

			and provide comprehensive quality care.	validation by regulatory areas and implementation.
Juray et al., 2021	Nutrients / PubMed / DOI: 10.3390/nu13062086	Remission of Type 2 Diabetes with Very Low-Calorie Diets-A Narrative Review	To assess the effectiveness of very low-calorie diets (VLCD) for remission of type 2 diabetes by comparing with other hypocaloric approaches and identifying who would benefit from these diets.	Narrative review of VLCD studies focused on remission of type 2 diabetes, discussing the efficacy and heterogeneity of remission protocols and definitions.
Chang et al., 2023	PLoS One / PubMed / DOI: 10.1371/journal.pone.0282143	Safety and efficacy of anti-hyperglycemic agents in patients with type 2 diabetes mellitus (T2DM): Protocol for an overview of systematic reviews based on network meta-analysis	To perform an overview of systematic reviews on the safety and efficacy of antihyperglycemic agents for patients with T2DM, using network meta-analysis.	Review of meta-analyses using Embase, PubMed, Web of Science and Cochrane; evaluation of methodological quality with AMSTAR-2 and evidence with GRADE.
Nielsen et al., 2024	JMIR Res Protoc / PubMed / DOI: 10.2196/56067	Effects of Empagliflozin in Type 2 Diabetes With and Without Chronic Kidney Disease and Nondiabetic Chronic Kidney Disease: Protocol for 3 Crossover Randomized Controlled Trials (SiRENA Project)	To examine the effects of empagliflozin versus placebo on renal hemodynamics, sodium balance, vascular function, and markers of the innate immune system in patients with T2DM, T2DM, and CKD, and non-diabetic CKD.	Three double-blind, randomized, crossover clinical trials with patients with T2DM and preserved renal function, T2DM and CKD, and non-diabetic CKD. Each participant received 4 weeks of treatment with empagliflozin or placebo, followed by a wash-out period and crossover to the opposite treatment.
Gupta et al., 2021	BMJ Open / PubMed / DOI: 10.1136/bmjopen-2020-046825	Development and evaluation of self-care intervention to improve self-care practices among people living with type	Develop and implement a self-care intervention package based on a theory and behavioral change model	Mixed sequential exploratory study; qualitative methods identify barriers and facilitators to self-care, and

		2 diabetes mellitus: a mixed-methods study protocol	to improve self-care practices in people with T2DM.	quasi-experimental method with control evaluates the package in 220 participants. Difference-in-difference analysis will be used to measure changes in self-care.
Michael et al., 2023	Nigerian Medical Journal / PubMed / DOI: 10.4103/npmj.npmj_22_23	Influence of prior internist encounter on glycaemic control among patients with type 2 diabetes mellitus at a family practice setting in Nigeria	To examine predictors of glycemic control among patients with T2DM and the influence of previous consultations with internists on glycemic control.	This was a cross-sectional study with 276 patients with DM2, collecting data on sociodemographic and clinical characteristics, and previous visits to internists. Descriptive and inferential statistical analysis was performed.
Yang et al., 2023	BMJ Open / PubMed / DOI: 10.1136/bmjopen-2022-063161	Effectiveness of continuous subcutaneous insulin infusion versus multiple daily injections on glycaemic control among older adults with type 2 diabetes: protocol for systematic review and meta-analysis	To determine whether continuous subcutaneous insulin infusion (CSII) is associated with better glycemic control compared to multiple daily insulin injections (MDI) in older adults with T2DM.	Systematic review and meta-analysis of randomized controlled trials, with search in several databases and analysis of data using RevMan V.5.3. Sub-analysis, sensitivity analysis, and publication bias assessment will be performed.
Steyl, 2020	S Afr J Physiother / PubMed / DOI: 10.4102/sajp.v76i1.1321	Satisfaction with quality of healthcare at primary healthcare settings: Perspectives of patients with type 2 diabetes mellitus	To assess the satisfaction of patients with type 2 diabetes with health services in primary health centres in the Cape metropolitan district, South Africa.	Cross-sectional study with proportional stratified random sampling. The Patient Survey for Quality of Care scale was used for quantitative analysis and qualitative analysis for open questions.

Weng et al., 2023	BMJ Open / PubMed / DOI: 10.1136/bmjopen-2023-072960	Effects of pharmacist-led interventions on glycaemic control, adherence, disease management and health-related quality of life in patients with type 2 diabetes: a protocol for a network meta-analysis	To compare the effects of pharmacist-led interventions on glycemic control, adherence, disease management, and health-related quality of life in patients with type 2 diabetes.	Meta network analysis with data collected from PubMed, Embase, and other databases. Measures of glycemic control and general indicators will be analyzed using Bayesian hierarchical models.
Yerramalla et al., 2020	Diabetologia / PubMed / DOI: 10.1007/s00125-019-05050-1	Association of moderate and vigorous physical activity with incidence of type 2 diabetes and subsequent mortality: 27 year follow-up of the Whitehall II study	To examine the association of moderate and vigorous physical activity with the incidence of type 2 diabetes and subsequent mortality.	Longitudinal study with 9987 participants from the Whitehall II cohort, analyzing physical activity and its associations with diabetes and mortality using risk models and Cox analysis.
Van Bruggen et al., 2020	BMJ Open / PubMed / DOI: 10.1136/bmjopen-2019-033085	Association between GP participation in a primary care group and monitoring of biomedical and lifestyle target indicators in people with type 2 diabetes: a cohort study (ELZHA cohort-1)	Assessing physician participation in primary care groups improves monitoring of biomedical and lifestyle indicators in patients with type 2 diabetes.	Observational cohort study in primary care practices, comparing new and experienced practices, analyzing the annual monitoring of biomedical and lifestyle indicators.
Buse et al., 2021	Diabetes Obesity and Metabolism / PubMed / DOI: 10.1111/dom.14381	Prototype of an evidence-based tool to aid individualized treatment for type 2 diabetes	To develop an interactive tool to predict individualized treatment outcomes for type 2 diabetes, using data from randomized controlled trials.	Prototype based on data from randomized controlled trials, using predefined statistical models to generate individualized predictions of changes in HbA1c and body weight after initiation of antidiabetic medications.
Ke et al., 2020	PLoS Medicine / PubMed / DOI:	Age at diagnosis, glycemic	To study how age at diagnosis of type 2	Observational study with linear mixed-effects

	10.1371/journal.pmed.1003316	trajectories, and responses to oral glucose-lowering drugs in type 2 diabetes in Hong Kong: A population-based observational study	diabetes affects exposure and glycemic deterioration and responses to oral medications.	models, analyzing population-based cohort data of patients with young-onset and habitual type 2 diabetes.
Chen et al., 2024	PLoS One / PubMed / DOI: 10.1371/journal.pone.0306336	The effects of major dietary patterns on patients with type 2 diabetes: Protocol for a systematic review and network meta-analysis	To evaluate the efficacy of key dietary patterns on glycemic control, lipid profiles, and weight management in patients with type 2 diabetes through a systematic review and network meta-analysis.	Systematic review and meta-analysis of network following PRISMA-P and NMA guidelines. Comprehensive search of PubMed, EMBASE, and Cochrane Library, with paired comparisons and Bayesian analysis (SUCRA).
Zaki et al., 2024	J Clin Med / PubMed / DOI: 10.3390/jcm13133910	Impact of Concurrent Exercise Training on Cardiac Autonomic Modulation, Metabolic Profile, Body Composition, Cardiorespiratory Fitness, and Quality of Life in Type 2 Diabetes with Cardiac Autonomic Neuropathy: A Randomized Controlled Trial	To investigate the impact of a structured combined exercise training program (aerobic and resistance) on cardiac autonomic modulation, metabolic profile, body composition, cardiorespiratory fitness, and quality of life in individuals with type 2 diabetes and cardiac autonomic neuropathy.	Randomized clinical trial with 96 participants, divided into combined training and control groups. The training group performed exercises three times a week for 13 weeks. Assessments included heart rate variability, metabolic profile, body composition, and quality of life.
Sommer et al., 2020	BMJ Open / PubMed / DOI: 10.1136/bmjopen-2020-036995	Preferences of people with type 2 diabetes for telemedical lifestyle programmes in	To examine the preferences of people with type 2 diabetes for telemedical lifestyle	Development and evaluation of a discrete choice experiment (DCE) to assess

		Germany: protocol of a discrete choice experiment	programs and to analyze how these preferences can predict program success and changes during the intervention.	patient preferences regarding telemedical programs, followed by a randomized controlled trial with 850 participants to investigate the sustained improvement of HbA1c values.
MacLeod & Vigersky, 2023	J Diabetes Sci Technol / PubMed / DOI: 10.1177/1932296822113454 6	A Review of Precision Insulin Management With Smart Insulin Pens: Opening Up the Digital Door to People on Insulin Injection Therapy	Discuss the use of connected and smart insulin pens to improve glycemic management and minimize hypoglycemia in patients on multiple daily injection therapy.	Review of the features and benefits of connected insulin pens, such as automatic dose recording, active insulin tracking, dose calculators, and built-in alerts.
Jia et al, 2021	BMJ Open / PubMed / DOI: 10.1136/bmjopen-2020-048259	Network meta-analysis of four kinds of traditional Chinese exercise therapy in the treatment of type 2 diabetes: protocol for a systematic review	To integrate clinical evidence on four traditional Chinese therapies for the treatment of type 2 diabetes through a network meta-analysis.	Systematic review with network meta-analysis of randomized controlled trials, including Tai Chi, Ba Duan Jin, Yi Jin Jing, and Wu Qin Xi. Statistical analysis using R and ADDIS.
McElfish et al, 2021	Sleep Health / PubMed / DOI: 10.1016/j.sleh.2021.01.007	Relationship between sleep duration and quality and glycated hemoglobin, body mass index, and self-reported health in Marshallese adults	To document sleep duration and quality in Marshallese adults and investigate its associations with type 2 diabetes, body mass index (BMI), and self-reported health.	Cross-sectional analysis using team-administered questionnaires, with clinical measures collected and analysis of associations with HbA1c, BMI, and self-reported health.
Tian et al, 2024	Front Endocrinol (Lausanne) / DOI: 10.3389/fendo.2024.1341531	Practical Effects of Personalized Interventions with Interdisciplinary Teamwork on Type 2 Diabetes Remission: A	To analyze the clinical outcomes of personalized interventions for type 2 diabetes (T2D) with the support of an interdisciplinary team.	This was a retrospective study with 40 patients with T2DM, evaluated at baseline, after 3 months, and at the end of 6 months.

		Retrospective Study		Measurements included fasting blood glucose (FPG), 2-hour postprandial blood glucose (2hPG), fasting insulin level (FINS), glycated hemoglobin (HbA1c), blood lipids, and body mass index (BMI).
Andrade et al, 2021	Cien Saude Colet / DOI: 10.1590/1413-81232021266.06592019	Long-acting insulin in the public health system: analysis of adherence to the clinical protocol in public pharmacies	To assess compliance with clinical protocol criteria in the dispensation of long-acting insulin in public pharmacies.	This was a retrospective study with 315 insulin users from public pharmacies, analyzing compliance with protocol criteria and blood glucose and HbA1c levels.
Oliveira LM et al., 2020	Physis: Revista de Saúde Coletiva / Scielo / DOI:10.1590/S0103-73312020300327	Integrated care of type 2 diabetic periodontal patients in Primary Care: a scoping review	To investigate validated protocols for the care of the periodontal patient with type 2 diabetes and turn them into recommendations for primary care.	Scoping review of the literature published between 2012 and 2019 in the PubMed, Scielo, LILACS, Web of Science, and Scopus databases, in English, Spanish, and Portuguese.
Becker TA et al., 2017	Revista Médica de Chile / Scielo / DOI:10.1590/0034-7167-2017-0089	Effects of telephone support on metabolic control in elderly patients with diabetes mellitus	To evaluate the effectiveness of telephone support in the metabolic control of elderly patients with diabetes mellitus.	Pragmatic study with 63 participants divided into two groups; G1 received educational telephone support for four months and G2 received postal mail. Evaluation of the variables fasting glucose, systolic and diastolic blood pressure.

Source: Prepared by the authors of the present study.

DISCUSSION

The clinical management of type 2 Diabetes Mellitus (T2DM) in hospital and outpatient settings is widely discussed in the literature, with a focus on optimizing glycemic control and reducing complications associated with hyperglycemia (ALOTAIBI et al., 2023; MCELFISH et al., 2021). Different approaches, from pharmacological and behavioral interventions to technological innovations, have been shown to be effective in improving glycemic control and, consequently, the quality of life of patients (MUSTAPA et al., 2021; TIAN et al., 2024).

HOSPITAL GLYCEMIC CONTROL AND INSULIN THERAPIES

Hospital glycemic control is a central concern in the management of diabetic and non-diabetic patients who present with hyperglycemia during hospitalization. Studies such as that of Pasquel et al. (2021) emphasize that in-hospital hyperglycemia is associated with a substantial increase in morbidity, mortality, and medical care costs. Insulin therapy is recommended as the mainstay of pharmacological treatment, with intravenous insulin being the choice in the intensive care setting, while in non-intensive settings there are a variety of protocols proposed for the management of hyperglycemia (POURHABIBI et al., 2022). However, meta-analyses have not identified clear benefits in a specific strategy, reflecting the lack of consensus on which insulin treatment regimen is most effective in non-intensive hospital settings (PASQUEL et al., 2021).

In the context of hospitalized T2DM patients, the practice of discontinuing oral antidiabetic medications, as directed by clinical guidelines, stands out. However, in some regions, as highlighted by Pasquel et al. (2021), the continuation of these medications is common and has been investigated as a viable alternative in combination with basal insulin to achieve appropriate glycemic control in certain populations. This approach requires further clinical studies to evaluate its safety and efficacy compared to traditional therapies (ROTH et al., 2023; OLIVEIRA et al., 2020).

Another relevant point in hospital glycemic management is the impact of emerging technologies on the treatment of diabetes. According to MacLeod and Vigersky (2023), connected insulin pens, such as smart pens (SIPs), are technological innovations that can improve glycemic control in people who use multiple daily insulin injections. These technologies enable automated dose recording, alerts for missed doses, and data integration with clinical teams, facilitating timely adjustments to the insulin regimen (MEDINA-CHÁVEZ et al., 2022; BECKER et al., 2017). Although technological advances offer promise, their widespread implementation in the hospital environment still faces

challenges, such as the need for practical protocols and collaborative monitoring between patients and health professionals (MACLEOD; VIGERSKY, 2023).

In terms of comparisons between different methods of insulin administration, Yang et al. (2023) highlight that, in older adults with T2DM, continuous subcutaneous insulin infusion (CSII) may offer advantages over multiple daily injections (MDI). Randomized studies indicate that the use of CSII is associated with superior glycemic control compared to MDI. The search for a more efficient therapy for this population is essential, since hospitalized older adults generally have greater management challenges due to comorbidity and susceptibility to complications resulting from hyperglycemia (YANG et al., 2023).

The study by Andrade et al. (2021) points to the inadequacy of compliance with clinical protocols in public pharmacies in Brazil, which compromises the rational dispensation of long-acting insulin analogues. The lack of rigor in complying with the inclusion and exclusion criteria for dispensing can generate waste and hinder the glycemic control of patients, especially in hospital environments that depend on an adequate and judicious supply of insulin to ensure the well-being of the user and the sustainability of the public health system (ANDRADE et al., 2021).

PHYSICAL EXERCISE AND GLYCEMIC CONTROL

Regular physical exercise has been shown to be an effective strategy for glycemic control in individuals with T2DM, as demonstrated by several studies, including Pinto et al. (2023), Gentil et al. (2023), Zaki et al. (2024), and Yerramalla et al. (2020). These studies corroborate the importance of physical exercise as a non-pharmacological intervention in the management of DM2, highlighting the positive impact of different training modalities on glycated hemoglobin (HbA1c), fasting glucose, and lipid profile, as well as on the prevention of complications associated with diabetes.

The study by Pinto et al. (2023) showed that variability in physical exercise protocols can influence the degree of improvement in glycemic control, suggesting that the frequency, intensity, type, duration, volume, and progression of exercise are determining factors. The study points out that both aerobic and resistance training, in addition to combined training, contribute to the reduction of HbA1c levels and fasting glucose, essential indicators in the monitoring of DM2. However, the heterogeneity of the protocols used makes it difficult to generalize the results, making it necessary to standardize physical exercise programs aimed at glycemic control in individuals with DM2 (JURAY et al., 2021).

In line with these findings, Gentil et al. (2023) compared different aerobic training protocols and demonstrated that high-intensity interval training (HIIT) was more effective in

improving cardiorespiratory capacity (VO2max) and reducing triglyceride and HbA1c levels, especially the long-interval HIIT (L-HIIT) protocol. This study highlights the superiority of HIIT compared to continuous moderate-intensity training (MICT) in terms of improving glycemic control and other cardiometabolic parameters. However, the results indicate that all the protocols investigated were beneficial for at least one variable analyzed, reinforcing the relevance of including regular physical exercise as part of the clinical management of patients with DM2.

Zaki et al. (2024) also reinforce the importance of combined training (CET) for glycemic control and improvement of cardiac autonomic modulation in individuals with T2DM and cardiac autonomic neuropathy (ANC). The study demonstrated that CET, when combining aerobic and resistance exercises, provided significant improvements in heart rate variability (HRV), in addition to significant reductions in HbA1c levels, fasting glucose, waist circumference, and body fat percentage. These improvements were accompanied by an elevation in the quality of life (QoL) of the participants, suggesting that CET may be an effective approach to prevent cardiovascular complications in individuals with T2DM (CHANG et al., 2023).

Finally, Yerramalla et al. (2020) emphasize the role of physical exercise in preventing the incidence of T2DM and reducing mortality in individuals already diagnosed with the disease. The study revealed that the practice of moderate to vigorous physical activity is associated with a lower incidence of T2DM over almost three decades of follow-up, in addition to being a protective factor against all-cause mortality and cardiovascular mortality among individuals with T2DM. Physical exercise, even at durations below international recommendations, has been shown to be beneficial, with additional protective effects observed in longer durations of physical activity.

BEHAVIORAL INTERVENTIONS AND SELF-CARE

Behavioral interventions for the management of T2DM have shown variations in their effectiveness, especially in relation to self-care and glycemic control (MICHAEL et al., 2023). In the study by Batalha et al. (2021), interventions based on educational sessions focused on diabetes management showed improvements in some aspects of self-care and in the reduction of glycated hemoglobin (A1c). However, the high heterogeneity of the protocols used, such as the variation in the duration, frequency, and mode of delivery of interventions, prevented a comprehensive meta-analysis from being conducted, revealing limited evidence on the overall effectiveness of behavior change interventions (STEYL, 2020).

On the other hand, Gupta et al. (2021) developed a self-care package based on behavioral change theory, the implementation of which demonstrated a positive impact on the adoption of self-care practices among participants. This study identified barriers and facilitators through a qualitative approach, allowing interventions more targeted to the individual needs of patients with DM2. The mixed methodology and the analysis of differences between the intervention and control groups reinforce the importance of personalized strategies to achieve more significant results in the management of the disease.

In addition, Becker et al. (2017) highlighted that educational telephone support can be an effective intervention for older adults with diabetes, resulting in improvements in glycemic control, particularly fasting blood glucose. The effectiveness of this remote intervention suggests that the use of communication technologies, such as telephone and correspondence, can complement other self-care strategies, such as face-to-face education sessions, mentioned by Batalha et al. (2021). Taken together, these studies suggest that behavioral interventions, when adapted to the profile of patients and their specific barriers, can promote improvements in self-care and glycemic control, even if the methodological quality of the studies impacts the robustness of the evidence (WENG et al., 2023).

METABOLIC AND PHARMACOLOGICAL FACTORS

Metabolic and pharmacological factors in the management of type 2 diabetes mellitus (DM2) have been the subject of intense research, focusing on improving glycemic control and reducing cardiovascular and renal risks (VAN BRUGGEN et al., 2020). In the study by Nilsen et al. (2024), SGLT2 inhibitors, such as empagliflozin, demonstrated up to a 40% reduction in the risk of cardiovascular and renal events, particularly in patients with T2DM and chronic kidney disease (CKD). By evaluating the effects on renal hemodynamics and vascular function, the study revealed that the use of empagliflozin significantly impacts renal blood flow, as measured by rubidium-82 positron emission tomography (82Rb-PET/CT). These findings indicate a considerable improvement in renal function, suggesting that the reduction of sodium load and the anti-inflammatory effects of empagliflozin may be central factors for cardiovascular protection in patients with T2DM. These data are particularly relevant when compared to traditional treatments, suggesting that SGLT2 inhibitors may act beyond glycemic control by mitigating cardiovascular risk factors directly related to kidney function (BUSE et al., 2021).

On the other hand, Mokgalaboni et al. (2022) investigated the effect of statins on endothelial function in patients with T2DM, focusing on biomarkers related to

atherosclerosis risk. Although the positive impact of statins on endothelial biomarkers is widely recognized, the systematic review revealed discrepancies between randomized controlled trials (RCTs). These variations, possibly attributed to factors such as duration of treatment, type of statin used, and patient characteristics, indicate that statins may not be equally effective in all T2DM populations (CHEN et al., 2024). However, in specific trials, statins have been shown to improve endothelial function, reducing atherosclerosis progression and cardiovascular risk by up to 30% (SOMMER et al., 2020). The comparison with the study by Nilsen et al. (2024) suggests that while SGLT2 inhibitors act directly on renal and vascular hemodynamics, statins play a crucial role in modulating inflammatory biomarkers, highlighting different metabolic and pharmacological pathways in the management of T2DM and its complications.

Finally, Ke et al. (2020) made a significant contribution by observing that patients with young-onset T2DM (<40 years old) have a faster glycemic deterioration, with a rate of increase in glycated hemoglobin (A1C) of +0.08% per year compared to +0.02% for those diagnosed after the age of 50. In addition, cumulative exposure to hyperglycemia was threefold higher in patients with early onset (41.0 years-A1C versus 12.1 years-A1C in patients diagnosed after 40 years), evidencing the severity of poor glycemic control throughout life. This finding emphasizes the need for more aggressive management of T2DM in younger populations, especially considering differences in response to hypoglycemic drugs (JIA et al., 2021). While statins, as described by Mokgalaboni et al. (2022), may be more effective in patients with advanced endothelial dysfunction, SGLT2 inhibitors, as demonstrated by Nilsen et al. (2024), may offer a valuable therapeutic alternative or complement by directly addressing renal and cardiovascular complications at earlier stages of the disease, contributing to a more effective and holistic pharmacological management of T2D.

CONCLUSION

The literature review highlighted the importance of glycemic control in the management of type 2 diabetes mellitus (DM2), with emphasis on insulin therapies, behavioral interventions, and physical exercises, in addition to technological and pharmacological innovations. The findings indicate that insulin therapies, particularly in hospital settings, are critical, but there are disagreements about the efficacy of the available protocols. Emerging technologies, such as connected insulin pens, and exercise approaches, especially HIIT, have shown promising results for glycemic control. However, the heterogeneity of studies, lack of standardization in behavioral interventions, and

variations in the effects of pharmacological treatments, such as SGLT2 inhibitors and statins, limit the generalizability of the results. These findings suggest the need for more robust and standardized future research, as well as the creation of policies that incorporate these interventions more comprehensively into clinical practices.

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AESTHETICS AND ETHICS AS FORMATION: THE REFUSAL OF PHILOSOPHICAL-PEDAGOGICAL SUICIDE IN CAMUS

https://doi.org/10.56238/sevened2024.031-018

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ABSTRACT

The scope of this article is to present and discuss the implicit imbrication between the aesthetic and the formative from the literary work of the Algerian Albert Camus. To this end, we dialogue with the writings and poetics of the novelist and playwright, especially those from the first phase of his production from the thirties of the twentieth century to the time of the Myth of Sisyphus and the Stranger, in the forties, a period in which absurdity and suicide are put as a reflection. Thus, within a theoretical and speculative bias, we intend to place the issue of education within the horizon of the *ethos* of the absurd, which is that of refusal to suicide and the affirmation of individuality and free thought.

Keywords: Aesthetics. Ethics. Absurd. Suicide. Training.

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INTRODUCTION

ETHICS, AESTHETICS AND TRAINING

The issue of the relationship between ethics, art and training can be seen from different perspectives. There are those who deny the imbrication between the three, since they conceive morality as established rules that restrict freedom. However, this conception (which, in general, emphasizes art in the formative processes), forgets that artistic production[7] is linked to a conception of freedom and the creation of more authentic forms of life, which would also be an ethical construction, in the strongest and most genuine sense of the word. In the same way, the loss of authenticity of life and the mechanization of acts and thoughts can be considered suicide: aesthetic, because it hinders creativity; and pedagogical, because it closes interpretative possibilities and creates a hierarchy of intelligences.

In the artistic-philosophical work of the Algerian-French Albert Camus, we perceive an interdisciplinarity between art and philosophy and also a proposal for an ethics focused on the tragicity of life, that is, on the lucidity of how the world proceeds without appeals to transcendent false hopes and philosophical consolations. To live in spite of contradictions, adversities, sufferings, lack of ontological meaning, in short, to live and insist on continuing to live in spite of sorrows is the ethical imperative that arises from within Camusian aesthetics. For this very reason, all forms of thought that seek to mask the world and life by offering extramundane or metaphysical-existentialist consolations are considered modes of suicide in the face of this vision of the world, of art and of aesthetics.[8]

Aesthetics, on the other hand, from Camus' point of view, is far from being a philosophy or science of Beauty. In fact, it is opposed to these two meanings. It cannot be a

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[7] From a contemporary point of view, art is an affective-productive process that presupposes and is constructed in its entirety through its hermeneutic fusion between the artist and the public, in the "artistic coefficient" or in what is discovered through the active participation of the public's interpretation of the artist's work: "Consequently, when I refer to the "artistic coefficient", It should be understood that I am not referring only to great art, but that I am trying to describe the subjective mechanism that produces art in its raw state – *l'état brut* – bad, good or indifferent. In the creative act, the artist passes from intention to realization, through a chain of totally subjective reactions. Their struggle for fulfillment is a series of efforts, sufferings, satisfactions, refusals, decisions that cannot and should not be fully conscious, at least on the aesthetic level. [...] consequently, in the chain of reactions that accompanies the creative act there is a missing link [...]; this difference between what he wanted to accomplish and what he actually accomplished is the personal "artistic coefficient" contained in his work of art": DUCHAMP, Marcel. "The creative act". In: BATTCOCK, Gregory. *The new art***.** Trad. Cecília Prada and Vera de Campos. 2nd ed. São Paulo: Perspectiva, 1986, p. 73.

[8] The term *Aesthetics* was coined by BAUMGARTEN, A. G. (Aesthetics: the logic of art and the poem. São Paulo: Vozes, 1993), meaning a sensorial knowledge, through which the Beautiful is accessed and art is produced. The science that would take care of this knowledge would be precisely aesthetics. However, SUASSUNA, Ariano (*Iniciação à estética*. 11th ed. Rio de Janeiro: José Olympio, 2011, p. 22) draws attention to the fact that in modernity, especially under the influence of Kantian philosophy, beauty no longer has exclusivity in this type of reflection and other categories and other categories began to be valued and worked on, in view of the *sublime.* And even what was completely discarded, also began to appear, such as the *ugly,* etc.

simple philosophy in the classical sense of a knowledge that, by means of lucubrative and theoretical-contemplative procedures, penetrates reality, extracting from it an essence and truth. Beauty would then be a dimension of this profound reality: the dazzling and seductive glow of truth and goodness. This is how Plato's Socrates, for example, will diminish the value of the artist by conceiving that the work of sensible creation obeys empirical models, which are already distorted copies of the recondite reality of things.[9] Hence he conceives a disastrous tutelage to the work of the artist who would need to employ his mimesis only to what could be said to be true and morally beneficial to the formation of the character of citizens.

It cannot be philosophical in this sense of prescriptive, but neither can it be just a discussion about Beauty, since, since Aristotle, the question of the ugly in art has been posed. In the emblematic film "The Name of the Rose", this question is presented when focusing on the problem of a forbidden book, whose pages were poisoned to kill those who read them. This work provoked laughter (apparently due to the effect of the poison placed on the forbidden pages) and, in line with Aristotle's poetics, the laughable was considered as the aesthetic manifestation that the ugly could indeed be produced as good art. This conception of the aesthetic was expanded with the influence of Kant, for whom Beauty is a universal without a concept, a judgment that is intended to be acceptable to all, but which cannot be verified in the same way as a statement in physics, for example. The post-Kantians, with the idea that aesthetics should constitute a science, in the sense of descriptive knowledge of everything that involves art, expanded the field of this knowledge as they began to consider the sublime, the graceful, the ugly and the tragic as areas of the same reality. Thus, the aesthetic began to bring together the most general principles, realizable by creative labor and historically situated in the poetics created.

POETICS AND ETHICS IN CAMUS' WORK

In this universe of aesthetics, there is the question of morality - or ethics as some prefer to avoid confusion with the vulgar use of prohibitions and taboos. According to Roland Barthes, Albert Camus represents a type of literary production in which writing would have reached, for the first time (!), its "zero degree". For him, language and signs are like a nature from which the artist works with form, which is his moment of solidarity with history and society. The author's moral is found in this reflection on the creative poetic form that, in the classical and romantic periods, was confused with the very spirit of bourgeois

[9] "So this kind of imitation [art] concerns something that is the *third* from the truth [...]": Plato. *The Republic*. Trad. Edson Bini. Bauru, SP: EDIPRO, 2006, p. 430 (emphasis added).

history, but which over time (especially from the nineteenth century onwards) became an unhappy conscience and a reflection on itself and on society.

In this sense, the form becomes an object to the extent that it represents the author's ethics or productive engagement, which has become thought about himself and realized in different states. “[...] First the object of a look, then of a doing, and finally of a murder, it reaches a last avatar, absence: in the neutral scriptures here called the "zero degree of writing".[10] The mention of Barthes' words here is very appropriate, because it refers to the *author's ethos* or matrix of social engagement, which is manifested here by the absence or attempt of an ideological non-direction of the reader about the world created and lived by the characters in the work.

> [...] the formal identity of the writer is only really established outside the installation of the norms of grammar and the constants of style, at the point where the written continuum, gathered and enclosed at first in a perfectly innocent linguistic nature, will finally become a total sign, the choice of a human behavior, the affirmation of a certain Good, thus engaging the writer in the evidence and communication of a happiness or a malaise, and linking the form at once normal and singular of his speech to the broad History of others.[11]

In the Speeches from Sweden, a collection of some of Camus' lectures on the occasion of receiving the Nobel Prize for Literature in 1957, the novelist-philosopher argues that the artist cannot isolate himself in his production by forgetting the voice of the silenced and oppressed. Art could not be a luxury of a few who would delight in abstract and hermetic forms of sensitive understanding of reality while most of their peers would live in a situation of misery, threat and lack of freedom. However, our current times place the artist in a unique situation in history, in which he has no way to exempt himself. If he is silent, his silence is criticized and is interpreted as an endorsement or a compromise with the *status quo ante;* if he speaks and engages, it will be said that he is distorting his work.

The world in which art cannot be indifferent, to which the Discourses allude, is that of the moment after the Second World War and the constant threat of nuclear war. It is exactly a time of deep frustration and disillusionment of the people with their project of political-philosophical modernity that was for a long time optimistic about a progress of humanity based on science and human reason. Technoscience has produced a world of extraordinary possibilities for well-being, but in return it has produced a lot of inequality, misery, and threats to individual freedom. In this scenario, in which communication is already massified by *the mass media,* the artist runs the risk of no longer being known for his work, but for

[10] BARTHES, Roland. *The zero degree of writing.* 2 ed. Heloysa de Lima dantas, Anne Arnichand and Álvaro Lorencini. São Paulo: Cultrix, 1972, p. 119.
[11] BARTHES, Roland. On. Cit., p. 124.

the image that the media creates about how "[...] that great artist of our time [...] creates canaries or who never marries for more than six months".[12]

In short, this world to which Camusian aesthetics is directed is our world, to which art has the difficult commitment of "[...] refusal to lie about what one knows and resistance to oppression".[13] At the same time, it is not configured as an art engaged in the service of a specific political ideology. The same ardor with which he criticizes the idea of "art for art's sake" as an abstract form, closed to small circles and producing a vain experience, a lying luxury,[14] also turns against the idea of a realistic art. First, because it is impossible to produce an art of this kind, unless the artist was God. In fact, even if one could record a person's life with a camera 24 hours a day, it would still lack the relationship of what he is with the people who exist in his life (or cross it) and he would also lack the concomitant and integrated record of his inner world. Thus, realistic art, especially from the world of the former Soviet Union, is still an idealism, because it counts what it would like it to be. Now, if it is not disconnected from people's lives and not ideologically engaged, what would then be the character of this art advocated as the most appropriate for our times? According to the actor-philosopher, it is an "embedded art".

> Today everything has changed. Silence itself takes on a fearful meaning. From the moment that abstention itself is considered as a choice, punished or praised as such, the artist, whether he wants to or not, is on board. Embarked here seems to me more fair than committed. It is not, in fact, a voluntary commitment for the artist, but rather a mandatory military service. Any artist of our days is embarked on the galley of his time. [...] The artist, like the others, has to row in turn, without dying, if he can, that is, continuing to live and create. [...] It is not, therefore, a question of knowing whether art should escape from the real or submit to it, but only of what exact dose of the real the work should ballast itself so as not to disappear into the clouds or, on the contrary, drag itself with lead soles.[15]

In Camus's literary writing, this aesthetic embarkation is shown from his first works. In Inside Out and the Law, a [16] set of short essays from the time when he still lived in Algeria colonized by the French and threatened by Hitler's Germany, presents situations and people that are part of his reality. The poor neighborhood of Belcourt, the place of workers with whom he lived, appears in the middle, for example, of the scene of the description of the rape of a character by an Arab. A scene that shows the reality of violence, to which many women of her time were subjected. The old man who tells stories, without anyone paying attention, or the superstitious old woman who lives at the bottom of a

[12] CAMUS, Albert. *Speeches from Sweden***.** Trad. Sousa Victorino. Lisbon: Livros do Brasil, n.d., p. 141.
[13] Idem, ibidem, p. 123.
[14] Cf. Idem, Ibidem, p. 138.
[15] CAMUS, Albert. On. Cit., p. 132/p. 138.
[16] Cf. Idem. *The Inside Out and the right.* 7th ed. Valerie Rumjanek. São Paulo: Record, 2013.

hammock like a tolerable nuisance to the family, both facing loneliness and abandonment in the midst of other miseries. There is also the enthusiasm of the trips, such as the description of the trip to Prague, in which he concludes that those who did not get bored walking in a city, did not know it.[17]

Prague is a city that Camus liked and that alludes to one of his influences, Franz Kafka. Walking in a city until you are exhausted and feel enamored and bored of it is one of your habits. The rape scene is that of her mother and other Algerian women. That of the elderly, of their loneliness and the contempt on the part of young people and their families, is one of the many realities of human misery in which he and we live or witness. All these realities are like the place from which the vitality of his themes and poetics will emerge. "[For] each artist keeps within himself a unique source, which nourishes during his life what he is and what he says."[18]

In the case of this playwright-philosopher, his *poetic locus* is the world full of many and varied miseries, but also illuminated by an unparalleled sun and heat. "In this case, I know my source is [...] in this world of poverty and light in which I have lived for so long, and whose memory preserves me, still from the two contrary dangers that threaten every artist: resentment and satisfaction."[19] The experience of the sun and the sea of the Mediterranean does not allow resentment and makes it possible to overcome prejudices. "It was not misery that put a barrier to these forces: in Africa, the sea and the sun cost nothing. The barrier is more in prejudice or stupidity."[20]

In the Nuptials, in addition to experiencing Camus' poetic source, we also perceive his ethical embarkation. By lyrically describing the cities of Algeria that he used to visit, he shows a hedonistic naturalism, in which the experience of nature with itself and with it takes place in a kind of sensible and affective union, beyond which there would be nothing else. "We walk towards love and desire. We do not seek lessons or the bitter philosophy that is required of greatness. Apart from the sun, the kisses and the wild perfumes, everything else seems futile to us."[21] Everything we can do to improve ourselves and become better and happy is not beyond the reach of our senses. The spiritual-sensible union with nature and the enjoyment of its beauty and strength, as much as we can, is the only rule of conduct that can really be realized. Everything else is just a postponement of pleasure in the name

[17] "Every country that I don't get bored with is a country that teaches me nothing": CAMUS, Albert. The Reverse and the Right, p. 77.
[18] Idem, Ibidem, p. 17.
[19] Idem, Ibidem, p. 18.
[20] Idem, Ibidem, p. 18.
[21] Ditto. *Wedding, The Summer*. Trad. Vera Queiroz da Costa e Silva. São Paulo: Editora Nova Fronteira, n.d., p. 8.

of a hope for a non-sensible, abstract, otherworldly and ideally and deontologically justified union.

> The union desired by Plotinus, what can be strange about finding it on earth? Unity is expressed here, in terms of sun and sea. It is sensitive to the heart, through a certain carnal taste, which originates its bitterness and greatness. I discover that there is no superhuman happiness or eternity beyond the curves of days. These derisory and essential goods, these relative truths, are the only ones that move me. As for the others, the "ideals", I do not have a soul big enough to understand them.[22]

Camusian's ethical-aesthetic embarkation presents itself as hedonic and naturalistic in the Nuptials and also in the Happy Death.[23] In this work from the time of Algeria in the thirties, the sun, the sea, the flesh and the carnal encounter are the only goods presentable for enjoyment and happiness. Even the idea of happy death is placed as part of the happy life, the result of a life that inverts the capitalist adage "time is money" so that all the investment of money and vital energy is to acquire time to live and die consciously and not just biologically. The character Mersault, who stars in this novel, has a spelling similar to the name of another work, namely: The Stranger. However, in this 1943 work, we find Camus within his same themes, but now with a new literary form.

Abroad, Mersault's character does not reveal himself in his interiority. We are not told whether it is good or bad. Your deep intentions are stored within you. What we are allowed to know is due only to the narrative of his life, which revolves around his daily life as a civil servant who, one day, is informed of his mother's death. So, he goes to the funeral and smokes at the funeral; and the next day, after the burial and back home, he meets Marie, a former employee of the same office where he worked. As he is fascinated by her, he asks her out... they bathe in the sea, in the sun and, at night, go to the cinema to watch a comedy.

Shortly after, on a walk in a beach house with Raymond, a neighbor who had a disagreement with a certain Arab, notices that his colleague carries a gun, which he asks for in order to stay in possession to prevent a murder. The problem is that, stunned by fatigue and heat, and dazzled by the reflection of the sun on the silver weapon, Mersault, seeing himself threatened by the Arab, shoots and repeats this act three more times, killing him.

After the murder, Mersault is arrested and enters a criminal process by which he wants, by all means, to prove the intent of his act to condemn him to death. The interesting thing about all this is that, at all times, we try to morally evaluate the character's life. They

[22] CAMUS, Albert. *Nuptials, The Summer*, p. 34.
[23] Ditto. *A Happy death*. Trad. Valerie Rumjanek. São Paulo: 1971.

want to know if he cried, if he smoked, what movie he watched, why he put his mother in the asylum, in short, they judge him from an already pre-established moral order to which the protagonist considers himself a foreigner/stranger to her. However, to all the questions he only answers that the physical fatigue and the effects of the sun on his body confused his feelings... However, it was not certain that he wanted his mother to die, although he knew that death was inevitable, especially at her age.

In the end, he is judged for not having cried at his mother's funeral and not for having killed a man. This is what can be deduced from the lawyer's words: "After all, is he accused of having killed his mother or of killing a man? To which the prosecutor replies "- yes - he exclaimed vehemently - I accuse this man of having buried his mother with a criminal's heart"[24]

Camus' engaged aesthetics from the Foreigner takes on a new scriptural form. The narrator does not reveal Mersault's morality. It does not allow us to search his intentions to know if we can judge him good or bad. The character is "beyond good and evil", Nietzsche would say, in such a way that the interpretation of the purpose of his action remains open. In effect, the writer innovates in literary form by giving up the conduction and formation of the hermeneutic conviction of the reader, who will now have to make his own readings and become responsible for them. Thus, Camus' embarkation in this phase known as "absurd" takes place negatively, that is, avoiding assuming an indoctrinating consciousness. For literary criticism, this author achieved with this poetic form, for the first time in universal literature, "the zero degree of literature".

> This transparent speech, inaugurated by Camus's The Stranger, realizes a style of absence that is almost an ideal absence of style; writing is then reduced to a kind of negative mode in which the social or mythical characters of a language are abolished in favor of a neutral and inert state of form; thought thus retains all its responsibility, without dressing itself with an accessory engagement of form in a History that does not belong to it."[25]

The literary-linguistic aspect of the writer's silence in relation to the ideology and morals of the character, far from being an alleged and false neutrality, is actually an engagement in education by respect for the worldview and individuality of each one. It is about not preaching the dominant ideology, even if it means not taking any side in evidence. And this is exactly the point that brings Camus closer and further away from Sartre with regard to the political reach of the literary work. Because the latter, although having made an excellent criticism of the Foreigner (complimentary, by the way!), sought to get closer to

[24] CAMUS, Albert. *The foreigner***.** 37th ed. Valerie Rumjanek. São Paulo: Record, 2015, p. 100.
[25] BARTHES, Roland. *The Zero Degree of Writing,* p. 161.

the communism of the former Soviet Union; while our author metaphorically declared in the play "The Mistake" that whenever we kill strangers, we run the risk of killing children or siblings. Ideological and scriptural disagreements yielded the end of a friendship; However, there are important philosophical points of contact that are worth highlighting.

THE GRATUITOUSNESS OF LIFE AND PEDAGOGICAL SUICIDE

Sartre presents life as total gratuitousness. Nothing is previously defined in advance. And if it were, we could not deduce from the discourse of the world the necessity of things and of what happens. Contingency is the essential thing in reality. It is the only thing of which we can be absolutely certain, because the beings are there and we know for sure only of their continuous being and non-being. The only truth is that of consciousness as a tendency to the world, as an apprehension of the world. In fact, this phenomenological experience is very well figured in Nausea in Roquentin's experience, who when he realized - sitting on a bench and looking at a root of a chestnut tree - that it was only as consciousness of the root of that tree, that his perception and sensation were fulfilled. However, despite being a kind of immediate knowledge of that being, it also understood itself as separate from it, subjectively and individually, since it perceived it, although immersed in it.[26]

Such a contingency that presupposes multiplicity, possibilities and existences[27] is based on the I Think, since otherwise it would be incoherent to speak of existence and reality; for they only exist as an active apprehension that constructs meaning. There is thus an essence to be constructed, but never given and ready, which explains Roquentin's constant feeling of nausea, who finds nothing in the world but pure gratuitousness of existence. Things and man himself are always *left over*. "I feel like leaving, going somewhere where I could really be *in my place,* where I fit in [...] But my place is nowhere; I'm left over."[28] Here, Sartre and the Stranger are very close in their aesthetic and ethical meanings, since the latter respects the multiplicity of individualities from his open poetics; and the former conceives man as anguish, since he has infinite freedom and responsibility for everything he does.

Once the ready-made meanings are discarded, everything takes place in the gratuitousness and equivalence of actions. Thus, from this conception, living and dying or even taking one's own life ceases to be an affront to existence, since every moral action is carried out as a work of art.

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[26] SARTRE, Jean-Paul. *Nausea*. Trad. Rita Braga. Rio de Janeiro: Nova Fronteira, 2015, p. 149.
[27] Cf. Ditto. *Existentialism is a humanism*. Trad. John Baptist Kreuch. Petrópolis: Vozes, 2014, p.34
[28] Sartre, Jean-Paul. *Nosia*, p.139.

> [...] moral choice can be compared to a work of art. [...] That being clear, would anyone censor an artist who, when painting a picture, was not following rules established *a priori*? Or would someone tell him what picture he should paint? [...] What does this have to do with morality? We are in the same creative situation. [...] What is common between art and morality is that, in both cases, we have creation and invention. We cannot decide *a priori* what should be done.[29]

Along the same line of reflection on the gratuitousness of life, Camus points out the central issue for philosophy, namely, suicide. But if there is nothing that can be deduced as necessary from existing things and their order, neither can the value of the actions perpetrated in the world be determined a priori. Therefore, it is the engagement in the projects we make of ourselves, the axiological producer of the motives and meanings of life. That said, it is then understood that what appears to be most relevant to human research or inquiry is what is at the basis of all other questions and problems, so that "To judge whether or not life is worth living is to answer the fundamental question of philosophy".[30] Everything else is nothing more than games of distraction for those who evade the ethical-fundamental responsibility of their own acts.

The gratuitousness of actions and things in Sartre is placed as the "absurd" in Camus. It is a matter of perceiving the world phenomenologically within a gnosiological dynamic in which intentional consciousness aspires to the unity of the world, whose reality integrates it. The density of the world and the strangeness of the overflow and surplus of things to our conceptions and meanings is precisely the cause of nausea in the face of the provisional and multiple character of meanings and values for the actions and events of the world. Therefore, the absurd is this awareness of/before the world that does not find the firm ground of a rational unity for what it apprehends. The only absolute is intentionality as a giver of meanings that do not exist in themselves, that is, there is no heaven of essences, nor things and values in themselves. And because there is no *scala rerum*, everything is deduced in the world without ontological necessity, hence we have no other horizon more evident than the feeling and (belief) of the absurd.

> [...] A world that can be explained, even with erroneous reasoning, is a familiar world. But in a universe suddenly deprived of illusions and lights, on the contrary, man feels himself to be a *foreigner*. It is an exile without a solution, because it is deprived of the memories of a lost homeland or the hope of a promised land. This divorce between the man and his life, the actor and his scenery is properly the feeling of the absurd.[31]

[29] SARTRE, Jean-Paul. *Existentialism is a humanism*, p. 38.
[30] CAMUS, Albert. *The myth of Sisyphus*. 11th ed. Roitman and Paulina Watch. São Paulo: Record, 2014, p. 17.
[31] CAMUS, Albert. *The Myth of Sisyphus*, p. 20, (emphasis added).

Faced with the world that always escapes man's inquiring apprehension (a reality that is not reduced and does not fit properly into the boxes of the empirical sciences), there is a humiliated reason, unable to find or access the much-desired unity of everything. So, what remains is the absurd and suicide. There is also hope, but this is not exactly a virtue, since it presupposes ignorance and insecurity as to the course of causes, which may also be favorable or not. The myth of Pandora itself already addressed this by placing her in the same box where all the evils of humanity were found. Thus, it seems that suicide would be the answer, if we speak hastily without understanding the term of the question.

Suicide and absurdity are thus central words/concepts in Camus. The Absurd perhaps in some way re-signified from the leap of Kierkegaardian absurdity (also understood as the leap of faith, but which for Camus is characterized as a theological suicide). Suicide, a fundamental problem of philosophy, for Camus, curiously comes from the Latin words *sui* and *caedes*, that is, to kill oneself, to slaughter. At the same time that the verb *caedere* means reduction and is a little close to *cadere*, to fall, however *suicide* is not a Latin word, because even if among the Stoics suicide was a freedom of choice, "in the ears of Cicero [the term] suicidium would have sounded like 'pig killing" (sus = pig)[32]. Latin did not need such a term." What there is in fact is an interpretative reading in which since Socrates, a kind of euthanasia, or a good choice of death. The question that arises here is how does the idea of absurdity (in the etymological sense of what is deaf and muffled) relate to suicide on the philosophical level?[33]

Committing suicide means denying the world and the only evidence we can access about the reality of things (namely, the absurd!). So that if there is an advantage in thinking of the pure gratuitousness of actions (and, therefore, biological living and dying at first as equivalent!), it is due to the fact that with this we become aware of the "mechanical life"[34] in which we are inserted. However, at the same time, suicide would be to renounce one's own reality just because it is absurd, that is, because it is not as we want it to be or as we have been told in soap opera or religious dramas that everything will be fine in the end.

However, it is not biological suicide. And this, we can say, is what matters least to Camus. It is, above all, philosophical suicide, which is perpetrated by existentialist philosophies that, when faced with the "rubble of reason" reduced to the human, start to

[32] HOOF, A. From autothanasia to suicide. New York: Routledge, 1990. p. 138.
[33] The expression [...] (*exagoge eulogos*) was mainly used by ancient Stoicism, and allows in Portuguese to be translated as *rational exit* or *reasonable exit*. Among Latin writers, such as Marcus Aurelius and the *New Stoics*, some terms are recurrent: *vitam fugere:* which indicates a hasty exit; *vita exire*, found for example in Cicero's books, means to *leave (exire) this vita.*" REIS, Alexandre. History of Suicide. Belo Horzonte: Páginas Editora, 2020. p. 102.
[34] Idem. Ibidem, p. 29.

take as a principle what they ignore, transforming it into a hope for life. Having no way of deducing the necessity of events, they "jump" from fragments of experiences and ideas, to a notion of the absolute.

> I take the liberty here of calling the existential attitude philosophical suicide. But this implies a judgment. It is a convenient way of designating the movement by which a thought denies itself and tends to surpass itself with regard to its negation. Denial is the God of existentialists. This god, exactly, is only sustained by the denial of human reason. But like suicides, the gods change according to men. There are several ways to jump, but the essential thing is to jump.[35]

Philosophical suicide can also be political. And here there is a focus of disagreement between Camus and Sartre. Resistance to oppression and the struggle for states of greater freedom cannot mean the justification of the use of violence and bloodshed by an ideology, even if it is the most accustomed to the condition of the oppressed. Our author did not understand that supporting the former Soviet Union and masking the *gulags* and state tyranny would be the emancipatory way out of the people; for, in the end, Nazi and fascist totalitarianism operated in the same way despite the deferential garb. In this case, the leap is ideological, starting from the notion of justness of a cause to the foundation of a disguised form of oppression. And renunciation, in this case, is that of freedom in the name of a hope of liberation at the end of the consummation of a revolutionary process.

In this way, suicide can be philosophical, religious, and political. Could it also be pedagogical?[36] Camus' philosophy does not thematize this educational issue, giving place of prominence and depth to concentrated reflections on the theme. However, it brings elements that can be very well used from an art-education perspective. I am referring to the idea of interdisciplinarity that appears indirectly when he states that "There are no boundaries between the disciplines that man employs to understand and to love. They interpenetrate each other and the same anguish confuses them."[37] For him, even a philosopher like Kant is an artist, since he is a creator.

If this is so, there is no reason to deny the postulation that there is a pedagogical suicide, which denies the evident of life, namely: that there are no ready-made formulas sufficiently adequate for emancipation; minds capable of illuminating the intelligence of others with their genius; institutions such as the School as saviors of society; Finally, if the

[35] CAMUS, Albert. *The Myth of Sisyphus*, p. 55.
[36] Epistemicide is another word that has been widely propagated by the studies of Boaventura Santos in *Pela Mão de Alice* as the destruction of local and even ancestral knowledge by the tendency of a Eurocentric ethnocentrism. Epistemology, as a judge of scientific processes and practices, ends up excluding from its field the processes and knowledge that differ from the academic institutionality of scientific rigor, which unfolds as a kind of affiliation, an egregore that cannot be refused. It is good that the disobedience of the absurd comes in a counterdirection of this tendency.
[37] Idem, Ibidem, p. 112.

absurd provokes a total absence of hope (in chimeras and illusions), an attitude of continuous refusal of one's own situation of meaninglessness and constant dissatisfaction, then every form of education that suppresses the creative and artistic aspect, the result of the gratuitousness of the world and of choices, constitutes a renunciation of life and the world as a field of freedom. The refusal of a reality in itself and inaccessible to "carnal reason" refers to the field of descriptions, interpretations and an ethics of quantity, which is constructed as a work of art. It is also a refusal of pedagogical explanation.

> The explanation is useless, but the sensation endures, and with it the incessant calls for a universe inexhaustible in quantity. Now we understand the place that the work of art occupies. It marks at the same time the death of an experience and its multiplication. It is like the monotonous and passionate repetition of the themes already orchestrated by the world: the body, the inexhaustible image of the pediment of the temple, the shapes and colors, the world or despair.[38]

Camus's absurd philosophy and art - in opposition to literary forms closed to the single interpretation of the writer or playwright and to philosophies of renunciation of the world - offer a strong conceptual apparatus to deal with Education as a formation that is both ethical and artistic. The creative character and its openness to the potentiality of individuals to appropriate them aesthetically and rationally constitute the field in which the explanatory-pedagogical and institutional-school character become a barrier to the free self-construction of the individualities involved in the teaching-learning processes.

The educational character of the principle of the absurd as phenomenological evidence is to refuse the world in the sense of always being dissatisfied and, therefore, willing to recreate it artistically. But it is also that of not renouncing it, of not clinging to philosophical doctrines of hope or alienating our carnal intelligence to that of others or to an institution, which would constitute pedagogical suicide. Moreover, when we take this question from Camusian's aesthetic horizon to the discussion of education, we can find excellent interlocutors who follow very similar lines of denial of the need for pedagogical explanation and the renunciation of individuality. Just to conclude, we cite, as an example, Jacques Rancière (2002), Paulo Freire (2011) and Sponville (2014) who in our view present a horizon of philosophical-pedagogical understanding similar to what we have been arguing with Camus. However, this virtual dialogue exceeds our purposes in this brief article.

[38] CAMUS, Albert. *The Myth of Sisyphus*, p. 111.

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PREDICTIVE TECHNIQUES AND ARTIFICIAL INTELLIGENCE MODELS IN THE MANAGEMENT OF DEFAULTED PUBLIC DEBTS: COMPARISON BETWEEN LINEAR REGRESSION AND DECISION TREES

https://doi.org/10.56238/sevened2024.031-019

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ABSTRACT

The analyzed study focuses on the application of predictive models, specifically Linear Regression and Decision Trees, for the management of delinquent debts in the public context of the United States. The main objective of the work is to compare the effectiveness of these models in predicting the compliance of debts older than 120 days, helping to direct these debts to the Treasury Offset Program (TOP), an essential initiative for government financial recovery. The problem that the study addresses is the need for effective management of delinquent public debts, seeking to ensure compliance with public financial policies that promote compliance and the proper redirection of financial resources to the government. This is particularly important to ensure fiscal transparency and accountability of federal agencies. The methodology used in the study was quantitative, based on the analysis of eligible debt data extracted from U.S. Treasury reports. The Linear Regression and Decision Trees models were applied, with performance metrics such as Mean Absolute Error (MAE), Mean Squared Error (MSE), Root Mean Squared Error (RMSE) and Coefficient of Determination (R^2). The study dealt with financial and temporal variables to analyze the behavior of these debts and their compliance. The main results show that both models showed high accuracy in the predictions, with the Linear Regression showing a perfect fit ($R^2 = 1$) and the Decision Trees excelling in capturing nonlinear nuances of the data. The "Compliance Rate Amount" variable was identified as the most significant in the Decision Tree model, suggesting that the amount of the compliance rate is one of the most important factors to predict the compliance of delinquent debts. This study offers valuable contributions to the field of public management, by demonstrating that the use of predictive models can help optimize debt recovery, improve fiscal transparency, and contribute to more informed decision-making.

Keywords: Public Financial Management. Predictive Modeling. Delinquent Debts. Applied Artificial Intelligence.

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INTRODUCTION

Public administration, especially in the United States, faces the challenge of efficiently managing delinquent debts. Under the Digital Accountability and Transparency Act of 2014 (DATA Act), delinquent debts older than 120 days must be forwarded to the Treasury Offset Program (TOP) to ensure the recovery of revenues to the federal government. Failure to comply with these guidelines can undermine the government's ability to fund essential public services, as well as compromise the transparency and accountability of federal agencies (US TREASURY, 2024).

Predictive models such as Linear Regression and Decision Trees emerge as important tools to improve compliance in debt routing. These techniques make it possible to predict which debts are most likely to be forwarded, helping to optimize financial recovery processes. The study focuses on the application of these machine learning techniques to identify significant variables and predict compliance with the DATA Act.

The present study aims to compare the effectiveness of Linear Regression and Decision Tree models in predicting compliance in the routing of 120-day delinquent debts in the United States. From this central objective, the study unfolds into four specific objectives. First, it seeks to compare the effectiveness of these models using evaluation metrics such as Mean Absolute Error (MAE), Mean Squared Error (MSE), Root Mean Squared Error (RMSE) and Coefficient of Determination (R^2). Such metrics are widely employed to measure the predictive accuracy of models and identify how well each of them fits the analyzed data.

Secondly, the study aims to identify the most significant variables for predicting compliance, considering which factors have the greatest impact on the predictive results of each model. This will allow for a deeper understanding of the key elements that influence the behavior of non-performing debts and their compliance in the context analyzed.

The third objective aims to analyze how these models can contribute to improving efficiency and transparency in the management of delinquent debts. The effective application of predictive models can optimize processes, reduce inefficiencies, and provide a clearer view of debt behavior, which is essential for public policy formulation.

Finally, the study seeks to provide strategic information that allows public managers to make evidence-based decisions. The use of robust predictive models can provide valuable insights for financial management, aiding in informed decision-making and promoting more effective management of delinquent debts, with a positive impact on compliance and the allocation of public resources.

This study is relevant for public administration, as it contributes to the optimization of revenue recovery and the increase of fiscal transparency. Compliance with the DATA Act is essential to ensure the financial efficiency of federal agencies, and the implementation of advanced predictive models provides tools to accurately predict debt routing, improving budget management.

Debt defaults have significant impacts on public financial management, affecting the ability of governments to allocate resources and maintain budget stability. As noted by Iudícibus (2010), effective management of delinquent debts requires strict monitoring of payments and the adoption of policies that encourage debtors to comply with financial obligations. A central tool in this process in the United States is the Treasury Offset Program (TOP), which plays a crucial role in debt recovery. This program allows resources to be redirected to the government through the clearing of payments, assisting in the recovery of amounts due and contributing to fiscal sustainability.

Forecasting techniques are essential for effective management of non-performing debt, providing a solid foundation for anticipating future behaviors and assisting in policymaking. Among these techniques, Linear Regression models and Decision Trees stand out, widely used in financial forecasting and delinquency management.

Linear Regression is a statistical technique that seeks to predict the value of a dependent variable based on one or more independent variables. According to Montgomery, Peck and Vining (2012), this model is particularly suitable for situations in which there is a clear linear relationship between variables, providing a simple but effective approach to forecasting financial results.

In addition, Angrist and Pischke (2009) emphasize that linear regression models are fundamental in the field of econometrics, being used as computational tools to estimate the differences between treated groups and control groups, with or without the use of covariates. This method is crucial in evaluating interventions and measuring their impacts, offering precise control over the factors that can influence the results.

On the other hand, Decision Trees are machine learning techniques that stand out for their ability to partition data into homogeneous subsets, creating a hierarchical structure that facilitates decision-making. According to Breiman et al. (1984), decision trees are especially useful when there are complex and nonlinear relationships between variables, as is often the case in predicting debt defaults. This method allows you to identify hidden patterns in the data and generate more detailed and accurate forecasts.

Decision Trees are widely recognized for their ease of interpretation and applicability in several areas. As noted by Pérez et al. (2019), this technique is often used in the

development of interpretable classifiers due to its visual structure, which resembles a flowchart.

Artificial Intelligence (AI) has proven to be a powerful tool in public administration, especially in the context of financial forecasting. Silva and Rocha (2019) highlight that AI can help predict income and expenses, identify potential debtors, and optimize debt recovery strategies. In addition, AI can also improve transparency and accountability in public administration (GOMES et al., 2020).

Another relevant study is that of Vasconcelos, Santos, and Amorim (2024), who explore the use of optimization algorithms to improve the allocation of resources in the public budget. Research shows that applying AI-based predictive models can increase the effectiveness of tax policies by ensuring that resources are directed to the areas of greatest need and social impact.

The incorporation of Artificial Intelligence (AI) in public management has stood out as one of the most significant advances for the modernization of government entities, especially in Brazil, where its adoption has the potential to transform the formulation and evaluation of public policies, in addition to improving service to citizens. According to Vasconcelos and Santos (2024), the study on the application of AI in the public sector is essential, as it explores effective ways to integrate this technology into Brazilian administrations, with the aim of optimizing processes and improving the quality of services offered to the population.

METHODOLOGY

This study employs a quantitative approach, using statistical and machine learning models to predict compliance in the routing of delinquent debts. The research is applied, aiming to provide practical insights for public managers on the effectiveness of Linear Regression and Decision Tree models in financial management.

The data used for this analysis was extracted from the 120-Day Delinquent Debt Forwarding Compliance Report, available on the U.S. Treasury website. That dataset includes detailed information on eligible debts, referred debts and non-forwarded debts.

Before applying the predictive models, it was necessary to prepare the data. The treatment involved replacing missing values with means or medians, as well as coding categorical variables to make them compatible with machine learning algorithms (HAIR et al., 2019).

The Linear Regression model was applied to capture linear relationships between variables, while the Decision Tree model was used to identify complex and nonlinear

interactions. Both models were trained and evaluated using performance metrics such as MAE, MSE, RMSE, and R^2 (BREIMAN et al., 1984; MONTGOMERY, PECK, VINING, 2012).

The effectiveness of the models was measured using statistical metrics. The Mean Absolute Error (MAE), Mean Squared Error (MSE), Root Mean Squared Error (RMSE) and the Coefficient of Determination (R^2) were used to evaluate the accuracy of the predictions and the robustness of the models.

To facilitate the understanding of the data used, Chart 1 was elaborated, where the original variables are presented, as well as their respective translations into Portuguese. This ensures that the analysis is consistent and understandable in the context of bad debt management.

Table 1: Table of Variables

Original Variable	Translation into Brazilian Portuguese
Total Eligible Debt Amount	Total Eligible Debt Amount
Total Eligible Debt Count	Total Eligible Debt Count
Eligible Debt Referred Amount	Amount of Eligible Debt Forwarded
Eligible Debt Referred Count	Eligible Debt Count Forwarded
Eligible Debt Not Referred	Amount of Eligible Debt Not Forwarded
Eligible Debt Not Referred Count	Count of Eligible Debt Not Forwarded
Compliance Rate Amount	Amount of the Compliance Fee
Compliance Rate Count	Compliance Rate Count
Fiscal Year	Fiscal Year
Fiscal Quarter Number	Fiscal Quarter Number
Calendar Year	Calendar Year
Calendar Quarter Number	Calendar Quarter Number
Calendar Month Number	Calendar Month Number
Calendar Day Number	Calendar Day Number

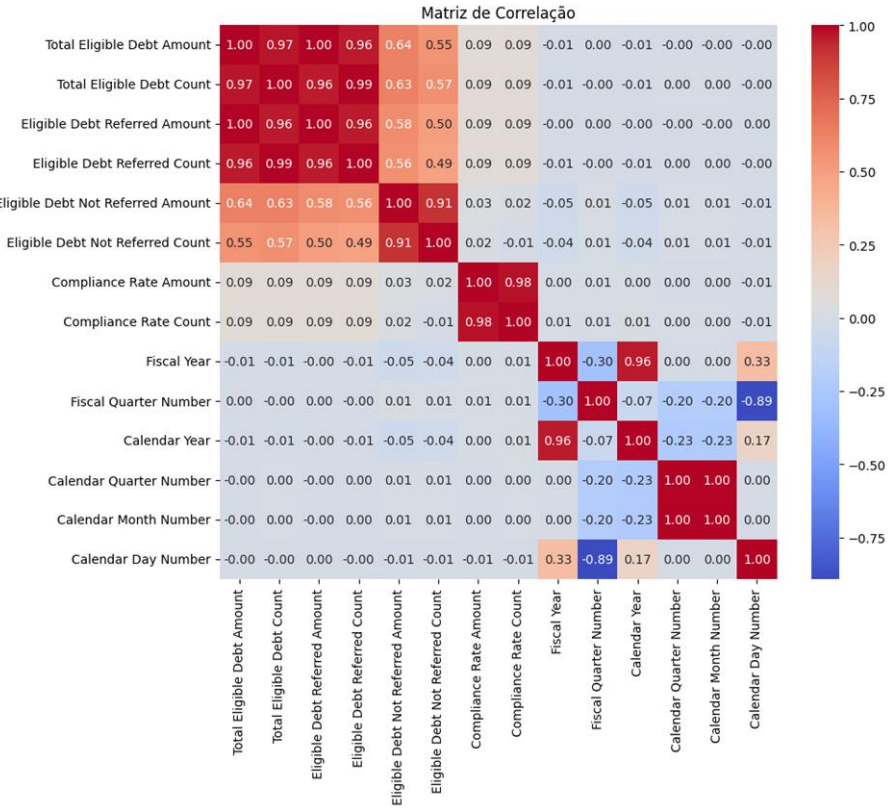
Source: Prepared by the author (2024).

These variables represent both quantitative aspects, such as amounts and counts of debts, and temporal factors, being fundamental for the construction of predictive models.

CORRELATION MATRIX

The Correlation Matrix, Graph 1: Correlation Matrix, was constructed with the objective of identifying the relationships between the numerical variables of the data set. This analysis allows us to understand how the different aspects of eligible and delinquent debts correlate, providing insights into the most influential variables for predictive models.

Graph 1: Correlation Matrix



Source: Prepared by the author (2024).

The "Correlation Matrix" shown in the image reflects the linear relationship between several variables associated with the study of eligible debts and their compliance in the forwarding of delinquent debts.

Analysis of the correlation matrix reveals important relationships between financial and temporal variables, offering valuable insights into the behavior of eligible debts and the compliance process. First, the strong positive correlation between financial variables stands out, especially between the variables Total Eligible Debt Amount and Total Eligible Debt Count, which have a correlation of 0.97. This ratio suggests that as the total number of eligible debts increases, the corresponding total amount also grows proportionately. Such behavior is to be expected, since a higher number of debts naturally results in an increase in the total amount owed. A similar pattern is observed between the Eligible Debt Referred Amount and Eligible Debt Referred Count variables, with a near-perfect correlation of 0.99. This interdependence indicates that the number of referred debts and the associated value go together consistently, pointing to a uniformity in the debt forwarding process, where both the number of referrals and the value follow the same trend.

In addition, a moderate correlation is observed with non-forwarded debts. The ratio between Eligible Debt Not Referred Amount and Eligible Debt Not Referred Count is 0.64, a value considerably lower than that observed in forwarded debts. This difference suggests

that the process of non-routing of debts may not be perfectly aligned in terms of amount and count, and there are fluctuations in the amounts that do not directly correspond to the number of unforwarded debts. Additionally, there is a moderate correlation of 0.98 between Compliance Rate Amount and Compliance Rate Count, indicating that compliance, both in terms of amount and volume of debt, is well aligned. This reinforces consistency in the compliance measurement process, considering both absolute amounts and the number of debts.

Another relevant point is the weak or no correlation with temporal variables. The matrix shows that there are no significant correlations between financial variables and calendar variables, such as Fiscal Year, Calendar Year, Calendar Month Number, and Calendar Day Number. The correlation between these variables ranges from -0.01 to 0.05, suggesting that temporal factors, such as the fiscal year, month, or day, do not exert a significant direct influence on variations in eligible or forwarded debts. The only exception is a moderate correlation of 0.33 between Calendar Day Number and Fiscal Quarter Number, which can be explained by the structure of the calendar within each fiscal quarter.

Finally, the matrix also reveals the existence of some negative correlations. For example, there is a correlation of -0.30 between Fiscal Quarter Number and Calendar Year, as well as -0.20 between Fiscal Quarter Number and Calendar Quarter Number. These relationships suggest that as the fiscal quarter number increases, the impact on the calendar year or quarter may diminish, possibly due to changes in the fiscal period from the regular calendar. In addition, a negative correlation of -0.04 is observed between Fiscal Quarter Number and Compliance Rate Count, indicating that, although the relationship is very weak, compliance in terms of debt count may be slightly affected by the structure of fiscal quarters. However, this correlation is so small that its relevance can be disregarded in the general context of the analysis.

The matrix confirms the expected interdependence between the amount and count variables of debts, especially for forwarded debts, where the correlation values are almost perfect. In addition, the weak correlation with temporal variables suggests that the compliance and debt routing processes are not directly linked to the calendar. This is important to understand that temporal factors, such as the fiscal year or the month, do not play a critical role in the behavior of these financial variables.

The biggest implication of this matrix is to identify the variables that most contribute to the success of predictions in compliance models. The strong correlation between amounts and debt counts indicates that these factors should be prioritized in predictive

models, while temporal variables can be ignored or minimized to avoid unnecessary noise in the model.

The correlation matrix was used to select variables with the greatest impact on the models. Variables with strong correlations were retained, while those with less relevance, such as calendar variables, were discarded to simplify the model and minimize noise in the data. This approach ensured greater accuracy in the predictive models.

LINEAR REGRESSION

The linear regression model was applied to predict compliance in the routing of delinquent debts older than 120 days. The evaluation of the model was performed using statistical metrics that measure the accuracy of the predictions and the quality of the model's fit to the observed data.

The results obtained from the model's evaluation metrics indicate its high accuracy. The calculated metrics were: Mean Absolute Error (MAE) of 3.2054e-12, Mean Squared Error (MSE) of 2.8218e-22, Root Mean SquareError (RMSE) of 1.6798e-11 and Coefficient of Determination (R^2) equal to 1.0.

These values show the performance of the model, evidencing the accuracy of the predictions made. The details of these results will be discussed below.

The Mean Absolute Error (MAE), which measures the mean of the absolute errors between the predicted values and the actual values, was extremely low, with a value of 3.2054e-12. This metric indicates that, on average, the difference between the model's predictions and the observed values is negligible. In the context of predictive modeling, such a low MAE suggests that the linear regression model has a very accurate ability to predict debt compliance while minimizing discrepancies between the observed data and the generated forecasts.

The Mean Squared Error (MSE), which measures the mean of the squares of the differences between the predicted and actual values, showed a value of 2.8218e-22. The MSE penalizes larger errors more severely, as it squares the discrepancies. The fact that this value is extremely small indicates that the model makes virtually no significant errors. An MSE close to zero is a strong indicator that the model is highly adjusted to compliance data, predicting with extreme accuracy.

The Root Mean Squared Error (RMSE), which is the square root of the MSE, provides a measure of the error that is in the same unit as the predicted values. With a value of 1.6798e-11, the RMSE also confirms that the magnitude of the prediction errors is extremely low, reinforcing the idea that the linear regression model is highly effective in

capturing the variations between the independent variables and compliance in debt routing. This value indicates that the deviations between the forecasts and the actual values are practically non-existent.

The Coefficient of Determination (R^2), with a value equal to 1.0, represents the model's ability to explain all the variability present in the observed data. In other words, the model explains 100% of the variation in the dependent variable (debt compliance) based on the independent variables used in the model. A value of R^2 of 1.0 suggests a perfect fit, which means that the model leaves no variation unexplained by the selected variables.

Regarding the accuracy and effectiveness of the model, we have that the evaluation metrics presented (MAE, MSE, and RMSE) show extremely low results, indicating that the linear regression model has remarkable accuracy. The absence of significant errors reinforces the robustness of the model, which proves to be highly effective in predicting compliance in the routing of delinquent debts.

The R^2 of 1.0 suggests a perfect fit between the predicted and observed values. This result indicates that the model is able to fully capture the relationship between predictor variables and compliance, leaving no room for unexplained prediction errors. This level of accuracy is rarely observed in common predictive practices, suggesting a strong relationship between the selected variables and the target variable.

Although the results obtained demonstrate a high accuracy, a perfect fit (such as the R^2 of 1.0) can raise concerns about overfitting, where the model fits excessively to the training data, compromising its ability to generalize to new data. However, if the data are well partitioned between training and testing and are representative, these results are extremely promising and indicate that the model can be reliable in practical applications.

The high accuracy of the linear regression model suggests that it can be widely applied to predict compliance in the routing of delinquent debts, offering valuable support for managerial and strategic decision-making. By accurately capturing the variables that influence compliance behavior, the model enables money managers to implement more effective debt management policies and strategies.

In addition, the detailed analysis of the metrics provides a solid basis for comparing the performance of the linear regression model with other predictive methods, such as the decision tree. This can be critical in choosing the most suitable model for different forecasting scenarios, especially in environments of high variability.

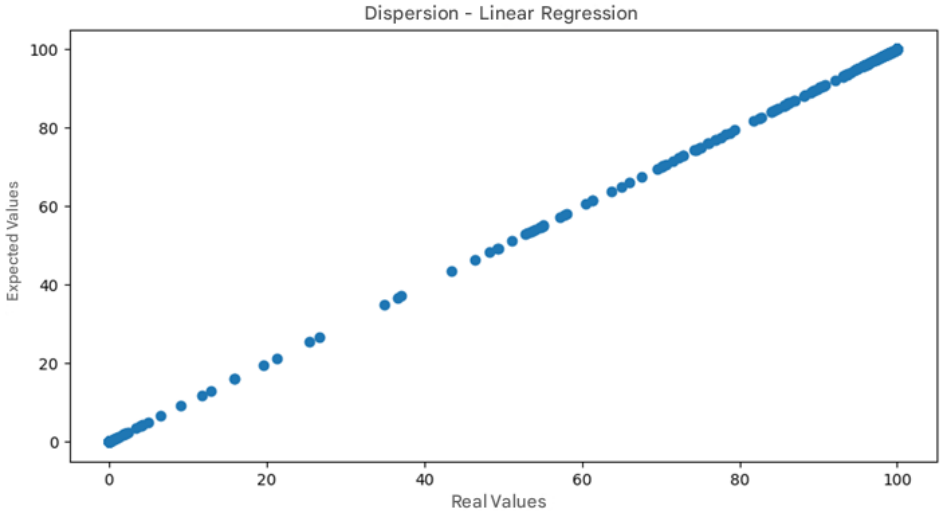
DISPERSION ANALYSIS – LINEAR REGRESSION

Dispersion analysis in linear regression is an essential statistical tool to evaluate the relationship between the independent variables and the dependent variable. This tool allows for a clear visualization of the accuracy of the predictions made by the model, highlighting how well the predicted values align with the observed values.

The scatter plot illustrates the relationship between the actual values and the values predicted by the decision tree model. The scatter plot is critical to visualizing the model's ability to capture data variability and make accurate predictions. The points should line up along a diagonal line that represents the perfect match between the predictions and the actual values. The analysis of this graph allows you to identify systematic deviations, evaluate the accuracy of forecasts in different ranges of values and detect possible outliers. In addition, dispersion provides insights into the robustness of the model in dealing with nonlinear variations in data, a distinguishing feature of decision trees (BREIMAN et al., 1984; HASTIE; TIBSHIRANI; FRIEDMAN, 2009).

As illustrated in Graph 2: Dispersion – Linear Regression, the dispersion of the predicted values in relation to the actual values is observed, allowing the identification of underlying patterns, as well as the detection of discrepancies or anomalies in the data.

Graph 2: Dispersion – Linear Regression



Source: Prepared by the author (2024).

Graph 2: Dispersion – Linear Regression presents a fundamental visual analysis to evaluate the performance of the linear regression model. The presence of a clear alignment of the points along the trend line indicates that the model has produced predictions that practically coincide with the actual data, which suggests a precise fit of the model to the analyzed variables.

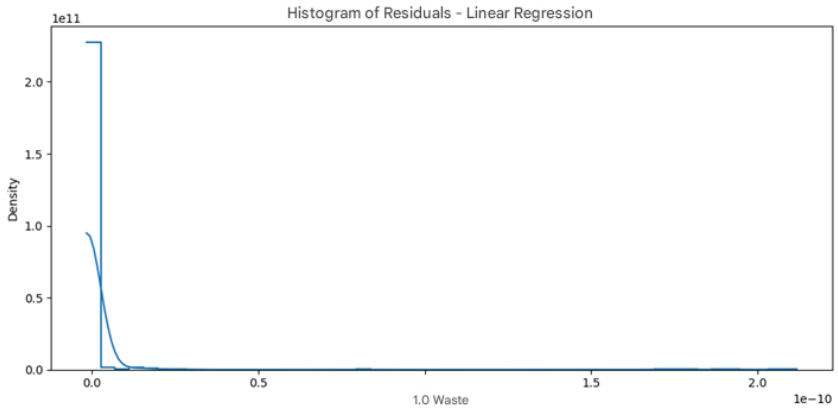
In the graph, it is observed that the points are almost completely aligned to this line, which confirms that the linear regression model performed highly accurately in most cases. This proximity between the predicted and observed values reinforces that the model was able to capture with a high degree of accuracy the relationship between the explanatory variables and the dependent variable, generating reliable predictions.

The visual analysis provided by the scatter plot confirms the effectiveness of the linear regression model in predicting the results. The strong correlation between the actual and predicted values demonstrates that the model was successful in capturing the underlying relationships between the variables. In combination with performance metrics such as MAE, MSE, RMSE, and R^2, discussed earlier, the scatter plot offers a comprehensive understanding of the model's accuracy and robustness. The absence of relevant discrepancies validates the applicability of the model to the predictions within the context of the study.

RESIDUAL HISTOGRAM – LINEAR REGRESSION

The residual histogram is an essential tool to assess the adequacy of a linear regression model, allowing the visualization of the distribution of prediction errors in comparison with the actual values. It assists in verifying the assumptions of the model, such as normality and independence from errors. In a well-fitted model, the residuals should present an approximately normal distribution, concentrated around zero, indicating the absence of systematic bias and unbiased forecasts. In addition, the histogram facilitates the identification of outliers, heteroscedasticity, and other deviations that can compromise the validity of the model.

Graph 3: Residual Histogram – Linear Regression



Source: Prepared by the author (2024)

Graph 3: Residual Histogram – Linear Regression offers a detailed analysis of the distribution of the residuals generated by the model, allowing an accurate assessment of

the quality of the adjustment made. The distribution of the residuals is an important tool to verify the accuracy of the forecasts, as well as to identify possible areas of improvement in the model's performance.

When analyzing the distribution of the residuals, it is observed that most of them are concentrated around zero, which indicates that the linear regression model produced very accurate predictions for most of the data. However, there is a slight asymmetry in the distribution, with a higher concentration of small waste. This may suggest that while the model performs well overall, additional adjustments may be needed to correct this asymmetry and achieve a perfectly symmetric distribution, which would potentially improve the predictive quality of the model.

Note the presence of outliers, mainly visible on the right tail of the histogram. These outliers correspond to larger residuals, indicating that, in some cases, the forecasts have distanced themselves from the actual observed values. This suggests that the model may not have adequately captured certain relationships between variables in specific situations, pointing to the need for further investigation into the factors that cause these discrepancies.

The density of the residuals around zero, in turn, is quite high, which confirms that most of the predictions were made with negligible errors. This high concentration of small residues is a positive indicator of the model's effectiveness, demonstrating that it presented a satisfactory performance in most cases, with few exceptions.

The presence of outliers and the slight asymmetry of the residues point to areas where the model can be improved. These results suggest that, although the model is broadly robust, there are opportunities to improve its adequacy to the data, especially in relation to variables that may have nonlinear effects or data that may be negatively impacting the distribution of the waste.

DECISION TREE

The decision tree model was used with the objective of predicting compliance in the forwarding of delinquent debts longer than 120 days. The performance of the model is evaluated through several metrics, which quantify the accuracy of the predictions and the quality of the fit to the observed data. Below, each of these metrics is discussed in detail, providing an in-depth analysis of the effectiveness and robustness of the model.

The main evaluation metrics presented the following values: Mean Absolute Error (MAE) of 0.0138, Mean Squared Error (MSE) of 0.00692, Root Mean Squared Error (RMSE) of 0.0832 and Coefficient of Determination (R^2) of 0.99999.

These results will be discussed in detail below, with the aim of explaining the importance of each metric in the context of the analysis performed.

The value obtained for the Mean Absolute Error (MAE) was 0.0138, a metric that measures the average of the absolute errors between the values predicted by the model and the actual values observed. This relatively low value indicates the decision tree model performed very accurately, with small average errors throughout its predictions. In the context of this study, the MAE of 0.0138 means that, on average, the difference between the actual and predicted values by the model is very small, which demonstrates the high effectiveness in anticipating compliance in the routing of delinquent debts.

The Mean Squared Error (MSE) was 0.00692, a metric that penalizes larger errors more severely by squaring the differences before adding them up. The fact that the MSE is so low reinforces the conclusion that the model makes predictions with high accuracy, with little discrepancy between the observed and predicted values. The MSE is particularly useful for identifying outlier predictions because it penalizes larger errors, which suggests that there are no major distortions in the predictions made by the decision tree model.

The Root Mean Square Error (RMSE), with a value of 0.0832, is the square root of the MSE and provides a more direct interpretation of the error, since it is expressed in the same unit as the original data. The low RMSE indicates that the magnitude of the prediction errors is similarly reduced, reinforcing the idea that the decision tree model is adequately capturing the relationships between the variables involved, which is essential for the reliability of the model in practical terms.

The Coefficient of Determination (R^2), with a value of 0.99999, indicates that the model explains almost all the variance present in the observed data. A value of R^2 so close to 1 suggests that the decision tree model is extremely effective at capturing the nuances and variations of the data set. In the context of predicting compliance in the forwarding of delinquent debts, this means that virtually all variations in observations are explained by the predictor variables, ensuring the robustness and effectiveness of the model.

The assessment metrics presented—MAE, MSE, RMSE, and R^2—indicate that the decision tree model performed exceptionally well in predicting compliance. The low magnitude of the errors and the almost perfect R^2 suggest a practically ideal fit to the observed data. However, because such accurate results are rare in practical scenarios, it is important to consider the possibility of overfitting, where the model fits excessively to the training data. If this has occurred, the model may present difficulties when generalizing to new data. However, if the data are representative and appropriately split between training

and testing, these results are highly encouraging and indicate that the model can be trusted in applied contexts.

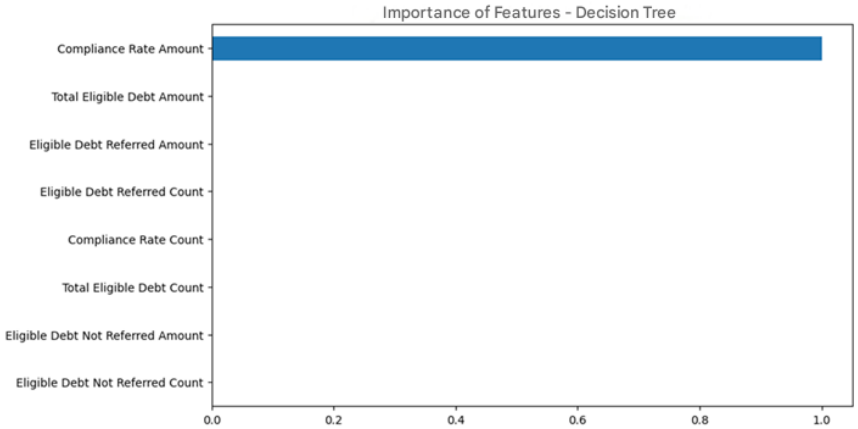
The decision tree model's high accuracy demonstrates that it can be used with confidence to predict compliance in the routing of delinquent debt. This can serve as an essential tool to assist managers in making strategic decisions and formulating financial policies, which can be based on the model's predictions to improve compliance rates.

The decision tree was able to identify significant patterns in the data, being a robust alternative to support the formulation of corrective and preventive actions in the context of debt management.

IMPORTANCE OF CHARACTERISTICS – DECISION TREE

In the decision tree model, identifying the most relevant variables is crucial to understanding the dynamics of the data and ensuring the effectiveness of the predictions. The importance of the characteristics reflects the contribution of each variable to the reduction of the impurity of the nodes along the tree. This concept is based on the idea that the variables that most reduce the heterogeneity of the data in the nodes are the most influential for the model's predictions.

Graph 4: Importance of Traits – Decision Tree



Source: Prepared by the author (2024).

The interpretation of Graph 4: Importance of Characteristics reveals crucial information about the factors that most influence the decision tree model in the context of predicting compliance in the routing of delinquent debts. The initial analysis highlights that the variable "Compliance Rate Amount" was identified as the most important in the model, proving to be the most relevant predictive factor. This result suggests that the amount related to the compliance fee plays a central role in the forecast, contributing significantly to

the division of the nodes of the decision tree and, consequently, to the accuracy of the generated forecasts.

The other variables, such as "Total Eligible Debt Amount", "Eligible Debt Referred Amount" and "Compliance Rate Count", had a considerably lower weight in the model. This indicates that its impact on the forecast is much smaller compared to the "Compliance Rate Amount" variable. Such distribution of relevance demonstrates that, although other variables can contribute to the adjustment of the model, they do not have the same level of influence in the determination of compliance.

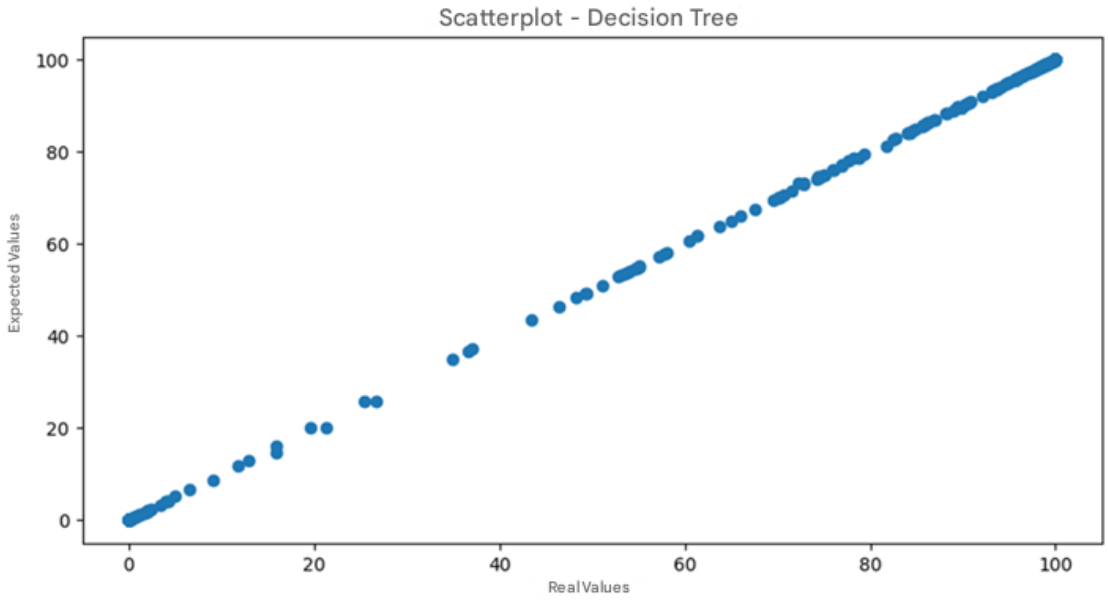
The graph reveals a concentrated distribution of importance around a single variable, the "Compliance Rate Amount". This extreme concentration suggests that the model is highly dependent on this specific variable, implying that financial managers should prioritize monitoring and optimizing the compliance rate when developing improvement strategies for the routing of delinquent debts. This dependence may also indicate that the model could be simplified by focusing more intensely on this variable, optimizing resources and efforts in the predictive analysis process.

SCATTERING – DECISION TREE

Scatter analysis is an essential technique for evaluating the accuracy and effectiveness of decision tree models. In the present study, the scatter plot demonstrates the relationship between the actual values and those predicted by the model, being essential to visualize the model's ability to capture the variability of the data and make accurate predictions. In an ideal scenario, the points on the graph should line up in a diagonal line, representing the perfect match between predictions and actual values. The analysis of this graph allows you to identify systematic deviations, evaluate the accuracy of forecasts at different intervals, and detect outliers. In addition, it offers insights into the robustness of the model in dealing with nonlinear variations, a distinctive feature of decision trees.

Graph 5: Dispersion – Decision Tree, below, suggests that the model is capable of capturing trends and patterns in the data with high accuracy.

Graph 5: Dispersion – Decision Tree



Source: Prepared by the author (2024).

The interpretation of Graph 5: Dispersion – Decision Tree reveals a clear analysis of the relationship between the actual values and the values predicted by the model. First, it is important to highlight that in the trend line observed in the graph the points are almost completely aligned, which suggests that the decision tree model made predictions very close to the observed values. This proximity indicates a high degree of accuracy in the forecasts made, which demonstrates the effectiveness of the model in anticipating compliance in the forwarding of delinquent debts.

This low dispersion around the trend line indicates that the prediction errors are small and consistently distributed, showing that the model correctly captured the interactions between the predictor variables. This model behavior reinforces its ability to make accurate and consistent predictions across the different data points analyzed.

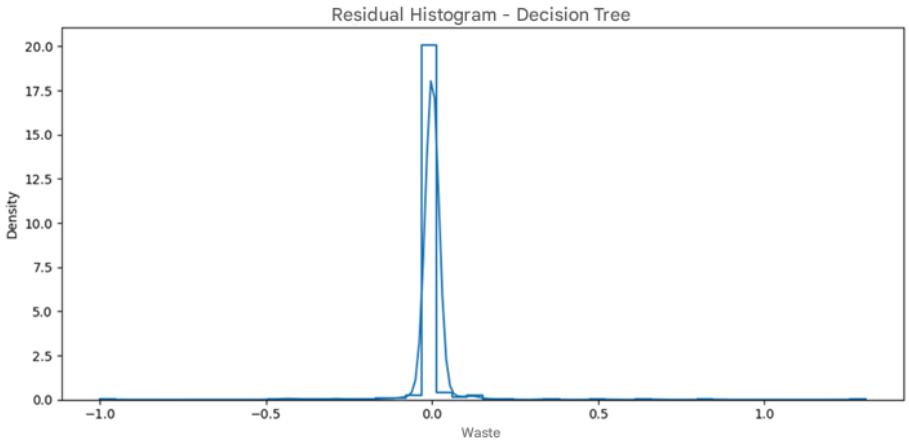
Graphical analysis complements the statistical metrics discussed earlier, validating the quality of the forecasts.

RESIDUALS HISTOGRAM – DECISION TREE

The residual histogram is an essential tool for evaluating the performance of predictive models, such as the decision tree. It allows you to visualize the distribution of waste, that is, the differences between the actual values and those predicted by the model. In the case of the decision tree, a histogram that is well distributed and centered around zero indicates accurate and unbiased predictions. The analysis of the residuals is essential to identify possible biases, heteroscedasticity and outliers, which can compromise the

validity of the forecasts. By observing the shape and dispersion of the residuals, it is possible to evaluate the adequacy of the model to the data and its ability to generalize.

Graph 6: Residual Histogram – Decision Tree



Source: Prepared by the author (2024).

Graph 6: Residual Histogram – Decision Tree provides a detailed analysis of the distribution of the model's residuals, being essential to evaluate its predictive performance. The distribution of waste is mostly concentrated around zero, which indicates that the model made accurate predictions in most cases. This symmetric distribution reinforces the assumption that the decision tree model is well-tuned to the data used, which increases confidence in its ability to generalize.

However, it is important to highlight the presence of some outliers observed at the ends of the histogram. These larger residuals indicate that, in certain observations, the model's predictions were less accurate. The occurrence of these outliers may be associated with specific characteristics of the data that were not properly captured by the model, suggesting a possible limitation in certain scenarios.

The high density of near-zero waste is an indication that most of the model's predictions were made with a high degree of accuracy. The significant concentration in this region reflects the overall effectiveness of the decision tree model, demonstrating that the prediction errors were mostly small and evenly distributed. In this way, the residual histogram confirms the robustness of the model, while pointing out possible areas for further adjustments, aiming to minimize outliers and further improve predictive accuracy.

The decision tree model showed exceptional performance, as evidenced by the statistical metrics, scatter plots, and residual histogram. These analyses indicate that the model is robust and reliable, making it a valuable tool for predicting compliance in the routing of delinquent debts.

DISCUSSION

The analysis revealed a strong correlation between variables related to the amount and count of debts forwarded. The near-perfect correlation of 0.99 between the "Amount of Eligible Debt Forwarded" and the "Count of Eligible Debt Forwarded" suggests a high interdependence between the number of debts and the corresponding amount. This finding is consistent with the expectation that a greater number of debts will result in a greater financial amount.

On the other hand, the more moderate correlation between the "Amount of Eligible Debt Not Forwarded" and the "Count of Eligible Debt Not Forwarded" (0.64) may suggest that while most debts are proportional to the corresponding amount, there may be fluctuations where the amount of unforwarded debts does not directly correspond to the number of unprocessed debts. This deviation may be related to policies or practices that prioritize certain debts over others, resulting in a disconnect between the total amount and the number of unforwarded debts.

The results offer several theoretical and practical implications. In theoretical terms, the strong correlation between amounts and counts of forwarded debts reinforces the theory that quantitative financial variables, such as total debt and the amount of forwarded debt, are crucial for predicting compliance in predictive models. These findings support the use of linear regression and decision trees to model financial phenomena with clearly defined predictor variables.

On a practical level, the knowledge generated by these predictive models can be applied to improve public debt management. The strong correlation between amount and count variables suggests that public managers can focus their efforts on larger debts to improve debt recovery rates. In addition, the absence of significant correlation with temporal variables, such as the fiscal year or the month, implies that these variables can be minimized in future models, allowing a simplification of the analysis process.

Despite the promising results, the study has some limitations. First, the models exhibited a near-perfect fit ($R^2 = 1$ for the linear regression model and $R^2 = 0.999997$ for the decision tree model), which raises the concern of overfitting. This problem occurs when the model fits too much to the training data, compromising its ability to generalize to new data. This question is critical to ensure that the model is applicable in future practical scenarios.

Another limitation is the lack of temporal variability in the variables studied, which may suggest that time-related factors were not adequately considered in the model. This can impact the model's ability to predict future behaviors at different periods of the fiscal cycle or in subsequent years.

Previous studies, such as those by Breiman et al. (1984), demonstrate that decision trees are effective in contexts where there are complex and non-linear relationships between variables, a finding that is confirmed by this study. Similarly, research that has used linear regression to predict delinquent debts confirms that this method is robust when there is a clear relationship between variables, as noted here.

However, the difference in the correlation between forwarded and non-forwarded debts deserves to be highlighted. Previous studies suggest that public policies that involve debt forwarding deadlines can interfere with this relationship, creating variations between the number of debts and the total amount. This suggests that more research is needed to understand the nuances of this relationship.

CONCLUSION

The results obtained show that both Linear Regression and Decision Tree are highly effective in predicting compliance in the routing of delinquent debts. Linear Regression, with its perfect R^2, suggests that there is a strong linear relationship between financial variables and compliance, confirming the importance of using this model in scenarios with strongly correlated variables.

On the other hand, Decision Tree stood out for capturing nuances in the data, including nonlinear variables that Linear Regression was not able to capture as well. The identification of "Compliance Rate Amount" as the most significant variable in the Decision Tree model reinforces the idea that the amount of the compliance rate is the main predictive factor of compliance in debt routing.

The findings of this study offer significant contributions to the field of public financial management and predictive modeling. First, the results confirm the effectiveness of statistical models such as Linear Regression to predict compliance in scenarios where there are clear linear relationships between financial variables. In addition, the successful application of machine learning techniques, such as Decision Trees, expands the use of predictive models in more complex situations, where there are nonlinear interactions.

Identifying the most important variables, particularly the dominant weight of "Compliance Rate Amount", can help managers focus on strategies that improve this specific aspect, optimizing the process of forwarding delinquent debts.

This study is relevant not only to the academic field, by contributing to a comparative analysis of predictive models, but also to the practice in public financial management. The high accuracy demonstrated by the models suggests that they can be successfully

implemented in real non-performing debt management systems, allowing for more informed decision-making and more effective strategies to improve compliance rates.

In addition, the analysis suggests that models such as the Decision Tree may be preferred in contexts where there is complexity in the interactions of variables or when the data have nonlinear characteristics.

Although the results obtain high accuracy, the study may have limitations related to the potential for overfitting, especially with a perfect R^2 in Linear Regression. This suggests that the model may have over-adjusted to the training data, which may impact its ability to generalize to new data. Another limitation is the lack of exploration of possible additional variables that could have improved the performance of the models, especially in the case of the Decision Tree.

Future research could focus on testing the generalizability of these models across different datasets, further exploring the issue of overfitting and how it can be avoided in prediction scenarios. In addition, the inclusion of other variables, such as macroeconomic economic factors, could enrich predictive analytics and provide a more complete picture of the factors that influence compliance in the routing of non-performing debts.

Another suggestion would be to apply more advanced machine learning techniques, such as Random Forest or Gradient Boosting, to see if these models can outperform Linear Regression and Decision Trees in similar scenarios.

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POLITICAL MOVEMENT WE ARE: FROM THE EMERGENCE TO THE FRACTIONATION OF THE LGBTQIA+ STRUGGLE

https://doi.org/10.56238/sevened2024.031-020

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ABSTRACT

The present work aims to understand the emergence and consolidation of the LGBTQIA+ political movement in Brazil, focusing on the 1970s and 1980s. The work was guided by the questioning of how and why the LGBTQIA+ political movement originated in Brazil? The investigation was based on a bibliographic and documentary research, anchored in the materialist-dialectical method. The theoretical support was given with the works of Cruz (2018), Green (2018), Mott (2018), Quinallha (2022), Trevisan (2018) among other authors dedicated to the theoretical unveiling of the problem. The historical moment that gave rise to the movement, the importance of the process of mass communication through the press, the political-ideological internal struggles for the conception of the LGBTQIA+ social and political movement and the reconfiguration of the homosexual movement in Brazil in the 1990s are highlighted. In the phase of the conclusions, the period is identified as fundamental for the organization of the initial struggles against homophobia and for the affirmation of the movement as instruments of collective struggles for rights.

Keywords: LGBTQIA+ political movement. Ideological struggles. Political organization. Are. Lampião da Esquina.

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INTRODUCTION

> The history and memory of LGBTI+ activism are of fundamental importance not only because it makes the past known and restores heredity between generations that, in each era, contribute to the formation of a community that is always becoming. Looking back is also essential to think about ways of acting in the present and projecting possible futures, there is no manual inscribed in history, it is not about repeating successes and avoiding mistakes made, but about facing the challenges that are posed in the light of information and awareness of our own trajectory (QUINALHA, 2022, p.147).

This look back, as the author puts it above, requires thinking about the different forms of organization of LGBTQIA+ activism in society when this social group is excluded from basic rights essential for its own survival, as well as when its freedom is curtailed through censorship and torture promoted by the State by imposing fear on groups in society in its process of mobilization and social organization, groups of individuals and collectives with different forms of contestation and struggle.

In Brazilian literature, different discussions make up the trajectory of the organization of the LGBTQIA+ movement, going through waves, demarcating some central moments, establishing the sequential and temporal idea of first, second and third wave. This process of periodization of the history of the LGBTQIA+ movement can compromise its heuristic capacity, giving rise to stagist readings (imposition of route, linearity). The waves seem watertight, without paying due attention to the procedural dimension of transition. The author also emphasizes that the division of history into phases imposes a certain artificiality, as it loses sight of the networks and generations in permanent conflict (Quinalha, 2022).

Quinalha (2022) adopts other ways of making this reading, based on the notion of cycles, in view of the agenda of demands in each historical moment, since one cycle is not exhausted in another, and they can coexist in different forms of interaction. Thus, the author will incorporate five cycles into his discussion: Cycle of Homosexual Affirmation and Combat to the Dictatorship (1978- Grupo Somos); HIV/AIDS Cycle and Onguinization (1980s); Cycle of Institutionalization, Public Visibility and Commodification; Cycle of Citizenship (1980), Diversification and Rights (turn of the 2000s); and Backlash Cycle and Bolsonarism (Jair Bolsonaro).

In this research, knowledge is totalizing, since it never reaches a defined stage, nor finished, so it is also a human activity, aiming to know the whole in order to perceive the parts. For the Marxist dialectic, [...] "The human being needs to have a certain overview of them: it is from the view of the whole that we can evaluate the dimension of each element of the picture. This is what Hegel underlined when he wrote: Truth is the whole" [...] (KONDER, 2014, p.34). It means, therefore, that if it is not possible to see the whole, the

risk of attributing an exaggerated value to a limited truth can turn into a lie, which will certainly harm the more general truth.

ORGANIZATION OF THE LGBTQIA+ MOVEMENT IN BRAZIL

In addition to knowing the reality of the organization of the social movement in Brazil in its different contexts, this study on the organization of the LGBTQIA+ movement dates back to the beginning of the process of contestation in Latin America regarding the issues of machismo, matriarchy, patriarchy, violence against women and the oppression of homosexuality. [...] "Through a change in meaning, since the term homosexual came from a medical classification, Latin American LGBT activism began in November 1969, under the dictatorship of General Juan Carlos Onganía, in Gerli, a suburb of Buenos Aires" (TRINDADE, 2018, p.229).

Undoubtedly, it was a moment in which the first attempt at homosexual organization in Argentina gave rise, with the creation of the Grupo Nuestro Mundo, founded by 14 middle-class homosexual trade unionists, under the coordination of Héctor Anabitrate, a former member of the Communist Party, with no direct connection to the events that took place in New York. Homosexuality was interpreted from a conservative point of view as a subversion of the patriarchal order and for the leftist wing as a bourgeois vice that would divide the class struggle (TRINDADE, 2018).

In 1971, the Argentine Homosexual Liberation Front (FLHA) was created in Bueno Aires[6], inspired by the North American Gay Power movement, which fought for human rights and against discrimination, a movement that brought together politicized young people, sociology students from at least ten congregations around common demands such as the contraceptive pill, abortion and criticism of heterosexuality, approaching left-wing agendas and feminist issues, leftist and Latin American trade union groups, which was committed to expanding the struggle to change the economy, laws, and authoritarian regimes, which increased the strong performance of its members, especially Isabel Macías Galeas and Nestor Perlongher.

[6] The FLHA was a kind of congregation of different autonomous groups that coordinated joint actions. Between March 1972 and August 1973, the FLHA had the participation of at least ten groups, among them Eros, in which Nestor Perlongher, Nuestro Mundo, Profesionales, Sappho (lesbian activism), Bandeira Negra (anarchist), Emanuel (Christians), Argentine Homosexual Catholics, among others, were militants. This organization has always remained in dialogue with the feminist issues discussed within some organizations such as UFA (Argentine Feminist Union), MLF (Feminist Liberation Movement), Nueva Mujer and Frente de Lucha por la Mujer. By stating that the "personal is political", these groups organized themselves around demands such as the contraceptive pill and abortion, but they also criticized compulsory heterosexuality that hindered the free enjoyment of sexuality (Trindade, 2018, 231).

The FLHA published "*Somos"* in 1973, the first magazine aimed at homosexuals in Latin America, which led to a visit by Nestor Perlongher to Brazil in 1976, at the invitation of José Silvério Trevisan, to participate in a meeting at the University of Rio de Janeiro, to talk about the writings of the FLHA magazine "Somos". *Somos* also became the name of the first Brazilian LGBTQIA+ political organization, to be highlighted later (TRINDADE, 2018).

The LGBTQIA+ movement was also showing signs of resistance in Mexico with the Communist Party government, which included in its agenda principles that no one should be discriminated against, marginalized for racial reasons, sex and religion. But it was in 1979 that the *First March of the Homosexual Pride took place in Mexico City,* led by the collectives Frente Homosexual de Acción Revolucionária (FHAR). Recalling that, "in 1970, Philosophy and Psychology student Manuel Velandia founded the first homosexual activism group in Colombia, the Movimento por la Liberación Homosexual, which organized several political activities, including the country's First Gay March" (TRINDADE, 2018, p. 132). Both countries that made up this continent had converging histories, marked by the subjugation of racialized bodies.

> [...] In analyzing the formation of LGBT politics in Latin America, Carlos Fígari points out that the inhabitants of this continent have always been subjected to a similar type of domination, based on the subjugation of racialized and sexualized bodies as part of the colonizing enterprise. It would have been because of this history marked by exclusion and oppression that the issue of normalization, in terms of citizenship, became the main political axis of sexual dissidence. However, it is common to hear it said in Brazil, and perhaps throughout the Latin American continent, that the sexual politics devised in the US served as inspiration or provided the basis for the LGBT political activism that would be built in these countries. It is a hegemonic version that preserves the old center-periphery dichotomy and that reaffirms the political-ideological imperialism of the central countries over the third world. My discomfort with this is that by removing this hegemonic LGBT perspective, we end up suppressing our own history, because, unlike American gays, lesbians, who lived through those troubled years of 1960-1970, Brazil and its Latin American neighbors were immersed in dictatorial regimes, economic exploitation, high poverty rates, low wages, social inequality, violence, in addition to the suffocating presence of conservative Christian moral perspectives that served historically of ideological support for the colonial system (TRINDADE, 2018, p.233).

The author Ronaldo Trindade (2018), in agreement with James Green (2019), admits that the gay and lesbian movement influenced Argentina, Mexico, and Puerto Rico, but that this same phenomenon did not happen in Brazil, since the repression of the military proved to be a major obstacle, especially with the Institutional Act - AI-5, that harshly persecuted people and groups who manifested thoughts of "disorder of the homeland" and the "good customs" of society's morals.

AI-5, which suspended *habeas corpus*, further deepened the circulation of terrifying information about the practices of the policy of torturing opponents, which left the population on high alert and in constant fear of men in uniform. "Closed places, whether they were

meetings in apartments or houses, or in newly opened bars and nightclubs, have become safer spaces for gays, lesbians. Although there is policing in these places" [...] (GREEN, 2019, p.184).

This obstacle throughout the military regime (1964-1985) postponed the construction of a social movement of political action. For this reason, this specific moment that sociology understands to take place in a type of organization with a repertoire of forms of political action, types of meetings, public acts with a collective gaze emerges, in fact, in April 1978, already in the process of "political détente" and at a time of cooling of repression, a group of homosexual intellectuals[7] launched the first vehicle of wide circulation in Brazil, the newspaper *Lampião da Esquina* (RODRIGUES, 2018).

This period of history, the end of the 1970s, Quinalha (2022) defines as the first cycle, a time to centralize concerns for the construction and affirmation of homosexual identity, consecrated in collective reception spaces, when the LGBTQIA+ population found more security in coming out and revealing themselves among peers, especially with the swelling of large urban centers, since the times of the Economic Miracle, where LGBTQIA+ sociability became more evident among middle-class activists, unlike the poorest people, who could not go to bars and support networks.

Quinalha (2022) points out that it was at this time of the context of liberalization of the dictatorship that, in the city of São Paulo, the first Nucleus of Action for the Rights of Homosexuals was created, precisely in May 1978, then it became the group Somos, Group for the Affirmation of Homosexual Identity, with significant impact from the publication of the newspaper *Lampião da Esquina*, concentrated in the Rio-São Paulo axis, with national circulation, distribution to subscribers and sales on newsstands.

LAMPIÃO DA ESQUINA NEWSPAPER: SPOKESPERSON FOR THE HOMOSEXUAL MOVEMENT

> Periodicals have always been good communicators of the history of life and dreams. In addition, they create true spaces for the expression of opinions on a certain topic, with some ideological coherence among themselves. They also collaborate to bring

[7] Eleven men made up the Lampião da Esquina: mostly white, literate, middle-class and liberal professionals. These, at the time, were already considered illustrious and worked (in)directly with the promotion of knowledge, due to their political, academic, journalistic experiences and dedication to artistic life. These elements contributed significantly to the guarantee of their importance in the history of homosexuality movements in Brazil. Among the self-styled "Lords of the Council" and their subsequent professions we have: Jean-Claude Bernardet, critic and film researcher in the country; Aguinaldo Silva, writer and police reporter; Antonio Chrysóstomo, critic of popular music; Darcy Penteado, plastic artist from São Paulo; Gasparino Damata, from Pernambuco based in Rio de Janeiro, former diplomat, writer, journalist; João Antônio Mascarenhas, lawyer, former high-level official at the Ministry of Education. João Silvério Trevisan, writer from São Paulo; in addition to Peter Fry, a researcher in the area of social anthropology. The Council was completed by journalists Francisco Bittencourt, Clóvis Marques and Adão Acosta (SOBRAL, 2019, p.111-112).

> together a certain group of people who read the same story and share values expressed there and who, in some way, identify with them (RODRIGUES, 2018, p. 238).

The story of the creation of the first homosexual editorial, with a wide circulation in Brazil, had its first impact with the visit of Argentine activist Néstor Perlongher to the University of Rio de Janeiro, in 1976, to talk about the magazine *Somos*. But the idea originated from the visit to San Francisco/California, of Winston Leyland, editor of a homosexual publication called *Gay Sunshine*, a visit that took place in search of Brazilian authors to make an ontology of homoerotic literature of the Latin American gay movement. "It can be said that the launch of the newspaper, in April 1978, strengthened the action of some young men from São Paulo who organized a group that would become responsible for consolidating the homosexual movement in Brazil - the Grupo Somos" (RODRIGUES, 2018, p.239).

Editor Winston Leyland stayed at the home of João Antônio Mascarenhas, a member of the newspaper *O Pasquin,* of the newspaper *Lampião da Esquina*, a pioneer in the fight for gay rights. From this visitation, a group of homosexuals was mobilized for a conversation that took place in the apartment of Darcy Penteado, a founding member of Lampião. The meeting took place in an atmosphere of excitement, resulting in the desire of some journalists and artists to organize a periodical related to issues directed to homosexuals. To carry out this project, competent professionals soon began an articulation to raise funds and thus guarantee the financing of the first homosexual Brazilian newspaper, using an initial strategy that took place by sending letters to about twelve thousand friends indicated to collaborate in the cost, while the other part would be on account of the editorial, which was successful in the enterprise with fixed capital and, consequently, with the manufacture of its first two issues (SOBRAL, 2019, p.110).

Rodrigues (2018) will call this period of history "First Moment", with the appearance of the newspaper *Lampião da Esquina*[8], which had the first essay of the magazine, number zero, as editor Agnaldo Silva and João Silvério Trevisan, who wrote an article entitled on the cover of the magazine: "Celso Curi sued. But what is the crime of this boy?"

> But a homosexual newspaper, for what? The easiest answer is the one that will show us wielding an exotic or "understandable" flag, digging deeper into the walls of the ghetto, endorsing - by "assuming" - the isolated position that the Great Homosexual Consciousness has reserved for those who do not pray for its booklet,

[8] The newspaper *Lampião da Esquina* can be found in PDF at the Prof. Dr. Luiz Mott Documentation Center. An extremely important newspaper for the moment of emergence of the LGTQIA+ movement. Available at: https://cedoc.grupodignidade.org.br/jornal-lampiao-da-esquina-1978-1981/?order=ASC&orderby=date&view_mode=cards&perpage=12&fetch_only_meta=&paged=1&fetch_only=thumbnail%2Ccreation_date%2Ctitle%2Cdescription . Accessed on November 28, 2023.

> and which suits its perpetuation and its functioning (Lampião da Esquina, April, nº zero, 1978).

In this first experimental edition of the newspaper *Lampião da Esquina*, in April 1978, an article stood out: "Leaving the Ghetto", announcing the favorable winds of political opening: "Brazil, March 1978. Favorable winds blow in the direction of a certain liberalization of the national framework: in an election year, the press reports promises of a less rigid Executive, there is talk of the creation of new parties, of amnesty, an investigation of the proposed alternatives even makes one sniff out an "opening" of the "Brazilian discourse".

> The title of the editorial, "Leaving the Ghetto", is an epitome of the important posture of breaking the mask of protection that gays and lesbians had created for themselves in the 1950s and 1960s, above all, to guarantee a little sociability away from the social stigmas that marginalized people, from the medical concepts that treated homosexuality as a disease of Catholic morality that considered homosexuality a sin. In this way, the editorial represented an appeal to interaction with Brazilian society whose objective was to arouse other attitudes regarding the topic of love (and sex) between people of the same sex. However, if this opening of the Brazilian discourse that the editorial celebrated offered precisely the possibility of collectively and publicly questioning these old prejudices about homosexuality, it also provided a space for divergences about the proposals, directions and objectives of the incipient movement in Brazil. That said, it can be considered that the debate that the newspaper *Lampião da Esquina* encouraged took place according to a fluid moment in the country; however, it is interesting to note that despite the optimistic tone of the author of the editorial, issue zero of the magazine came out fourteen years after the 1964 coup, when it was not yet known whether the new winds were really blowing for a definitive opening or for another gale (GREEN, 2019, p.177-178).

The newspaper *Lampião da Esquina* acted as a spokesperson for the homosexual movement; it produced 38 editions on the Rio-São Paulo axis, and incorporated the main debates about dissident groups of the time, marking its name in history and fulfilling what it had promised, that is, "to talk about the present and seek to clarify the homosexual experience in all fields of society and human creativity" (RODRIGUES, 2018).

The production of reports in *Lampião da Esquina* subverted the limits of debates on homosexualities by questioning the normative approach related to the theme of sexualities, morals and customs, therefore, it acted forcefully in the tone of criticism of these discriminatory manifestations, in addition to content directed to recurrent political issues, thus creating a space for homosexual sociability and denunciations focused on the issues of other groups, such as blacks, women, indigenous people and transvestites, provoking the ire of politics. All these elements of the censorship policy of his period (SOBRAL, 2019).

> Personalities from the cultural and political milieu, not necessarily homosexuals, were also interviewed. Short stories, poetry, theater reviews, film reviews, literary reviews, etc. They joined the letters of the readers, in a forum of great debates. He

> will talk about Foucault and Sartre, Carmen Miranda and Mário de Andrade, political openness and violent repression. The Brazilian homosexual, with his multiple identities, finds his peers in Lampião da Esquina. Different, but equal in some aspects (RODRIGUES, 2018, p.240).

One cannot, however, ignore the obstacles that dogged the newspaper, one of which was related to the very few advertisers. It may reflect the complexity of the discussion focused on the homosexual community in that period, which probably led advertisers to fear having their services associated with a periodical engaged in agendas correlated to sexualities considered outside the norm. The scarce resources and the fear of associating the advertiser with the homosexual image certainly contributed to the fact that, in June 1981, the Lampião went out, leaving a great legacy for a generation of people who no longer felt alone and no longer lived in the shadow of their own existence (Sobral, 2019).

In addition, there were ideological problems, as well as the political system, added to the inquiries that were imputed to journalists, accused of undermining morals and good customs, being treated by the Federal Police as people who suffered from serious behavioral problems. In fact, " *Lampião* raised a flag that was difficult to be accepted by a large part of society, to assume pleasure as a fundamental right of the human being" [...] (RODRIGUES, 2018, p.241).

It is salutary to recognize that, until the end of its days, the newspaper Lampião da Esquina gave visibility to the homosexual movement, illuminating a significant portion of the community through reports on homosexuals, transvestites, cariocas, lesbians, women, persecution against journalists, the position of the Church, announcements of parties, dances, tourism, films, creation of a reader's tribune "Cartas Mesa", interviews. He brought the debate on the situation in Cuba, Argentina, the United States, among others.

The newspaper *Lampião da Esquina*, launched at an uncertain and obscure moment in the history of Brazil, did not resist the obstacles imposed by the financial issues in view of the few advertisers, and consequently by the difficulty in obtaining new advertisements, since the companies feared their names linked to a newspaper with this bias, accused of subversive by the brown press, by the army and by religious. Its closure was also due to the confrontation against the policy of sabotage and annihilation of the repressive police, which accused publishers of being subversives, framing them in crimes, constantly attacked by part of the moralistic society, which felt threatened by the "plague" of homosexuality and the destruction of families. But not only the moral issue and the danger of a communist revolution, it was obstinacy to prevent a significant portion of the subalternized, invisible population from living life freely and from achieving access to universal goods and services.

Even without the real certainty of the decline of the military regime at that time, or even if a new gale emerged, the fact is that three months after the newspaper hit the newsstands, the homosexual movement group "*Somos"* is created, not by coincidence, in which part of the editors of the *Lampião newspaper* would be part of the first group of Brazilian Homosexual Affirmation.

Green (2019) attributes this courageous initiative to the writer and intellectual João Silvério Trevisan, when he founded a homosexual affirmation group in 1976, when he returned from self-exile in the United States and Mexico. The author also recalls that "it is equally fundamental not to forget the May column of the newspaper *Última Hora de São Paulo*, written by Celso Cury, reporting on homosexual sociability", ending in his resignation, and emphasizes the importance of the newspaper "*Lampião da Esquina*", launched in April 1978. The following month, the creation of the Action Center for Homosexual Rights also takes place in São Paulo.

"SOMOS" - FIRST BRAZILIAN HOMOSEXUAL AFFIRMATION GROUP

All these transformations initiated by visionary leaders, during the period of decline of the Military Coup, contributed to the constitution of ideas for confronting the dictatorship, even with different perceptions about the political moment, because what was sought was to create means of participation in opposition to the dictatorship. "Both the editors of the *newspaper Lampião* and the most active people of *Somos* understood that the situation in the country had changed. New and crucial possibilities opened up from 1978 onwards" (GREEN, 2019, p.183).

Green (2019) recalls that the emergence of the LGBTQIA+ social and political movement in 1978 was also due to other forms of sociability, which had already been established in the 1950s and 1960s, when behaviors and notions of gender and non-normative sexualities were affirmed. The author reinforces that, in 1960, an LGBTQIA+ audience was created in closed places, such as bars and later in exclusively gay nightclubs, especially during Carnival time. From there, certain connections, codes, behaviors, customs were established within a semi-clandestinity.

> Among the various examples of the cultural transformations of this period, which reflected new ways of thinking about the body and behavior, is tropicalism, especially the non-traditional representations of Caetano Veloso on stage, among other artists. The values and international influences to which this cultural movement approached shocked people accustomed to the more conventional presentations of national rock and Brazilian Popular Music. The daring clothing, the male body in movement with gestures considered feminine and the expressions of freedom instilled in his shows offered an alternative model of masculinity and femininity that broke with the social rigidity of the time. The success of Maria Betânia and Gal Costa and the rumors about their sexualities, among other examples, created

> alternative models for young lesbians who were discovering the world of sociability among women. Caetano Veloso's concerts and images, especially after his return from exile in 1972, when he emphasized his feminine side, the performances of Dzi Croquetes in 1973, with ruptures and mixtures of gender representations, and the punctuality of Ney Matogrosso, who sang with a fine and effeminate voice, offered new icons and new standards that broke with the traditional roles of men and women (GREEN, 2019, p.185).

Also recovering fundamental characteristics of the forms of organization and sociability of sexuality, through culture and intellectual thinkers, Green (2019) agrees that AI-5 of 1968 obliterated any possibility of homosexual liberation. On the other hand, he recognizes that this was also a period of transnational effervescence and visibility of information circulating about "Gay Power" in the United States, as well as coming from Europe, giving signs in the Brazilian press, even with censorship. Arriving in 1976, with a radical impossibility of bringing people together to organize and discuss a homosexual movement in São Paulo, the editors of *Lampião* knew how to take advantage of the collapse of the dictatorship to start its publication.

The initiative of the first Brazilian homosexual group, founded in 1978, brought together a dozen students, clerks, bankers, and intellectuals who met weekly in São Paulo, taking turns in different apartments, without minimum conditions, given the lack of sufficient furniture, such as chairs to sit, as well as a place of their own, but without being able to prevent the first organization for the rights of homosexuals in Brazil (TRINDADE, 2018).

Green (2018) confirms the precariousness in which the Somos group lived, and adds that most were from the lower middle class, with few resources, without their own headquarters and that there were difficulties in finding space for general meetings, with rare exceptions in theater spaces and nightclub owners. The group faced the brown press, such as the newspaper "Notícias Populares", which published sensationalist articles, with aggressive manifestations in the stereotyped portrayals of homosexuals. Another difficulty lay in the resistance of the majority of the members in refusing any proposition of traditional structures with the figure of president, vice-president, treasurer, "they were even against the legalization of Somos as a civil entity, precisely because this theoretically implied a bureaucratized organization and because, possibly, it would allow State control over the group" [...] (GREEN, 2019, p.191).

Regarding the change of location, Trevisan (2018) clarifies that it was an initial work strategy of the Somos group, which was linked to the rotation of meetings in the members' homes, as well as to keep only one Mailbox for contacts and correspondence. He says that, by decision of the group, he defended the creation of a collegiate management of the sub-groups, including: recognition groups, external action, bureaucratic services, artistic

activities, external dissemination, different from the traditional formalities of the figure of president (TREVISAN, 2018).

It should be noted that the members were mostly gay, with some lesbians circulating. "There, they debated stories that disparaged homosexuals, frequently published by the newspaper *Notícias Populares*, as well as the response to be sent to the newspaper by the Action for Homosexual Rights group. In these meetings, the issues of *Lampião da Esquina*, a monthly publication aimed at homosexuals, were also carefully read" (TRINDADE, 2018, p.234).

Another important detail concerns part of the members of *Somos*, who began the process of organizing and founding the group even before it was baptized by that name. There was a concern in the "*Somos*" group related to the exercise of power; therefore, they sought to articulate themselves in order to avoid concentration of power and centralizing leaderships in order to avoid division and exclusion within the group, which was organizing politically (TREVISAN, 2018).

At the time of choosing the name*,* one that was unifying was chosen, hence the idea of *somos,* since it honored the publication of the Argentine Homosexual Liberation Front (FLHA). "At least at that time, proposals that included the term gay were rejected, as it was not intended to make a movement that began as an imitation of the North American movement" (TRINDADE, 2018, p.234).

> It was after the famous public debate in February 1979, at the Faculty of Social Sciences of the University of São Paulo, then one of the largest poles of official progressivism, that the group acquired some maturity to articulate itself minimally. In fact, with the growth of the representativeness of participants and the enrichment of the internal political debate, only then did we define its official name: We Are the Homosexual Affirmation Group. The elaboration of his political project was ambitious, starting with the name: alternate, purposeful and comprehensive, claiming our right to be what we were. But it was also a name of a palindromic nature: our state of being asserted itself with such determination that even when read backwards it remained what it is. Thus, not even the mirror of ideology, which at that moment stood between us and our reality, could deceive us: even from the inside out, the reflection would always reflect what we are. The political objectives of the group could be summed up in two pillars: the absolute autonomy of our excluded voice and the fundamental solidarity for this autonomy to be consolidated. I believe that these two foundational purposes can still serve as a reference for the debate in social segments that fight for their freedom and their political role in Brazilian society (TREVISAN, 2018, p. 138).

Green (2019) recognizes that it was from this event at USP, in 1979, that the *Somos* group began to grow by presenting an alternative project, different from the hegemonic Marxist ideas at that time, by proposing a debate on "minorities", such as women, blacks, Indians and homosexuals and had the participation of members of the "Lampião Newspaper" and the group *Somos attracted more than a hundred people, under strong*

controversy and clashes between the different sectors of the left, involving the members of *Somos* and other gays and lesbians who attended the event. At the time, many participants joined the Somos group or formed others (GREEN, 2019, p.190).

This event yielded an article in the newspaper Lampião, with controversial versions and facts, since *Somos* defended an organization only for "minorities", different from the Marxist-Leninists who defended the priority struggle to overthrow the dictatorship and campaigns to eliminate sexual discrimination. Neither the activists of *Somos* nor the left-wing militancy understood each other, which demanded problems of articulation. "Leftist groups that saw homosexuality as a bourgeois deviation or disease, simply decided to ignore the event" (GREEN, 2019, p. 191).

The members of the group *Somos,* according to Green (2019) had little experience in student movements or equivalent before joining the group, and those who had experience assumed the leadership spontaneously. The author cites the example of João Silvério Trevisan, who accompanied the gay movement in the United States; Edward MacRae, who had contact with the English movement, and himself (Green), an activist in the LGBT movement, who had participated in the American LGBTQIA+ movement between mid-1973-1975. "Some members of *Somos* who studied at universities had contact with the clandestine organizations of the left that were active in the student movement, but the traditional and homophobic views of these groups alienated almost all of these people" (GREEN, 2019, p.188).

THE FRACTIONATION OF THE "WE ARE" GROUP

> [...] Among the various divergences, as has also occurred in other places in the world, the Brazilian homosexual movement was divided between a sector skeptical of a policy of alliances with other political actors and, therefore, more centered on sexuality itself as the vector for the transformation of reality, putting the homosexual cause in first place, and another group that defended the more marked intersectionality between the struggles for social liberation with the claims of progressive sectors of society, namely political parties and left-wing collectives, as well as social movements – such as black, feminist, trade union, student, etc. (QUINALHA, 2022, p.110).

On the field of a fierce battle, two activists from the movement starred in different situations. On the one hand, João Silvério Trevisan, who distrusted the left because the party took advantage of the movement that fought for autonomy; on the other, the also leader of the group Somos, James N. Green, of the Homosexual Faction of the Socialist Convergence. "The Convergence was a Trotskyist socialist grouping that was one of the first to open up to discussions related to sexual freedom in the context of a hegemonic left that was still very straight" [...] (QUINALHA, 2022, p.110).

Green (2019) highlights three poles of divergences within the *Somos group*, which emerged in 1979, and which led to the division of the group: first, it was that one of the blocs defended an anti-authoritarian and libertarian stance, in order to package strong criticism of the left. The second revolved around the group of lesbians, diluted into subgroups in *Somos*, making it difficult for them to actively participate in all meetings, in addition to suffering a certain misogyny from members of *Somos.* Finally, the third pole, formed by the bloc of the American James Green, of the *Socialist Convergence*, which accumulated political experience and identified with the left; therefore, aiming at an activism beyond identity reflections within the group. "Our political action involved the elaboration of ideas or proposals to politicize *Somos* with the aim of interacting with society, as the newspaper *Lampião da Esquina* proposed in its initial editorial" (GREEN, 2019, p.193).

Regarding Green's statement about his political performance in Somos, Trevisan (2018) rejects it and says that he took the opportunity to prepare the ground and carry out the coup against the group:

> Green only joined *Somos* in the express purpose of opposing our scope of autonomy in relation to political parties. In other words, by creating a Gay Fraction, CS intended to integrate (or dissolve) *Somos* into its party group, under the leadership of James Green. It would be like bringing the fly to honey. Through this surreptitious movement, we saw the old left enter the scene in the nascent (and hesitant) Brazilian homosexual activism, bringing the typical political vices of the best Stalinism, which proved to be very much alive in a Trotskyist group supposedly critical of Stalin's authoritarianism. From then on, the coup was prepared, in a Stalinist movement (assumed or not) they knew how to do well: conspire (TREVISAN, 2018, p. 140).

Green (2018) claims that what was intended was to take seriously the discourse of the newspaper *Lampião* in making alliances with feminists, blacks and other segments to unify the struggle, so he insistently resorted to left-wing organization to confront homophobia, and also fought for a political homosexual movement, as he knew that organizations opposed to homophobia dictatorship had resistance in relation to issues of sexuality, including within the left. He exemplifies the case of medical student Herbert Eustáquio de Carvalho, known as Herbert Daniel, of the armed struggle to overthrow the dictatorship in 1966, forced to repress his (homo)sexuality and live in celibacy while he was part of the organization, which provoked fierce resistance against the left in Brazil in the 1960s and 1970s.

Even so, Green (2019) said he would not renounce the struggle for a political movement, so much so that the *Socialist Convergence group* [9]participated in the public act

[9] Political tendency inspired by the ideas of the Russian revolutionary Leon Trotsky, founded in 1978 in Brazil. She collaborated with the organization of the labor movement, having a strong influence on the struggle of

of November 20, 1979, Black Consciousness Day, in São Paulo, with thirty members, with the group's banner "*We are: Homosexual Affirmation Group"* and making pamphlets about the importance of the homosexual group, also about racial discrimination. [...] "It gave the impression that some militants accepted solidarity while others were indifferent. At the same time, the issue of racism and ideologies that defended racial democracy were still little discussed within the Somos group" [...] (GREEN, 2018, p.74).

Green (2019) highlights the commitment of the *Socialist Convergence* by arguing that this was the only left-wing organization that had as its leading role the banner against discrimination against homosexuals in public places. To reinforce his thesis, he presents a program prepared by the *Homosexual Faction*, in which he defined in its guidelines, a kind of booklet, inalienable principles, such as: the defense of the freedom of organization of groups; against the attacks of the government; for the end of the Press Law; for equal rights; for the end of the psychiatric and medical classification that kept homosexuality as a disease in its code, among other guidelines distributed in eight topics, adding up to a total of seventeen directives. Green concludes by questioning: "It is interesting to ask, thirty-five years after the elaboration of this program that was made in 1980, what are the gains of the LGBT movement, what are the proposals that have not yet been obtained and the items that could still generate controversy?" (Green, 2019, p.195). In a statement, the author accuses the newspaper *Lampião* of encouraging a campaign against the Socialist *Convergence group*, supposing that the intention was only to take possession of the organization of *Somos*, and goes on to vent:

> *"* [...] Instead of recriminating organizations such as the Brazilian Communist Party, the Communist Party of Brazil or the Revolutionary Movement of October 8 that maintained clearly homophobic positions" and, therefore, did not express interest in supporting the movement, the editors of *Lampião* reproached precisely the only left-wing organization that was trying to transform the conservative if not reactionary and moralistic positions that the other tendencies still defended (GREEN, 2019, p.196-197).

The disagreements between James Green and João Silvério Trevisan, both members of the group Somos, expanded to other levels of accusations. Trevisan insisted on the coup engineered by Green, of the *Socialist Convergence*, to take power from *Somos* and carry out the purpose of party centralization, so that Green knew how to choose the most accustomed participants of *Somos* to participate in a clandestine Marxism course, without anyone knowing, who engineered a conspiracy through collusion, manipulation and tactics of explicit erotic seduction by the charm of blond hair and green eyes.

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women, the black movement, the LGBTQIA+ movement, among others. It was one of the most influential tendencies in the founding of the PT.

These last attributes were called "bed politics", seduction practices used to gather information and get adherents to the positions of the *Socialist Convergence*, as satirized by Trevisan in an article in the newspaper " *Lampião da Esquina",* in 1980. However, Green defends himself by saying:

> The allegations that I made "bed politics," another term of the time to refer to people who supposedly won people off the left through sexual means and then manipulated new members into following their political ideas, are curious, given the poor results of my efforts to attract people to CS. As was the culture of the group and the gay milieu in a pre-AIDS era, I had sex with people who gave tension and we talked very little about politics when we shared a bed. We were at these moments, concerned with other matters (GREEN, 2018, p.68).

Trevisan (2019) insists that there was a clear intention of the *Socialist Convergence* to leverage notoriety, and this included the possibility of co-opting new young people, such as appearing in public. "The hegemony intended by *the Socialist Convergence* within *Somos* had been noted since the propagandist effort, in search of greater visibility. In the public protests against delegate Richetti, in June 1980, a huge and overhanging banner bore the name *"Gay Fraction of the Socialist Convergence".*

The fuse of these clashes between Green and Trevisan took place in the commemoration of May Day, at the Vila Euclides Stadium - São Bernardo, in 1980, when a group of feminists and male homosexuals appeared under a banner of the *Socialist Convergence*, a decisive episode for the split and for the removal of Trevisan, who began to dedicate himself more to the editorial of the newspaper *Lampião*, although he still maintained some contacts with other members of the *Somos* group, opening space for Green to finally take the lead, even placing himself as Trevisan's spokesperson, which caused more tension between them and led to a total rupture between them (TREVISAN, 2018, p.141).

The presence of fifty lesbians and gays on May 1, 1980, inevitably caused the split in *Somos* two weeks later. "Anyone who criticizes our performance in the march through the streets of São Bernardo and our presence at the Vila Euclides Stadium devalues the ability of gays and lesbians to think for themselves, as if we were alienated homosexuals incapable of making political decisions" (GREEN, 2018, P.74-75).

After the split, according to Trevisan (2018), the *Socialist Convergence* joined the Workers' Party (PT) and took *Somos* with it. This time, with a fixed address in a room that housed the PT directorate, in São Paulo. Thus the mask fell, with this there was no longer a need for a specific group of homosexuals, which was being diluted, within a "revolutionary party".

Green (2018) refutes the accusation that the *Somos group* dissolved within the PT, because, according to him, "the group has never aligned itself with any political party". On the other hand, he admits that between 1979 and 1981, he himself acted as a member of *CS* and *Somos*, but always maintaining political autonomy, even writing a document that affirmed the right to party affiliations, but independent.

> The capillarity of pro-legalization activists of the PT in the homosexual movement was decisive in ensuring a connection between the party and movement groups. Between 1980 and 1981, activists with dual or multiple affiliations circulated between the two domains, sometimes engaged in the movement's agendas, sometimes working on the campaign for the legalization of the party. The most prominent initiatives in this regard took place in Belo Horizonte and São Paulo. In the capital of Minas Gerais, the Gay Nucleus of the Workers' Party, founded in 1980 by activist Edson Nunes, had the participation of former members of the then extinct Third Act, the first organized homosexual group in the city, founded in 1979. In São Paulo, in 1981, militants of the Homosexual Faction of the Socialist Convergence created the Gays and Lesbians Nucleus, which brought together militants of the Socialist Convergence and the OSI to hold open debates that aimed to attract affiliates and sympathizers to the party. The activists also participated in joint efforts that collected, door to door, the signatures for the legalization of the party (CRUZ, 2018, p.261-263).

Unfortunately, "the erratic way in which Somos was integrated into the newly founded Workers' Party is an unknown fact when not even underestimated by academics and scholars, including in the areas of gender diversity" (TREVISAN, 2018, p.151).

> In other words, the forceps method with which the integration of the *Somos* group took place, through a coup, illustrates in an emblematic way the friction between the interests of a legitimate movement of unprecedented civil/popular representation and the priorities of a party that proposed, at best, to be its representative. In the worst case, not always visible to the naked eye, this implied a dilution of the newborn popular movement, as it was co-opted by the most orthodox leftist forces firmly rooted in their grammar of conquering power, at any "revolutionary" cost, even against the fundamental respect for the oppressed (TREVISAN, 2018, p.151).

Trevisan (2018) recalls that it is necessary to scrutinize the historical details of this seizure of power by *Somos* not as a melancholic nostalgia of those who lost the battle, but with a view to examining the stumbling blocks of a progressive party wing, in order to rethink a modern left. "The left needs to learn this lesson from history, over and over again, whenever such "revolutionary leaderships" have taken the lead to "mobilize" such popular movements, that is, to manipulate them" (TREVISAN, 2018, p.152).

> From the never-healed split of Somos, 40 years ago, a question can still be asked today in a more general context: why do groups of the oppressed so easily conceal the concept of solidarity and, by entering into fierce internal competition, end up reproducing the same oppressive project they fight? All this, of course, by dispute of his small power - the same one that he wanted to conquer in solidarity. For me, there is a misconception embedded exactly in this idea of the struggle for power, in which anything goes to reach the goal of a hegemonic group, against a power that should be diluted among all. In the inevitable fragmentation of the resulting splits,

> the loss of the sense of solidarity, which should be the mortar of the resistance of the oppressed sectors, is not of secondary importance (TREVISAN, 2018, p.149).

The battle fought between these two intellectuals of the *Somos movement* diverges in the sense of how to build the struggle with autonomy. Green could not separate the political-partisan struggle from identity issues, such as homosexuals, blacks, women, indigenous people, since he saw in this scenario a range of opportunities to be able to bring together groups of "minorities" to organize politically and overthrow the dictatorship and, thus, build a new political base of command in the country.

Filmmaker, writer and essayist João Silvério Trevisan, on the other hand, disagrees with the American James Green because he understands that he organized a conspiratorial action when he began to meet clandestinely with members of Somos, taking courses in Marxist manuals, by co-opting young people to left-wing positions in order to carry out the coup and take over Somos to integrate within a political party, in this case, the Workers' Party. So he did, he took *Somos* to a room in the party's directory in São Paulo.

The quarrels and arm wrestling between the two great leaders of the *Somos* group contributed to the group's decline, since the positions defended on autonomy and organization were absolutely opposite, even though in its essence the struggle for social justice on both sides remained. It is known that the *Somos* group was relentless with regard to the issues of the LGBTQIA+ movement, and that it highlighted the specific problems related to women, blacks and indigenous people, in an attempt to build a collective independent of political party, alien to left-wing, autonomous and democratic groups.

> In addition to the more properly ideological divisions around the direction of the movement, other splits will be imposed. One of the main ones was that of lesbians, who had already denounced the misogyny of gay men since they began to enter Somos, in early 1979. Although they were already self-organized in the Lesbian-Feminist Collective within Somos, they also decided in 1989 to organize separately in the Feminist Lesbian Action Group (GALF) due to the difficulties of sharing the same political spaces as men (QUINALHA, 2022, p.111).

Other factors contributed to further shake the possibility of unity between Green and Trevisan, due to criticism within the homosexual movement in relation to the PT union leader, Luís Inácio Lula da Silva, in the face of an interview he gave to the newspaper *Lampião da Esquina,* nº 14, of July 1979[10], entitled: "***Hello, Hello working class: and paradise nothing? Lula talks about strikes, dolls, and feminists, buckshot!"*** During

[10] Check out the interview in the newspaper *Lampião da Esquina*, on pages 9-10-11. Available at: https://cedoc.grupodignidade.org.br/jornal-lampiao-da-esquina-1978-1981/14-ed-jornal-lampiao-da-esquina-julho-1979/ . Accessed: Dec. 26. 2023.

this interview, Lula fired homophobic phrases against gays and feminists, further distancing the possibility of using the homosexual movement for partisan purposes.

In one of these sentences, Lula says: "Homosexuality in the working class? I don't know"; "Feminist for me is unoccupied"; FEMINISM - I think it's something for those who have nothing to do." To retract the homophobic and prejudiced speech made, Lula sought to regain his position during the first convention of the Workers' Party, including the homosexual cause in the party's program. Like this

> In September 1981, union leader Luís Inácio Lula da Silva, until then criticized by homosexual activists due to an interview published in 1979 in the newspaper *Lampião da Esquina*, gave a speech in support of the struggle of political minorities, including homosexuals, during the First National Convention of the PT, in Brasilia. The defense of the homosexual cause was ratified in March 1982 with the launch of the party's first electoral program, entitled "Land, Work and Freedom". The choice of the name was not accidental and corresponded to the need to shelter, in an electoral program, banners that ranged from the defense of union freedom, through agrarian reform, the right to housing and access to instances of power, to issues considered thorny such as equal opportunities for women, the fight against racism and homosexual discrimination. The initiative made the PT the first political party to formally support the homosexual movement in the history of the party system (CRUZ, 2018, p. 263).

All these discussions around the constitution of the LGBTQIA+ social movement produced in Brazil are a reflection of different forms of thought and divergent interests, even despite the origin of this movement in Latin America. This research is based on the perspective that the emergence of the LGBTQIA+ movement in Brazil took place from the confluence of the different movements that erupted in those 1960s and 1970s.

In this sense, the thesis according to which this Brazilian movement was born with the marks of May 1968, in France, gains strength; with June 28, 1969, at the Stonewall bar, in New York; and in Argentina, in 1971, with the creation of the Argentine Homosexual Liberation Front (FILHA), inspired by the North American Gay Power movement, in addition to other countries that showed signs of resistance in the face of the emergence of new forms of sociability, behaviors, notions of gender and against dictatorial regimes.

THE RECONFIGURATION OF THE HOMOSEXUAL MOVEMENT IN BRAZIL

The inevitable splits and divisions within the Brazilian homosexual group "Somos", led by Green and Trevisan, refer to a long discussion regarding the forms of action of Brazilian homosexual activism, while imposing new reflections on how to organize the struggle without the direct interference of political parties. This form of restructuring of the homosexual movement would lead to other forms of mobilization in the 1980s, in the face of

the difficulties faced by different groups of the popular classes due to the impoverishment of the population and due to the HIV/AIDS epidemic.

At a time of crisis in the AIDS epidemic, organizations emerged around civil society for demands repressed during the dictatorship, leading to campaigns for Direct Elections Now and for a new constitution. This process of mobilization of the popular classes in the 1980s also led to an activism averse to the derogatory spread of homosexuality by the medical-scientific powers, which exploded with the outbreak of the HIV/AIDS epidemic, called by the press the "gay plague" or "gay cancer", in view of the first diagnosis of the virus among homosexuals, confirmed in the United States in 1981. and the following year in Brazil (QUINALHA, 2022).

> The disease was serious because it quickly led several people to death and was still a threat over which there was a huge lack of knowledge. Increasingly, homosexuals appeared at health services with symptoms such as Kaposi's syndrome and pneumonia, opportunistic diseases that began to cause distrust among doctors. Cases multiplied at a rapid pace, and it did not take long for this new epidemic to be linked to a risk group and its sexual practices stigmatized as dangerous. Religious sectors even saw AIDS as a divine punishment for the promiscuity of homosexuals, prevailing a logic of blaming the subjects themselves (QUINALHA, 2022, p. 113).

Despite the stigma of the pathologization of AIDS with the epidemic of information, the disease brought sexuality out of the closet and contributed to the process of mobilization and organization of the groups, which were forced to rethink new forms of activism, aiming to create bonds of solidarity, support for people who had the disease, to put pressure on the public authorities, the pharmaceutical industries, as well as the struggle for the right to health through a universal system, for treatment policies, financing, prevention policies, agreements with NGOs and governments inside and outside Brazil, thus displacing the struggle of the movement against the dictatorship to fight the disease, in addition to denouncing the various forms of LGBTphobic violence. "The path of emancipation, which until then would pass through a rupture with the Authoritarian State and with the current sexual order, then begins to shift to the claims of equal rights and citizenship within the framework of the incipient democracy" [...] (QUINALHA, 2022, p.117)

> The 1980s were characterized by a broad process of mobilization of organized civil society. The demands repressed by the two decades of the dictatorship erupted on the public scene with enormous force since the end of the 1970s, leading to the campaigns for Diretas Já and for a new constituent assembly. As seen, the Brazilian homosexual movement was present in the redemocratization, but as a more marginal political actor in a context in which debates on sexuality were either not well known or were still the object of great taboo in pro-democracy sectors (QUINALHA, 2022, p.112).

The characteristics of the 1980s, marked by the mobilization of organized civil society, are what Rodrigues (2018) will call the "second moment", while Quinalha will call the HIV/AIDS Cycle and NGOuinization, focused on the social field and on the real issues that affected the citizens involved. "Within this context, non-governmental organizations (NGOs) are strengthening in Brazil and in the world. And, with the beginning of the AIDS epidemic, actions aimed at a solidary union between different groups and social segments began to emerge [...]" (Rodrigues, 2018, p.243).

All the manifestations and discussions listed about the LGBTQIA+ movement in its constitution, going through different historical contexts, resulted in the visibility of the causes raised and the struggle for rights, which favored the organization of new groups on different fronts in other states. An example of the expansion and opening of this movement was the creation of the first LGBTQIA+ NGO in February 1980, in Salvador, by the then activist prof. Dr. Luiz Mott, adopting the *gay* name as an identity: Grupo Gay da Bahia (GGB).

The GGB led the most significant campaign, in 1980, regarding the depathologization of homosexualities, which had already been overcome in the United States, still in the 1970s, with the removal of homosexuality from its list of disorders by the American Psychoanalytic Association in 1973, then by the Psychological Association in 1975 (QUINALHA, 2022).

> The Gay group of Bahia was not the first, but it became the "dean", the oldest group and, uninterrupted operation and with an unparalleled history within the LGBT movement in Brazil and Latin America. It was the first homosexual NGO to be registered as a civil society and of municipal public utility, led the fundamental victorious campaign for the depathologization of "homosexuality" in Brazil (1985), rescued the unpublished biography of hundreds of Luso-Brazilian sodomites persecuted by the Inquisition and as many lesbians and trans VIPs in our history, initiated the prevention of AIDS among the gay population, to the visually impaired and to the povo de santo in Candomblés, introduced among us the term homophobia and the use of the feminine to refer to transvestites and transsexuals, published dozens of books and hundreds of articles, folders and posters, maintains the largest database on LGBT+ murders in the world, participated directly in the foundation and training of a dozen LGBT groups and leaders, it is the NGO that has been most occupied and continues to be active in the national and international media. He deserved from Caetano Veloso this nice declaration of love: "the GGB and its founders are the pride of Bahia!" An unavoidable reality: cabotinism aside, the history and success of the GGB are inseparable from its founder and author of these lines (MOTT, 2018, p.211-212).

Another campaign, in the process of drafting the Constituent Assembly, took place with the inclusion in the text on the recognition and rights of minorities, thanks to spokesperson João Antônio Mascarenhas, founder of the Pink Triangle Group, who fought for the inclusion of the "expression prohibition of discrimination based on sexual orientation in the Constitution, taking his discourse against machismo, against prejudice, stigmas against transvestites. "Thanks to conservative resistance, the proposal had the support of

only a little more than a quarter of the constituents, not reaching the necessary majority" (QUINALHA, 2022, p.123).

Although the constitutional text was not successful, even with the support of the PT bench, defeated by 429 of the 559 constituent deputies, this initiative had consequences in other municipal and state legislatures in more than seventy cities that approved anti-discrimination provisions in their respective Organic Laws. Therefore, "... the possibilities of institutional disputes began to be increasingly explored, which reached a concrete horizon of achievements, even if limited by incipient democracy and prejudice rooted in society..." (QUINALHA, 2022, p.125).

All these campaigns gave visibility to the movement, based on an activism that increasingly created spaces, expanding dialogues and organizational capacity, with a strong potential for mobilization, intensified in the 1990s with LGBTQIA+ pride parades, International Conferences, National Meetings, protests.

The role of NGOs has contributed to the strengthening of struggles for rights, especially for public recognition. However, the crisis that took place in the 1990s caused changes in the relationship between NGOs and the State, since, from being a protagonist in the fight against forms of oppression and discrimination in cooperation with popular movements since the 1970s, it became a partnership with the State in the 1990s, in search of resources to implement public policies. in the context of the so-called New Social Movements (Third Sector), as will be detailed below.

FINAL CONSIDERATIONS

Thus, we seek to understand the emergence and consolidation of the LGBTQIA+ political movement in Brazil, addressing the movement in the period between the 1970s and 1980s. The period studied was fundamental for the organization of the first struggles against homophobia in the country and for the affirmation of the movement as instruments of collective struggles for the rights of homosexuals.

We also identified the relationship between the origin of the movement in Brazil and the phenomena that occurred in other countries, with more or less influences that converged to its conformation. The struggle of the American gay movement of 1969, known as Stonewall, against police raids and the repression of the expression of sexuality in the USA; the French May of 1968, whose declarations for freedom, against conservative values and customs and questioning authoritarian governments in socialist countries ran through almost all countries; the same can be said of the struggles in the movement in Mexico and Latin America.

The context of the military dictatorship, with frequent arrests of LGBTQA+ people who dared to express their sexuality, a youth sensitive to living without prejudice and repression by the military regime, added to the political and union effervescence in the struggle for democracy and against the military regime, creates the conditions for the grouping of the LGBTQIA+ population around these agendas.

The inevitable clashes and divisions within the Brazilian homosexual group "Somos", led by Green and Trevisan, refer to a long discussion regarding the forms of action of Brazilian homosexual activism, while imposing new reflections on how to organize the struggle without the direct interference of political parties.

The clashes between the ideas of the two main leaders of the movement organized in Somos marked the ideological struggles that took place within the movement, at the time of its birth, especially during the formation of the group. These were positions that reflected the clashes that occurred at that historical juncture, which varied between Marxist theses (and their different views) and autonomist ideas with a strong European influence. These ideas confronted each other within Somos and provoked the political fractionation of the movement, until the end of the minimum programmatic agreements and their subsequent organic dissolution.

The importance of the process of mass communication through the press gains prominence at the origin of the movement. Lampião da Esquina was the first public newspaper, spokesperson of the movement, of national circulation between 1978 and 1981, to disseminate positions on controversial issues around homosexuality issues. The name came in honor of a publication of the Argentine homosexual movement that circulated between 1971 and 1976. In addition to being a communication channel, he was a political and collective organizer of the LGBTQIA+ population around his ideals.

Finally, the restructuring of the LGBTQIA+ movement led to other forms of mobilization in the 1980s, in the face of the difficulties faced by different groups of the popular classes due to the impoverishment of the population and the HIV/AIDS epidemic. This is what Rodrigues (2018) will characterize as the "second moment", while Quinalha (2022) will call the HIV/AIDS Cycle and NGOuinization, focused on the social field and on the real issues that affected the citizens involved

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ASSOCIATION BETWEEN RELIGIOSITY AND QUALITY OF LIFE IN WOMEN WITH BREAST CANCER UNDERGOING CHEMOTHERAPY RELIGIOSITY AND QUALITY OF LIFE IN WOMEN WITH CANCER

https://doi.org/10.56238/sevened2024.031-021

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ABSTRACT

Objective: To verify the correlation between religiosity and health-related quality of life in women with breast cancer. Method: Analytical longitudinal, prospective study, conducted between January 2019 and March 2020, on a public hospital in Maranhão. A sociodemographic questionnaire and the instruments EORTC-QLQ-C30, EORTC-QLQ-BR23 and DUREL Scale were applied. The data were verified by the Shapiro-Wilk test, Pearson correlation coefficient and Spearman. Results: Eighty women, mean age 52 years, married, with high school education, white, Catholic participated in the research. A positive correlation was observed between religiosity and quality of life in all stages of chemotherapy treatment. Conclusion: The positive association between religiosity and quality of life in women with breast cancer undergoing chemotherapy was the conclusion of our study. Religiosity is an essential factor of quality of life in oncological diseases.

Keywords: Breast Cancer. Chemotherapy. Religiosity. Quality of Life. Woman.

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INTRODUCTION

Cancer patients have many stressors that can affect their quality of life (QoL) [1,2,3]. Therefore, it is of great value that the multidisciplinary team assess QoL in order to develop strategies thus improving QoL [4,5,6].

Among these resources is religiosity, understood as adherence to practices that the individual believes and follows. Religious coping can present itself as an element that contributes to treatment adherence [7,8].

The objective of this study was to verify the correlation between religiosity and HRQoL of women with breast cancer undergoing chemotherapy treatment.

METHOD

STUDY TYPE

A longitudinal, observational, analytical study of the prospective cohort type, with a follow-up time frame of six months.

POPULATION

Women with breast cancer undergoing chemotherapy treatment at the Chemotherapy Service of the Hospital Estadual de Câncer Tarquínio Lopes Filho, located in the city of São Luís - Maranhão. Women with breast cancer in chemotherapy treatment exclusively, in any stage of the disease, aged 18 years or older were included. Excluded were those who were undergoing hormone therapy and/or radiotherapy.

SAMPLE

The sample was sized in a non-probability manner, sequentially including all breast cancer patients undergoing chemotherapy treatment from January 2019 to March 2020.

DATA COLLECTION

After initial presentation and signing of the informed consent form, the data were collected by the researchers, through individual interviews and completion of questionnaires and instruments on the first day of treatment (phase 01) and at the end of six months (phase 02), at the end of the chemotherapy cycles.

The interviews were conducted during the chemotherapy session, in a suitable place, lasting approximately 60 minutes. Three questionnaires were used: questionnaire of sociodemographic and clinical characterization, constructed by the researchers with data such as age, sex, marital status, education, professional occupation, religious activity,

medical diagnosis, previous surgeries, chemotherapy schemes applied in the first phase; the HRQoL questionnaires elaborated by the *European Organization for Research and Treatment of Cancer Quality of Life Questionnaire -Core 30* (EORTC QLQ-C30) and the *Quality of Life Questionnaire - Breast Cancer Module (*QLQ-BR23), both in Portuguese and validated in Brazil, applied in all phases of the research. The EORT QLQ C30 questionnaire is self-explanatory, composed of 30 questions, and divided into three dimensions: general quality of life, functional scales (physical function, emotional function, cognitive function, general function, and social function), and symptom scales (fatigue, pain, dyspnea, insomnia, loss of appetite, nausea and vomiting, constipation, diarrhea, and financial difficulty). The BR23 questionnaire, a specific module for patients who had breast cancer, is composed of 23 questions divided into two dimensions: functional scales (body image, future perspective, sexual function and sexual satisfaction) and symptom scales (chemotherapy effects, concern about hair loss, breast symptoms and arm symptoms). For the evaluation of religious coping, the Duke Religiosity Scale (DUREL) was used, validated for the Brazilian culture by Taunay [9]. It is an instrument that has five items measuring religious involvement associated with the health outcome. Item 1 is about organizational religiosity (OR), in which the frequency of religious meetings is verified. Item 2, non-organizational religiosity (NOR), deals with the frequency of private religious activities, such as prayers and religious programs on open television. Items 3 to 5 comprise intrinsic religiosity (IR) and denote the perspective of the search for the experience of religiosity as an individual objective [9].

DATA ANALYSIS AND TREATMENT

The data from this study were analyzed quantitatively, applying the principles of descriptive and inferential statistics. They were entered into an Excel spreadsheet, with double entry of the answers and their validation. After database validation, the statistical procedures were performed in the SPSS version 19 program, considering a significance level of 5%.

For the descriptive analysis of nominal or categorical variables, measures of position, minimum and maximum values, and standard deviation were used for continuous variables.

Bivariate analysis was performed, demonstrating the association relationship between the variables, in which the Fisher's Exact Test was used. Spearman's Linear Correlation was also used to evaluate the correlation between the domains of the WHOQOL and the DUREL scale. To verify differences between groups, the non-parametric Kruskal-Wallis test and the Mann-Whitney test were used.

ETHICAL ASPECTS

The development of the study met the national and international standards of ethics in research involving human beings, of the National Health Council, and was approved by the Research Ethics Committee of the UNICEUMA University institution with Ruling Nº. 606.999, CAAE: 27793614.6.0000.5084

RESULTS

The sample consisted of 80 women, whose mean age was 52.54 ± 9.54 years, predominantly white, married, Catholic, with a medium level of education [10].

Regarding the HRQoL assessment of patients in phase 01, we observed higher mean QoL scores for the dimensions of the functional scale (physical function) and symptom scale (dyspnea, loss of appetite, nausea and vomiting, constipation, diarrhea, effects of chemotherapy, concern with hair loss, and arm symptoms). The worst mean QoL scores were present within the functional scale (sexual function) and symptom scale (Insomnia) (Table 1) [10].

Table 1: Minimum, maximum, mean, and standard deviation values of the responses for the domains of the Quality of Life questionnaires in phase 01 and phase 02 chemotherapy oncology treatment.

EORTC QLQ-C30 Questionnaire									
	Dimensions	**Minimum**	**Maximum**	**Mean ± Standard Deviation**		**Dimensions**	**Minimum**	**Maximum**	**Mean ± Standard Deviation**
Phase 01	**Overall quality of life**	58,33	83,33	77,71 ± 7,36	***Phase 02***	**Overall quality of life**	50	75	66,15 ± 5,19
	Functional Scale					**Functional Scale**			
	Physical function	86,67	100	97,25 ± 3,63		*Physical function*	80	100	94,50 ± 5,49
	Emotional function	58,33	100	81,35 ± 10,71		*Emotional function*	58,33	91,67	78,13 ± 8,00
	Cognitive Function	83,33	100	95,83 ± 7,26		*Cognitive Function*	83,33	100	96,88 ± 6,55
	General function	83,33	100	92,71 ± 8,32		*General function*	50	100	78,13 ± 18,10
	Social function	33,33	100	66,88 ± 25,09		*Social function*	33,33	66,67	62,08 ± 8,38
	Symptom Scale					**Symptom Scale**			
	Fatigue	0	22,22	5,56 ± 7,50		*Fatigue*	0	33,33	9,44 ± 9,37
	Pain	0	33,33	3,96 ± 7,61		*Pain*	0	33,33	0,83 ± 5,24
	Dyspnea	0	0	0		*Dyspnea*	0	0	0

	Insomnia	0	33,33	16,25 ± 16,77		*Insomnia*	33,33	33,33	33,33 ± $0,10^{-7}$
	Loss of appetite	0	0	0		*Loss of appetite*	0	33,33	16,67 ± 16,77
	Nausea and vomiting	0	0	0		*Nausea and vomiting*	0	50	19,38 ± 17,48
	Constipation	0	0	0		*Constipation*	0	0	0
	Diarrhea	0	0	0		*Diarrhea*	0	33,33	4,58 ± 11,55
	Financial Difficulty	0	33,33	3,75 ± 10,60		*Financial Difficulty*	33,33	33,33	33,33 ± $0,10^{-7}$
EORTC QLQ-BR23 Questionnaire									
	Dimensions	**Minimum**	**Maximum**	**Mean ± Standard Deviation**		**Dimensions**	**Minimum**	**Maximum**	**Mean ± Standard Deviation**
Phase 01	**Functional Scale**				***Phase 02***	**Functional Scale**			
	Body image	0	66,67	25,73 ± 18,57		*Body image*	16,67	50	34,06 ± 6,10
	Future outlook	33,33	66,67	34,58 ± 6,37		*Future outlook*	33,33	66,67	40,00 ± 13,42
	Sexual Function	0	16,67	8,54 ± 8,38		*Sexual Function*	0	16,67	4,38 ± 7,38
	Sexual satisfaction	-	-	-		*Sexual satisfaction*	-	-	-
	Symptom Scale					**Symptom Scale**			
	Effects of chemotherapy	0	0	0		*Effects of chemotherapy*	0	19,08	12,50 ± 6,49
	Hair loss	0	0	0		*Hair loss*	0	100	48,33 ± 36,32
	Breast Symptoms	0	16,67	4,90 ± 4,72		*Breast Symptoms*	0	16,67	8,54 ± 1,86
	Symptoms in the arm	0	0	0		*Symptoms in the arm*	0	11,11	7,50 ± 5,24

In phase 02, better ratings were recorded for the functional scale (cognitive function) and symptom scale (dyspnea and constipation). The worst evaluations were descriptive for the functional scale (sexual function) and symptom scale (concern about hair loss) (Table 1) [10].

As for religiosity, in general, the indices showed median values in both phases of treatment. For the OR, the averages were 2.00 ± 0.00 (min. 2 and max. 2) (phase 1) and 1.31 ± 0.47 (min. 1 and max. 2) (phase 2). For the NOR, the means were described as 2.21 ± 0.41 (min. 2 and max. 3) (phase 1) and 2.00 ± 0.00 (min. 2 and max. 2) (phase 2). In the

IR index, the mean values were 4.61 ± 0.93 (min. 3 and max. 6) (phase 1) and 4.84 ± 1.32 (min. 3 and max. 8) (phase 2). (Table 2).

Table 2: Minimum, maximum, mean and standard deviation values of the responses for the domains of the Duke Religiosity Scale (DUREL) questionnaire in phase 01 and phase 02 chemotherapy oncology treatment.

Phase 01 - Duke Religiosity Scale (DUREL)			
Key Figures	**Minimum**	**Maximum**	**Mean ± Standard Deviation**
Organizational religiosity (OR)	2	2	2,00 ± 0,00
Non-Organizational Religiosity (NOR)	2	3	2,21 ± 0,41
Intrinsic religiosity (IR)	3	6	4,61 ± 0,93
Phase 02 - Duke Religiosity Scale (DUREL)			
Key Figures	**Minimum**	**Maximum**	**Mean ± Standard Deviation**
Organizational religiosity (OR)	1	2	1,31 ± 0,47
Non-Organizational Religiosity (NOR)	2	2	2,00 ± 0,00
Intrinsic religiosity (IR)	3	8	4,84 ± 1,32

When comparing the Religiosity Scale in the two phases of treatment, it was observed that the indices of OR (t = 13.18; G.L. = 79; p = 0.000) and NOR (t = 4.62; G.L. = 79; p = 0.000) showed a significant decrease in the evaluation score (Table 3). While IR, did not show any significant variation between the two evaluation periods of the patients (t = -1.69; G.L. = 79; p = 0.095) (Table 3).

Table 3: Comparison between the mean scores of the Duke Religiosity Scale (DUREL) questionnaire in phase 0 1and phase 02 chemotherapy oncology treatment.

	Duke Religiosity Scale *Questionnaire* (DUREL)			
Key Figures	**Phase 01**	**Phase 02**		**p-value[(a)]**
	Mean ± Standard Deviation	**Mean ± Standard Deviation**	**Difference**	
OR	2,00 ± 0,00	1,31 ± 0,47	0,69	0,000*
NOR	2,21 ± 0,41	2,00 ± 0,00	0,21	0,000*
IR	4,61 ± 0,93	4,84 ± 1,32	-0,23	0,095

(a)Student's t-test for paired samples/ *Significant difference, p < 0.05
Legend: OR - Organizational religiosity; NOR - Non-organizational religiosity; IR - Intrinsic religiosity.

The correlation matrix between QL domains and the Religiosity Scale (DUREL) in phase 01 of chemotherapy treatment indicated positive associations for: GQL and NON; GQL and IR; General Quality of Life (GQL) and EORTC QLQ-C30 functional scale, EORTC QLQ-C30 functional scale and EORTC QLQ-BR23, General Quality of Life (GQL) and EORTC QLQ-BR23 functional scale, NOR and R (Table X). Negative associations were also recorded between: GQL and EORTC QLQ-C30 symptom scale, GQL and EORTC QLQ-BR23 symptom scale, functional scale and EORTC QLQ-BR23 symptom scale (Table 4).

Table 4: Correlation matrix between Quality of Life domains (EORTC QLQ-C30 and EORTC QLQ-BR23) and Duke Religiosity Scale (DUREL) indices in phase 01 chemotherapy oncology treatment.

Variables	Functional Scale[a]	General Quality of Life [a]	Symptom Scale[a]	Functional Scale [b]	Symptom Scale [b]	NOR[c]	IR[c]
Functional Scale [a]	-	0,348*	-0,126	0,534*	-0,151	0,147	0,217
General Quality of Life [a]	0,348*	-	-*0,244	0,350*	-*0,311	0,156*	0,201*
Symptom Scale [a]	-0,126	-*0,244	-	-0,081	0,131	0,214	0,084
Functional Scale [b]	0,534*	0,350*	-0,081	-	-*0,455	0,076	0,180
Symptom Scale [b]	-0,151	-*0,311	0,131	-*0,455	-	0,109	-0,067
NOR[c]	0,147	0,156*	0,214	0,076	0,109	-	0,381*
IR[c]	0,217	0,201*	0,084	0,180	-0,067	0,381*	-

[a]EORTC QLQ-C30/ EORTC[b] QLQ-BR23/[c] Duke Religiosity Scale (DUREL)/ *Significant difference, $p < 0.05$
Legend: NOR = Non-Organizational Religiosity; IR = Intrinsic Religiosity.

In the correlation matrix with the same variables in treatment phase 02, positive relationships were observed between: EORTC QLQ-C30 and EORTC QLQ-BR23 symptom scale, EORTC QLQ-C30 and EORTC QLQ-BR23 functional scale, IR and GQL (Table 12). Negative relationships were described for: NOR and GQL, EORTC QLQ-C30 functional scale and EORTC QLQ-C30 symptom scale, EORTC QLQ-C30 functional scale and EORTC QLQ-BR23 symptom scale (Table 5).

Table 5: Correlation matrix between Quality of Life domains (EORTC QLQ-C30 and EORTC QLQ-BR23) and Duke Religiosity Scale (DUREL) indices in phase 02 chemotherapy oncology treatment.

Variables	Functional Scale[a]	General Quality of Life [a]	Symptom Scale[a]	Functional Scale [b]	Symptom Scale [b]	NOR[c]	IR[c]
Functional Scale [a]	-	0,101	-0,448*	0,251*	-0,366*	0,145	-0,014
General Quality of Life [a]	0,101	-	-0,165	0,087	-0,053	-0,019*	0,121*
Symptom Scale [a]	-0,448*	-0,165	-	0,104	0,472*	0,032	0,004
Functional Scale [b]	0,251*	0,087	0,104	-	-0,213	-0,007	0,018
Symptom Scale [b]	-0,366*	-0,053	0,472*	-0,213	-	-0,121	-0,086
NOR[c]	0,145	-0,019*	0,032	-0,007	-0,121	-	0,001
IR[c]	-0,014	0,121*	0,004	0,018	-0,086	0,001	-

[a]EORTC QLQ-C30/ EORTC[b] QLQ-BR23/[c] Duke Religiosity Scale (DUREL)/ *Significant difference, $p < 0.05$
Legend: OR = Organizational Religiosity; IR = Intrinsic Religiosity.

DISCUSSION

The average age of the interviewees was 52 years, most were married, with a high school education, data corroborated by research conducted nationally and internationally, such as the studies conducted in Fortaleza - Ceará, Belo Horizonte - Minas Gerais and Thailand, which investigated the HRQoL of women with breast cancer. [11,12,13]

With the exponential growth of BC cases, the consequences of chemotherapy treatment on the physical, psychological, social and spiritual/religious conditions of this public have also undergone robust changes, making room for better and continuous investigations of the influence of CT on the QL of these patients [14].

HRQoL assessment, therefore, has been listed as an essential tool in measuring the impact of the disease on the patient, generating indicators of disease severity and progression [15].

This study entailed the description of real-world data about changes in HRQL linked to CT. This helps the multidisciplinary team to quantify and qualify the effects of CT on potential [16] biopsychosocial characters.

In this study, the patients' HRQoL is worse when comparing phase 01 with phase 02 of treatment. The GQL decreased due to CT, inferring that woman with BC considered the worsening of their health status during CT. This was also observed in Binotto [16], Jang et al [17], and Wildes [18], who showed that overall health worsened following CT and worsening symptoms conferred by chemotherapy treatment.

This study also examined religiosity and its relationship to HRQL in breast cancer patients undergoing chemotherapy.

The results of the study made explicit a direct correlation between NOR and IR with GQL in phase 01 and IR and GQL in phase 02 of the treatment. GQL was significantly higher in patients with high IR.

Zamanian *et al.* [19], Jang et al [17], Aukst-Margetic [20], Wildeset al [18] , despite methodological and cultural differences, showed that positive religious *coping* was associated with better GQL, while negative religious *coping* was significantly linked to worse HRQL , like our study.

Carvalho [21], when relating the domains of the WHOQOL-bref with the dimensions of religiosity of the Durel scale, identified a significant correlation between the physical domain and IR. It is inferred that the decrease in individual religious activities (prayers, meditations) increases physical pain, as observed in our study. The IR evaluates how much religion can influence individual behavior and daily life, explaining how much and how the patient sees the importance of religion in her life [22].

In recent times, a diversity of evidence has inferred a relationship between religiosity and GQL with no clear mechanism of this relationship. Studies have induced that religiosity was associated with biopsychosocial support mechanisms that may mitigate the severity of BC [23] symptoms. Sadath and [24] Scheder [25] explained that women with BC align themselves to life-threatening illness by preserving hope, compensating for loss, and actively conserving their personal lives through experiential learning process. This learning process allowed patients to create or discover opportunities that enabled them to maintain or gain pleasure in life, even if suffering persisted during the cancer [24,25] problem.

Given our results, the importance of GQL in cancer treatment, the numerous physical, psychological, and religious changes of patients with BC, it is essential to gain information despite the religious care within the holistic.

Health professionals, especially those who work directly with cancer patients, tend to optimize assistance when they consider religious aspects in the humanized approach to care. It also provides a better discernment by the professional of the coping strategies used by the patients, implementing the bond, respect, integrity, and motivation during therapy.

We emphasize the importance of supporting these healthcare professionals' own religiosity, being available as a religious resource for their patients, and recognizing, understanding, and meeting the patients' religious needs.

CONCLUSION

The positive association between religiosity and quality of life in women with BC undergoing cancer chemotherapy treatment was the conclusion of our study. Religiosity is an essential factor for quality of life in oncological diseases, optimizing the ability to face the disease, both for patients and caregivers, whether family and/or professional. Thus, it is necessary for health professionals to carry out studies on religiosity, with the objective of better interventions during the treatment of women with BC.

AUTHOR CONTRIBUTIONS

All authors made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual content; agreed to submit to the current journal; gave final approval of the version to be published; and agree to be accountable for all aspects of the work.

DISCLOSURE

The authors report no conflicts of interest associated with this publication.

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PERCEPTIONS OF THE APPLICATION OF THE MODEL OF CARE FOR CHRONIC CONDITIONS IN PARANÁ, BRAZIL

https://doi.org/10.56238/sevened2024.031-022

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ABSTRACT

The current health care model for users with chronic conditions in the Unified Health System needs to be transformed. In Paraná, there are strategies for continuing education and co-financing of services focused on the Care Model for Chronic Conditions. This is a descriptive and exploratory study, with a qualitative approach, which analyzed the perceptions of Primary Health Care and Specialized Outpatient Care professionals about the implementation of the Care Model for Chronic Conditions. 4 focus groups were held, with the participation of 37 professionals, the discussions permeated the work processes from the perspective of thematic analysis. In the statements, elements such as the risk stratification of the health condition, the organization of care and the approximation of the teams were identified. The elaboration of the care plan is incipient due to the lack of understanding of professionals and users about the tool. In health units, access occurs in the logic of acute care, and care is shared through regulation centers. Permanent education strategies, structured public policies and specific funding are drivers for the consolidation of the Model.

Keywords: Attention Models. Chronic condition. Primary Health Care. Outpatient Care.

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INTRODUCTION

In recent decades, there have been important variations in the morbidity and mortality patterns of the population worldwide, due to demographic and epidemiological transitions, with a decrease in the prevalence of infectious diseases and a higher prevalence of Chronic Non-Communicable Diseases (NCDs) (Martins et al., 2021).

According to Mendes (2018; 2011), there are different models of health care for acute and chronic conditions in public and private health systems around the world. To offer effective and effective care to the population, it is necessary to organize the supply of health services to meet the demand for care for both acute and chronic conditions, balancing the intensity of the care offered, according to the needs of the population and the territory of sanitary responsibility(Mendes, 2018; 2014).

NCDs include diseases of the circulatory system (CAD), neoplasms, chronic respiratory diseases (CKD) and diabetes mellitus, and constitute the main cause of death in the world. In Brazil, in 2019, 738,371 deaths due to NCDs were recorded, and 41.8% of these deaths occurred prematurely, between 30 and 69 years of age, representing a mortality rate of 275.5 deaths per 100 thousand inhabitants (Brasil, 2021).

Considering the assumptions of the Unified Health System (SUS) and the challenge of a universal health system in a continental country such as Brazil, with inequalities in the supply and access to health services in the different health regions, it is urgent to change the health care model. Currently, the current model is still predominantly organized to care for acute conditions and acute events, and it is necessary to move towards a system that is proactive, integrated, continuous and focused on promoting and maintaining the person's health (Mendes, 2014; 2011).

In 2011, a Brazilian sanitarian proposed a model of care that considered the peculiarities of the health conditions of the Brazilian population, the Chronic Conditions Care Model (MACC). This model is based on the models of the Social Determination of Health, on the elements of the Chronic Care Model (CCM), and on the proposal of the Kaiser Permanente Risk Pyramid (Mendes, 2018).

In Paraná, since 2014, the MACC has been recommended for the care of users in the Lines of Care established in the state. The lines of care seek to describe the user's itinerary in the Health Care Network (RAS), in order to improve the problem-solving capacity of care, based on the risk stratification of the population, which directs the intensity of care and priority location for adequate care in the RAS (Paraná, 2018).

Systemic Arterial Hypertension (SAH) and Diabetes Mellitus (DM) represent chronic conditions that impact the quality of life of a large part of the population of Paraná,

generating disabilities and lost years of life, which requires public health efforts at the municipal, state, and federal levels to ensure the care of the affected population (Paraná, 2023).

According to the Paraná State Health Plan (2020-2023), within the scope of SUS management, strategies are developed to drive the change in the current care model for the care of people with chronic conditions, with a focus on the permanent education of health professionals in Primary Health Care (PHC) and Specialized Outpatient Care (AAE), and on the co-financing of specialized outpatient clinics that serve the SAH and DM Care Lines, that in order to be entitled to the financial resources made available, they need to organize the service with a focus on the implementation of the MACC.

In this context, it is relevant to incorporate scientific evidence into clinical practice, in an attempt to reduce the gap between scientific investigation and professional practice, with the integration of knowledge and routine practice of health services to promote the quality and effectiveness of health care. Therefore, analyzing the implementation of public policies in the context of the SUS is essential to evaluate the performance of interventions at all levels of management, contributing with reflections applied to practice (Bomfim *et al.,* 2021).

Thus, considering the need to identify the impact of the strategies implemented in Paraná, to change the care model offered to the population living with chronic conditions, this research aims to analyze the perceptions of PHC and AAE health professionals about the implementation of the MACC.

METHODS

This is a descriptive and exploratory study, with a qualitative approach. Four (4) face-to-face focus groups were held, mediated by a semi-structured script, conducted by 2 researchers, where we sought to collect information on how the implementation of the MACC is delivered to the target population, in this case users with SAH and DM, from the perspective of PHC and SEA professionals.

The groups were carried out between April and July 2023, in two PHC Units and two AAE services managed by Intermunicipal Health Consortia, in the municipalities of Apucarana, Piraquara and São José dos Pinhais, in the state of Paraná. These health establishments were included in the research because they are located in two different health macro-regions of Paraná, being in the northern macro-region the municipality of Apucarana, and in the eastern macro-region the municipalities of São José dos Pinhais and Piraquara. In addition, the health services that provided care to users of the SAH and DM Care Lines at the time of data collection were selected .

The type of sampling used was by convenience, and the participants were middle and higher level health professionals from PHC Units and AAE services, with a minimum time of 06 months of experience in the service. The focus groups were carried out in the workplaces of the health professionals, who agreed to participate in the study, after signing the ICF, which ensures the confidentiality and confidentiality of the data. Nurses, physicians, nursing technicians, dentists, community health agents, nutritionists, psychologists, physiotherapists, pharmacists and social workers who worked at the research sites participated, according to the composition of the PHC and AAE teams, the study scenarios. There was no refusal on the part of the professionals to participate in the research.

The semi-structured script used in the focus group discussions was composed of six (6) subjective questions, which allowed the participants to express perceptions about the interaction between health professionals from the same service and with other points of the RAS, the facilities and weaknesses found to perform care according to the MACC, and what is the professionals' perception of the user's participation in their own care.

During the execution of each group, the audio discussions were recorded through a voice recorder and video capture by the Zoom videoconferencing® platform. The audios were transcribed and the product of the transcriptions were transformed into text files and reviewed through the text editor software. The transcriptions were analyzed through thematic analysis, from the perspective of Minayo, Deslandes, Gomes (2016).

This article emerged from the results achieved in the research entitled "Implementation of the Care Model for Chronic Conditions in Primary Health Care and Specialized Outpatient Care from the perspective of health professionals", approved by the Research Ethics Committee of the Federal University of Paraná under CAAE No. 64814622.1.0000.0102. All ethical aspects provided for in Resolutions No. 466/2012 and No. 510/2016 were observed.

RESULTS AND DISCUSSION

Thirty-seven (37) health professionals participated, nineteen (19) of them from PHC (51.3%), and eighteen (18) from AAE (48.7%). Each focus group lasted an average of 54 minutes, totaling 3 hours and 37 minutes of discussion on the theme. Of the total number of study participants, thirty-four (34) had higher education in the health area, and three (3) participants had completed high school. Regarding the gender of the participants, in PHC, fourteen (14) health professionals were female and five (5) were male. In the AAE, thirteen (13) female professionals and five (5) male professionals. The average time to finish the participants' academic training was 5 to 10 years.

After a thorough transcription and rereading of the focus group products, vertical data analysis took place, which consists of evaluating the individual speech of each participant. Next, the horizontal analysis of the material was carried out, through the identification of common elements in the speeches of different participants. From this, it was possible to identify a main theme, related to the work processes in PHC and SEA with a focus on MACC. From this central theme, 3 nuclei of meaning emerged: 1) Access and organization of care; 2) Care plan and the performance of the multiprofessional team; 3) Permanent education focused on work processes in PHC and AAE.

ACCESS AND ORGANIZATION OF CARE IN PHC AND AAE

For Marziale (2016), users' access to health services is a topic widely discussed in the literature, considering the peculiarities of universal health systems and the variety of forms of access that a system can provide. It is related to the way users enter health services, as well as their continuity of care within the system. In Brazil, considering the assumptions of the SUS, PHC is the main gateway for the user to enter the system, being responsible for coordinating the care and ordering of the user in the RAS (Brasil, 2017; Mendes, 2015).

Ensuring the user's access to the system is an essential attribute for PHC, as a source of care for each new problem or new episode of the same health problem, with the exception of emergencies and urgencies, when the population and the team identify PHC as the first resource to be sought when there is a need or health problem (Brasil, 2017).

Thus, the presence of spontaneous demand, which is about users who seek the service on demand, in case of need, and the act of welcoming it, when they seek this level of care, is part of the work routine of PHC teams. User embracement is recommended by the National Humanization Policy (2013) as an alternative to meet the needs presented by the user, to reorganize the team's work process and overcome the biomedical health model, removing the focus on careof the medical professional only, for the involvement of the PHC team in this process of welcoming (Moura *et al.*, 2022).

Moura et al. (2022) describe that one of the biggest challenges of PHC is to organize the forms of access, balancing the needs arising from acute and chronic conditions. In the PHC focus groups, in the statements of the study participants, it is evident that the search for care occurs predominantly by spontaneous demand, in the search for welcoming, and that the programming of care for chronic conditions is focused on the agenda of the medical professional, for specific groups:

> We can make more appointments for the doctor [...] because only the nurse can do the reception [...] there is a movement that we are not able to solve, you know? there are people with sore throats, there are people with chronic low back pain, there are decompensated people [...] we spend most of the time in the shelter [...] (P13. APS, Nurse Practitioner)
>
> [...] we try to separate a space in the agenda specifically for chronic, hypertensive and diabetic patients, it turns out that it is much more than [...] it ends up that in the middle of the pregnant women's consultation, there are hypertensive and diabetic patients (P15. APS, medical)

In Brazil, it is common in PHC to have a future thematic scheduling model, such as the organization of its service flow, for access by specific groups, such as: pregnant women, children, the elderly, hypertensive and diabetic, excluding a large part of the population of its territory that does not fit into a group, and when they actually need care, they end up facing the difficulty of access. It is important to highlight that appointments with later dates favor absenteeism and hinder care, restricting access to those who really need it (Pires Filho *et al*., 2019; Brazil, 2017).

It is recommended that the PHC team organize its agenda in order to contemplate the diversity of the health needs of its population. It is necessary to guarantee access in cases of urgency, non-urgent spontaneous demand and continued/scheduled care for chronic conditions. The portfolio of PHC services is broad, and the offers of consultations, exams and procedures need to be scheduled with a certain periodicity, according to the risk stratification and the individual needs of each user (Moura *et al*., 2022; Pires Filho *et al*., 2019).

The participants' statements corroborate the identification of absence or fragile scheduling of the agendas for the care of users with chronic conditions, and especially with SAH and DM. Reactive and episodic care is identified in the statements, predominantly focused on acute conditions and exacerbation of chronic conditions:

> Diabetics are very common to come, right? to manage the reception [...] We have agendas, right? We have the days that make appointments for patients to come with scheduled appointments, but they also come to the reception [...] (P13. PHC, Nurse)
>
> [...] But I try to talk a lot with patients when they come uncompensated in the reception [...] (P14. APS, medical)
>
> [...] Even in the reception, when the chronics pass the reception, we already see in the medical record if there are recent exams, if there are not, we already request it and then it is already scheduled [...] (P17. PHC, Nurse)

Mendes (2019) argues that one of the major problems of contemporary health care systems is to respond to non-acute chronic conditions through the acute conditions care model. A care model focused predominantly on spontaneous demand and reception of

acute cases and exacerbation of chronic conditions is not effective for stabilizing health conditions, and especially chronic conditions. The organization of care centered predominantly on unscheduled care is a sign of the fragility of care for chronic conditions(Chávez; Rennó; Viegas, 2020).

The MACC recommends risk stratification of users with chronic conditions in PHC, based on guidelines, guidelines, and clinical protocols, based on the best scientific evidence (Mendes, 2018; 2014). Risk stratification is fundamental because it allows the identification of people and groups with similar health needs that must be served by specific technologies and resources, enabling PHC to organize the care of users in the territory, with a view to promoting adequate access, through the programming of appropriate care for each case, with regular and predictable intervals, in addition to being a beacon for the user to share with other points of care in the RAS, in a timely manner (Mendes *et al.*, 2015).
element.

The execution of risk stratification of chronic conditions in PHC was identified in the statements of PHC participants. It is noteworthy that the professionals understand that risk stratification helps in the monitoring of these users within the scope of PHC, and it is necessary that it be carried out and reviewed at each service, as evidenced in the following statements. Another important detail is that it was identified that the act of stratifying was not centralized in the figure of the PHC medical professional only, and the nurse also performs:

> [...] even in the reception [...] when the chronic patients pass the reception, we already see in the medical record if there are recent exams, if there are not, we already request and stratify them too [...] and already ask to schedule the appointment to follow up [...] (P17. PHC, Nurse)

> [...] we work with risk stratification [...] we record the stratification of patients in our spreadsheets [...] the professionals who do the stratification are the professionals at a higher level, who are the doctors and nurses who end up doing it [...] (P13. PHC, Nurse)

Mendes et al. (2015) argue that in AAE, for the care of users with chronic conditions, access to the outpatient clinic depends on the identification of users eligible by PHC, based on risk stratification, and considering its essential attribute of coordinating user care in the RAS. This means that the outpatient clinic's agenda expresses the work of PHC in identifying the population with chronic conditions, who knows who and how many people should be shared with the specialized team (Mendes, 2014; 2018).

In the following statement, it is identified that for the sharing of care with the outpatient clinic, the risk stratification of the chronic condition is performed and informed:

> [...] I usually make written referrals, right? Guiding, talking about something that takes, why I am forwarding, along with the risk stratification [...] (P11. APS, medical)

In the AAE services, the participants described that access to the outpatient clinics is somehow regulated by the user's municipality of origin. The difficulty reported in relation to this flow is related to the fact that the people responsible for scheduling are from the administrative area, and do not understand the criteria established through the guidelines and clinical guidelines, which are expressed in the risk stratification of the referrals made, as reported below:

> [...] For them to have access to the outpatient clinic, they are scheduled by the municipality, right? [...] who manages the queue [...] most are administrative people in the scheduling part [...] the doctor can even make a referral [...] but the scheduler does not have this notion of what is stratified, what the patient's demand is [...] he will schedule where he thinks it is convenient (P2. AAE, nurse)

> [...] Schedulers [from the municipalities] don't know what the criteria are, depending on what is placed in the referral there and if there is no stratification, just because there is the word diabetes in the middle of the referral is diabetes network, you know? (P5. AAE, Physician)

The existence of another stage of verification of the sharing of care between PHC and AAE, such as that carried out by existing regulation systems in the SUS, removes from PHC the coordination of care for the users under its responsibility, considering that risk stratification already represents the criterion for regulating access to specialized care (Mendes *et al.*, 2015).

Therefore, it is suggested that the professionals of the PHC teams themselves directly schedule users with stratified chronic conditions, according to the criteria for care in the outpatient clinic. Such autonomy enables PHC to be in fact the organizer and coordinator of user care in the RAS, contributes to the reduction of waiting time by providing timely scheduling, strengthens the ties between PHC and AAE professionals for the sharing and transition of care, and strengthens the co-responsibility of PHC for the integrality of care (Chávez; Rennó; Viegas, 2020; Mendes, 2018).

A qualitative study carried out by Gomes and Melo (2023) between 2019 and 2020, evaluated the decentralization of outpatient regulation for PHC in the municipality of Rio de Janeiro, through interviews with managers and health professionals, complemented by analysis of municipal documents. Advances were identified in the interaction between the requester (PHC) and the regulator, the partial expansion of the capacity to coordinate PHC care. However, the proposal increased the competition for vacancies and inequities of access between Health Units, and exposed the fragile interface between PHC and

specialized care. The study concluded that the decentralization of regulation is promising, but requires attention to the work processes in PHC and SEA, in addition to the synergy between centralized regulatory processes.

For Mendes (2018), PHC and SEA should function as a single clinical microsystem, even if operating separately in different units. This conception, by being based on the concept of network, breaks the principle of hierarchy so present in the theoretical, legal and operational documents of the SUS. In the logic of the clinical microsystem, PHC and SEA are organized to meet the same purpose, with the structuring of common processes, with the center of this microsystem being the users, with health professionals who meet and know each other, with well-designed work patterns and processes, which complement each other for the provision of shared care(Almeida *et al*., 2022).

The participants described how the care of users with chronic conditions in the outpatient clinic is organized, with details regarding the flow since the user's arrival at the service, aspects related to multiprofessional action, and how the care is concluded both for new users shared by PHC and for users who return for sequential care:

> [...] When they arrive at the outpatient clinic, they are welcomed, triaged, and after that they do a whole cycle of care [...] So everyone is passed on the same day by the team (P2. AAE, nurse)

> [...] Most people come from far away, because in their municipality there is no such service [...] So, one day that she would spend to make an appointment with the doctor, that he would refer another day to go to the nutri, to refer the next day to the pharmacist, he already goes through everyone [...] (P6. AAE, nutritionist)

For the organization of care in outpatient clinics according to the MACC, the Sociedade Beneficente Israelita Brasileira Albert Einstein (2022) argues that care should occur in the logic of Continuous Care. It is a care technology developed for the management of people with chronic, non-acute, more complex conditions, who benefit from varied professional approaches.

Consultations by different professionals occur individually, sequenced, in the same work shift and are terminated after the case is discussed and the care plan is prepared (National Council of Health Secretaries, 2016).

Regarding the dynamics of care provided by the multidisciplinary team during the continuous care cycle, in the following statement, the participant emphasized that users with SAH and DM are cared for by all members of the multidisciplinary team (nurse, physician, nutritionist, pharmacist and psychologist) every time they return to the outpatient clinic:

> [...] they [nursing technicians] make this distribution to ensure that patients go through all professionals [...] So all [users] are passed on the same day by the team [...] Always! It always goes through everyone [...] Unless he doesn't want to, it's very difficult [...] (P2. AAE, nurse).

It should be noted that the cycles of continuous care in the AAE can be differentiated into complete cycles of care, for users in the first care at the outpatient clinic or in subsequent care, according to the care plan elaborated; or partial, in the case of subsequent care, considering the recommendations made by the team in their last care plan (Sociedade Beneficente Israelita Brasileira Albert Einstein, 2022).

This means that in the user's first visit to the outpatient clinic, he or she will be submitted to the evaluation of all the professionals who make up the specialized team, and the returns should consider the user's needs, expressed in the individual care plan, completed by these professionals in the first evaluation (Mendes, 2014).

Thus, according to the National Council of Health Secretaries (2016), there are no impediments for the user to be seen again by the entire team on the return visit, as long as this care adds value to the care of this user, which was not evident in the statement evidenced above. The participant also refers to the support point in the continuous care cycle of the outpatient clinic:

> [...] And at the end, there is the support point [...] where he checks this entire cycle to see if he has gone through all these professionals (P2. AAE, nurse).

The support point is a health professional in the outpatient clinic responsible for managing the user's care during their stay in the service. He acts and intervenes so that the user is at the center of care, must have technical knowledge about the functioning of PHC and AAE, the care plan and the clinical guidelines adopted by the service, to propose interventions with the team whenever necessary (Sociedade Beneficente Israelita Brasileira Albert Einstein, 2022).

CARE PLAN AND PERFORMANCE OF THE MULTIPROFESSIONAL TEAM IN PHC AND HCA

For Mendes (2018), the care plan is an important tool to promote the management of the health condition of all users in the PHC territory, and especially users with chronic conditions. It is recommended that it be prepared by the PHC team together with each user, with the definition of goals to be met over certain periods, with the proactive participation of users in their care (National Council of Health Secretaries, 2016).

In the need for PHC to share the user's care with other points of care in the RAS, the care plan is essential because it is an instrument completed by the PHC multiprofessional team that demonstrates all the management already carried out by the team, as well as the way the user participates in their own care (Mendes, 2014; 2018).

For this reason, it is desirable that it be assumed as the main communication instrument between the teams, being initially prepared by the PHC team, reviewed and complemented by the SEA team and monitored by both teams, always centered on the needs and expectations of the main person interested in care: the user (Brasil, 2017).

According to the reports, in relation to the elaboration and use of the care plan, it was identified that this tool is used, but in an incipient way by the PHC and AAE teams, as shown in the following reports:

> He doesn't come back [with a care plan], if he comes back [...] he comes back with the prescription changed like this, he took out the Losartan and entered, I don't know, Amlodipine, let's suppose [...] (P2. PHC, Nurse)

> [...] Some units write [in the care plan] there are some that are very cute, they do everything right, but some don't even look [...] (P16. AAE, nutritionist)

The function of the shared care plan is to ensure that PHC and SEA professionals are pursuing the same goals, and not just a mere filling in of information about individual conducts of professional categories. The actions foreseen in the care plan need to add value to the care of the user, who is the main protagonist of this process, as well as contribute to PHC exercising its role of care coordination (Silva *et al.*, 2016).

The participants comment on how the process of sharing the care plan between PHC and SEA occurs, and it is evident that the initial elaboration of the tool does not occur by PHC, but by the SEA team, which delivers a copy of the care plan to the user and forwards the same document to the PHC team, thus disqualifying the main purpose of the tool, which is the communication and integration between the teams and conducts carried out by the two teams, with different levels of care:

> [...] We structured the care plan through Google Drive [...] then the municipalities have access [...] if the municipality has seen the care plan, if it hasn't seen it [...] we can do this through technology, but it is still very difficult [...] (P7. AAE, Physician)

> They send the care plan to us [...] and deliver a copy to the patient, right? [...] it comes in the unit's email, I download the care plan and in our electronic medical record you can attach the PDFs [...] then I attach it (P13. PHC, Nurse)

According to the National Council of Health Secretaries (2016), the establishment of goals with the user, and the monitoring of the actions foreseen in the care plan by the PHC

and AAE teams are essential to ensure that the user achieves the stability of his health condition. Therefore, it is essential that the user understands the importance of the instrument developed by the two teams that accompany him, as well as what his participation will be in his own care process (Silva *et al.*, 2016).

The participants recorded in their statements the difficulties in understanding the users' understanding of the care plan prepared by the team during the continuous care cycle, highlighting barriers such as low education and lack of understanding of the proposal for using the tool, as observed in the following statements:

> [...] We have already made attempts to make the care plan printed and deliver it to the patient, but it did not work [...] the process is lost [...] most of our patients are illiterate. So we delivered, they were like, "Oh, what do I do with this here?" I arrived at the unit "ah, they gave me this, but I don't know what it is". I came back to the appointment, "was I supposed to bring this here?", so it wasn't working [...] (P17. AAE, psychologist)

> [...] The feeling I have is that less than 10% of patients read the care plan [...] If you ask the patient at the return appointment "did you bring the exams?", they deliver the care plan and say: this is what you asked for" [laughs] (P5. AAE, Medical)

Ribeiro et al. (2021) describe that the difficulties that users have in understanding, evaluating, and applying guidelines for health care are related to the level of health literacy. Studies have shown that individuals with low socioeconomic conditions, lower educational level and lower self-perception of social status have limitations in understanding written materials and the guidelines spoken by health professionals (Marques *et al.*, 2018).

A cross-sectional survey conducted by Borges et al. (2019), in the municipality of Picos in 2017, in the state of Piauí, assessed the level of health literacy of 357 adults with and without Systemic Arterial Hypertension, through the application of the Brazilian version of the *Test of Functional Literacy in Adults*, in individual interviews. Inadequate literacy was observed in more than 70% of the hypertensive patients investigated. The finding reinforced the need to improve the self-care skills of this group, especially in those with older age and fewer years of schooling.

In contrast to the user's limitations, health professionals often use incomprehensible words, speak fast and do not provide enough information about their health status, in addition to not making sure that the individual understood their health problem, according to a study carried out by Passamai et al. (2012). As important as the health literacy competence of users are the vocabulary and communication skills of professionals, especially when promoting effective communication through simple language (National Council of Health Secretaries, 2022).

For Gomes et al. (2021), the monitoring of chronic conditions in PHC and AAE, especially SAH and DM, represents a significant challenge for the health system, requiring approaches that go beyond the traditional model centered on isolated specialties. For this reason, the performance of the multidisciplinary team, in an interdisciplinary way, can substantially increase users' adherence to the therapeutic goals established collaboratively in the care plan(Furtado, 2022).

Filho et al. (2023) state that the integration of teams from different levels of care emerges as a promising strategy, bringing together professionals from different areas to provide comprehensive and personalized care. In this sense, the participants discussed the potential of the multiprofessional team's performance in the care of users with SAH and DM, both in PHC and in AAE:

> [...] Another potential that I also see is the multiprofessional team [...] so we have the privilege of having a multiprofessional team every day in the unit, right? [...](P1. APS, occupational therapist)

> [...]I, particularly, also see this issue of the development of the work from the moment we had other professionals within the area [...] this helped a lot in this issue of care for hypertensive patients, diabetics and other issues as well, right? Because there are several professionals in physical education, psychologist [...] (P8. PHC, community health agent)

In the AAE service, it is highlighted that the presence of the multiprofessional team is not common at this level of care for individuals with SAH and DM, and that even for SUS users, the multidisciplinary and not just focal care modality is a differentiated practice:

> [...] They go through a multi-team, which is also not common in many places... And what already scares them is this business of the multi-team But when they enter the first service, they are well attended, that they are well received, that they observe that we are there to guide and help... already change [...] (P1. AAE, nurse).

> [...] Because we serve in a multidisciplinary way, right? So, every patient who comes to us in the first appointment is received by the whole team, right? [...] (P15. AAE, endocrinologist)

Machado et al. (2021) describe that the presence of a multidisciplinary team within PHC has occurred since 2008, when the Family Health Support Centers (Nasf) were established, through a normative act and funding from the Ministry of Health. In the AAE, historically, the services were organized for care in focal specialties, in a fragmented way and without communication with PHC, and without standardization by the Ministry of Health of the organization and model of care for this point of care (Tesser; Poli, 2017).

In 2023, the National Policy for Specialized Care was instituted within the scope of the SUS, representing an important normative act that corroborates the change in the care

model, especially in the organization of care through multiprofessional teams, which work in an interdisciplinary way, to ensure access, welcome, offer quality care, and provide support, through matrix support to other teams and services of the RAS.

CONTINUING EDUCATION FOCUSED ON THE WORK PROCESSES OF PHC AND AAE

Considering the complexity of the work processes in PHC, Guimarães and Castelo Branco (2020) argue that the presence of a multiprofessional team with an expanded knowledge of different health conditions is essential to achieve better levels of care and serve the user in their entirety, thus ensuring the problem-solving capacity of this point of care.

For this reason, investing in the permanent education of teams is an important step towards the integrality of care and work in RAS. In the MACC proposal, SEA services play an important role as PHC matrixers, through active practice-based learning, strengthening ties between the teams of these two points of care (Peduzzi; Agreli, 2018; Saints; Zambenedetti, 2024).

From the participants' speeches, permanent education actions emerged through training and meetings between the teams of the care levels:

> [...] because in addition to these trainings, there are some videos too, both the [cardiologist] and the [endocrinologist] made some very didactic videos explaining how to stratify and all municipalities have access, so if doubts arise they look there [...] (P17. AAE, psychologist)

> [...] Only when the [outpatient clinic] opened [...] When it opened, they came here to the municipality and presented all the lines, right? From pediatrics, the elderly [...] When it opened, after that it never [...] Then we went there too, we went to meet the professionals, all the professionals at the higher level at the time [...] but there was never this movement again (P13. PHC, Nurse)

Providing integrated actions and practices in a continuous way between PHC and SEA favors the strengthening of bonds, considering that the daily routine of health work constitutes an intense relationship of knowledge exchange and cooperation among professionals (Peduzzi; Agreli, 2018).

Through these actions, the aim is to incorporate different tools in the management of health care, which depends directly on professionals who understand a new way of thinking and offering care to chronic health conditions, uniting theory and practice, to achieve the expected changes in the organization of services and, consequently, in the model of care offered to this population (Guerra *et al.*, 2022).

FINAL CONSIDERATIONS

The study made it possible to highlight the perceptions of health professionals from PHC and AAE services about the work processes implemented to care for SUS users with chronic conditions, especially with SAH and DM. From the perspective of these professionals, issues related to the participation and accountability of the user in their own care emerged in the discussions, and that the population served still has little understanding of the MACC proposal, to the detriment of the fragmented and biomedical model that prevails in the care of chronic conditions in public and private health services.

In the statements of the study participants, important elements related to the MACC were identified, such as the approximation of the PHC and AAE teams, the risk stratification of the population with chronic conditions identified in the PHC territory, and the organization of care in a multidisciplinary and interdisciplinary way, especially in the AAE. However, there are still barriers to the consolidation of this model, such as the organization of the PHC agenda without care programming, focused on medical conduct, and the presence of intermediaries between the relationship between PHC and AAE, such as municipal regulation, making it difficult for these levels of care to act as a single clinical microsystem.

Permanent health education strategies focused on changing the current care model for chronic conditions, as well as structured public policies and directing funding, are potentiators for changing care practices, and need to be effectively established in the SUS, followed and monitored permanently, regardless of government programs and political movements, in order to actually achieve the desired change in the care model.

Evaluating the changes in the model of care offered to chronic conditions in Brazil, and especially in Paraná, is a challenge, because the transformation of this scenario involves basic professional training in the health area, which is still fragmented, centered on the figure of the medical professional and on the model of care for acute conditions and the exacerbation of chronic conditions, as situations related to the management of services and the organization of work processes.

Of the limitations observed, it is noted that the study covered the universe of two (2) AAE services that receive co-financing from the state of Paraná to organize the care of users with SAH and DM according to the MACC, out of a total of twenty-two (22) existing in Paraná in the same condition. In addition, the technical teams of the PHC and AAE services participated, and it was not possible to understand the perception of managers and users about the implementation of the care model.

It is important that new studies in this perspective be carried out, to identify the impacts and effectiveness of permanent education strategies and public financing policies focused on the MACC.

ACKNOWLEDGMENTS

The present study was carried out with the support of the Coordination for the Improvement of Higher Education Personnel – Brazil (CAPES) – Financing Code 001.

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HOMOCYSTEINE IN PREGNANCY AS A PREDICTOR OF PRE-ECLAMPSIA

https://doi.org/10.56238/sevened2024.031-023

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ABSTRACT

Background. For more than 3000 years, medical conditions known as hypertensive states of pregnancy have been described. Hippocrates described epileptic seizures, while in the first century Celsus linked epileptic seizures to fetal death. Galen distinguished between epilepsy and peripheral epilepsy. Maternal mortality due to epilepsy reaches 44% and perinatal mortality reaches 27.8%. Homocysteine is related to PE between 20 and 30%, and an increase in PE or hyperhomocysteine may be the result of a genetic defect in the enzyme methylenetetrahydrofolate reductase (MTFHR) that is involved in homocysteine synthesis. The purpose of this study was to identify homocysteine levels in pregnant women between 16 and 20 weeks as an indicator of the likelihood of developing preeclampsia. Material and method. - It was an observational, longitudinal and prospective research. The study population consisted of patients who attended the first prenatal care consultation between 16 and 20. weeks, the sample was randomized that included 312 patients who were determined to have serum homocysteine. Results. 270 patients (86.5% of the total) had a normal pregnancy. 27 patients (8.65%) developed gestational hypertension, 9 (2.88%) had mild PE, and 6 (1.9%) had none developed HELLP syndrome. Homocysteine levels in patients with preeclampsia were in the standard range (11.05). Conclusions. In the current analysis, the frequency of hypertensive disease in pregnancy was found to be 13.5%. There is no correlation found between homocysteine levels and the development of hypertensive disease during pregnancy.

Keywords: Homocysteine. EP. Gestational hypertension. Hypertensive gestosis.

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INTRODUCTION

Hypertensive disorders of pregnancy (HUD) represent the second leading cause of death in pregnant women in developed nations and the leading cause of health problems and mortality in neonates. Preeclampsia (PE) represents a significant factor in maternal, fetal and neonatal morbidity, particularly in low-income countries. media. In 2010, it was identified as the main cause of death of pregnant women in Ecuador according to the INEC of that year. In a recent study, the prevalence of DUS was 7%, which is significantly less than the 10% expected1,2.

Some algorithms for predicting PE have been developed and are encouraging, which need to be validated. Simple preventive measures, such as low-dose aspirin, calcium, and diet and lifestyle interventions, show some potential benefit2.

It has been found that alterations in methionine-homocysteine (Hci) metabolism may be related to systematic vascular damage, which can lead to the classic clinical appearance of DHE. It is also assumed that higher levels of Hci may contribute to the development of placental microvascular diseases and PE, negatively affecting the endothelium. Women diagnosed with PE are at increased risk of future cardiovascular or cerebrovascular disease, compared to unaffected women. Hyperhomocysteinemia increases the risk of cardiovascular diseases, peripheral vascular diseases, cerebrovascular diseases, cognitive-dementia disorders, neurodegenerative disorders, and fractures associated with osteoporosis. The increase in Hci. it can be of genetic origin or related to folate deficiency3.

Hci is an amino acid, which is measured in serum in pregnant women with a reference value of up to 10 mmol/dl. In our country and particularly in the University Hospital of Guayaquil (HUG) there are no preconception care programs, likewise prenatal care is deficient and routine control programs are not adequate in patients with respect to the dosage of folic acid and the determination of Hci in the serum; Patients usually go to the first prenatal control from the second trimester.

According to the World Bank (2014), it is estimated that the average expenditure on health care is 579 dollars per year per person in low-income countries; and preconception care protocols are not carried out and if they exist they are deficient, thus we observe that preconceptional and postconceptional folic acid supplementation do not follow international protocols; in pregnancy pathologies, screening is not performed in asymptomatic stages such as gestational diabetes and DHE4.

In Argentina, ninety percent of women receive care for institutionalized childbirth, however, ten percent arrive at delivery without having had contact with the health system, that is, without performing any prenatal control. Only 24.3% of women who are screened

start check-ups early in the first trimester (SIP-2008), and the number of women of childbearing age who were interested in preparing for pregnancy was lower5.

The World Health Organization advises that all women take folic acid supplements (400 micrograms of folic acid daily) from the time they decide to conceive a baby until 12 weeks of pregnancy. Women who have carried a fetus with a neural tube defect or have given birth to a child with this condition should be genetically counseled about the chances of it happening again, in addition to receiving high-dose folic acid supplements (5 mg daily) in the periconceptional period.)[6].

In recent decades, the association of HCI with vascular disorders has been a major issue. In one study, 11 of 58 severe EPs (19%) were found to have elevated homocysteine levels before 28 weeks' gestation. Pregnant women with preeclampsia have higher plasma homocysteine concentrations during the third trimester of gestation than healthy pregnant women. Compared to the control group, patients with preeclampsia have a higher frequency of hyperhomocysteinemia when they receive high doses of folic acid (5 mg folic acid daily)[7]. Hyperhomocysteinemia can increase the risk of developing peripheral vascular disease by making the blood vessels that supply the placenta more sensitive during pregnancy. Sensitivity can continue after pregnancy and increase the risk of vascular disease or coronary heart problems at any time in life. Some predictive risk factors for the development of PE before clinical presentation have been described8.

According to this background, it was observed that there are risk factors that are related to this pathology of pregnancy that have a high rate of MMP, but the etiological situation and the way to predict its development is not yet clear.

With the aforementioned background, we observed that there are many risk factors that are related to the development of PE, so we proposed to pose the following problematic situation.

Would *serum hyperhomocysteinemia be a predictor of preeclampsia in pregnancy*?

OBJECTIVE

To determine serum Hci levels in pregnancy from 12 to 20 weeks as a predictor of PE in patients attending the HUG, in the period from October 2018 to October 2019

JUSTIFICATION

Preeclampsia and eclampsia are a public health problem worldwide. The disease has no clear causes and several mechanisms have been studied to explain its appearance. Within these, elements have been found to have an increase in serum homocysteine or a

folate deficiency. Although the factors that cause high blood pressure are not fully understood, it is important to conduct research because of its importance to the health of the population. It seeks to provide up-to-date information and additional criteria in order to improve the assessment of the main risk factors influencing this disease, particularly diet, and to promote the relevance of antenatal visits and other preventive actions that will be very beneficial for women who are expecting a baby.

It is crucial to investigate this question because, according to the WHO's new model of antenatal care, the pregnant woman must have four to eight contacts with doctors throughout the pregnancy. Recent research indicates that an increase in the number of prenatal visits by women to the health system is associated with a decrease in the probability of deaths occurring in the prenatal period. This is because there are a greater number of opportunities to detect and address potential drawbacks. Prenatal care with at least eight visits can decrease perinatal mortality rates by as much as eight per 1000 births, compared to just four visits.

The research "HCI in pregnancy as a predictor of PE" was significant from a social point of view, since DUS are one of the main causes of maternal and fetal morbidity and mortality (MMF) in Ecuador. Currently, the cause of the pathology is not known, several studies have been carried out on the subject, but the definitive etiology and primary prevention techniques have not yet been identified, which would reduce MMF.

From the theoretical point of view, this study made it possible to know and confirm other risk factors for PE and helped to promote preconception care programs, thus being able to investigate ethological factors in a timely manner and carry out optimal prenatal control.

From a scientific point of view, this research provided one more procedure for the timely detection of DEU, as is the case with other biochemical and ultrasound markers that show the flow of the uterine arteries, as well as the early administration of aspirin and calcium during pregnancy.

From the methodological point of view, this information obtained was applied to the patients, timely diagnosing PE and its consequences; continue in future research related to the subject and include in the curriculum the programs for predicting DHE.

BACKGROUND OF THE RESEARCH

DUS dates back 3000 years, from ancient Egypt and China patients with seizures were reported; in the fourth century BC Hippocrates described these seizures as complications; In 1739, François Boissier de Sauvages introduced the word "eclampsia",

which originates from the Greek word "eclampsis", which denotes brightness, sparkle, glow or radiance, in order to distinguish eclampsia from other episodes of seizures that occur persistently and repetitively.

Pritchard first published on this hematologic condition in 1954, describing a case of patients with preeclampsia-eclampsia with erythrocyte destruction, thrombocytopenia, and hemostatic abnormalities. In 1982, Dr. Louis Weinstein Weinstein detected HELLP syndrome in pregnant women with hypertension, linking it to increased liver enzymes. MM is a serious health problem that causes 600,000 deaths annually globally, especially in developing countries, where the risk of maternal death is 1/48 compared to 1/1800 in developed countries1,9.

Eclampsia/PE occurs in 5 to 10% of pregnancies and is a major cause of death for both mother and infant. In addition, it causes prematurity, limitation in intrauterine growth, perinatal death, placental abruption and premature rupture of membranes due to maternal vascular disease, in addition to all the secondary repercussions of premature pregnancy, such as pulmonary and immunological immaturity. It occurs in about 12-22% of pregnancies and is the direct cause of 17.6% of maternal mortality in the United States10. Young women under 20 years of age are more likely to develop DHE, an age group in which the chances of suffering from triple syndrome11,12,48 are higher. The lack of general and particular health services, together with a high deficit in the self-care of the population's health. In Peru, Bryce and his team found that managing mild to moderate hypertension decreases the likelihood of unregulated hypertension, but does not prevent PE13.

In Germany, Beekers et al. found common complications between gestational diabetes and hypertension, with sensitivity and positive predictive values of 62-89% and 53-64%, respectively14. In South America, cases of DUS ranging from mild to severe have been reported, which are linked to depression, depressive symptoms, aggression, and a lower number of prenatal visits, with less than five, as psychosocial risk factors associated with PE15.

In one study, they observed that low-risk nulliparous women are willing to take aspirin in pregnancy and have high levels of acceptance as a preventive of PE. They also observed that aspirin use was associated with higher rates of vaginal bleeding16. Allotey et al. validated prediction models based solely on clinical features; clinical and biochemical markers; clinical and ultrasound parameters; and clinical, biochemical, and ultrasound tests that allowed the development and validation of the multivariate prediction model of PE17. There are a number of risk factors for PE that can be determined early in a woman's pregnancy18,19. Arterial hypertension, weight gain >0.85 kg/week, fetal growth restriction,

edema and decreased plasma albumin, thrombocytopenia, poor compliance, perinatal examinations, and tertiary hospital examinations were associated with severe PE.20 In a Swedish study about the direct causes of MM are dominated by hypertensive/PE disease, followed by thromboembolic disease, sepsis and obstetric bleeding21. The Japanese identified a total of 246 cases of eclampsia that corresponded to an incidence of 7.4/10,000 births with a mean age of onset of 30.7 ± 5.8 years. The proportion of primiparous women was 81.3%, and the mean gestational age at delivery was 36.7 ± 4.0 weeks. Four maternal deaths were identified in the PE group, which ranged from 8.6 to 27.8%[22]. Serrano et al. observed that women whose mothers had PE had a 3.38% higher risk than those who did not, and having an affected sister increased the odds of PE by 2. 95%[23].

In a study carried out at the Guasmo hospital in Guayaquil,24 high neonatal morbidity was found, with 58% of neonatal depression, 47% small for gestational age, 34% preterm and 25% with respiratory distress syndrome. Bajaña et al. found a correlation between the presence of DUS and PE25 in women aged 30 years and older. In Ecuador, the mortality rate is 21.1% per hundred thousand live births, which includes maternal deaths due to obstetric complications during pregnancy, childbirth or after childbirth. Eclampsia is the third most common cause of maternal death in the country, being responsible for 30% of cases. In a research carried out in Manabí, Ecuador, in 2016, it was found that 3.4% of the 3400 pregnancies had severe or moderate epilepsy, which has a significant impact on maternal and neonatal mortality, in addition to premature birth, decreased intrauterine growth, perinatal death and all complications linked to premature birth. such as pulmonary and neurological immaturity26.

In the last ten years, one study found that 11 out of 58 severe EPs (19%) had high Hci levels before 28 weeks gestation. This demonstrates the relationship between Hci and severe PE. Of the 289 subjects who developed PE after 28 weeks, 35 (10.4%) exhibited elevated concentrations of this metabolite. The increased sensitivity of the blood vessels in the uterus during pregnancy can continue after childbirth and increase the likelihood of developing vascular disease or heart problems in the future. This risk factor can contribute to the development of preeclampsia, as can a lack of folate or elevated levels of homocysteine in the blood. Some risk factors that predict the development of PD before clinical presentation have been described. Several studies related to the research topic support the research project presented.

Leeda et al. in 1998, studied the incidence of hyperhomocysteine in patients with PE, growth restriction with the effect of vitamin and methionine supplementation. A total of 207 patients with a history of PE or fetal growth restriction were evaluated, and Hci was

determined; 37 patients who had hyperhomocysteine were administered folic acid and vitamin B6, 27 had a second load of methionine and 14 patients became pregnant again with the use of vitamin and aspirin. All patients undergoing a methionine loading test after vitamin supplementation had a fully normalized methionine loading test. Of the 14 pregnancies that received aspirin and vitamins, 7 pregnancies were complicated with PE. They concluded that the administration of vitamin B6 and folic acid in patients with hyperhomocysteinemia prevents PE or growth restriction7

In 2001, Cotter Amanda et al. studied whether the determination of Hci in early pregnancy and the association with PE. Asymptomatic pregnant women in early gestation who later developed PE were evaluated. Hci was measured by polarized fluorescent immunoassay. Of the 56 patients studied with severe PE at 15.3 weeks and 112 controls at 14.9 weeks, Hci levels were significantly higher in PE, which concluded that early determination of hyperhomocysteine increases the risk of PE8

At the Sarda hospital, Secondi and his colleagues. We present a clinical case of a 30-year-old patient with severe PE and plasma Hci levels increased to 17.8 uml/l, with the normal value being less than 15. This finally triggered the termination of the pregnancy in the 28th week of gestation and the death of the baby. The findings support the importance of finding appropriate and available evidence for early detection of hyperhomocysteinemia. Unfortunately, the use of the hyperhomocysteinemia measure for this purpose is ineffective27.

Vargas et al. descriptively investigated HCI as a predictor of PE disease. According to the reviews carried out, it was possible to define the relationship between hyperhomocysteinemia and severe PE28.

In 2003, De la Calle and his collaborators. Hyperhomocysteinemia was examined in both groups by contrasting Hci levels in 50 pregnant women with fetal epilepsy (PE) against a control group of healthy pregnant women during the third trimester of gestation. A notable increase in homocysteine levels in the blood of individuals with preeclampsia was reported in contrast to the control group29.

Fernández et al. in 2005, studied the effect of folic acid and its relationship with plasma Hci levels in women who developed PE in the first and second trimesters of pregnancy, it was found that Hci values did not vary significantly with the administration of folic acid and that it did not influence the development of PE in the population studied3.

Hasanzadeh et al. In 2008, they studied the possible association between hyperhomocysteine and PE; 3 groups of patients were studied with the case control method 75 PE: mild, 37 with moderate PE and 38 with severe PE without complications in

pregnancy. The Hci was determined in all subjects. It is concluded that women who had PE had elevated Hci levels compared to those who did not have PE30.

Reina-Villasmil et al. in 2014 compared the plasma concentrations of HCI in PE, eclamptic and normotensive in the pre- and postpartum periods, in three groups of patients, the sample was collected before delivery and follow-up at 7 days and 6 weeks after delivery. The highest plasma concentrations were observed in the prepartum group of eclamptic patients followed by severe EPs. All groups had high HCI compared to controls, concluding that hyperhomocysteine is increased in eclamptics up to 6 weeks after delivery31.

In 2017, Maged et al. investigated the role of serum Hci and uterine artery doppler as predictors of placental complications such as growth restriction, PE, and other complications. In a prospective cohort study with miscarriage, 500 women were studied. HCI was taken at 15-19 weeks of gestation and Doppler was performed at 18-22 weeks of gestation. 453 patients completed the study, with women with uterine growth retardation and other complications than the control group, with significantly higher hyperhomocysteinemia and uterine artery resistance. Therefore, it was concluded that serum Hci screening and uterine artery Doppler would be good predictors of PE, intrauterine growth retardation, and other placental complications32.

Bhatia in 2017 studied the association of hyperhomocysteine with recurrent miscarriages in 50 patients who had miscarriages of unexplained causes. 19 cases had hyperhomocysteine of which 14 developed DHE, 47% of these had a low birth weight newborn compared to 25% of the control group; concluding that hyperhocysteinemia is associated with recurrent miscarriages and with a higher probability of developing PE and intrauterine growth retardation33.

Rasha et al. in 2018 studied the association between PE and plasma Hci levels in 61 pregnant patients; 30 normotensive and 31 with PE; it was found that hyper Hci was significantly higher in EPs than in normotensive ones34.

In a study conducted at the International Maternity and Child Health Hospital of Shanghai Jiao Tong University in 2017, Sun F et al. Hyperhomocysteine during the first trimester of pregnancy was found to be an independent risk factor for both gestational hypertension and severe gestational hypertension35. Mohini and his colleagues. In 2018, a study was carried out on the correlation between PE and Hci and folic acid levels; The study was conducted prospectively and used a control case of 50 patients with preeclampsia. Hci levels were found to be significantly high compared to the control group, while folate levels were low compared to the control group. However, the opposite was statistically insignificant. They found an inverse correlation between folate levels and Hci levels in pre-

eclamptic patients: Hci levels were significantly higher and folic acid levels were lower in Hci patients compared to the control group36.

Andrey et al. in 2018 carried out a systematic review to put together the available pieces of knowledge of Hci with pregnancy, they reviewed the articles from 1990 to 2017 of several databases (PubMed, ClinicalKey and Embase databases) in which they revealed that Hci levels are altered in uncomplicated pregnancy as in complicated ones, in some check-ups they tend to decrease in the second and third trimesters of pregnancy37.

Zarfeshan et al. in 2018, revealed a link between polymorphism and abortion. Sufficient data were obtained indicating the relationship between hyperhomocysteinemia and PE. Placental abruption was also associated with elevated Hci levels, increasing the risk of 5.3-fold, but there is still no data to support the hypothesis that Hci levels correlate with placental abruption38.

THEORETICAL BASES

The cause of DUS and PE has not yet been defined, but risk factors have been identified that play a role in their appearance. The review by Cruz Hernández (2018) analyzes the emerging risk factors for PE, which include biological phenomena such as oxidative stress, vitamin deficiency39 and endothelial dysfunction, among other immunological and endocrine aspects.

Another review by Paula J. Williams (2011), in which it is evident that some genes are predisposed to the occurrence and recurrence of PE. Research approaches involving the analysis of genes and connections in the relationship between the genotype of the fetus and the mother have been proposed. More than 70 potential genes have been investigated that are linked to a variety of pathophysiological processes, such as inflammation, the renin-angiotensin system, vasoactive proteins, thrombophilia and hypofibrinolysis, oxidative stress and lipid metabolism, endothelial injury. There are more than 20,000 genes and 10 million single nucleotide polymorphisms (SNPs), making many tests unnecessary. Placental anti-angiogenic factors are dysregulated and alter the endothelium, leading to an anti-angiogenic state with significant clinical outcome of PE. It is clear that PE has a genetic component, but this will depend on a complex genetic disorder and environmental factors40.

Biomarkers in maternal blood can predict PE early in pregnancy. Herraiz and Myatt showed that PE is predicted by a decrease in serum concentrations of maternal placental growth factor (proangiogenic) before 5 weeks and an increase in soluble forms such as tyrosine kinase1. However, the clinical utility of these biomarkers has not been evaluated in the studies carried out41,42. It is now known that women with PE have a placental disorder

that is characterized by an imbalance of angiogenic and anti-angiogenic factors. It was found that the serum concentration of placental growth factor (PlGF) decreased, while the concentration of tyrosine kinase 1 (sFlt-1) in its soluble form increased. And the onset of the disease is preceded by these altered values of PlGF and sFlt-141.

These placental metabolites predict adverse outcomes that occur within 2 weeks. The introduction of these biomarkers into clinical practice should be preceded by intervention studies.

Livingston et al. established that serum placental growth factor would be a predictor of PE, but this hypothesis was discarded with the studies carried out in which they established that this serum marker is decreased in the states of severe PE clinically demonstrated, but is not altered in the first trimester of pregnancy, which is why they considered it a poor marker to predict PE43.

In a multicenter study in the United States, Allen et al. found that risk factors, including angiogenic factors in maternal blood during the first and second trimesters, had a sensitivity of 88% and a specificity of 80% for predicting endometriosis in early pregnancy44. Poon et al. found that the combination of uterine artery Doppler in the late first trimester with placental growth factor and pregnancy-associated plasma protein (PAPPA) in maternal blood predicts early pregnancy with PE with a sensitivity of 93% and a specificity of 95%, but this model requires validation45.

A meta-analysis by Velauthar et al. demonstrated that Uterine Artery Doppler Echo in the first trimester had a sensitivity of 48% and a specificity of 92% in predicting PE. The prediction of endometrial disease is very accurate when a Doppler ultrasound of the uterine artery is performed at 20 weeks of gestation. In order to be used in clinical practice, it is necessary to validate all these models46.

Koopmans et al. investigated women with PE about the relationship between protein and creatinine in urine and suspicion of proteinuria. The protein/creatinine ratio is poorly understood and can be used in clinical practice. In conclusion, the protein/creatinine ratio of a single urine sample is a reliable indicator of renal dysfunction in patients with kidney disease. It may be an alternative rapid test method for the diagnosis of renal dysfunction47. Rojo and his collaborators. It was found that the usual production of nitric oxide (NO) is affected by enzymes, causing oxidative stress in the maternal and placental endothelia, with an increase in thromboxane A2 and a decrease in prostacyclin. These changes stimulate the Renin-Angiotensin system, resulting in an increase in peripheral resistance and generalized vasoconstriction. These modifications cause a decrease in the uterine flow of

the placenta, causing thrombosis in the placental vascular bed, fibrin accumulation, ischemia, and the formation of infarctions in the placenta48.

The circulating elements cause damage to the endothelial tissue, which leads to increased endothelial permeability, a reduction in the dilation capacity of blood vessels, and a decrease in the function that prevents platelet aggregation.

In one study, Gómez Jiménez et al. raised the connection between antiphospholipid syndrome (aPL) and epilepsy, especially when it occurs before 34 weeks of gestation. Lupus anticoagulant-dependent ACL (B2GPI) was found to be strongly associated with unfavorable pregnancy outcomes. suggests that pregnant women should generally perform a screening test with ACL-dependent Anti B2GP1. In patients with ACL who develop PE, endothelial damage may result from the release of vasoactive compounds, such as B2GPI, on the surface of the placental endothelium49.

During a 2017 Lapidus Alicia obstetrics congress, it was revealed that there are additional risk factors for endometrial disease, previous endometrial disease, hypertension in pregnancy, chronic kidney disease, high blood pressure, type 1 or type 2 diabetes, and autoimmune disorders, as well as moderate risk factors, such as first pregnancy at age 40. However, in clinical practice, only 30% of these factors predict the development of preeclampsia. Mean blood pressure at 15 weeks' gestation, birth weight, family history of coronary heart disease or heart disease, vaginal bleeding for more than 5 days during current gestation, and miscarriage with the same partner in less than 12 months are factors that predispose to heart disease in early pregnancy[50].

The clinical manifestations of the may be due to its maternal nature. Hypertension, proteinuria, and a fetal syndrome involving reduced fetal growth, reduced amniotic fluid, and fetal hypoxia, as well as systemic changes, are possible. Pregnant mothers who experience high blood pressure are more likely to suffer life-threatening complications, such as sudden onset of the normally inserted placenta, disseminated intravascular coagulation, brain hemorrhage, liver failure, and acute kidney failure. Nulliparous pregnant women with other complications or obvious risk factors are more likely to develop these complications, although preeclampsia is one of the most common types.

Therefore, hypertension is a pregnancy-specific syndrome that occurs in 3-5% of pregnancies and is diagnosed with increased blood pressure and proteinuria. A recent study revealed that hypertensive disease is more prevalent in pregnant women, with a rate of 7 compared to the predicted 10 cases. In 2010, INEC 2010 reported that the cause of maternal death in Ecuador was the leading cause. It is one of the main factors contributing

to maternal, fetal and neonatal mortality in underdeveloped nations and appears to be one of the main factors2.

The relationship between PD and mortality, as well as maternal and neonatal morbidity, demonstrates its clinical relevance. Pregnant women who do not receive PE treatment are at risk of developing serious complications such as eclampsia, liver rupture, stroke, pulmonary edema or kidney failure, which can be fatal51. In addition, PE is linked to preterm delivery and decreased fetal growth, either for iatrogenic or spontaneous reasons. Children born to mothers with epilepsy are at increased risk of developing bronchopulmonary dysplasia and cerebral palsy due to preterm and small-for-gestational-age births24,52,53. PE increases the risk of postpartum depression and quality of life54,55.

DHE are multisystems of unknown origin. These conditions include abnormal junction, hypoxia or placental ischemia, maternal endothelial dysfunction, and inadequate or excessive immune response, possibly due to immunogenetic abnormalities6. A wide variety of terminology and diagnostic criteria have been used over the years to classify DUS and define PE. Clinical manifestations of PE. The International Society for the Study of Hypertension in Pregnancy (ISSHP) updated the diagnostic criteria for PE in 2014. High blood pressure only after 20 weeks of pregnancy and associated with proteinuria (more than 300 mg/day) and other organic changes in the mother such as renal failure, hepatic, neurological, hematological involvement, as well as placental complications or fetal growth restriction are defined as PE.

There are two types of proteinuria: PE proteinuria and non-proteinuria. Blood pressure was measured in a seated and upright position or in the left lateral decubitus position with a manual or semi-automatic oscillometer certified for PE (Omron T9P or Omron MIT Elite devices)[56]. Hypertension is defined as a systolic blood pressure greater than 140 mm Hg or diastolic blood pressure greater than 90 mm Hg twice in 4–6 h56. When women with underlying idiopathic hypertension have one or more of the above symptoms, they are diagnosed with PE. More aggressive treatment is recommended to prevent complications, as proteinuria is not an indicator of MM or MMP. The disease can present in a variety of ways, most often without symptoms, and is usually diagnosed during routine prenatal care. The findings indicate that 10% of women experience adverse effects; when the disease begins earlier, this risk increases to 15%[56].

Women who suffer from severe epilepsy report symptoms such as headaches, visual difficulties (including blindness), epigastric pain, nausea, and vomiting. Neurological problems include eclamptic seizures, a reversible ischemic stroke, cortical blindness, retinal detachment, and reversible encephalopathy. Liver dysfunction, bruising, or fractures are

signs of liver involvement, while renal involvement is characterized by acute kidney failure requiring dialysis. Cardiovascular manifestations include myocardial ischemia, infarction, and pulmonary edema. There is often bleeding and problems related to placental abruption and HELLP syndrome, which is characterized by microangiopathic hemolytic anemia, liver disease, and thrombocytopenia, without proteinuria, and heavy bleeding. HELLP syndrome is usually fatal, with a rapid deterioration of the mother's condition; A third of cases occur before 28 weeks of gestation. Growth restriction, prematurity with complications of preterm birth, fetal and neonatal death are examples of fetal complications. Because the clinical presentation of severe PE is heterogeneous, other disorders should be considered before definitive diagnosis.

In a 2011 systematic review by Thangaratinam et al., mean arterial pressure of 140 mm Hg or upper blood pressure of 170/110 mm Hg was found to be ineffective in predicting eclampsia, placental abruption, renal impairment, neurological impairment, and liver impairment (all of which are related to adverse maternal outcomes)[57]. After a diagnosis of illness (PE), blood pressure should be measured frequently or hospitalized, depending on the severity of the disorder. In general, medical history and physical examination assess the severity of PE and predict possible complications, but they are inaccurate and should not be used to make decisions about the management of birth behavior.

Laboratory tests . The urine protein/creatinine ratio is suspected of proteinuria in women with PE; There is little knowledge about the protein/creatinine ratio that should be used in the clinical setting as a measure of accuracy and prevalence, since they are varied56. Proteinuria does not signal immunosuppression specific to HELLP syndrome or site. Oxygen saturation anticipates detrimental maternal health outcomes in the first 48 hours after exposure. Monitoring of diabetic women includes biochemical examinations (liver and kidney) to assess progression and monitor the severity of the disease. These one-off tests are not effective in anticipating problems. Uric acid present in serum is an ineffective indicator of results and would not be evaluated in routine evaluation. If the platelet count is greater than 100 × 109 per L., the coagulation profile is not necessary. As a result, it is not considered a sensitive indicator of adverse coagulopathy.

Models for prediction. There were attempts to integrate these tests into multivariate models, but all of the tests mentioned have limited accuracy in predicting complications. Estimating overall risk is one way to assess the risk of adverse events among patients with PE.

To this end, predictive models have been developed that use predictors such as demographic characteristics, medical/birth history, symptoms and laboratory test results. A

combination of gestational age, chest pain or dyspnea, oximetry, platelet count, creatinine concentration, and aspartate transaminase (full PIERS model) can predict adverse maternal outcomes within 48 hours of the reminder of this disease59. The model's findings could be affected by the treatment paradox, where antihypertensive treatment or childbirth can reduce hypertension-related events such as stroke, eclampsia, and transient ischemic attack. The model could be affected by the drop in blood pressure.

Clinical management of PE. – Hospitalization for PE is recommended to avoid serious complications and consult with subspecialties in case of complications. It is recommended to avoid preloading by avoiding pulmonary edema and oliguria, which is not caused by fluid restriction or kidney failure. For severe hypertension during pregnancy, international guidelines recommend antihypertensive medications60. In 80% of women, in addition to magnesium sulfate, blood pressure can be monitored every 15 to 30 minutes Repeated doses of nifedipine, intravenous hydralazine, or labetalol should be given. The mother may benefit from treatment for maternal hypertension, which could affect the growth of the fetus without increasing the risk of fetal death.

Magnesium sulfate is the preferred drug for the treatment and prevention of eclampsia. Maternal risk assessment is the first management of PE, when fetal growth is limited, and induction/conduction is required. Work relationships reduce the risk of maternal high blood pressure, which reduces the risk of adverse outcomes for mother and baby. It also reduces the risk of cesarean section. Mechanical insemination using an exchange balloon or oral misoprostol is safer than traditional prostaglandins. Early delivery, either by induction or cesarean section, decreases the probability of negative results in women with non-negative DUS during weeks 34 and 37 of gestation56.

However, being born prematurely increases a baby's risk of developing breathing difficulties. Therefore, it is not justified to give birth immediately and the solution would be to maintain expectant vigilance until the clinical situation improves, which could be observed in the 37th week of gestation. Expectant management is often associated with an increased risk of placental abruption. Delivery in women with severe PE before 34 weeks is a topic of research, so expectant management is most appropriate in an equipped setting. Women with PE have been shown to have an increased risk of heart cardiovascular disease.

After childbirth, 30% of women experienced high blood pressure and 25% metabolic syndrome. Therefore, it is recommended that women who experienced complications during pregnancy such as gestational diabetes, intrauterine growth limitation, or preterm birth undergo cardiovascular disease risk assessments.

Thus, women with a history of PE are likely to develop microalbuminuria, something similar to patients with type I diabetes. According to some scientists, reducing heart disease after surgery and lifestyle modifications, such as physical activity, diet and smoking cessation, can reduce this risk by 4%. The American Heart Association advises that pregnant women with hypertension monitor their blood pressure, lipid profile, and blood glucose levels, as they may have a history of gestational diabetes and diabetes mellitus as risk factors for this disease.

Planning services and prevention of unwanted pregnancies are important strategies for reducing PE.

The fullPIERS model, an adaptation created to predict the risk of negative outcomes in these patients, should be evaluated at the time of admission of women admitted to hospital with impairment due to PE. Gestational age, headache, visual disturbances, chest pain, dyspnea, vaginal bleeding with abdominal pain, systolic blood pressure, and proteinuria strips are integrated into the model59

This comprehensive fullPIERS model was developed to predict maternal mortality or adverse effects of PE. The FullPIERS model does not include other negative results. As these findings may have short- and long-term adverse effects on maternal and infant health, their association with PE should be investigated.

Early PE lacks symptoms that would alert women to the need to seek medical attention. Regular and routine prenatal checkup, including blood pressure and proteinuria tests, are necessary for all pregnant women. The principle of increasing the frequency of visits in the last trimester when PE is more common in low-income patients. WHO recommends scheduling 4 basic antenatal visits in women at low risk of PE. Dietary calcium intake is poor in low-income strata. PE was less frequent in the Mayan Indians of Guatemala, who have a diet rich in calcium, which led to the hypothesis of the relationship between poverty and PE that would be given by calcium deficiency in diets. In populations with low dietary calcium intake, calcium supplementation in the second half of pregnancy has been shown to reduce PE62. The WHO recommends a daily dose of calcium of 1.5 to 2 g, which could be a limiting factor in patients with limited resources. In women at high risk of high blood pressure, the use of low doses of aspirin is recommended; Once high blood pressure is diagnosed, the mainstay of treatment is to control blood pressure, control delivery and placenta, and determine whether conservative treatment has more benefits from childbirth than conservative treatment.

In low-income countries, monitoring for hypertension, proteinuria, and early delivery care in critically ill patients could reduce maternal mortality from PE. Magnesium sulfate

reduces mortality, but it is not a cornerstone of MM reduction programs. Respiratory outcomes are not affected by prenatal exposure to corticosteroids after 34 weeks' gestation. An increase in infant mortality was observed in the general population, although no decrease in infant mortality was observed in low birth weight infants and in low-income groups. To reduce maternal and child mortality in low-income groups, health systems need to be reevaluated.

Prevention. Based on findings from individual patient data (IPD) in a meta-analysis, aspirin and other pharmacological drugs such as heparin and dalteparin demonstrated a moderate benefit for the prevention of PE in women at increased risk of PE, but trials have not reached definitive conclusions. PE correlates with a diet low in serum calcium. High-dose calcium supplements reduce PE, so women with a deficiency are advised to supplement with calcium (1.5 to 2 g daily) in the second half of pregnancy. According to a systematic review of calcium-rich supplements during pregnancy, cereals, such as wheat and maize, are the main source of calcium in the diet62. A randomized trial of women with PE testing the hypothesis that dietary calcium supplementation during early pregnancy can prevent PE. The presence of magnesium, vitamin C, and vitamin E in the diet does not reduce the risk of PE. Marine oil and other long-chain polyunsaturated fatty acids do not help prevent obesity.

Although only one randomized controlled trial was conducted to evaluate preventive vitamin D supplementation, vitamin D insufficiency was found to be linked to an increased risk of gestational diabetes, peptic disease, and low weight-for-gestational age. A combination of L-arginine and antioxidants was administered to women at high risk of PE with deficient synthesis of the nitric oxide precursor. Other studies in low-risk women routinely recommended L-arginine supplementation during pregnancy63. In response to lifestyle changes in primiparous women, a high intake of vegetables, fruits, and vegetable oils was associated with a lower risk of PD. In summary, aspirin therapy is the only way to prevent PD for which the evidence is strong, but the effects are not great. Other preventive interventions, except calcium supplementation in women with a low dietary calcium intake, require further evaluation and should not be prescribed without the context of clinical trials [62,64,65].

The daily intake of methionine is related to the amino acid homocysteine (Hci), which is obtained through transmethylation, remethylation and transsulfuration reactions66. This is based on the presence of vitamin cofactors such as folic acid, vitamin B12, and vitamin B6, which are essential for the enzymatic reactions of the enzymes methyltetrahydrofolate reductase (MTHFR), methionine synthetase (MS), and cystathionine beta synthetase

(CBS). In addition, mediators such as S-adenosylmethionine (SAM) and S-adenosylhomocysteine (SAH) are crucial to preserve balance if the concentration of Hci in plasma is increased.

It is present in vitamin cofactors such as folic acid, vitamin B12, and vitamin B6, which are essential for the enzymatic reactions of methyltetrahydrofolate reductase (MTHFR), methionine synthetase (MS), and cystathionine beta synthetase (CBS), as well as for defenders. Products such as S-adenosyl methionine (SAM) and S-adenosyl homocysteine (SAH), essential for altering balance, increase the concentration of Hci in plasma. If the balance is disturbed, there is an increase in plasma Hci levels, a situation known as hyperhomocysteinemia. It promotes various forms of cell development, thrombus generation, increased oxidative stress and cell apoptosis. Therefore, vitamin B12 and folic acid are essential for the metabolism of Hci.

A lack of these nutrients increases the concentration of Hci66. Endothelial cell dysfunction, including activator and inhibitor reactions, fibrinolytic systems, vascular cell matrix proteins, and vascular endothelial growth factors, resulting from hyperhomocysteinemia, affects the uterus-placental circulation. Changes in methionine-Hci metabolism were found to be linked to systemic vascular damage, which may be the typical clinical aspect of hypertensive disorders of pregnancy (THE). In addition, it is believed that elevated Hci levels may contribute to the development of placental microvascular diseases and endothelial diseases, which have a negative impact on the endothelium67.

Several studies have shown that women with severe PE are related to hyperhomocysteinemia68-70, but some authors oppose it and establish that the increase in homocysteine Hci in the second trimester is not related to PE, pregnancy-induced hypertension or fetal growth restriction71. According to previous studies and theoretical foundations, we observed that Hci is a thrombotic risk factor in patients with asymptomatic relatives, possibly related to folic acid in the diet. In addition, its association with the polymorphism of methyltetrahydrofolate reductase and its genetic, nutritional, oncological, psychological, bone metabolic and DUS effects is important.

LEGAL BASES

Various legal documents support the following research: *Homocysteine in pregnancy as a predictor of pre-eclampsia*

Constitution of the Republic of Ecuador

Article 3 dictates that the main obligations of the state are: "1. To ensure the effective enjoyment of the rights enshrined in the Constitution and in international instruments, especially in education, health, nutrition, social security and water for its inhabitants."

Article 32 establishes that health is a right that the State has the obligation to protect and whose fulfillment depends on the realization of other rights, such as access to water, food, education, physical training, work, social security, healthy environments and others that promote health. The State shall protect this right through economic, social, cultural, educational, and environmental policies, ensuring uninterrupted, timely, and unrestricted access to programs, actions, and services related to comprehensive health promotion and care, including sexual and reproductive health. Equality, universality, solidarity, interculturality, quality, effectiveness, efficiency, prevention and bioethics will be the rules that will guide the supply of health services with an emphasis on gender and age.

Article 48 establishes that the State, society and the family have the obligation to give priority to the integral development of children and adolescents, thus guaranteeing the full exercise of their rights. In all circumstances, the principle of the best interests of the child shall prevail and their rights shall override those of others. Article 3 states that the primary responsibilities of the state are: "1. To ensure the efficient use of the rights set forth in the Constitution and in international law, particularly in areas such as education, health, nutrition, social security, and water for its residents."

Article 386 establishes that the system will include programs, policies, resources and actions, merging with state agencies, universities, polytechnic schools, public and private research institutes, public and private companies, non-governmental entities and natural or legal entities that carry out research, technological development, innovation and those related to ancestral culture.

3. Ensure the dissemination of and access to science and technology, in addition to the use of discoveries and findings made in the context of the stipulations of the constitution and legislation.

4. To ensure freedom of creation and research within the framework of respect for ethics, nature, the environment and the recovery of ancient culture.

According to Article 388, the government will allocate the required funds for scientific research, technological progress, innovation, scientific education, the recovery and development of ancient knowledge and the propagation of knowledge. One element of these allocations will be used to fund projects through competitive funds. State-funded entities will be subject to the responsibility and monitoring of the relevant state72. Organic Constitution of Health

Article 6 dictates that all patients have the right to decide whether or not to access medical treatment. In both circumstances, the health centre has the obligation to inform him about the consequences of his choice73. Programme for the rapid reduction of maternal and neonatal mortality.

Article 1. Consider the National Plan for the Accelerated Reduction of Maternal and Neonatal Mortality, as well as the regulatory chapters that make it up, as a public policy of the first order for the health sector.

HYPOTHESIS

H1 Hyperhomocysteinemia in pregnant women between 12 and 20 weeks can provide timely prediction of the development of PE and other DHEs.

Ho Hyperhomocysteinemia in pregnant women between 12 and 20 weeks does not allow timely prediction of the development of PE and other DHEs.

SYSTEM OF VARIABLES

The theoretical concepts of the variables High blood pressure is a particular syndrome of pregnancy that occurs between 3 and 5% of pregnancies, and is diagnosed when the woman shows an increase in blood pressure, edema and proteinuria, factors that can cause MMF. The daily consumption of methionine has a relationship with Hci, an amino acid that is acquired through processes of transmethylation, remethylation and transsulfuration. The involvement of vitamin cofactors such as folic acid, vitamin B12 and vitamin B6 plays a notable role in PE-eclampsia74

It will be operationalized according to dimensions and indicators with: General characteristics and hypertensive states of pregnancy

SERUM HOMOCYSTEINE

The Hci will be operationalized according to dimensions and indicators with**:** Hci levels per laboratory <13 mmol/l (Reference value); Normal. High

EFFECTIVENESS

Specificity, sensitivity, and positive and negative predictive value

OPERATIONALIZATION OF THE VARIABLES

GENERAL OBJECTIVE: To determine serum homocysteine levels in pregnancy from 12 to 20 weeks as a predictor of PE in patients attending the University Hospital of Guayaquil Ecuador in the period from October 2018 to October 2019			
VARIABLES	**DIMENSIONS**	**INDICATOR**	
Serum homocysteine	Homocysteine levels by laboratory	5-13 µmol/L (Reference Value)	Normal Alto
	Specificity, sensitivity and positive and negative predictive value	75% 75%	
EP .	General characteristics Hypertensive states of pregnancy	Age Weight gain Parity: Origin: Antecedent of PE Instruction Blood pressure 120/80: mmHg: Protein in urine: Oedema:	Years Completed Starting weight, final weight Nulliparous, Primiparous, multiparous Rural, urban, dispersed Si, in the none, primary, secondary, higher normal/elevatedAbsent/present Absent/present

Vargas-Vera (2023)

MATERIALS AND METHOD

TYPE OF RESEARCH. This research work is prospective, longitudinal and correlational, with a non-experimental design because no variables were manipulated. It developed in different stages, until the birth of the product and the follow-up of the first weeks of the puerperium75

POPULATION. The study was carried out between October 2018 and October 2019 in a group of 6000 women who attended prenatal care at the maternal and child health department of the University Hospital of Guayaquil, located in the town of Guayaquil, in the Guayas region. The inclusion and exclusion criteria were applied to all pregnant women who attended antenatal care between 12 and 20 weeks' gestation. It was estimated that 25% of this group met the inclusion and exclusion requirements, which equates to approximately 1500 patients.

The study was conducted between October 2018 and October 2019 in a group of 6000 women who attended prenatal care at HUG's maternal and child health department. The inclusion and exclusion criteria were applied to all pregnant women who attended antenatal care between 12 and 20 weeks' gestation. It was estimated that 25% of this group met the inclusion and exclusion requirements, which equates to approximately 1500 patients.

SAMPLE. The formula was used to establish the random sample size. The prevalence of gestational hypertensive disease fluctuates between countries and provinces, even between provinces; however, it has been reported that the average prevalence in Ecuador is 8.29% with an accuracy of 0.05, which implies that a prevalence of 5 to 10% is

anticipated in Ecuador. Thus, the estimated proportion of each group was determined, which made it possible to assume that the data beyond this range were markedly different76.

$$n = \frac{N + Z2_x p_x q}{e2_x(N-1) + z2_x p_x q}$$

N = population size 6000

n = sample size confidence ?

Z= Level of 1.96

e= maximum estimate error 00.5%

p = probability of an event occurring 0.5

Q = probability that it will not occur 0.5

360 patients were selected for the study using the formula for an observational study, with a Zα value of 1.96 and a significance level of 95%. Patient Distribution – An Excel table of numbers with the random function was used to distribute patients in a simple, probabilistic random manner. All patients were monitored during pregnancy until the end of pregnancy for possible complications of hypertension.

INCLUSION CRITERIA

1. Patients in the second trimester of pregnancy who attended prenatal care when they were 12 to 20 weeks pregnant.
2. Patients who signed the informed consent to participate in the protocol.

CRITERIA FOR NON-INCLUSION

1. patients who had previous hypertension.
2. Heart disease
3. diabetes Millitus
4. persistent degenerative diseases.
5. Multiple pregnancies
6. Therapy with antifolic medications, such as methotrexate or antiepileptics.
7. Kidney diseases.
8. patients who are over 40 years old.

EXCLUSION CRITERIA

1. Patients who had not administered the drug adequately.
2. Not having your prenatal checkups.
3. Patients who concluded their pregnancy in a different medical entity.
4. Patients who did not participate in the research.

METHOD. Prior to informing the patient about the study, she was given a written informed consent to participate in the study, then the general data was taken by means of a medical history file validated by experts; 5 cc of peripheral blood was taken to determine the levels of Hci, which were processed in the laboratory

DATA COLLECTION. The information was extracted from the medical record and recorded on a form verified by specialists (see Annex 2A-B). The evaluation of Hci was carried out using a 5 ml sample of blood collected through a venipuncture. It was performed in the laboratory, performing a centrifuge at 4,300 revolutions per minute for 10 minutes at 4°C. The plasma (obtained from blood anticoagulated with EDTA) was segmented and then preserved in a plastic tube. He kept to himself. The Hci study was carried out using a turbidimetic method using Roche's COBA®6000 equipment with an analytical sensitivity of 0.5 µmol/L. The platform was COBA6000® able to carry out technical validations and reflex tests in real time. This test determined the level of Hci in the blood. Reference requirements: 5-12 µmol/L and an analytical sensitivity of 0.5 µmol/L.[77]

DATA ANALYSIS Version 20 of the SPSS program was used to analyze the results achieved, which were incorporated into a database defined in Excel 2010 (SPSS, Inc., Armon; NY)[78]. The qualitative variables were presented with their corresponding frequency and percentage distributions. Numerical variables were distinguished by their mean and standard deviation (SD), while variables that did not meet a normal distribution were distinguished by their median and interquartile range (IQR). Comparison of Risk Factors for DUS carried out by the University

A modification was made to a binary logistic regression model for each slope. This model was used to analyze the autonomous variables associated with each event. As with all polytomic variables, normal, low and high reference values were determined for numerical variables, with the aim of creating dummy variables.

RESULTS

In the present research "HOMOCYSTEINE IN PREGNANCY AS A PREDICTOR OF PRE-ECLAMPSIA" we will evaluate the results according to the objectives set

To determine the clinical and general characteristics in the first consultation of pregnant women from 12 to 20 weeks of gestation

In the first trimester of pregnancy, of the 312 women who attended the HUG obstetrics consultation, those with high blood pressure, cardiovascular disease, diabetes mellitus, current multiple pregnancy, treatment with anti-folates, detected kidney disease and who were over 40 years of age were not considered.

All variables, including risk factors for gestational hypertensive disease, together with sociodemographic variables (age, origin, residence, educational level, health service, etc.), and personal histories, whether pathological or not, showed uniformity. 58% of the patients lived in urban areas, 23% in rural areas and 19% in peripheral urban areas. The hereditary records of all the individuals studied were examined, including diabetes, hypertension, infertility, tuberculosis, cancer, heart, thyroid or kidney disorders, tobacco, alcohol and drug use, previous blood transfusions, allergies, intestinal diseases, gestational age, marital status, occupation, education, eating style, regular menstrual cycle and application of contraceptive procedures. 23.1% of the 72 patients had previously had more than two partners, which means a significant increase in blood pressure, both systolic and diastolic. The population analyzed showed similar characteristics in relation to their consumption of folic acid.

TABLE 1. Descriptive table (Initial homogeneity)

VARIABLE		**AVERAGE**
Age	19-year-old <	63(20.2%)
	> 35 years old	33(10.6%)
	20 – 34 years old	216(69.2%)
Starting Weight		65.64 + 15.01
Systolic TA		110 (66-144)
TA Diastólica		68 (44 - 98)
Weight gain		129(39.1%)
Proteinuria		21(9.1%)
Antecedent of PE	Yes	96 (30.7%)
	No	216 (69.3%)
Gestation	Primigesta	111(35.6%)
	Multiparous	201(64.4%)

Table 1 shows the initial homogeneity among the patients in the study in terms of age, weight, blood pressure, history of hypertension and number of pregnancies.

With respect to the risk factors studied, we observed maternal age, parity, low intake of foods rich in folate has an important value. See Table 2

To test Hci levels in pregnant women 12 to 20 weeks gestation.

Homocysteine values did not show significant values, of the 312 pregnant women only 9 patients (2.7%) had elevated serum homocysteine ranging from 12 to 15 IU, and 303 patients (84.5%) had normal homocysteine.

High homocysteine	9(2.7%)
Normal homocysteine	303(84.5%)

Relate Hci levels in the blood to the development of PE or some DHE. The proportion of DHE, the most important variable of interest, was not statistically significant (P 0.454), indicating a prevalence of 13.5% of hypertensive disease. Of the 312 pregnant women, 270 (86.5%) had a normal-evolutionary pregnancy, 27 (8.7%) had gestational hypertension, 9 (2.9%) had mild pelvic edema, and 6 (1.9%) had severe edema. In addition, 21 (6.7%) did not develop HELLP syndrome. Elevated serum homocysteine levels were not correlated with EHGs observed in pregnant patients.

TABLE 2. Risk Factors for Gestational Hypertension and Hypertensive Disease

VARIABLE		**PATIENTS (n312)**
Gestational age	< 15 weeks	141(56.6%)
	16-20 weeks	108(43.4%
Marital status	Common-law marriage	171(54.8%)
	Catholic	69(22.1%)
	married woman	72(23.1%)
Work	Student	42(14.3%)
	Housewife	162(55.1%)
	Other	90 (30.6 %)
Instruction	Primary	75(23.1%)
	Secondary	177(56.1%)
	Superior	60(19.2%)
Domicile	Rural	72 (23%)
	Urban	183(58.7%)
	Marginal urban	58(19%)
Gestations	Primigesta	108(46.4%)
	Multiparous	204(53.6%)
Couples	One	237(76.9%)
	More than two	75(23.1 %)
Folic acid intake	No	36 (11.5%)
	Preconception	57 (18.3%)
	Postconception	219(70.2%)

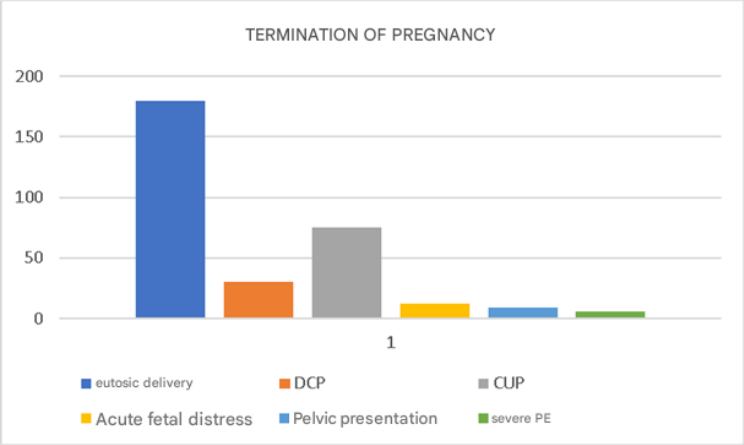
Foods rich in cereals and vegetables	No	0
	1-2 times	168 (53.8%)
	More than 3	144(46.2%)
Foods rich in meats	No	12 (3.8%)
	1-2 times	159(51%)
	More than 3	141(45.2%)
	normal	297(90%)
Table 3 shows a comparison of risk factors for hypertensive disease during pregnancy, with no notable differences between patients		

Table 3. EHG AND HOMOCYSTEINE.

Variable		Patients	%
EHG	Evolutionary norm	270	(86.5%)
	EHG	42	(13.5%)
EHG TYPE	Gestational hypertension	27	(8.7%)
	Lightweight PE	9	(2.9%)
	EP Severa	6	(1.9%)
Serum homocysteine (12.48)		9	(2.9%)
Proteinuria		21	6.7%

Perinatal data and the end of pregnancy All patients had an uncomplicated pregnancy and continued with regular prenatal check-ups, as well as the intake of iron, calcium and folic acid. 57.7% of pregnant women had a eutocic birth and 42.3% had a cesarean delivery, according to the results of the sample. The main reasons for cesarean section were: 30 patients (22.7%) due to pelvic narrowness, 75 (56.8%) due to a previous cesarean section, 12 (9.1%) due to acute fetal distress, 9 (6.8%) due to a pelvic product, and 6 (4.5%) due to severe PE**.** The mean weight of the newborns was 3227 g ± 407. (Graph 1)

Determine the efficacy of hyperhomocysteinemia using specificity, sensitivity, and positive and negative predictive values. Using the sensitivity of 80% and the specificity of 95%, we evaluated the positive and negative predictive value of homocysteine as a predictor of preeclampsia and found a positive predictive value of 44.7% and a negative predictive value of 98.9%. These results are related to the prevalence of preeclampsia in current research.



STATISTICAL ANALYSIS

To examine the results, we used two dependent variables: gestational hypertension and preeclampsia. A comparison was made between each of these variables with pregnant women with EHG and pregnant women without EHG; risk factors for EHG and PE have been considered independent associated variables.

The detailed study of 312 patients showed that 27 (8.7%) developed EHG and 15 (4.8%) developed PE. The group with hypertensive disease (n=42) and the group without hypertensive disease did not show statistically significant differences. This was attributed to risk factors such as age over 34 or under 20, excess weight or obesity, alcohol and tobacco use, and poor education. Only 30.8% of patients with a history of EHG had a personal history of PE, which proved to be statistically significant; however, only 2% of patients with no history of EHG had a personal history of PE; The patients who participated in the research were in the first trimester of gestation and required rigorous prenatal control until completion, which is why prenatal control was not considered a risk. When segmenting the population into three age categories, one from 19 to 19 years old, another from 20 to 34 years old, and the third from 35 years and older, we noticed statistically relevant variations in the proportions of gestational hypertension, mild pulmonary pathology, severe pulmonary pathology, and normal evolutionary pregnancies between each of the age categories.

Patients between 19 and 34 years of age showed normally evolving pregnancies in 85.7% and 88.9%, respectively, while in those over 35 years of age, the proportion of normally evolving pregnancies only reached 54.5%.

In addition, no significant difference was detected between individuals with severe PE. The percentages stood at 0%, 0.96% and 0.96% for individuals under 19 years of age, 20 to 34 years of age and 35 years of age, respectively (Table 4).

ANALYSIS OF THE PE VARIABLE

The detailed study of 312 patients involved notes that 15 (4.8%) of them experienced PE.

TABLE 4. Proportion of gestational hypertension in age groups

Pregnancy	< 19	20 - 34	> 35	Total
Normoevolutionary	54 (85.7%)	201 (88.9%)	15 (54.5%)	270
Hypertension Gestational	6 (1.92%)	12 (3.85%)	9 (2.88%)	27
Lightweight PE	3 (0.96%)	0 (0%)	6 (1.92%)	9
EP Severa	0 (0.0%)	3 (0.96%)	3 (0.96%)	6
Total	63	216	33	312

The levels of Hci in patients with PE and those with a normal pregnancy show Hci levels without statistical differences (p 0.0088) in patients with PE and (p 0.03766518) in patients with gestational hypertension (Table 5)

TABLE 5. Comparison of Homocysteine between patients with PE and normal pregnancies.

Variable	Gestational hypertension (n=27)	PE (n=15)	Evolutionary norm (n=297)
Homocysteine	10.05 ± 1.28	11.05 ± 1.29	10.13 ± 1.65

ANALYSIS OF THE RESULTS

DEUs stand out as the leading causes of MMP. It is widely recognized that they are linked to risk factors and it has been found in the literature that the extremes of female reproductive life are related to DHE19,25. However, our research did not detect women under 19 years of age or those over 35 years of age as risk factors. Clinicians' ability to anticipate PE before symptoms manifest has not progressed significantly in decades of study of the disease17,32,40

According to Guven et al. (2009), during the third trimester, Hci levels are higher in patients with preeclampsia compared to healthy pregnant women. Thus, Hci levels could be used as an indication of preeclampsia3,7,8,9,27,29,31-33-35,37. These levels are considered to cause endothelial dysfunction and intrauterine growth delay66,68,69; however, this study did not detect an increase in these levels; in contrast, Hci levels in PE patients were within normal ranges. According to Sun research, hyperhomocysteine during the first trimester is an independent risk factor for severe PE36.

Other studies also report elevated levels of Hci in early pregnancies, linking them to the later emergence of mild PE7. Kharb et al. found that Hci levels in the maternal blood of pregnant women with hypertension were slightly higher compared to pregnant women with normotensive hypertension ($p < 0.001$, $p > 0.05$ respectively). Vitamin B12 levels in the maternal blood of hypertensive pregnant women were lower compared to normotensive pregnant women, suggesting that folate and vitamin B12 deficiency, together with high Hci levels during pregnancy, may be a risk factor for lung disease and future cardiovascular risk50. However, our findings do not align with these publications, as Hci levels did not show a direct correlation with the development of PE as a result of a folic acid-enriched diet, in addition to supplementation of 5 mg of folic acid since the patient joined the study.

Maged et al. concluded that serum ICH screening and uterine artery Doppler would be good predictors of PE, intrauterine growth retardation, and other placental complications32. This was not corroborated in our study because the uterine arteries were not Doppler performed on our patients.

Mujawar et al. demonstrated that, in pre-eclampsia, serum Hci, folic acid, and vitamin B12 levels are altered81; and hyperhomocysteinemia and low folic acid levels are related to PE6,27,82. However, some studies, such as the one published by Wadhwani et al., evaluate the levels of maternal plasma folate, vitamin B12, and Hci in women with normotensive control (CKD) and women with PE from early pregnancy to delivery83. At all times, maternal plasma homocysteine levels were higher in PE than in CKD. These findings contradict those of current research and suggest that women with PE have higher levels of homocysteine from early pregnancy to delivery. In this context, our research has found no evidence to suggest folic acid supplementation to decrease the possibility of PE and minimize homocysteinemia levels84. Thus, we can contrast our results with those that Mujawar et al.[81] published in 2011, which indicate that Hci concentrations in the blood have a negligible negative correlation in patients with PE85. Hci levels vary in both uncomplicated and complicated pregnancies, and according to some reviews, they tend to be reduced in the second and third trimesters of gestation, according to Andrey et al.[Question 37].

Sociodemographic and cultural elements have a considerable influence on folate consumption86-89. Since 1996, both Mexico and Chile have included folic acid in flour as a component of the neural tube closure abnormality prevention program. This is a component of the basic nutrition program in Mexico and in several Latin American countries. In the United States, 20% of the population does not consume folic acid supplements and its incidence is comparable to that of the rest of the population, supporting the idea that folic acid levels do not affect the progression of PE9. Currently, it is known that

hyperhomocysteinemia represents a cardiovascular risk, causing endothelial damage in veins and arteries due to a decrease in the capacity to absorb deoxyuridine47,56, including the placental vasculature. Therefore, it is crucial to consider higher doses of folic acid during pregnancy to prevent the emergence of preeclampsia66,90. Folic acid L-arginine supplementation may help prevent PE by enhancing endothelial function91.

Pregnant women show evidence of hyperhomocysteinemia as a predictive factor for PE; however, our research found no significance due to their meals being enriched with folic acid; this indicates that exogenous folic acid intake does not have a significant impact on the progression of PE. This provides us with a scheme for randomized, blinded, and placebo studies, which allows us to establish the dose and its relationship with PE. The daily recommendation for folic acid to reduce the risk of neural tube closure abnormalities is 1 to 5 mg91.

According to Briceño and Briceño92, there are numerous studies that seek to clarify the cause of the various DUS in pregnancy and establish timely prevention and cure. In addition, it is necessary to choose patients correctly and take into account the severity of mothers and fetuses, starting with inducers of lung maturation, administering antihypertensives, magnesium sulfate and monitoring the progress of the fetus.

As has been demonstrated, DUS is one of the main causes of MMP, showing a notable chronic disability and death in mothers. In addition, they lead to serious and relevant problems in the newborn, such as premature birth, delayed intrauterine development and loss of the placenta. Prevention or treatment methods have not been developed for these disorders3,19,24,25. A health priority should be the reduction of maternal and fetal complications caused by DHE. It is estimated that in Ecuador alone, 43 deaths from this reason were registered in 2013, with a projected maternal mortality rate of 43 per 340,000 live births94.

In Argentina, only 24.3% of women of childbearing age expressed interest in preparing to undertake pregnancy during the first trimester (SIP - 2008), and check-ups begin early in the first trimester5. In contrast, the incidence of PE, whether mild or severe, varies between 5 and 8%, or even 10%, with a significant rate of maternal and fetal mortality, in addition to prematurity, intrauterine growth delay, and placental abruption95,96 . The percentage incidence of DUS found in this study was 13.5%, something similar to that reported in previous studies. The corresponding proportion stood at 8.7% for gestational hypertension, 4.8% for distributed hypertension, 2.9% for mild hypertension, and 1.9% for severe hypertension. No significant variations were observed between sociodemographic, personal, pathological, and gynecological-obstetric risk factors (p 0.0088), nor among what

was published in the literature94. The danger of the disease recurrence is linked to the history of previous PE.

A recurrence of 25 to 65% has been reported in patients with severe prior PE and 5 to 7% in patients with moderate prior PE; this information contrasts with the frequency of less than 1% in patients with previous normal EP. In our research, five patients had PE and had a history of PE; this constitutes 40% of the patients and 25% had gestational hypertension, findings that are similar to those reported by other authors97.

There are multiple studies that have examined modifications in the enzyme 5,10-methylenetetrahydrofolate reductase (MTHFR), an enzyme involved in the metabolism of homocysteine, an intermediate sulfur amino acid of methionine metabolism, from food proteins. Substitution of C for T in nucleotide 677 (C677T) modifies serum homocysteine levels, which could represent a risk factor for PE. This mutation has been found to be related to higher Hci levels in patients with severe PE, in contrast to patients with mild PE and control groups98-99

Chedraui et al. determined the prevalence of C677T and A1298C single nucleotide polymorphisms (SNPs) of the *MTHFR gene* in nulliparous women complicated with PE and concluded that the prevalence of the CC mutant genotype of the A1298C polymorphism was higher in women with eclamptics67. Likewise, the same authors determined the frequency of the C677T and A1298C SNPs of the MTHFR gene in the placenta of PE pregnancies and healthy controls, and observed that the frequency of the TT mutant genotype of the C677T polymorphism was higher in the placenta of pregnancies complicated with pre-eclampsia100. In our research it was not possible to determine this genetic polymorphism.

The research had certain restrictions. Initially, we propose to increase the volume of the sample. It was found that high doses of folic acid did not decrease the PE index, and an opposite trend was detected, in which higher proportions of hypertensive disease were recorded during pregnancy, although not statistically significant. We are convinced that the result is attributed to the first restriction established, so it is recommended to carry out an analysis to find analogies with hypertensive conditions during pregnancy. In 2015, Ochoa discovered that MTHFR mutations are the same as those mentioned in the literature9.

CONCLUSIONS

Finally, since eclampsia and PE represent the second most frequent cause of maternal death globally, hypertensive disorders during pregnancy are a public health issue.

By studying the clinical and general features of pregnant women in the first consultation during the 12th and 20th week of gestation, we have been able to verify that

the risk factors for DUS were found in the population studied. All sociodemographic variables (age, origin, residence, educational level, medical service, etc.), as well as personal histories, both pathological and non-pathological, demonstrated uniformity as risk factors for gestational hypertension.

Regarding their origin, 58% of the patients came from urban areas, 23% from rural areas and 19% from peripheral urban areas. In addition, they had a family history related to diabetes, hypertension, infertility, tuberculosis, cancer, and heart, thyroid, or kidney disorders. In addition, they had tobacco, alcohol and drug use, previous blood transfusions, allergies, intestinal pathologies and surgeries. 23.1% of patients had had more than two previous partners, which turned out to be statistically relevant for systolic blood pressure.

86.5% of pregnant women experienced a normal evolution of their pregnancy, 8.7% showed gestational hypertension, 2.9% experienced mild pregnancy problems, and 1.9% experienced severe pregnancy. A statistically significant HELLP syndrome (P 0.454) was not observed, which is aligned with a prevalence of 13.5% of hypertensive disease during pregnancy and 4.8% for PE. Homocysteine levels in pregnant women aged 12 to 20 weeks did not present statistical variations in patients with hypertensive disorders of pregnancy; that is, when serum homocysteine levels were linked to the onset of PE or hypertensive disorders of pregnancy; both patients with PE and those who experienced a normal evolutionary pregnancy did not present statistical differences.

We examined the effectiveness of hyperhomocysteinemia as a marker of preeclampsia by using specificity, sensitivity, and positive or negative predictive value. With a sensitivity of 80% and a specificity of 95%, a positive predictive value for preeclampsia of 44.7% and a negative predictive value of 98.9% were recorded, which would be adjusted to the prevalence of preeclampsia in existing studies. Therefore, we conclude that serum hyperhomocysteinemia is a predictor of PE during pregnancy and that early administration of 5 mg of folic acid does not reduce the risk of hypertensive alterations during pregnancy; that in our research, the prevalence of hypertensive diseases was 13.5%; that our findings did not show a correlation between serum homocysteine levels and the birth of the Finally, no statistically significant differences were detected between the proportions of hypertensive gestational pathology and normal evolutionary pregnancy in these patients; Approximately 87.3% of patients in the category of patients under 35 years of age suffered a normal evolutionary pregnancy, while this percentage rose to 90.9% in the category of patients who exceeded 35 years of age. On the other hand, this percentage rose to 90.9% in the category of patients who exceeded 35 years of age.

RECOMMENDATIONS

This research seeks to prevent hypertensive disorders of pregnancy and preeclampsia in particular; Based on individual patient data findings, aspirin is the drug of choice for preventing preeclampsia; It is important that the Faculties of Medical Sciences and Medical Careers are empowered in this field of prevention of hypertensive disorders of pregnancy, since it is one of the main causes of maternal death. To evaluate the possible risks for this vulnerable group of women who are prone to develop this pathology, the MSP and doctors program promotion and education campaigns on preconception care, prenatal control.

The outcome of this study made it easier for us to make progress in understanding some of the possible risk factors for hypertensive disorders of pregnancy, in which the most susceptible people are young people and individuals aged 35 years and older. The discoveries will provide us with the possibility of promoting actions for the prediction and prevention of hypertensive disorders during pregnancy. This will facilitate future studies with other population groups and samples with more patients, in addition to the involvement of other participants in the research such as the faculty of medical sciences, educational sciences, journalism, among others.

In a meta-analysis, it was shown that aspirin, together with other substances such as heparin and dalteparin, favor women at risk of preeclampsia 101, 102, and multiple studies support the prevention of hypertensive alterations during pregnancy with aspirin. Thus, diet and low levels of calcium in the blood are often linked to PE. Calcium supplementation is advised during the second half of pregnancy (1.5 to 2 g per day), as supplements containing large amounts of calcium decrease PE. Cereals, such as wheat or corn101,102, are one of the most significant sources of calcium in the diet. Weight loss during early pregnancy can be prevented through dietary calcium supplementation. This is corroborated in a randomized study of women with a history of physical activity. A diet rich in vegetables, fruits, and plant-based oils was found to decrease the risk of preeclampsia.101-102 In conclusion, the only method to avoid PE is the use of aspirin. To suggest other preventive measures, additional research is needed.

Homocysteine is related to daily methionine intake and interacts with the enzymes methyltetrahydrofolate reductase (MTHFR), methionine synthetase (MS), and cystathionine synthetase (CBS). An increase in homocysteine levels occurs in the plasma, a condition known as hyperhomocysteinemia. This increase has an impact on cell proliferation, thrombus generation, increased oxidative stress and cell apoptosis. Folic acid and vitamin B12 are essential for homocysteine. The absence of folic acid causes an increase in the

amount of homocysteine. The common clinical presentation is due to systematic vascular damage associated with changes in methionine-homocysteine metabolism. Hyperhomocysteinemia alters the operation of the vascular endothelium, activating and inhibiting fibrinolytic systems, cell matrix proteins, and vascular endothelial growth elements.

Finally, based on the studies carried out and the theoretical basis, we observe that homocysteine is a risk factor for thrombotic and hypertensive disorders of pregnancy that is related to a deficiency of folic acid in the diet or in supplementation. However, our study did not conclude that hyperhomocysteine is a predictor of preeclampsia, so it is important to recommend a diet rich in folate and folic acid.

Accessibility to high-quality family planning services and prevention of unwanted pregnancy are important strategies for reducing PE. Significant progress has been made in smartphone-based systems that enable prediction of PE risk in low-resource strata using algorithms based on simple clinical data using or without a smartphone with pulse oximeter. The miniPIERS model, an adaptation of the PIERS model, is used to assess women admitted to hospital with impairment from PE at the time of admission. This model was created to predict the risk of negative outcomes in these patients. The model integrates factors such as gestational age, headache, visual disturbances, chest pain, dyspnea, vaginal bleeding with abdominal pain, systolic blood pressure, and proteinuria strips59.

Women do not show symptoms that alert them to the need for medical attention when they experience early sex education. All pregnant women should receive regular and routine prenatal checkups, including blood pressure and proteinuria tests. the principle of increasing the frequency of visits in the last trimester, when PE is present in low-income patients. WHO recommends scheduling four basic antenatal visits for women who are at low risk of developing PE. Low-resource groups have a low intake of dietary calcium. PE was less common among the Maya Indians of Guatemala, who have a diet rich in calcium, leading to the hypothesis that PE and poverty are related by calcium deficiency in diets.

In populations with low dietary calcium intake, calcium supplementation in the second half of pregnancy has been shown to reduce PE62. The WHO recommends a daily dose of calcium of 1.5 to 2 g, which could be a limiting factor in patients with limited resources. Compared with placebo, low-dose calcium supplements (usually 500 mg daily) consistently decreased PE in a review of randomised trials. In women at high risk of preeclampsia, the use of low-dose aspirin is recommended; once preeclampsia is diagnosed, the mainstay of treatment is to control blood pressure, management of delivery and placenta, and to see if the benefits of delivery are greater than conservative treatment

In low-income countries, monitoring for hypertension, proteinuria, and early delivery care in critically ill patients could reduce maternal mortality from PE. Magnesium sulphate reduces mortality, but it is not the main component of programmes to reduce maternal mortality. Respiratory outcomes are not affected by prenatal corticosteroid exposure after 34 weeks' gestation. In low-resource nations, monitoring of high blood pressure, proteinuria, and early delivery care in patients with severe illness could decrease maternal mortality by childbirth. Magnesium sulphate reduces mortality, however, it is not the essential element of programmes to reduce maternal mortality. Exposure to antenatal corticosteroids after 34 weeks' gestation has no impact on respiratory outcomes. There was an increase in neonatal mortality in the general population, although there was no evidence of a decrease in neonatal mortality in low birth weight newborns and in low-resource areas. To reduce the MMP, by PE in the strata of limited resources, it is necessary to review the health systems.

Prevention. Based on individual patient data (IPD) findings from a meta-analysis, aspirin and other pharmacological drugs, such as heparin and dalteparin, offered moderate benefits for the prevention of PE in women at increased risk of PE. However, trials have not reached definitive conclusions. PE correlates with a diet low in serum calcium. High-dose calcium supplements reduce PE, so women with a deficiency are advised to supplement with calcium (1.5 to 2 g daily) in the second half of pregnancy.

According to a systematic report on supplements containing large amounts of calcium during pregnancy, cereals are the main source of calcium in the diet. A randomized study in women with PD is testing the hypothesis that adding calcium to the diet during early gestation could prevent PE. The inclusion of magnesium, vitamin C and vitamin E in the diet does not reduce the risk of lung disease. Marine oil or other polyunsaturated long-chain fatty acids do not contribute to the avoidance of PE.

Although only one randomized controlled study was conducted to assess preventive vitamin D supplementation, a lack of vitamin D was found to be associated with an increased risk of gestational diabetes, peptic diseases, and low weight-for-gestational age. A mixture of L-arginine and antioxidants was implemented in women at high risk of PE, using the precursor nitric oxide with insufficient synthesis. Some research conducted in low-risk women suggests regular L-arginine supplementation during pregnancy63. In response to lifestyle changes, nulliparous women who ate diets rich in vegetables, fruits, and plant-based oils were found to have a reduced risk of PE

In summary, aspirin treatment is the only way to prevent PE that has strong evidence, but its effects are not significant. Other preventive interventions, except calcium

supplementation in women with a low dietary calcium intake, require further evaluation and should not be prescribed without the context of clinical trials62,64,65.

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MICROBIOLOGICAL EVALUATION OF THE QUALITY OF BOTTLED WATER – ADDED WITH SALTS – IN PET AND PP BOTTLES WITH A CAPACITY OF 20 L IN THE STATE OF CEARÁ (A CASE STUDY)

https://doi.org/10.56238/sevened2024.031-024

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ABSTRACT

In this work, microbiological analyses were carried out in order to investigate the following microorganisms described in ANVISA's Normative Instruction No. 161, *Total Coliforms, E.coli, Pseudonomonas aeruginosas* and *Enterococcus spp* in water added to salts bottled in PET and PP bottles with a capacity of 20 L. Under the same analysis conditions, the results for PP bottles were unsatisfactory with 100% presence *forTotal Coliforms and Pseudonomonas aeruginosa*, while in the 20 Liter PET packages all the results were satisfactory, that is, with the absence for all microorganisms of ANVISA's I.N. No. 161.

Keywords: Polyethylene terephthalate, PET. Polypropylene. Water added with salts. Microbiology. 20 Liter Carboys.

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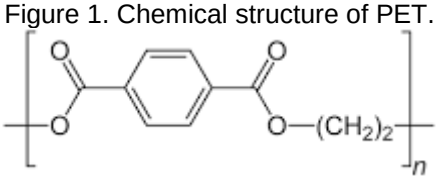
INTRODUCTION

The present study aims to evaluate the microbiological contamination in the Added Salts Water that were bottled in PET and PP bottles (20 L packages) and that underwent analysis in accordance with the current legislation, Normative Instruction No. 161 National Health Surveillance Agency (ANVISA) of July 1, 2022. These plastic packages are made up of polymers: Poly (Ethylene Terephthalate) PET and Polypropylene (PP).

In the State of Ceará there are many companies that produce, bottle and distribute Water Added with Salts and with that the consumption by the 20-liter capacity bottles (packages) also follow the same proportion, so there is a regulation that each bottle has a shelf life of 3 years for both PET and PP, so the great demand for these packages cross the borders of the municipality and the State for this material and some bottling companies, in the state itself, manufacture their PP bottles both for their own consumption and to meet the demand of other companies.

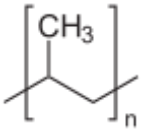
Poly (Ethylene Terephthalate) PET was introduced in the Brazilian market in 1988 and is one of the most widely used polymers today, mainly in the manufacture of packaging (J. THERM. SPRAY TECHNOL., 2, 2, p.145, 1993). Of the total PET consumed in Brazil, only about 21% is effectively recycled, despite the fact that PET is one of the most present components in plastic waste in Brazil. (PLÁSTICO MODERNO, 266, 8-18, 1996).

Figure 1. Chemical structure of PET.



Polypropylene PP was developed in 1954 and is used in wide applications such as the manufacture of sterilizable bottles, packaging films, luggage bags, car bumpers, toys, disposable injection syringes, household appliance housings, containers, ballpoint pen loading tubes, among other applications (MANRICH, 2005; MANO, 2001; CALLISTER, 2008). It has limited performance at low temperatures due to its glass transition temperature and has a molecular structure as shown in Figure 2.

Figure 2. Chemical structure of PP.



Currently, all types of bottled water, that is, Natural Mineral Water, Added Salts, Natural Water and Drinking Water from Tables and beverages in general use plastic packaging for bottling.

MATERIAL AND METHODS

Water samples were analyzed in 20 L bottles from 07 (seven) companies bottling water with added salts, where 5 (five) are located in the city of Fortaleza/Ceará, 1 (one) in the interior of the state and 1 (one) in the Metropolitan Region of Fortaleza, which will be called A, B, C, D, E, F and G.

In each company, 5 bottles were collected, in a total of 35, and in the tax expert analysis, the methodology was used with the objective of obtaining the necessary information and data on microbiological contamination only qualitative, that is, the presence or absence of the microorganisms contemplated in ANVISA's I.N. No. 161/2022. These analyses were performed by the Public Health Laboratory of the State of Ceará - LACEN with the enzymatic substrate method for *Total Colifortmes, E.coli (*Collilert*),* *Pseudonomonas aeruginosas* (Pseudalert), *Enterococcus spp* (Enterolert*)*. All substrates from the manufacturer Idexx, with detection in 24 hours in PP and PET carboys.

The method used for the analysis of total coliforms and fecal coliform (*Escherichia coli)* uses an enzymatic substrate and consists of an enzyme-substrate reaction, resulting in the release of a chromogenic and fluorogenic substance with the presence of yellow color (total coliforms) and fluorescence (*Escherichia coli*). The result is presented in a qualitative way (presence or absence). The sample should be analyzed at room temperature. The vial containing the specimen must be sterile, transparent, and identified with the specimen number. 250 mL of sample is measured and poured into the vial. The contents of a Colilert flask are added and the flask is homogenized with circular movements until the reagent is completely dissolved. It is incubated in an oven at 35 ± 0.5ºC for 24-28 hours.

The method applied for the analysis of *Pseudomonas aeruginosa* uses an enzymatic substrate and consists of an enzyme-substrate reaction. *Growing Pseudomonas aeruginosa* strains have an enzyme that cleaves the substrate in the reagent producing blue flowering under ultraviolet light. The result is presented in a qualitative way (presence or absence). The sample should be analyzed at room temperature. After identifying the sterile and transparent vial with the sample number, 250 mL of sample is measured and poured into the vial, the contents of a Pseudalert vial are added and the vial is homogenized with circular movements until the reagent is completely dissolved. It is incubated in an oven at 35

± 0.5ºC for 24-28 hours. Any fluorescence in blue indicates that the sample is positive for *Pseudomonas aeruginosa*.

The method applied for the analysis of *Enterococcus spp* uses an enzymatic substrate and consists of an enzyme-substrate reaction. When the substrate is metabolized by *Enterococcus spp,* it turns from blue to green, indicating positive detection. The result is presented in a qualitative way (presence or absence). The sample should be analyzed at room temperature, and after identifying a sterile and transparent vial with the sample number, 250 mL of sample is measured and poured into the vial, the contents of an Enterolert flask are added and the vial is homogenized with circular movements until the reagent is completely dissolved. It is incubated in an oven at 41 ± 1.0ºC for 24-28 hours.

Photo1. Substrates used by the Central Laboratory of Public Health of Ceará (LACEN) to identify microorganisms of ANVISA's I.N No. 161.



The analyses were carried out from December 2023 to September 2024 and companies A, B, C and D were bottled in PP carboys and companies E, F and G were bottled in PET carboys, making a total of 35 samples and all of Added Salts Water.

RESULTS AND DISCUSSIONS

The results in this study were obtained, in accordance with the current legislation, ANVISA's Normative Instruction (I.N.) No. 161 of 2022, which deals with the microbiological criteria for bottled waters.

Table 1 - Microbiological analyses carried out from December 2023 to September 2024 in 7 companies bottling water with added salts in the State of Ceará.

ENTERPRISES	PP carboys (quantity)	Results of qualitative analyses			
		Coliforms totais	***E. coli***	***Pseudomonas aeruginous***	***Enterococcus***
The	**5**	presence	absence	presence	absence
B	**5**	presence	absence	presence	absence
C	**5**	presence	absence	presence	absence
D	**5**	presence	absence	presence	absence
ENTERPRISES	**PET carboys (quantity)**				
And	**5**	absence	absence	absence	absence
F	**5**	absence	absence	absence	absence
G	**5**	absence	absence	absence	absence

Source: The Author.

Therefore, the microbiological analyses of water that were bottled in the PP bottles, in this study, pointed to 100% non-conformity, that is, unsatisfactory according to the current legal normative standards, Normative Instruction No. 161 National Health Surveillance Agency (ANVISA) of July 1, 2022.

In the returnable system, a 20 L carboy, the packaging is successively reused for water packaging, which makes it more complex compared to a disposable packaging system (one way) in which only preforms of PET origin are used. Thus, because the bottles are not owned by the bottling companies, they vary in manufacturers, time of use and material composition. These carboys must be standardized in order to adapt to automatic washing, filling and capping systems.

The ABNT NBR 14222:2005 standard establishes the minimum requirements and test methods for plastic carboys, regardless of the material, new and unused and with a capacity of 20 L.

According to the standard, the specified parameters are:

- Material: meet ANVISA specifications.
- Appearance: absence of defects internally and externally that favor the encrustation of dirt and the absence of undesirable odor is also required.
- Transparency: minimum specular light transmission of 60% at wavelengths 700 nm to 780 nm in the UV/VIS region.
- Mechanical resistance: evaluated by means of static compression tests, in which the bottled bottles must support 42 kg for 15 days at a temperature of 40ºC with a variation of more or less 3ºC, resistance to free fall at a height of 1.5 m and impact resistance using a mass of 12 kg, which evaluates the resistance of the carboy at the stage of application of the cap.

- Marking and identification: the standard establishes that the bottles must contain the following minimum words at the bottom and in high relief: recycling symbol, date of manufacture and expiration, manufacturer's name, mold number and the phrase "exclusive use for natural mineral water or water added with salts".

Compliance with ANVISA requirements aims to ensure that the packaging used in the packaging of bottled water is not a vehicle for contamination, taking into account that packaging materials are not totally inert and can transfer substances or microbiological contamination to the water.

All the water bottling companies from which the samples were collected and analyzed, 07 (seven), use reverse osmosis, which is a process that uses a semipermeable membrane, capable of retaining up to 99% of low molecular weight solutes, such as salts, viruses, bacteria and other contaminants, resulting in cleaner and safer water for consumption. Nowadays reverse osmosis is widely used in various sectors such as the pharmaceutical, food, chemical, petrochemical, desalination and drinking water and wastewater treatment industries.

CONCLUSION

This research of microbiological parameters showed the presence exclusively of total coliforms and *Pseudomonas aeruginosa in the* waters of the 20-liter carboys that were bottled in PP packages. According to the results obtained in this study and based on the standards established and in force in Normative Instruction No. 161 of the National Health Surveillance Agency (ANVISA) of July 1, 2022.

In all the samples analyzed, which were packaged in 20-liter PP-type bottles, there were amounts of total coliform bacteria and *Pseudomonas aeruginosa* above the acceptable limit by the legislation, in which it is noted that none of the bacteria standardized by IN No. 161 for this research is present in 250 mL of sample. Therefore, it is possible to understand that the water contained in carboys with this composition are unfit for human consumption.

It is important to note that there are no inspections in these companies that manufacture 20 L PP carboys and as a result we have a large number of packages that do not follow manufacturing standards appropriate to the standards in force in the country. It is essential to constantly monitor the good manufacturing practices of PP type carboys so that the microorganisms present that cause water contamination are eliminated. In addition, the proportional values of recycled and non-recycled (virgin) material inserted in the extrusion process until the final manufacture of the finished product must be identified and quantified.

Therefore, microbiological analyses were essential to investigate and raise an alert about the bottling of water for human consumption in PP type bottles with a capacity of 20 liters. The quality of the water available in this type of packaging, during the study period, was unsatisfactory for the purpose, which differs from the PET bottles that did not present any type of contamination in the research of microorganisms listed in IN No. 161 of ANVISA. Emphasizing: all water samples came from a reverse osmosis system in its manufacturing process, which leaves purified water.

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INFLUENCE OF BIOSTIMULANTS ON GROWTH AND INITIAL VIGOR OF SEEDLINGS IN VARIOUS SNAP BEAN VARIETIES

https://doi.org/10.56238/sevened2024.031-025

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ABSTRACT

The snap bean, belonging to the same botanical species as the common bean (Phaseolus vulgaris), is a legume with high economic value. The use of bioregulators in its cultivation shows great potential. This study aimed to evaluate the effects of applying four commercial chemicals on the germination and vigor of snap bean seedlings.

Keywords: Snap bean, Bioregulators, Germination, Seedlings vigor.

INTRODUCTION

The snap bean, belonging to the same botanical species as the common bean (Phaseolus vulgaris), is a legume with high economic value. The use of bioregulators in its cultivation shows great potential. This study aimed to evaluate the effects of applying four commercial chemicals on the germination and vigor of snap bean seedlings.

MATERIAL AND METHODS

In the laboratory, a completely randomized design with eight replicates was used, while in the germination plot, a randomized block design with four replicates was applied. Both conditions followed a 5 x 5 factorial scheme, involving five cultivars (Trepador Torino, Feijão Maravilha de Veneza Amarelo, Teresópolis Manteiga, Hx10093000, and Macarrão Favorito), all using certified seeds treated with the fungicide Captan, and four commercial seed treatment chemicals (Stimulate®, Acadian®, Ever®, and Profol NiCoMo®) at the manufacturer's recommended doses, along with a control treatment using water. In the laboratory, the parameters evaluated were normal plants (PN) and abnormal plants (PAN). In the soil, the emergence speed index (IVE), emergence percentage (E), root length (CRaiz), shoot length (CPA), fresh shoot weight (MFPA), fresh root weight (MFRaiz), dry shoot weight (MSPA), and dry root weight (MSRaiz) were measured. The data were analyzed using analysis of variance, and in cases of significance, means were compared using the Scott-Knott test at a 5% probability level.

RESULTS AND DISCUSSION

In the soil assay, the Manteiga and Hx10093000 cultivars showed greater responsiveness to the application of biostimulants. Regarding biostimulants, the Acadian biostimulant resulted in the highest root dry matter weight (Table 1), though no significant differences were observed for the other evaluated variables. This aligns with findings from Lima et al. (2009), who reported similar results when using Stimulate at two concentrations and liquid gibberellins on Artocarpus heterophyllus Lam. seeds. In the laboratory evaluations, a significant interaction was found between biostimulants and cultivars (Tables 2 and 3). Acadian® produced the highest values for normal seedlings across several cultivars (Table 2). The lowest occurrence of abnormalities was observed in the Hx10093000 cultivar (Table 3), with similar means and no statistically significant differences in the presence of biostimulant treatments.

Table 1: Average values of CPA and CRaiz in cm; MFPA, MFRaiz, MSPA and MSRaiz in grams and percentage of emergence (E) of snap bean concerning the cultivars and biostimulating products

Cultivars	CPA	CRaiz	MFPA	MFRaiz	MSPA	MSRaiz	IVE	E
Veneza	9.34d	9.39b	13.41a	5.82	1.80	1.66	5.51d	47.50d
Torino	11.22c	11.41a	11.17b	4.95	1.69	1.36	9.84c	71.90c
Favorito	14.71b	14.71a	11.78b	5.31	1.50	1.49	18.21b	84.90b
Manteiga	15.59a	11.25a	14.21a	4.81	1.55	1.68	21.43a	94.40a
Hx10093000	16.20a	13.11a	13.78a	4.30	1.47	1.16	22.88a	96.20a
Products								
Ever	13.44	10.55	12.98	4.49	1.63	1.19b	15.58	79.90
Stimulate	13.16	10.95	13.31	5.11	1.62	1.44b	15.07	78.40
Acadian	13.31	1.14	12.25	5.36	1.63	2.05a	16.83	78.20
Profol	13.78	11.13	12.77	4.85	1.51	1.40b	15.29	79.20
Test	13.37	11.19	13.03	5.34	1.62	1.31b	15.10	79.20

Within each factor, means followed by the same letter belong to a same group by the Scott-Knott test at the level of 5% of probability.

Table 2. Average values of the normal seedlings as regards the first (five days) and the second (9 days) counts of the emergence test of the snap bean conducted concerning the cultivars and biostimulating products

Cultivars	**Products**				
	Acadian	**Ever**	**Profol**	**Stimulate**	**Testemunha**
Veneza	50cA	46cA	39cB	50cA	38cB
Torino	92aA	88bA	78bB	85bA	87bA
Favorito	86bA	84bA	85bA	81bA	82bA
Manteiga	96aA	97aA	97aA	81bB	87bB
Hx10093000	96aA	95aA	91aA	99aA	98aA

Means followed by the same capital letter in the rows and small letter in the columns do not differ by the Scott-Knott test at the level of 5% of probability.

Table 3. Average values as regards the abnormal plants concerning cultivars and biostimulating products

Cultivares	**Produtos**				
	Acadian	**Ever**	**Profol**	**Stimulate**	**Testemunha**
Veneza	50cA	53cA	61cB	50cA	61cB
Torino	8aA	11bA	21bB	14bA	12bA
Favorito	14bA	16bA	15bA	17bA	17bA
Manteiga	3aA	2aA	8aA	18bB	12aA
Hx10093000	3aA	5aA	3aA	1aA	1aA

Means followed by the same capital letter in the rows and small letter in the columns do not differ by the Scott-Knott test at the level of 5% of probability.

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MORPHOLOGY OF THE SOCIAL NETWORK OF JUDICIALIZED ELDERLY: ANALYSIS OF INSTITUTIONALIZATION AND CIVIL CURATORSHIP

https://doi.org/10.56238/sevened2024.031-026

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ABSTRACT

This qualitative study investigates the morphology of the social network of judicialized older adults, making an analysis of institutionalization and civil guardianship, focusing on older adults living in the Lar dos Velhinhos in Viçosa, Minas Gerais, Brazil. Semi-structured interviews were conducted with nine participants, including older adults whose care was judicialized through civil guardianship or institutionalized by court decisions, as well as caregivers responsible for their well-being. The results indicate that the institutionalization of the elderly results in a significant strengthening of internal ties, both with the caregiver team and with other elderly people, with 75% of the interviewees highlighting this characteristic. At the same time, there is a weakening of ties with the family and a lack of frequent visits from family and friends, both reported by 50% of the interviewees. In addition, although the feeling of welcome in the institution is also high (75%), half of the elderly express a desire to participate in external activities, indicating a need for greater interaction with the environment outside the institution. It is concluded that the institutionalization of the elderly in the Home for the Elderly strengthens internal ties, but weakens family ties, revealing the need for greater interaction with the external environment.

Keywords: Elderly Person. Social Network. Judicialization of Care.

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INTRODUCTION

Population aging is a global reality that brings with it significant challenges, especially about the care and protection of the elderly. In the Brazilian context, the increase in life expectancy and the demographic transition have driven debates about public policies and care practices aimed at this portion of the population. In particular, the judicialization of the care of elderly people in nursing homes in long-term care institutions such as the Lar dos Velhinhos, in the city of Viçosa in Minas Geras, emerges as a complex issue that needs careful analysis.

The present research is justified by the need to understand how institutionalization and civil guardianship impact the social network of the elderly in court. The analysis of social interactions and relationships inside and outside institutions is essential to ensure the integral well-being of these individuals. By identifying the strengthening of internal ties and the weakening of external connections, this research aims to provide subsidies for policies and practices that promote the maintenance of family and social ties, as well as the inclusion of older people in external activities, ensuring that their fundamental human rights are respected and that their quality of life is improved. Thus, the main objective of this research is to understand the dynamics of social interactions and relationships of the elderly in nursing homes at the Lar dos Velhinhos.

To this end, the structuring of this text is shown in five sections. The first is the introduction, in which the theme, the justification for the research, the objectives, and the characterization of the sections of the text were identified. The second section brings the literature review, addressing the concepts of social network, institutionalization and civil curatorship. In turn, the third section details the methodology used in the study. Next, the results and discussions are presented, in which the morphology of the social networks of the elderly who had their care judicialized and who live in asylum in a long-term care institution was analyzed. The fifth section is composed of the conclusions of the research and, finally, the references are indicated.

THEORETICAL-CONCEPTUAL FRAMEWORK

SOCIAL NETWORK

Portugal's (2006) social network perspective is based on four central elements of social networks: the actors (collective or individual), the interactions between individuals, the ways in which networks are structured, and the patterns established by virtue of these relationships.

In this sense, the interaction between social actors, through the qualitative analysis of networks, provides an explanation for social behavior. Relational analysis allows us to study how actors are conditioned by the social fabric that surrounds them, but also how they are able to influence and modify the network according to their interests.

According to Portugal (2006), there are 3 types of networks: intimate networks, interaction networks and exchange networks, and all of them must conjugate and articulate actions, through nodes, ties and norms that govern them. The interactions called bonds can be strong, weak, normal, discontinuous, or even interrupted, conflictual and ambivalent, depending on the social context in which the actor is inserted, either because he has been socially conditioned to a certain context, or because of his predilections or preferences.

Thus, the qualitative analysis of the social network of the elderly person who had their care judicialized, either through institutionalization or through civil curatorship (interdiction), is extremely important. The social fabric that involved it before and after judicialization and the respective knots, ties and norms that were fought before and after judicialization will be able to assess whether its fundamental human rights were respected at the time of judicialization.

The morphology of social networks will be operationalized, according to Portugal (2006), considering: Who? or the forms (The knots and the ties); What? or the content of the network flows (Instrumental and Expressive); How? or the norms that regulate actions (Reciprocity, Obligation, Equality and Autonomy).

INSTITUTIONALIZATION

Among the non-family options for the care of the elderly, the oldest is the asylum institution, whose origin dates back to Ancient Greece. Currently, however, these institutions are often associated with negative images and prejudices, and are often seen as places where the elderly are left to wait for their time to die (Christophe and Camarano, 2010; Novaes, 2003; Born, 2001; Davim et al., 2004).

Two consequences of the strong stigma surrounding this type of care are the low supply of residential institutions for the elderly and the reduced number of elderly people living in them. In addition, in Brazil, although these institutions are part of the social assistance network, in general, they arise in response to the needs of the community (Born and Boechat, 2006) and not as a result of a long-term care policy. This omission by the State hinders and inhibits inspection and explains, to a large extent, the problems in the quality of the services offered (Giacomin and Couto, 2010).

For Born (2001), in Brazilian society, nursing homes are associated with poverty, neglect and abandonment of the elderly by families. Recurrent feelings of guilt and failure are faced by relatives who take their elderly to live in this type of institution (Camarano and Scharfstein, 2010).

As a consequence, families only seek an institution for their family members when they exhaust their capacity to care (Karsch, 2003). It is still common to perceive that living in a Long-Term Care Institution for the Elderly (LTCF) means breaking ties with family and friends. In general, the institution ends up being held responsible for situations of abandonment that, in fact, already existed before the elderly person arrived at it.

According to the understanding of Da Silva *et. al* (2023), the institutionalization of the elderly is one of the oldest alternatives used as a solution to care for elderly people with partial or total loss of autonomy. Despite all the problems that hospitalization in a nursing home can cause, it is the most sought-after care resource, especially for seniors with dementia.

Although it is true that a considerable percentage of elderly people without family ties (single, widowed without children, etc.) are institutionalized, the family is one of the main resources to prevent or postpone hospitalization in nursing homes. However, many elderly people who live in nursing homes have families. Thus, knowing your family ties is a fundamental issue.

Popularly, the hospitalization of an elderly person in a nursing home can have connotations of abandonment. In this sense, caring for the elderly at home continues to be the preferred option for both the elderly and family caregivers. Currently, homes for the elderly are considered places of support capable of responding to the diverse and heterogeneous needs of the elderly when community life does not satisfy them (Bayter and Ramos, 2016).

However, from a historical point of view, the option for residential care emerges from the concept of asylum. Asylum institutions were designed in the context of traditional care, assumed by the primary family group, a function that was partially assumed by these institutions, when trying to alleviate the social problems derived from poverty (Zalai *et. al.,* 2024; Nighat *et. al.,* 2024; Ghafoor *et. al.* 2024). With the increased need to provide care for dependent individuals, especially older adults with dementia and severe limitations in basic activities of daily living, these institutions also became an option to relieve families who needed to care for older adults with severe disabilities.

There is a consensus that family care does not end with hospitalization in the nursing home (Frahm *et. al.,* 2010). Many studies agree that, in general, the decision to admit an

elderly person to a nursing home was made after a long period of home care and during a period of crisis. Most caregivers experienced mixed feelings about their older relative's admission to a nursing home because of feelings of burden relief, along with feelings of guilt over not being able to continue fulfilling their "duty of care" (Teng *et. al*, 2020; Vaismoradi *et. al.,* 2016).

This emotional conflict does not automatically end with the admission of the elderly to a nursing home; occasionally, it can increase, generating significant damage to mental health and affecting the relationship between the family member, the elderly resident, and the institution's employees (Koppitz *et al*., 2017).

CIVIL CONSERVATORSHIP

According to Ferreira and De Loreto (2024), in order to understand the roots of the discussion about curatorship in the Brazilian legal context, it is necessary to consider that, after the arrival of the Portuguese in the year 1500, the country adopted the laws of Portugal, developing its own laws only years later. According to Pequeno (2020), curatorship in Brazil has had legal support since the Philippine Ordinances, promulgated by King Felipe I in 1603. These Portuguese norms remained in force until 1916, when the first Civil Code of the Brazilian Republic was instituted, which was replaced only in 2002, according to the aforementioned author.

The Philippine Ordinances followed the same line as the Alphonsine Ordinances, providing for the curatorship of prodigals and mentally capped. This regulation was similar to that of the Alphonsine Ordinances, determining that, if the judge knew that a sandwich could cause damage to the person or property, he should hand it over to the care of his father, who would guarantee his protection and manage his assets (Rodrigues; Crispino, 2019).

The authors also point out that in the Philippine Ordinances, people with mental disabilities were treated by the police in a similar way to ferocious animals. There was an article that specified that the police should contain the danger posed by mad people in the same way they did with ferocious animals.

From 1916 onwards, Brazil adopted a Civil Code established by Law No. 3,071, of January 1, 1916, which remained in force from 1917 to 2002. In the first Brazilian Civil Code, people with intellectual disabilities were considered absolutely incapable, described as insane of all kinds, and were subject to curatorship.

Originally, the Civil Code of 2002 classified people with mental disabilities as absolutely or relatively incapable, according to the degree of discernment they had to perform acts of civil life.

In the context of the time, the New Civil Code represented progress by recognizing that, depending on the degree of discernment of the person, he could be considered absolutely or relatively incapable. There was also an update in the terms, referring to this population as people with disabilities and people with illnesses (Ferreira; de Loreto, 2023). Despite the advances, the Civil Code, in its original version, did not recognize possibilities of autonomy for curators, especially for those with mental health issues, as understood by Rodrigues and Crispino (2019).

Major legal changes have occurred in the field of curatorship debates since the enactment of Law No. 13,146, of July 6, 2015 – Brazilian Law for the Inclusion of Persons with Disabilities (Statute of Persons with Disabilities). Right at the beginning, the law changes the legal concept of a person with disabilities. According to Pequeno (2020), *"Thus, the concept of a person with disabilities is changed and expanded, relocating the focus from the subject to society and enhancing functionality to the detriment of disability".*

The statute defines the characteristics of the subject to be characterized as disabled:

> Art. 2 A person with a disability is considered to be one who has an impediment of a physical, mental, intellectual or sensory nature, which,
> in interaction with one or more barriers, may obstruct their participation full and effective in society on equal terms with others people.
> Paragraph 1 - The assessment of the disability, when necessary, will be biopsychosocial,
> carried out by a multiprofessional and interdisciplinary team and will consider: (Term) (See Decree No. 11,063, of 2022)
> I - the impediments in the functions and structures of the body;
> II - socio-environmental, psychological and personal factors;
> III - the limitation in the performance of activities; and
> IV - the restriction of participation. (BRAZIL, 2015).

Article 4 of the Statute of Persons with Disabilities recognizes that people with disabilities have the right to enjoy the same opportunities as others, without suffering discrimination. Next, Article 6 addresses the legal capacity of these persons, stating that:

> Art. 6 Disability does not affect the full civil capacity of the person, including towards:
>
> I - to marry and form a stable union;
> II - to exercise sexual and reproductive rights;
> III - to exercise the right to decide on the number of children and to have access to adequate information on reproduction and family planning;
> IV - to preserve their fertility, with compulsory sterilization being prohibited;
> V - exercising the right to family and family and community life; and

> VI - to exercise the right to custody, guardianship, curatorship and adoption, as adopter or adoptee, in equal opportunities with the others people. (BRAZIL, 2015).

In the context of the issue related to curatorship, this implies that a person with a disability cannot be submitted just because he or she has it; It is essential to demonstrate that her condition makes it impossible for her to manage the acts of civil life. In "Chapter II: Equal recognition before the law", curatorship is treated as follows:

> Article 85. The curatorship will only affect acts related to the rights of patrimonial and business nature.
> Paragraph 1 - The definition of curatorship does not reach the right to one's own body, to the sexuality, marriage, privacy, education, health, work and voting.
> Paragraph 2 - Curatorship is an extraordinary measure, and must be included in the sentence the reasons and motivations of its definition, preserving the interests of the curator.
> Paragraph 3 - In the case of a person in a situation of institutionalization, when appointing curator, the judge must give preference to a person who has a relationship of nature family, affective or community with the curator. (BRAZIL, 2015).

As of 2015, after the enactment of the statute, the Civil Code began to consider as absolutely incapable only individuals under 16 years of age, and as relatively incapable:

> Article 4 - They are incapable, in relation to certain acts or the manner of exercise: (Text given by Law No. 13,146, of 2015) (Validity)
> I - those over sixteen and under eighteen years of age;
> II - habitual drunkards and drug addicts; (Text given by Law No 13.146, of 2015) (Term)
> III - those who, for transitory or permanent reasons, cannot express his will; (Text given by Law No. 13,146, of 2015) (Term)
> IV - the prodigals.
> Sole Paragraph. The capacity of indigenous people will be regulated by legislation special. (Text given by Law No. 13,146, of 2015) (Validity). (BRAZIL, 2015).

Thus, the distinctions between absolute and relative curatorship are abandoned, and curatorship is understood as a mechanism intended to protect while preserving the rights of the person under curatorship.

METHODOLOGICAL PROCEDURES

In order to achieve the objectives proposed in this research, in addition to a literature review, considering scientific articles from various areas of study that can contribute to the understanding of aging from a gender perspective and the judicialization of elderly care, the field research itself was carried out, aiming to analyze aging from the perspective of gender,

characteristics of the profile, motive and consequences of judicialization. The survey was carried out in 2024, with elderly people who live institutionalized in the non-profit foundation, called Lar dos Velhinhos, established in the city of Viçosa in Minas Gerais.

Data collection was carried out through interviews, in which a semi-structured script was applied to the elderly who live institutionalized, as well as to the professionals who work with the care of the elderly, totaling 9 people, being: 1 Director of the Institution, 1 Nurse, 1 Social Worker, 1 Nutritionist and 5 Elderly, 3 women and 2 men.

The social network variables identified were the following: nodes (individuals or entities), ties, content, and norms.

RESULTS AND DISCUSSION

THE MORPHOLOGY OF THE SOCIAL NETWORKS OF THE ELDERLY WHO HAD THEIR CARE JUDICIALIZED

The 5 elderly people who had their care judicialized were interviewed and, after identifying themselves, were questioned with question number 1 of block ii – social networks: characteristics and morphology: "How did their institutionalization affect their social relationships?", resulting in the following responses:

> Interviewee 1: "Cut. Because no one knows. Nobody knows I'm here, my compadres from Rio don't know."
>
> Interviewee 2: "It distances friendships a little, my children also distance them because they work and can't keep coming, but I talk on the phone with my boys almost every day."
>
> Interviewee 3: "Yes. He pushed him away, right?"
>
> Interviewee 4: "He pushed his relatives away a little..."
>
> Interviewee 5: "He pushed away the friendships that he had a lot of friendship abroad. He pushed it away."

The analysis of the interviewees' answers, based on the perspective of the social network of Portugal (2006), reveals a significant impact of social networks on their relationships. According to Portugal, social networks are made up of four central elements: the actors (collective or individual), the interactions between individuals, the structure of the networks and the patterns established in these relationships. By applying these concepts, we identified notable changes in respondents' bonds and interactions.

In terms of distance from friendships, it was observed that 100% of the interviewees (5/5) reported that their friendship ties were interrupted or weakened after the judicialization

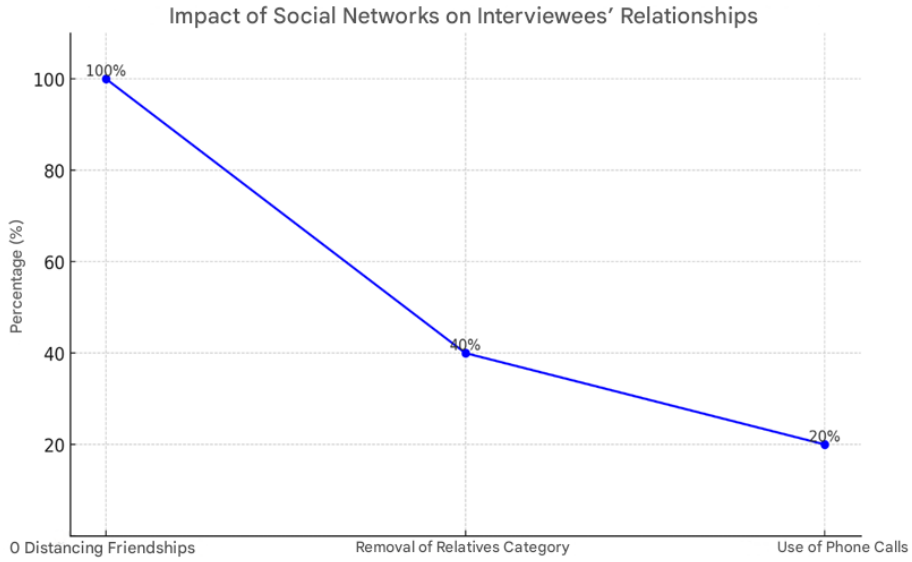
of care. This distancing represents an alteration in the networks of intimates, where previously strong ties have become weak or even broken.

In addition, 40% of the interviewees (2/5) mentioned a distance from relatives, indicating a change in the interaction networks. These family ties, which may have been strong or normal, have been weakened, reflecting a change in the norms of reciprocity and obligation that governed these relationships.

On the other hand, only 20% of respondents (1/5) highlighted the use of phone calls to keep in touch with their family members. This data reveals that, despite the difficulties, some social actors still manage to maintain instrumental and expressive ties through telephone communication, although these ties are less frequent and more fragile.

Graph 1 below clearly shows the intensity of the impact in each category, highlighting significant estrangement from friendships, followed by estrangement from relatives and, to a lesser extent, the use of phone calls to maintain contact.

Graph 1: Impact of Institutionalization on the Social Network



Source: Prepared by the authors (2024).

These results show that the judicialization of care, whether through institutionalization or civil curatorship (interdiction), profoundly impacts the morphology of the social networks of the elderly (Song, *et. al,* 2023). The nodes and ties that make up these networks are altered, affecting the reciprocity, obligation and autonomy of the actors involved. This change in the social fabric can be analyzed to understand whether the fundamental human rights of the elderly were respected at the time of judicialization, as suggested by Portugal (2006).

Question No. 5 of the same block of questions wished to investigate with the elderly interviewed and judicialized if "there was any change in social ties after the judicialization of care", the answers to this question were as follows:

> Interviewee 1: "I had too much friendship. Many compadres. Now they don't... They know I left Rio, right? They don't know I'm here. I have affiliated, I have many compadres. I had a lot of friendship. My godmother was too friendly. Then after he came here, he cut off these friendships a little because no one knows. Nobody knows."
>
> Interviewee 2: "Friendships from abroad are all very far away."
>
> Interviewee 3: "We stay away from family and colleagues in the church..."
>
> Interviewee 4: "You can't go out for a walk or go to mass, that's not good."
>
> Interviewee 5: "I get very stuck... I liked to go back and forth and now I can't."

The analysis of the interviewees' answers, based on the perspective of the social network of Portugal (2006), reveals that there was a change in social ties after the judicialization of care. By applying these concepts, we identified notable changes in the nodes and loops of the respondents' networks.

As in the previous results, it was observed that 60% of the interviewees (3/5) reported a withdrawal from friendships after the judicialization of care. This distancing, as previously observed, represents an alteration in the networks of intimates, where the previously strong ties have become weak or interrupted.

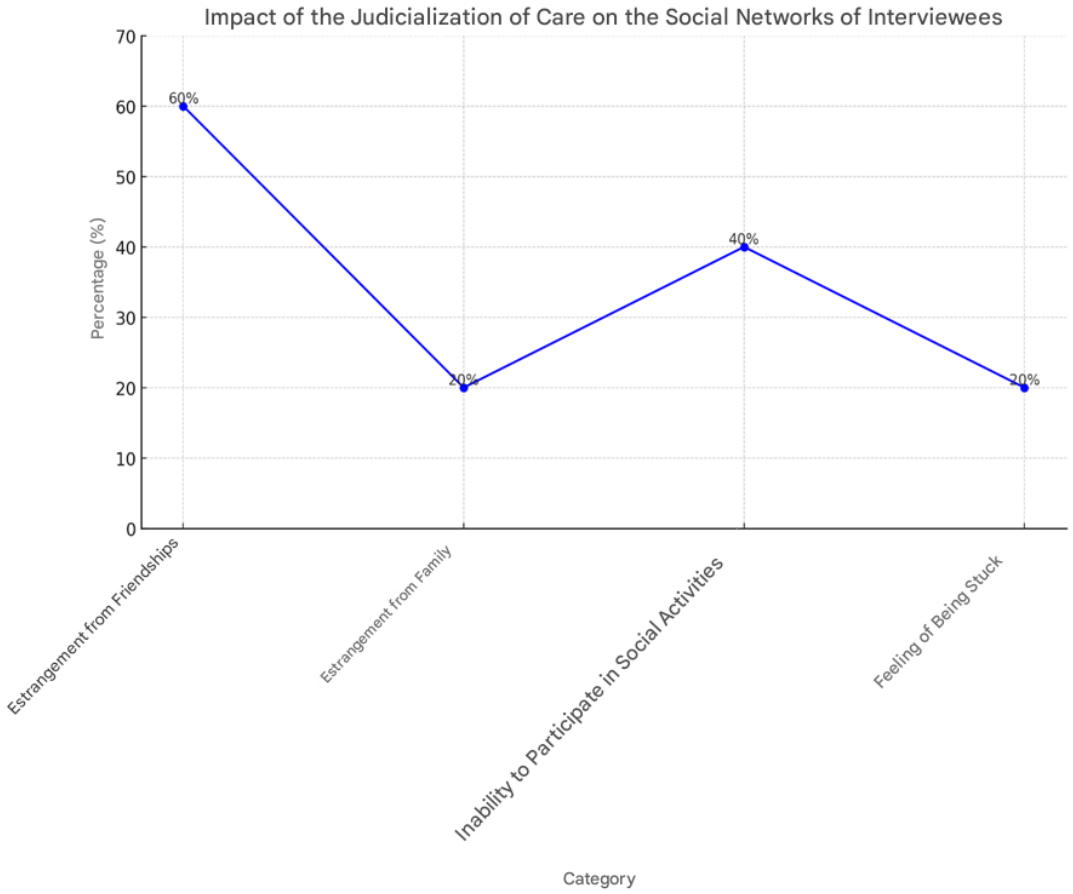
In addition, 20% of the interviewees (1/5) mentioned a distance from the family after judicialization, indicating a change in the interaction networks. Additionally, 40% of respondents (2/5) highlighted the impossibility of participating in social activities, such as walking or going to mass, which indicates a significant restriction in their social interaction networks. This impossibility represents an interruption in the expressive and instrumental flows of these networks, showing how the norms of equality and autonomy have been altered.

Finally, 20% of respondents (1/5) expressed a feeling of being trapped, without the freedom to move and socialize as before, showing an alteration in autonomy and the ability to maintain active social ties. This feeling shows a change in the knots and ties that make up the social networks of these individuals, affecting their ability to influence and modify the network according to their interests.

These results show that the judicialization of care has a profound impact on the social networks of the elderly, altering the established patterns of interaction and negatively affecting the ties and knots that make up these networks. According to Panas (2024), the

qualitative analysis of the social networks of the elderly shows that the judicialization of care causes a weakening of social ties, leading to isolation and a decrease in meaningful interactions. Graph 2, as shown below, reveals in a tabular way the results that were found in the research:

Graph 2 – Impact of the Social Network after the Judicialization of Care



Source: Prepared by the authors (2024).

The graph clearly shows the intensity of the impact in each category, highlighting significant estrangement from friendships, followed by inability to participate in social activities, estrangement from family, and feeling stuck.

As for the support public that works in the care of the elderly and were interviewed, the social network of the elderly, after the judicialization of care, can be characterized as follows:

> Interviewee 1: "I think that from the moment they are here, their network here is stronger. Because they start to trust the whole team. So what happens? They make a bond with the caregivers, with the work team and with themselves among themselves. One elderly man calls the other uncle. They form a family here. So, like this, everyone depends on the other. I think that when one lends a hand to the other, then they have lunch. So, one goes to fetch, the one who has more skill, fetches water for the other. So, like that, they make their family. It's a family bond. Some have some resistance. But most achieve everything. Between them, here, the bond is very strong. Therefore, if one is sick, they worry. If one goes to the hospital, they

worry. How are you in the hospital? Is he doing well? When will it return? Know? That concern, you see that it is a family concern, a volunteer concern. And when, outside, the family, what happens? Little comes to visit. Sometimes, I have to stay on my cell phone, asking, practically begging (...)"

Interviewee 2: "So, I think that their dealings with us, the employee, we became his family, I see them very loving. I think it's very strong, very reliable. They even consider us more as family than the family that comes to visit. And they love the visits, you know, sporadic. Visits that are not familiar. I also feel that they feel very welcomed and as for the family, they get more stuck. Over time, the ties with the family do weaken. I have only three elderly people that I receive from friends, former neighbors. Few, then, would be a minority, for sure. But I don't think they're sad about that either. It's as if it were like that, a relationship that they created here. And then, already in the part of going out for a walk, I see that they really miss a church, a bar, a farm, a club, a forró."

Interviewee 3: "I think it's much stronger here. I notice some caregivers like this, the care they have is different when a family comes. When you go to hug, it seems that the bond is close, you know? That middle and correct hug. It is just like that. I think it's weakened out there. And here inside the bond is strong. It's like an elderly woman, who the two stay together, sleep in the same room, they fight about slamming the door, about one wanting to knock on the other, but then, at dinner time one takes the hand from the other and helps to climb the stairs, right? Cute. So, I think it becomes a family, like that. And abroad, the relationship they had before, the family that is fragile, but for example, friends they had abroad? Some still come here, but I think it's not enough. So, I've been here for a short time, right? I even want to work on this issue of strengthening, of a friend I came here, of them to go for a walk to have this family life, but I think it's weak. I don't know if it's because of their knowledge, of knowing that they can come here. I don't know if we need to publicize more. Sometimes they ask to go to mass. Something like that, which I think is also a negative side, that I think we can't throw all the activities in here. Like this, there is celebration, so you don't need to go out to go to mass. Let's do an activity here, you don't need to do it outside. I think we have to look a little more outside for them to leave, I think that would be good for them. Here with institutions there are, for example, the celebrations that come through the church that is only Catholic, only Catholic, evangelical I have not yet seen."

Interviewee 4: "Here I think it's very good, but in other institutions where I worked, there were many who threw the elderly there and said: only call me if I die. Many changed their phone numbers, we couldn't get in touch. It was very sad. "

The analysis of the interviewees' answers, based on the perspective of the social network of Portugal (2006), revealed to the public of care for the elderly that institutionalization also had a significant impact on social networks.

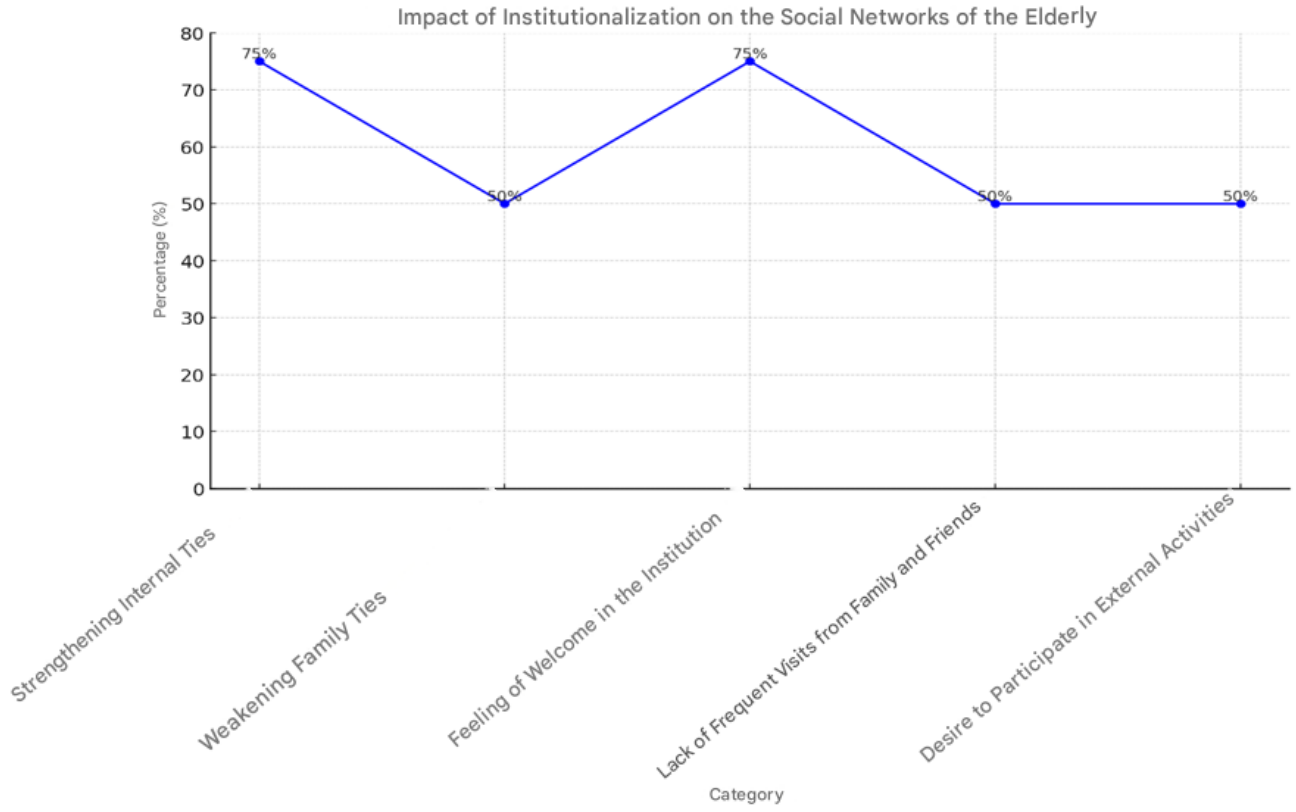
It was observed that 75% of the interviewees (3/4) reported a strengthening of internal ties in the institution, both with the team of caregivers and with other elderly people. This strengthening reflects the creation of new networks of intimates, where bonds are often strong and stable. The elderly form a kind of family within the institution, with interactions based on reciprocity and mutual obligation.

On the other hand, 50% of respondents (2/4) mentioned a weakening of ties with the family. This change indicates a modification in the interaction networks, where family ties become weak or interrupted, affecting the norms of reciprocity and obligation that governed

these relationships. In addition, 75% of the interviewees (3/4) expressed a feeling of welcome in the institution, showing that the new networks of intimates provide an environment of support and trust. However, 50% of respondents (2/4) highlighted the lack of frequent visits from family and friends, reflecting a change in the established patterns of their exchange networks.

Finally, 50% of respondents (2/4) expressed a desire to participate in outside activities, such as going to church or going for a walk. According to Liang (2023), this need for external interaction indicates that, despite strong internal ties, there is a lack of expressive and instrumental flows that only activities outside the institution can provide (Huang *et. al,* 2024). Graph 3, as shown below, reveals in tabular form the results that were found in the research:

Graph 3 – The social network of the elderly after judicialization from the point of view of the supporting public.



Source: Prepared by the authors (2024).

The graph clearly shows that the institutionalization of the elderly results in a significant strengthening of internal ties, both with the caregiver team and with other older adults, with 75% of the interviewees highlighting this characteristic. At the same time, there is a weakening of ties with the family and a lack of frequent visits from family and friends, both reported by 50% of the interviewees.

In addition, although the feeling of welcome in the institution is also high (75%), half of the elderly express a desire to participate in external activities, indicating a need for greater interaction with the environment outside the institution. These observations suggest that, while the internal social network of the elderly is strengthened, their external connections tend to weaken, highlighting the importance of balancing these two aspects to promote integral well-being.

FINAL CONSIDERATIONS

The answers of the interviewees revealed a significant impact of the judicialization of care on the social networks of the elderly. The analysis shows that both friendship and family ties were severely affected, with the majority of respondents reporting a weakening or disruption of these ties. The structure of the social networks of the elderly has changed substantially after judicialization.

There was a clear shift in interaction patterns, with a decrease in meaningful interactions and a reduction in participation in external social activities. Within the institutions, the elderly found new support networks with the team of caregivers and among themselves. This resulted in stronger and more stable bonds, providing a welcoming environment and emotional support.

Despite internal support in institutions, many older adults expressed a desire to participate in outside activities such as going to church or going for a walk, indicating a gap in exchange networks that only activities outside the institution can satisfy. The results highlight the need for policies that promote the maintenance of the social networks of the elderly in court, both inside and outside the institutions. This includes measures to strengthen family and friendship ties, as well as encouraging social activities that promote social integration. It is important to recognize the limitations of this study, such as the sample size and the generalizability of the results. Future research can further explore the impact of specific interventions on improving the social networks of older people in court.

However, as *a policy making*, it is suggested to use technology to promote strong social networks for elderly people in court. As technology has played a fundamental role in keeping people connected, regardless of the physical distances that separate them, the policy proposes a platform for making video calls, allowing a closer and more frequent contact of the elderly in court with their families and their entire social network outside the institution through a digital project called Digital Connection 60+. It is expected to reduce loneliness, improve mental health and strengthen family and friendship ties, providing a more supportive environment for the elderly in legal proceedings.

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SPONTANEOUS PLAY AS A STRATEGY FOR THE DEVELOPMENT OF CHILDREN'S AUTONOMY

https://doi.org/10.56238/sevened2024.031-027

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ABSTRACT

The aim of this study was to investigate the contribution of spontaneous play to the construction of children's autonomy. For this, a qualitative study of the microethnography type was carried out with six children, five boys and one girl, aged between two and three years belonging to a kindergarten 1 class, of an early childhood education school, were observed for 4 months, daily. From the participant observation, 03 (three) thematic categories emerged: the importance of the organization of spaces as a facilitating agent of free play; free play and interactions between children and free play and the development of autonomy. The results showed that the organization of spaces interferes with free play and the development of the child's autonomy; that when playing freely, children enhance symbolic play, assume roles and interact spontaneously, and when children play freely, they develop in their entirety, learning to think, question, discover, explore, experience new discoveries. These factors are essential for the integral growth and construction of children's autonomy through actions in free play.

Keywords: Child. Play. Autonomy.

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INTRODUCTION

> God is joy. A child is joy.
> God and a child have this in common: they both
> They know that the universe is a box of toys.
> God sees the world with the eyes of a child.
> He is always looking for companions to play with.
> Rubem Alves

The importance of understanding the meaning of play for the child and for the construction of their autonomy arises from the moment childhood begins to have different meanings in society. Over the centuries, the portrait of childhood has changed, and different childhoods have been perceived. The child went from being a mini-adult to a vulnerable being and should be protected and consequently led to later exercise his role as a historical and capable being (Ariès, 1981).

The child plays to understand the world and participate in it, plays house, dolls, plays imitation games. Through sensory and exploratory play, she gets to know the physical environment that surrounds her and her role in it. When playing with handicrafts, with songs and cirandas, the child gets to know the culture of his social group (Brasil, 2019).

Playing is a right guaranteed by law and defended by the United Nations (UN) since 1959, in the Universal Declaration of the Rights of the Child. This was strengthened in 1989 with the Convention on the Rights of the Child, to which Brazil is a party. In Brazil, play is guaranteed in the Federal Constitution (1988), in the Statute of the Child and Adolescent (1990) and in the Legal Framework for Early Childhood (2016).

Children are unaware that playing stimulates their cognitive and motor learning, favoring greater interaction with the environment in which they live, they want to play (Kishimoto, 2011). By playing freely and spontaneously, she expresses herself, builds her identity, develops socio-affective aspects and perceives her place in the world (Chicon; Olive tree; Rocha, 2019). Heuristic play, better known as free play, is a playful activity, free of rules or impositions. Children have the opportunity to explore their creativity within their own time, create rules in their games and bonds of friendship with other children without the intervention of an adult, in order to better integrate with the environment and in the environment in which they are inserted (Penina, 2016).

The dimension of freedom seen as a characteristic of the authentic nature of play is developed by Caillois (1967), who argues that playing should be a free and voluntary activity, therefore, it cannot be imposed, but carried out for the mere pleasure of doing it; separated from ordinary life and crossed by a feeling of fantasy that keeps it distinct from what really happens (Savio, 2023).

Understanding the different languages of the child, and respecting the time of each one is fundamental for their development, not requiring all children to perform the same activity at the same time, leaving them free to explore the environment, interact with peers, the teacher, the materials, this is the role of the teacher. The attentive look, observing that the child also communicates through gestures, looks, bodily and sensitive and active listening, establishing a dialogue with the child, making him feel valued, will strengthen the bond, increase trust with the teacher, enabling the child to develop autonomously.

There are still schools with the thought that the child should play, but always under the direction of an adult or teacher, mentioning free play, as a messy situation, with children running around the room, without any direction, or sitting on the floor with several random toys around them.

At times, children need the figure of the teacher to feel safe, and the teacher needs to have an attentive eye, because during the game, the needs of the group and the child individually are revealed. Thus, even during free play, the figure of the teacher is important, whether in the organization of the space, in the choice of materials, and in the interpretation of what the child is expressing.

Organizing an environment that is welcoming, safe and, at the same time, that allows exploration and discovery is paramount for the child. Early Childhood Education institutions must both offer a clean and safe space, aimed at ensuring child health, and organize themselves with welcoming, challenging and inclusive environments, full of interactions, explorations and discoveries shared with other children and with the teacher (Opinion CNE/CEB 20/2009). Observing the spaces of daycare centers and preschools, as well as reflecting on them, helps to understand the child's place in society.

Lopes mentions that

> Playing is one of the fundamental activities for the development of identity and autonomy. The fact that the child, from a very early age, can communicate through gestures, sounds and later, play a certain role in the game, makes him develop his imagination. In play, children can develop some important skills, such as attention, imitation, memory, imagination. Some socialization capacities also mature, through interaction, use and experimentation with rules and social roles (2006, p.110).

The very young child (19 months to 3 years and 11 months) is in the pre-operational stage, according to Piaget (1964), where egocentrism and playing loaded with symbolism predominate. Pretend play will play an important role for the child, allowing him to relive situations that may have caused enormous joy or anxiety, fear or anger, being able, in the magical and relaxed situation of the game, to express and work on these emotions that are very strong or difficult to bear. It is during this period that there is a need to use concrete

objects with a symbolic character. For Kishimoto (1994), the toy is related to an image, which can be used as he wishes by the child. A simple pot, for example, becomes a pot for the child who at that moment is imagining himself cooking. She has the pot as an object, but in her imagination she visualizes this object as a pot.

Thus, it is through play that the child discovers the world, exercises his imagination, learns rules and limits, learns about respect and empathy. "Playing spontaneously allows the child to be led to an imaginary sphere, a world of conscious make-believe, but capable of reproducing the relationships he observes in his daily life, symbolically experiencing different roles, exercising his ability to generalize and abstract." (Melo, Valle, 2005, p. 45).

Based on the above, the following research question was formulated: What is the contribution of free play to the construction of the child's autonomy?

The general objective of the study was to investigate the contribution of spontaneous play to the construction of the child's autonomy.

The specific objectives were: to carefully observe how the child expresses himself through spontaneous play; to actively listen to the children, stimulating dialogue and mutual respect so that they feel safe and develop; to organize the spaces in a playful way in order to stimulate situations in which the child can create, discover and exercise his creative side.

METHOD AND PROCEDURES

> Playing is the work of childhood
> Piaget

DELINEATION

This research has a qualitative approach, descriptive in relation to the objectives, field in relation to the place of data collection, with a microethnographic design.

For Denzin and Lincoln (2006), qualitative research encompasses an approach that interprets the world, and seeks to understand what is observed, bringing meanings to what is being observed. According to Vergara (2000), descriptive studies show the particularities of a specific population or phenomenon, establishing connections between variables. The author also mentions that the purpose of the research is not necessarily to explain the phenomena described, although it can serve as a basis for such explanations. For Lakatos and Marconi (2001), in field research, the researcher observes the facts and phenomena as they occur spontaneously, during data collection, in the natural environment of the one being researched. Ethnography can be a methodological alternative for educational research, seeking to

> [...] describe, understand and interpret the educational phenomena that take place in the school context. It is evident that it is always linked to theory and description through a holistic, naturalistic and inductivist view, which characterizes the approach in question (Engers, 1994, p. 67).

The microethnographic design or context analysis, according to Creswell (2010) focuses on one of the aspects of culture, where the organization of events is socially constructed, seeking this construction in the expressions and gestures of the participants.

INTRODUCING THE PARTICIPANTS

According to the National Common Curriculum Base (BNCC, 2017), early childhood education is organized into three age groups: babies (zero to 18 months), very young children (19 months to 3 years and 11 months) and young children (4 years to 5 years and 11 months). In the present study, six children from the age group classified as very young children, five boys and one girl, aged between two and three years, belonging to a kindergarten 1 class of an early childhood education school, participated. The six children have been in this school since nursery, so they are already well acquainted with the school environment in which they are inserted (Brasil, 2017).

According to Piaget (1964), children between two and three years old are in the pre-operational stage, so named because it is the phase in which children create new meanings for situations that were previously confusing. It is in this period that they begin their verbal development, beginning to use symbols to express themselves (Rappaport, 1981). This phase is also well known for self-centeredness, where children feel the center of attention, having difficulties in sharing toys, and have their own vision of understanding the world (La Taille, 1992).

Therefore, around the age of two, children's thoughts meet language, and their brain development evolves, and the way of expression that was previously through gestures and cries, is transformed into words, starting language, an advance that also covers some cognitive processes such as perception, imagination, attention and memory. Vygotsky (2007) says that "it is through the toy that the child reaches a functional definition of concepts or objects, and the words become part of something concrete".

For Vygotsky (1998), the development of children between two and three years of age is fundamental for the formation of their cognitive and social capacities. To better understand this development, we need to take into account the reality that each one lives, and the incentives to which they are exposed or not. Their progress is linked to how they are motivated or not, and their interests evolve, with the interest of a five-year-old being

different from the interest of a two-year-old. The child between two and three years old wants things to happen immediately, not having the maturity to wait yet, the same occurs in the act of playing, as it is the phase where they are still egocentric. In Piaget's view (1964) this happens due to the lack of notion of the self. Children's thinking is confused in the pre-operational period because everything is very concrete for them and so the child focuses on material objects (Papalia, 2006).

The act of playing therefore offers a solid basis for development. During the process of the world of make-believe and fantasy, the creation of various possibilities that children create when playing constitute new skills that will be used by them throughout their childhood, whether in the school space or in society itself.

SITUATING THE FIELD OF INVESTIGATION

The early childhood education school is a private school and is located in the center of the city of Alegrete, serving full-time, with mixed classes in the morning and in the afternoon classes of nursery 1 and 2, kindergarten 1, kindergarten 2, level A and B. Each class has a regent teacher and an assistant. The group that was observed for the data collection of this research was the one from kindergarten 1, where I worked as an assistant.

Thus, the teaching staff is composed of 6 pedagogues, where each one has her assistant, totaling 11 professionals. Of these 6 teachers, one of them is the psychopedagogue who meets the demands of the specialized educational service room (AEE). In the SEA room there are toys and resources adapted for children with disabilities, while in the toys in the square and *playground,* there are no toys adapted for children with disabilities. The school management is composed of a principal, educational supervisor and pedagogical coordinator.

The school's physical space is large, with a patio, a square with sand and toys, an indoor and outdoor playground, a specialized educational service room (AEE) and a toy library. The school has seven (7) classrooms, two bathrooms, one for the use of teachers and adults, and another for the use of children, with a baby changing room for nursery and kindergarten 1 babies who use diapers, there is also a pantry and a kitchen for adult use, the school does not have a cafeteria, children have snacks in the classroom.

THE COLLECTION OF THE DATA GENERATED

The data collection instruments used were participant observation, recording through photos and video, as well as conversations and exchanges with the children. The field notes were typed on the cell phone, used as a "field diary".

Bogdan and Biklen (1999) describe the field notes as reports written by the researcher about what he heard, saw, experienced and thought during the course of the research. In the records made, we sought to detail the events, to quickly describe what the children said. The notes were important to record impressions quickly as well as interpretations.

To observe is "to perceive the activities and interrelationships of people in the field setting, through the researcher's five senses" (Angrosino, 2009, p.56), and participant observation occurs when the researcher is completely immersed in the social context of the observed (Sampieri, Collado and Lucio, 2006). It is believed that only in this way would it be possible to perceive, reflect and understand how spontaneous play is organized among children, observing and participating in the reality of these children who talked not only through speech, but also through gesture, facial expression, body language.

The photographic record allowed situations not perceived *in loco* to be revealed later in the photographs. By using photography, we sought to have one more element for the registration of gestures, looks and moods of the children. "One of the potentialities of photography is its ability to highlight a particular aspect of a situation that is diluted in a vast field of vision, thus making explicit the singularity and transcendence of a scene" (Guran, 2012).

Video was an important resource as it made it possible to capture situations that occurred simultaneously in the same space and at the same time. When filming a specific child, this research teacher, when reviewing the video, often noticed even more interesting events occurring in parallel than the one she intended to film.

PROCEDURES

The data were collected from March to June 2023, with a frequency of five times a week, and lasting 50 minutes each observation session. In total, there were 80 sessions observed, approximately 78 hours of observation.

The first month was dedicated to observing the space, how the materials are arranged and distributed in the environment, the degree of autonomy that the children had over these objects, that is, if the toys were within their reach or if they needed the teacher's help to access them, as well as the time available for spontaneous play.

In the second month, the focus was directed to observing how the children interacted, whether they played alone or with the other children, whether there was adult intervention in the game, and observing whether the child, even during free play, looked at the teacher in need of approval about her activity.

In the following two months, we sought to understand how free play could enhance the development of these children's autonomy. What exchanges children make with each other, the type of language they use to talk, develop and expand their creative potential; how they manifest the imagination in this phase in which playing is predominantly symbolic for the child.

RESULTS AND DISCUSSION

The objective of this study was to investigate the contribution of spontaneous play to the construction of children's autonomy. For this, a research with a qualitative approach was carried out, where six children, five boys and one girl, aged between two and three years old, belonging to a kindergarten 1 class, from an early childhood education school, were observed, photographed and filmed with full consent. In total, there were 80 (eighty) observation sessions, in the afternoon shift, resulting in approximately 78 hours of participant observation. Through these observations, 03 (three) thematic categories emerged: 1) The importance of the organization of spaces as a facilitating agent of free play; 2) Free play and interactions between children; 3) Free play and the development of autonomy.

It is important to note that this researcher investigated her own practice since she worked at the school and in particular with the researched class. In addition, he was responsible for being with the children during the period in which they played freely. Lima and Nacarato (2009) also investigated the practice itself and concluded that it is "knowledge in action, integrating theory and practice, and constructed locally, enabling the movement between the singular of each teacher and the plural of the community of teachers who investigate their own practice" (p. 246). The fact of working with the researched class itself allowed me to be already familiar with the children and, much more importantly, that the children were already comfortable with me. I tried to carry out a research that really gave visibility to the children, their speeches, their gestures, looks, actions, their play and even their absences. Initially it was more a task of self-observation than of observation of children, and I say this because I wanted in every way to report what I was really observing without the recurrent adult-centrism of research done with children. The concern was to maintain an attentive and sensitive look and listening, a true exercise of observation of the children, their actions and reactions, their manifestations and interactions, participating and interacting with them.

THE IMPORTANCE OF THE ORGANIZATION OF SPACES AS A FACILITATING AGENT OF FREE PLAY

The children arrive at school at 1:30 p.m., and follow a routine, important for them to feel safe not only physically but also emotionally. Children guide themselves through the performance of activities, daily tasks, and when they are aware of what will happen, they develop the perception of time Souza (2013, p. 51) states that "(...) The sequence of activities allows the child to orient himself in space and time and to have opportunities to learn and develop, with practical experiences that stimulate autonomy and socialization (...).

This routine, that is, this organization of time that occurs daily, is the same for all classes and would be no different with the observed class: 1) children arrive at school; 2) the teachers receive the children at the door of the classroom: the moment of welcome takes place; 3) the children begin to pick up the toys available in the room, starting to play freely; 4) the teacher organizes the class to go to the playground to perform some directed or non-directed activity; 5th) when returning to the class, they do the hygiene and have the snack they take from home; 6) an activity is carried out and the child's construction is recorded; 7) The children are organized by the teachers to go home.

The spaces that the children observed had at their disposal to play freely were generally well-organized and clean (figure 1). Most of the time, the children used the classroom to play, which is a good size, taking into account that there were few children in the class. The room has two shelves with various toys available to children. Although it is a considerable amount of toys, they are well-organized, not causing any type of visual pollution.

Horn *et all.* (2014) point out that the way the classroom is organized informs about the real possibility of the child exercising the right to play, that is, a very tidy classroom would indicate that children do not express themselves, do not play and messy classrooms indicate that children are not responsible for tidying up.

Sometimes the children asked this research teacher for the toys that are in the last part of the shelf, because they could not reach it. However, most of the toys were within easy reach of the children. I immediately did not realize that in this regard I was not contributing to the autonomy of the little ones. When I realized, I could do nothing immediately because the school has an organization and I was simply a small part of a whole. In this phase of self-observation, I realized that the fact that the children did not reach all the toys really bothered me. I felt as if I was contributing to their dependence and not autonomy. It was then that I began to observe which of the toys that were higher up, on

the shelf, were the most requested and which toys for children's access were less used and I changed places.

Horn et. All (2014) pay attention to the classroom that has an exaggerated playful look, with so many offers of toys and games that children cannot assimilate and end up moving away from the material. This is not the case with the observed room, as already mentioned.

Often, early childhood education teachers face difficulties in having this attentive enough look to position themselves and meet the emerging demands of children. It is common for teachers to continue doing what is already customary, not meeting the needs that each class has, they are new children, new ways of acting and thinking about this has a crucial impact on the act of free play. (Dufour, 2005).

The issue of time in early childhood education is important, although for some time is only an organizer of daily life. According to Hoyuelos (2007), a temporal organization in schools has resulted in inflexible routines that in no way reflect the way children perceive time. This situation occurs because the way the school routine is often structured emphasizes an institutional time regulated by a pedagogy of activities (Fochi, 2014) because they are often standard activities, not giving due emphasis to the playful experiences that are lived collectively and individually by the children themselves.

It was and continues to be the concern of this research teacher to serve and understand each child and with this in mind I chronologically described some situations that occurred and were perceived as significant for the development of children's autonomy throughout the month of March 2023. We emphasize that children's names are fictitious names in order to preserve their identities.

Day 10/03/2023: This afternoon was very sunny so the head teacher of the class decided that free play would be held in the schoolyard. Even though it was outside, the patio, a large space, was previously organized with the arrangement of toys and rugs on the floor for children who liked to play sitting. The children were very excited when the free play time was held in the courtyard, as they had more space to explore with the toys, and could play games that involved running such as tag, for example.

On that day, the chosen toys were the motorcycles, and they were riding with them in circles making sounds imitating real motorcycles, imitating horns and noises of cars talking to each other as if they were in traffic. There was a situation in which Vitor, 3 years old, received a hit on the back of the motorcycle, from his colleague Gustavo, 2 years old. Vitor showed that he was outraged by the situation by putting his hands on his head and saying:

"*bah*", his colleague Gustavo apologized and the two talked in their own language, and continued to joke (Field diary).

Very young children still do not have well-developed linguistic and writing resources and thus express themselves through other languages such as movement, play, laughter, dance, dramatization, and imitating horns and car noises, simulating riding a real motorcycle were ways for these children to express themselves and communicate, exploring their creative potential and recognizing themselves as people.

It is important that children can exercise their bodies feeling safe and one way to provide security to the child is to plan the environment favoring the experimentation of their motor possibilities, providing opportunities for self-organization and providing well-being.

Brougére (2008) exposes that toys have a function of cultural value and have a wealth of meanings. Therefore, all the toys that are used by children during their spontaneous play have meanings and with the "motorcycles" it would be no different. The children felt as if they were adults on top of the toy. Perhaps they were reproducing situations already seen at another time.

Even if the toy does not seem to have a definitive function, when the child manipulates it freely without being bound by rules imposed by adults or models of use, "we can say that the function of the toy is play" (Brougére, 2008, p. 3). We agree with Vygotsky (1994) when he says that during play "the child behaves beyond the usual behavior of his age, beyond his daily behavior; in the toy, it is as if it were bigger than it really is" (p. 117).

Figure 1 Organization of the internal and external space



Source: Author's personal collection

03/15/2023: Rodrigo, 3 years old, asked the research teacher to take a box from the top of the bookshelf where there were some pieces of medium-sized *leggos* and various

colors. The research teacher complied with the request and placed the box on top of the carpet. Classmates Liana, 3 years old, and Gustavo, 2 years old, seeing their classmate with the pieces on the carpet, approached and joined him. The boys built rockets with the *leggos* pieces and Liana built a castle with only the pink and lilac pieces they had available. I noticed that the way the box was arranged on the rug made the children more attracted to those pieces and at the same time comfortable because they were playing on top of the rug (Field diary).

The parallel game was evidenced, that is, the children played side by side, with each other without interacting socially, playing individually. Children sometimes play alone, sometimes they play in groups, sometimes they play in pairs. It is important that they have time to "think" on their own, to explore a toy without interference from their classmate.

Moreno (2007) emphasizes the importance of organizing the early childhood education room in order to make it an attractive and stimulating environment, well structured and welcoming, aiming at the acquisition of new knowledge and varied explorations. It is also important for the construction of the child's self-esteem and identity that he or she organizes the room himself after the game. Picking up a toy, playing and then putting it away, this whole organization system can be part of the game.

It is also worth emphasizing the need for professionals to be qualified to work with children, a teacher who is knowledgeable about the importance of spontaneous play and the preparation of the place where this play will be experienced and explored by the children will provide different interactions and investigations (Truccolo and Rosa, 2024). Freire (2002) exposes that the way in which the teacher environmentalizes the games makes a real difference in how children will proceed with free play. In this sense, the teacher must always be attentive to what is requested by the children during free play, knowing how to interpret the children's requests without interfering in the way they handle the materials (Monken, 2015).

03/31/2023: On this day there was something different in the room when the children arrived at the tables and chairs were not inside the classroom, as there was going to be a birthday at school and the tables were moved to the outside area. The first to arrive was 2-year-old Gustavo, soon after 3-year-old Vitor and 2-year-old Mario arrived, the three took the cars that were on the shelf and with the broom that is in the classroom, they made a track for the cars to pass over the broom, some pots formed the sides of the track.

With the arrival of their classmates Rodrigo, 3 years old, Liana 3 years old and Tiago 2 years old, the others stopped playing on the track they had built and started running all around the classroom. When her classmate Liana, 3 years old, took one of the pots that

was serving as the side of the boys' car lane, and continued running, the others also went to the bookshelf and took a toy and each one continued running in a circle around the room. When Liana said "hid" out loud, the other classmates put the toy they had in their hands in front of their faces and stopped running, when the girl said "run", they kept running and stayed like that for a considerable period.

At that moment I realized that Liana, 3 years old, had influence over her classmates, because she had the initiative to create and lead the game all the time, which was a kind of hide and seek with tag.

Even though there was an agreement not to run in the classroom, the regent was only observing the children's action, because they were not just running for the sake of running, there was a meaning to the game, they had organized themselves with the leadership of a colleague and were following the commands she gave them (Field diary).

We agree with Alves (2022) when he says that it is part of the teacher's watchful eye to observe without intervening or judging children's play, except if a child is at risk. In addition, the space is a living environment, and can even say that it is an educational agent. When well organized, it promotes autonomy, curiosity, and the child's interest in acting and exploring.

When toys are organized at children's eye level, in boxes labeled with the names of the toys, they give children autonomy to pick them up, use them and then put them away. It is in this way that the child acquires responsibility for taking care of the object that is for collective use. The child's self-organization, in this process of picking up and storing the toy, contributes to his formation and becomes part of the game, in addition to gradually discovering the meaning of the words written on the boxes. In this context, the teacher's responsibility is to guide the child by indicating the toys that are scattered and where they should be stored, until the child acquires the habit of self-organization (Kishimoto and Freyberger, 2012).

It is often difficult for the adult who observes spontaneous play to understand that he should not interrupt children and their games. It is important to observe if playing is pleasurable for all children when they request the teacher's attention to something. (Goldschmied, Jackson, 2006). Thus, it is worth noting that the role of educators is mediation, no less important, but the protagonism must be played by the children (Piorski, 2016).

We understand that the arrangement of the materials, the way they are arranged in the room, interferes with the moment of free play. By having to request the material from the

teacher, the child is deprived of recognizing himself as capable and independent of picking up the toy alone, delaying the development of autonomy.

FREE PLAY AND INTERACTIONS BETWEEN CHILDREN

The national curriculum reference for early childhood education (RCNEI) personal and social formation Brazil, 1998) is clear in stating that the construction of identity and autonomy are related to the child's socialization processes, and that when they occur, social interactions expand the affective bonds that children establish with other children and with adults. In the National Curriculum Guidelines for Early Childhood Education (DCNEI) we find that pedagogical practices should have interactions and play as guiding axes (Brasil, 2010). Thus, the importance given to interactions for the child's development and autonomy is observed in these documents.

There are numerous studies that emphasize the importance of interactions for the good development of the child, as well as free play as a facilitator of interactions between children. Truccolo and Rosa (2024) point out that it is through interactions during free play that children are able to develop understanding of various situations, understand and form opinions about themselves and others. (Truccolo and Rosa, 2024). Colchesqui (2015) reinforces that free play fosters interactions between children as well as the development of memory, language, perception and attention, all with affection and exchanges between children.

The role of the regent teacher is important for interactions to take place during free play, because when a place is thought of for the reality of the class and organized in a way that promotes spontaneous doing by children, without imposed rules, it favors the discoveries that will happen among peers (Perka and Sponchiado, 2023).

Teixeira *et all* (2020) point out that interactions between children deserve attention and appreciation by teachers during free play. The author refers that the situations that happen when peers interact through spontaneous games are also a way for teachers to get to know their students with another look.

The National Common Curriculum Base (BNCC), a guiding document for early childhood education, stresses the 'need for children to socialize with each other so that their knowledge is expanded and diversified, learning from each other'. (BNCC, 2017, p. 36).

04/05/2023: Gustavo, 2 years old, took a medium-sized dice that is on the shelf, and which has a drawing of an animal (cow, dog, cat, rabbit, chicken and frog) on each side. Liana, 3 years old, seeing Gustavo with the dice (usually not used much at the time of free play by them) came closer and asked him what he was going to do. Gustavo replied that he

would play and Liana was already taking the dice from his hands and throwing it up. When the dice fell, the figure of the frog was up, Liana said "*frog*" and Gustavo started to jump imitating a frog. Vitor (who doesn't have much oral language) seeing the reaction of his classmates joined the two and threw the dice once again, when he fell on the rabbit he jumped out imitating the animal. And so they went on for a considerable time, rolling the dice and imitating the falling animal. I found that even the initial idea of getting the dice was Gustavo's, it was Liana who led the game. Vitor, even with difficulty expressing himself, did the imitation correctly when Liana said the name of the animal. Everyone was able to understand each other well during the game, created their own order and way of communicating even if not always through speech, also used gestures and mimics (Field diary).

The child has many ways of communicating, whether through gestures, looks, even imitations. Speech is one of the forms, but a three-year-old child, who does not yet have refined linguistic resources, elaborates alternative forms. This demonstrates the ability of children to create situations in which they can express their desires, develop skills, or play.

The interactions that take place between children when they are playing freely institute their affective and social bonds, promoting some primordial skills that will help in adult life, because in addition to the pleasure of playing, there is also the perspective of the child's development (Padilha, Steidel, 2024).

Piaget (1978) sought to ascertain how children produce knowledge and interact, explaining that the characteristics of children's relationship with the environment depend on their stage of development.

04/17/2023: Upon arriving in the room, Tiago, 2 years old, non-verbal autistic, but who socializes with classmates in his own way, went directly to the shelf where most of the toys are, and picked up a phone. 3-year-old Liana arrived next. She understands the way Tiago jokes and expresses himself. He took another phone, put it to his ear and said: "*Hello*". Tiago dialed on the other cell phone expressing that he was calling Liana. Afterwards, the other classmates arrived and Gustavo, 2 years old, asked the teacher to take the toy from the clown's mouth, she complied with his request, he placed the object on top of a chair and the other classmates were arriving around him, even though the initiative to take the toy was Gustavo's who decided the order of who would go was Liana, talking to his colleagues and pointing out the order of each one. This toy had a small ball where they had to hit inside the character's mouth. Mario at one point wanted to go on the turn that wasn't his, there was a disagreement between him Liana, and Mario moved away from the group of classmates going to another corner of the room, taking a motorcycle and started

playing alone. The teacher did not intervene at the time of the disagreement of the colleagues, but she was attentive and observed, but there was no crying, they talked in their own way (Field diary).

Kishimoto (2021) says that the act of free play allows not only fun, but also communication and socialization, and it is not possible to think of a child without associating it with the act of playing. Vygotsky (1996) reminds us that playing is a social action for children, that when they play, they create an imaginary situation in which they assume a role, bringing with them rules of behavior from the places where they live. Therefore, free play is essential for children to understand the reality in which they are inserted.

In free play, children learn to make agreements with their peers, to wait their turn and to manage themselves. That is why playing makes the child learn to interact, socialize and live with other children (Truccolo and Rosa, 2024).

04/28/2023: Rodrigo and Liana 3 years old, Gustavo 2 years old picked up the unicorns and dinosaurs sat on the floor. The interaction between the three that I noticed was in relation to the sounds that each one made and the voice they gave to each animal: the boys were with the dinosaurs and Liana with the unicorns. What caught my attention was that Liana, while holding a unicorn in each of her hands and showing them to her two colleagues, made a sweet and soft voice to represent the animals that were in her hands. And the boys with the dinosaurs made a louder, deeper growling sound making their animals jump to the ground. (Field diary)

These interactions and dialogues that take place between children have an interconnection with the physical space in which the child is inserted, as it significantly influences the construction of make-believe and shapes how children conduct free play (Thelma Harms, 2009).

The child is the protagonist of his learning in the situations in which he interacts with colleagues, materials and the teacher, and the teacher's role is to mediate the child's experiments, enabling sensations and learning (Horn, 2017). The children interacted and learned. Even though it does not seem that the research teacher was mediating, the very act of planning and making the materials available is already a form of mediation.

The documents RCNEI Brasil, 1998) and DCNEI Brasil, 2010), bring the importance of play and interactions between children and with adults as well, as fundamental axes and estimate that playing should go hand in hand with the other learning processes present in early childhood education.

Callai, Maia, and Serpa (2022) bring the need to guarantee students pedagogical practices that are in line with normative documents such as the National Curriculum

Guidelines for Early Childhood Education, where the interactions and games axis is considered essential for the children's learning process.

The Reggio Emilia approach considers that the individuality of children is important, but group cooperation should also be valued. Learning built in groups and mini-groups, through free play, is a driver of development and learning (Edwards, Gandini and Forman, 2016).

The approach to Italian education, called fields of experience, goes beyond the simple development of children. She also considers the impact of this growth both on the school community and on society (Santaiana, Silva, Gonçalves, 2021).

We found that when playing freely, children enhance symbolic play, assume roles and interact spontaneously, without needing the mediation of an adult. We evidence that on some occasions, when interacting, conflicts arise, and that at the age of three children are already able to manage and resolve such conflicts in order to continue the exercise of playing.

FREE PLAY AND THE DEVELOPMENT OF AUTONOMY

Free play happens when the child uses simple objects available in everyday life. By manipulating these objects, the child has curiosity and creativity stimulated, finding new meanings for the toys and choosing those they consider the best. This process of free play helps in the development of children's autonomy (Alves, 2022).

Autonomy in early childhood education is essential for children to develop not only physically but also cognitively. Therefore, it is necessary to offer an environment in which they can experience situations appropriate for their age group, exercising their sense of initiative, being able to explain their curiosities and engage in new experiences such as choosing, deciding, creating new rules and ways of playing (Gallahue, Ozmun and Goodway, 2013).

05/02/2023: A group formed by Liana and Rodrigo 3 years old and Mario and Gustavo 2 years old, took the toys that are shaped like foods such as pizza, grapes and ice cream, and went to the toy stoves available in the living room, started playing restaurant where on one side of the stoves were the cooks Liana and Gustavo and on the other side representing the customers were Mario and Rodrigo. I realized that the one who organized the actions that would happen in the game was the student Liana, as she gave the food that her colleague Gustavo should put in the pot and later deliver to colleagues Mario and Rodrigo who were on the other side being the customers. The group spent a considerable period performing this game (Field diary).

During the observations I observed the constant occurrence of role-playing games. In these games, the child relives situations experienced by playing, presenting them according to his understanding, playing roles, giving a symbolic meaning to the objects. Children at this age are not concerned with the rules of the game, creating "particular rules according to their interests" (Horn et all., 2014, p. 131).

The act of free play is a way for children to choose what and where they will play, thus exercising their autonomy fully (Truccolo and Rosa, 2024).

For Vygotsky (2007), first, the child plays alone, manipulating objects, and then he tends to look for partners to play with, thus exercising his power of choice.

05/12/2023: Rodrigo, 3 years old and Vitor, also 3 years old, went to the shelf and each took a bus. Liana, 3 years old and Gustavo, 2 years old followed their classmates and did the same. The children started playing with the buses, created two traffic lanes, one bus went on one road and the other came back on the other track. Rodrigo and Vitor expressed themselves more during the period, and the others followed.

When the children were carefully observed in their way of expressing themselves during spontaneous play, the dramatic expression was identified when the children assumed the role of driver. By entering the symbolic world, the child understands the role of the driver in society, that he drives cars. This presence of the symbolic, of make-believe was found in practically all the games.

Vygotsky (1979, p.138) states that, "in development, imitation and teaching play a role of first importance.... The child will do tomorrow alone what he is capable of doing today in cooperation". It is important to mention the pedagogy of Reggio Emilia, created by pedagogue Loris Malaguzzi. Malaguzzi emphasized the importance of the teacher establishing a relationship of trust with the child, thus allowing him to feel safe and confident to enter the world and develop skills. Malaguzzi said that children are not equal beings and that they express themselves in many ways, needing to be given the opportunity to make choices and discoveries, and that it is through experiences that they become autonomous (Edwards, Gandini and Forman, 2016).

Mario, 2 years old, decided not to join the group and approached him to tell him that the baby (a doll) was cold, because he wore short clothes, and the day was cold. It was then that he began to look around looking for something that I understood to be a blanket, to cover the doll, until he went to the place where his washcloths were, took his towel, and covered the doll on the table, saying that the cold had passed.

According to Piaget (1969, p. 29) "the child who plays with dolls remakes his own life, correcting it in his own way, and relives all pleasures or conflicts, resolving them, compensating for them, that is, completing reality through fiction".

Still, according to Piaget (1978) apud Assis (1994), the symbolic game plays a fundamental role in the child's life and represents the purest form of egocentric thinking, where the child transforms the world into what he wants this world to be; characteristic of the two-year-old child's representative or preoperative intelligence. Piaget (1978) apud Santos (2023) also evokes affectivity, mentioning that in this phase both thought and affectivity are "supported by symbolic and representative apparatuses".

Another moment on this day of observation of Mario 2 years old, was where he was playing with two cars and one facing down with the wheels up, he claimed to his classmates who were watching his game that there had been a crash between the cars. (Field diary)

Santos (2002, p. 9) says that "Symbolic games, also called symbolic play or make-believe, are games through which the child expresses the ability to act dramatically."

According to Nascimento (2022), children play with objects in different ways, discovering new possibilities for the materials they handle. It is important to mention that the process of developing autonomy requires social interaction, as it is extremely important for the child to be able to build his own independence through contact with various experiences. In agreement with Reichert and Wagner (2007) "The achievement of autonomy is a gradual and daily process, which begins from the beginning of our existence and, despite being a particular process, needs to favor the social context" (p. 54).

Florentino and Pescador (2022) highlight that free play has the power to promote the development of children's autonomy, when they play in a joyful, spontaneous way without adult intervention, allowing them to develop skills both collectively and individually.

For Vygotsky (1998, p. 137) "the essence of the toy is the creation of a new relationship between the field of meaning and the field of visual perception, that is, between situations in thought and real situations".

Day 13/06/2023: On this day Mario and Gustavo 2 years old, Rodrigo, Liana and Vitor 3 years old, chose the fitting games. Usually, when one chooses, the other classmates go and ask for the same toy to play with. They spent practically all the time destined to play free on this day, playing a game that is like a ball slide, where you put the ball in the clown's mouth and the ball goes down until it stops in the clown's shoe. At first there was some confusion among the classmates who were involved in this game, because they all wanted to go at the same time, so the head teacher made an intervention and explained to them that for a better moment and use of the toy they would have to go one at a time, waiting for

the classmate to finish handling the toy. After this speech by the teacher, they organized themselves and carried out the game without further interventions (Field diary).

Salgado, Dorneles and Brutti (2020) reflected on the role of the teacher during free play, the authors say that it is important for teachers to be prepared to carry out an approach when necessary, and to conduct the pertinent situations that arise during free play.

06/22/2023: The class that was being observed received a donation of children's books, and the teachers left it on the carpet, so that when they arrived they could see the news. Vitor, 3 years old, was the first to arrive, going to look closely and get some books to handle, and the others Liana, 3 years old, Gustavo, 2 years old and Rodrigo, 3 years old, after entering the room, were already approaching where their classmate and the books were. After a while, 3-year-old Vitor saw a book that had a story about firefighters and took a large truck that he had in the room similar to a firefighter's and began to act out in his own way what he was seeing in the images of the book. Then colleagues Gustavo, 2 years old and Rodrigo, 3 years old joined their colleague Vitor, I realized that this boy has an influence on the other classmates, because whenever he picks up a toy or even asks his classmates to take the toys he asks for, he is answered. I perceive Vitor as a leader of several games.

After the moment of ecstasy of the class for the new books that had arrived in the room, each one took the toys of their choice and continued to play. On this day they had greater attraction for the animal toys available in the room. Mario 2 years old, Gustavo 2 years old, Liana 3 years old and Rodrigo 3 years old picked up sheep, horses and ponies and went to play. The children organized themselves with little dialogue, and at a certain point each one took a pony and made the "pocotó" sound on the table, doing it several times. (Field diary)

Vygotsky (1998, p. 127) states that "in toys, however, objects lose their determining force. The child sees an object, but acts differently in relation to what he sees." It is for this reason that, when playing, children are able to distinguish thought, that is, the meaning of a word from objects, and action stems from ideas, not from objects themselves.

One of the responsibilities of teachers working in early childhood education is to ensure that students have opportunities to live situations, through free play, that help in the development of awareness about who they are and about the other subjects around them (Lopes, 2018).

The way the teacher plays her role will influence the child's behavior, as the child has not yet fully developed his autonomy, often imitating the teacher when interacting with other children.

It was noticed that the teacher planned the children's daily routine in order to promote independence and meaningful learning. In this way, the teacher contributed to the general development of the children, since she provided them with emotional stability and responsibility.

Zanluchi (2005) states that when children play freely, they themselves create situations that are preparing them for the social situations of life outside the school that they will seek to experience.

Soares (2017), in the light of the Pikler approach, states that playing as the child's main activity is essentially linked to their integral development, which encompasses emotional, motor, cognitive and social development. As a result, it is up to the teacher to provide the child with quality play, through which the little subjects are allowed to act on their own initiative with freedom of movement, with the possibility of exploring their movement with trial and error, building meanings and maturing in direct contact with the experience of spaces, it also says about providing the child with a quality development sensitive to their feelings and needs.

Bossonaro and Bruder (2018), on the quality of play in the light of Pikler, point out that the guarantee of a favorable environment for the child's autonomous activity is directly linked to the possibilities of action that the environment offers. From this premise, in agreement with the authors, we can highlight that it is not simply making available various objects that will incite the child's autonomous activity, but all actions that imply the promotion of the child's autonomous activity, of an inviting scenario where the child feels safe and welcomed to explore.

Piaget (1975) apud Silva *et all.* (2024) tells us that play should be seen beyond fun or play, and that it is through them that "children develop the notion of autonomy and reciprocity, order and rhythm". In this way, "play favors physical, cognitive, affective, social and moral development" (undated).

Children in early childhood education should not be seen as the same or similar subjects, each one has their own desires and ways of expressing themselves and consequently developing. Barbosa (2014) states that all the time that is invested for children to play freely should be respected, as it is a production that they will discover and build learning.

The importance of active listening to children was verified, stimulating dialogue and mutual respect so that they feel safe to develop, that is, giving voice to children, allowed us to verify that autonomy is built from the understanding that the child is competent to discover, experiment, test, try, rediscover, redo alone. To stimulate autonomy is to enable their free movement and respect their choices.

I evidenced that when playing spontaneously, children necessarily need to think, negotiate with their peers about the game to be played, discover new ways to play the same game, imagination, creativity is required and their individual repertoire grows. These factors are essential for the integral growth and development of the child's autonomy.

FINAL CONSIDERATIONS

The guiding question of this research was: What is the contribution of free play to the construction of the child's autonomy? To answer the research question, the general objective was to investigate the contribution of spontaneous play to the construction of the child's autonomy. In order to achieve the general objective, the following specific objectives were outlined: to carefully observe how the child expresses himself through spontaneous play; to actively listen to the children, stimulating dialogue and mutual respect so that they feel safe and develop; organize the spaces in a playful way in order to stimulate situations in which the child can create, discover and exercise your creative side.

By carefully observing the child's way of expressing himself during spontaneous play, the use of dramatic expression and the importance of symbolic play were identified. This presence of the symbolic, of make-believe was found in practically all the games. The children also showed independence of movement, being able to use more structured toys such as motorcycles to practice physical activities and dice or *leggos* for manipulation activities. They enjoy being together and it even seems that they develop their own language where only they understand each other.

Actively listening to children, stimulating dialogue and mutual respect so that they feel safe and develop, that is, giving children a voice, allowed us to verify that the child's autonomy is built from the understanding that he is competent to discover, experiment, test, try, rediscover, redo on his own. To stimulate autonomy is to enable their free movement and respect their choices.

We understand that the arrangement of the materials, the way they are arranged in the room, interferes with the moment of free play. By having to request the material from the teacher, the child is deprived of recognizing himself as capable and independent to pick up the toy alone, delaying the development of autonomy. Thus, theorganization of spaces in a

playful way, stimulating situations in which the child can create, discover and exercise his creative side contributes positively to the development of his autonomy. In front of a large space, previously organized by the teacher, the children were able to make their choices and discover that they are capable of resignifying toys. Through constant dialogue and respect, the children were able to experience different activities, they were able to make different choices, while realizing that there are limits that they needed to respect, always under the watchful eye of the teacher.

The act of playing freely without adult intervention is the possibility that the child has to become confident, autonomous, attentive to his possibilities and limitations conferred by his young age. This whole process needs to be fostered, thought out, so that this little being develops integrally, with good self-esteem, with joy, autonomy, being able to exercise their favorite language, which is the language of playing.

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THE INSTITUTIONAL COMPETENCIES OF THE STATE PUBLIC SECURITY AGENCIES OF GOIÁS AND THEIR PROPENSITY TO RESPOND TO CATASTROPHES

https://doi.org/10.56238/sevened2024.031-028

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ABSTRACT

This article seeks, based on a review of the institutional competencies of state public security agencies, a relationship between these competencies and the propensity of each agency to be activated in the event of catastrophes. A survey of the legislation, especially of the public security agencies of the State of Goiás, was carried out, tracing their competencies from the provisions of the Federal Constitution, in addition to a brief bibliographic review on disaster response. Treated with the four state institutions of public security provided for in the Brazilian Magna Carta, it was evident that, due to its institutional competencies, the Military Fire Brigade is the body most prone to activation in response to catastrophes. In this way, it is possible to take a look at the institutions, including the formulation of organizational policies aimed at providing care to professionals.

Keywords: Public Security. Disaster. Disasters. Institutions.

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INTRODUCTION

The objective of this paper is to discuss the institutional competencies of state public security agencies, relating them to the propensity of institutions to be employed in response to major catastrophes. First, presenting the public security agencies and, then, which of them are at the state level. Finally, presenting the concepts involved in the study of catastrophes, discuss which of these state agencies would be most required for the response to major disasters.

This research originated from the following question: verifying their institutional missions, which state public security institutions are more likely to respond to major catastrophes?

For its execution, the research proposed to raise the bibliography that deals with disasters, their concepts, their impacts on society and their conditions of care. A search was carried out on the portals for the dissemination of scientific material so that it was possible to learn about works that dealt with public security, civil defense and disasters.

According to Botelho, Cunha and Macedo (2011), the most established methods of documentary analysis propose to elaborate a synthesis based on different data already discussed from the same atmosphere, or even from different sources of the same theme.

That said, the legislation that deals with the competencies of public security agencies, in addition to works that deal with their missions, were sought with a view to, after analysis and relationship with the scientific content on catastrophes, formulate reasoning that allowed correlating the institutional competencies of the state agencies constitutionally defined for public security with the use of their personnel in responding to disasters.

According to Federal Decree 10,593, of 2020, which provides, among other things, for the organization and operation of the National Civil Protection and Defense System, a disaster is "the result of an adverse event resulting from natural or anthropic action on a vulnerable scenario that causes human, material, or environmental damage and economic and social losses", In other words, already in its definition, there is the recognition that it is a relationship of exceptionality of the situation, which is closely related to the susceptibility of the place to suffer the consequences of it.

When disasters occur, it is imperative to recognize that, among other things, there is a disruption in the routine of society. Obviously, citizens impacted by the effects of the disaster will have the course of their lives altered, by property damage, by human, community or environmental damage. It turns out that, in addition to the people directly affected by the disasters, there are several other people involved with the phenomenon: the responders. Those who cover the news, health care, the reconstruction of the scenario and

even public security operations also have their lives and their routines changed by the disaster. Very often, the first responders to a disaster are public security professionals (RIBEIRO, 1995).

The analysis of the institutional missions of the agencies involved in disaster response and also of their ordinary care routines can reveal how the corporations involved in responding to adverse events are in extraordinary demand. More than an increase in work intensity, it is important to know about the variation of scenarios and innovation in demands, to understand the impact that the performance in response will have on the professionals called to serve you. Doing the same thing that is done every day, but in a more intense way, is different from acting more intensely than the ordinary and in scenarios where there is an intense presence of the improbable, the unpredictable or the imponderable (ARAÚJO, 2013).

Public security is an important area for Brazilian society and requires public policies that are properly designed for its institutions and professionals. The establishment of public policies requires that more approximate aspects of bodies, activities and professionals be considered, in order to avoid generalizations and obstacles that arise from the attempt to treat the entire state segment as a monolithic block (BALLESTEROS, 2014).

Understanding, then, from the analysis of the institutional missions of corporations, the demand that falls on their members, makes it possible, with greater proximity, to understand what is the routine of a public security professional and how he is subject to the impacts of occupational exposure to disasters, which can add risks, stressors and procedures that are not common to his daily life and, therefore, they deserve special attention. The recognition of extraordinary exposure to certain situations, in this case, disaster response, can lead to the establishment of appropriate public policies to respond to occurrences, to respond to affected communities and also to care for the responding professionals involved.

THE PUBLIC SECURITY ORGANS

It is common for everyone to imagine knowing what public security is about, since the issues related to the theme and the approach by society are already old in Brazil. There are those who treat the issue referring to the police and their actions, omissions, behaviors, training and other aspects. There are those who include issues involving criminal prosecution in a broader way, including actors such as jurists, lawyers, the Public Prosecutor's Office and the Judiciary. There are also those who expand their discussions,

inserting social, educational, historical, and philosophical issues in the concepts and theme of public security (LIMA et al, 2015).

Perceptions on the subject of public security have undergone, over time, reformulations and adaptations. During the military regime, it was treated with an air of national security and, more recently, referring to the concept of citizen security, presuming the active participation of society (FREIRE, 2009). Constitutionally, in the caput of article 144 of the 1988 Charter, the matter is dealt with saying that "public security, a duty of the State, a right and responsibility of all, is exercised for the preservation of public order and the safety of people and property".

Especially within the federal constitutional text, the bodies listed as responsible for public security are the federal, federal highway, federal railway, civil, military and criminal police, in addition to the military fire departments. There are also mentioned in the paragraphs of the articles, the provision for municipal guards and traffic agencies, as well as components of public security. Limiting, therefore, to what is addressed in article 144 of the Federal Constitution about state public security agencies, it is possible to say that the federation units will certainly have civil, military and criminal police, in addition to military fire departments.

THE INSTITUTIONAL COMPETENCE OF THE CIVIL POLICE

Little addressed before the twentieth century in Brazilian historiography, the Civil Police has in its origin a characteristically Brazilian method of providing public security. Defined for the attributions of judicial police and headed by police chiefs, the corporation is responsible for the instruction of inquiries and investigations (BRETAS and ROSEMBERG, 2013).

The Federal Constitution, in article 144, § 4, states that the civil police "are responsible, except for the competence of the Union, with the functions of judicial police and the investigation of criminal offenses, except for military ones". In other words, as Baraldi (1999) asserts, it is up to the civil police, through its police investigations, to collect evidence of authorship and materiality of alleged infractions of the criminal law that subsidize criminal investigations and prosecutions.

The Constitution of the State of Goiás, when dealing with the Civil Police, focuses on repeating the provisions of the Federal Charter, focusing on the investiture and central position of police chiefs and establishing relative independence to the forensic bodies. The role of the Civil Police of Goiás, however, is clearer in article 5 of State Law 16.901/2010, Organic Law of the Civil Police, when it is established that, except for the competences of

the Union and the military, the corporation is responsible for the actions of the judicial police and the investigation of criminal offenses, also dealing, in this area, with actions at crime scenes, the secrecy of investigations, scientific research and maintenance of information banks.

THE INSTITUTIONAL COMPETENCE OF THE CRIMINAL POLICE

Until 2019, among the bodies that make up Brazilian public security, there was no constitutional institution responsible for the control and security of prison establishments. It is from this legislative gap that the only change in the article of the Federal Constitution that deals with public security arises: Constitutional Amendment 104, of December 4, 2019, which creates the federal, state, and district criminal police (CARVALHO and VIEIRA, 2020).

The Criminal Police, then, was born as an institution at the end of 2019, to clarify the responsibility for prison complexes in the country, previously subject to guard action exercised by members of other police forces, as described by Oliveira and Santos (2021), or even by prison officers who were not assisted in their missions by constitutional provision, but who acted to ensure compliance with the Penal Execution Law.

Thus, in a recent amendment, the Federal Constitution now determines, in article 144, § 5-A, that it is up to the criminal police to "the security of penal establishments". In the State of Goiás, the state constitution says, in its article 126-A, that "the Criminal Police is responsible for the security of penal establishments, the security measures for the effective execution of penalties and the penitentiary policy", also noting that a subsequent law will define "the concept of security of penal establishments".

THE INSTITUTIONAL COMPETENCE OF THE MILITARY POLICE

"The military police are responsible for the ostensive police and the preservation of public order", as provided for in article 144, paragraph 5 of the Federal Constitution. As Paredes (2014) discusses, in addition to being auxiliary and reserve forces of the Brazilian Army, the military police are public security organs, that is, they perform police functions and can also be called upon to perform national defense functions.

The Constitution of the State of Goiás is more specific when it says, in its article 124, that the Military Police is responsible for ostensible security policing, the preservation of public order, the military judicial police, the guidance and instruction of the Municipal Guard, and the guarantee of the exercise of police power, state powers and public bodies,

especially those in the areas of finance, sanitation, land use and occupation and cultural heritage.

A mission cited in the constitution, both at the federal and state levels, is the preservation of public order. In this regard, Lazzarini (2000) clarifies that it is a matter of guaranteeing peaceful coexistence among individuals, ensuring aspects of public safety, tranquility and health.

Called to state legislation, including the statute of military police officers, State Law No. 8,033/1975, two federal norms still discuss the mission of the military police: Federal Law 14,751/2023, the national organic law on military police and military fire departments, and federal decree 88,777/1983, which approves the regulation for military police and military fire departments (R-200). They deal with matters of State and establish, in general terms, that the military police are responsible for carrying out ostensive policing, acting in a preventive and repressive manner, "in order to ensure compliance with the law, the maintenance of public order and the exercise of constituted powers".

THE INSTITUTIONAL COMPETENCE OF THE MILITARY FIRE BRIGADE

Founded on the pillars of hierarchy and discipline, like the other Brazilian military corporations, the Military Fire Brigade, in federal constitutional headquarters, is established that "in addition to the attributions defined by law, it is incumbent on the execution of civil defense activities". The Constitution of the State of Goiás, in its article 125, in turn, is more specific as to what is incumbent on the corporation, such as the execution of civil defense activities, the prevention and fighting of fires and panic situations, as well as search and rescue actions for people and property, the development of educational activities related to civil defense and the prevention of fire and panic and the analysis of Designs and inspection of preventive installations for fire and panic protection in buildings.

In the national organic law of military police and military fire departments, federal law 14.751/2023, although the national civil protection and defense system is mentioned as composed of the two corporations, the matter is only within the competences of the fire departments.

It is also perceived the concern that the institutional competencies of the Military Fire Brigade are dealt with in article 2 of the statute of the military firefighters of the State of Goiás, State Law No. 11,416/1991, where it is stated that the corporation is intended for expertise, fire prevention and fighting, search and rescue, provision of aid and execution of other services that are necessary for the protection of the community, including civil defense activities.

Finally, complying with the federal constitutional commandment to display its attributions in infra-constitutional laws, the Military Fire Brigade of the State of Goiás has a provision of competencies explicitly established in state law 18.305/2013, which provides for the organizational structure of the corporation:

Art. 2 It is incumbent upon the Military Fire Brigade:

I – To plan and execute fire prevention and firefighting activities, search, rescue and rescue of people and property, as well as to control panic situations;

II – To apply and supervise compliance with legislation and specific standards that deal with protection against fire, explosion, panic and disasters;

III – To carry out fire investigations aimed exclusively at the prevention of accidents and related to its competence;

IV – To coordinate the response to disasters, emergency situations or states of public calamity;

V – To plan and execute environmental protection activities, related to its competence;

VI – To develop educational activities related to its competence;

VII – To carry out other activities, aiming at the fulfillment of its constitutional and legal attributions.

For all this framework of competences, Wolkmer (2014) also argues, the military fire brigades, although not explicitly in the Federal Constitution, are corporations equally competent for the preservation of public order, within the scope of their attributions, just like the military police, which are also contained in the same item, in article 144 of the Magna Carta of 1988.

DISASTER RESPONSE

In a country of continental dimensions like Brazil, the occurrence of disasters is not so rare, but that, regardless of its magnitude, has an impact on the people involved, whether victims or workers in the scenario. Therefore, considering human aspects in dealing with disasters is essential for a more efficient response to the episode. In this way, considering all those impacted, victims, responders and the community, makes the formulation of policies more appropriate to the response, which, in the end, is still to the people involved and to society in general (VALENCIO, 2014).

Disasters are adverse events that befall a community that cause economic and social damage, as well as human damage. They can be of natural or human origin and have their intensities classified according to the need for resources, for the reestablishment

of the situation of normality, and with the availability of these resources in the affected municipality and in the other levels of support to the municipality (CASTRO, 1999).

The Brazilian classification and codification of disasters – COBRADE divides disasters by their origin, as being natural, such as landslides, floods, flash floods, drought, epidemics or floods, or as being technological, such as fires in residential agglomerations, dam ruptures, radioactive accidents, among others (COUTINHO, 2019). Disasters are still classified according to their evolution, when it is considered that they evolve abruptly or suddenly, gradually or as a result of the sum of identical events that occurred over time. As for intensity, disasters are considered to be small, medium-sized, large, and very large, according to their impact on communities and the vulnerability of the scenarios (CASTRO and ALMEIDA, 2019).

Those disasters that are classified as being very large, that is, those whose losses are very large and considerable and whose damage is very important, often require international aid for the affected communities, since their impacts are not surmountable and bearable, even when these communities are well prepared, informed, participatory and easily mobilizable. It is common, in these cases, to classify it as a calamity or catastrophe, giving rise to even official acts of recognition by the public power of the abnormal situation, in this case, a decree of a State of Public Calamity (CASTRO, 1998).

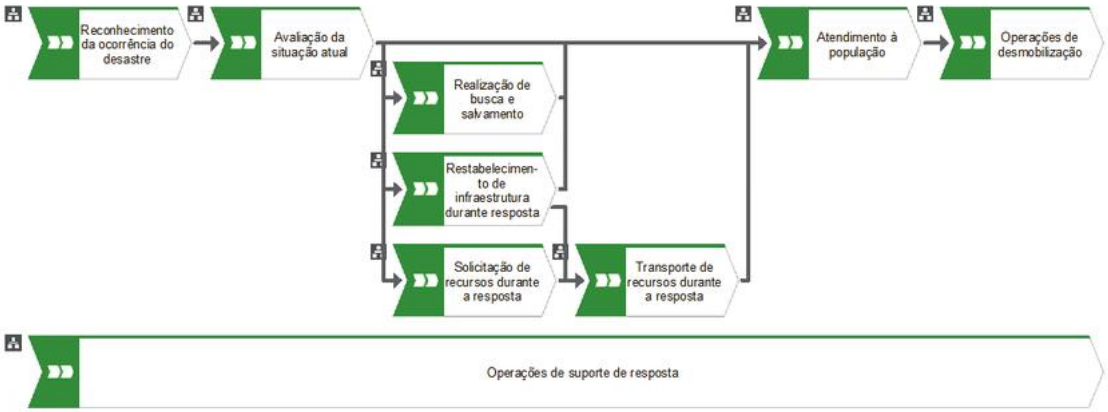
When disasters occur, it is important to consider the activation of security agencies, especially those that respond to emergency calls, given that their performance is certain and the involvement of their units needs to occur in order to establish the best response to the event (DA SILVA, 2020).

There are several aspects to consider in disaster response. When trying to respond to catastrophic events, it is imperative to consider the immediate actions, taken soon after the outbreak of the event, such as the rescue of possible victims and measures aimed at minimizing the consequent damages and losses, as well as it is also necessary to consider the medium and long-term actions, aimed at the reconstruction of the scenarios or, at least, the reestablishment of normality in the place (BRASIL, 2011).

Fundamentally, when it comes to disaster response, the reference is disaster response actions. Listed by Fontainha et al (2015), the macro processes of disaster response begin with the recognition of the occurrence with the assessment of the situation, start with the performance of search and rescue operations, go through the reestablishment of the infrastructure during the response and go to the service of the general population, ending with demobilization operations. Throughout this process, response support

operations are eventually increased by requests and transportation of specific resources for the response, as shown in Figure 1.

Figure 1: Macro processes of disaster response.



Source: Fontainha et al, 2015.

Finally, it is evident that the employment of institutions and, consequently, of public security professionals, in the midst of the chaos that can be generated by disasters, subjects police officers and firefighters to chaotic scenarios that have an impact on them, as evidenced by Flores and Najberg (2021), but it is also true that responding to disasters inevitably requires the use of these institutions in the affected scenario, each one in the sphere of its attributions.

DISCUSSION

There is no margin that allows us to deny that, when disasters occur, there is a serious rupture in the course of the life of the affected community, as presented by Ribeiro (1995). Likewise, there is certainly a rupture in the work routine of the institutions and professionals designated to respond to these events, which obviously, as Flores and Najberg (2021) argue, will have some impact on them and, therefore, give rise to the establishment of public policies in this regard.

Among the main responders to disasters are the public security agencies, capitulated in article 144 of the Federal Constitution. By the way, regarding state activity related to disasters, that is, civil defense, the term appears in the Magna Carta in only two moments: in article 22, determining that it is a legislative competence of the Union and precisely in article 144, that of public security, when it appears as a competence of the military fire brigades.

Observing the response to disasters, it can be adduced from the classification of episodes that, as stated by Coutinho (2019), are adverse events that involve extreme

phenomena, which are not limited to jurisdictions and which have an important impact on communities. Still observing the flow of macro processes of care, brought by Fontainha et al (2015), it is noticeable that, as a rule, it is necessary to consider, among other organization and logistics activities, the search and rescue operations at the site.

Turning to the state panorama of public security, it is clear that, constitutionally defined, there are the Criminal Police, the Civil Police, the Military Police and the Military Fire Brigade. In the first case, as brought by Oliveira and Santos (2021), the Criminal Police has its responsibilities focused on the prison system and its complexes. It is possible to deduce, from this, that there is the possibility of the agency being used to respond to disasters, but if they occur within prison complexes, that is, only in a specific case of location, whereas, even in this case, it is possible that the other 3 state public security agencies had also been employed, because it involves, most likely, an investigation into what happened, security in the vicinity and saving people.

When it comes to the institutional competencies of the Civil Police, it is important to know that, as Baraldi (1999) points out, its role is for the investigation and elucidation of criminal offenses, that is, in order for it to be used in response to disasters or any other occurrence, there must be a crime to be clarified, which may not occur, necessarily, for example, in the case of floods and floods, as a result of the increase in water precipitation.

The preservation of public order, the constitutional mission of the Military Police, involves ensuring aspects of public safety, tranquility and health, as argued by Lazzarini (2000). It is, therefore, an institution that is widely called upon to attend to any events that deviate from normality and, even more, that cause ruptures in the perception of safety, tranquility and healthiness. Even so, the author himself, when dealing with public health, ratifies: "More linked to the activity of Military Firefighter, it is directly linked to conditions that prevail health, as a responsibility of the Public Power".

In the case of the Military Fire Brigade, legislation and literature converge on strong arguments for its use in all cases of disaster. First, it is remarkable that only this corporation is assigned a clear and specific civil defense function in the Federal Constitution. Comparing its institutional competencies with other public security corporations, it is noticeable that its performance is not limited to risks of human violence against people or facilities, nor to the occurrence of crimes, much less to specific locations.

In addition, firefighters exhibit competencies clearly related to disaster response, as is the case of the attribution of search and rescue, contained in the flowchart of macroprocesses for disaster response, demonstrated by Fontainha et al (2015). Corroborating the argument of its use in major disasters, the Brazilian Codification and

Classification of Disasters – COBRADE, presented by Coutinho (2019) displays the list of predicted events that, related to the competencies of the Military Fire Department, unequivocally highlight the institution's duty to respond to these occurrences, especially the most important ones, whose human damage is present.

Sealing the responsibility of the Military Fire Brigade with major disasters, the state law that deals with the organization of the Goiás corporation is explicit in listing, among its competences, "coordinating response to disasters, emergency situations or states of public calamity".

FINAL CONSIDERATIONS

When it comes to state public security corporations, it has been proven that, in the event of major disasters, the Military Fire Department is the institution most frequently demanded for assistance.

The other state public security agencies, due to their institutional competences, can be used in response to catastrophes, however, unlike the Military Fire Brigade, they exhibit contours of competence that, in some or many cases, depending on the institution, will be removed from these services.

Understanding how exposed corporations are to disaster response is preponderant for public policies to be formulated in order to prepare the agencies and, in addition, to observe the professionals regarding this assistance, since disasters represent an important rupture not only for the affected community, but also in the professional and personal routine of the responders.

Finally, it is hoped that this work has contributed to the solution of the questions it proposed, since the objectives of addressing the competencies of state public security institutions and relating them to disaster response have been fulfilled, shedding light on issues that certainly matter to corporations and professionals in the area, in addition to the community in general.

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EVALUATION OF THE REUSED WATER OF THE PINHEIROS SUBWAY STATION IN THE CITY OF SÃO PAULO (BRAZIL) FOR THE PRESENCE OF METALS BY THE TECHNIQUE OF X-RAY FLUORESCENCE WITH SYNCHROTRON RADIATION

https://doi.org/10.56238/sevened2024.031-029

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ABSTRACT

Ensuring the conservation of water reserves is a challenge for all humanity, which makes it essential to continuously study new forms of treatment and use of water sources on the planet. One of the focuses of water conservation and sustainability is the reuse of water sources in order to ensure the continuity of the main reserves of drinking water for watering and food production activities. The present research aimed to investigate the quality of the water used for reuse in the Pinheiros subway station in the city of São Paulo (Brazil) in order to evaluate the degree of presence of heavy metals and other chemical elements by the X-ray fluorescence technique by synchrotron radiation of the National Synchrotron Light Laboratory (LNLS). The data collection for a sample collected in the summer and analyzed revealed a pH of 6.8 and the presence of 19 chemical elements by the technique with concentrations in the order of ng.mL-1, with emphasis on the presence of lead (Pb).

Keywords: Water. Reuse. Sustainability. Water Economy.

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INTRODUCTION

Water resources are an important constituent for the existence of life. The survival of all living beings and their supply in quantity and quality is vital for the maintenance of humanity.

The reflection of the importance of drinking water sources can be noticed by the presence and development of ancient civilizations such as Egyptian, Babylonian and Greco-Roman. Since these peoples only prospered and developed thanks to nearby drinking water reserves in their territories.

According to Shiklomanov (1997), in quantitative terms, the total volume of water on Earth is constant and only 2.5% of it is made up of fresh water. However, of the 2.5% portion of fresh water, only 0.3% constitutes the surface portion of water present in rivers and lakes, which are subject to exploitation and use by humans.

Shiklomanov (1997) explained that when analyzed in qualitative terms, water is a molecule composed of hydrogen and oxygen capable of transporting biotic and abiotic substances and molecules from the earth's surface to rivers, lakes, oceans and aquifers, making them a point of concentration of the materials carried, such a characteristic gives water the title of universal solvent.

The vertiginous growth of the human population and the great upsurge of the industrial and technological sector led to an increasingly accelerated and massive demand for sources of clean water for public supply and as raw material for the primary and secondary sectors.

Due to the fact that surface reserves are constant and the great environmental impact generated by the misuse of water sources, which causes major environmental disasters with the rampant pollution of water bodies, it is important to study technologies and methodologies that aim to preserve drinking sources and consequently preserve life on the planet.

According to projections by the United Nations (UN) indicate that, if the trend of consumption and pollution persists, in 2050 more than 45% of the world's population will be living in countries that will not be able to guarantee the minimum daily quota of 50 liters of water per person (MELO JÚNIOR *et al.*, 2019).

OBJECTIVE

The purpose of the research was to evaluate the relationship of heavy metals and other chemical elements present in the reused water from the rainwater source, captured and stored in a well for use in general activities at the Pinheiros subway station in the city of

São Paulo, Brazil. Remembering that the use used in the place is varied, with the exception of potability.

For this study, the high-standard technology for synchrotron radiation was used thanks to the support of the National Synchrotron Light Laboratory (LNLS).

LITERATURE REVIEW

WATER RESOURCES IN BRAZIL

According to Lima (1999), due to the territorial dimension of Brazil, it presents great variations related to climate, geology, relief, vegetation and also water resources, economic and social development and population distribution.

Based on the distribution of surface waters, the Brazilian territory holds 13.7% of the fresh water of the globe. It should be noted that the surface reserves of fresh water on the planet are only 0.3% (MARTINS, 2003).

Most of Brazil's surface freshwater reserves are 73% (of the 13.7% in global reserve) in the northern region of the Amazon basin, which is inhabited by less than 5% of the Brazilian population (LIMA, 1999).

On the other hand, only 27% of Brazilian surface water resources are available to the other regions, where 95% of the country's population resides (LIMA, 1999).

Poor water distribution causes problems and possible supply crises in the centers of greatest demand, and the problems are greater in hydrographic basins where water withdrawals exceed water availability, which forces the population to seek alternative sources of water. In this context, the basins close to large urban centers are the most affected, in addition to having the aggravating factor of compromising water quality due to uncontrolled urbanization, which causes an increase in treatment costs and restricts water use (ANA, 2005).

In rural areas, the main interferences with water resources are the destruction of permanent vegetation areas, the indiscriminate use of pesticides and fertilizers, and the poor disposal of animal and human waste. All these contaminants are carried by the water with soil particles or are deposited directly in surface water sources (GONÇALVES, 2003).

According to Gonçalves (2003), one of the great limitations of crop productivity is the supply of water. Thus, the use of technologies aimed at crop irrigation increases more and more and with it comes greater water consumption, an increase in the number of dams, reservoirs, river exploration and even groundwater. In addition, in agriculture, water waste is very large, especially in crop irrigation, when furrow or flood systems are used. In this way, in quantitative terms, agriculture becomes the great user of water resources.

According to Shiklomanov (1997), on average, the agricultural sector uses 70% of the total fresh water consumed, followed by industrial (20%) and water for supply (10%).

Concomitantly, the acquisition of inputs such as fertilizers and pesticides has increased significantly, which are considered essential products to obtain high productivity ceilings. However, the massive use of these inputs can have serious consequences for the environment and for man himself, and can cause the contamination of both terrestrial and aquatic resources (LIMA, 1999).

Thus, according to Von Sperling (2000), agriculture has become a major source of diffuse pollution of surface waters, due to the use of the soil without respecting its capacity to support and simplify production, through the adoption of technological packages.

ADVANCES IN ENVIRONMENTAL LEGISLATION

In Brazil, in 1930, the Head of the Provisional Government of the Republic of the United States of Brazil, using the powers conferred on him by Decree No. 19,398, of 11/11/1930, and, on July 10, 1943, through Decree No. 24,643, establishes the Water Code. Among the formulations of the legislation, there is the Treaty on Environmental Education for Sustainable Societies and Global Responsibility, presenting 16 principles, among which principle 16 stands out, described below: Principle 16 - Environmental education should help develop an ethical awareness of all forms of life with which we share this planet, respect their life cycles and impose limits on the exploitation of these forms of life by human beings. By signing this Treaty, the organizations set out to program twenty-two essential guidelines, and agreed, among other things, to disseminate and promote in all countries the Treaty on Environmental Education for Sustainable Societies and Global Responsibility through individual and collective campaigns, promoted by NGOs, social movements and others (MARTINS, 2003).

In Brazil, Law No. 9,433/97, known as the Water Law, completes 22 years in 2019 and brought advances in the field of national water resources management, such as the preparation of the National Water Resources Plan (PNRH), approved in 2006 (MARTINS, 2003).

WATER REUSE

As reported by Cetesb (2023), the reuse or reuse of water or the use of wastewater is not a new concept and has been practiced around the world for many years. There are reports of its practice in Ancient Greece, with the disposal of sewage and its use in

irrigation. However, the growing demand for water has made the planned reuse of water a current and important topic.

In this sense, water reuse should be considered as part of a broader activity that is the rational or efficient use of water, which also includes the control of losses and waste, and the minimization of effluent production and water consumption (CETESB, 2023). Within this perspective, treated sewage plays a fundamental role in the planning and sustainable management of water resources as a substitute for the use of water for agricultural and irrigation purposes, among others.

Types of Reuse

According to CETESB itself (2023), water reuse can be direct or indirect, resulting from actions planned or not by the responsible sector. It is important to differentiate each type of reuse water.

Unplanned indirect water reuse

This process occurs when water, used in some human activity, is discharged into the environment and used again downstream, in its diluted form, in an unintentional and uncontrolled manner. Walking to the point of capture for the new user, it is subject to the natural actions of the hydrological cycle (dilution, self-purification).

Planned Indirect Water Reuse

This type of reuse occurs when the effluents, after being treated, are discharged in a planned manner into surface or groundwater bodies, to be used downstream, in a controlled manner, to meet some beneficial use. The planned indirect reuse of water presupposes that there is also control over any new effluent discharges along the way, thus ensuring that the treated effluent will only be subject to mixtures with other effluents that also meet the quality requirement of the targeted reuse (CETESB, 2023).

Planned direct reuse of water

In this type of reuse, its use process occurs when the effluents, after being treated, are sent directly from their point of discharge to the place of reuse, not being discharged into the environment. It is the case with the highest occurrence, intended for use in industry or irrigation (CETESB, 2023).

X-RAY FLUORESCENCE

Kneip and Laurer (1972) describe the advantages of energy-dispersive X-ray fluorescence over wavelength scattering. Initially, quantitative analysis with XRF required many standards, for the construction of system calibration curves or for calculations of the so-called alpha coefficients.

The alpha coefficients are constant correction factors and at least **n-1** standards are required ; where **n** is the number of elements present in the sample (KNEIP and LAURER, 1972)

This method is based on corrections that are made due to the interferences produced by an element **i1** in the intensity of the fluorescent radiation of an element **i2** present in the sample.

Another method, using the physical principles of X-ray fluorescence production, was developed by Criss and Birks (1968). It is known as the Fundamental Parameters Method, this method is based on the analytical solution of theoretical equations that describe the dependence of the intensity of fluorescent radiation in terms of fundamental physical parameters and instrumental parameters. The method is simple and does not require a large number of patterns, making it currently one of the most used and widespread methods in terms of XRF.

Fluorescence of synchrotron radiation by total reflection (TXRF)

Yap *et al.* (1989), used total reflection X-ray fluorescence for the analysis of fine samples of mineral sand.

The total reflection X-ray fluorescence method was tested with certified rock samples (JB-3J). They evaluated that the method has some advantages, namely: multi-elementary; with simplified sample preparation; contribution of scattered radiation and the need for small amounts of digested samples, about 2 ml, for the analysis.

Chen *et al.* (1990), showed that synchrotron radiation sources have important characteristics for the analysis of materials, mainly due to the ability to determine the elemental composition and molecular structure. They reported that for microscopic analysis (micro-characterization of materials), synchrotron radiation sources offer a spatial resolution of 10 μm with a detection limit between 10 and 100 ppb.

Salvador (2003) used a total reflection X-ray fluorescence (TXRF) system to analyze samples of mineral and vegetable oils, using different sample preparation techniques. The direct preparation of dilute oil solutions showed good results for element concentrations at trace levels higher than 1 μg.g-1.

Liendo *et al*. (1999), described a comparative study between PIXE and TXRF for the analysis of Cl, K, Ca, Fe, Cu, Zn and Br in human amniotic fluid. They found an agreement in the measurements performed with the two techniques for the following elements: K (100%), Cl (60%), Fe (80%), Cu (50%) and Zn (50%). They reported the need for further studies to be able to establish the ideal experimental conditions that lead to complete agreement between TXRF and PIXE.

METHODOLOGY

CASE STUDY

The research was based on analyzing the reused water of the Pinheiros subway station located in the city of São Paulo, Brazil.

Figure 1 shows a visualization of the station's location.



Figure 1: Overview of the Pinheiros subway station.

The region covered by figure 1 (above) has the fundamental characteristic of being a region of great importance and mass circulation of people. The Pinheiros station has an average flow of 60 thousand passengers per day. It is also an important transport exchanger, with access to the Metro and the Companhia Paulista de Transporte Metropolitano (CPTM).

Line 4 (see figure 1) that corresponds to the study line, called the yellow line, has about 13 km of route with 11 stations allocated along the route.

The station has the process of capturing the local rainwater network in order to use rainwater for general activities within its facility, that is, the use of a rainwater reuse system in order to minimize costs and allow a process of local sustainability.

Thus, the research aimed to verify the quality of the water in relation to the levels of heavy metals and other chemical elements present by the synchrotron radiation technique.

An aliquot of 500 mL of reused water from the location of interest of study was taken for analysis in scientific research. The sample was collected in the Brazilian summer period and frozen for its multielemental analysis and acidity/alkalinity degree.

SYNCHROTRON RADIATION ANALYSIS BY TOTAL REFLECTION

The research project included an analysis of the elemental chemical concentration present in a sample of reused water from rainfall in the location of interest of the study (figure 1).

The sample aliquot was 500 mL, and it was previously frozen at -50C to preserve its initial characteristics.

The technique adopted was carried out at the National Synchrotron Light Laboratory (LNLS), in Campinas, by the process of total reflection using synchrotron radiation, which allows a multi-element analysis of the chemical compounds present in bottled rainwater, without the need to destroy the samples by acid action. Such a process allows a clearer and more concise analysis of the concentration and a wider spectral range of analysis by the adopted radiation beam.

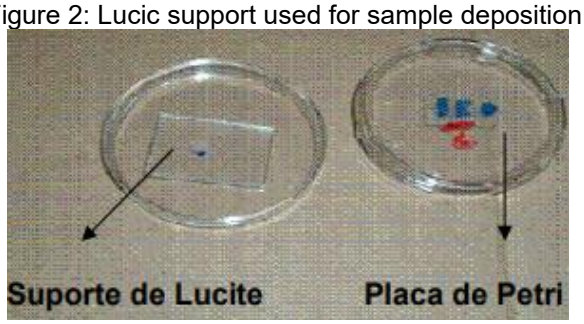
Synchrotron Radiation with Total Reflection Metal Detection Tool

In the total reflection analysis, an aliquot of 1 mL of reused water (from the 500 mL bottle) was removed from the study and a 100 µL Gallium standard (102.5 mg. L-1) used as the internal standard, resulting in a concentration of 9.32 mg. L-1 in sample.

The internal pattern was used to eliminate the non-uniformity of the aliquot on the substrate, because the thin film formed on the substrate does not have a regular geometry. Thus, the intensity of the X-rays obtained in the irradiation of the sample depends on the position in which it was placed on the support, as reported by Melo Júnior (2007). With the addition of the internal standard, the result obtained will always be in relation to this standard, regardless of the position of the sample (MELO JÚNIOR, 2007).

At the end of the preparation, 5.0 µL of the resulting solution was then pipetted under a lucite plate and dried with the aid of an infrared lamp the sample, as shown in figure 2.

Figure 2: Lucic support used for sample deposition.



Synchrotron Radiation Line Installations – Total Reflection Technique

The synchrotron radiation line for total reflection is intended for the analysis of multielemental chemical composition (Z ≥ 13) in scientific applications of trace element determination in environmental, biological and material sciences, thin film chemical depth profiling and chemical mapping. It operates with a beam from 4 to 23 KeV, in table 1 other characteristics of the line can be seen (MELO JÚNIOR, 2007).

Table 1 - General Characteristics. Source: National Synchrotron Light Laboratory. www.lnls.br (2023).

Source	Deflector magnet D09B(15º), σy = 0.222 mm, in-sample flux: 4 x 109 photons/s at 8 keV.
Monochromator	Monocromador *channel-cut.*
Crystals	Si (111) (2d=6.217 Aº): 4-14 keV (E/ΔE=2800); Si (220) (2d=3.84 Aº): 5-23 keV (E/ΔE=15000).
Detectors	Solid-state detectors of hyperpure Ge (150 eV resolution) and Si(Li) (165 eV resolution); photodiodes and ionization cameras.
Optics	Capillary optics with 20 μm spatial resolution.
Sample handling	Vacuum chamber (2-10 mbar) with conventional excitation geometry (45º - 45º). Stations for grazing incidence and 2D mapping experiments, both with full control of sample positioning.

Figure 3 shows the pipe of the DO9B – XRF line, used in the experiment, through which the synchrotron light beam passes from the ring to the fluorescence experimental station located at LNLS.

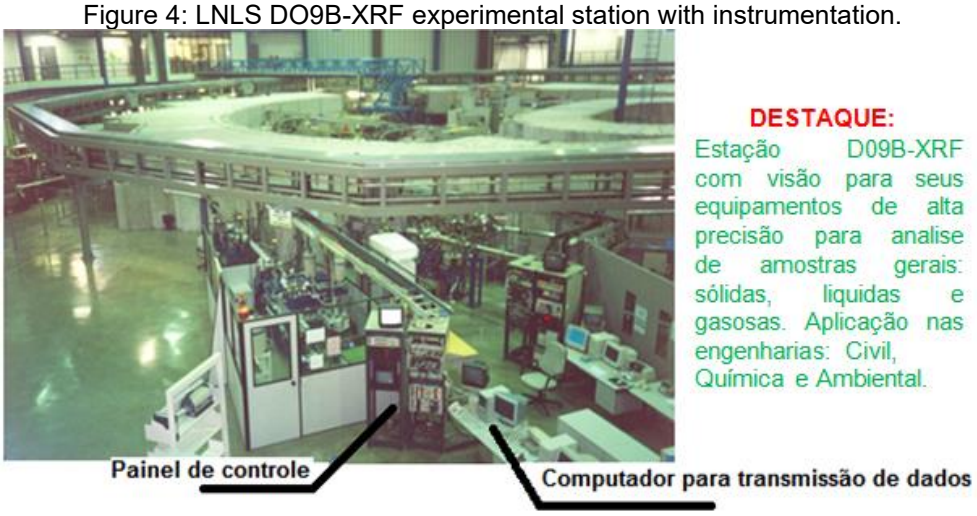
Figure 3: Photo of the ring pipe for the DO9B – XRF line of LNLS.



In the X-ray fluorescence experimental station (figure 3), a hyperpure Ge semiconductor detector with an 8 m thick beryllium windowμ, an active area of 30 mm2, coupled to an amplifier module and a multichannel analyzer board, inserted in a microcomputer, was used for the detection of X-rays.

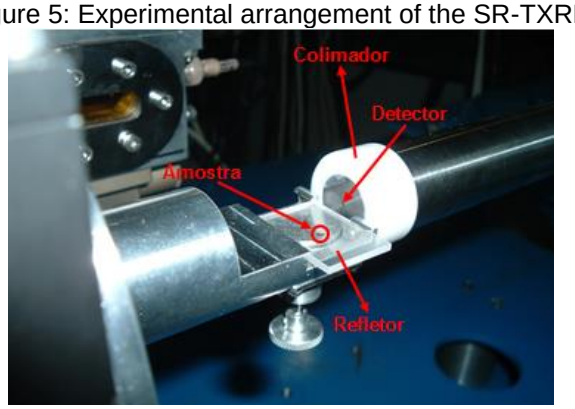
Figure 4 shows station D09B-XRF and a partial view of the radiation ring.

Figure 4: LNLS DO9B-XRF experimental station with instrumentation.



The experimental arrangement allows the rotation and translation of the sample in order to obtain the condition for the total reflection of the incident beam on the sample that is allocated to the rectangular lucite plate (*Perspex*) fixed in the sample holder, allowing the measurement of the chemical elements contained in the sample. Figure 5 shows in detail the rainwater sample (reuse) deposited on the reflector and the detector with the collimator. It is important to highlight that for statistical purposes, triplicates were made from the same sample for a better accuracy of the data captured by the technique.

Figure 5: Experimental arrangement of the SR-TXRF.



PH INHALE

Care was taken to analyze the degree of acidity/alkalinity of the sample that was the focus of the research.

For this purpose, a conventional pH meter was used, and the PH-127 Digital model from Conteck was adopted.

This meter is widely used in swimming pools and due to its practicality and low cost, it was chosen for use in Unicamp's partner laboratories with LNLS.

RESULTS

MULTIELEMENTAR ANALYSIS

Analysis by the Synchrotron Radiation Technique – Validation

To ensure that the detected values are reliable, a characteristic curve with defined patterns was constructed. Thus, a degree of reliability was obtained to later evaluate the samples collected.

The elemental sensitivity was calculated using five standard solutions with known elements and in different concentrations, plus the element gallium (Ga) used as the internal standard. For this purpose, the range for this pattern curve is called the K series.

The determined values of the experimental sensitivity for the elements contained in the solutions and the results obtained are presented in Table 2, below.

Table 2 - Experimental sensitivity for the K series.

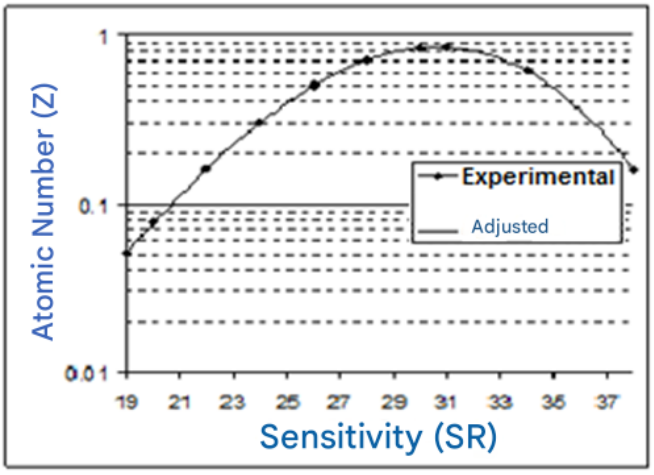
Atomic number	Chemical element	Sensitivity
19	K	0,083270
20	Ca	0,086387
22	Ti	0,199891
24	Cr	0,393820
26	Fe	0,593576
28	Ni	0,796228
30	Zn	0,897568
31	Ga	0,975819
34	Se	0,809614
38	Sr	0,306673

Reliability Curve

Using the data obtained from table 2, the reliability degree curve was raised from a characteristic graphic curve, called the relative sensitivity curve for series K. Figure 6 (below) shows the characteristic reliability curve for the elements in the range of interest of the study.

Such a curve is important to align the error deviation and reflect on the accuracy of the analyses and ensure the reliability of the analyzed data.

Figure 6: Relative sensitivity curve (SRi) for the K series.



The sensitivity curve presented in figure 6 initially allowed the use of certified samples with known values. This made it possible that when using the same energy beam in the sensitivity curve for the certified samples, the values were close to the pre-defined ones, thus allowing the collected and analyzed samples to have their values really within reality without detection errors.

Default Adjustment by NIST

The adjustment was made to a standard certified by the *National Institute of Standards and Technology* (NIST).

Table 3 shows the samples certified by NIST for the standard called Drinking *Water Pollutants*, with the values measured at LNLS and those certified by NIST, respectively.

Table 3 - Comparison of the values measured in LNLS and certified by NIST.

Element	Measured Value and Confidence Interval (mg. L-1)	Certified Value and Confidence Interval (mg. L-1)
Cr	8.91 ± 0.18	8.89 ± 0.45
As	8.66 ± 0.17	8.77 ± 0.45
Se	4.87 ± 0.07	4.69 ± 0.23
Cd	4.55 ± 0.64	4.54 ± 0.23
Ba	89.99 ± 0.76	91.89 ± 4.55
Pb	10.03 ± 1.01	10.09 ± 0.45

Results surveyed from the rainfall sample

Only after this validation of the system was the dry rainwater sample used in the lucite plate, in which the average concentrations of the measured chemical elements can be evaluated by table 4.

Table 4 - Average concentration ($^{ng.mL-1}$) of the elements present in the rainfall sample.

Chemical Element Symbol	Concentração $ng.mL^{-1}$
Al	126,40
S	140,00
Cl	372,70
K	16,80
Ca	738,50
Ti	1,60
Cr	19,60
Mn	13,00
Fe	118,50
Co	0,60
Ni	0,80
Cu	29,95
Zn	679,60
As	2,20
Se	0,70
Br	1,30
Sr	2,32
Hg	10,50
Pb	35,90

The values found of the elements in table 4 make it possible to verify the degree of water quality. It can be noted that the presence of concentrations of lead (Pb), chromium

(Cr) and mercury (Hg) among the others reflects the study locality that has a high level of hydrocarbon combustion motor vehicles that emit these compounds into the air, being "washed" from the local air by rain and stored in reuse water.

PH ANALYSIS

Thanks to the use of Conteck's PH-127 Digital pH meter. It was possible to measure the average pH value of the collected rainwater, which revealed an average pH of 6.8. This showed a slight acidity of the stormwater studied in question.

The values found in table 4 (above), as well as the pH values, showed an acceptable reuse water quality value for general activities that do not involve: human thirst, bathing or use in fruit and vegetable foods; since there is no data on the presence and concentration, for example, of fecal coliforms from rainwater that is stored in a rainwater reserve containment tank at the Pinheiros station.

It should also be taken into account that the sample was a one-off collection, which does not reflect the quality of the water over a longer temporal amplitude.

CONCLUSION

The research had an important focus because it further disseminated the use of a refined and high-tech technique used in the scientific field. However, the fact of using only one rainwater collection cannot be generalized and ensure that the water quality is the same throughout the year.

As implications, there is the fact of the need for collections on more days of the week, as well as during the climatic seasons, especially in the summer and winter, which has the lowest distribution of rain and consequently a greater accumulation of contaminant levels in the winter period in dissonance with the Brazilian summer. This implication is due to the high concentrations of compounds from automotive combustion in the atmosphere, which are more prominent in winter.

If there were collections in this period of winter, it would be very interesting to verify the dissolved levels in the reused water at the time of "washing" the elements dispersed in the atmosphere.

But the research had the merit of the concern in researching and studying the quality of reused water that is of great importance, showing a significant evolution in the environmental concern of the São Paulo government sector and a clear evolution of the goals of the United Nations (UN) for 2050 in relation to water preservation.

Another fact that can be raised is the continuous need to change the energy matrix, especially the terrestrial network represented by the vehicle sector, with the adoption of new practices that minimize the automotive concentration in regions such as the one studied, which reflects the presence of toxic and harmful chemical elements to humans, especially lead (Pb) and mercury (Hg) detected.

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EVALUATION OF THE LEVEL OF SLEEP QUALITY AND FUNCTIONALITY OF PHYSIOTHERAPY STUDENTS

https://doi.org/10.56238/sevened2024.031-030

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ABSTRACT

Objective: To evaluate the level of sleep quality and functionality in physical therapy students from the perspective of the International Classification of Functioning. Methods: This is a descriptive, quantitative study approved by the CEP/UESPI. A questionnaire developed by the researchers was used to trace the sociodemographic profile, as well as the validated questionnaire "Pittsburgh Sleep Quality Index" to assess the sleep quality of physical therapy students. Regarding the statistical analysis, a confidence interval of 95% was considered and a significance value of $p<0.05$. Results: 55.89% of the students had poor sleep quality, 23.53% had sleep disturbance, and 20.58% had good sleep quality. Analyzing the sleep data, they present the following median: at bedtime 23:00, latency of 20 minutes to fall asleep, they wake up at 06:00 and sleep 6 hours a night. A predominance of females was identified, with 69.12% and 30.88% for males. The age range ranged from 18 to 32 years, with a mean age of 21.64 (SD+- 2.29) years. Regarding functionality, the components of body functions, environmental factors and activity and participation are altered, including b1341 (sleep functions), b1343 (sleep quality), e2250 (temperature), d230 (performing the daily routine). Conclusion: Physical therapy students had poor sleep quality and changes in sleep functionality within the domains of body functions, environmental factors, and activity and participation.

Keywords: ICF. Quality. Sleep. Students. Physiotherapy.

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INTRODUCTION

Sleep is the state of unconsciousness from which a person can be awakened by sensory or other stimulus. It exists in all mammals and has important functions in homeostasis, having effects on the nervous system and other functional systems of the body. Its specific physiological functions are not yet known, but it is assumed that sleep restores the natural balance between neuronal centers and therefore lack of sleep can cause irregularities in behavioral activities and in the process of thought and memory (GUYTON, 2006).

Sleep problems are frequent in the general population, but students in the health area are a vulnerable group to poor sleep quality, they have higher rates of sleep disorders than students in other areas, this is due to greater exposure to stressors such as high workload, emotional stress, hours using social networks, stages and life choices. Good sleep quality is important for learning and greater patient safety (PEROTTA, 2021)

Sleep quality is influenced by several factors: socioeconomic status, segregation, lighting, air pollution, noise, architecture of the place where the individual lives, as well as violence in their neighborhood, and access to socialization places. The environment in which an individual finds himself, whether physical or social, can interfere in important aspects for the quality of sleep, such as the duration and time he goes to sleep, as well as contribute to the development of the most prevalent sleep disorders: insomnia, sleep apnea, and circadian cycle disorders (BILLINGS, 2020)

These various factors not only interfere with sleep quality, but also with sleep functionality and the individual's own functionality, and one way to classify the impact of these factors is using the International Classification of Functionality (ICF). The ICF was approved in May 2001 during the 54th World Health Assembly with the objective of standardizing and universalizing language in health, and is the international standard for the description of a disability, its use is recommended by the World Health Organization (WHO) in conjunction with the International Classification of Diseases (ICD) to provide information on individuals and populations in terms of health status. The ICF has epidemiological and social importance, the psychosocial approach complements the insufficiency that morbidity and mortality data bring in the definition of health status (WHO, 2003. LEONARDI, 2022)

The ICF contains a variety of categories to describe body functions, structures, activity, and participation, all of which are influenced by environmental factors and personal factors. These categories or domains are represented by letters: Letter "b" represents physiological functions, letter "s" represents anatomical parts of the body, letter "d" represents execution of actions and participation in activities, and finally letter "e" represents

environmental factors that can be facilitators or barriers. The ICF goes beyond clinical practice, it has relevance as a tool: statistical, pedagogical, research, and social policy development (BARRETO; ANDRADE; CASTANEDA; CASTRO, 2021. MADDEN; BUNDY, 2019)

As a standardized tool that explores environmental and personal factors and their interactions with patient functionality, the ICF is a multifactorial, patient-centered assessment that indicates impacts on functional ability and quality of life. Sleep quality is a determining factor for the health of the individual, considering this, this study is important to determine which aspects of students' functionality are being affected by their sleep quality, identifying the compromised functional skills and coding according to the ICF to guide future interventions focused on this group of society (MADDEN; BUNDY, 2019)

Many studies analyze the quality of students' sleep, but few associate it with functionality. Therefore, this research aims to evaluate the level of sleep quality and functionality in Physical Therapy students from the perspective of the International Classification of Functioning.

METHODOLOGY

This is a cross-sectional descriptive and quantitative study approved by the Research Ethics Committee of the State University of Piauí CEP/UESPI under opinion number 6.388.233, according to the norms established in Resolution 466/12 of the National Health Council (CNS).

The sample consisted of 136 students duly enrolled in the bachelor's degree course in physiotherapy at UESPI. Physiotherapy students, of both sexes, who were attending the first to the tenth block of the institution, aged between 18 and 32 years, and who agreed to participate in the research by signing the Informed Consent Form (ICF) were included in the study. Students who withdrew the Informed Consent Form and those who answered the questionnaire incompletely were excluded.

Data were collected through questionnaires applied to physiotherapy students from October 2023 to April 2024, at the State University of Piauí (UESPI) located in Teresina-PI. Initially, they were invited to participate in the research, presenting them with the informed consent form with all the necessary clarifications, through the researchers, before signing it. If they agreed, after signing the term, the research was initiated through the application of a questionnaire prepared by the researchers with the objective of outlining the sociodemographic profile: gender, age, color/race and socioeconomic condition), the period

in which the participant was enrolled, their main mode of commuting, how they classified their physical and mental health, if you use oral relaxation plate and CPAP during sleep.

Next, the validated questionnaire "Pittsburgh Sleep Quality Index (PSQI)" was applied, which evaluates sleep quality in the last month. In order to provide a brief and clinically useful evaluation of a variety of sleep disorders that may affect sleep quality, it was translated into Brazilian Portuguese with its validated Brazilian version (BUYSSE et al, 1989; BERTOLAZI et al, 2011)

The first four questions are open-ended and the rest are objective questions. The questions are categorized into seven components, graded in scores from zero ("none in the last month" or "no difficulty") to three ("three or more times in the week" or "severe difficulty"). The components evaluated are subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, presence of sleep disorders, use of sleep medications, and presence of daytime sleep dysfunction. The sum of the values attributed to the seven components varies from zero to twenty-one in the total score of the questionnaire, the lower the result, the better the quality of sleep (DE ARAÚJO et al, 2015)

The PSQI questions were analyzed and ICF categories were assigned, and categorical data were presented in absolute and relative values. Quantitative variables were described as mean and standard deviation, according to the distribution of the data analyzed by the Shapiro-Wilk normality test. The collected data were tabulated in spreadsheets prepared in the *Microsoft Office Excel 365 software*, where a database was built. The analysis was performed using the statistical program *JASP 0.18.3.0*, for the statistical analysis, a confidence interval of 95% and a significance value of $p<0.05$ were considered, as recommended for studies in human beings.

RESULTS

The study population consisted of 136 university students from a physiotherapy course at a public higher education institution in Teresina-Piauí. In the group studied, a predominance of females was identified, with 69.1% and 30.9% for males. The age range ranged from 18 to 32 years, with a mean age of 21.6 ± 2.3 years.

Regarding socioeconomic status, 64% of the participants reported having medium socioeconomic status, 36% low socioeconomic status, and none reported having high socioeconomic status. There was a predominance of brown (46.3%), followed by whites (28.7%), blacks (24.3%) and yellow (0.7%), and 94.12% of the participants in this study reported living with someone.

Regarding the period referring to student enrollment, there was a predominance of students enrolled in the 3rd period and in the 10th period with 14.7% each, followed by the 5th (10.3%), 7th (10.3%) and 8th (10.3%) periods. In the other periods, 39.7% of the interviewees are enrolled.

When asked about their main means of transportation used, 54.4% answered that they use the public service, 20.6% own vehicle, 11% app driver and 14% received a ride from relatives or friends. Regarding the practice of physical activity, 38.2% do not perform it, 26.5% perform it 1 to 3 times a week and 35.3% perform it more than 3 times a week.

Regarding the perception of their own physical health, 1.5% classified it as very bad, 8.1% as bad, 33.1% as neither bad nor good, 46.3% as good and 11% as very good. Regarding the perception of their own mental health, 5.9% classified it as very bad, 18.4% as bad, 43.4% as neither bad nor good, 28.6% as good and 3.7% as very good. No participants reported using a relaxation plate and/or CPAP at bedtime.

Regarding the intrinsic characteristics of the participants' sleep, the interviewees presented the following median: bedtime at 11:00 p.m., latency of 20 minutes to fall asleep, they wake up at 6:00 a.m. and sleep 6 hours a night. (Table 1)

Table 1: Sleep schedule and time of students of the physiotherapy course at UESPI – Teresina-PI (2024)

	Time to sleep	**Latency**	**Time to agree**	**Time of are**
Valid	136	136	136	136
Median	23:00	00:20	06:00	06:00
Test the Shapiro-Wilk	0,472	0,794	0,873	0,931
P-value do Shapiro-Wilk	< ,001	< ,001	< ,001	< ,001
Minimal	20:30	00:00	03:00	03:00
Maximum	03:00	02:00	11:00	09:00

Source: Authors of the research.

Using the Pittsburgh Sleep Quality Index (PSQI), the results obtained were: 55.9% had poor sleep quality, 23.5% had sleep disturbance, and 20.6% had good sleep quality. When asked about their perception of their own sleep quality, 47% rated their sleep quality as good, 39% as poor, 9.6% as very good, and 4.4% as very poor. (Table 2)

Table 2: Sleep quality of students in the physical therapy course through the PSQI. UESPI, Teresina-PI, 2024

PSQI Result	**Frequency**	**Percentage**
Good sleep quality	28	20,6
Distúrbio do Sono	32	23,5
Poor sleep quality	76	55,9
Total	136	100

Source: Research authors

The difficulties in sleeping reported by the students were predominantly waking up in the middle of the night or early in the morning (83.8%), not being able to fall asleep in 30 minutes (69.9%), having to get up to go to the bathroom (63.2%), feeling very hot (61.7%) and having bad dreams (58.1%). Some students reported other reasons why they had difficulty sleeping, such as: anxiety, vomiting, college, excess caffeine, spending too much time on the cell phone, noise and eating late. (Table 3)

Table 3: Factors that interfere with the sleep of students in the physical therapy course through the PSQI. UESPI, Teresina-PI, 2024

Difficulty sleeping due to	Frequency	Percentage
Couldn't fall asleep in 30 minutes	95	69,9
Woke up in the middle of the night or early in the morning	114	83,8
Had to get up to go to the bathroom	86	63,2
Couldn't breathe comfortably	36	26,5
Coughed or snored hard	25	18,4
Felt very cold	62	45,6
He felt very hot	84	61,7
Had bad dreams	79	58,1
There was pain	42	30,9
Other reasons	36	26,5

Source: Prepared by the authors

Also as a result of the survey, 16.9% of the students reported having taken some medication to help sleep, 58.1% reported difficulty staying awake while driving, eating or participating in a social activity, and 89.7% had problems maintaining enthusiasm to do things.

By analyzing the PSQI, it was possible to determine the ICF categories addressed in the questions, using three components of the ICF: body functions, environmental factors, and activity and participation. (Table 4)

Table 4: Characterization of the PSQI questions according to the ICF categories. UESPI, Teresina-PI, 2024

PSQI issue	ICF Categories	Category Description
2. During the last month, how long (in minutes) did it usually take you to sleep at night?	**b1341**	**Sleep onset:** Mental functions that produce the transition between wakefulness and sleep
5. During the last month, how often have you had trouble sleeping because you: A) Could not fall asleep within 30 minutes	**b1341**	**Sleep onset:** Mental functions that produce the transition between wakefulness and sleep
B) Woke up in the middle of the night or early in the morning	**b1342**	**Sleep maintenance:** Mental functions that sustain the state of being asleep

PSQI issue	ICF Categories	Category Description
D) Could not breathe comfortably	**b440**	**Respiratory functions:** Functions related to the inhalation of air into the lungs, the exchange of gases between air and blood, and the expulsion of air
	B460	**Sensations associated with cardiovascular and respiratory functions: Sensations** such as loss of heartbeat, palpitation, and decreased breathing. It includes: chest tightness, irregular heartbeat sensations, dyspnea, suffocation, nausea, wheezing, and the need to swallow air.
E) Coughed or snored strongly	**b450**	**Additional respiratory functions:** Additional breathing-related functions such as coughing, sneezing, and yawning
F) Felt very cold	**e2250**	**Temperature:** Degree of heat or cold, such as high and low temperature, normal or extreme temperature
G) Felt very hot	**e2250**	**Temperature:** Degree of heat or cold, such as high and low temperature, normal or extreme temperature
I) Had pain	**B280**	**Sensation of pain:** Unpleasant sensation that indicates potential or actual injury to some structure of the body
J) Other reasons -Anxiety	**B1522**	**Range of emotions:** Mental functions that produce the spectrum of experiences related to the emergence of affect or feelings such as love, hate, anxiety, grief, satisfaction, fear, and anger
-Nauseas, urge to vomit	**b5350**	**Feeling nauseous:** Feeling related to the need to vomit
-Noise	**e2500**	**Sound intensity:** Level or volume of the auditory phenomenon determined by the amount of energy generated, where high energy levels are perceived as loud sounds and low energy levels as low sounds.
-Faculty	**D830**	**Higher education:** Participate in the activities of advanced educational programs at universities, colleges, and vocational schools and learn all aspects of the curriculum necessary for degrees, diplomas, certificates, and other permits, such as earning a bachelor's or master's degree, graduating from medical school, or another vocational school
- Excess caffeine, Eating late	**D5701**	**Diet and fitness control:** Taking care of oneself by being aware of one's needs, selecting and consuming nutritious foods, and staying in shape
- Too much time on mobile	**e125**	**Products and technology for communication**
6) Over the past month, how would you rate your overall sleep quality? Hands	**B1343**	**Sleep quality:** Mental functions that produce natural sleep leading to optimal physical and mental rest and relaxation

PSQI issue	ICF Categories	Category Description
7) During the last month, how often have you taken medication (prescription or "on your own") to help you?	**e1101**	**Medicines:** Natural or man-made substance, harvested, processed, or manufactured for medicinal purposes, such as allopathic and natural medication.
8) In the last month, how often have you had difficulty staying awake while driving, eating, or participating in a social activity (party, gathering friends)?	**D475**	**Driving:** Controlling and moving a vehicle or the animal that pulls it, moving under one's own direction or having at one's disposal any form of transport such as a car, bicycle, boat or animal.
	D550	**Eating:** Performing the coordinated tasks and actions of eating the food served, bringing it to the mouth and consuming it in a culturally acceptable manner, cutting or breaking the food into pieces, opening bottles and cans, using utensils, activities related to meals, banquets and dinners.
	d9205	**Socializing:** Participating in informal or casual gatherings with others, such as visiting friends or relatives and informal gatherings in public places
9) During the last month, how troublesome has it been for you to maintain enthusiasm (spirits) to do things (your usual activities)?	**D230**	**Perform the daily routine:** Perform and coordinate simple or complex actions to plan, manage and complete the requirements of day-to-day procedures or duties, such as managing time and making plans for various activities throughout the day

Source: Prepared by the authors

DISCUSSION

Analyzing the sleep data, the participants in this study sleep less than recommended by the American Academy of Sleep Medicine, which recommends that adults should sleep 7 or more hours a night regularly to promote health and well-being, sleeping less than recommended is associated with poor performance, increased errors and higher risk of accidents. However, not all individuals need this time interval, genetic, behavioral, medical and environmental factors alter the individual's need for sleep time. (WATSON et al, 2015)

When asked about sleep quality, the participants in this research mostly rated their sleep as good or very good, which is in contradiction with the PSQI results that identified poor quality or presence of sleep disorders in approximately 3/4 of the sample. This contradiction has already been found in another study, demonstrating that the disagreement between the subjective perception of sleep quality and reality is due to the normalization of poor sleep patterns to meet the academic requirements of health courses. The subjective perception of sleep quality is an important factor for the assimilation of the content covered in the classroom, a study carried out with adolescents demonstrated that those with a poor perception of sleep quality are more likely to have difficulty assimilating the subject, regardless of sociodemographic variables (BATISTA et al, 2018. MARQUES et al. 2024;)

In the scientific literature, sleep problems are more prevalent among women due to hormonal changes during pregnancy, menopause, and menstrual cycles, as well as roles and responsibilities that are socially assigned to them. The sample of this research was predominantly female and young, therefore, the students interviewed are more susceptible to developing some sleep problem (BARROS et al, 2019)

The population's routine is mainly governed by one practice: commuting, which is the recurrent journey between home and the place of work or study. In the capitals, the greatest distances and consequently the longest time spent commuting are frequent for individuals of low and medium socioeconomic class, which can be evidenced in this research, where 64% of the participants reported having medium socioeconomic status and 36% low socioeconomic status. Due to this, the time available for activities that do not involve work or studies is reduced, impacting several health-related activities, especially sleep (DOKKEDAL-SILVA et al, 2022)

Studies show that commuting by own vehicle and by public transport that lasts more than 30 minutes is associated with increased daily stress, lower vitality and poorer subjective perception of sleep quality. In addition to distance, poor urban planning and traffic jams are factors that prolong the duration of commuting, so students may be exposed to these stressors that harm physical and mental health (CHATTERJEE, et al 2020).

Physical activity is proven to be beneficial for sleep in several ways: it increases the production of hormones that regulate the wake cycle, reduces stress, improves mood, and helps regulate body temperature. This is in accordance with this study where most respondents practice physical exercise at least once a week and consider physical health good or very good, being a possible positive factor for sleep quality (ALNAWWAR et al, 2023)

Problems sleeping and impaired mental health are intrinsically associated. Before, it was assumed that altered mental health caused problems sleeping, however, the reverse can also be true, as poor sleep contributes to the recurrence, appearance and maintenance of mental problems. What can be proven by analyzing the subjective perception of mental health, few participants in this research classified mental health as good or very good. (SCOTT et al, 2021))

After analyzing the content and extracting data from instruments applied to obstructive sleep apnea validated for Brazil, a study found that the PSQI addresses the function domain more frequently, but also has environmental factors, activity, and participation addressed. This was observed in this research, the codes referring to sleep functions were more frequently addressed by the questions, among them are b1341 (sleep

onset), b1342 (sleep maintenance) and b1343 (sleep quality), as well as codes from the other domains such as e2250 (temperature) and d230 (performing the daily routine) that were the most affected among the students (NASCIMENTO and FERREIRA, 2021)

In the CIF model, the components interact with each other dynamically, that is, changes in one element have the potential to modify one or more of the other elements. The presence of disability does not dictate the limitation of capacity, however, most of the interviewees presented deficiencies in sleep-related functions, characterized by the ICF through subdivisions from b1341 to b1343 that can be visualized due to the large percentage of poor sleep quality (55.9%) and the presence of sleep disorders obtained through the PSQI results. (23,5%) (WHO, 2003).

A study showed that a poor sleeping environment is one of the main causes of sleep interference, as well as the temperature of the place that leads to a worsening of sleep quality. In this survey, 61.7% of students reported having difficulty sleeping due to heat, an environmental factor characterized by the code e2250 (temperature) that is acting as a barrier to good sleep quality. (XIONG et al, 2020)

This study was limited to analyzing sleep quality and functionality, so association and correlation tests were not performed. Due to the large number of variables and a large population, the data collected can be used for research that aims to correlate the variables, making this research a possible umbrella study for a greater knowledge of the sleep quality of physiotherapy students

CONCLUSION

There is a predominance of poor quality and presence of sleep disorders in physical therapy students at UESPI. In the aspect of functionality, the students have alterations in the components of physiological functions, environmental factors and activity and participation. The subdivisions of the ICF referring to the functions of sleep, temperature and performing the daily routine stand out.

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IMPACTS ON THE MENTAL HEALTH OF HOMOSEXUALS WHO ARE VICTIMS OF INTERNALIZED HOMOPHOBIA: A PSYCHOTHERAPEUTIC APPROACH

https://doi.org/10.56238/sevened2024.031-031

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ABSTRACT

Homophobia is a set of disqualifying, violent and aversive behaviors with everything that refers to the homosexual universe, that is, any action or person that invisibilizes or inferiorizes members of the LGBTQIA+ community is considered homophobic. The objective of this work is to analyze the impacts of homophobia on the mental health of homosexuals, for this purpose it uses a bibliographic review of the literature on the psychosocial aspects in the mental health of homosexuals affected by homophobia. Most studies have consisted of analyzing the impacts of homophobia on the social and personal dynamics of these individuals and research evidence suggests that, compared to heterosexuals, homosexuals suffer from more mental health problems. Discrimination related to the status of social minorities creates a double risk for the development of mental illnesses, even more so when psychological therapies do not validate the feelings of this population and/or focus only on reducing symptoms.

Keywords: Homophobia. Prejudice. Mental health. Homosexuality. Therapeutic process.

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INTRODUCTION

Psychology in the scientific field has historically shared the understanding of sexuality linked to the biomedical-sanitary model, associating the idea of sex, the difference between genital organs, as well as the binary concept of normality. It was only around the 80s that the cultural and historical aspects surrounding the concept of sex began to be included in the theories and understandings of this scientific field (Nuernberg, 2008; Costa, 2015).

The field of studies on sexuality involves interdisciplinary themes, which touch on cultural, biological, genetic, behavioral, psychological and social knowledge. In this sense, it is necessary to conceptualize gender and sex, often used in theoretical discussions about sexuality in the search to contextualize them. According to Laqueur (2001), historically, the term sex has been related to biological language, linked to desire and genitals, while the concept of gender was associated with the Feminist Movement and understood as how the individual culturally constructs the meanings of their bodies, gestures and postures.

Thus, a broadening of the understanding of sexuality and its consequences can be seen with the expansion of the concept of gender, beyond the difference between the sexual organs (Foucault, 1994; Butler, 2003). The theoretical deepening of sexuality broadens the understanding of the constitutive function of sex in social and cultural life, considering gender and also sex, in its most complex sense, diverging from the binary concept (male-female) of biological distinction or socially imposed social roles. Both words carry multiple effects in the construction of people's subjectivity and identity and the exercise of their citizenship. Thus, it is highlighted that the subjects have several ways of exercising and experiencing their gender and sexuality (Louro, 1997).

According to Schwandt (2006), throughout history, anthropologists and sociologists have carried out work that included qualitative research on sexuality and prejudice. However, it was only in the 1970s that qualitative research gained strength, regarding the methodological procedures and different health concepts implemented in the discussion.

The adoption of the term "homosexuality" to designate people who had sexual relations with others of the same sex was part of a movement to create categories linked to sexual behaviors, mainly influenced by legal practices and medical and psychological categorization. According to the philosopher Foucault, the very creation of the category "homosexual" and its association with the idea of pathology are linked to a political strategy of dissociating sexual practice between people of the same sex from the idea of crime or moral fragility and subjecting it to the framework of mental illnesses (Foucault, 1979).

The term "internalized homophobia", when used scientifically, refers to the prejudice that homosexuals internalize against themselves and other members of the LGBTQIAPN+

community (Weinberg, 1972; Borges, 2009). Prejudice, according to Allport's theory (1954), is composed of hostile and aversive attitudes directed at people or groups, justified only by a wrong generalization, characterized by discrimination.

In psychology, mental health is dictated primarily by the quality of the relationships established, being considered the greatest determinant of an individual's health, and the environment plays a significant role greater than one imagines in the development of stress, psychological suffering, pathological diseases and psychiatric disorders. Unfortunately, internalized homophobia, same-sex intimate partner violence, emotional dysregulation, and minority stress are part of the reality of the vast majority of the LGBTQIAPN+ population (Walsh, 2010; Trombetta et. Al, 2023).

Therefore, this study is justified by the need to discuss what are the issues related to the mental health of gays in the context of homophobia and how this practice reflects on the quality of life of this social group. Thus, the objective of this study is to discuss the theories that justify the existence of internalized homophobia and to present a brief history of the social repercussions of homophobia on the mental health of gays present in the scientific literature.

THEORETICAL FRAMEWORK/STATE OF THE ART

HOMOSEXUALITY: BRIEF HISTORY AND EVOLUTION OF THE CONCEPT

The practice of homoerotic relationships has records from antiquity to the present day, such a relationship is characterized by being a natural variation of human sexuality and the issues arising from homophobia are limited to the social, cultural and religious standards established in a given society (Borges, 2009).

This practice has been seen historically since Mesopotamia (2,800 and 2,500 BC), with records of the oldest epic preserved in history, the Epic of Gilgamesh, king of Sumer, being one of the first love stories between men, portrayed by the character Enkidu. At that time, privileges were given to prostitutes if they participated in religious cults, that is, these people left their marginalized status and became sacred from the moment they had homoerotic relations with devout men within the temples of Mesopotamia, Phoenicia, Egypt, among other places (Rodrigues, 2004).

In Egyptian civilization, Egyptians established sex with other men in the scenario of war with their enemies, as they believed that the passive role (the one who is penetrated) of a man was an act of extreme insult, being a means of obtaining power over the adversary. As for the Mesopotamians, the problem with sex between men was in this relationship of type and status of the partner. For both civilizations, the man who underwent anal

intercourse lost his masculinity, being considered inferior, denoting that masculinity was associated with a relationship of power, strength, and domination (Antunes, 2017).

Centuries later, in the classical era of Ancient Greece, Pederasty (Sexual relationship of a pedagogical nature between an adult man and a young man) was institutionalized. This practice was based on the idea that older men were in charge of the physical, political, labor, sexual, intellectual, civil and philosophical education of younger men, that is, the relationship between people of the same sex was allowed, as long as it had an educational and citizenship character. It was, therefore, a pedagogical institution, in which the lover (*erástes*) transmitted his knowledge and citizenship formation to the beloved (*eromenos*) (Antunes, 2017; Borrillo, 2016; Neman, 2010).

It is worth mentioning that in Greece, there are some elements of internalized homophobia: machismo, heterosexism, heteronormativity and misogyny, present since ancient societies, helping to propagate homophobia over time. These elements evidence the view of the superior position of men to the detriment of women, composing the definition of internalized homophobia (Bourdieu, 2009; Rodrigues, 2004; Antunes, 2017).

In the Middle Ages, Catholicism was configured as the official religion of the Roman Empire, with this, homosexual behaviors became punishable by death. Even in the Middle Ages, the word homosexuality did not even exist, and in its place, the term "sodomite" was used. Such a conception is a product of the philosophy of St. Thomas Aquinas who for the first time referred to sex between men as "sodomy". It is observed that the formalized condemnation related to sexual relations between people of the same sex was based on religions. The biblical verses can be considered as the first moral codes that forbade what we know today as homosexuality (Antunes, 2017).

In the monotheistic religions of Christianity and Islam, the practice of sex that did not aim at procreation was condemned. The religious concepts of the time brought the idea of sex as sin, perdition, depravity and filth, and any sexual practice that did not aim at procreation was considered inappropriate and heresy. Such a way of understanding sexuality would have a profound and discriminatory impact on sexual relations that did not lead to procreation. In this way, "homosexuality" begins to stand out, and the first signs of association of homoerotic relationships with pejorative and discriminatory value are seen, triggering consequences for practitioners of their own class, such as internalized homophobia (Giumbelli, 2005).

In the modern age, as Foucault (1993) argues, the homosexual comes to be seen as a threat to the system of social functioning, family model and perpetuation of the species, so the practice of sodomy is transformed into the figure of the sodomite, that is, a criminal. The

understanding presented by the biological sciences of the time was that the subject had the body of a man in which "a woman dwelt". His psyche was feminine, so he felt affective/sexual attraction to men (Borrillo, 2010).

In this context, because of prejudice and lack of information, on the night of June 28, 1969, in the *Greenwich Village* neighborhood of New York City, the most popular bar for homosexuals at the time, *the Stonewall Inn,* was the scene of a rebellion that resulted in the beating and arrest of dozens of demonstrators. This fact is recognized worldwide as the catalyst event for movements in defense of civil rights in the current LGBTQIAPN+ community, among which the famous LGBT pride parades emerged (Carter, 2004; Mottier, 2010).

At a time when homosexuality is seen as a medical problem, the discussions fall on those who consider it a deviation. Then, in a progressive movement, George Weinberg published, in 1972, "Society and the healthy homosexual", introducing the concept of homophobia. The term quickly gained popularity and common use in political activism, representing an advance in the claim for the rights of LGBT populations and in the understanding of the prejudice to which this population was subjected (Weinberg, 1972).

Still on this movement, contrary to Freud and the current norm of the Victorian era, which had a character of concealment and sexual reprimand, Kinsey revolutionized studies and created the famous report on male sexuality "Sexual Behavior in the Human Male", in 1948. According to Kinsey (1948), "there is no aberration or deviation, it is only an infinity of practices and preferences, which no law is capable of banning". In Kinsey's studies, it was found that sexual orientation, as well as its practice, is not necessarily related to the appearance of the subject who practices them, that is, many men who had sexual relations with other men did not have an appearance related to what was considered feminine, causing a shock to society, as it had investigated unconventional sexual practices.

Sexual desire plays an important role in shaping sexual orientation. Heterosexual is the subject who fulfills the "normal" pattern of sexuality, enjoying the harmony between the biological, psychic and civil sexes, characterized by orientation to the opposite sex to his or her own (Louro, 2018). When we talk about homosexuality, we refer to a natural variation of human sexuality and the issues arising from homophobia are limited to established social, cultural and religious standards (Borges, 2009).

Thus, thinking about sexual orientations as a choice will necessarily influence the construction of homophobia. However, sexual orientation is complex and composed of biological, psychological, and social aspects. According to Kimeron (2000), some studies prove that growing up as gay can be difficult and dangerous in a homophobic society, and

this reality hinders the process of self-knowledge, quality of life, self-love and self-esteem of this social group. If there is prejudice, there will be social exclusion that can trigger mental suffering and self-flagellation. Pedro Antunes (2017) brings that homophobia is introjected in all people, regardless of their sexual orientation and gender identity. However, the greatest impact on mental health is when it affects homosexuals, receiving the terminology of internalized Homophobia.

It is observed that homophobia is classified as behavior that is disqualifying, aversive and violent against homosexuality or people who are identified or perceived as homosexuals, lesbians, bisexuals, transvestites and transgenders (LGBT), directly or indirectly (Brasil, 2016). It is a varied phenomenon in its manifestations and can be expressed in the form of comments, antipathy, contempt, prejudice and discrimination against people due to their presumed sexual orientation and/or gender identity, also using aversion, hatred, physical and/or verbal aggression and even homicides (Borges, 2009).

Most studies have consisted of looking at the impacts of homophobia on the social and personal dynamics of these individuals and research evidence suggests that, compared to heterosexuals, homosexuals suffer from more mental health problems, including substance use disorders, affective disorders, anxiety, depression, and even suicide, likely influenced by the effects of social stress caused by homosexuality being widely stigmatized (stress of minorities), which can be a risk indicator for higher rates of psychological distress and some mental disorders (Gilman, et al., 2001).

With regard to substance abuse, depression, anxiety, and other comorbidities, several studies prove that compared to heterosexuals, homosexuals are more likely to develop mental and physical health problems. High levels of internalized homophobia are associated with high levels of development of psychiatric problems. Gay men develop coping strategies characterized by self-repression of feelings, control of behaviors, and ways of disguising impulses. As a result, there is the emergence of feelings of loneliness, fantasies and suicide attempts in adolescence.

Among the factors pointed out as responsible for this pattern, homophobia and all its consequences is the most evident. In an attempt to alleviate the symptoms of anxiety and depression caused by the suffering imposed on gays (internalized homophobia), substance abuse becomes a powerful and dangerous ally of these. However, it can result in a number of physical and mental health problems, including chemical dependency, overdose, and even suicide.

IMPACTS OF HOMOPHOBIA ON THE MENTAL HEALTH OF HOMOSEXUALS

According to Allport (1954, p 142), the relationship between the negative consideration of others and the harm to this minority is evident. According to Weinberg, homophobia is conceptualized as a fear of being in closed environments with homosexuals. In the case of being present in homosexuals themselves, he defined it as being the abomination, hatred and contempt for themselves (Weinberg, 1972).

Homophobia is a mixture of the word homo – itself and the neoclassical morpheme, "phobia" which comes from the Greek, -phobos, which means "fear", "aversion", "repulsion", "lack of tolerance" and "morbid fear" (Weinberg, 1972). In phobias, fear manifests itself in an exaggerated way. From a clinical and psychopathological point of view, phobias are part of the spectrum of anxiety disorders, with the special characteristic of manifesting themselves in particular situations. Thus, homophobia is defined as fear/aversion/repulsion/lack of tolerance/morbid fear for people who have same-sex relationships (Houaiss, 2004; Galimberti, 2010; Sadock & Sadock, 2007; Goldblum, 2017).

The idea of "fear or dread" of homosexuality has been described as "homosexual panic." It is a term originally coined by psychiatrist Edward J. Kempf in 1920, to describe a violent reaction caused by the real or imagined perception of seduction by homosexuals. Homophobia and stigmatization have consequences in private life, such as in family conflicts, relationships worn out by prejudice and the non-acceptance of those responsible leading to leaving or expelling from home, as well as in social life, which deals with all the violence and forms of prejudice that homosexuals suffer for not conforming to the binary gender norms imposed by the heteronormativity of society (Brasil, 2011).

Homophobia and stigmatization produce and reproduce a negative view of abnormality for certain groups; such as prejudiced behaviors against homosexuals. Prejudice aims to justify behaviors of social exclusion and dissociation by reinforcing heteronormative standards of conduct and behaviors that, through a socio-historical construction and determination, are considered acceptable (Finneran, 2012).

Internalized homophobia is then all the violence and prejudice experienced by homosexuals throughout their lives, which they end up internalizing, resulting in hatred and aversion against themselves (Antunes, 2017). The homosexual constantly lives under the domination of fear, guilt and shame, leading to internalized homophobia (Borges, 2009).

In this way, the individual enters a process of psychic illness, leading to the denial of their own sexuality, repulsion against their own social segment, the incessant search to change their sexual orientation can cause the tendency to enter into abusive relationships or be abusive, development of anxiety and chronic depression, substance abuse, propensity

to possible health risk behaviors, such as unprotected sex and discrimination against the LGBTQIAPN+ community itself (Borges, 2009; Lima, 2016).

Theoretically, Internalized Homophobia (HI) may contribute to decreased individuals' self-esteem, attachment insecurity, fears of intimacy, and self-doubt and self-doubt and others (Meyer & Dean, 1998). Individuals with HI are more likely to avoid long-term relationships, in order to protect themselves from possible losses and threats. In addition, it is feasible to say that HI increases intimate partner violence because some of the factors mentioned (low self-esteem, low commitment, insecurity) favor the perpetration of violence when there is interaction with their intimate peers (Capaldi et al., 2012).

According to Szymanski et al (2008), men from sexual minorities who report high rates of HI are more likely to have low levels of self-esteem, suggesting that verbal and physical homophobic bullying impacts both directly and indirectly LGBTQIAPN+ youth. That said, psychologists who work with homosexual men realize that the appearance, idealization, and performance of traditionally masculine roles serve as an element for the stigmatization of effeminate behavior in other homosexuals (Oliveira, 2020).

It was observed in three different studies carried out with homosexuals that, among the gay men interviewed, there is an appreciation of oneself and one's own appearance if there were elements that are considered masculine. This fact is related to the feeling of self-stigma (internalized homophobia) for being homosexual, that is, the culturally idealized male appearance hides his own sexual orientation. However, this has consequences for mental health and quality of life, both of which are negatively impacted, reflecting on negative feelings, such as abandonment, loneliness, guilt, shame and rejection about being homosexual (Carper, 2010; Sánchez, 2010; Siconolfi, 2009).

Taboos and discrimination also affect the dynamics of relationships between homosexual couples, and can lead to abusive experiences where there is physical and psychological violence, as well as the control of behaviors with persecution, isolation, and restriction of access to education, health, employment, or financial resources (Woulfe; Goodman, 2018).

According to Hatzenbuehler (2009), "stigma-related stressors make sexual minorities more vulnerable to emotional dysregulation." In view of this, it is found that minority stress contributes to chronic burnout by undermining functional emotion regulation strategies and the repercussions of this are maladaptive emotion regulation strategies used to alleviate the conflict between discrimination and perceived sexual orientation. An increase in psychological suffering, anxiety and depression is also observed, and all the elements mentioned are correlated with each other (Michl et al., 2013).

Thus, thinking about the impacts of homophobia on the mental health of homosexuals, it is noted that sexual minorities face specific challenges related to their status as sexual minority. Young victims of homophobia may internalize these prejudices as signs of social disapproval and condemnation of behaviors, favoring the internalization of self-stigma and increasing the impacts even on the very concept of homosexual identity (Michl et al., 2013).

AFFIRMATIVE THERAPY: A THERAPEUTIC MANAGEMENT FOR INTERNALIZED HOMOPHOBIA

Affirmative therapy is a therapeutic resource whose psychotherapeutic approach is employed by psychology professionals with the aim of developing a positive LGBT+ identity. Assuming that all sexual orientations, including homosexual and bisexual, are legitimate and not inferior to heterosexuality, this approach recognizes that homophobia and other forms of discrimination are the real problems and not sexual orientations themselves.

Professionals who use this resource understand that non-heterocisnormative existences are a positive, genuine, spontaneous, and valid manifestation of the sexuality, affectivity, and gender identity of LGBTQIAPN+ people. The approach denotes in its objectives and principles working in favor of human rights, providing a more critical reflection with the understanding of lifestyle markers in the social and personal dynamics of the different forms of prejudice and oppression to which homosexuals are subjected (Borges, 2009; Davies, 2012).

Borges (2009, p. 14) illustrates affirmative psychology as a tool for the deconstruction of internalized homophobia, whose foundations consist of "a set of theoretical assumptions about homosexuality and a clinical attitude specifically aimed at the development of a positive homosexual identity". Also according to the author:

> "homophobia, and not homosexuality *per se*, is the main responsible for many of the conflicts experienced by homosexuals and affirmative therapy comes to question the traditional views that see homosexuality as a pathology or immature manifestation of human sexuality" (Borges, 2009 p.15).

Psychotherapists who adopt this approach, regardless of their theoretical or technical orientation, convey respect for their patients' sexuality, culture and lifestyle, helping to build a healthier self-esteem in these subjects who are directly and indirectly impacted by issues related to the prejudice and oppression to which they are subjected (Borges, 2009).

From a theoretical point of view, affirmative therapy is not restricted to sexual practices, encompassing numerous psychosocial issues, closely related to gender

psychology. According to Malyon (1982), the first psychologist to use the term "affirmative therapy", states that:

> "Gay affirmative psychotherapy represents a special body of psychological knowledge that questions the traditional view that homosexual desire and fixed homosexual orientations are pathological, using traditional psychotherapeutic methods, but from a non-traditional perspective. This approach considers homophobia, rather than homosexuality itself, as the most important pathological variable for the development of certain symptomatic conditions found in homosexuals."

Based on this assumption, the neutrality of therapists, prescribed by most psychology schools, being a totally traditional view, should not be applied to gays due to the history of oppression and exposure to negative messages about homosexuality to which they have been subjected throughout their lives, so affirmative therapy becomes an attitude that must be aimed at and developed within a therapeutic setting, constituting a value that is manifested through the behavior of care, attention and appreciation of the therapist for the homosexual patient (Isay, 1998).

In the book *Pink therapy: a guide of counsellors and therapists working with lesbian, gay and bisexual clients* , organized by Davies and Neal, the concept of respect and care to be observed in affirmative therapists who care for homosexual patients was deepened, in summary, the conditions are:

> "Respect for the personal integrity of the patient, remembering that homosexuals have a history of oppression that makes them very vulnerable in the power relationship (transferential relationship) with the therapist. Respect for the client's culture and lifestyle, and it is necessary for the therapist to seek to know the diversity of lifestyles and subcultures of the gay and lesbian communities. Respect for their own beliefs and attitudes, that is, the therapist must be willing to examine their own prejudices and beliefs about sexual orientations different from their own and, in certain situations, be able to recognize their inability to care for homosexual patients, so that there is no attempt to mold and fit a certain behavior of the client into a category of "dysfunctional" with reference to a psychological approach chosen to perform their function professional" (Davies, 2000).

Still regarding the therapist's attitudes, Joe Kort, psychotherapist and author of the book Gay affirmative therapy for the straight clinician: the essential guide

> "There is nothing intrinsically wrong with being gay or lesbian. The problem lies in what homophobic and homoignorant society and heterocentric therapies do to gays and lesbians. Living in a culture based on shame creates a variety of behavioral and psychological disorders. Affirmative therapy focuses on repairing these disorders, helping clients move from shame to pride" (Kort, 2008).

In this context, these mechanisms of oppression can be so harmful as to cause a confusion between sexual behavior and identity, that is, the homosexual himself does not

describe his sexuality in a way that is congruent with his behaviors and fantasies. Even though there has been the depathologization of LGBT+ experiences, health professionals continue to act against the guidelines and the code of ethics of their professions that aim to affirm human rights, for example, as estimated by the Code of Professional Ethics for Psychologists (CONSELHO FEDERAL DE PSICOLOGIA, 2005, p. 7):

> "The psychologist will base his work on the respect and promotion of freedom, dignity, equality and integrity of the human being, supported by the values that underpin the Universal Declaration of Human Rights. II. The psychologist will work to promote the health and quality of life of people and communities and will contribute to the elimination of any forms of negligence, discrimination, exploitation, violence, cruelty and oppression".

With this, it is worth remembering that it was in this context that affirmative psychology began to develop, with the notion that it is not enough for the therapist to be "open-minded" and well-intentioned, he needs to know the demand closely, the social context and the challenges faced by an LGBT+, understanding preparation, study and interest as primordial points (Kinsey; Pomeroy; Martin, 1948).

For affirmative psychologist Joe Kort (2008), it is necessary to organize the mess left by the ghosts of past therapies that still plague current sessions when clients are exposed to archaic and outdated ways of thinking on the part of their therapists. By acknowledging and confronting the "ghosts" of past therapies, therapists can create a more welcoming and safe environment for their LGBT+ clients, promoting emotional and psychological well-being, and helping them achieve greater authenticity and fulfillment in their lives (Perucchi, 2014).

These therapies assume that the affections and sexuality of these people are not developed, as their focus was on the search for causes and remission of conditions considered pathological without considering or reflecting general aspects of the life and daily life of LGBT+ people, such as their family relationships, health, career and intimacy (Borges, 2009).

FINAL CONSIDERATIONS

There is a direct relationship between internalized homophobia and difficulties in emotional dysregulation, causing the perpetration of violence within a relationship between intimate partners of the same sex. This abusive dynamic is fed by the heterosexist context and the stigma internalized throughout the life of a homosexual, that is, the experiences of stress and internalized homophobia itself contribute to the decrease of adaptive strategies of emotional regulation and the decrease in the quality of relationships, which, in turn,

increases the risk of controlling behaviors of isolation as a way to avoid contact with uncomfortable emotions.

Discrimination related to the status of social minority creates a double risk for the development of mental illnesses, even more so when psychological therapies do not validate the feelings of this population and/or focus only on reducing symptoms. Therefore, it is necessary to understand that minority stress considers that the psychological suffering of the LGBTQIAPN+ population is caused by stigma related to sexuality, in this context, communities begin to have behaviors of concealment of sexual identity, compulsive sex and substance abuse to mediate high levels of stress and fear of rejection, However, several mental health problems can arise, such as addiction, depression, social isolation, interpersonal difficulties and a sense of intrinsic low self-esteem.

If the psychologist does not have an expanded and updated clinical look at issues involving sex, gender and sexuality, there will be no acceptance and validation of the life history and feelings of these individuals, so the professional will lose the patient's real demand. In psychology, social stress is directly associated with disabling consequences and a higher risk of developing mental health problems. Stressful conditions, such as growing up in risky family environments, make a person unable to regulate emotions.

In relation to psychological therapies, minority stress seems to play a significant and useful role in understanding the possible steps in the treatment of a homosexual patient in a series of therapeutic traditions, such as Cognitive Behavioral Therapy (CBT) and Acceptance and Commitment Therapy (ACT). However, it is necessary to have a specific direction so that there is a significant reduction in psychological suffering on the part of these patients. It can be concluded that prejudice influences several psychiatric conditions due to the way of being and how each individual deals with discrimination and internalized homophobia.

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INSURANCE CONTRACTED TO PAY OFF INDEMNITY DEBTS FOR HARASSMENT THAT OCCURRED IN THE WORKPLACE: A FORM OF COMPLIANCE

https://doi.org/10.56238/sevened2024.031-032

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ABSTRACT

Compliance has been increasingly established as an institute that leads to the sustainability of the company concerned with its future. Setting rules, worrying about adapting to the rules of the legal system and anticipating possible damage to the image and unnecessary costs, promoting the well-being of your workers, can be a way to remain stable in the labor market. This article studies communication as a form of compliance to avoid harassment practices and the contracting of private insurance to prevent harassment from taking hold and destroying the work environment, and consequently, causing irreparable damage to the company. Even repudiating the practice of harassment, it can occur and the simple contracting of insurance can lead to the safety of the work environment, which should always be healthy for the worker. It is concluded that the contracting of this type of insurance, which is not yet common in Brazil, could lead to fewer lawsuits to request compensation as a result of harassment, harassers who are more reported, avoiding new victims and sustainable profit.

Keywords: Compliance. Harassment Indemnity. Moral and Sexual Harassment. Harassment Insurance.

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INTRODUCTION

There is already talk about corporate social responsibility and there are companies that are adept at this reality, with a view to internal and external customer satisfaction. As an appendix of ESG - *Environmental, Social and Governance, compliance, when practiced, can in several ways improve the performance and image of the corporate world, as long as it is concerned with adapting to the legal system.*

Creating transparent and accessible rules, having effective and efficient communication, makes it less likely that errors occur in the company's environment, especially harassment. Such crime, committed in the workplace, makes it sick, making its workers need to leave and even leave their posts permanently because they cannot stand the actions and gestures that may characterize it.

A work environment observed by the employer, careful not to be hostile, should be the goal of every employing institution. If the company makes it clear to its internal and external public that it values the quality of life of its employees, linked to the dignity of the human person, in the work environment, it will also have numerous benefits inside and outside the company: more satisfied workers, fewer work accidents, less possibility of moral or sexual harassment and, consequently, lower costs with indemnity actions and a better image in the market.

The practice of harassment may still occur, which again goes back to the rules of *compliance*. Well-received communication, actively listening to workers in the company's environment, can avoid greater damage, such as the perpetuation of harassing acts with this or another victim(s) and even with the contracting of insurance for harassment, large lawsuits for compensation as a result of harassment can be avoided.

The general objective of this article is to study insurance for harassment as a form of *compliance* and maintenance of a healthy environment for all workers in a corporate environment. In the specific objectives, we will analyze whether *compliance* translates into a good tool to support a good work environment, with effective and efficient communication. We will see what is the model of a good work environment to have a good workplace and if the idea of contracting insurance to cover compensation as a result of harassment practices is already practiced and can be a form of *compliance*, generating a good work environment.

The hypothesis launched is that when the corporation invests in committees concerned with compliance with standards, that is, in *compliance*, it will have clearer rules and tools to achieve a healthier work environment for all and that, even if the practice of harassment still occurs, if the company is concerned about contracting insurance to cover

such practices and the damages resulting from it, The consequence of this is a more sustainable company.

The methodology used was bibliographic research in articles, news, international jurisprudence, written books and e-books. As for the approach, the research is qualitative, in which it seeks to evaluate the theme and its nuances, deepening the concepts and verifications.

ESG (ENVIRONMENTAL, SOCIAL AND GOVERNANCE), COMPLIANCE AND COMMUNICATION AS COMPANY RESPONSIBILITIES

Labor law in Brazil is regulated, among other norms, by the Federal Constitution, in its article 7, which establishes minimum rules to be complied with. These are rules that should give direction to labor law and execution by employers, due to the employment relationship, but, in addition, they should lead to management excellence for the satisfaction of their internal customers (workers) and positioning as a quality reference in the market.

Quality company management involves the satisfaction of its first customers, who are its workers, with not only compliance with existing laws, but also with the planning of compliance with excellence in relation to the work of these workers. Among other factors, knowing that the company they work for is concerned with the prevention of damage and maintains a social responsibility policy and rules, and compliance structure, is a gain when developing their daily activities.

Be aware that the company is concerned with issues such as the possibility of harassment, for example, leaving clear rules so that they do not occur, ascertaining facts for verification in case of a complaint of harassment, punishing even with dismissal for cause those who practice abusive conduct to their role within the company and, If there is damage, compensating them for the possible realization of the event, even without filing a lawsuit, it translates into a reliable environment to work in.

Labor *compliance* can be the salvation to avoid large property damage in the corporate environment. It will draw up daily rules so that inappropriate actions do not turn into greater damage in the future. A well-defined work environment, with compliance with labor rules, can avoid work accidents, avoid unnecessary demands, and can avoid actions that may cause moral and sexual harassment.

With the publication of the Anti-Corruption Law (No. 12,846/13), much has been said about compliance with the laws in companies and even more about integrity programs, from Decree No. 8,420/2015, which deals with integrity programs. Although they are not the

same, integrity and *compliance program*, the Office of the Comptroller General of the Union understands that, according to article 41 of the aforementioned Decree, they ended up having connection points, but being a *broader compliance* program because it deals with several areas of the same company, in which an integrity program can be incorporated. (Comptroller General of the Union, 2015, p. 06).

The constant concern to comply with legal and ethical determinations makes *compliance*, in addition to seeking improvement, the sustainability of economic activity with respect to natural resources, professional governance and the quality of life of workers. In the corporate environment, the well-being of workers should be sought with customer satisfaction, without forgetting the greater good, which is the development of activities with the quality of being in a safe environment.

In order to have a more concerned, organized, planned management and in the daily search to be in accordance with legal precepts, we talk about corporate governance, whose concept has also been pursued by several institutions. "This more general concept of governance focuses on the possible mixtures of agents that can govern more efficiently" (Peters, 2013, p. 29). Good governance outlines the goals it wants to achieve, involves the participants, makes clear the desired objectives and identifies the means to achieve the goals. It is based on four elements, namely, the establishment of goals, the coherence so that these goals can be met, the implementation and the accountability and evaluation of the project, whether successful or not, so that it can continue on the right path or reshape the path (Peters, 2013).

The biggest problem occurs when one agent acts for another, and there are conflicts of objectives, such as employee and employer, when it is necessary for the principal to act firmly to establish a structure of incentives and monitoring aimed at aligning interests (Chiarello and Scalisse, 2019, p. 367). The concept of governance is not a closed idea, without questions or something to be added, but what there is consensus is that it is based on the search for compliance with the legal system in which the organization is subject and the improvement of interpersonal and power relations (Azzari, Scalisse and Chiarello, 2020).

The Brazilian Institute of Corporate Governance has formulated a document that it called the Code of Best Corporate Governance Practices and which provides, among others, the principle of corporate responsibility. This principle asserts that the economic and financial viability of corporations must be valued, to the point where negative externalities to their businesses are reduced and positive ones are increased, "taking into account, in their

business model, the various capitals (financial, manufactured, intellectual, human, social, environmental, reputational, etc.) in the short, medium and long term. (IBGC, 2018)"

As part of the governance of excellence, there is *compliance,* which derives from *to comply*, and translates into complying, being in agreement, in conformity, and means, within the parameters of governance, as being the adaptation to what the legal norms and regulations determine, to carry out planning, outline flows and guidelines for the constant search for compliance with the norms (Florêncio Filho and Zanon, 2019, p. 417). Among the rules and regulations to be complied with, there is the labor field, which has a voluminous collection of federal laws, administrative acts of the Ministry of Labor, such as Ordinances and Regulatory Standards – NRs, in addition to specific state standards, Collective Labor Conventions and Collective Labor Agreements, individual employment contracts and company regulations.

The concern to adapt to compliance with legal and regulatory rules must go through principles that must govern the company's activities, such as the fundamental of human dignity (art.1, III), which is the guide for all decisions. Decree 9,571/2018 brings national guidelines on business and human rights, which must be complied with voluntarily and companies that adapt to such situations will be granted by the Minister of State for Human Rights a seal of respect for human rights (art. 1, §3). In addition, the company must act in a preventive manner in its fields of activity "in order not to infringe the human rights of its employees, collaborators, third parties, customers, the community where they operate and the population in general" (art. 6, I). To be a "friendly" company of Human Rights and to go further, valuing the worker and his life as a whole.

The implementation of a *compliance* program will bring a greater probability of financial sustainability to the employer, with the reduction of risks such as labor claims with claims for compensation for moral damages as a result of moral or sexual harassment. A well-implemented and monitored compliance program goes beyond the simple pursuit of compliance, as it ends up being a strong tool for risk management.

One of the factors that must be monitored by the company for risk management is effective communication, internal to its workers and external to its customers and suppliers. Clear communication within the corporate environment reduces damage, avoiding, among other risk factors, moral and sexual harassment.

Communication within organizations is old, since since the middle of the twentieth century, the existence of internal newspapers in international companies has been registered. The communication process has undergone major innovations, especially in the pandemic period, and is no longer formed by only one sender, one message, and one

receiver. It currently presents another fundamental issue, which is the medium, vehicle or the media, which transmits the message (FIGUEIREDO, 2011).

According to Baldissera (2000), internal business communication is directed to the internal audience of organizations, especially employees, and whose main purpose is to promote maximum integration between the organization and its employees. It can be said that internal business communication is one of the ways for an organization to communicate with its priority audience, composed of its employees, with a primarily motivational function. In this way, it contributes to the development and maintenance of a positive organizational climate, which is very conducive to the fulfillment of the organization's strategic goals and to the continued growth of its activities, services and product lines (RÊGO, 2002).

Internal communication is key to building good relationships between leaders and subordinates in a company, making it possible to share messages in a standardized, simple and efficient way, in order to favor the formation of consistent and solid bonds and avoiding violent and aggressive communication, which can cause them moral damage, with the duty to indemnify.

Employees who know the pillars and the current situation of the company well tend to identify with it, dedicate themselves perfectly to the execution of their tasks, and become true collaborators, promoting the brand in a genuine way. On the contrary, the lack of effective internal communication hinders the flow of important information, interferes with the organizational climate, and facilitates the transmission of rumors and, therefore, the generation of conflicts.

Nassar and Figueiredo (2005, pp. 73-74) state that internal communication "is a tool that will allow management to make common messages aimed at motivating, stimulating, considering, differentiating, promoting, rewarding and grouping the members of an organization", since "management and its set of values, mission and vision of the future provide the conditions for business communication to act effectively". The moment, especially in the relationship with employees, is to examine how managers' interpersonal communication is going and to make it possible to listen to the employee himself, as a driving instrument of appreciation and welcoming.

For all these reasons, investing in *compliance* (setting accessible and easy-to-understand rules), especially showing how workers should treat other workers and other people who access the company, is essential to feed team spirit, keep workers satisfied and motivated and, as a natural consequence, increase productivity without harm. But if they exist, the company must also provide solutions to remedy them, also being part of compliance, as it will avoid even greater damage, such as the departure of the victim and

the permanence of the harasser, who can continue his mission of displeasure and offenses and the filing of labor claims with claims for compensation.

Effective communication is only established in a climate of truth and authenticity. Otherwise, there will only be appearance games and time waste. However, it is not enough for communication to occur, it is necessary to make sure that the content is effectively learned so that people are in a position to use what is informed (RUGGIERO, 2002).

Curvello (2008) defines internal communication as the set of actions that the organization coordinates with the objective of listening, informing, mobilizing, educating and maintaining internal cohesion around values that need to be recognized and shared by all and that can contribute to the construction of a good public image.

According to Ruggiero (2002), the quality of communication comes from some important issues: preference for communication, that is, ensuring harmony between the effectiveness and resources of all employees with the organization's objectives; opening of essential information and guarantee of fundamental inputs to employees; authenticity in the relationship between employees, ensuring teamwork; guarantee of learning to improve communication; consider the differences of each one to improve the relationship in the company, increasing the degree of help to the objectives; Balancing technology with human contact increasing team strength.

To achieve effective communication, it is necessary to appreciate and provide the opportunity to speak to the receiver of the message. It is not enough that the means used for communication are comprehensive, as well as the language is understood by everyone indiscriminately, if there is no opportunity for the recipient of the message to feel valued, we will be doomed to failure.

In cases of harassment, for example, it is necessary to have channels for ombudsman, verification of facts and punishment of the harasser, in addition to there being forms of compensation still in the corporate environment, if the facts verify the inappropriate acts. According to Shapiro (2009, p. 36), appreciation demands, in addition to gratitude, understanding the point of view of each one of those involved; o Recognize the merits in each other's thoughts, feelings, and actions, as well as understanding through words and actions.

The employer should value what the worker thinks, the tone of his speech, the context in which he is involved, as a way of understanding what will be said to him by the worker who reports an act of harassment and worrying about how to proceed when such a situation occurs. By recognizing the merit of what the other person thinks, feels or does, even if they disagree with the consideration, one gives value to the thoughts and attitudes

of the other, and can even recognize the reasons, feelings of a certain attitude. "Recognizing the merits of the other's line of reasoning requires that you really see the merit of the other" (SHAPIRO, 2009, p. 38).

Finally, the last element is the recognition of the other person's merits through understanding through words and actions, clear and correct, in an appropriate way and without exaggeration. It is necessary not only that the recognition is clear, but that the communication, the message brought is understood. "You can let a person you are working with know that you have a specific point on which you would like to receive attention to be heard" (SHAPIRO, 2009, p. 51). Contracting indemnity insurance for its workers in case of damages incurred by harassment translates into effective communication that that corporation does not admit such situations.

Thus, the corporation that is concerned with the worker, establishing in its internal policy, accessible and easily understandable standards, as a way to maintain active *compliance*, including with regard to obligations with effective, courteous and professional communication, tends to offer a safe environment to each person who passes by. Such intentions and actions reduce the probability of damage to the company, but if there is, the company should also think about how to remedy them and how to indemnify the worker who may have suffered from them, which is also a form of *compliance*.

THE COMPANY'S RESPONSIBILITY FOR A HEALTHY ENVIRONMENT

After glimpsing that the corporate world can mitigate damage with implemented *compliance* policies and with accessible and effective communication, it is now seen that the work environment in which the worker is inserted must be conducive to his well-being and quality of life, always ensured by the employer, as he is responsible for such a mission. A bad and harassing work environment makes the worker sick and will lead the employer to compensation for the damages caused.

To achieve sustainable development within the reality of the labor contract, the environment must be balanced between the conjunction of natural, artificial and cultural elements, providing the quality of life of workers and those involved, without degradation under the argument of development. This integration aims to achieve a unique environment that comprises natural and cultural resources (SILVA, 2007, p. 2). An environment complete in its balance or as well defined by Mateo (2003, p. 24), "the set of physical circumstances that surround living beings opposing the physical to the moral, and correctly acting in the continent and in the content: animals, plants and microorganisms that make up the ecosystems".

This concern with the environment, in fact, had as its first stage, in 1972, the International Conference on the Environment, in Stockholm and since then, the subject has only taken higher flights. In 1987, at the two conferences on the United Nations and Development, there was a need to adopt a new development strategy, broadening the concept of sustainable development. Later, in 1992, there was the United Nations Conference on the Environment and Development – Rio 92, in which the Stockholm principles were ratified. Among these, Principle 1 was seen, which says that "human beings are the center of concerns related to sustainable development. They have the right to a healthy and productive life in harmony with the environment."

Since then, a balanced environment, which provides a healthy life, as a source of sustainable development, has not ceased to be desired. It was a matter of making knowledge, so that it could be implemented, and help solve existing environmental problems. In Brazil, the Federal Constitution of 1988 brought an entire chapter dedicated to the protection of the environment, (art. 225), which had not occurred in previous Constitutions, bringing a protected environment as a set and not just a natural resource. The Federal Constitution of 1988 also elevates the right to a healthy environment to the category of fundamental human right, when it provides for the right of action for damage to the environment, in article 5, LXXIII.

In reality, to take precautions is to analyze, to see the possible mistake yet to be made and, when verifying this possibility of non-conformity, to take action so that the mistake does not come to fruition. In the environmental sphere, precaution requires a change of action, directly implying a change in the way economic activity is developed (DERANI, 1997, p. 166), which includes the vision and possible change in attitude of the corporate world, in what is not adequate to the legal and ethical in the conjunction of economic and environmental balance, included in the latter, that of work.

It should be remembered that article 7 of the CF/88, more precisely in item XXII, which brings a minimum level of protection to workers, asserts the "reduction of risks inherent to work, through health, hygiene and safety standards", which shows the concern for workers, permeating all the principles of labor law, social values and especially for the dignity of the human person. When, therefore, environmental damage occurs, all citizens lose quality of life and, therefore, also the worker.

Thus, it is observed that there should be no corporate solution that does not take into account economic development, but also the healthy environmental heritage for the next generations, along with the well-being of the worker. There will be no quality of life, considered a fundamental right, if there is no interaction between the work environment and

the external environment, both healthy, without losing the company's focus, which is profitability.

The degradation of the natural environment has a direct impact on the quality of life of workers, as well as the possible diseases acquired by them from the performance of their activities in the unhealthy work environment, since both debasements are inserted in the same economic and social context. It is no coincidence that the Constitutions subsequent to the Stockholm Conference of 1972 recognized the balanced environment as a fundamental right among the social rights of man (SILVA, 2007, p.69-70).

In order for this work environment to be balanced and always in accordance with the well-being of the worker, the employer must be vigilant in the attitudes of its workers and managers, in order to avoid the environment that makes it sick. The environment should be as healthy as possible, as it is the employer's responsibility with the obligation to indemnify in case of illness of the worker.

The work environment is not limited only to pre-established and legal contractual labor standards, but enters the legal and systematic system of Environmental Law, which has a characteristic of transversality and multidisciplinarity. It can be said that the work environment is everything that surrounds the worker, including social, psychic and physical factors, granting him conditions for full development. "In the environment, it is possible to fit practically everything, that is, the physical, social and psychological environment; in fact, the entire environment outside the organism, which affects its integral development", (PADILHA, 2011, P. 241)

Thus, Environmental Law crosses the entire legal system, and there is no rigid delimitation of relevant regulations, and it is no different with Labor Law. This correlated relationship entails the obligation to observe Environmental Law in each of the other branches and activities exercised by law, making the work environment protected by Environmental Law, avoiding any form of degradation and, therefore, also protecting the worker.

What is tried to be protected is the "working man", and, therefore, one cannot dissociate himself from the other, even if he performs the work activity. There will be no completeness of the human being, for the good exercise of his activities, if the environment is not healthy and providing him with conditions of quality of life (FIORILLO and RODRIGUES, 1997, p. 66). Man and nature complement each other "Indeed, as the epigraph quoting Karl Polanyi suggests, not only are we part of nature, but labor is also a key relation that constitutes the socio-ecological system" (ZBYSZEWSKA, 2018, p.11)

The worker's environment as "the interrelation of the human labor force (energy), and his activity in the economic plane through production (matter), affecting his environment (ecosystem)" (PADILHA, 2010, p. 377), is intrinsically linked to the conception of the natural environment that involves the relationship of ecosystems in the interrelation of living beings.

And regarding the quality of life, the importance given as a social factor to the worker coincides, both as a purpose to be pursued by Environmental Law and by Labor Law. Although both branches have the Industrial Revolution as their starting point, in the labor field the damage always manifests itself quickly in the worker, which demanded more energetic, almost immediate regulatory measures. In Environmental Law, on the other hand, the damage would take longer to appear as a scarcity of natural resources (FIGUEIREDO, 2007, p. 19-20), which led to the late concern of the subject.

In addition, a responsible company should be concerned with strict compliance with the laws, but not only. It should go further and ask itself what it can do more, within its core activity, for society in general, and improve relations, activities and the environment. It should be concerned with business ethics, with a focus on economic and socio-environmental development, which will surely lead to sustainable profitability (RIBEIRO and DINIZ, 2016, p. 17)

Currently, companies are concerned with Corporate Social Responsibility in their environments, which has ethics as a member of the concept. It was realized that, "in addition to being an ethical issue, CSR can be done strategically to have a positive impact on the company's core activities, thus generating greater return to the company in the medium and long term." (PUPIM, 2013, p. 26). It is about acting for the worker (social issue), for society (environmental issue) and for the company itself, which will inspire good internal conduct and a feeling of greater satisfaction in its internal and external customers with greater profitability (financial issue).

Such a decision cannot lead to a worsening of the company's income, but this index cannot be analyzed only immediately, because profitability, as already demonstrated here, may come in another guise and perhaps not at the first moment (first semester, for example). To the point where one of the advantages of telework at the societal level is "reduction in pollution levels due to the lower flow of vehicles circulating daily" (FARIA and LOUREIRO, 2021, p. 3), there is also a more environmentally protected and more satisfied worker, complete in his existence.

The fact is that the work environment should be as healthy as possible for the worker, as it contributes to the dignity of the human person. Dignity translates into a moral value that is naturally correlated to the person, manifesting itself in the will to live and that

requires respect from other people (MORAES, 208, p.22), making up an invulnerable minimum that legal systems must ensure.

In this way, a safe work environment cannot be a merely business analysis. It must take into account the dignity of the human person so that acts of harassment (among others) do not allow acts of harassment to occur (among others), for example, and, if they still occur, that the employer can have actions and compliance rules that allow the victim's human dignity to be restored and allow the work environment to continue to be a safe and pleasant place.

HARASSMENT AT WORK, THE DUTY TO INDEMNIFY AND INSURANCE

In order to have a good business performance and for the company to establish itself in a sustainable environment, it is necessary that its foundation is based on three essential pillars: the environmental (as already seen by the importance of a good internal and external work environment), the social (in which we have the employee as the main actor) and the profit (because after all, the company remains profitable, if it is not a philanthropic entity) (ANTONIK, 2016).

The importance of *labor compliance* in the corporate environment, with well-defined rules, providing a safe environment for the worker, translates into mitigation or non-existence of damage to employees, and, consequently, also to the employer, which will maintain the profit margin (third pillar) safely. However, if there is still an abusive relationship between the employer and the worker, or even between workers, there may be damages and compliance must also involve a policy of immediate compensation still in the work environment, without the need for contractual termination and the worker having to seek the judicial bodies to request compensation.

The company will be able to dedicate itself to avoiding damage with a sector focused on the conformation of standards, in constant thought and vigilance and still come across actions by its employees or managers that may constitute harassment. After all, harassment, also known as *mobbing*, psychological terrain or psychoterror (ALKIMIN, 2010), is characterized by the reiteration of acts, words, or even omissions, implicit or explicit, that destroy the victim's human psychology, being practiced by one or more people. A process of psychological destruction of the victim.

Such a situation, although it must be monitored by the employer, can sometimes occur even in the extension of the work environment such as hitchhiking, or only in the presence of victim and harasser, which does not allow the company to intervene in setting standards and compliance surveillance. Thus, it is necessary for the company to take

precautions to remedy the damages that have occurred, such as taking out insurance to indemnify the victim of moral damage and without the need to file lawsuits (labor claims).

Usually, by trying to shake the victim's psychological state, it ends up bringing diseases such as depression or panic syndrome, but there are also physical pathologies linked to harassment, which can cause even more aggravated damage such as heart disorders, alcoholism, *burn-out*, among others (THOME, 2009). In short, harassment, in addition to weakening the worker, will end up turning against the employer, as it will cause the worker's leave and possible compensation for bad marriages.

The fact is that cases of moral and especially sexual harassment have become more common over the years and already at the end of the last century and the beginning of this one, there are reports of an increase of almost 50% in the USA (CATLETT and GRAY, 2003). Thus, there was no other way but to think about taking out work insurance that also covered moral damage as a result of moral and especially sexual harassment.

Much of this explosion was due to two well-known cases in the US, which were widely publicized and possibly motivated other people to seek compensation for the same purpose. These were the cases of Anite Hill, who accused Supreme Court Justice Clarence Thomas, as well as the even more well-known case of Paula Jones who accused former President Bill Clinton of acts of sexual harassment, in the late 90s.

Another very important case to raise awareness was what happened to Bill O'Reill, host of *The O'Reilly Factor* and who was sued along with the companies *News Corporation, Fox News Channel, Twentieth Century Fox Film Corporation* and *Westwood One, Inc*. (DUNCAN, 2005). In this case, they were sued for sexual harassment both for acts and words that occurred in person and for those uttered over the phone.

It is questioned whether even if there are transparent rules for repudiating acts of harassment, or channels for reporting practices of acts contrary to the company's policies, these acts can still occur. It was seen that keeping the work environment balanced, providing the environment of nature as healthy as possible, along with rules that can prevent acts of harassment, help a lot to prevent them from occurring. And that is the intention. But if they occur, the company must also act quickly to try to remedy the damage and reduce the damage to the victim's personality, as well as to try to reduce compensation expenses.

In the process in which O'Reill was involved, some graphic allegations were disseminated *online* and everyone quickly had access to them (DUNCAN, 2005). The terms of the agreement signed, however, were confidential, which did not prevent it from being known or speculated that it occurred in several million dollars, which in addition to having

alerted people even more about the matter, which was an asset, may have damaged the company's image and taken a few years to recover or has not yet occurred.

In the face of these events, companies warned that they would need insurance to cover this type of episode, and then the *Employment Practices Liability Insurance* or "EPLI" policy emerged. Such insurance has only grown in the USA, with the Federal basis for indemnity actions, Title VII of the Civil Rights Act of 1964 (but which were expanded to allow indemnity actions for such purposes, since before they only allowed injunctive relief) and also some state laws such as the New York State Human Rights Law–N.Y. Exec. Law §290 *et seq*., (DUNCAN, 2005).

In Brazil, the Civil Code regulates civil liability and the Consolidation of Labor Laws, the employment contract with an employment relationship, so that cases of sexual and moral harassment generate compensation for both material and moral damages, the latter being able to reach the ceiling of fifty workers' salaries, in cases considered very serious.

In 2001, here in Brazil, a law was published that deals with the subject of sexual harassment, when the crime ceased to be only illegal embarrassment to be typified as sexual harassment. The law says that embarrassment with the intention of obtaining favoritism or sexual advantage, because the agent is a hierarchical superior, when in the exercise of the function, is a crime and the penalty is from one to two years. But the CLT does not yet provide any typification.

Although there is still no regulation here in Brazil on sexual and moral harassment in the labor field, this does not mean that it is not necessary to compensate the victims of this crime in the workplace. On the contrary, both one owes and indemnifies, provided that some requirements characterized by civil liability provided for in the Brazilian legal system are met.

The victim may file a labor claim, as it is enough to prove the unlawful object that occurred (the crime), the damage (constraints, when in the presence of other people, and sometimes even physical and mental illnesses due to the repeated act and committed in exhaustion until the illness) and the causative agent (this being a hierarchical superior and even peers already accepted by the jurisprudence). The civil liability of the employing company is then characterized, which is the one that must provide a safe work environment for its workers.

Insurance with only general labor clauses, which are called Commercial General Liability Policies – CGL, in the USA, arising from work contact, insures, for the most part, only physical aggression, or even defamation, but not those expected or even intended. CGLs may also have coverage for personal injuries, such as false arrests, detentions, but

what we have is that there are still discussions in the American Courts about what would and would not be included in the coverage of the policy, because personal injuries arising from employment, not having occurred in the scope of work, for example, may not be insured.

As for the Directors and executives, it is stated that "directors and officers are covered for their wrongful acts, and the corporation is reimbursed for indemnifying them. Most of these policies exclude coverage for personal injury or bodily injury." (DUNCAN, 2005). Thus, even moral damages that may be incurred due to harassment should already be covered and the corporation should be compensated for possible compensation that it has to pay.

What can be observed is that the coverage of general and employment policies has gradually included issues and situations of repair, so that today we have issues such as: wrongful termination, discrimination, defamation, harassment, negligent hiring, among others also allowed by American state laws (DUNCAN, 2005).

But what is most certain is that when the policy is not EPLI Labor Practices Liability Insurance, it will rarely cover damages incurred by harassment in the workplace. General clause policies tend to exclude harassment in the workplace, which means that the company is always uncovered in relation to this issue, if it does not have the specific policy for the case.

The jurisprudence of the American courts is proof of this, as they deny that umbrella insurances that cover generic clauses should not even cover issues related to moral harassment in employment contracts, since there are specific policies for these cases. If the company wanted coverage for harassment cases, it should have contracted specifically (EPLI) (*Truck Insurance Exchange v. Gagnon*, 33 p.3d 901, 906 (N.M. Ct.App. 2001).

There is still much to be said about the insurance currently carried out to cover claims for sexual harassment in the US (and there is talk because there is no news of these in Brazil). What we have is that there is currently real consumption of these products due to the large pecuniary amount that is attributed to indemnities of this nature in that country, especially the sexual one. It is a specific product that seeks not to decapitalize the company with an amount not foreseen in the budget, which may destabilize and even make it impossible for the company to operate depending on the amount set as compensation.

Thus, the ideal would be for companies to be able to offer their employees safe work environments, even if they were better in a teleworking regime. And that in order to always provide better working conditions, they can have a specific sector taking care of compliance with the laws and seeking to monitor compliance with established and

transparent internal rules for all. And, if there are still cases of harassment, which may extend the company's compliance to compensation, without filing a lawsuit, but only with internal verification of facts. Such concerns and attitudes can lead to responsible and sustainable profit.

FINAL CONSIDERATIONS

It was seen that there are ways to have a sustainable profit within the business environment, which is not only with an emphasis on gain, because it is worthless to earn and not be able to retain values for growth and sustainability of the business. What is most cautious is the adaptation to the legal system in place, and companies should always seek this framework for survival.

When *compliance* becomes a priority for the company, always seeking to have trained personnel for it, specific objectives, goals to be achieved and budget, there should also be a more organized company, with less wasted cost due to fines, fewer convictions due to administrative and judicial proceedings. And when it comes to compliance, as a member of Corporate Social Responsibility, there are not only precautionary rules for the damage to occur, but also quick solutions so that the damage does not increase, if it was inevitable that it would occur.

In labor law, there is a lot to adapt in a company. Among these, the work environment should be a constant concern of the employer, since it is responsible for providing a healthy and safe environment for the worker, as well as having the duty to supervise that the worker always complies with the rules dictated by the state, to also keep him safe.

The work environment, whatever it may be, on the premises of the company or even at the worker's home, must provide him with quality of life in full harmony with the dignity of the human person, which is so inherent to the worker, in the exercise of the function. The work environment, whether internal or in contact with nature, dignifies the exercise of daily work and when molested, brings illness to the worker, physically or even morally, or psychologically.

Harassment in the workplace, whether moral or sexual, can kill the worker, all at once (there are many cases of worker suicides due to overwork due to harassment) or little by little with the emergence of pathologies such as depression, panic syndrome or *burn-outs* and heart diseases.

The employer who cares about his human and material assets and invests in the company's compliance, creating transparent and accessible rules for repudiation and non-acceptance of harassment, should have fewer problems related to this issue. But situations

related to this problem may still arise, as they will not always be in control of the relationship between workers and managers, such as in social media messages or voluntary rides between them.

In these cases, the company may be penalized in compensation actions for moral or sexual harassment, without even knowing what happened, until the moment of knowledge of the lawsuit filed by the victim. And being in compliance with the laws can be much more than having an ombudsman channel, for example, but to solve the problem so that the work environment is harmonious again without the victim having to leave the company because he can no longer support the actions or gestures of the harasser.

If you have contracted insurance with a policy that protects these situations as a result of an employment contract, you can designate the compliance sector to investigate reported facts and indemnify the victim. Upon knowing that the company maintains this type of policy, the harassed worker will certainly be able to seek the company to be compensated even before filing a labor claim or even having to leave his work environment, the harasser being the one who must be terminated and no longer practice any unlawful act.

In this article it was seen that in the USA, since the beginning of the century, this practice has already been taken as true, which may have even reduced damage to the company's image, because when disclosed, even if without the intention of harming, it takes a long time to have the company's image added back to good practices. In several lawsuits, it is not accepted that these indemnities are covered by genetic policies, since there are already specific policies for these situations.

In Brazil, there are still no rules within labor law that provide for harassment and its compensation, but it would be interesting to start the practice of contracting these insurances, including with a possible provision in Collective Labor Agreements, as the result of collective bargaining between unions. Possibly, there would be a lower number of labor complaints, healthier work environments, more satisfied workers, more denounced harassers and the company's image preserved, with consequent sustainable profit.

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ENCOURAGING CREATIVITY IN STANDARDIZED POSTGRADUATE PROGRAMS WITH PPW

https://doi.org/10.56238/sevened2024.031-033

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ABSTRACT

This article previous published at Caderno Pedagógico in 10/10/2024 DOI: https://doi.org/10.54033/cadpedv21n10-106 explores the concept of PhD by Previously Published Works (PPW) and proposes the unification of the 42 different terms currently used to describe this doctoral pathway. It also provides a very comprehensive dataset on PPW regulations. The study compares three distinct models of PPW and examines the feasibility of adopting this modality in Brazil. The research investigates the recognition of high-performance self-taught researchers by considering recent advancements in European postgraduate systems, with a focus on the United Kingdom, Norway, Ireland, and France. Two main questions are addressed: (1) whether PPW represents a viable alternative to traditional doctoral programs and (2) how this modality is implemented in the analyzed countries. The study argues that rigid and bureaucratic educational structures often limit creativity and innovation, highlighting the need for more flexible approaches in postgraduate programs. Academic environments that promote diverse thinking and encourage experimentation are better positioned to nurture excellence and creative potential. The results show that countries such as the United Kingdom, Norway, Ireland, and France have adapted their educational systems to balance quality and creativity, offering valuable insights for potential improvements in the Brazilian academic landscape. The conclusion

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emphasizes that PPW should not be seen as a shortcut, but rather as a rigorous alternative that recognizes the significant contributions of researchers who may not have followed traditional academic paths. Implementing PPW in Brazil could enhance the national academic environment by valuing the substantial work of experienced professionals and fostering a culture of innovation and excellence in research.

Keywords: Previous Published Work. PhD by Prior Output. PhD by Research. Post Graduation Models. PPW.

INTRODUCTION

Rigid and bureaucratic structures in postgraduate education, which prioritize efficiency over individuality and experimentation, can hinder creativity—an essential component of research and innovation (Amabile, 1996). Such standardized approaches often restrict students' ability to explore novel ideas, engage in divergent thinking, and apply innovative research techniques (Beghetto, 2007a). Therefore, initiating open discussions about how to balance quality and consistency with fostering creativity is crucial (Paulus, 2000). Addressing this complex issue is vital for the future of teaching and research (Craft, 2003), as the most effective solutions to intricate problems are likely to come from minds encouraged to think beyond standardized frameworks (Sternberg, 2003).

Achieving a balance between quality and fostering creativity in postgraduate education requires a critical re-evaluation of program structures and objectives (PAULUS, 2000). It involves creating environments that encourage diverse thinking, experimentation, and student-driven exploration of personal interests (Beghetto, 2007b). The learning process should be seen as an organic, ongoing dialogue that fosters curiosity and critical inquiry, rather than focusing solely on predefined outcomes (Bain, 2004). This transformation demands a shift in mindset from both educators and students, alongside a review of existing policies and practices. Cultivating creativity is most effective when the educational environment actively integrates and values it across all aspects of learning (Bain, 2004). Creativity is not just an innate talent but can be developed through practice and stimulation (Csikszentmihalyi, 1996). Therefore, postgraduate programs must offer opportunities to explore creativity across various disciplines and contexts, which might include interdisciplinary projects, collaboration with industry professionals, and dedicated spaces for experimentation and innovation (Amabile, 1983).

The roots of standardization in educational systems can be traced back to the Industrial Revolution, when education transitioned into a perceived instrument for workforce development (TYACK; CUBAN, 1995). This shift led to a system designed to produce uniformity in student outcomes, ensuring the acquisition of a common set of skills and knowledge deemed necessary for specific industrial roles. This emphasis on standardization extended to graduate studies, where specialization and deep focus within a singular discipline became the norm. This model aimed to cultivate highly skilled experts in various fields, fostering societal advancement through specialized knowledge (KERR, 2001). However, concerns are rising regarding the potential limitations of this approach. Critics argue that an overemphasis on standardization can stifle creativity and critical thinking, skills increasingly valued in the contemporary world (GRAESSER, 2012).

Therefore, educational systems must undergo adaptation to meet the demands of the contemporary world. This necessitates embracing a more holistic approach that fosters creativity and encourages students to engage in critical thinking beyond established frameworks. This does not necessitate the complete abandonment of the standardized model; instead, it requires the integration of methodologies that nurture creative expression and interdisciplinary exploration, allowing students to develop their creative problem-solving skills (ROBINSON, 2011). Furthermore, it is crucial to recognize that creativity is not the exclusive domain of artistic or related fields; it can be productively applied across diverse disciplines, from scientific research to technological innovation.

Within the realm of higher education, the concept of the "Research Doctorate" stands out as a pivotal subject worthy of in-depth exploration. This post-baccalaureate doctoral degree signifies the pinnacle of scholarly engagement, culminating in the successful defence of an original dissertation. At the heart of the Research Doctorate experience lies the independent production of novel research, often manifested as a written dissertation or the orchestration and execution of a groundbreaking artistic or academic project. Highly prized within academia and various industries, the Research Doctorate cultivates a robust foundation in in-depth research methodologies and fosters significant contributions to a specific field of knowledge. Ultimately, graduates of Research Doctorate programs are recognized as experts within their respective domains, equipped with the independent research skills, critical thinking abilities, and problem-solving prowess necessary to navigate complex challenges at the forefront of their disciplines (LONDON METROPOLITAN UNIVERSITY, [s.d.]).

British universities, with their longstanding tradition of academic excellence and innovation, have in recent years embraced a more interdisciplinary and creative approach to postgraduate programs. This shift has resulted in a diversification of research and academic work, alongside the development of novel methodologies and approaches across various disciplines. This trend is further supported by investments in collaborative spaces and learning environments that foster the exchange of ideas and nurture creativity(BLACK, 2021) (EVIS, 2022).

The United Kingdom offers a unique doctoral pathway through the "PhD by Prior Output" (or "Doctorate by Previous Work"), recognizing substantial academic or creative achievements accomplished prior to formal doctoral enrollment. This distinct degree pathway acknowledges accomplishments such as published books, peer-reviewed articles, musical compositions, architectural designs, or patented inventions. Assessment for this doctoral award hinges on the relevance, depth, and originality of these previous works,

alongside their significant contribution to the candidate's field of study (KINGSTON UNIVERSITY, 2024). The PhD by Prior Output provides a valuable avenue for established, experienced professionals to gain formal academic recognition for their notable achievements (POWELL, 2015).

The following sections will delve into the characteristics of these educational systems, analyzing how they have adapted to meet the evolving 21st-century demands (Marginson, 2016). Following a comprehensive literature review, a detailed examination of the methods employed in the United Kingdom, France, and Norway will be presented. This analysis will encompass the diverse terminology for this doctoral pathway and propose a unified term for clarity and cross-national comparison. . In conclusion, the paper will discuss the multifaceted benefits and challenges associated with these advancements, considering the implications for both students and society as a whole (MARGINSON, 2016).

LITERATURE REVIEW

In the Australian context, professional doctorates have continued to grow and diversify across a wide range of disciplines (Boud & Tennant, 2006). Empirical studies, such as "The Doctoral Education Experience" at Australian universities, have looked at doctoral experiences in departments that offer both traditional and professional doctorates. This paper discusses professional doctorates in areas such as education, management, law, and creative arts, commenting on the similarities and differences found between these and traditional doctoral programs.

Three specific areas are discussed in Lester (2004) and Maxwell (2003): student recruitment and selection, the choice made by professional doctorates, and perceived career benefits; program structure and organization, including research topic identification; and the perception of the status of professional doctorates compared to traditional ones. The conclusions are discussed within the context of governmental policy on postgraduate education and emerging literature on professional doctorates.

Doctoral education, whether traditional or professional, continues to have a significant impact across multiple levels: for students, supervisors, institutions, and disciplines. It has been argued that alternative pathways, such as the PhD by Published Work, offer significant advantages, including greater flexibility and the ability to integrate practical work with theoretical research (Park, 2007). The drive for innovation and quality continues to shape the landscape of PhD programs around the world, driving ongoing reflection on practices and policies.

While (PALTRIDGE; STARFIELD, 2023) focused his work on previously published thesis in Australia, Canada, the United States and the United Kingdom, this work focuses in more details on the United Kingdom, and compares the postgraduate systems of Ireland, Brazil, France and Norway. On the other hand, (ANDERSON; SAUNDERS; ALEXANDER, 2022) focuses his research on the thesis writing format. Already, (BADLEY, 2009) demonstrates concern about quality measurement for article-based doctorates.

These studies point to a growing trend of diversification in doctoral programs, ranging from traditional PhDs to more innovative modalities like the PhD by Published Work. The evolution of doctoral education aims to prepare future academics and research leaders capable of addressing contemporary challenges with robust and relevant qualifications. To ensure that these changes bring the expected benefits, it is crucial for academic institutions to establish clear guidelines and provide necessary support to students.

Therefore, the pursuit of innovation and the maintenance of quality continue to shape the landscape of doctoral programs globally, demanding ongoing reflections on best practices in terms of guidance and institutional support for various doctoral pathways.

Doctoral training has evolved significantly, especially with the option of the PhD by Published Work. In this context, experienced researchers in Europe, including the United Kingdom, have adopted this approach (BROWN-BENEDICT, 2008; DAVIES; ROLFE, 2009; KIRKMAN et al., 2007). Guidelines for writing a PhD thesis by Published Work vary between institutions and countries.

Another study explored supervision in the PhD by Published Work route, investigating the role of the supervisor in this context. Additionally, a symposium analysed doctoral training geared towards the future in the healthcare field, considering the trend of qualifying through published works. This diversified approach includes genres such as taught PhDs, professional doctorates, and those by published work, reflecting the growing international literature on doctoral programs.

In the Australian context, professional doctorates have continued to grow and diversify across a wide range of disciplines (BOUD; TENNANT, 2006). Empirical studies, such as "The Doctoral Education Experience" at Australian universities, have looked at doctoral experiences in departments that offer both traditional and professional doctorates. This paper discusses professional doctorates in areas such as education, management, law, and creative arts, commenting on the similarities and differences found between these and traditional doctoral programs.

Three specific areas are discussed in (LESTER *, 2004; MAXWELL, 2003): the first is student recruitment and selection, the choice made by professional doctorates, and perceived career benefits; the second area is program structure and organization, including research topic identification; and the third area is the perception of the status of professional doctorates compared to traditional ones. The conclusions are discussed within the context of governmental policy on postgraduate education and emerging literature on professional doctorates.

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These studies contribute to a broad understanding of the evolution of doctoral education and its implications for future academics, researchers, and leaders in their respective fields. By considering different forms of doctoral programs, the discussions progress towards educational models that meet the varied needs of students and the job market, while ensuring high standards of academic quality.

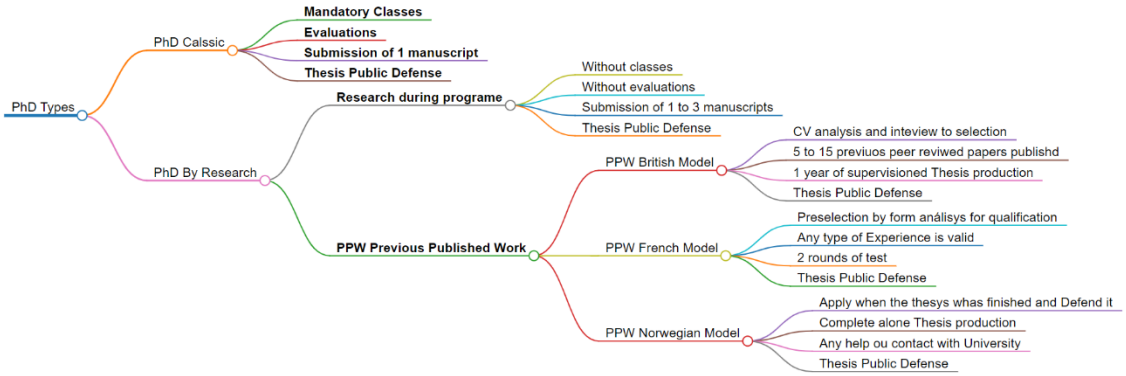
METHOD

This work adopts a descriptive-comparative study methodological approach by defining a classification of the main types of PhD models identified in the research. Figure , visually illustrates this ontology. The ontology is structured into two main types of doctorates: "Classic PhD" and "PhD by Research." The "Classic PhD" is characterized by mandatory classes, evaluations, the submission of a manuscript, and the public defence of the thesis. On the other hand, the "PhD by Research" is more flexible, involving continuous research during the program, without mandatory classes or evaluations.

This classification provides a clear and structured understanding of the different doctoral models, offering a solid foundation for analysis and comparison. The visual representation in Figure 1 facilitates the assimilation of the complexities of these models. Additionally, the inclusion of subtypes in "PhD by Research" highlights the diversity of existing approaches, such as the British, French, and Norwegian models. By establishing this ontology, the article provides a valuable framework for researchers and academics to comprehend and discuss the various doctoral modalities identified in the study.

The proposed classification not only categorizes doctoral models but also recognizes the evolution and adaptability of these models, reflecting the dynamic nature of academic research. This approach significantly contributes to the literature on doctoral programs, emphasizing the importance of recognizing and understanding the diversity of approaches in the doctoral degree attainment process.

Figure 1 PhD Types Classification and requests in last level



Source: Authors

In the following sections, we will delve into a comprehensive exploration of each PhD type outlined in the ontology, providing detailed insights into their respective structures and operational frameworks. This in-depth analysis will shed light on the distinctive characteristics of "Classic PhD" programs and the more flexible "PhD by Research" models. Furthermore, we will explore variations within the "PhD by Research" category, including the British, Brazilian, Irish, French, and Norwegian modes, unravelling the specific criteria, processes, and unique features associated with each. By examining concrete examples from various countries, we aim to offer a nuanced understanding of the global landscape of doctoral programs, emphasizing the diverse approaches employed in different academic contexts. Through this detailed exploration, we seek to contribute valuable insights to both academic discourse and practical considerations within the realm of doctoral education.

This article proposes the term PPW (Previous Published Work) to define and normalize the 44 different founded term to describe similar system around the Europe. This concept is gaining traction in the realm of academia. Notably, it recognizes the significant contributions made by individuals in their respective fields through their published work. Based on the forthcoming table, it can be observed that 83 universities have already adopted the PPW approach. Seven countries globally offer PPW-based degrees, reflecting its growing international acceptance. Furthermore, 19 of the world's top 250 universities offer PPW, indicating its credibility and value in high-ranking institutions. Remarkably, this study shows that in the United Kingdom, 75 of the top 100 universities have implemented

PPW, suggesting the significant domestic acceptance of this approach. By acknowledging the value of PPW, academic institutions are embracing the diversity and richness of professional experience, thereby revolutionizing traditional educational pathways.

The following array of titles demonstrates the breadth and flexibility of the PPW concept and its relevance in a contemporary academic context. The list is structured as [PPW variant term]: [(ranking in the country of University/ranking in the world by Webometrics captured in 2022 https://www.webometrics.info/en/Europe)] [Name of Universities that use the term].

Alternative Format Thesis: (31/323)University of Bath. **Award of Phd By prior Based On Prior Publications:** (9/2093)Technological University Dublin. **Degree of Doctor in Philosophy by Prior Publication:** (35/361)University of Liverpool. **Degree of PhD (by Published Works):** (48/634)Aberystwyth University. **Degree of PhD by Publication:**(27/309)University of East Anglia. **Degree of Phd By Published Works:** (47/617)Bangor University. **Doctor of Philosophy (PhD) by Published Works:** (60/749)Manchester Metropolitan University. **Doctor of Philosophy (PhD) on the basis of published work:** (95/1471)Staffordshire University. **Doctor of Philosophy by Previous Published Works:** (84/1137)Glasgow Caledonian University. **Doctor of Philosophy by Published Work:** (23/246)University of Leicester, (79/1047)University of Bradford. **Doctor of Philosophy on the Basis of Published Work:** (65/829)Sheffield Hallam University. **Doctor of Philosophy (PhD) By Published Work:** (45/575)Swansea University. **Doctorate by Published Work:** (71/895)University of Greenwich. **Doctorate by Published, Established and Creative Works:** (68/855)Nottingham Trent University. **Dr. Philos:** (1/98)University of Oslo, (2/202)NTNU, (3/223)University of Bergen,(9/994)University of Stavanger, (12/1884)NORD, (27/8630)MF. **Existing Published or Creative Work PhD:** (1/7)University of Oxford, (101/2135)University of Sunderland. **Higher Doctorate Degrees on Published Work:** (14/4282)National University of Ireland. **PhD (by Research Publications):**(4/41)University of Edinburgh. **PhD By Completed Work:**(93/1443)Teesside University. **PhD By Existing Published Work:** (19/1386)Leeds Beckett University. **PhD by Portfolio:**(88/1295)University of South Wales. **PhD by Previously Published Work:** (58/720)Aston University. **PhD by Prior Publication:** (29/319)University of Surrey, (44/536)City University London, (46/579)Royal Holloway University of London, (7/1303)RCSI- University of Medicine and Health Science. **PhD by prior publication/output:**(89/1359)London Metropolitan University. **PhD by prior publication/portfolio:** (76/945)Kingston University London. **Phd by Prior Published Work:**(3/383)University College Cork. **PhD by Pubication:** (103/1787)University of

Chester, 3/19)University College London, (18/185)University of Exeter, (21/206)University of York,37/391)Loughborough University,(39/420)University of Kent,(52/669)University of Portsmouth, (77/967)Coventry University, (106/1916)University of Gloucestershire,(5/660)Dublin City University. **PhD by Publication/Portfolio:** (54/700)Keele University. **PhD by Published or Creative Work:** (111/2172)University of Worcester. **PhD by Published Research:** (42/526)Heriot-Watt University. **PhD by Published work:** (6/65)University of Manchester, (10/120)University of Warwick, (12/138)Bristol University, (26/304)Lancaster University, (56/713)University of Ulster, (59/731)Northumbria University, (66/841)Liverpool John Moores University, (69/866)University of Central Lancashire, (78/973)University of Westminster, (80/1068)University of Wolverhampton, (85/1238)Anglia Ruskin University, (67/846)De Montfort University. **PhD by Published Work or Practice:** (105/1849)University of Bolton. **PhD by Published works:** (22/208)Cardiff University, (28/310)University of Sussex, (30/322)Queen's University Belfast, (32/323)University of Reading, (52/681)University of Hull, (86/1248)Napier University Edinburgh, (98/1512)University of Derby, (107/1948)University of Northampton, (108/1961)Cardiff Metropolitan University, (62/795)University of Salford. **Phd on the Basis of Prior Published Works in:** (41/521)University of Plymouth. **PhD on the Basis of Published Work:** (64/825)Oxford Brookes University. **PhD Public Works:** (74/934)Middlesex University. **PhD under Special Regulations:**(2/10)University of Cambridge. **Research Degree by Published Works:**(11/136)University of Nottingham. **Submission by Published Work:**(13/145)University of Southampton. **Thesis by Publication:**(15/148)Newcastle University Newcastle upon Tyne. **VAE:**(1/201)Sorbone Université, (2/211)Université Paris-Saclay, (8/347)Univesité de Bordeaux, (11/383)Université de Lorraine, (35/1010)Université de Poitiérs, (41/1105)Université Paris Cité, (46/1287)Conservatoire National Des Arts et Métiers.

In this study, at least three different types of PPW were identified, which are named the British model, the French model, and the Norwegian model, and will detailed below. Each of these models has specific characteristics that will be thoroughly discussed, highlighting the nuances and particularities that defines each country's approach to the concept of a PPW. We will include the Irish variant as a note and exclude the Australian and Canadian initiatives explored by (PALTRIDGE; STARFIELD, 2023).

THE PHD IN TRANSITION: HISTORICAL DEVELOPMENT AND CONTEMPORARY VARIATIONS

The evolution of the PhD credit system is inextricably linked to the broader development of higher education, driven by the escalating demand for specialized knowledge. A historical examination of this system illuminates its purpose, structure, and the factors influencing its widespread adoption.

Originally conceived as a professional qualification granting teaching licensure (GOODCHILD; MILLER, 1997), the PhD gradually transformed into a research-focused degree during the 19th century. This shift, recognizing the pivotal role of rigorous inquiry in knowledge advancement, laid the foundation for the credit-based PhD model.

The Bologna Process, initiated in the late 1990s, aimed to establish a coherent European Higher Education Area (EHEA) (MASIC; BEGIC, 2016). Building on the Sorbonne Declaration of 1998, the Bologna Declaration of 1999 outlined a framework for standardizing degrees, enhancing comparability, fostering international mobility, and implementing quality assurance mechanisms (VERGOLINI; VLACH, 2024). While non-binding, the process garnered widespread participation, ultimately involving 47 countries by 2010, reflecting the growing global challenges in higher education and research.

The analysis reveals a consistent pattern across examined countries: where research-oriented PhD programs exist, the traditional PhD is also offered. This finding underscores the enduring presence of the classic doctoral model as a viable alternative, irrespective of the program's research emphasis. Such diversity in doctoral program offerings caters to the varied needs and preferences of candidates, institutions, and societal expectations globally.

A distinctive variant often termed the "Research Doctorate" prevails in certain European educational systems (SÖDERQVIST, 2018). This model prioritizes supervised research over coursework and credits. The underlying premise is that immersive engagement in independent research under expert guidance constitutes the cornerstone of doctoral education (WISKER, 2012). Consequently, Research Doctorate students typically commence their research projects at the outset of their studies.

This approach facilitates an in-depth exploration of research interests, fostering a comprehensive and integrated understanding of the discipline (MARSH, 2018). Regular supervision provides essential guidance and feedback, ensuring the student's progress. The Research Doctorate model's flexibility empowers students to tailor their studies to individual needs and interests. Unlike predefined curricula, this model encourages exploration of research-relevant areas (LEE, 2008). While demanding, this approach offers

significant rewards. By prioritizing research, students contribute to knowledge advancement and develop critical research skills essential for future academic or professional endeavours (MALFROY, 2005). In the next subsections, we will discuss the doctoral systems from previous works (PPW) in Brazil, Ireland, United Kingdom, Norway and France.

BRAZIL

Brazil's postgraduate education is bifurcated into 'lato sensu' and 'stricto sensu' modalities (CERVO; BERVIAN; SILVA, 1996). The former, encompassing Specialization Courses and MBAs, is primarily vocational, oriented towards professional development and market demands (BARCELOS, 2000). Conversely, 'stricto sensu' programs, comprising master's and doctoral degrees, are dedicated to academic and scientific training.

The quality assurance and evaluation of postgraduate programs in Brazil are the purview of CAPES (*Coordenação de Aperfeiçoamento de Pessoal de Nível Superior*). This agency employs a rigorous assessment process, considering factors such as faculty and student research output, and available infrastructure. CAPES assigns a rating scale of 1 to 7, with programs achieving scores of 6 or 7 recognized as internationally excellent(CAPES. (N.D.)., [s.d.]).

Brazilian master's and doctoral programs operate on a credit-based system, with each credit representing a specific number of class hours. Students accumulate credits through mandatory and elective coursework, seminars, and research activities. The credit requirements vary by program and institution but typically range from 24 to 64 credits for master's degrees and 48 to 96 for doctoral degrees (SEVERINO, 2007).

Master's programs, two years in duration, culminate in the defence of a dissertation before a committee (VASCONCELOS, 2002). The dissertation requires na in-depth exploration of a specific topic, demonstrating a comprehensive grasp of relevant literature and the capacity for independent research under the guidance of an advisor.

The Brazilian doctoral program adheres to a traditional model, necessitating a prior master's degree for admission. The program spans four to five years and requires the completion of sixteen credit hours of coursework before eligibility for a qualifying examination. Doctoral students conduct research under the supervision of a faculty mentor.

Doctoral programs often afford students flexibility in credit acquisition, allowing for up to half of the required credits to be earned at other institutions. A qualifying examination is administered, wherein students present a proposed research agenda and a preliminary doctoral thesis outline to a faculty committee. Demonstrated English language proficiency, typically assessed through a standardized test or interview, is also a prerequisite. Upon

successful completion of the qualifying examination, students may proceed to the doctoral dissertation defence (FEEC-UNICAMP, [s.d.]; USP, 2023). The conferral of the doctoral degree necessitates the submission of an article to an indexed journal, regardless of prior publication status.

The doctoral thesis is a rigorous, in-depth research undertaking that demands an original contribution to the scholar's field (MORAES, 1996). It necessitates a substantial advancement of knowledge or perspective within the chosen field of study. While structurally similar to a master's dissertation, the doctoral thesis typically involves a more comprehensive and intricate analysis (SMITH; JOHNSON, 2018).

The culmination of doctoral studies is the thesis defence, a formal examination conducted by a committee, typically including external examiners (SMITH, 2010). The candidate presents their research findings and is subject to questioning from the committee, which assesses the research quality and the candidate's ability to articulate and defend their work. The supervising professor provides essential guidance in preparation for this rigorous examination, ensuring the candidate is adequately equipped to address potential challenges (DOE, 2017).

Universities possess discretion in modifying these prerequisites. For instance, some institutions may substitute a portfolio assessment for the traditional master's degree, provided the candidate can demonstrate research aptitude. However, this flexibility is infrequently exercised.

A prevalent practice involves the enrollment of special students, individuals who undertake coursework independently without formal supervisory affiliation or postgraduate program matriculation (ANDERSON, 2019). While offering opportunities for exploratory learning and skill development, this status often necessitates the accumulation of substantial credits prior to securing a supervisory role and formal postgraduate admission (TAYLOR, 2020). Balancing academic commitments within this non-traditional framework can be demanding (ROBINSON, 2021).

Special students navigate a competitive landscape in pursuit of potential advisors. This highly competitive environment underscores the critical role of mentorship. An effective advisor can significantly influence a student's trajectory, offering guidance, feedback, and intellectual stimulation (M. Johnson, 2015). Such support is instrumental to academic success.

IRELAND

It's noteworthy that universities in Ireland exhibit a high degree of autonomy, with many offering programs similar to those in the UK regarding the acceptance of prior publications (MINISTRY OF EDUCATION AND SCIENCE, 2004).

The Irish Department of Education and Science manages the Irish education system. Recently, this department began a restructuring effort, delegating tasks to regional offices and external agencies, seeking to focus on political issues and educational challenges.

The National Qualifications Authority of Ireland (NATIONAL QUALIFICATIONS AUTHORITY OF IRELAND, 2003) established the National Framework of Qualifications (NFQ), which brought significant changes in education and training in Ireland. The NFQ details the categories and anticipated educational achievements of national awards granted by universities at both undergraduate and postgraduate levels. The NFQ is a structure comprising of 10 levels that enables the comparison of qualifications with varying standards and levels. There is a diagram available on the Quality and Qualifications Ireland (QQI) (QQI, [s.d.]). Levels 6-10 in the Framework correspond to third-level qualifications (MINISTRY OF EDUCATION AND SCIENCE, 2004). Recognition for achievements in the NFQ is both national and global, supported by quality assurance measures based on legislation.

The expansion of doctoral programs can be attributed, in part, to the formation of networks among university deans of graduate schools (MINISTRY OF EDUCATION AND SCIENCE, 2004). The emphasis on skills development beyond technical expertise is evident in documents like the PhD Postgraduate Skills Declaration, which promotes the cultivation of generic and transferable skills (MINISTRY OF EDUCATION AND SCIENCE, 2004). As independent academic institutions, universities retain autonomy over curriculum design, assessment methods, and the issuance of certificates and diplomas (QQI, [s.d.]).

Admissions processes and student selection quotas are typically determined at the institutional level. Eligibility for doctoral programs, often based on a candidate's publication record (Previous Publications Workload - PPW), typically requires an honours degree and a minimum of 3-10 peer-reviewed publications (TECHNOLOGICAL UNIVERSITY DUBLIN, 2022). These publications can encompass peer-reviewed articles, books, chapters, monographs, technical reports, architectural results, and even creative works such as performances or exhibitions.

Upon acceptance into the program, students are assigned a primary advisor, and potentially a co-advisor, who are responsible for overseeing their progress and research activities. Following a year of supervision, students are expected to present a final thesis

based on their publications, adhering to the same rigorous standards as a traditional doctoral dissertation (TECHNOLOGICAL UNIVERSITY DUBLIN, 2022).

The doctoral journey culminates in an oral defence of the thesis before a committee of examiners. This committee must include at least one external member, unaffiliated with the awarding institution. The thesis and subsequent defence are designed to assess the candidate's contribution to knowledge through their publications, alongside their mastery of the field, and their acquired expertise in both fundamental and advanced methodologies and techniques (MINISTRY OF EDUCATION AND SCIENCE, 2004).

The Irish university evaluation system exhibits close parallels to the British system. This autonomy is reflected in the significant freedom granted to individual institutions in setting criteria for postgraduate studies. Notably, this extends to the selection of PhD candidates, where prior publications often play a prominent role. This emphasis on a research track record aligns with the high level of independence enjoyed by Irish universities.

Therefore, this work evaluates that the Ireland doctoral system is very similar to United Kingdon Model.

UNITED KINGDOM

British universities, renowned for their longstanding tradition of academic excellence and innovation, have witnessed a recent shift towards a more interdisciplinary and creative approach within postgraduate programs. This trend has fostered a diversification of research endeavours and academic pursuits, simultaneously facilitating the development of novel methodologies and approaches across diverse disciplines. This evolving landscape is further bolstered by investments in collaborative spaces and fostering learning environments that actively promote the exchange of ideas and stimulate creative exploration (BLACK, 2021; EVIS, 2022).

The United Kingdom offers a special doctoral pathway through the "PhD by Previous Achievement" (PPW) program. This program recognizes and validates substantial academic or creative achievements undertaken prior to formal doctoral enrollment. The UK PPW approach emphasizes the recognition and validation of a candidate's existing scholarly accomplishments, which may encompass published books, peer-reviewed articles, artistic compositions, contributions to academic journals, books or chapters, research reports, patents, exhibitions and performances, architectural designs, or patented inventions (UNIVERSITY OF LONDON, 2021). This program provides a valuable avenue

for established and experienced professionals to obtain formal academic recognition for their significant contributions (POWELL, 2015).

The selection process for the PhD by Previous Achievement (PPW) program typically commences with a meticulous analysis of the candidate's *curriculum vitae* (CV). Assessment for this doctoral award hinges on the relevance, depth, and originality of the applicant's prior scholarly works, along with their demonstrably significant contribution to the chosen field of study (KINGSTON UNIVERSITY, 2024). These attributes constitute the primary evaluation criteria employed by the admissions committee. The committee seeks compelling evidence of substantial academic achievements. This may include publications in high-impact, peer-reviewed journals, presentations at international conferences, or demonstrably innovative contributions to the relevant discipline (MCGILL UNIVERSITY, 2020). It is essential to emphasize, however, that the quality of publications often carries more weight than sheer quantity (SMITH, 2018).

Minimum requirements may vary, but a general guideline suggests approximately 10-15 high-impact publications for STEM fields (Science, Technology, Engineering, and Mathematics) and healthcare disciplines, while the humanities and social sciences typically require 2-4 books or their equivalents (JOHNSON; LEE, 2019). However, these figures serve as a mere starting point. The admissions committee ultimately evaluates each candidate holistically, prioritizing the depth, originality, and field-specific relevance of their prior work (DAVIS, 2020).

Following a comprehensive analysis of the *curriculum vitae* (CV), shortlisted candidates are invited for an interview. This stage constitutes a critical component of the selection process, as it affords candidates the opportunity to elaborate on their academic achievements and articulate their potential for future research endeavours (UNIVERSITY OF OXFORD, 2018). During the interview, candidates are evaluated on their ability to:

a) Clearly and persuasively communicate their ideas;
b) Demonstrate a profound understanding of their chosen field of study;
c) Evince the potential to make meaningful contributions to the advancement of academic research.

Furthermore, the interview serves as a platform to assess the candidate's suitability for the specific academic environment and the institution's cultural context (UNIVERSITY OF OXFORD, 2018).

The thesis supervision process constitutes a vital component of the PhD by Previous Achievement (PPW) program. Following admission, candidates are assigned a supervisor or supervisory team with expertise aligned with their field of study. This advisor plays a

pivotal role in guiding the candidate throughout the thesis preparation process, which typically has a one-year timeframe (BROWN; DAVIS, 2017). Regular meetings between the candidate and supervisor serve as a platform to discuss research progress, address uncertainties, and collaboratively define the subsequent research steps. The supervisor also provides invaluable guidance and support in preparing for the thesis defence (JOHNSON; LEE, 2019).

Participation in the PPW program typically entails the requirement for additional publications beyond the doctoral thesis. These publications should demonstrably connect to the candidate's research area and ideally involve co-authorship with the assigned supervisor(s) (SMITH, 2018). Co-authorship with the supervisor not only bolsters the work's relevance but also serves as a testament to the candidate's ability to engage in effective research collaboration. These additional publications provide a valuable opportunity for the candidate to showcase their development and refinement as a researcher throughout the program (DAVIS, 2020).

The thesis defence serves as the culminating and critical stage of the PhD by Previous Achievement (PPW) program. This formal occasion entails the candidate presenting their research findings and conclusions to an expert panel, typically comprised of both internal faculty members and external evaluators who ensure an objective and rigorous assessment (JONES, 2020). The candidate is expected to deliver a clear and concise presentation detailing their research methodology, the obtained results, and the potential impact of their work on the chosen field of study (JONES, 2020). Following the presentation, the panel engages the candidate in a Q&A session, probing various aspects of the research to evaluate the depth of their knowledge and critical thinking abilities (BROWN, 2018). A successful defence signifies a significant accomplishment, marking the candidate's attainment of a level of competence and expertise acknowledged by their academic peers (TAYLOR, 2017).

However, the defence process may yield outcomes beyond a simple pass or fail. If the examining board deems the candidate's work to possess academic merit, yet falls short of the criteria for a doctoral degree, they may award a Master's degree (GREEN, 2019). This decision acknowledges the candidate's substantial contribution to their field, while indicating that the research scope or depth may not fully meet doctoral expectations (WHITE, 2016). In a less favourable scenario, if the presented research is judged to fall below established academic standards, the candidate may be deemed unfit for the doctoral award. In such cases, the title is not granted, and the candidate may be required to revise and strengthen their work before attempting another defence (BLACK, 2021).

NORWAY

Norway's postgraduate system stands out for its strong emphasis on research and technological innovation (OECD, 2022). This emphasis is fostered by a long-standing tradition of collaboration between universities and companies. This collaborative environment facilitates the integration of theoretical knowledge with practical application, empowering students to tackle real-world problems (OECD, 2022). Notably, Norwegian universities have established themselves as pioneers in fields like information technology, renewable energy, and biotechnology, contributing significantly to global scientific advancement (UNIVERSITY OF OSLO, 2024; VERGOLINI; VLACH, 2024).

A unique doctoral pathway exists in Norway: the "Dr. Philos." (Doctor Philosophiae). This distinction is awarded to candidates who demonstrate exceptional independent research capabilities in their chosen field, without formal enrollment in a traditional doctoral program (UNIVERSITY OF OSLO, 2024; VERGOLINI; VLACH, 2024). Recognized in both academic and industrial settings, the "Dr. Philos." title signifies the holder's experience in conducting rigorous and independent research endeavours. Similar to the traditional doctorate, the Dr. Philos. remains the highest academic credential attainable in Norway (RØRING et al., 2013).

An examination of the university regulations presented in Table 2 reveals a high degree of standardization in the "Dr. Philos." process. While formal enrollment in a doctoral program is not required, candidates must undergo a rigorous evaluation to demonstrate the quality of their research. The key difference between the Norwegian "Dr. Philos." and the UK doctoral system lies in the absence of formal supervision. There is no standardized timeline for obtaining this title, and candidates lack a formal affiliation with the institution until their doctoral exam is approved (RØNNING; SØRBØ, 2015). Furthermore, universities do not offer financial support, supervision, or other forms of assistance during the "Dr. Philos." journey (JOHNSON; WILLIAMS, 2010; SMITH, 2005).

To apply for the "Dr. Philos.," a completed thesis must be submitted. Following thesis approval, the candidate is formally enrolled in the doctorate, and an evaluation committee is appointed. The evaluation process for the "Dr. Philos." prioritizes the quality and originality of the presented thesis, which is expected to make a substantial contribution to the existing body of knowledge in the candidate's discipline (UNIVERSITY OF OSLO, 2024).

The Doctor of Philosophy (Dr. Philos.) degree is awarded based on several criteria: an approved scientific dissertation, successful completion of two experimental classes (one on an assigned topic and one chosen by the candidate), and a satisfactory public defence of the thesis (disputatio). It is crucial to emphasize the independent nature of the doctoral

thesis. When the Faculty deems the submitted dissertation worthy of public defence, it arranges for its appropriate printing and distribution (JOHNSON; CHRISTENSEN, 2014).

FRANCE

France offers a unique pathway to the doctorate through the "*Valorisation des Acquis de l'Expérience (VAE)*" system, allowing recognition of prior learning and completed master's degrees (IPAC, 2024; SORBONNE UNIVERSITÉ, [s.d.]; VAE CENTRE INFFO, [s.d.]) . Candidates undertaking this route engage in a supervised research period, typically one year in duration, culminating in a doctoral thesis defence (FRENCH MINISTRY OF HIGHER EDUCATION, RESEARCH AND INNOVATION, 2023).

Unlike the Norwegian "Dr. Philos.", which fosters independent doctoral research without formal enrollment, the French model integrates candidates into a doctoral program under the guidance of one or more supervisors. This structured approach, complemented by a qualifying examination, facilitates a robust interaction between the doctoral candidate and the academic community. While valuing researcher autonomy, the French system also provides clear frameworks for research development, akin to the United Kingdom's "PhD by Prior Output" programs (UNIVERSITIES UK, 2018).

The VAE process is intricate, demanding substantial evidence of skills and knowledge commensurate with a traditional doctoral program. Given its complexity and rigorous standards, prospective candidates are strongly advised to seek guidance from the target institution or a field expert.

The VAE model is designed to streamline the validation of acquired experience (VAE CENTRE INFFO, [s.d.]). Candidates with a clear academic goal can initiate the process by submitting an application directly to the France VAE website. However, for those without a defined academic trajectory, consulting with an advisory point or professional development consultant prior to application is recommended.

The VAE process, governed by Decree No. 2017-1135 (LÉGIFRANCE, [s.d.]), necessitates specific criteria (2024):

a) **Eligibility Verification:** Candidates must possess a minimum of three years of relevant professional or volunteer experience aligned with their desired doctoral program. Experience can be accrued through various avenues, including employment, internships, or voluntary roles (IPAC, 2024);
b) **Experience Relevance:** Acquired knowledge and skills must directly pertain to the targeted doctoral field;

c) **Institutional Selection:** Candidates identify a suitable university or higher education institution offering the desired doctoral program. Given the variability of VAE policies across institutions, preliminary consultations with institutional representatives are recommended to ascertain program feasibility and specific requirements, including deadlines;

d) **Academic Compliance:** Additional criteria may apply for higher education degrees. Candidates must submit a comprehensive dossier detailing their experience, acquired skills, and their relevance to the academic program;

e) **Dossier Evaluation:** A committee of academics and professionals assesses the submitted dossier to determine eligibility for doctoral candidacy. Committee composition and roles are elaborated in "*Comment se déroule un jury VAE*" (VAE CENTRE INFFO, [s.d.]);

f) **Potential** Interview**:** Candidates may be required to participate in an interview or dossier presentation;

g) **Committee Decision:** The committee renders a decision regarding doctoral eligibility or mandates the completion of supplementary coursework;

h) **Outcome:** Successful candidates are awarded the doctorate. Unsuccessful candidates may be afforded opportunities for reassessment or skill acquisition.

Certain institutions may provide support or guidance throughout the VAE process, including assistance with dossier preparation. Seeking mentorship or tutoring from individuals experienced in VAE procedures is advisable. Comprehensive documentation of professional experiences and achievements is essential, and networking with VAE alumni can offer valuable insights. For candidates with a robust foundation in their desired field, the VAE presents a viable pathway for academic recognition of practical expertise.

The VAE process comprises several distinct stages:

a) **Stage 1: Application and Support** Candidates initiate the VAE by submitting an application on the France VAE website, providing personal details and a concise overview of their relevant experience. A support organization is designated to assist throughout the process;

b) **Stage 2: Personalized Course Development** The support organization assigns a course advisor to guide the candidate. Together, they develop a tailored course aligned with the candidate's experience and goals;

c) **Stage 3: Admissibility Assessment** The course advisor prepares a feasibility document outlining the candidate's experience and project. This document is

submitted to the certifying body for admissibility evaluation. A positive decision allows the candidate to proceed;

d) **Stage 4: Validation Document and Submission** Candidates engage in the core VAE stage by crafting a validation document that comprehensively details and analyzes their relevant experiences. The course advisor provides ongoing support to ensure the document aligns with the certifying body's expectations. Upon completion, the document is submitted;

e) **Stage 5: Final Evaluation and Decision.** The VAE culminates in a presentation before a panel of professionals and academics. The panel assesses the candidate's acquired skills against degree standards. A full or partial degree may be awarded, with the latter option including potential post-evaluation guidance for achieving full qualification.

The French VAE system, as outlined in Table 4, exhibits a degree of standardization while allowing for institutional flexibility. Notably, the process incorporates supervisory elements.

Sorbonne University offers a dedicated VAE doctorate pathway. Candidates undergo a rigorous evaluation to establish a correlation between their professional and personal experiences and the target degree (COLARDYN; BJORNAVOLD, 2004). The VAE process at Sorbonne University comprises five distinct phases. Initial information gathering and professional guidance are followed by a viability and admissibility assessment. Subsequent stages involve candidate support in dossier preparation and monograph composition, which details the candidate's professional and personal journey, including research contributions. Formal dossier submission and expert evaluation precede a final defence before a professorial panel (SORBONNE UNIVERSITÉ, [s.d.]).

The doctoral school, aligned with the candidate's specialty, oversees the VAE process within Sorbonne University's Department of Continuing Education (BOURGEOIS; HERAUD, 2005). As the academic unit responsible for doctoral programs, the doctoral school encompasses research units focused on specific scientific domains.

DISCUSSION

The traditional credit-based doctoral pathway remains a well-established global standard (SCHOOLS, 2010). However, the emergence of the PhD by Previous Work (PPW) program has sparked debate within academic circles. Critics contend that PPW offers an expedited and less rigorous path to a doctoral degree (RØRING et al., 2013). This assertion, however, lacks empirical support, as evidenced by the stringent requirements

outlined in Table 5. A mere review of the regulations governing PPW programs reveals the substantial demands placed on candidates (UNIVERSITIES UK, 2018). The sheer volume of publications required, coupled with the rigorous evaluation of their quality and thematic relevance, poses a significant challenge for individuals lacking established research experience (POWELL, 2015).

Furthermore, it is noteworthy that a significant portion of doctoral candidates globally rely on public funding for their research training, often accompanied by exemptions from administrative or manual labour to ensure their livelihood (MARGINSON, 2016). In this context, the PPW pathway emerges not as a shortcut, but rather as a rigorous and selective avenue for recognizing researchers who, due to various circumstances, lacked access to the financial and academic resources typically available to early-career researchers (Røring et al., 2013).

Individuals who excel within the PPW framework often demonstrate a strong profile of autodidacticism, characterized by a pronounced curiosity and a passion for disseminating knowledge (RØRING et al., 2013). This intrinsic drive to share their expertise frequently manifests in the form of published works (POWELL, 2015). Consider, for example, the scientific laboratory technician who, over the course of their career, has collaborated extensively with doctoral-level researchers across various scientific disciplines. Such individuals often possess decades of practical research experience, potentially exceeding the cumulative hours dedicated to research by a traditional doctoral student prior to thesis defence (MARGINSON, 2016). It is precisely these highly skilled professionals who are most likely to be identified by, or themselves seek out, PPW doctoral programs as a means of formalizing their extensive research experience.

Table 1 Classic and PPW PhD comparison.

	Classic PhD	**PPW PhD**
Mandatory Disciplines	YES	NO
Mandatory Previous Masters	Usually YES	NO
Time at program	2 to 4 years	1 year
Preparation Time previous program	4 years (Masters)	5 to 10 years, practical work in science
Mandatory Submited papers	1	3 to 10
Mandatory Accepted papers	0	3 to 10
Professional experience and others publications have value?	NO	YES

Source: Authors

To bolster the case for alternative pathways to scholarly recognition, it is instructive to consider the achievements of prominent Brazilian scientists who did not hold a doctoral degree (PhD). These individuals, through their groundbreaking research and contributions to their respective fields, would undoubtedly garner recognition in countries like France, the United Kingdom, Norway, or Ireland, where alternative doctoral pathways like the "PhD by Prior Output" or "Dr. Philos." exist (RØRING et al., 2013; UK, 2018). Below, we present a short list of brazilian researchers that may be included in the PPW pathway:

a) Carlos Chagas (1879-1934): A physician-scientist, Chagas is celebrated for his discovery of the Trypanosoma cruzi parasite, the causative agent of Chagas disease, and its vector, the triatomine bug (WYNIA et al., 2013);
b) Oswaldo Cruz (1872-1917): A public health physician, Cruz played a pivotal role in combating epidemics and modernizing public health infrastructure in Brazil, including the successful control of yellow fever and smallpox (FONSECA, 2009);
c) Vital Brazil (1865-1938): A physician and researcher, Brazil is renowned for his development of antivenom serums and for his significant contributions to the study of venomous animals (GUTIÉRREZ et al., 2009);
d) Bertha Lutz (1894-1977): A biologist and women's rights activist, Lutz made substantial contributions to the field of ornithology while also championing the feminist movement in Brazil (DREYS, 2017);
e) Adolfo Lutz (1855-1940): A public health physician and pioneering researcher, Lutz is recognized for his groundbreaking work on tropical diseases prevalent in Brazil, such as leishmaniasis and typhoid fever (NARA et al., 2009).

You can find more information about these scientists in online academic databases for scholarly biographies.

While a nation's number of PhD graduates can be a metric of research output, it is not the sole indicator of research excellence. A more nuanced evaluation requires considering the quality and global impact of research publications (GLÄNZEL; LETA; THIJS, 2006). This is exemplified by the contrasting cases of the United Kingdom and Brazil. Despite possessing a comparatively lower number of PhD graduates per capita, the UK boasts an impressive h-index1 of 1.815. This metric signifies a substantial impact of their research endeavours on a global scale (HIRSCH, 2005). In contrast, Brazil, with a significantly larger number of PhD graduates (21,600) (UNESCO, 2023), exhibits a lower h-index per PhD. This disparity suggests a potential area for improvement within the Brazilian research landscape, where efforts to enhance the quality and international influence of research publications could be prioritized. The data presented in Table 6 highlight the

critical need to move beyond a purely quantitative evaluation of national research performance. A more comprehensive assessment that incorporates both the quantity and impact of research output is essential for a more accurate understanding of a nation's overall research excellence.

Table 1 - Scientific production in comparison to Population and PhD

Country	PhD*	Population	PhD/Per habitant	h-index**	h-index/per Phd
Norway	1.500	5.400.000	0,000277778	785	0,5233
Ireland	1.400	4.900.000	0,000285714	665	0,4750
France	13.600	67.000.000	0,000202985	1.420	0,1044
UK	28.100	67.000.000	0,000419403	1.815	0,0646
Spain	20.000	47.000.000	0,000425532	1.127	0,0564
Brazil	21.600	211.000.000	0,00010237	729	0,0338

*Source OECD https://www.oecd-ilibrary.org/sites/8389c70e-en/index.html?itemId=/content/component/8389c70e-en
**Source: https://www.scimagojr.com/countryrank.php

An examination of the ratio between PhD graduates and the national population yields intriguing insights. Countries with comparatively smaller populations, such as Norway and Ireland, may hold an advantageous position due to their potentially higher PhD graduation rates per capita (OECD, 2022). Despite their demographic size, these nations exhibit a pronounced dedication to fostering advanced educational opportunities(MARGINSON, 2016). This emphasis on higher education can be interpreted as an indicator of a populace with a high level of educational attainment and a thriving research and academic ecosystem (UNESCO, 2023).

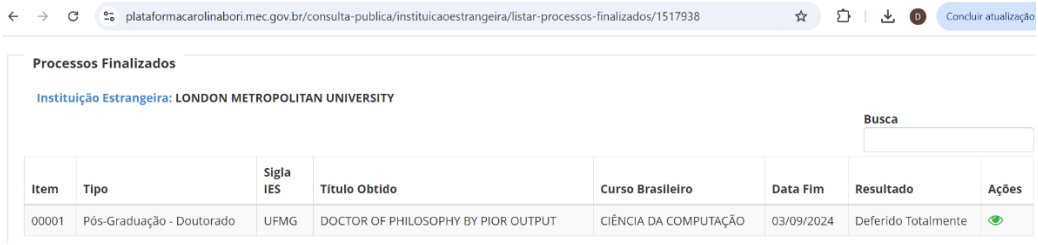
In contrast, Brazil, a nation with a substantially larger population and a considerable number of PhD graduates, exhibits a lower h-index per PhD. This disparity suggests a potential need for the implementation of strategic initiatives aimed at augmenting the global impact and visibility of its research publications (GLÄNZEL; LETA; THIJS, 2006). It is crucial to acknowledge that these comparisons are inherently proportional and do not necessarily imply a universal correlation between population size and PhD graduation rates. A nation with a smaller population does not guarantee a consistently higher PhD graduation rate, nor does a larger population invariably translate to a lower ratio of PhD graduates (MARGINSON, 2016).

The paramount concern should invariably be the quality of education and research, coupled with the effective allocation and utilization of these human resources within a nation's borders (MARGINSON, 2016). There is no universally applicable formula for

attaining academic pre-eminence; each nation must chart its own unique course, informed by its specific circumstances and aspirations. In the contemporary Brazilian context, access to public research funding and scholarships often hinges on the possession of a PhD degree. This raises a pertinent question: would the groundbreaking contributions of the aforementioned researchers be feasible under the current system, or would they face an insurmountable obstacle in the form of a mandatory PhD requirement? This scenario underscores the potential tension between credentialism and fostering innovative talent within a nation's research landscape.

Under the current Brazilian doctoral system, even accomplished researchers like those mentioned previously might face a significant hurdle in pursuing a PhD. Despite their impressive résumés, they would likely be categorized as "non-regular students" and excluded from formal doctoral programs. Their path to doctoral candidacy could involve spending several years completing coursework while lacking a formal affiliation with a research group. Furthermore, securing sponsorship from a well-established professor for thesis development could hinge on establishing positive relationships within the academic community. This scenario raises a critical question: is this the sole viable pathway for established researchers to obtain a PhD in Brazil? The emphasis on coursework and faculty sponsorship within the current system might inadvertently create barriers for highly qualified individuals who possess extensive experience outside of traditional academic settings. After the first validation of a PPW PhD in Brazil Figure 2, the path becomes less bleak for those who have the characteristics for this type of Doctorate. But it still becomes a contradiction for Brazil to validate this modality while at the same time discarding its offer in Brazil.

Figure 2 - This print is from the Carolina Bori platform, a Brazilian system for recognizing foreign diplomas. It demonstrates the first known case in Brazil of a university validating a PhD PPW, in this case in Computer Science.



Source: https://plataformacarolinabori.mec.gov.br/consulta-publica/instituicaoestrangeira/listar-processos-finalizados/1517938

CONCLUSION

One critical challenge within contemporary research landscapes lies in the identification and recognition of high-performing individuals who lack formal doctoral qualifications. While the traditional PhD serves as a benchmark for academic achievement,

there exists a growing recognition of the potential contributions of self-taught researchers. Several countries have begun exploring alternative pathways for acknowledging and integrating these individuals into research communities.

A variety of approaches are emerging to recognize the accomplishments of self-taught researchers. One prominent method involves the use of "portfolio reviews" that evaluate the quality and impact of a researcher's past work. These reviews often assess publications, patents, and other tangible outputs alongside contributions to the broader research community. Additionally, some institutions are establishing "adjunct researcher" positions, offering self-taught researchers access to research facilities and mentorship opportunities.

The question of whether alternative recognition methods constitute valid alternatives to the traditional PhD pathway remains a subject of ongoing debate. Proponents argue that these approaches allow for the inclusion of talented individuals who might not thrive in traditional academic settings. Opponents, however, raise concerns regarding the potential for a lack of standardization and the need for robust evaluation criteria.

Historical figures like Michael Faraday, Thomas Edison, Nikola Tesla, Steve Jobs, Bill Gates, Ada Lovelace, Alexander Graham Bell, and James Clerk Maxwell underscores the fact that significant contributions to science and innovation can emerge from diverse educational backgrounds. These examples highlight the potential value in exploring alternative pathways for recognizing and nurturing talent within the research community.

While Brazil's established doctoral system has demonstrably yielded valuable contributions across diverse disciplines, this work proposes alternative pathways for achieving academic excellence. The "PhD by Previously Published Works" (PPW) method is not intended to be a shortcut to a traditional PhD. The evaluation process is rigorous, demanding a substantial time commitment from the candidate and a robust portfolio of high-quality work. At its core, the PPW serves as a mechanism for formally recognizing significant research contributions amassed over an extended period, often exceeding a decade. This doctoral pathway is frequently pursued by researchers employed at universities and research institutions, as well as by accomplished inventors and professionals. Therefore, the implementation of the PPW or similar methods in Brazil could represent a significant step forward, fostering the continued evolution of its academic system. This exploration should encourage further discussion and research on the topic, with the goal of enriching the discourse surrounding doctoral pathways and their impact on national research excellence.

The continual expansion of accessible and comprehensive educational and academic opportunities should remain a paramount objective. The core strength of the PPW lies in its capacity to formally recognize previously accomplished, substantial research contributions, often accumulated over an extended period. Additionally, it offers an incentive for the continued generation of high-quality research and publications. These combined attributes position the PPW as a potentially valuable system for propelling both individual and collective academic progress. Through a meticulously designed implementation process and the establishment of rigorous evaluation criteria, the PPW has the potential to become a well-respected and widely recognized doctoral pathway within Brazil. Ultimately, such an adoption could contribute significantly to the continued advancement and growth of the nation's academic system. Further research and discussion are necessary to explore the optimal means of integrating this approach into the Brazilian context and to assess the long-term efficacy of these alternative models.

Beyond the potential benefits of the PPW, fostering a culture that values scholarly contributions is equally crucial. This can be achieved by actively encouraging the publication of research findings and prioritizing the enhancement of the quality of Brazil's national scientific output. By implementing these multifaceted strategies, Brazil can cultivate a more vibrant research environment that fosters innovation and propels the nation's academic standing on the global stage. The goals and objectives presented in this work were the proposal to standardize the 42 terms that describe the PPW, the presentation of a classification diagram of the main types of Doctorate and their characteristics, in addition to offering a comparison of the doctorate systems in Brazil, the United Kingdom, Ireland, France and Norway.

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PERSPECTIVES OF CONSENSUALITY IN BRAZILIAN ADMINISTRATIVE LAW

https://doi.org/10.56238/sevened2024.031-034

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ABSTRACT

This study aimed to analyze the implementation of consensuality in Brazilian Administrative Law, highlighting the legal instruments that enable the resolution of conflicts and the correction of conduct in a negotiated and collaborative manner. Instead of resorting exclusively to litigation, these mechanisms seek solutions that meet the interests of the public administration and individuals, promoting more efficient and transparent management. The main consensual instruments used were addressed, such as the Conduct Adjustment Term (CAT), leniency agreements, mediation, and arbitration. Each of these mechanisms has specific characteristics that make them suitable for different types of situations and conflicts, offering viable alternatives for the solution of administrative issues and promoting speed and specialization in decisions.

Keywords: Consensuality. Public administration. Conduct Adjustment Term. Mediation. Conciliation and arbitration.

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INTRODUCTION

In recent years, Brazilian Administrative Law has undergone a significant transformation, marked by the rise of consensuality as a central principle in public administration. This shift reflects an evolution from the traditional model, characterized by rigidity and unilateral imposition of norms, to a more flexible and collaborative model, where decisions are often made based on mutual agreements and considering the positions of individuals.

Consensual administration, also known as Administrative Law of consensus, is guided by compromise and the search for solutions that meet the interests and needs of the parties involved. This new paradigm promotes greater citizen participation in the decision-making process, offering a more inclusive and transparent approach. The public administration, by adopting consensual practices, can achieve several benefits: a) greater transparency and participation; Efficiency and reduction of litigation; Conflict resolution in a more balanced way; Flexibility and adaptability.

To deeply understand these benefits and the impacts of consensuality in Administrative Law, it is essential to conduct a literature review that explores academic contributions and analyses on the subject. This article will address the main works and studies that discuss the transformation to consensual administration, analyzing the theoretical foundations, practical challenges and implications for public administration. Next, the main sources and authors who contributed to the development of the theory and practice of consensuality in Administrative Law will be examined, offering a critical and comprehensive view of how this paradigm has shaped contemporary public administration and the results it has produced in practice.

FOUNDATIONS AND EVOLUTION OF CONSENSUALITY IN BRAZILIAN ADMINISTRATIVE LAW

CONCEPT AND IMPORTANCE

Consensuality has emerged as a central principle in Brazilian Administrative Law, reflecting a significant transformation in the approach to public administration. This movement towards conflict resolution and the conduct of agreements in a consensual manner seeks not only to improve the efficiency of administrative actions, but also to strengthen the legitimacy and acceptance of public decisions. The basic premise is that the use of dialogical and collaborative methods can lead to more balanced and acceptable solutions for all parties involved, contrasting with the traditional imposing and unilateral approach.

The benefits of consensuality are evident in several dimensions. First, the consensual approach tends to promote greater transparency and participation of stakeholders in the decision-making process, which facilitates the resolution of conflicts in a more democratic and inclusive manner. In addition, by allowing the parties involved to directly negotiate the terms of the agreements, consensuality can reduce the possibility of prolonged and costly litigation, promoting solutions that better meet the specific needs of all involved.

However, it is crucial to recognize that, despite the advantages, consensuality is not without challenges. One of the main problems that may arise is "abusive consensuality", in which negotiation and agreement mechanisms are used in order to mask authoritarian or imposing practices by the Government. This occurs when, despite the appearance of agreement, one of the parties, usually the state power, exerts a disproportionate influence, imposing conditions that are not really the result of a fair and balanced dialogical process.

Therefore, while consensuality represents a significant advance in the search for a more collaborative and efficient public administration, it is essential to be aware of the possible distortions and abuses that may occur. The challenge is to ensure that consensuality does not become a tool for excessive or inappropriate practices, but rather a true means of building fair and equitable agreements. Critical examination and continuous reflection on the subject are fundamental to maintain consensuality as a legitimate and effective instrument in public administration.

HISTORICAL EVOLUTION

Brazilian Administrative Law has undergone a significant transformation over the last few decades, with consensuality emerging as a fundamental principle. This shift reflects an evolution from a traditional administrative model, characterized by rigidity and the imposition of norms, to a more flexible and collaborative model. This article explores this trajectory and the factors that drove the adoption of consensual methods in public administration, based on the contributions of important authors in the field.

Historically, Brazilian Administrative Law has been marked by a more rigid and imposing governance model. Administrative decisions were predominantly unilateral, with the government exercising its authority without the need for consensus or participation by the affected parties. André Cyrino points out that the public administration, in this context, acted with a centralizing and formalistic vision, which often resulted in a relationship of conflict with the administered (Cyrino, 2017).

From the 1990s onwards, Brazil began to adopt a more dialogical and cooperative approach to Administrative Law. This movement was influenced by a growing appreciation of citizens' rights and a search for more transparent and participatory administrative processes. Floriano Peixoto argues that the introduction of consensual mechanisms represents a response to the need to modernize the administrative apparatus and the desire for greater citizen engagement in the decision-making process (Peixoto, 2019).

The concept of consensuality gained prominence with the enactment of norms and the creation of instruments that favor negotiation and mediation. The Law of Introduction to the Rules of Brazilian Law (LINDB) of 2016, with its article 26, is an important example that establishes the principle of proportionality in administrative agreements. Rafael Oliveira notes that this legislation marks a significant inflection point, as it promotes the idea that agreements and solutions should be fair and balanced, reflecting the change in administrative approach (Oliveira, 2021).

The adoption of consensual practices has brought several benefits, including greater efficiency and transparency in administrative processes, and the possibility of agreements that better meet the needs of the parties involved. However, the transition to a more flexible model also presents challenges, such as the need to ensure that agreements are truly balanced and do not result in abuses of power. The critical analysis of Cyrino, Peixoto, and Oliveira points to the importance of continuous monitoring and a robust regulatory framework to ensure the effectiveness of consensual principles (Cyrino, 2017; Peixoto, 2019; Oliveira, 2021).

Next, we will analyze the main principles that guide administrative decisions.

RELATED PRINCIPLES

Consensuality in public administration is not sustained in isolation; It is intrinsically linked to several fundamental principles that guide administrative action. Among these, efficiency, good faith, reasonableness and proportionality stand out.

The principle of efficiency, as defined by the Federal Constitution of 1988 and analyzed by Marçal Justen Filho, is central to public administration and is directly associated with consensus. Efficiency implies obtaining the best results at the lowest possible cost. In his work *Curso de Direito Administrativo*, Justen Filho (2020) points out that the search for efficiency demands that the public administration adopt practices that maximize the use of resources and minimize waste. In this context, consensuality contributes to efficiency by allowing solutions that directly involve stakeholders, which can

reduce the need for litigation and speed up the implementation of agreements (Justen Filho, 2020).

The principle of good faith is fundamental to ensure trust in the relations between the public administration and the administered. According to Justen Filho, good faith requires that the parties act with sincerity and honesty in their interactions. Consensuality is deeply rooted in this principle, since the success of any consensual agreement depends on mutual trust and the willingness to negotiate in good faith (Justen Filho, 2020). Good faith prevents deceptive practices and ensures that the parties involved in the negotiation process are committed to achieving a fair and transparent agreement.

Reasonableness is a principle that requires administrative decisions to be logical and fair, considering the circumstances and interests of the parties. According to José dos Santos Carvalho Filho, in *Manual de Direito Administrativo* (2019), reasonableness implies the need for administrative actions to be proportional to the desired ends and appropriate to the circumstances. Consensuality incorporates the principle of reasonableness by allowing the parties involved to discuss and adjust the conditions of the agreement in a way that considers the needs and interests of each one, resulting in fairer and more appropriate solutions to specific situations.

The principle of proportionality, on the other hand, is crucial to ensure that the measures adopted by the public administration are not excessive in relation to the objectives to be achieved. According to Alexandre Santos de Aragão, in *Administrative Law* (2018), proportionality requires that administrative actions be balanced and that restrictions on the rights of the administered be minimized. Consensuality is aligned with proportionality by allowing the parties to adjust the terms of the agreement in a way that balances the interests involved, avoiding excessive impositions and ensuring that solutions are proportional to the needs and expectations of all involved.

APPLICATION OF CONSENSUALITY IN PUBLIC ADMINISTRATION

Consensuality in Brazilian Administrative Law emerges as a response to contemporary demands for a more efficient, transparent and problem-solving public administration. Traditionally, the relationship between the State and private individuals was marked by a hierarchical dynamic, where the unilateral authority of administrative decisions prevailed. However, the growth of a more complex and interdependent society, combined with the need to promote agile and less litigious solutions, has led to the adoption of consensual practices as essential instruments for public management.

In this context, it is perceived that administrative agreements are more present in the examination of the discretion of the public manager. In terms of *legal culture,* consensuality has asserted itself as a technique for the development of administrative activities that is sometimes preferable among the traditional ways[4].

In the past, the idea prevailed that state affairs could not be resolved through consensus, on the grounds that the principle of legality restricted public administration to unilateral and inflexible decisions. However, this view has evolved significantly. Today, the Public Administration not only has the possibility, but also the responsibility to seek consensual solutions to its controversies. This new paradigm recognizes that the principle of legality can coexist with more flexible and collaborative practices, where dialogue and mutual understanding become valuable instruments for more efficient, fair, and less conflictual public management. Thus, consensuality emerges as a central element in the modernization of administrative practices, promoting an approach that prioritizes the peaceful and negotiated resolution of conflicts, in line with democratic values and effectiveness in the application of legal norms.[5]

Brazilian administrative law was built from an eminently French matrix, characterized by a legal regime based on the supremacy of the public interest, on the vertical relationship between Public Administration and the private sector, and on the State's action through unilateral, imperative and self-executing administrative acts. This authoritarian conception of public law was directly reflected in the idea that the interests involving the Administration would be unavailable. According to this traditional view, the public interest, which should prevail a priori over private interests, would be unavailable, and anyone would be forbidden to dispose of it or compromise on it. Thus, the idea of the procedural and material *non-transactability* of the interests of the Public Administration was consolidated among us.[6]

The application of consensuality in public administration takes place through different legal and administrative instruments, which allow the resolution of conflicts and the formalization of commitments between the public power and those administered in a more collaborative way. Among these instruments, the Conduct Adjustment Agreement (CAT),

4 Sérgio Guerra and Juliana Bonacorsi de Palma. New legal regime for negotiation with the Public Administration Rev. Direito Adm., Rio de Janeiro, Special Edition: Public Law in the Law of Introduction to the Rules of Brazilian Law – LINDB (Law No. 13,655/2018), p. 135-169, nov. 2018. Pag. 138

5 Public Administration and consensual means of conflict resolution or "facing the Leviathan in the new seas of consensuality" Bruno Lopes Megna https://revistas.pge.sp.gov.br/index.php/revistapegesp/article/view/538/481 Accessed on 15 Aug 2024 pg. 04

6 BINENBOJM, Gustavo. Administrative consensuality as a legally adequate technique for the efficient management of social interests. Electronic Journal of the Attorney General's Office of the State of Rio de Janeiro - PGE-RJ, Rio de Janeiro, v. 3 n. 3, Sep./Dec.2020. Accessed on 17 Aug. 2024.

leniency agreements, mediation, and arbitration stand out, which have proven effective in promoting a more participatory and dialogue-oriented public administration.

Regarding the application of consensuality within the scope of the public power, it is also important to highlight that the Code of Civil Procedure of 2015 and the Mediation Law, in line with this trend, aim to expand the incentive to use consensual mechanisms within the Public Administration. Previously, these methods had limited progress with the performance of the Special Courts of the Public Treasury, which have the attribution of "processing, conciliating and judging" civil cases of lesser complexity involving the State as a defendant (article 3 of Law 10,259/2001 and article 2 of Law 12,153/2009). Today, therefore, we observe a growing incentive for consensuality in public administration, reflecting a search for more collaborative solutions, which aim not only at administrative efficiency, but also at the reduction of unnecessary conflicts and litigation.

The appreciation of alternative forms of conflict resolution is already demonstrated in article 3 of the Code of Civil Procedure. Under the terms of § 2, the State shall promote, whenever possible, the consensual resolution of conflicts, while § 3 provides that conciliation, mediation and other methods of consensual resolution of conflicts shall be encouraged by judges, lawyers, public defenders and members of the Public Prosecutor's Office.[7]

For contextualization purposes, in order to demonstrate the paradigm shift on the subject under examination, it is worth bringing another important legislative change, that is, the enactment of Law No. 13,655, of April 25, 2018, which amended Decree-Law No. 4,657, of September 4, 1942, known as the Law of Introduction to the Rules of Brazilian Law (LINDB), to incorporate provisions that allow the public manager to establish negotiations with private individuals. These adjustments and commitments, which seek to solve irregularities, reduce legal uncertainties and prevent conflicts, directly reflect the principle of consensuality in public administration. This normative change reinforces the importance of a more cooperative and effective approach to public management, promoting consensual resolution as a preferable alternative to traditional unilateral measures.

Another legislative change that demonstrates this paradigm shift, and deserves to be highlighted due to its importance in the day-to-day life of public administration, is Law No. 14,133, of April 1, 2021, which governs bids and administrative contracts, which further reinforces this trend by expressly incorporating consensual mechanisms for the resolution of disputes. This law introduces important innovations that expand the use of alternative

7 NEVES, D.A.A. (2016). Manual de direito procedual civil.São Paulo: Método. Pag. 64.

methods of conflict resolution in the context of public administration, strengthening consensus as an essential pillar for efficiency and administrative justice.

In spite of all the approaches, in this work we will deal with the instruments that stand out the most, namely, the Conduct Adjustment Term (CAT), leniency agreements, mediation, and arbitration, since they have proven to be effective in promoting a more participatory and dialogue-oriented public administration.

In the following sub-items, the main instruments of consensuality applied in public administration will be explored, with practical examples and an analysis of their implementation and effectiveness in resolving conflicts and promoting administrative integrity.

CONSENSUAL INSTRUMENTS

The implementation of consensuality in Brazilian Administrative Law takes place through legal instruments that allow the resolution of conflicts and the correction of conducts in a negotiated and collaborative manner. These instruments, instead of resorting exclusively to litigation, seek solutions that meet the interests of the public administration and private individuals, promoting a more efficient and transparent management. Among the main consensual mechanisms used in public administration, as we have already mentioned, the Conduct Adjustment Agreement (CAT), leniency agreements, mediation and arbitration stand out.

Each of these instruments has specific characteristics that make them suitable for different types of situations and conflicts. The CAT, for example, is widely used to adjust the conduct of private individuals that contravene administrative rules, thus avoiding the need for prolonged legal proceedings. Leniency agreements, on the other hand, have proven to be effective tools in the fight against corruption, allowing companies involved in illicit practices to cooperate with the authorities in exchange for benefits, such as the reduction of penalties. In addition, mediation and arbitration emerge as viable alternatives for the resolution of administrative conflicts, offering speed and specialization in decisions.

Below, we will explore in detail how these instruments work in practice, what are their main advantages and challenges, and how they have contributed to the promotion of consensuality in the Brazilian public administration.

Conduct Adjustment Term (CAT)

The Conduct Adjustment Term (CAT) is one of the most important and widely used instruments in the implementation of consensuality in Brazilian Administrative Law. Provided

for in Law No. 7,347/1985, known as the Public Civil Action Law, the CAT allows the Public Prosecutor's Office or other legitimate entities to enter into agreements with private parties to adjust conduct considered illegal or inappropriate to legal norms, without the need to initiate or prolong a judicial proceeding.

For Hugo Nigro Mazzilli, the adjustment commitment is only a legal instrument intended to collect, from the person who caused the damage, an extrajudicial executive title of obligation to do, through which the promisor assumes the duty to adapt his conduct to the requirements of the law, under penalty of sanctions set in the term itself.[8]

Edis Milaré, Joana Setzer and Renata Castanho state that it is "a mechanism for the peaceful resolution of conflicts, with the legal nature of a transaction, consisting of the establishment of certain rules of conduct to be observed by the interested party, including the adoption of measures aimed at safeguarding the diffuse interest affected" [9]

The primary objective of the CAT is to correct irregularities and promote compliance with the law quickly and effectively, avoiding the wear and tear and costs of prolonged litigation. The CAT has the legal nature of an administrative contract, being a commitment signed between the offender and the public agency, in which the offender undertakes to cease the illegal practice or to adopt compensatory or reparative measures. In exchange, the public agency can grant benefits, such as the suspension of sanctions or the reduction of fines.

One of the great advantages of CAT is its flexibility, allowing parties to find customized solutions for each specific case. For example, in environmental cases, the offender may commit to carrying out environmental recovery actions or investing in preservation projects, thus avoiding a high fine or a public civil action. In addition, the CAT can be a faster mechanism than a judicial process, allowing problems to be resolved more quickly and with less economic and social impact.

Another significant advantage is the possibility of monitoring and inspecting compliance with the obligations assumed in the CAT. The term itself can provide for monitoring mechanisms, ensuring that the agreed actions are effectively implemented and that the intended objectives are achieved.

A notable example of the application of a CAT occurred in the area of environmental protection. In the case of the environmental disaster in Mariana, Minas Gerais, in 2015, the

8 MAZZILLI, Hugo Nigro. Commitment to conduct adjustment: evolution and weaknesses: performance of the Public Prosecutor's Office. Law and Liberty Journal, Mossoró, 1, 2005. p. 191.
9 MILARÉ, Edis; SETZER, Joana; CASTANHO, Renata. The commitment to conduct adjustment and the fund for the defense of diffuse rights: relationship between the alternative instruments of environmental defense of Law 7.347/1985. Journal of Environmental Law, São Paulo, 39, 2005. p. 12.

mining company Samarco, together with its parent companies Vale and BHP Billiton, entered into a CAT with the Federal Public Prosecutor's Office (MPF), the Public Prosecutor's Office of Minas Gerais, and other public agencies. This agreement aimed to ensure the repair of the damage caused by the collapse of the Fundão dam, which resulted in an environmental tragedy of great proportions.[10]

Through the CAT, the companies committed to adopt various environmental, social, and economic compensation measures, including the recovery of the affected areas, the resettlement of the affected communities, and compensation for the damage caused. The agreement allowed for a more agile and coordinated response to mitigate the impacts of the disaster, avoiding a long and uncertain judicialization of the case. While full compliance with the CAT is still ongoing, the agreement is an example of how consensuality can be applied to effectively promote corporate responsibility and environmental protection.

Despite its advantages, CAT also faces challenges and criticism. One of the criticisms is regarding the transparency and fairness of the agreements, especially when it comes to large companies or actors with greater negotiating power. Another challenge is to ensure the effectiveness of the fulfillment of the obligations assumed. Although the CAT provides for sanctions in case of non-compliance, such as judicial enforcement of the term, inspection is essential to ensure that the agreements are satisfactorily complied with.

Mediation, conciliation and arbitration

Mediation and arbitration are alternative instruments of conflict resolution that have gained prominence in Brazilian Administrative Law as ways to implement consensuality in the relations between the public administration and private individuals. These tools offer efficient and less adversarial means to resolve disputes, avoiding judicialization and promoting faster, more specialized solutions that are appropriate to the interests of the parties involved.

We move on to the concepts in order to better clarify the methods in question.

Mediation is a conflict resolution process in which an impartial third party, the mediator, assists the parties in reaching an agreement. In the context of Administrative Law, mediation is used to resolve disputes involving administrative contracts and other situations where there is public interest at stake.

10 MILANEZ, Bruno. PINTO, Raquel Giffoni. Considerations on the Transaction and Conduct Adjustment Agreement signed between the Federal Government, the Government of the State of Minas Gerais, the Government of the State of Espírito Santo, Samarco Mineração S.A., Vale S.A. and BHP Billiton Brasil LTDA. Available at https://www.epsjv.fiocruz.br/sites/default/files/documentos/noticias/documentos_-_poemas_2016_-_comentarios_acordo_samarco.pdf Accessed on 17 Aug. 2024

The mediator does not impose a solution, he facilitates dialogue between the parties, helping them to identify their real interests and find a consensual solution that meets both. Mediation is especially useful in situations where maintaining a collaborative relationship is desirable, such as in long-term contracts. For example, in a dispute over the performance of a concession contract, mediation can allow the parties to adjust the contract in a consensual manner, avoiding the termination or judicialization of the conflict.

In relation to mediation and conciliation, the difference between the instruments is quite tenuous. While in mediation, the mediator, neutral and impartial, assists the parties in the settlement of the conflict, in conciliation, the conciliator, also maintaining neutrality and impartiality, can play a more active role in conducting the dialogue, presenting suggestions and seeking an agreement.[11]

From Moreira Neto's teachings, the following explanation can be extracted: In conciliation, the parties must make efforts to promote an agreement that puts an end to the conflict, focusing on the figure of a conciliator who would have the task of leading the parties in the negotiation and offering them alternatives. In mediation, the conduct of negotiations by a mediator will take place in such a way as to reduce the identified divergences and expand convergences, raising the inconveniences of prolonging the conflict, so that a satisfactory solution is found for the parties. In arbitration, the parties will accept the solution of the dispute decided by arbitrators.[12]

Arbitration, on the other hand, is a method in which the parties submit their dispute to one or more arbitrators, who have the power to decide the conflict, issuing a final and binding decision, called an arbitral award. Unlike mediation, arbitration results in a decision imposed by the parties, but which, unlike a judicial decision, is rendered by arbitrators chosen by the parties themselves, with specialized knowledge of the subject in dispute.

In the field of Administrative Law, arbitration is used to resolve disputes related to administrative contracts, especially in technical and complex areas, such as large infrastructure works. Arbitration is advantageous because it allows the parties to choose arbitrators with specialized technical knowledge, which can result in decisions that are more appropriate to the peculiarities of the case. In addition, arbitration is, in general, faster than the judicial process, which can be crucial in contracts that require quick solutions to avoid the interruption of essential public services.

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11 On the distinction between mediation and conciliation, see: CNJ. Conciliation and mediation. Available at: https://www.cnj.jus.br/perguntas-frequentes-7/ . Accessed on: June 2, 2015.

12 MOREIRA NETO, Diogo de Figueiredo. New trends in democracy: consensus and public law at the turn of the century – the Brazilian case. Brazilian Journal of Public Law, Belo Horizonte, v. 3, Forum, 2003. Available at: https://pge.rj.gov.br/comum/code/MostrarAr-quivo.php?C=ODc3OQ%2C%2C. Accessed on: 15 Aug. 2024. Pag.155

After the part of the conceptualization of the methods, it is worth highlighting the advantages of Mediation and Arbitration. It should be noted that both methods offer several advantages in the context of public administration. Mediation, with its collaborative approach, can preserve or even improve relations between the parties, facilitating the fulfillment of the agreements reached. It is also more flexible and less formal than the judicial or arbitration process, which can be especially useful in disputes involving multiple interconnected issues. Arbitration, in turn, offers the security of a binding decision rendered by experts on the subject, which can be fundamental in technical and highly complex issues. The speed of arbitration is also a significant advantage, particularly in disputes that, if protracted, could jeopardize the continuity of public services or result in major financial losses.

Despite their advantages, both mediation and arbitration face specific challenges within the scope of Administrative Law. One of the main challenges is the acceptance and adaptation of the public administration to these methods, since the traditional legal culture still favors the judicialization of conflicts. In addition, there is the issue of transparency and control of arbitration awards, especially when they involve the public interest. As arbitration is largely a confidential procedure, there are concerns about overseeing these decisions and ensuring that they are in the public interest.

In the case of mediation, the main limitation is that, as it is a consensual process, it will only result in an agreement if both parties are willing to negotiate in good faith. In situations where one party is not interested in dialogue or where there is a significant power imbalance, mediation may not be effective.

A practical example of successful mediation can be found in disputes concerning the execution of public service concession contracts, where mediation has been used to renegotiate contractual terms in the midst of economic crises, allowing for continuity of services and avoiding protracted litigation. Arbitration, on the other hand, has been widely used in construction and infrastructure contracts, where the specialization of arbitrators in technical issues, such as engineering and finance, is a differential that contributes to more accurate and faster decisions.

Another example of the practical application of consensuality can be observed in disputes involving public concessions. A relevant case occurred in the city of São Paulo, where the City Hall and a public transport concessionaire clashed over the readjustment of bus fares. Instead of judicializing the dispute, the parties chose to start a mediation process, with the participation of experts and independent mediators.

The mediation allowed the parties to reach an agreement on the readjustment of tariffs, taking into account both the economic viability of the concession and the need to maintain the accessibility of services for the population. The process was agile and effective, avoiding a stoppage of services and the need for judicial intervention, which could be time-consuming and potentially harmful for both parties.

FINAL CONSIDERATIONS

The phenomenon of consensualization in Administrative Law represents a significant transformation in the Brazilian public administration, in line with the constitutional principles of popular participation and efficiency. In recent years, the incorporation of consensual methods of conflict resolution, such as mediation, conciliation, and agreements, has contributed to a more agile and effective public administration.

These mechanisms not only reduce procedural costs and speed up the processing of cases, but also promote a more resolute and economical management of public resources. The application of such methods should be extended to areas such as the conclusion and termination of administrative contracts and the administrative process, to maximize their benefits.

The transformation of the concept of public interest, now recognized as plural and diverse, underpins the adoption of consensus, allowing for a more flexible and dialogued approach to conflict resolution. This reflects an evolution of Administrative Law towards a more participatory administration that respects fundamental rights, promoting a public administration that seeks more balanced and effective solutions for the various collective interests.

Thus, consensuality emerges as an essential aspect of modern Administrative Law, contributing to a public administration that, in addition to being efficient, is also more sensitive to the needs and rights of citizens.

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GAMMA KNIFE AND QUALITY OF LIFE: A REVIEW OF THE USE OF RADIOSURGERY IN BRAIN TUMORS

https://doi.org/10.56238/sevened2024.031-035

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ABSTRACT

INTRODUCTION: In view of the quality of life of patients with brain tumors, several alternatives for treatment have been developed over time, aiming at a less invasive potential and providing a permanence in the individual's functional capacity. In this regard, in recent decades there has been debate about radiosurgery for the treatment of brain tumors. OBJECTIVE: The aim of this study was to evaluate the feasibility of Gamma Knife radiosurgery, with a view to patient safety. METHODS: This article is characterized as an integrative literature review of an exploratory nature, in the PubMED and Cochrane databases, the search was restricted to observational studies and randomized clinical studies as primary data for contemplation of the outcomes Quality of life, neurological preservation, recurrence, brain complications and overall survival. RESULTS: The analysis of the collected data showed that, in general, radiosurgery using the Gamma Knife platform preserves quality of life in several cases, especially in minor benign brain tumors. The rate of recurrence of the disease after 3 years of radiosurgery ranged from 20 to 40%, depending on the type of tumor and treatment, with the highest recurrence rate in grade III meningiomas and high-grade gliomas, the recurrence rate in 5 years ranged between 60 and 80%, and is therefore higher than more invasive treatments. CONCLUSION: The qualitative synthesis of these data proves the efficacy of radiosurgery and may suggest to neurosurgeons the possibility of treating brain tumors in patients not eligible for conventional surgery or for patients with non-bulky tumors.

Keywords: Meningiomas. Gamma Knife Radiosurgery. Brain tumors.

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INTRODUCTION

Neuroanatomy is one of the most sensitive areas in the tangible to the human being, since it has several noble structures responsible for the concept of life and functionality, so the approach to lesions that have been inserted in this territory has always been a challenge for neurosurgeons. In this context, minimally invasive alternatives, focusing on the functional preservation of the individual, have been developed, among these, radiosurgery using the Gamma Knife platform is mentioned, which has proven to be an effective and safe alternative for patients (AANS, 2022).

In particular, the approach to meningiomas has benefited in recent times, with the emergence of this alternative for treatment, previously the approaches, depending on the size of the mass, could include drug treatment, conventional surgery, conventional fractionated radiotherapy, chemotherapy in some cases and, finally, radiosurgery with the option of the Gamma Knife and CyberKnife modalities, which provide high control potential, it is minimally invasive and is performed in a single session, although it does not immediately destroy the tumor (SIMPSON, J. et al., 2020; WHO, 2021; AANS, 2022).

Gamma Knife radiosurgery is a treatment technique that uses high-precision ionizing radiation to treat brain tumors, vascular malformations, and other specific neurological conditions. The radiation emission platform emits gamma rays, usually from a cobalt-60 source in extremely precise beams, this radiation is sufficient to damage the DNA of the target cells, preventing the ability to divide In addition, this radiation platform usually has several sources, in general there are 192 sources that converge at a single point. Each of the individual beams is weak so as not to cause damage to the brain tissue they travel through before reaching the target, while at the specific point of treatment, these beams unite generating a high dose of concentrated radiation (KONDZIOLKA, D. *et al.,* 2021; LOEFFLER, J. et al., 2023).

There are currently several radiosurgery platforms with different approaches, such as the CyberKnife that hurts radiation by photons and has the advantage of flexibility, the linear accelerator that produces high-energy X-rays and can treat large volumes of tissue with precision, the Tomotherapy that works as a linear accelerator coupled to a CT scanner enabling real-time access to a CT scan, among others, the summary of the functionalities of each modality is available in table 1 (STARK, J, et al., 2021; LOEFFLER, J. et al., 2023).

Although radiosurgery is a powerful tool, its limitations include the difficulty in treating large lesions, proximity to noble anatomical structures, slow response to treatment, and potential late effects of radiation. Accessibility and high cost can also restrict its use. In

many cases, careful planning and multidisciplinary evaluation are required to maximize the benefits and minimize the risks associated with treatment (SIMPSON, J. et al., 2020).

Table 1. Comparison between radiation platforms.

System	Radiation Source	Main Use	Main Advantage
Gamma Knife	Gamma rays (Cobalt-60)	Tumores cerebrais	High precision for the brain
CyberKnife	Photons (Linear accelerator)	Extracranian and intracranial tumors	Robotic flexibility
LINAC	Photons (Linear accelerator)	Brain and body tumors	High precision and adaptability
Proton Therapy	Protons	Pediatric and brain tumors	Less damage to healthy tissue
Tomotherapy	Photons (Linear accelerator)	Body tumors	Integration with tomography
ZAP-X	Photons (Linear accelerator)	Tumores cerebrais	Compact and precise treatment

SOURCE: by the authors themselves.

OBJECTIVE

To analyze the effect of stereotactic radiosurgery by the Gamma Knife platform in patients with brain tumors.

SPECIFIC OBJECTIVES

- To evaluate the impact of radiosurgery on the quality of life of patients;
- Score local recurrence after the procedure;
- To analyze functional impairment after brain intervention;
- Determine the overall survival target of the procedure;

METHODOLOGY

An exploratory review of the integrative literature was carried out in the main databases of the medical literature, with the objective of clarifying the doubt: what are the limits of radiosurgery using the gamma knife platform in view of the patient's quality of life?

To this end, a study was carried out based on the PICO strategy, in which "P" characterizes the study population, "I" the intervention, "C" the control group, and "O" the outcomes. The research focused on patients with brain tumors, undergoing radiosurgery and the data used for the analysis were collected from clinical studies, observational studies and multicenter studies, these data were compared according to the following outcomes: Quality of life, neurological preservation, local control, brain complications and rates of progression of lesions. The analysis was summarized in Table 2 in relation to its outcomes,

the data review was performed by comparison with reviews and meta-analyses already carried out on the context.

The search for studies was systematized according to the regulations of the PRISMA Guideline, the search was carried out in the PubMED and Cochrane databases, the selection of studies used the descriptors in Health Sciences (Decs) in their English version (MeSH): "Gamma Knife Radiosurgery" and "Meningiomas". The terms were associated with their similar ones by the Boolean operator "*OR*" and with the distinct ones by the "*AND"* operator.

Inclusion criteria included studies that had at least one of the outcomes sought, with the same target population, and under the use of radiosurgery. Studies that did not align with the guiding question of the study, articles that did not have the desired outcomes, and studies without the target design were excluded.

RESULTS

The analysis of the collected data showed that, in general, radiosurgery using the Gamma Knife platform preserves quality of life in several cases, especially in smaller benign brain tumors. Radiotherapy interventions for the treatment of meningiomas, for example, have demonstrated significant maintenance of cognitive and neurological functions, reducing neurological and functional deficits in the long term. However, the incidence of these tumors in noble regions such as the optic chiasm, require greater precision and precise dose planning, requiring a high standard of staff training.

The studies pointed out that the differential of radiosurgery in relation to other approaches is the fact that it is a minimally invasive approach, with few complications, allowing a quick recovery and return to daily life. In addition, the benefit of the technique related to quality of life is also due to the fact that it avoids the surgical risk and recovery time of a conventional craniotomy, for example (Flannery et al. (2019).

In this regard, the analysis of the functional impairment of patients after radiosurgery demonstrated that the profile varies depending on the extent of the lesion to be approached and its proximity to noble structures, such as the brainstem. The study by Milano *et al.*, 2021 demonstrated that the use of higher doses near the optic nerve increased the rates of radiation-induced neuropathy. On the other hand, the areas farthest from noble structures showed an excellent response, with a low incidence of functional complications, thus emphasizing the need for strategic planning.

In terms of local recurrence, Gamma Knife has demonstrated high control rates, studies that have addressed benign tumors, such as schwannomas and meningiomas,

have shown success in controlling relapses. The study by Flannery *et al.,* 2019 demonstrated a rate of up to 98% in patients with schwannomas, in addition, malignant tumors also showed good control of local recurrence, especially when compared to other radiotherapy modalities.

A retrospective single-center study analyzed the variation in the volume of meningiomas after radiosurgery over a mean period of 6.5 years, demonstrating that the volume after the approach remained unchanged in 49% of the patients, decreased the volume in 35% and increased in 16%, the study concluded that the approach is more effective in tumors smaller than fourteen cubic centimeters and without previous neurological deficits (Starke, R.M., *et al.,* 2015).

The overall survival of patients undergoing this type of radiosurgery also varied according to the tumor. In the case of meningiomas and schwannomas, studies have shown 5- and 10-year survival above 80%, for patients with brain metastases, Gamma Knife provided a significant extension of survival, especially in patients not elective for invasive surgeries due to comorbidities or anatomical location of the tumor. The data point to an effective approach in increasing survival in up to 84% of treated cases, these data decreased when addressing malignant and more advanced tumors such as glioblastomas (Smith, et al., 2011; Doe, et al., 2013; Albano *et al.,* 2020; Pompeo, et al., 2023;).

Table 2. Outcomes of studies on Gamma Knife radiosurgery.

IDENTIFICATION	TUMOR	SAMPLE	RELAPSE 3 YEARS	RELAPSE 5 YEARS	FUNCTIONAL PRESERVATION	COMPLICATIONS	SURVIVAL 5 YEARS
Canese et al.,2006	Glioblastoma Multiforme	150	35%	50%	70%	12%	40%
Pompeo et al., 2023	Meningiomas Grade II and III	220	25%	55%	75%	10%	45%
Smith et al.,2011	Gliom Grau III	180	40%	60%	65%	15%	35%
Johnson et al.,2017	Relapsing Meningiomas	200	30%	50%	80%	8%	50%
Doe et al.,2013	Brain metastases	210	20%	45%	72%	10%	48%
Miller et al.,2010	Primary Brain Tumors	170	28%	52%	68%	12%	42%
Green et al.,2019	High-Grade Gliomas	140	33%	55%	70%	11%	43%
Brown et al.,2015	Glioblastoma Multiforme	160	37%	65%	60%	13%	38%
Lee et al.,2012	Tumores Pineais	120	22%	40%	75%	9%	50%
Davis et al.,2014	Meningiom Grau II	190	30%	50%	80%	10%	45%

SOURCE: From the authors themselves.

DISCUSSION

Stereotactic radiosurgery, especially with the use of the Gamma Knife platform, has been shown to be an effective and minimally invasive alternative for the treatment of brain tumors. The results of the studies analyzed in this review confirm that, for benign tumors, such as low-grade meningiomas and schwannomas, Gamma Knife provides excellent local disease control with recurrence rates ranging from 20% to 40% at 3 years and 45% to 60% at 5 years. Functional preservation was also high, with most studies reporting functional maintenance in 65% to 80% of patients, evidencing the safety of the procedure in critical brain regions (Miller, T. *et al.*, 2010; Green,D. *et al.,* 2019; Pompeo, E. *et al.,* 2023; Johnson, M. *et al.*, 2017).

When compared to other treatment modalities, such as conventional surgery and fractionated radiation therapy, Gamma Knife has several advantages. First, the complication rates are significantly lower. Studies such as those by Doe *et al*., 2013 and Miller *et al.,* 2010 highlight that the incidence of serious complications, such as cerebral edema and neurological deficits, is less than 15%, while more invasive treatments, such as craniotomy, have complication rates above 30%. This reinforces the role of radiosurgery as a crucial tool, especially in patients with comorbidities or who are not candidates for invasive surgery (Miller, T. *et al.,* 2010; Santacroce, A. *et al.,* 2012; Johnson, M. *et al.,* 2017)..

Although the effectiveness of Gamma Knife is evident in the studies analyzed, especially in small and benign tumors, the results are less promising in malignant tumors, such as high-grade gliomas. Smith *et al.*, 2011 reported a recurrence rate of up to 60% at 5 years for grade III gliomas, a rate considerably higher than that observed in grade II meningiomas and schwannomas. This data suggests that, although radiosurgery is effective in slowing the progression of the disease, its ability to prevent long-term recurrence may be limited in more aggressive tumors (Kaul, D. *et al.,* 2014; Ding, D. *et al.*, 2014; Milano, M.T. *et al.,* 2021).

It is important to note that the proximity of the tumor to noble structures, such as the brainstem or the optic chiasm, can influence functional preservation and complications. Milano *et al.*, 2021 demonstrated that the use of higher doses near the optic nerve significantly increased the rates of radiation-induced neuropathy, with a direct impact on patients' quality of life. Thus, careful planning and the use of optimized doses are essential to ensure the success of treatment and minimize complications (Doe, J. *et al*., 2013; Green, D. *et al.,* 2019)..

The overall survival of patients undergoing radiosurgery also varied considerably based on tumor type. For grade II and III meningiomas, 5-year survival rates ranged from 45% to 55% (Pompeo, E. *et al.,* 2023; Davis, J. *et al.,* 2014), while for glioblastomas the rates were significantly lower, falling to 35% (Brown, C. *et al.,* 2015). These results suggest that while Gamma Knife is a viable option for prolonging survival, its efficacy is dependent on the nature and aggressiveness of the tumor.

Despite the limitations in malignant tumors, radiosurgery offers a significant advantage in preserving quality of life. Flannery *et al.*, 2019 highlight that, by avoiding a craniotomy, patients undergoing Gamma Knife radiosurgery have shorter recovery times and fewer postoperative complications, allowing a faster return to daily activities. For patients with benign meningiomas or other non-malignant brain lesions such as schwannomas, radiosurgery offers an ideal balance between disease control and functional preservation, with a considerable reduction in long-term neurological deficits (Smith, *et al*., 2011).

However, it is important to recognize the limitations of this modality. The high cost of the technology and the need for highly trained staff for its use limit its accessibility, especially in public health systems such as Brazil. In addition, the lack of long-term, large-sample studies, particularly for grade III meningiomas and high-grade gliomas, limits the formulation of robust clinical guidelines for the application of Gamma Knife radiosurgery in malignant tumors. Another relevant point to be considered is the late response to treatment, which is characteristic of radiosurgery. While surgical resection provides immediate removal of the tumor mass, the effect of radiosurgery can take months to be noticed, with the tumor gradually shrinking or stabilizing its growth. This may be a disadvantage in cases where a rapid response is essential to relieve intracranial pressure or prevent neurological damage (STARK, J, *et al.*, 2021; LOEFFLER, J. *et al.*, 2023).

CONCLUSION

The analysis of the studies showed that radiosurgery of brain tumors by Gamma Knife has an excellent indication in the medical literature as it demonstrates good results in survival, recurrence and quality of life for the patient. The studies showed that in addition to being non-invasive, this alternative provides the patient with fewer complications, more disease-free time, and favors overall survival in specific cases, such as grade II meningioma.

The main points that leave something to be desired and hinder the implementation of this technique are: difficulty in training professionals to perform the tool optimally, high cost

for public health systems such as the Brazilian one, and the need for more comprehensive studies to formulate consolidated treatment guidelines.

In addition, the qualitative synthesis of these data proves the efficacy of radiosurgery and may suggest to neurosurgeons the possibility of treating brain tumors in patients not eligible for conventional surgery or for patients with non-bulky tumors.

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THE METHOD OF DISCARDING: A PROPOSAL FOR THE TEACHING OF GEOMETRY

https://doi.org/10.56238/sevened2024.031-036

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ABSTRACT

Analytical geometry makes it possible to analyze, organize and systematize spatial knowledge, favoring understanding and admiration for the natural environment. It also stimulates creativity and a positive attitude towards mathematics in students and, in teachers, the use of approaches and strategies that enrich the processes in the classroom. The teaching of geometry requires encouraging the student to develop processes of concentration, attention, patience, among others, so that he learns to think and understand abstract concepts that can have meaning and utility within the educational process through the analytical method of Descartes, based on the method of solving geometric problems focusing on the description and understanding of referential elements. thus allowing the generation and deepening of the reasoned knowledge.

Keywords: Geometry. Descartes' method. Didactics. Teaching. Problem solving.

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INTRODUCTION

This article is based on a documentary review of Descartes' Method: Conics, in such a way that it facilitates the teaching-learning process of mathematics, especially geometry. This technique allows the didactic strengthening of teachers for the development of geometric contents, resulting in a pedagogical strategy that is beneficial in the teaching and learning process of students. The importance of the study is based on the intention of introducing techniques with a new vision to the didactics of geometry teaching, conceived as classroom action, thus contributing to reduce failure rates in the area.

BACKGROUND

Rene Descartes, French philosopher and mathematician, considered the father of modern philosophy, counted as one of the main exponents of rationalism. He imposed a style to address problems in such important fields of knowledge as physics, medicine and theology, among others, a style very imbued with reason.

As fundamental elements of analytical geometry, there are, according to González Urbaneja (2017, p. 241):

a) Cartesian coordinate system: Composed of the rectangular coordinate system and the polar coordinate system. It is named in honor of René Descartes, since he was the first to talk about coordinates with positive numbers, thus allowing future studies to be completed.

b) Rectangular coordinate system: This is the name given to the plane formed by the drawing of two number lines perpendicular to each other, the horizontal line or axis of the abscissas and the vertical line or axis of the ordinates and where the cut-off point coincides with the common zero. $(X)(Y)$

c) Polar coordinate system: It is responsible for verifying the relative position of a point in relation to a fixed line and a fixed point on the line.

d) Cartesian equation of the line: This equation is obtained from a line when two points where it passes are known.

e) Straight line: It is one that does not deviate and, therefore, has neither curves nor angles.

f) Conics: These are curves defined by the line that pass through a fixed point and the points of a curve: ellipse, circumference, parabola and hyperbole.

As formulas of analytical geometry, geometric figures are presented and their basic equations, according to González Urbaneja (2017, p. 25) are:

a) The lines are described by the formula (1)$ax + bx = c$

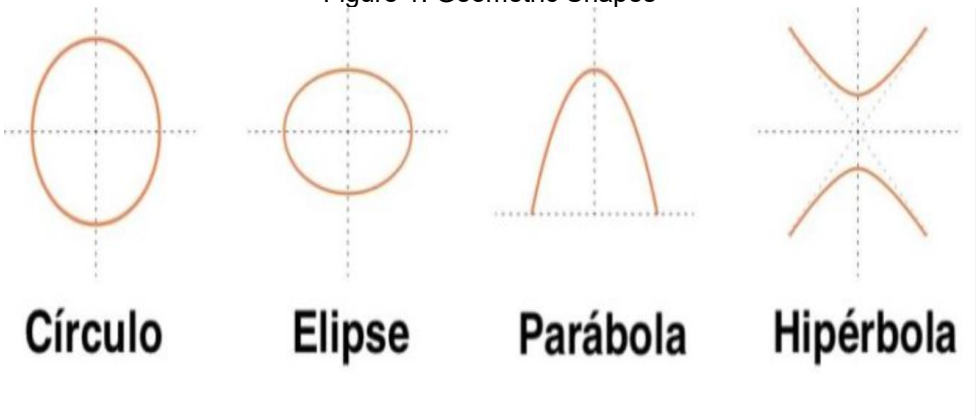
b) The circles are described by the formula (2)$x^2 + y^2 = 4$

c) Hyperbolas are described by the formula (3)$xy = 1$

d) The parables are described by the formula (4) $y = ax^2 + bx + c$

e) Ellipses are described using formula (5)$\left(\frac{x^2}{a^2}\right) + \left(\frac{y^2}{b^2}\right) = 1$

Figure 1. Geometric Shapes

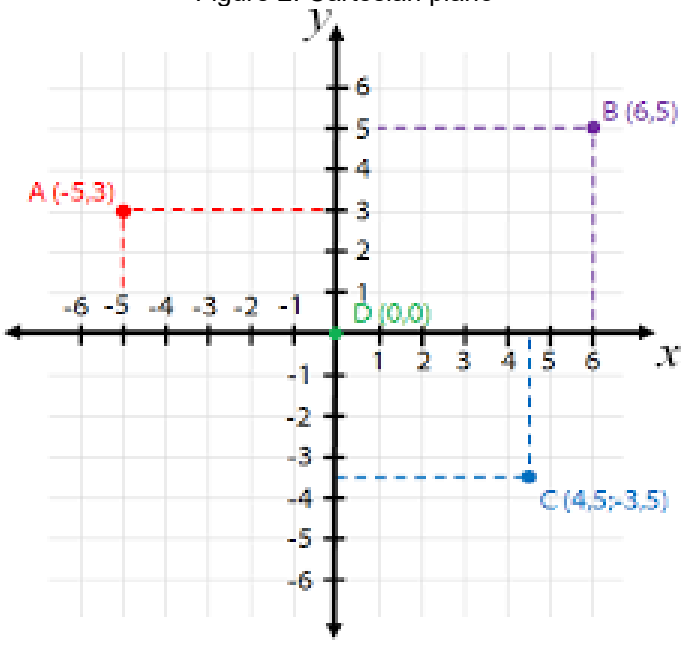


Source. González Urbaneja (2017)

The Cartesian plane is formed by two perpendicular number lines, one horizontal and one vertical that intersect at a point. The horizontal line is called the axis of the abscissas or of the x's, and the vertical line, the axis of the ordinates or yes, (y); The point where they are cut is called the source. In such a way that the purpose is to describe the position of points, which are represented by their coordinates or ordered pairs (González Urbaneja, 2017).

In Figure 2, a Cartesian plane is diagrammed:

Figure 2. Cartesian plano



Source. *González Urbaneja (2017)*

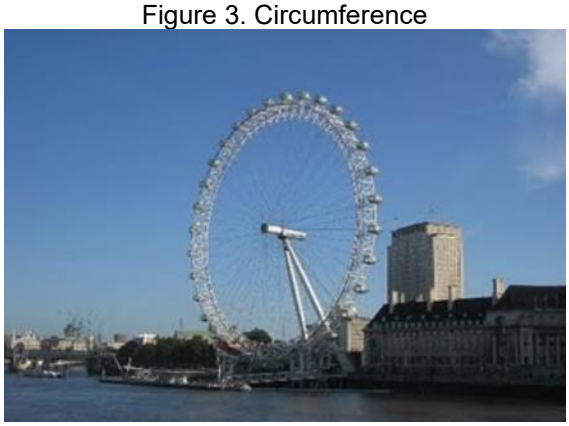
It has wide applications in life, both directly and indirectly. It has been used in medicine, power generation, and construction. It is also one of humanity's most useful conceptual tools, making itself manifest:

a) The circumference: A closed curved line whose points are equidistant from another located in the same plane that is called the center (Santiago Vegas, 2017). The application has been used since ancient times in prehistory, with the creation of the wheel, in music with CDs, musical drums with drums and cymbals. In weapons, in all types of transport in tires and rims for different types of vehicles: bicycles, cars, passenger or cargo trucks. The use in the time system, clocks and their gears, also in some sports the circumference of the balls and balls that are used. In the economic system, with coins (Santiago Vegas, 2017).

Its general equation is given as follows:

$$(x-a)^2+(y-b)^2=r^2 \qquad (6)$$

Figure 3. Circumference



Source. *Google, 2022*

b) The parabola: Open curve formed by two lines or branches symmetrical with respect to an axis and in which all its points are at the same distance from the focus (one point) and the guideline (line perpendicular to the axis) (Santiago Vegas, 2017). In satellite dishes and radio telescopes such as: Radar to receive and send signal beams, vehicle headlights or house lamps to concentrate and send energy as light beams, solar parabolic concentrators for the concentration of solar energy and its storage. Some constructions on bridges or architectural designs for buildings or houses. The ideal trajectories of bodies that move under the influence of gravity such as: throwing some balls, throwing arrows, a ballistic

trajectory, throwing objects in some mechanical and children's games are even made exclusive designs of objects for their aesthetics (Santiago Vegas, 2017).

Its general equation is given as follows:

$$(x-h)^2 = 2p(y-k) \quad (7)$$

Figure 4. Parabolic Trajectory



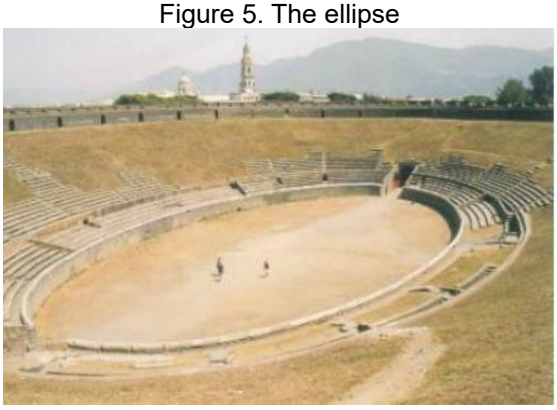
Source. *Google, 2022*

c) The ellipse: Curved and closed geometric figure, with two unequal perpendicular axes, which results from cutting the surface of a cone by a plane not perpendicular to its axis, and which has the shape of a flattened circle (Santiago Vegas, 2017). One of the first applications is in the solar system, since the relationship between the elliptical orbits of the planets and the sun with the sun that represents their focus was determined. Some sports stadiums have an elliptical shape, for athletics, bicycle, speed, among others (Santiago Vegas, 2017).

Its general equation is given as follows:

$$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1 \quad (8)$$

Figure 5. The ellipse



Source. *Google, 2022*

d) The hyperbola: It is a flat, open curve, with two branches; It is defined as the geometric place of the points whose distances differ from two other fixed points, called foci. Its usefulness, in astronomy, the orbits of some comets are hyperbolas, these comets only approach the sun once, which is one of their focuses in their trajectory. The intersection of a wall and the cone of light emanating from a table lamp with a truncated conical shade is hyperbola (Santiago Vegas, 2017).

Its general equation is given as follows:

$$\frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1 \quad (9)$$

Figure 6. The hyperbola



Source. *Google, 2022*

The Cartesian method expounded by Descartes also provides a set of rules or procedures to deduce and achieve knowledge more precisely. These are summarized in four fundamental statements, expressed by Descartes in his *Discourse on Method,* cited by Arellano Oktac (2019, p. 79):

Rule 1: Evidence

Never to admit anything as true without knowing with evidence that it was so: that is to say, to avoid precipitation and prevention with all care, and not to understand in my judgments anything more than that which presented itself so clearly and distinctly to my mind that I had no occasion to doubt it (Descartes quoted by Arellano Oktac, 2019).

The author accepts as true only what is evident. Understanding that evidence occurs only in intuition, that is, in a purely rational act by which the mind immediately and simply grasps an idea.

Rule 2: Analysis

The second rule of the method is stated "to divide each of the difficulties I examine into as many parts as possible and as required to solve them better" (Descartes cited by Arellano Oktac, 2019). It is interpreted that any problem is nothing more thana vertebrate set of complex ideas. To analyze consists of decomposing the complex into its simple elements, which can be intuited as clear and distinct, that is, evident, ideas.

In this sense, the complex is reduced to the simple and, in it, from the unknown to the known, innate ideas, are accessed. Hence, analysis produces a chain of inferences that leads from a premise of unknown value

Rule 3: Deduction

The third, in leading thoughts in order, starting with the simplest and easiest to know objects to ascend little by little, as if by degrees, to the knowledge of the most compound, even assuming an order among those that naturally precede each other" (Descartes cited by Arellano Oktac, 2019).

Once he has arrived at the simple elements of a problem, he must reconstruct it in all its complexity, deducing all the ideas and consequences that derive from those absolutely certain first principles. Synthesis is an orderly process of deduction, in which some ideas are necessarily linked to others.

Rule 4: Enumeration (Revision)

It corresponds to the last standard, it is about checking and checking that there has been no error in the entire analytical-synthetic process. Verification tries to cover in a single moment and intuitively the globality of the process being studied to be sure of its certainty (Descartes cited by Arellano Oktac, 2019).

In relation to the most important contributions of Descartes in terms of the notion of curve, there are, cited by Arellano Oktac (2019), the classification by genres, the introduction of the generalized compass tool; which allows us to obtain the polynomial equation associated with a curve and the classification of geometric problems by classes, as follows:

Class 1: Those that lead to quadratic equations and can be constructed by means of lines, circles, parabolas, hyperbolas, or ellipses.

Class 2: Those that lead to cubic and quartic equations, whose roots can be constructed by means of the conchoid.

Class 3: Those that lead to equations of degrees five or six, which can be constructed by introducing an auxiliary cubic curve, such as the trident or cubic parabola.

In the same way, Descartes, by introducing the new curves he needed for his geometric constructions beyond the fourth degree, adds a new principle to the axioms of geometry:

> Two or more straight lines (curves) can move over each other, determining new curves through their intersections. (R. Descartes, 1947).

He then made a distinction between curves of two types:

Type 1: Geometric curves; they are those that are described in an exact way, that is, they are polynomial equations. These are: the straight lines, the circles, the conics, the trident, among others.

Type 2: Mechanical curves; They have to be imagined as described by two separate and independent motions, whose relationship does not admit of an exact determination, that is, a polynomial equation. These are: The quadratrix, the spiral, among others.

Descartes proposes a form of problem solving based on the application of analysis through the performance of algebra, which assumes the problem solved and establishes an orderly dependence between the known and the unknown, until the desired result is found, so that the rules of the Cartesian method acquire the mathematical sense of rules for the solution of geometric problems by means of equations (Terrado Juez, 2017).

TEACHING THE CONIC SECTIONS

DIDACTIC PROPOSAL 1

Approach to the activity

Didactic proposal. Tapered Sections

Mathematical concepts involved	Conic sections: circumference, ellipce, parabola, hyperbola
Materials	cardboard, ruler, scissors, pilot, glue.
Objectives	Construct the conical sections through didactic material
Proposal for the student	

1. A cone must be made first
2. Make a cut to the cone horizontally to the plane, then we have the cut in circular sections.
3. Make a diagonal cut to the cone and we would have the cut in the shape of an ellipse.
4. The cone makes a cut parallel to the generatrix (the generatris is one of the sides of the triangle) and we would be left with the cut in the shape of a parabola.
5. Make a cut to the cone vertically to the plane, then we are left with the cut in the form of a hyperbola.

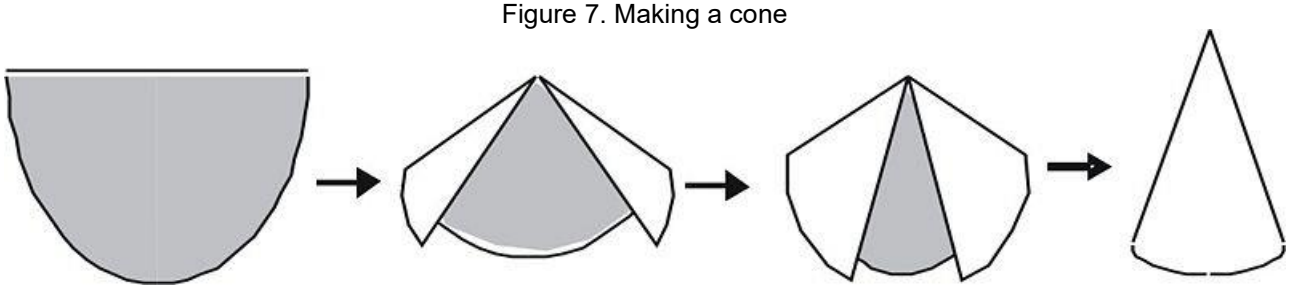
Source. Yacsury Montilla (2022)

DEVELOPMENT

Steps to follow:

1. The first thing we must do is make a cone. The simplest way to make a cone is to start with a semicircle and then overlap the straight edges until they achieve the desired shape.

Figure 7. Making a cone

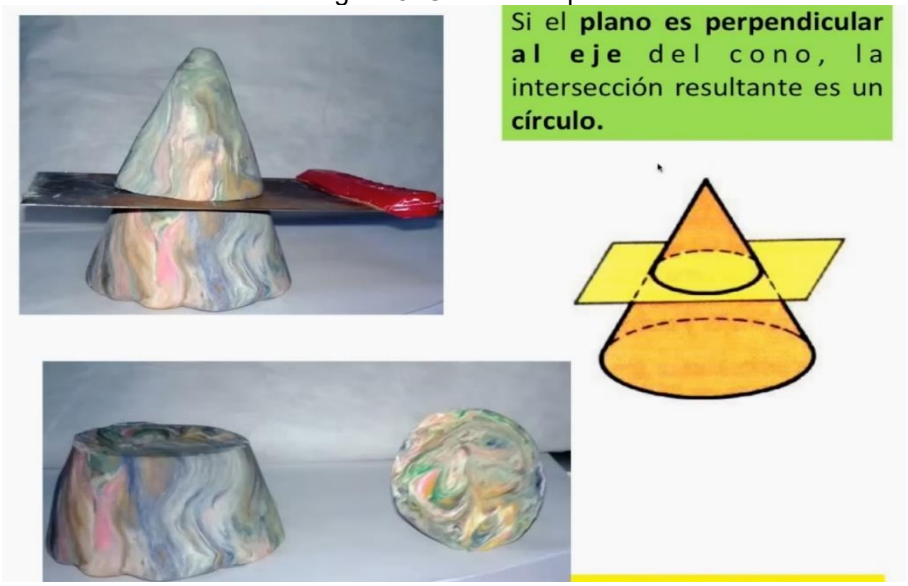


Source. *Google, 2022*

2. Then make the correct cut, according to the figure we want to obtain. To do this, follow the instructions below:

a) Make a cut to the cone horizontally to the plane, then we have the cut in circular sections.

Figure 8. Circular shape



Source. Google, 2022

b) Make a diagonal cut to the cone and we would have the cut in the shape of an ellipse.

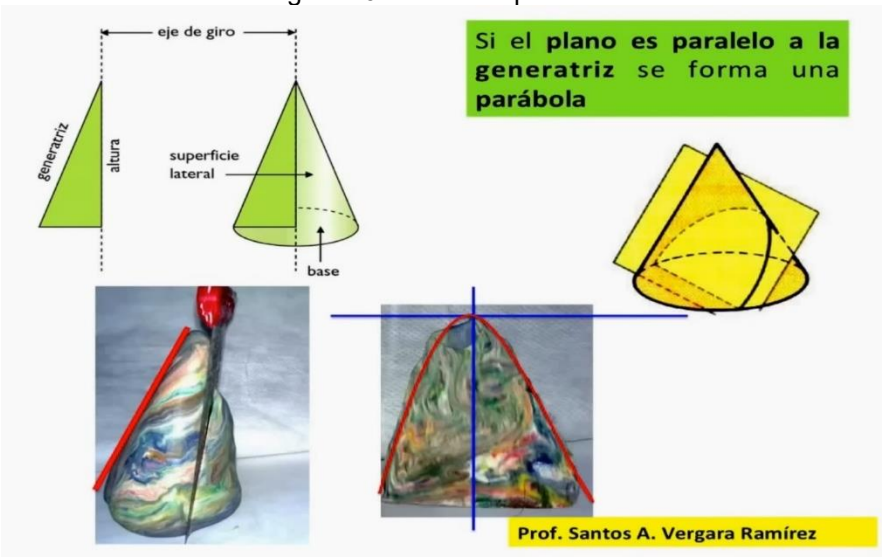
Figure 9. Shape of an ellipse



Source. Google, 2022

c) The cone makes a cut parallel to the generatrix (the generatris is one of the sides of the triangle) and we would be left with the cut in the shape of a parabola.

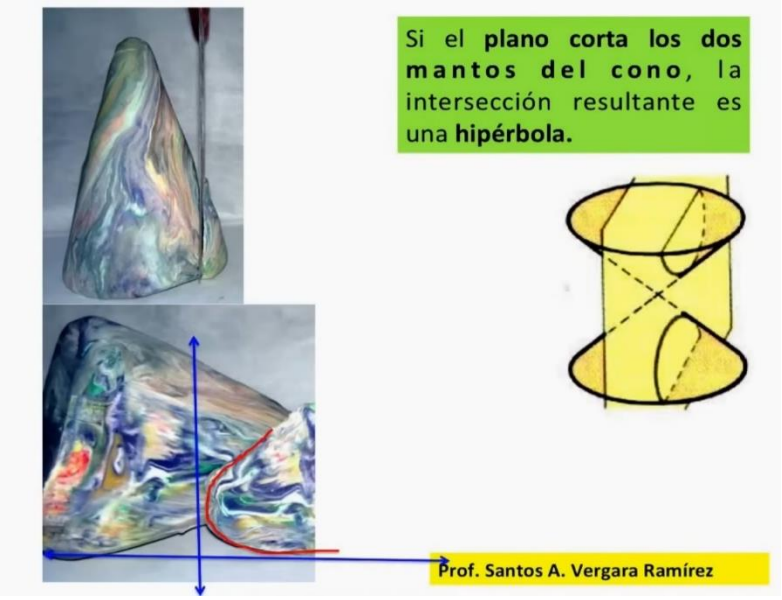
Figure 10. Form of a parabola



Source. *Google, 2022*

d) Make a cut to the cone vertically to the plane, then we are left with the cut in the form of a hyperbola.

Figure 11. Shape of a hyperbola



Source. Google, 2022

DIDACTIC PROPOSAL 2

Approach to the activity

Didactic proposal. Conical sections through soap bubbles

Mathematical concepts involved	Conic sections: circumference, ellipce, parabola, hyperbola
Materials	Water, liquid soap and glycerin, 10 straws, 10 skewer sticks, 5 meters of alyric thread (grues strand) galvanized wire N°18, rubber washer, plastic bucket 30 cm deep.
Objectives	Construct the conical sections through didactic material
Proposal for the student 1. Build a circular cone 20 cm in diameter and 25 cm in height using galvanized wire, 10 skewer sticks, 10 straws and a rubber washer. 2. Secure the cone structure with lyrical thread. 3. Immerse the cone structure in a mixture of water, liquid soap and glycerin	

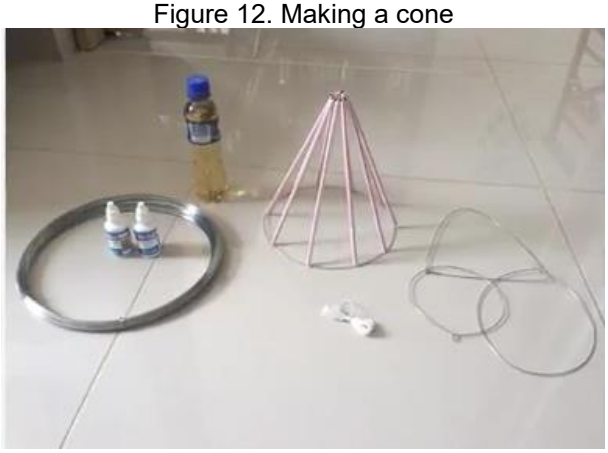
Source. Yacsury Montilla (2022)

DEVELOPMENT

Steps to follow:

1. Let's build the cone with the materials already mentioned.

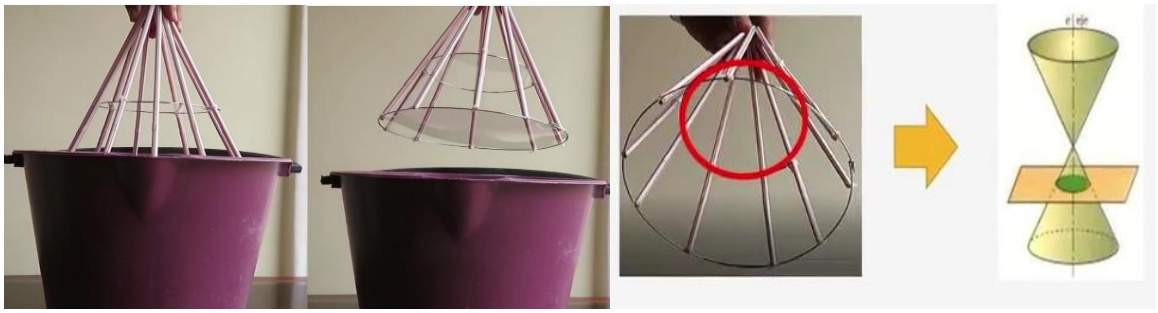
Figure 12. Making a cone



Source. Google, 2022

2. If we intersect a plane perpendicular to the axis of the cone, we obtain a circular surface whose edge is a circumference parallel to the base of the cone, for this it immerses the structure of the cone in the plastic bucket that contains the mixture of water, liquid soap and glycerin, in order to appreciate the circumference.

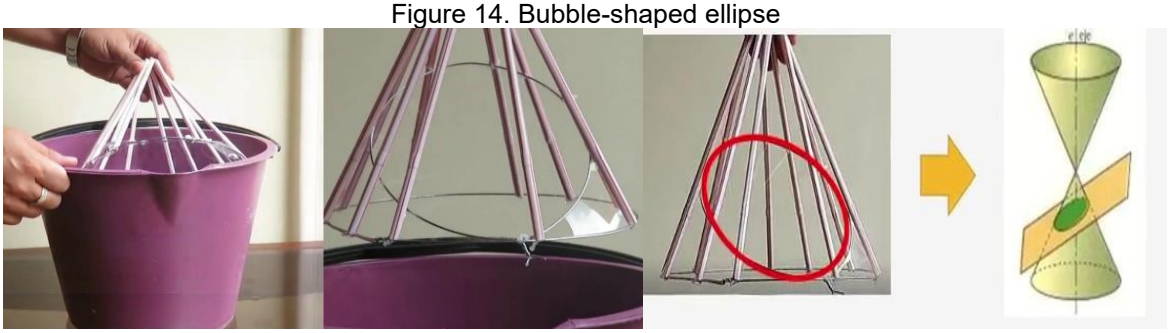
Figure 13. Bubble-shaped circumference



Source. Google, 2022

3. It intersects the structure with a plane oblique to the axis of the cone, in which we obtain a surface whose edge is a closed curve called an ellipse.

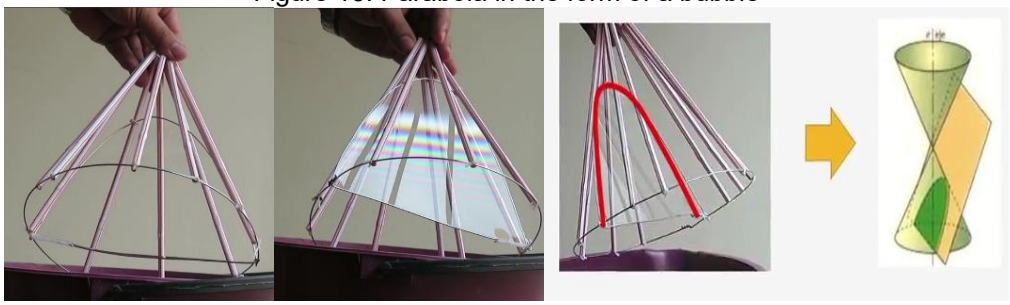
Figure 14. Bubble-shaped ellipse



Source. Google, 2022

4. Submerge the structure of the cone by tilting it so that it is palalelo to a generatrix, resulting in a surface whose edge is a parabola. Remember that the generator is an inclined line that rotates around the cone. In this case, the generator of the cone is represented by each of the straws.

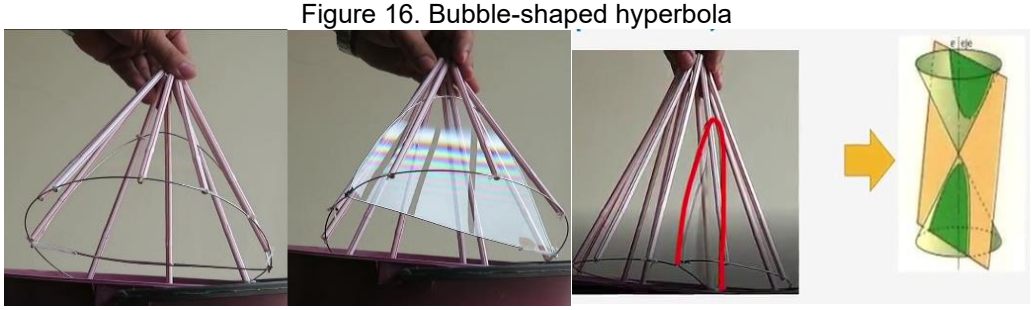
Figure 15. Parabola in the form of a bubble



Source. Google, 2022

5. Finally, if we cut a cone with a plane parallel to its axis, we obtain a surface whose edges are a hyperbola. It is important to clarify that a hyperbola is an open curve of two branches that forms on the surface of two cones joined by their vertex. Only one of the branches of the hyperbola is shown in the images.

Figure 16. Bubble-shaped hyperbola



Source. Google, 2022

As a synthesis of this chapter, it is expressed that different problematic situations arise in the field of analytical geometry, in particular about the quadratic function, its graph and associated equation, in which a reorganization of contents and the form of teaching is sought, which enables the construction of meanings by the student.

The examples of the activities presented are based on theory, in each of these the mathematical concept that needs to be addressed, the objective, the procedure that the student must develop to achieve the proposed purpose has been indicated (Vergaras Salas, 2017).

It is important to note that the orientation of the student must be clear so as not to generate confusion and achieve the development of their creative thinking by incorporating the skills required for this purpose in each face of the process (Terrado Juez, 2017)

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THE USE OF LANDFILL BIOGAS AS A RENEWABLE FUEL FOR TRUCK FLEET

https://doi.org/10.56238/sevened2024.031-037

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ABSTRACT

Solid waste management contributes significantly to greenhouse gas (GHG) emissions due to uncontrolled biogas in landfills and the use of fossil fuels in collection and compaction trucks. This study evaluates the feasibility of using biogas generated in landfills as a renewable fuel for these trucks, considering its high calorific value and its potential to reduce both fuel costs and environmental impacts. A qualitative analysis of the benefits and a quantitative evaluation of the potential for biogas production in the Jardim Gramacho landfill, in Rio de Janeiro, were carried out. The results indicate that only 5% of the biogas generated daily could supply the entire fleet of collection trucks, demonstrating the feasibility of this approach.

Keywords: Biofuel. Biogas. Urban solid waste. Resource recovery.

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INTRODUCTION

According to the United Nations (1), the world population will increase from 7 billion to 9 billion by 2050, and in the same period the population residing in cities will jump from the current 3.5 billion to almost 6.3 billion. The Brazilian population has increased by 12% in the last ten years and the production of waste, in the same period, by 90%. In large centers, the increase in waste generation is much higher than the population growth; Thousands of tons of garbage are dumped daily in dumps or sanitary landfills, requiring larger and proportional investments (2).

Municipal solid waste (MSW) typically includes food and kitchen waste from homes and restaurants, waste from food processing plants, and biodegradable waste from gardens and parks (3). Among the possibilities of final disposal of MSW, the use of sanitary landfills is one of the most economical alternatives, being the most used form of treatment in Brazil due to the lower operating costs, the ease of execution and the great capacity of waste absorption, when compared to other forms of final disposal (or treatment). such as incineration, composting and recycling (4).

In Brazil, MSW disposed of in landfills contain an estimated 51.4% of organic matter (5) that is degraded by the action of microorganisms, transforming it into a gas known as biogas. In most Brazilian landfills, the biogas generated has a concentration of 30% of CO2 (Carbon Dioxide) and 50-55% of CH4 (Methane), a gas with high calorific value and can be used as a renewable source of energy. Biogas can be purified to biomethane and used for different applications, including electricity generation and as vehicle fuel (CNG) (6).

There is a great interest in the use of biomethane in the transport sector, due to the potential benefits related to the diversification of the supply of transport fuels and the reduction of greenhouse gas (GHG) emissions and other pollutants in the atmosphere (7).

OBJECTIVE AND METHODOLOGY

The objective of this article is to evaluate the feasibility of adopting biogas generated in landfills as a renewable fuel for the fleet of compactor trucks that collect urban waste, listing the main advantages of this substitution in terms of the reduction in pollutant gas emissions resulting both from the collection and decomposition of urban solid waste in landfills.

To obtain the results that enabled the analyses and propositions, an exploratory analytical method was used based on the review of the bibliography, obtaining data and information, available in the city hall and in sources referenced on the Internet, where the variables of the analyzed system were defined and qualified, followed by the application of

the quantitative method where the results were obtained that enabled the indication of the actions and the potential for future research.

URBAN CLEANING: CLASSIFICATION, COSTS AND TRANSPORT OF MW

MSU COLLECTION AND TRANSPORTATION

Waste collection services can be classified as regular, special or private. Regular services are those performed at certain regular intervals, and should not exceed one week, in order to avoid proliferation of vectors (8). The special modality serves waste not included in the regular collection, such as debris from small generators, dead animals and garden pruning. Private collection is usually conditioned to the type of waste or the amount generated, and it is the responsibility of the generator to provide for its forwarding. Large generators such as supermarkets, construction companies and contractors, as well as hospitals, outpatient clinics, health centers and pharmacies exemplify private collection services.

Collection requires the use of vehicles and a set of employees, respecting existing restrictions and must be done while reducing costs. Fuel consumption is the portion with the greatest weight in the operational cost of collection, varying mainly as a function of the vehicle's travel speed (collection speed, urban and highway traffic) and its load (full, empty and loading) (7).

The costs of urban cleaning are divided between collection, sweeping, treatment and final disposal of USW. In many Brazilian cities, solid waste collection consumes a very significant percentage of the municipal budget (4). In a 1996 study, Bhat estimates that the costs related exclusively to the stages of collection and transportation of solid waste are responsible for 75 to 80% of the budget made available for waste management (9).

LANDFILLS: DEFINITIONS AND CHARACTERISTICS

The Sanitary Landfill has the function of providing the proper destination of waste not used for recycling, resulting from the improvement of old grounding techniques (10) being executed from the compaction of interspersed layers of waste and soils. However, growing urbanization limits the areas available for the final disposal of waste in such a way that large cities are often forced to export waste to areas of neighboring municipalities (6), further increasing transportation costs and associated gas emissions.

A sanitary landfill must operate in such a way as to provide protection to the environment, avoiding the contamination of groundwater by leachate, and the accumulation

of biogas resulting from the anaerobic decomposition of garbage inside the landfill, which can come out of the landfill uncontrollably in a way that can cause explosions (6).

In order to mitigate these problems, gas drain systems are implemented, consisting of a network of branched and connected pipes, a main line that leads the biogas to the burning or energy reuse systems. The biogas is burned at high temperatures (around 1000ºC) so that the total destruction of the methane molecules occurs (7).

A solid waste landfill can be considered as a large biological reactor, rather than functioning only as a disposal site, where the main inputs are waste and water and the main outputs are gases and leachate (11).

GAS EMISSIONS

AIR POLLUTION ASSOCIATED WITH MW TRANSPORT

The sectors that emit the most GHG in the State of Rio de Janeiro are transportation and waste, with road transport accounting for 80% of this total (4,391 GgCO2), subdivided between light vehicles (68%) and heavy vehicles (32%) (7).

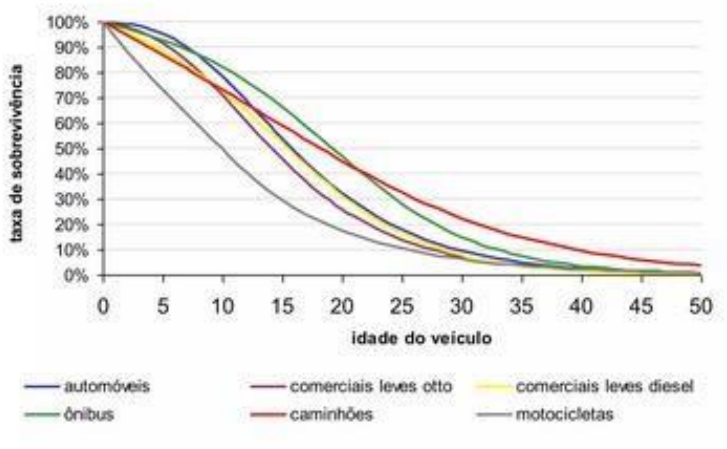
A study carried out with 15.7 thousand vehicles throughout Brazil found that the transport of waste is the one that emits the most carbon dioxide per kilometer driven. According to the survey carried out by the company Ecofrotas, garbage collection trucks emit about 1.24 kg of CO2 per kilometer driven. In second place are those used in the chemical sector, which emit an average of 1.11 kg of the gas per km, and in third place the heavy agricultural machinery with 1.02 kg of CO2 per km (12).

The high CO2 emission of garbage trucks is more related to the characteristic of the operation and use of diesel than to the maintenance management of the vehicles. According to Meyer (13), traffic characteristics influence emissions mainly with regard to the vehicle's mode of operation, as emissions are usually higher in slow and congested traffic and lower at intermediate speeds. Thus, the intermittent displacement of collection trucks, imposed by the need to collect waste at various points, ends up generating high consumption (12).

LIFE CYCLE OF A HEAVY TRUCK

In Brazil, the truck fleet is mostly made up of heavy vehicles powered by highly polluting fossil fuels. As can be seen in figure 1, the average age of trucks in Brazil is approximately 20 years. Regarding garbage collection, there are still several municipalities with fleets of trucks, some with 15 years of use or more, which consume more fuels and generate a greater volume of pollution than the current models.

Figure 1 - Vehicle scrapping curve in Brazil.



Source: MMA (2009).

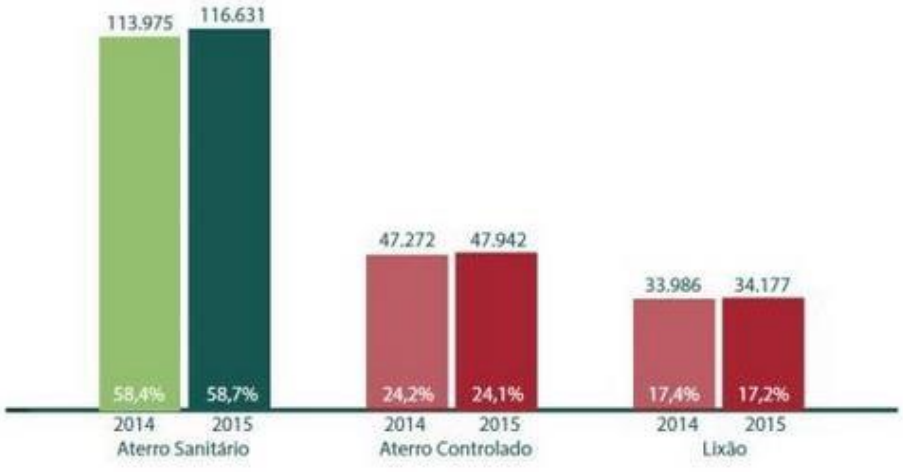
ISSUANCE DUE TO DISPOSITION

In addition to the pollution emitted by MSW transports, estimates of global methane emissions from landfills reach 70 Tg/year, while the total estimated emissions from anthropogenic sources are equivalent to 360 Tg/year (21), indicating that landfills may produce about 20% of the total methane. It is worth mentioning that when considering a period of 100 years, 1 gram of Methane contributes 21 times more to the formation of the greenhouse effect than 1 gram of Carbon Dioxide (14).

DISPOSAL OF MSW WITHOUT ADEQUATE PREPARATION

According to data from Abrelpe (15), and presented in figure 2, it can be seen that open-air dumps, controlled landfills and sanitary landfills are still significant forms of waste disposal in the ground in Brazil.

Figure 2 - Final disposal of USW in Brazil by type of destination (t/day).



Cast Iron: Abrelpe (2015).

Most landfills use the open drain system, where there is a flame to burn the naturally drained biogas.

This system has a low efficiency and it is estimated that only 20% of the drained biogas is actually burned (7).

RENEWABLE ENERGY: LANDFILL BIOGAS AND ITS USE

According to Borba (16), the potential for methane generation depends solely on the type of waste and varies between 5 and 310m³. CH4/three (cubic metre of methane per tonne of waste), varying as a function of moisture, nutrient availability, pH and temperature (7).

The biogas originating in landfills has its composition listed in table 1, below:

Table 1: Composition of Landfill Biogas.

Composition	Percentage
Methane	45 - 60
Carbon Dioxide	40 - 60
Nitrogen	2-5
Sulphur	0,1 – 1,0
Ammonia	0 – 0,1
Hydrogen	0 – 0,2
Carbon Monoxide	0 – 0,2
Other	0,01 – 0,6

Source: Borba (2006).

Biogas can be used as natural gas, however for vehicular use there is a need to remove some of its components, such as hydrogen sulfide gas (H2S), carbon dioxide (CO2), as well as moisture and any particulates. According to the ANP (17), through Resolution No. 8, of January 30, 2015, establishes the minimum percentage of methane in natural gas for vehicular use should be 90% and maximum CO2 of 3%.

The Deganutti Study (18) establishes a comparative equivalence relationship of 1m³ of biogas with the usual fuels:

- 0.61 litres of petrol
- 0.55 liters of diesel oil
- 0.45 kg of liquefied gas
- 0.79 litres of fuel alcohol
- 1,428 kWh of electricity

COMPARISON OF EMISSIONS BETWEEN HEAVY-DUTY VEHICLES POWERED BY DIESEL, DIESEL-GAS AND CNG

One of the best possibilities for using biogas is with the conversion of older collection trucks to transit through diesel-gas technology, based on the use of the original diesel cycle engine and the combined burning of natural gas with diesel oil. This process is implemented by installing an original engine retrofit kit without structural modifications, maintaining a more efficient operating cycle (19).

Emissions of vehicular origin are the result of the burning of fuel with carbon dioxide (CO2), carbon monoxide (CO), hydrocarbons (HC), sulfur dioxide (SO2), nitrogen oxides (NOx) and particulate matter as primary pollutants. The evaluation of the levels of pollutant emissions from diesel, compressed natural gas (CNG) and CNG-diesel engines found a significant difference in the quantities emitted.

Table 2 shows that diesel had the highest levels of overall emissions in the comparison between the three types of engines tested (7).

Table 2: GHG emissions by heavy-duty vehicles and by fuel.

	MP g/km	NOX g/km	HC g/km	CO g/km
Diesel	1,15	14,60	1,35	10,35
GNC- Diesel	0,19	9,47	6,10	2,65
GNC	0,01	10,13	8,35	1,55

Source: Comlurb Rio de Janeiro, RJ, 2014.

According to Araújo (7), the main advantages of using CNG/CNG are:

- The world average indicates that CNG consumption is 66% cheaper than gasoline and 33% more economical than diesel.
- CNG/CNG engines produce 25% less carbon dioxide than those powered by gasoline and 35% less than those using diesel.
- CNG/CNG does not contain sulfur (there are diesel engines in which 18.4g/particles, lead or traces of heavy metals are released).
- Natural gas is non-toxic or corrosive and does not contaminate groundwater.
- The burning of the mixture between CNG/CNG and air is perfect at any ambient temperature, generating a residue-free combustion, favoring the maintenance of the cleanliness of the spark plugs and engine cylinders, which results in better and more effective lubrication.
- The vehicle can become bi-fuel. Converting to CNG does not eliminate the possibility of using the original fuel.

THE BIOGAS SUPPLY CAPACITY IN RELATION TO THE NUMBER OF TRUCKS SERVED

Once the qualitative benefits of the use of landfill biogas have been presented, a quantitative evaluation of the potential for biogas generation in the Jardim Gramacho landfill is presented below in view of the demand for fuel from the fleet of collection trucks and transporters of the Municipal Company of Urban Cleaning of Rio de Janeiro.

LANDFILL JARDIM GRAMACHO, RIO DE JANEIRO, RJ

The Jardim Gramacho landfill operated for 34 years, from 1978 until June 3, 2012, during which time it was the largest landfill in Latin America and the main one in the metropolitan area of Rio de Janeiro, accumulating 80 million tons of garbage. (20). Thus, it has a production of 480,000 m³ of biogas per day with a content of 50% methane and a calorific value of approximately 5,000 kcal/Nm³ (7).

To carry out the cleaning in the municipality of Rio de Janeiro, the company has a fleet of 296 compactor collection trucks.

The amount of waste collected in December 2014 was 184,500 tons and the average mileage traveled by each vehicle was 4,160 km, presenting an average variation of 15% of the total traveled.

The average consumption of the vehicles was 1.9 km/liter (7).

Table 3 summarizes the input data of the collection of MSW by diesel-powered vehicles.

Table 3: Input parameter of the collection.

Número de caminhões	296
Consumo médio	1,9 km/L
Distância média por turno de 8h	80 km
Capacidade de combustível	126 m³
Produção diária de biogás no aterro	480.000 m³
Poder Calorífico do metano puro	9274 kcal/Nm³
Poder Calorífico do biogás de aterro	5000 kcal/Nm³

Source: Comlurb Rio de Janeiro, RJ, 2014.

CNG PRODUCTION ESTIMATES

The daily energy availability of the landfill can be expressed by:

$$480000\ m^3 \cdot 5000\frac{kcal}{m^3} \cdot 4.1868\frac{kJ}{kcal}$$
$$= 10048320000\ kJ$$
$$= \frac{10048320000}{3600}\ kW = 2791200\ kWh$$

Where:

1kcal = 4.1868 kJ

The energy contained in 1 m³ of fuel biogas for vehicular use composed of 100% methane can be expressed as:

$$9274\ \frac{kcal}{m^3} = 9274 \cdot 4.1868\ \frac{kJ}{m^3} = \frac{9274 \cdot 4.1868\ \frac{kW}{h}}{3600\ m^3} =$$
$$= 10{,}786\ kWh/m^3$$

Where:

9274 kcal/m³ = Heat power of methane

Thus, each m³ of biogas has 10.786 kWh of energy. Assuming the efficiency of the engine of the order 0.34 for conversion of combustion energy into mechanical energy, we have the following effective energy per m³:

$$0{,}34.\ 10{,}786\frac{kWh}{m^3} = \ 3{,}667\ \text{kWh/m}^3$$

Assuming a fleet composed of 296 vehicles and that each truck has a supply capacity of 126 m³ of gas, with 1 m³ of gas equivalent to 3.667 kWh, it is possible to evaluate the total expenditure necessary to supply the entire fleet:

$$3{,}667\frac{\text{kWh}}{\text{m}^3} \cdot 126\frac{\text{m}^3}{\textbf{vehicles}} \cdot 296\ \textbf{vehicles}$$
$$= 136763\ kWh$$

Each 8-hour shift, each truck travels about 80 km, making a total of 240 km daily. Assuming that each truck has a supply capacity of 126 m³ of gas and that the average consumption of the vehicles is 1.9 km/m³, there is a range of 239.4 km.

$$126\frac{\mathrm{m}^3}{\text{vehicles}} \cdot 1{,}9\frac{km}{m^3} = 239{,}4\frac{km}{\text{vehicles}}$$

It is observed that the values of the autonomy and total daily traveled are practically identical, indicating that each vehicle in the fleet needs to be fueled on average once a day, making the total consumption per day 136763 kWh

Soon:

$$\frac{\text{Fleet demand of 136763 kWh}}{\text{Landfill capacity of 2791200 kWh}} = 0.05$$

The results showed that only 5% of the total gas produced daily by the Gramacho landfill would be sufficient to supply the fleet of compactor collector vehicles, with 95% still remaining to be sold.

CONCLUSIONS

The cost of public transport is underestimated, as the environmental liability resulting from pollution is disregarded. Thus, the transition from diesel or gasoline to natural gas represents a benefit, as the adaptation of engines to biogas is feasible from a mechanical point of view, generating beneficial impacts on waste operating costs by reducing fuel expenses.

If there are surpluses in the production of natural gas, it can be sold or transformed into electricity, indicating feasibility studies for the conversion of potential GHG emissions from landfills into electricity, which may generate quotas in the international carbon market.

The preliminary calculations presented indicate that biogas recovery from the Jardim Gramacho Landfill, in Rio de Janeiro, proved to have potential for the total supply of the fleet of collection trucks, and the hypothesis is possibly verifiable in other Brazilian municipalities, thus avoiding the use of fossil fuel, reducing GHG emissions.

A significant advance in research on the production of vehicular biomethane via biodigestion of municipal solid waste was presented by Romanholi (25).

The result of this research demonstrated the potential for environmental, social and governance (ESG) gains (24), made possible through the development of business models (22), which prove the viability for new investors from different sectors, for the use and commercialization of surplus energy, which can be a topic for future research.

It is concluded that it is feasible to adopt biogas generated in landfills as a renewable fuel for the fleet of compactor trucks that collect urban waste, reducing the resulting GHG emissions both due to the collection and decomposition of urban solid waste in landfills and also the generation of new business models, in compliance with the UN Sustainable Development Goals (SDGs). mainly with SDG 7 – Affordable and Clean Energy (23).

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CANNABIDIOL AS A FORM OF TREATMENT IN PATIENTS WITH POST-TRAUMATIC STRESS DISORDER OF VICTIMS OF VIOLENCE – COMPREHENSIVE REVIEW

https://doi.org/10.56238/sevened2024.031-038

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ABSTRACT

Introduction. Violence as a social and public health problem, with a particular focus on its consequences, such as Post-Traumatic Stress Disorder (PTSD). According to the World Health Organization, violence encompasses the intentional use of physical force or power, threatening or harming individuals, groups, or communities. Objective: To describe the effects of Cannabidiol in patients with Post-traumatic Stress due to physical and psychological violence. Methodology: This is an integrative observational and retrospective systematic review, with the following exclusion criteria: non-empirical articles, non-indexed publications, a total of 545 articles related to post-traumatic stress and cannabidiol were found and only 13 articles were selected to present the results of this study. Results and discussion: The endogenous endocannabinoid system plays a significant role in the processing and extinction of fear memory. Cannabidiol (CBD), a non-psychoactive component of Cannabis sativa, has shown potential in the treatment of anxiety disorders, including PTSD. CBD interacts with the endocannabinoid system indirectly by increasing the availability of endocannabinoids like anandamide, which acts on CB1 receptors in the brain. This activation of the endocannabinoid system can help reduce the behavioral response to aversive memories and improve fear extinction. Final Thoughts: While early research on the effects of CBD on PTSD is promising, more studies are needed to determine its efficacy and safety, particularly in victims of violence. The sources also emphasize the need for greater awareness and accessibility to cannabinoid-based treatments for those who can benefit from them.

Keywords: Physical Violence. Psychic Violence. Post-traumatic stress. Cannabidiol Therapy.

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INTRODUCTION

According to the World Health Organization The Organization defines violence as the use of physical force or power, in a threatening or practical manner, against oneself, another person, group or community. Violence can result in suffering, death, psychological damage, impaired development, and deprivation. Unfortunately, violence affects all sectors of society, being a multidetermined and extremely complex phenomenon, and brings with it damage not only to the victim, but also to the perpetrator and society. The impact of violence interferes with the economy, development and social relations of a population (De Tartari *et al*, 2006); (De Souza; Vizzoto, 2018).

The term violence, of nature, can be used in many social contexts, it can be used for physical violence, abandonment, financial abuse, emotional, verbal and psychological abuse, among others. In many cases, it can become fatal for the victim or leave irreversible sequelae. In the various life cycles we find violence present, the most common, perhaps because it is more notified, is that practiced against women, in most cases subjecting women to sexual practices against their will; mistreatment – physical abuse, social isolation; by prohibiting the use of the media; access to health care; intimidation (Gomes, 2012); (Dias et al, 2018).

When discussing violence, we can cite Minayo (2004) who reports that violence is a social issue and due to this it is not the object of any specific sector, the author states that the theme of violence becomes a theme more linked to health because it is associated with quality of life; by the physical, psychic and moral injuries it entails and by the demands of attention and care of the medical-hospital services, and by the expanded conception of the concept of health (Minayo, 2004); (Johnson, 2008).

Brazil is within a historical context, it is considered one of the most violent countries in the world. According to data from the Institute of Applied Economic Research (IPEA), homicide rates have remained one of the causes of deaths above 20 per 100 thousand inhabitants since the 1990s, reaching the highest level in 2017, and with a considerable increase during the COVID-19 Pandemic, as if the command "stay at home" was a trigger factor for the practice of violence. Until 2017, the homicide rate was approximately 31.6%. If we consider the global average rate, this same year in the world was 6.1 homicides per 100 thousand inhabitants, the Brazilian statistics are presented and remain well above the world average. According to the report "Citizen Security in Latin America" (Muggahe Tobon, 2018) Many Latin American countries, states and cities are facing a chronic public security crisis. Despite a modest economic growth rate, crime and victimization rates are increasing, every day However, information from 2017 shows some signs of improvement. Criminal violence

is routinely pointed out as one of the main concerns in South America. And there are warning signs that the region's high rates of criminal violence and victimization will continue to rise if nothing is done (Muggahe Tobon, 2018); (Abude, 2021.

Homicides in Brazil accounted for 13% of the world total in 2016, however homicide rates did not occur equally in Brazil. What can be observed is that violence, homicide being its cruelest form, has been suffering a worrying increase in several Brazilian municipalities, especially those with less than 100 thousand inhabitants (et al., 2019), in the last two decades there has been a sharp growth in homicide rates in small municipalities (below 100 thousand inhabitants), where rates grew 113% between 1997 and 2017, on the other hand, medium-sized municipalities (between 100 and 500 thousand inhabitants) had an increase of 12.5% and in large municipalities (above 500 thousand) a reduction of 4.5% was observed (Cerqueira *et al* , 2019); (Cerqueira *et al*, 2020); (Motini; Mountain; Becker, 2021); (Cerqueira *et al*, 2021).

However, when violence does not evolve into death, it can leave both physical and psychological sequelae in the victims, in any life cycle. In this premise, the post-violence period is challenging for the victim, as there may be a loss of continuity of violence or even the denial of violence and thus not seek help, which can expose the victim to high rates of adverse events, such as medication errors, lack of follow-up of test results (in cases of sexual violence. However, the post-violence period is an especially vulnerable time for these victims, as they return physically and psychologically injured to the same environment in which the violence was perpetrated (De Tartari *et al*, 2006).

In the fight against violence, there have been some advances in relation to it, as it is the recognition of it as a public health problem and not just a domestic one, despite the fact that cases of domestic violence are usually caused by family members or intimate partners and often within the home. (De Souza; Vizzoto, 2018).

Unfortunately, one of the most common consequences of violence, when it does not evolve to death, includes psychiatric disorders, including substance abuse, illicit drugs, depression, anxiety, and post-traumatic stress disorder (PTSD), according to scientific reports stating that aggression has a strong association with the occurrence of psychic and physical impairments (De Souza; Vizzoto, 2018).

An article conducted in 1997 reported that the strongest risk factor for the identification of battered women in one of the primary care settings was depressive symptoms (Campbell; Lewandowski, 1997)

Exposure to traumatic events can be frequent throughout life, and can affect 90% of the general population, especially men5 . However, the development of PTSD is not linear

and can vary according to individual characteristics of the victim, reaching the level of approximately 7% throughout life in the United States, its occurrence may depend on social, individual and genetic factors such as: age, education, religion, personality, in addition to individual factors and how each individual deals with problems and feelings and previous history of mental disorders (Astur *et al*, 2006); (Wofford; Hertzberg; Vacchiano, 2012); (Johansen, 2007); (Cervantes *et al*, 2013).

For the treatment of PTE, three types of drugs are currently being used, including selective serotonin norepinephrine reuptake inhibitors and atypical antipsychotics, although the results have been limited. However, pharmacological therapeutic alternatives are needed (Hoskins *et al),* including cannabidiol (CBD), a component of the *Cannabis sativa* plant that does not produce hallucinogenic effects and has presented numerous therapeutic possibilities used with good results in cases of epilepsy and pain, in addition to its anxiolytic and antipsychotic effects. The anxiolytic effect of CBD has been used in humans in controlled experimental situations, using a single dose in healthy volunteers and patients with social anxiety disorder. CBD is believed to have a neuroprotective role and against acute excitability, indirectly activating CB1, reducing excessive glutamate (GLU) transmission, pointed out as a factor that causes excitement toxicity and seizures (APA, 2013); (Bayer *et al*, 2023); (Bolsoni *et al*, 2020); (Elms et al, 2023); (Guimarães *et al*, 2023); (LI, Han *et al*, 2023)

Thus, this study aims through an integrative review, to describe the effects of Cannabidiol in patients with Post-traumatic Stress due to physical and psychic violence.

METHODOLOGY

The integrative systematic review is characterized by an observational and retrospective research design, which synthesizes the results of multiple primary investigations. This type of study seeks to perform content analysis consistent with a research technique for the objective, systematic and quantitative description of the manifest content related to a specific theme, in the study in question, the authors established subcategories based on pre-established variables with which the data searches were directed (Beltran, 2016); (Berelson *et al*, 2017).

Information was collected from the national and international literature. Subsequently, a synthesis of the distribution of the subcategories in quantitative techniques was made. In a first phase, the search and individualized follow-up of terms related to violence, post-traumatic stress and therapy with Cannabidiol as a form of treatment were carried out. For this we used the following descriptors "Physical Violence" and "Psychic Violence" and

"Post-Traumatic Stress" and "Cannabidiol Therapy". The bibliographic search included the following databases: Web of Science, Medline, PubMed, Scielo and Scopus. The inclusion criteria were: empirical studies that refer to the treatment of victims of violence with post-traumatic stress with cannabidiol over a period of 15 years. As an exclusion criterion: articles that were not related to the theme, non-indexed publications were excluded. Thus, a total of 545 articles related to post-traumatic stress and cannabidiol were found and only 13 articles were selected to present the results of this study.

Due to the high methodological/clinical heterogeneity of the studies and the limited data available, we did not attribute ratings of strength of evidence or affirming studies related to phytocabinoid therapy in victims of violence who developed Post-Traumatic Stress, which may associate the use of cannabidiol and post-traumatic stress sufferers due to several factors.

RESULTS AND DISCUSSION

Due to the scarcity of studies found in the literature on the subject, we used the use of cannabidiol in the treatment of Post-traumatic Stress, including as a common complication in victims of violence, according to several studies, as observed in CHART 1 ((Vila-Verde, 2019);(Palladini, 2023).

Chart 1 - Articles used in the study. São Paulo - 2024

Author(s)	Title – Year/Journal	Synthesis
PALLADINI, M.C.	Indication of the use of cannabinoids. BrJP, v. 6, p. 142-145, 2023.	This review article explores the use of cannabinoids in the treatment of chronic pain, focusing on both natural and synthetic cannabinoids. The research analyzes the action of cannabinoids on CB1 and CB2 receptors and their effects on the body. The article discusses in detail the effects of various cannabinoids, such as CBD, THC, and CBN, and terpenes, highlighting their properties and potential medical applications. Finally, the study emphasizes the importance of additional research to better understand the benefits and risks of cannabinoid use in the treatment of chronic pain.
FERRO, L. *et al.*	Efficacy of cannabidiol use in the treatment of post-traumatic stress disorder: a systematic review. Brazilian Journal of Implantology and Health Sciences, v. 5, n. 3, p. 707-717, 2023.	In this article, the authors analyze the therapeutic potential of cannabidiol (CBD) in the treatment of anxiety, focusing on a narrative review of the scientific literature. The article highlights the growing importance of global mental health

		and the search for effective treatments for disorders such as anxiety and depression. CBD, derived from the Cannabis sativa plant, emerges as a promising alternative due to its anxiolytic properties and wide molecular interaction with the central nervous system. The reviewed research consistently indicates the positive effects of CBD in reducing anxiety in a variety of conditions, including post-traumatic stress disorder (PTSD) and social anxiety disorder. However, the complex relationship between CBD's plasma concentration and its therapeutic effects, along with the lack of detailed data on its pharmacokinetics, underscore the need for further clinical studies to validate its efficacy and safety in various psychiatric conditions. In this study, the broad therapeutic potential of CBD in other areas, such as schizophrenia and Parkinson's disease, as well as its role in modulating brain activity in areas related to anxiety and psychosis, is discussed.
BOLSONI, L.M.	Effects of Cannabidiol on anxiety induced by the recollection of the traumatic event in patients diagnosed with post-traumatic stress disorder. 2020. Doctoral Thesis. University of São Paulo.	It is a thesis where the author investigates the effects of cannabidiol (CBD) on anxiety induced by the recollection of traumatic events in patients with Post-Traumatic Stress Disorder (PTSD). The study analyzes the effectiveness of CBD in mitigating anxiety and cognitive impairments related to the remembrance of trauma, in addition to evaluating the influence of CBD on the reconsolidation of traumatic memory. The research uses an experimental protocol with two groups (CBD and Placebo), with participants diagnosed with PTSD, and collects data on anxiety, mood and physiological responses through scales and physiological measures before and after the recollection of the trauma. The author concludes that, although the results did not demonstrate a significant anxiolytic effect of CBD in the dosage used (300mg), the research brought to light important findings that deserve attention and complementary studies. One of the highlights of the research lies in the finding that CBD attenuated the "cognitive impairment" experienced by patients

		during trauma recall. This effect, which persisted even after a week of CBD administration, suggests a possible interference with the mechanisms of reconsolidation of aversive memory. The study offers an in-depth look at CBD's potential in treating PTSD, demonstrating the need for additional research to determine effective doses and specific application conditions. The research sets an important precedent for the development of new therapies for PTSD by exploring the mechanisms of action of CBD in the human mind and body.
SCHIER, A. R. de M. *et al*.	Cannabidiol, a component of Cannabis sativa, as an anxiolytic. Brazilian Journal of Psychiatry, v. 34, p. 104-110, 2012.	This study addresses the effects of Cannabidiol, a component of Cannabis sativa, as an anxiolytic", reviews the scientific literature on the anxiolytic properties of cannabidiol (CBD), a non-psychoactive compound present in the Cannabis sativa plant. The authors analyze animal and human studies, showing that CBD has anxiolytic effects, similar to medications used to treat anxiety. The article highlights that CBD acts on the serotonergic system, especially 5-HT1A receptors, and that additional studies are needed to determine the optimal therapeutic range for CBD and elucidate the exact mechanisms involved in its anxiolytic action. According to the authors, future studies should test clinical trials involving patients with different anxiety disorders, especially panic, obsessive-compulsive, social anxiety and post-traumatic disorders. In addition, since the actions of CBD are biphasic, the appropriate therapeutic window for each anxiety disorder has yet to be determined
RIBEIRO, G. R. *et al.*	Potencial uso terapêutico dos compostos canabinoides– canabidiol e delta-9-tetrahidrocanabinol. Research, Society and Development, v. 10, n. 4, p. e25310413844-e25310413844, 2021.	This study investigates the therapeutic potential of the cannabinoid compounds, cannabidiol (CBD) and delta-9-tetrahydrocannabinol (THC), derived from *Cannabis sativa*. Through an integrative literature review, the authors examine the available research on the pharmacological effects of these compounds in various areas of health, including neuropsychic effects, relief for symptoms such as pain, inflammation, anxiety, and seizures. The article argues that, despite scientific advances demonstrating the benefits of using cannabinoid

		compounds, there is still a need for more studies to prove their effectiveness and safety.
VIANA, F. G. Al. *et al.*	Medical cannabis as a therapeutic conduct: an integrative review. Electronic Journal Medical Collection, v. 5, p. e10059-e10059, 2022.	This scientific article is an integrative review that analyzes the prescription pattern of cannabis compounds for different diagnoses. The authors conducted a literature search covering clinical trial articles, case-control studies, and cohort studies published between 2017 and 2022. The results show that medical cannabis is prescribed for a variety of conditions, including fibromyalgia, post-traumatic stress disorder, chronic insomnia, Crohn's disease, ulcerative colitis, chronic pain, and epilepsy, among others. The article highlights the use of tetrahydrocannabinol (THC) and cannabidiol (CBD) compounds as therapeutic agents, discussing their mechanisms of action and potential benefits, as well as their adverse effects and controversies surrounding their use. They conclude that The combination of tetrahydrocannabinol (THC) and cannabidiol (CBD) was the most prescribed in the studies analyzed. THC is the main psychoactive component of Cannabis, whereas CBD has therapeutic properties without causing the psychoactive effects. They emphasize that the dosage and type of Cannabis compound must be individualized for each patient, considering their medical history and the condition to be treated.
VILA-VERDE C. - 2019.	Effects of cannabidiol and 7-Nitroindazole on the contextual conditioned fear response after exposure of rats to intense stress: involvement of the nitrergic, serotonergic and cannabinoid systems. 2019. Doctoral Thesis. University of São Paulo.	This is a study that analyzes the impact of severe stress on rats and investigates the potential of cannabidiol (CBD) and Nitroindazole (7-NI) to attenuate the behavioral and molecular changes associated with post-traumatic stress disorder (PTSD). The method used was the experimental one where the effects of CBD using Wister rats weighing between 260 and 330 grams, the rats were exposed to stressful situations for a long period and after using CBD the researcher observed pain relief, anticonvulsant effects, antineoplastic potential, nausea relief, appetite stimulation, muscle relaxation, reduction of anxiety and induction of sleep. In addition to these benefits, it has also been shown to have a protective effect on neuroplasticity, which makes it valuable in the treatment of

		neuropathic pain. The study utilizes the unique prolonged stress model (SPS) to induce PTSD-like symptoms in rats, and examines the role of the nitrergic, serotonergic, and cannabinoid systems in modulating fear responses. The research concludes that both CBD and 7-NI show promising effects in preventing and reversing PTSD-related behaviors in rats, suggesting their therapeutic potential for the treatment of this condition.
COHEN-LOUCK, K.; Z.V.I, L.	A model for predicting post-traumatic stress disorder due to exposure to chronic political violence: big five personality traits, ego-resiliency, and coping. Journal of interpersonal violence, v. 37, n. 23-24, p. NP23241-NP23261, 2022.	This study examines the relationship between the Big Five Personality Traits (neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness), ego resilience, coping styles, and post-traumatic stress disorder (PTSD) symptoms in Israeli civilians exposed to chronic political violence. The authors argue that ego resilience and emotion-centered coping mediate the relationship between personality traits and stress symptoms. It was found that people with high levels of neuroticism were more vulnerable to PTSD due to low levels of ego resilience and a preference for emotion-centered coping strategies. The study also found that extraversion and openness to experience were positively associated with ego resilience, which was negatively associated with PTSD symptoms. These results suggest that ego resilience may play a protective role in the traumatic stress response.
BONACCORSO, S. *et al.*	Cannabidiol (CBD) use in psychiatric disorders: A systematic review. Neurotoxicology, v. 74, p. 282-298, 2019.	This article analyzes the efficacy and safety of using cannabidiol (CBD) in the treatment of psychiatric disorders, both as monotherapy and in combination with other treatments. The methodology used was the systematic review that is based on placebo-controlled clinical trials (RCTs) that evaluated the effect of CBD on a variety of psychopathological conditions, such as substance use, psychosis, anxiety, mood disorders, and other psychiatric disorders. The authors conclude that despite some studies indicating potential therapeutic effects for specific conditions, such as substance use disorders, chronic psychosis, and anxiety, solid evidence on the safety and efficacy of CBD for the treatment of psychiatric disorders is limited. They

		advocate the need for large-scale clinical trials to better evaluate the effectiveness of CBD in acute and chronic diseases, special categories, and to exclude any possible risk of abuse or adverse effects.
BERARDI, A.; SCHELLING, G.; CAMPOLONGO, P.	The endocannabinoid system and Post Traumatic Stress Disorder (PTSD): From preclinical findings to innovative therapeutic approaches in clinical settings. Pharmacological research, v. 111, p. 668-678, 2016.	This article looks at the impact of cannabinoids on the treatment of post-traumatic stress disorder (PTSD), exploring their influence on different phases of memory processing, from consolidation to traumatic memory retrieval and extinction. The authors examine animal and human studies, showing that cannabinoids can modulate the intensity of fearful memories and reactions, as well as potentiate the effectiveness of exposure therapy. The review discusses the potential clinical applications of cannabinoids in PTSD, focusing on the short- and long-term effects on different stages of traumatic memory. The article also mentions the ethical issues and the need for additional research to determine the safety and efficacy of cannabinoids in the treatment of PTSD.
BLESSING, E. M. *et al.*	Cannabidiol is a potential treatment for anxiety disorders. Neurotherapeutics, v. 12, n. 4, p. 825-836, 2015.	The article looks at the potential of cannabidiol (CBD), a component of Cannabis sativa, as a treatment for anxiety disorders. The authors examine evidence from preclinical, experimental human studies, clinical studies, and epidemiological studies. They conclude that CBD shows promise as a treatment for a variety of anxiety disorders, including generalized anxiety disorder, panic disorder, social anxiety disorder, obsessive-compulsive disorder, and post-traumatic stress disorder, particularly in acute doses.
ZUARDI, W. *et al.*	The anxiolytic effects of Cannabidiol (CBD). In: Handbook of cannabis and related pathologies. Academic Press, 2017. p. e131-e139.	This is a comprehensive review of the anxiolytic effects of cannabidiol (CBD), a non-psychoactive compound found in the Cannabis sativa plant. The article highlights studies conducted on animals and humans, demonstrating that CBD has anxiolytic properties in different models of anxiety, including conditioned fear, elevated maze, and social anxiety. The review discusses the potential pharmacological mechanisms by which CBD exerts its anxiolytic effects, including interaction with serotonin receptors (5-HT1A) and the endocannabinoid system. The article concludes that CBD shows great promise as a

		potential treatment for anxiety disorders.
MORINA, N. *et al*.	Psychological interventions for post-traumatic stress disorder and depression in young survivors of mass violence in low-and middle-income countries: meta-analysis. The British Journal of Psychiatry, v. 210, n. 4, p. 247-254, 2017.	This study looks at the effectiveness of psychological interventions to treat post-traumatic stress disorder (PTSD) and depression in children and adolescents who have survived mass violence in low- and middle-income countries. A meta-analysis was conducted using randomized controlled trials (RCTs) published up to July 2016.45 The study included participants under the age of 19, residents of shelters subject to mass violence, and who received psychological interventions for PTSD and/or depression. The data They were collected from a database such as PsycINFO, Medline and PILOTS, in addition to the analysis of reference lists. The quality of the studies was assessed using the Cochrane Collaboration tool to assess risk of bias. The data were analyzed using the random effects model to calculate the effect sizes (Hedges' g) The authors conduct a meta-analysis of 21 randomized controlled trials, finding that psychological interventions can be effective in the treatment of PTSD, The authors discuss the implications of their results for the implementation of mental health interventions in low- and middle-income countries, highlighting the need for low- and cost-effective interventions.

Source: Authors

Post-traumatic stress disorder (PTSD) is a common psychiatric condition in some cases, including victims of violence with a lifetime prevalence of 6.1% in the United States (Ferro *et al*, 2023); (Gomes, 2012).

PTSD is often characterized by a group of symptoms, including reliving traumatic events through intrusive memories and nightmares, avoidance of certain distressing factors, and changes in mood, arousal level, and cognition. Psychotherapy is the established first-line treatment (gold standard) for PTSD, however several medications have been used in psychiatry. Unfortunately, in victims of violence, this is a common consequence found in

especially individuals and situations of vulnerability (Karatas; Altinoz; Essizoglu, 2020); (Cohen-Louck, 2022); (Ribeiro *et al*, 2022).

The development of additional treatment agents is of critical importance, as current medications, including selective serotonin reuptake inhibitors, serotonin/norepinephrine reuptake inhibitors, antiadrenergic agents, and second-generation antipsychotics, have questionable efficacy and often have significant undesirable side effect profiles. Although the pathophysiology of PTSD has not yet been robustly described, several factors are suspected to contribute to the development of this disorder. One hypothesis relates PTSD to dysregulated memory retrieval through the process of reconsolidation and impaired extinction of aversive memories. Recent studies report that the endogenous cannabinoid system has been shown to play an important role in the process of aversive memory extinction through the activity of central CB1 receptors. We have 2 cannabinoid receptors in our body that are CB1 and CB2 receptors. CB1 receptors are mainly found in the brain and controlling the release of neurotransmitters in order to prevent excessive neuronal activity, calming and decreasing anxiety. CB1 receptors also play a role in reducing pain, inflammation, regulating movement, and controlling posture the CB1 receptor is located in several brain regions, such as the hippocampus, cortex, and cerebellum (Zanelati, 2010); (Schier *et al*, 2012).

This receptor is linked to inhibitory G protein, which, when activated, blocks adenylate cyclase, reduces cAMP (cyclic adenosine monophosphate) levels, and therefore inhibits calcium channels. These have essential activity for the process of neurotransmitter release, when activated, and their inhibition reduces GABAergic and glutamatergic release, in addition to leading to the process of attenuation of neuronal activity regulation of sensory perception, memory and cognitive function. CB2 receptors, on the other hand, when activated, produce anti-inflammatory effects in different experimental models of inflammation, including in processes of infectious origin. found mainly in the peripheral nervous system and immune cells, as its action is fundamental to control the immune system, modulation of inflammation, contraction and pain However, there are still no studies describing the effect of activation of this receptor on the inflammatory reaction induced by mycobacteria (Ibeas *et al*, 2015); (Vila-Verde, 2019).

Cannabidiol (CBD) has several physiological mechanisms of action, including serotonergic 5-HT1A agonism, adenosine and opioid receptor modulation, activation of the endogenous endocannabinoid system, antagonism at GPR55 receptors, and activation of transient receptor potential channels. CBD's action on 5-HT1A receptors may lead to neuroprotective, antidepressant, and anxiolytic benefits, although the mechanism of action

by which CBD decreases anxiety is still under study. CBD has been shown to improve anxiety alleviation through a sham public speaking test at doses of 300–600 mg in single-dose studies. Other authors suggest that lower doses of 10 mg/kg have a more anxiolytic effect than higher doses of 100 mg/kg in rats. Of particular interest for this study is the effect of CBD on the endogenous cannabinoid system. CBD has minimal affinity for CB1 and CB2 receptors, but indirectly causes activation of CB1 receptors by increasing the availability of endogenous endocannabinoids. Anandamide, on the other hand, is considered an endogenous cannabinoid that acts as a partial agonist at CB1 receptors. It can be deactivated by the enzyme fatty acid amide hydrolase (FAAH). CBD according to studies has shown important action on FAAH, thus increasing the availability of anandamide and causing activation of the endocannabinoid system (Zanelati, 2010); (Schier *et al*, 2012); (Elms *et al*, 2018).

Studies in rodent models have shown that pharmacological activation of the endocannabinoid system via CB1 receptor agonist agents leads to decreased behavioral response to aversive memories in rodent models through inhibition of memory reconsolidation and enhanced extinction. Studies suggest that agents such as CBD cause indirect activation of the endocannabinoid system and may be useful in the treatment of PTSD resulting from various events, including violence (Berardi.; Schelling; Campolongo, 2016); (Morino *et al*, 2016) (Vila-Verde, 2019); (Palladini, 2023).

Among the many cannabinoids in Cannabis sativa, CBD stands out for its effectiveness, at first as a treatment for epilepsy, and later as a treatment for chronic pain, being the most prescribed and with which the medical population is most familiar. CBD acts on CB1 receptors in different ways, as neutral antagonists, that is, they do not activate the receptor itself, but block the action of the agonist, preventing binding to the receptor. This is why CBD modulates the potentially toxic effects of THC. CBD also acts as an allosteric modulator, modulating the effects of the agonist on the CB1 receptor up or down. It induces a conformational change in the structure of the CB1 receptor that increases or decreases the activation of the receptor by the agonist. In this way, the potentially toxic effects of THC are modulated and therapeutic effects enhanced. (Zuardi *et al*, 2017); (Blessing *et al*, 2015); (Bolsoni *et al*, 2020); (Cohen-Louck, 2022); (Viana *et al,* 2022).

Among the effects of one of the components of Cannabis we have an action that is associated with improving sleep induction in patients who have difficulty sleeping, which occurs in many victims of violence who develop Post-Traumatic Stress. Its affinity for the CB1 receptor is weak, its psychoactive effect is negligible when compared to THC (25%) and it has an anxiolytic effect. Phytocannabinoids can contribute to the treatment of

numerous disease states. (Blessing *et al,* 2015): (Bolsoni *et al*, 2020). The therapeutic effects of medical cannabis were unfortunately only recognized in 2014, by the Federal Council of Medicine (CFM) authorized the use of medicines produced from CBD, but unfortunately in Brazil the costs are very expensive and not available to the majority of the population that needs it.

FINAL CONSIDERATIONS

We can conclude with this study that phytocannabinoids can contribute to the treatment of numerous pathological states, helping to rebalance the ECS - endocannabinoid system - where its receptors and its functions in maintaining human homeostasis have been allowing its use in various diseases and in recent years, with good results, especially in the treatment of Post-Traumatic Stress, in the case of this study, victims of violence. In this study, an important characteristic was observed; lack of scientific production related to the use of CBD in the treatment of victims of violence in a state of Post-Traumatic Stress, another question found is the concern of researchers in controlling the use and the correct way to use this therapy with a focus on the patient, taking care of the cannabinoid of choice based on the clinical condition, in addition to being a requirement for the Certificate of Laboratory Analysis of Cannabis-based products, as a way to ensure the correct substance for the patient and control of side effects and that the treatment based on phytocabinoids achieves the purpose indicated for its use. In short, cannabidiol has satisfactory effects on symptoms of post-traumatic stress, a common complication in victims of violence, especially in symptoms of anxiety, fear, pain and aversive memory.

Studies need to be done, in this area, few report the use of CBD in situations of Post-Traumatic Stress and none have found its indication in the physical and mental treatment of victims of violence. The authors suggest experimental studies be carried out in order to understand the effects of phytocabinoids in victims of violence who developed post-traumatic stress, due to their efficacy in situations of anxiety, sleep induction and pain.

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THE ROLE OF THE LITERARY CRITIC: STUDY OF THE OBJECT AND AESTHETICS IN THE PROCESS OF SEMIOTICS THROUGH A CRITICAL READING

https://doi.org/10.56238/sevened2024.031-039

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ABSTRACT

The respective essay aims to guide students of Literary Criticism and Comparative Aesthetics through the study of the *Work and criticism* (2019, p 9-31) and *Aesthetics and Semiotics* (2019, p 1-8) of Literature and Intersemiotic Systems, by Flávio Khote. From this perspective, the analysis of the role of the critic will be a relevant theme in this essay, in addition to enunciations in relation to the role of semiotics within literature and the study of the object among the aesthetics in comparison. Therefore, comparative studies will be used with the semiotic theory of Algirdas Julien Greimas, For Greimas, the sign is called "textual aspect", Semiotics is the theory of signification and its object is not the sign, but the Semiotic Systems. According to Greimas, "each science has its particular semiotics". This comparative study seeks to substantiate the role of the critic and assist him in his training, guiding him not to fall into traps preformed by methodological procedures of the criticism of comradeship, in this way, it seeks to form critics who excel in the ethical and isonomic precepts of literary criticism.

Keywords: Semiotics. Aesthetic. Object. Criticism.

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INTRODUCTION

The work and criticism of Flávio Khote make us think in order to deepen our knowledge in relation to the role of the literary critic. This observation has the purpose of assisting in the critical and personal formation of each professional, in a way the study under analysis is contained in a process of examining the critical concept, we must analyze as well as the analysis of other works on the same subject. We cannot excel here in saying relevant, because for the critic we should not discard even those devoid of critical sense. From the moment the critic discards any hypothesis regarding the understanding of the critical process, he makes his first mistake, because all study and thought must be analyzed with caution, because the processes are in constant transformation.

Following Aldo Tagliaferri,

> "Theory is made in the absence of the very possibility of building adequate knowledge about literature. For this reason, the effort to produce an aesthetic would be at odds with its own impossibility, based on our premises, and would become, in the manner of Sisyphus, the reiteration of the very impossibility of aesthetics" (TAGLIAFERRI, 1978, p.68).

This statement shows us how the critic must have the sensitivity of knowledge of aesthetics, because when we analyze the word theory, we concomitantly have the word possibility, thus reinforcing the idea that nothing, nor any study on the subject should be discarded.

For Jakobson, as is well known, Literary Theory was the investigation of literariness, characterized as the organized deformation of everyday language (EIKHENBAUM, 1976, passim). This statement by Jakobson, in relation to the organized deformation of everyday language, is in line with Khote's writing, who in The Work and Criticism, p 9, tells us "this should have already led "left-wing" readers and literati to distrust literature to a greater degree than the Dadaists. It seems that the "protest" of the "People" is even more radical and effective: he simply does not read Literature". (KHOTE, 1981, p. 9-31.) If literature is based on the organization of everyday language, in a way these transformations require in-depth studies based on linguistic concepts. According to Brito, "if we consider that this epistemological problem resulted from an insufficiency of the thing and not of language, if the contradiction is immanent to the literary work, then perhaps the impasse of the universal through the particular phenomenon – of theorizing something as literature – proves to be a particularism itself. It is not to make a theory of something like literature that is impossible, it is the theoretical vice of linguistics that makes literary experience impossible.

In relation to aesthetics and semiotics, Khote alerts us to the role that aesthetics needs to assume in relation to the criticism that is made of it, both by semiotics and by the

conspiracy of silence. According to Khote, "aesthetics is constituted within the relatively limited horizon of the Western metaphysical tradition, a horizon that philosophy, perhaps pushed by social forces and ferment for more than a century, has desperately sought to transcend" (KHOTE, 1981, P.2). According to Matheus Brito,

> "Aesthetics would properly qualify the dialectic between the opaque interest, but immanent to the object, and the judgment that does it justice by conferring primacy on it. The insolubility of the question – theory or literature, semiotics or aesthetics – is useful if it allows us to radicalize another stance. So far we have said that the conceptual knot between referent, value, subject, and experience has been reduced to the problem of the meaning of the text. Is there any notion of language that, without becoming entangled in semiotics, we can recover for literary studies?" (DE BRITO, 2015, p.1419)

Brito ends his thought with a questioning in relation to the notion of language, in this aspect we can observe that semiotics and aesthetics are something inseparable for understanding, in this way we can observe an eminent concern and questions that help to guide the theoretical basis of criticism.

THEORETICAL FRAMEWORK

GENERAL GUIDELINES OF THE THEORETICAL FRAMEWORK

Literary criticism is the study, discussion, evaluation and interpretation of literature. It can take the form of a theoretical discourse based on the theory of literature or a discourse that details or revises a literary work. The method of literary criticism is directly influenced by history, in this aspect the analysis of terms of the time, help in the translation and explanation of themes relevant to society.

In the 4th century BC, Aristotle wrote the *Poetics*, a literary typology and description of form with many specific criticisms of contemporary works of art. In this aspect, the literary criticism of the Renaissance developed classical ideas of unity of form and content in literary neoclassicism, neoclassicism was the literary school that sought to disseminate and resume the classical models of art and poesisa, with decasyllabic verses and art based on aesthetics. Thus, making criticism incomprehensible to the less prestigious population of knowledge. In the Enlightenment, criticism becomes more popular, in this period the literacy rate starts to rise, reading no longer becomes exclusive to people of possession.

In contemporary times, Northrop Frye is the influential *Anatomy of Criticism* (1957), Frye notes in his work that some critics intend to adopt an "ideology" to judge literary works, this thought has been a great influence for modern and postmodern thinkers. Thus, we have Hemerneutics: knowledge via interpretation to understand the meanings of human texts and symbolic expressions, including the interpretation of texts that interpret other

texts. In the 1960s, the "New Criticism" developed around two primordial figures Gérard Genette eRoland Barthes, for whom criticism has become literature itself.

Semiotics emerged in linguistic studies with the research of the Lithuanian **Algirdas Julius Greimas** (1917-1992). However, the word "semiotics" was first used by the American philosopher and linguist **Charles Sanders Peirce** (1839-1914). Semiotics serves to understand signs and based on this improve communication, being useful in the analysis of human behavior.

All these historical aspects are guidelines for the study of literary criticism, in this way they serve as an analytical basis for the teaching of semiotics and comparative aesthetics, because when we analyze the historical aspects we observe the evolution in the study of literary criticism, semiotics improves this advance and tries to help in the explanation of concepts not yet identified

By researching semiotics and aesthetics, it is possible to perceive the relevance of these themes for a good literary analysis, for Khote, "Semiotics seems today to be the overcoming of linguistics (considered a mere subdivision) and aesthetics. It claims to be the science of what aesthetics would have been mere philosophy, or worse still, mere metaphysics." (KHOTE, 1981, p. 1-8.) And aesthetics was unable in its function to explain art and for such an object received much criticism.

Since the discovery of photography and with the techniques of sign reproduction, such as film and television, there has been an increase in memory in relation to the record, in this way, the systems of arts have become too narrow and secondary. In this perspective, Khote reveals the desire to give semiotics the scientificity it needs, because in this way, when analyzing the philosophical positions of Nietzsche and Heidegger, it is observed that for his conclusions the poet also started from theoretical bases, thus explaining that only the theory that is capable of questioning its presuppositions can aspire to become science.

In the article "Umberto Eco and Semiotic Aesthetics", Edgar Roberto Kirchof refers to the poet as one of the great writers of the 2000s and recognized for his literary works, but even before that, in the 1960s, Umberto Eco begins to develop the theory and construction of a semiotic system in "La Struttura Assente" (1968) and "Trattato de Semiótica Generale" (1975), in which it defines the aesthetic message based on semiotic criteria. In one of the author's best-known works, *The Name of the Rose* (1980), there is also a predominance and clearly manifestation of his theoretical postulates on poetics, narrative and semiotic interpretation.

Eco does not develop an aesthetic theory in a broad sense, but deals with aesthetic issues throughout his work, from his productions in the 50s to the current productions. In his

book, Eco makes his own analysis of the aesthetic evolution of his productions, distributing it in four phases, in the last of which the phase of aesthetics and semiotics, aesthetics is placed under the prism of the semiotics of the text. In the third phase, in which there is the highlight of "Aesthetics and mass communication", Eco begins to work on the issues and to occupy a new aesthetic territory, marked by the relationship between intellectual and contemporary culture in general, in this phase we observe a social commitment typical of Humberto Eco.

For Eco, the aesthetic experience brings into play a kind of contradiction, since, on the one hand, it cannot be reduced to a quantitative measure or to a structural systematization, on the other hand, however, it is only possible because "it must have a structure, because otherwise there would be no communication, but pure occasional stimulation of random responses (ECO, 1976, p.60). Therefore, Eco develops the concept of aesthetic idiolect to solve this paradox.

Heidegger, philosophically, tries to simplify Peirce's theory, his contribution is not in the writing of literary essays or in the imitation of his terminology. His texts are unveilers of the object studied. Heidigeer explores the simpleton, sender, receiver, channel, message and code concept of information theory, in this perspective suggests that the icon is more faithful, so the symbolic would only be superior if it were iconic. "The iconic may be less identical to the real, and therefore perhaps the 'symbolic' may become ideological," according to Khote.

When we talk about the object of study, we cannot fail to talk about Greimas, in his work on poetics and linguistics, Greimas seeks to discover how linguistics can contribute to the definition of the object. For this, he uses the principle of equivalence used by the poets Baudelaire, Hugo and Apollinaire, who in turn show the limits of application of this limit.

When talking about the poetic object, he begins by talking about the analyses that proliferate in the poetic field, it is evident in this initial part of his text the criticism made by the author when using the term "profession of faith", a term used in the Catholic religion that begins with "I believe in God the Father Almighty" so if we analyze this perspective, The author demonstrates that many writers have difficulties in writing texts in terms of language, but the poet mentions that abstention from writing can be worse in poetics than in linguistics.

Therefore, even though the author reestablishes his criticism of poets who treat this definition of the object as a profession of faith, he shows appreciation for the importance of writing such texts, so that it enables the reader to seek knowledge and obtain a basis for these theoretical principles. There is a great concern with the construction of an

increasingly coherent and conservative discourse, in this aspect it would be very difficult in today's world to unify so intensely in words a single discourse of literary critic, anthropologist, philosopher and grammarian.

The author asks us, through a rhetorical question, how it would be possible to identify in a given text if it is poetry. This question is very important for the observation of the process of creation of poetic texts. From the week of modern art, when we enter contemporary writings, poetry has given freedom in the sense of aesthetic and structural construction, we can easily define the structure of prose and poetry, but the definition of searching for a text and its poeticity is something more complex.

Thus, the denomination of the poetic object becomes mythical, as there is questioning in relation to schools of thought and it is shown that for this analysis to become effective, it would be necessary for each school to define with propriety what this poetic object would be. When we do this analysis, we realize that each school aims to innovate, but this innovation does not have the function of replacing the object of the previous school, but becomes an object of futuristic function, which is ahead of its readers.

This object remains to be discovered, and this is where the fundamental role of the literary critic comes in, who has the function of discovering through his methods and theories the rules and specificities that each object has in mind. I understand that in this phase the critic must observe the vertical and horizontal aspect of the text, in addition to paying attention to the historical moment and the social problems that can interfere in the identification of this object.

The complexity of such terms can be explained by P Valéry. According to Valéry, art can be applicable in the sense of "equivalence" between the background and the form. This equivalence can be observed through the vertical and horizontal planes, in which the linguistic levels are stacked on top of each other, in addition to adding the idea of phonics, grammar and semantics.

Khote, like Valéry, affirms that poetry is not only an oscillation between sound and meaning, but that sound and meaning are configured in it as a function of the silence that permeates them and against which they assert themselves. For Khote, sound cannot exist in the poem as something opposite to meaning, as if sonority came to the detriment of meaning and was poeticity itself.

Finally, Khote ends his text with the statement that "science is not the ultimate and only horizon of knowledge, the objectivity of knowledge is not, however, "scientific jargon" in the name of objectivity and it is necessary to reevaluate the claim of the scientificity of science".

CONCEPTUAL ASPECTS

Thus, we consider that:

1) The critic is responsible for pointing out the successes and failures of certain productions in aesthetic, linguistic and rhetorical terms;

2) Semiotics seeks to understand how human beings can interpret things, especially the environment that surrounds them;

3) The object does not have the function of replacing the previous school, but rather innovating and making it current

FINAL CONSIDERATIONS

By concluding these studies of comparative aesthetics, it is possible to observe that arts, music and literature are intimately linked, when analyzing a work of art or poetic text we cannot detach ourselves from the historical facts that permeate them, observe the author's intentionality and still maintain the social role to which the text was exposed.

Therefore, the critic must be concerned with having a theoretical foundation and depth in semiotics so that he can make the creative process of his criticism, not fail to observe the details of the themes studied in addition to comparing it with the themes and authors of current events.

One of the recommendations is the tireless reading of theoretical and guiding texts, having a grounded basis makes the critic have more credibility in his analyses, finally being an attentive reader and especially of books, makes him not fall into traps and untruths of the technological world.

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LEGACY OF SOCIAL POLICIES AND FALL IN INEQUALITY: INCOME NOT DERIVED FROM WORK BETWEEN THE YEARS 2003 AND 2007

https://doi.org/10.56238/sevened2024.031-040

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ABSTRACT
The research describes the field of public policies focused on highlighting the legacy of the actions implemented in the period from 2003 to 2007, which, in that period, resulted in the fall of inequality, particularly that not derived from salaried work. The impact of income on inequality and the improvement of the Gini coefficient indicators is one of the aspects addressed from the point of view of the methodological approach. The research based on the result of data from the National Household Sample Survey (PNAD), demonstrates the movements of the poorest percentiles of the population towards the equality line, as a result of the displacement of this population contingent motivated by policies focused on conditionalities.

Keywords: Focused policy. Conditionality. Poverty. Income inequality. Salaried work.

INTRODUCTION

In order to understand the changes or the maintenance of the structures underway in the Brazilian social formation, it is important to present the academic debate on the fall in income inequality in Brazil[10] resulting from the implementation of income redistribution mechanisms, a phenomenon anchored, in particular, in the monetary transfers of income made in the period from 2003 to 2007.

The methodological approach that guides the discussion on the reduction of inequality recognizes that this phenomenon encompasses people and families in the most severe levels of poverty in the Brazilian population. Among the aspects that guide this debate, the monetary income transfer policies stand out, which, among other analytical categories, include the policy of recovery of the real remuneration of the minimum wage, aiming to revert to benefits to the poorest population.

However, the material scenario where the fall in inequality was configured is based on the assumption of the market economy, which has asserted throughout historicity the distances between the poorest layer of the Brazilian population, when compared to the layer with the highest income. In this sense, Fagnani (2005) points out that the ordering and intertwining of issues related to the maintenance of poverty are based on other macroeconomic complexities: high interest rates, social security deficit, payment of internal debt service, high tax burden and inflexible labor market, which would possibly imply the maintenance or delay of changes in the structure of poverty and inequalities.

The fall in inequality implies understanding the retreat of poverty, through multifactorial aspects that characterize the distribution of monetary per capita income and the dimensions of poverty in Brazilian society. It is worth emphasizing that the fall in poverty and inequality is not a coincidental process, although they may be associated in certain historical circumstances.

Income transfers are conceived as social policies that guarantee access to a set of benefits, such as a minimum income, for population contingents classified as unqualified, populations in poverty and in a situation of family vulnerability. Thus, the objectives of the social policy focused on income transfer would act on the protection and social insertion of those populations that are hopeless of the condition of citizenship, inserting them in a new condition of affiliation to the social protection system, which is the responsibility of the state.

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[10] BARROS, Ricardo P.; FOGUEL, Miguel N.; ULYSSEA, Gabriel (eds.). Income inequality in Brazil: an analysis of the recent drop. Brasília: IPEA, 2007, v 2.
IPEA. About the recent drop in income inequality in Brazil. Technical Note. Brasília: Institute of Applied Economic Research, ago. of 2006. Available at <http://www.ipea.gov.br/082/08201004.jsp?ttCD_CHAVE=2895> Accessed: jun.2024.

Corroborating the goals established within the Bolsa Família Program[11] (PBF), conceived as a direct income transfer program, are the actions articulated through complementary programs, whose objectives explain the development of capacities and potentialities, with the offer of opportunities. In contrast to the opportunities, there are the conditionalities, which imply the fulfillment by the beneficiary families of certain conditionalities for the permanence of the link to the program: school attendance, monitoring of the health of women and dependents in the family and assistance offered to those families in an imminent situation of social risk. In this way, the so-called compensations are created through support mechanisms for individuals and families, enabling the emancipation of the situation of extreme poverty to a level above this line.

The problem raised implies investigating to what extent the policies of direct income transfer, through the focus on poor populations, demonstrate effectiveness in acting on the living conditions of those who are in the condition of extreme poverty and social vulnerability. It is also asked how the financial compensation offered to poor families can change the course of the configuration of the fractured social fabric and cause a drop in inequality, social inclusion and change in the conformation of poverty in Brazilian society.

Pointing to the monetary compensatory aspect of the focused social policies implies understanding that such policies are circumscribed to a methodology, which aims at the emancipation of families from their condition of social vulnerability. Medeiros (2008) points out the need for projects with requirements for the radical execution of social policies, in order to change the social structure of the country. The radical moral stance is understood as a possibility of dilution or as a minimizing aspect of inequalities, having as a mechanism the focused policy of direct income transfer. This peculiar characteristic of social policy may be closer to its realization, while opportunities for professional qualification and qualified work are created.

However, care practices have an ambiguous role in remaining below in overcoming an unequal system, corroborating the fact that certain portions of the population remain under the condition of being unqualified, lacking social capital to overcome the poverty line.

Poverty is characterized as a multifaceted phenomenon. A theoretical model that makes this multifaceted field explicit seeks in the social and human sciences to understand the dimension of exclusion, produced from the absences in the modes of social denial. In the general picture, the fall in inequality needs to be researched from the perspective of elucidating which inequality is being talked about: in the present case, it is a matter of

[11] The Bolsa Família Program was created by Decree-Law No. 5,209, of September 17, 2004. Provides for the creation of the Bolsa Família Program and provides for other provisions. Presidency of the Republic. Chief of Staff: Deputy Chief of Staff for Legal Affairs, Brasília, 17 Sep 2004.

exploring the fall in inequality[12] related to per capita income, measured by the Gini coefficient. It is recognized, as Soares (2006) points out, the impossibility of reducing to a single scalar number, all the variation contained in an income distribution, because, with the use of quantitative methodology, it can qualify a measure and disqualify another indicator.

Thus, the theoretical-methodological approach deals with the recent fall in the inequality of per capita family income; the redistribution of income through the relationship of salaried work and the reduction of poverty. When referring to the composition of income, it is the analysis of all incomes, especially those arising from income from salaried work. Inequality will be analyzed by the decomposition of the Gini coefficient,[13] an indicator that makes it possible to ascertain the movement, concentration or distribution of income. One of the reasons for using this coefficient refers to the variation factor, easily decomposed by source of income. To analyze how important the decrease in inequality was, methodologically the coefficient proposes a measure of income inequality, with a greater propensity to aggregate, in a single index, a variety of information, including those translated by the National Household Sample Survey (PNAD).[14]

FOUNDING CONCEPTIONS ABOUT THE FALL IN INEQUALITY

The phenomenon of falling inequality[15] is of special interest to demonstrate not only the perception of falling inequality, but also the dynamics of income as a redistribution of positions. Translating these concepts into comparative terms, Communiqué No. 63 IPEA

[12] Other literature treats the increase in inequality over the years as a persistent phenomenon, especially in the period between 1960 and 1980. We refer to Langoni (2005), in the extensive debate of the 1970s and 1980s. We emphasize the existence of numerous attempts to measure inequality in the literature.

[13] The Gini and Concentration coefficients are defined as numbers ranging between 0 and 1. However, for ease of reading — as with percentages — it is usual to express them as numbers between 0 and 100, as is often used. This is done by using the concentration coefficient, which indicates how regressive or progressive a source of income is. The more regressive (pro-rich) an income is, the closer to one (+1) is its concentration coefficient; The more progressive (pro-poor) an income is, the closer to minus one (-1) is the coefficient associated with it. If everyone in the population receives the same amount from a given source of income, its concentration coefficient is zero. A useful piece of information is that the Gini coefficient is nothing more than the weighted sum of the concentration coefficients, in which the weighting weights are the weights of each source of income in the total income. This makes static and dynamic decompositions of the Gini coefficient relatively simple. It is a matter of defining which are the relevant incomes, calculating the weight and coefficient of concentration of each one and doing a few calculations (SOARES, 2010, p. 36).

[14] They obtain annual information on demographic and socioeconomic characteristics of the population, such as sex, age, education, work and income, and characteristics of households, and, with varying periodicity, information on migration, fertility, marriage, among others, with households as the collection unit. Specific themes covering demographic, social and economic aspects are also investigated. Available at: <http://www.ibge.gov.br/home/estatistica/pesquisas/pesquisa_resultados.php?id_pesquisa=40>Acesso: jun.2024.

[15] Achieved in four years, could a drop of almost 5% in the Gini coefficient be considered sharp? Of the 74 countries for which information is available on the evolution of this indicator throughout the 1990s, less than 1⁄4 managed to reduce it at a faster rate than that achieved by Brazil in the 2001-2005 quadrennium (Graph 3). Therefore, the pace at which inequality has been declining in the country is one of the fastest in the world (Barros, Carvalho, Franco & Mendonça, 2006, p. 108).

(2010b), "PNAD 2009 — First Analyses: Income Distribution between 1995 and 2009" reveals that the income of the poorest 5% increased by 84% between 1995 and 2009, against a 13% increase in income for the richest 5%. In another analysis, it is observed that, between 2001 and 2005, income inequality shows its greatest decline.

In this sense, Barros, Carvalho, Franco and Mendonça (2006) state:

> Between 2001 and 2005, the degree of income inequality in Brazil declined sharply and continuously. According to the Gini coefficient, one of the most widely used measures, the degree of income inequality in Brazil in the period declined by 4.6%, from 0.593 to 0.566. In 2001, it was close to the average of the last thirty years; in 2005, it reached the lowest value recorded in the period (Barros, Carvalho, Franco & Mendonça, 2006, pp. 108).

Thus, this work situates the analysis of the fall in inequality, treating it in the socio-historical context, the decision-making arena of actions around public policies (WANDERLEY, 2004). Added to this discussion is not only the data surveys, which allow us to measure the results closely, but also by analyzing them under the understanding of the extent to which social welfare was altered, which produced a new configuration of the social fabric.

Methodologically, the fall in inequality in the period from 1995 to 2009 is demarcated and analytically situated, where it is done, in the context of the possibility of its follow-up and monitoring, in view of economic stability, understood in its monetary totality, allowing measurements, without, however, analyzing the interference of inflation indices[16] that, in a way, hinder measurements.

The importance of the fall in the inequality of per capita monetary income in the wage base is highlighted, as this factor acts directly on income, putting downward pressure on its aggregate purchasing power, between the incomes of the poorest strata of the population and that arising from salaried work. When analyzed, these two elements bring to the center of the economic debate the fall in poverty, a relevant aspect for the sociological understanding of this phenomenon, characterized as persistent and long-lasting in the Brazilian social reality. In this sense, corroborating the discussion, Kerstenetzky, (2009), adds reasons for the fall in inequality.

> The two most important reasons for the fall in inequality seem to have been the behavior of labor income — a combination of the expansion of the formal labor market with the readjustments of the minimum wage — and social programs, especially the Bolsa Família (Saboia, 2007; Soares, 2006; Hoffmann, 2005). The

[16] Otherwise, it would not be possible to observe the fall in the inequality of per capita monetary income in the wage base, eroded by high inflationary indices that did not allow income to maintain its aggregate purchasing power, especially that of salaried labor. According to estimates by IPEA (2006) "from 2001 to 2004, per capita family income inequality fell continuously and substantially, reaching its lowest level in the last 30 years." (IPEA, 2006, p. 3).

> policy of increasing the minimum wage in real terms – adopted since the Fernando Henrique era, although not as a government policy; continued and accelerated during the Lula administration, now as a government policy — had an important impact on reducing wage and retirement and pension inequality, and can be considered the main determinant of the recent fall in income inequality while wages, pensions and pensions represent the majority of household income (Kerstenetzky, 2009, p. 6).

In the historical context, there are always variations in the measurement of the indexes, however, we place the year 2001 as the year in which inequality began to fall by an average of 0.7 points of the Gini coefficient per year, as pointed out by Soares (2010a) in the text "The distribution of labor income and the fall of inequality from 1995 to 2009".

The same text points out that this trend of the Gini coefficient can be observed in its almost linear rhythm until 2009, declining from 0.592 points to 0.538. The percentile of this drop, although apparently small in the last ten years, deserves all the "redoubled attention to understand and maintain the policies that have led to greater equality in the incomes of Brazilians" (SOARES, 2010a, p. 35).

Regarding inequality, it should also be added that the surveys of the last two decades point to its continuous decrease. According to IPEA surveys (2010b), the fall in household income inequality per capita, which began in 2001, continues in 2009. The indicator used to measure per capita income inequality, as already announced, is the Gini coefficient, understood as such.

> From 2001 to 2008, inequality measured by the Gini coefficient fell by an average of 0.70 Gini points (x100)2 per year. From 2005 to 2008, the pace was slightly stronger and inequality fell by 0.72 Gini points (x100) per year. From 2008 to 2009, inequality fell less: 0.54 points (IPEA, 2010b, p. 3).

However, taking the series from 2001 to 2008, when the Gini Coefficient fell more sharply, those data do not allow us to make a judgment to the point of stating that it is a trend, except for the fact of the decomposition of aggregate income in the indicated period, where it will be possible to perceive that the changes in the Concentration Coefficients are directly related to the changes in the features presented by inequality, as pointed out by Soares (2010a). Thus, the income was broken down into:

> Labor income, which can be subdivided into labor income indexed to the minimum wage and other labor income; social security income, which can be subdivided into benefits equivalent to a minimum wage and benefits not equal to a minimum wage in September of that year; income from focused cash transfer programs, which can be subdivided into income from the Bolsa Família Program (PBF) and continued cash benefits (BPC); and other incomes, a residual category that includes the poorly measured capital income in the PNAD, transfers from other households, incomes of little relevance such as the permanence allowance and any other income that does not fit into the other categories (Soares, 2010a, p. 36).

By the sociological understanding of the importance given to this drop in recent years, it is possible to reinforce the meaning of maintaining social policies that have increased the consumption capacity of the lower sectors, as such, brought them closer to greater equality in the income of Brazilians. Thus, when it comes to income distribution, it locates it in relation to wage labor, and finally, when it comes to poverty, it includes non-monetary poverty.

Torres, Bichir and Carpim (2006) highlight a 'different poverty' associated with the improvement of consumption patterns and the increase in the population of poor people, as factors related to a set of transformations in structural conditions, associated with the following factors: the role of public policies, variations in the price structure, changes in family size, the transformation of the role of women and the greater supply of credit.

> In summary, despite the increase in the proportion of poor households in the metropolitan regions, significant improvements can be observed in terms of greater access to goods and services, indicating the complexity of recent patterns of urban poverty. These results suggest that a "different" poverty is evident in terms of the contents associated with it. This different poverty is now characterized — at least in metropolitan areas — by greater access to the consumption of goods and services (TORRES, BICHIR & CARPIM, 2006, p.20).

Referring to other analyses, especially from 2010, IPEA (2010a) released a series of studies[17] taking data from PNAD/IBGE and evaluating the distribution of income in Brazil from 1995 to 2009. Over fourteen years since the PNAD was carried out, the data pointed to a drop in inequality through income redistribution. The PNAD surveys in 2009 revealed a trend little observed until then and favors correcting some misconceptions in relation to the fall in inequality, especially those indicators published by studies that attribute to public income transfers the responsibility for the fall in inequality in per capita income. On the contrary, labor income was more important for the fall in inequality, according to data from the PNAD's, discussed by Soares (2010b) in the text: "Is the pace of the fall in inequality in Brazil acceptable?"

However, as already pointed out, direct income transfer programs act on the structure of poverty, meeting the needs vital for the very survival of the unprotected contingents. Hunger and misery incapacitate the subject in decision-making and make it impossible for him to make his own choices (Yazbek, 2009).

[17] Three important documents published by IPEA can be analyzed: Communiqué No. 58 — Dimension, evolution and projection of poverty by region and state in Brazil (IPEA, 2010a); Communiqué No. 63 — PNAD 2009 — First Analyses: Income Distribution between 1995 and 2009 (IPEA, 2010b); o Bulletin no. 45 — Labor Market — conjuncture and analysis (IPEA, 2010c).

On the other hand, it is understood that income transfer programs do not act using a single programmatic path: they need to be articulated with other actions and programs that promote the capacities of the subjects and empower them for decision-making (SOUZA, 2004).

The form of regulation is perceived, when the actions complementary to the income transfer programs generate impacts on the beneficiaries who, in a way, would not have options to choose which services and programs they could access, in addition to those already pre-established.

The redistribution of income via direct transfer by the State is equally important to reduce inequalities and has contributed to the retreat of poverty. Resorting to the long debate and discussions generated, three possible factors are pointed out, pointed out by national academic productions, which are interconnected and contributed to the fall in per capita income inequality in Brazil: 1) income redistribution, understood as income from salaried and non-salaried work (indexed to the minimum wage and also that not indexed to the minimum wage); 2) the inequality of per capita household income, measured by the concentration of income; 3) and the retreat of poverty added to the growing rate of labor participation (IPEA, 2010c).

In another understanding, Barros, Carvalho, Franco & Mendonça point out:

> The immediate determinants considered here are demographic transformations, the expansion of government transfers and other sources of income not derived from labor, and the changes that have occurred in the labor market, whether those resulting from the expansion of employment or from a better distribution of labor remuneration among the employed (Barros, Carvalho, Franco & Mendonça, 2006, p. 7).

In this context, income redistribution will be addressed in the following item, under three significant approaches: the first analyzes the decomposition of the factors of the fall in inequality from 1995 to 2009; the second emphasizes the fall in poverty that took place in 2009 and the third analyzes the growth of income from salaried work, indexed or not to the minimum wage.

However, it is still considered that the phenomenon of the reduction of income inequality occurred in the population strata whose income comes from salaried work, while this is indexed to the minimum wage, as a function of the real earnings aggregated therein. On the other hand, in order not to make mistakes about the reduction of poverty, we dissociate this phenomenon as resulting from the reduction of inequality. Inequality, the object of study, refers to the inequality of per capita monetary income, indexed to the minimum wage.

The criticisms[18] formulated to the publications about the 'recent fall in inequality' can in a certain way be understood beyond the means of production themselves, the material conditions in which income is produced. It is evident that the conditions for the production of the income of a salaried worker are limited to the field of his salary, not allowing him any other form of income. However, if the analysis takes only the income from wages, a contractual labor situation is privileged, the birthplace of contractual labor relations, of a considerable population layer of workers in Brazil.

The population contingents devoid of this relationship with salaried work with an employment relationship (due to the structural and conjunctural problems that the market economy produces, generating surplus value and reserve of workers for the market) are outside these statistics and official surveys. However, the unemployed or those inserted in informality are not given the right to integrate into the contractual society of work: therefore, they remain in the category of inequality, excluded in their informality. In this sense, the protection of the State will be able to shelter the unprotected and, in this way, act to guarantee income for the reduction of poverty.

In the academic debate, controversies and antagonistic views regarding the different ways of reading data and methodological interpretation of the fall in inequality are evident. We agree with the authors who guide this debate and maintain that there are 'Immediate Determinants of the Fall in Brazilian Income Inequality', which indicate that:

> Between 2001 and 2005, the degree of income inequality in Brazil declined sharply and continuously, reaching the lowest level in the last 30 years in 2005. The Gini coefficient declined by almost 5%, and the ratio between the income of the richest 20% and that of the poorest 20%, more than 20%. This reduction in inequality contributed to substantially reducing poverty and improving the living conditions of the poorest population, even in a period of relative stagnation of *per capita* income. Despite this decline, inequality in the country remains extremely high (BARROS, CARVALHO, FRANCO & MENDONÇA, 2006, p. 7).

However, one of the criticisms of the lightened celebrations of the fall in inequality lies in the fact that some economists ignore the level of income. Soares (2006, p. 91) points out that "inequality can fall because there was a general impoverishment, those who gained the most lost the most, those who earned the least". An example of this phenomenon can be seen in the great drop in the income of all citizens between the years 1989 and 1990.

[18] In this regard, see: Neri, Marcelo. "Fall in inequality in the decade is legend". In : Folha de São Paulo, 10 set. 2010. Available at < http://www.ihu.unisinos.br/noticias/noticias-anteriores/36184-queda-de-desigualdade-na-decada-e-lenda >. Accessed: jun.2024.
Also the chapter by Cláudio Salm in the collection: Barros, Ricardo P.; Foguel, Miguel N.; Ulyssea, Gabriel (eds.). Income inequality in Brazil: an analysis of the recent drop. Brasília: IPEA, 2007, v 2.

Soares (2006) points out that any citizen who celebrated the fall in inequality in the first year of the Collor government would be celebrating the general impoverishment of the nation. In other words, it can be seen after the euphoria of the Real Plan — with the advent of monetary stability — that the indicators show the increase in the per capita income of the poorest sectors of Brazilian society, treated below in terms of the indicators of the fall in inequality, the fall in poverty and the impact of incomes on poverty.

INDICATORS OF THE FALL OF INEQUALITIES, POVERTY AND INCOME IMPACT ON POVERTY

The indicators of the fall in per capita income inequality in Brazil are treated with due importance, considering the decrease in absolute poverty rates. These indicators indicate the fall in per capita income inequality throughout the national territory. The most recent indicators of the retreat of monetary income inequality and the reduction of poverty reveal that the Brazilian macroeconomic context points to economic growth, with the construction and expansion of social equity mechanisms. In this way, the Brazilian macroeconomic model in the last fifteen years would adjust to an economic growth supported by the indicators: monetary policy, fiscal policy, exchange rate policy, credit policy and income distributive policy, thus forming the basis of the macroeconomic model (Sicsú, 2010).[19] The author highlights that fiscal policy has changed focus in recent years; from a policy focused on accounting, fiscal, and financial objectives, to growth with development, in order to cause positive impacts on the social mobility of population segments in vulnerable situations.

Before focusing the discussion on the determinant factors of the fall in inequality, we highlight the retreat of the evolutionary and historical dimension of absolute poverty and extreme poverty, in the regions and states of the federation, a phenomenon translated into the dialectical structural relationship, as a persistent and long-lasting phenomenon. To better dimension the discussion, we took as a time frame the beginning of the period of monetary stability, economically characterized as one of the structural elements of the new Brazilian macroeconomy.

The data are supported by the results of the IPEA discussions (2010b), based on the literature that deals with the decrease in the evolution of the poverty rate by region and states, referring to the period of stabilization of the Brazilian currency, between the years 1995 and 2009, concomitant with the retreat of the inflationary process and the

[19] Sicsú, João. Macroeconomic context. Basic Income as an instrument of Justice and Peace. In: 13th BIEN Congress 2010, June 30 to July 2. FEA-USP, São Paulo, Brazil, 2010. Available at: <http://www. Sinteseeventos.com. br/bien/en/txt_ cabecalho_pt.gif>. Accessed: jun.2024.

achievements of the group of workers, in relation to the real gain incorporated into the minimum wage, with indexes adjusted above inflation.

The historical series between the years 1995 and 2009 is characterized, with three distinct periods of evolution in income distribution, according to the text: "Dimension, evolution and projection of poverty by region and by state in Brazil" (IPEA, 2010 aa). The period between 1995 and 2001, marked by economic balance, which generated monetary, fiscal, exchange rate and financial stability.

On the other hand, it is understood that such balance did not generate significant changes in the social and economic formation of Brazilian society, due to structural adjustments in public policies, guided by the neoliberal conception, reducing the action of the State. This period marks the action of the State with timid social policies, understood as public spending, adjusted to the new macroeconomic model under construction. From this perspective, the State conceives social policies aimed at vulnerable categories, such as public spending that should be controlled by adjustments in the economy. The consequence of this economic model results in little change in inequality and in the average income of individuals.

The second period is the one that begins in 2001 and lasts until 2005, and is marked by the beginning of the fall in inequality. However, on the other hand, the average income increases little in this period. This phenomenon, perceived in the fall in inequality, without an increase in income, is explained by the insertion of those population strata that were excluded from the relationship with the labor market. The result of this relationship is due to the distribution of income, via salaried employment, and not due to the equality close to the income gap.

The third period, which occurred between 2005 and 2009, points to a new phenomenon in Brazilian society: a trend of increases in income begins to solidify. This phenomenon occurs simultaneously, with the fall in inequality. As we have previously stated, one of the important factors for the fall in inequality is the increase in the monetary value of the minimum wage, as a result of the State's intervention in the capital-labor relationship. The context and action of the State as a mediator of conflicts are analyzed, but with the propensity of a government policy, for the implementation of social policies, whose implementation process and the management model are at the heart of the debate on the centralization and decentralization of the size and action of the State.

Different views gain the contour of the debate: if, on the one hand, income transfers have contributed to the fall in inequality, on the other hand, the Brazilian social formation is not altered. Bava (2010) points out that the constituent processes of the market economy,

even when mitigated by compensatory policies, do not profoundly alter the social issue. According to the author, public policies were supposed to guarantee the universalization of rights for all citizens, but, in the logic of neoliberalism, they were transformed into compensatory policies.

From another perspective, the relationship of concession and conquest is considered in the conception of progressive social policy: it privileges employment, access to land, wages, social capital, health and education.

Compensatory and targeted measures, while mitigating poverty, can be an auxiliary mechanism, not the center of action of such social policy. However, the differences are revealed in the government's policies, regarding the orientation of the State in the formulation of policies for social protection: the Lula government, in its reformist and developmentalist perspective, expanded the performance of the compensatory policies initiated by the predecessor, but also maintained a government close to the industrial bourgeoisie, speculative capital and agribusiness. The rapprochement with the large exporting corporations blocks the path to wage recovery, since wage compression is one of the main assets available to this sector to compete in the world market. Just as the rapprochement with agribusiness bars the path of the dreamed incidence in agrarian reform.

Barros, Henriques and Mendonça (2000) highlight the importance of revealing the initiatives for the definition of a minimum wage policy that cares about income distribution. Just as it is important to reduce the inequality of monetary per capita income, equally important for Brazilian society is the growth of income among poorer sectors, however small it may be, especially among workers who have income from earnings with the current or nominal minimum wage and necessary according to some criteria:

> Minimum wage fixed by law, nationally unified, capable of meeting their basic vital needs and those of their family, such as housing, food, education, health, leisure, clothing, hygiene, transportation and social security, periodically readjusted in order to preserve purchasing power, prohibiting its binding for any purpose (BRASIL, p. 07, 1988).

To understand the readjustment of the minimum wage and its contribution to greater social equality, the central issue is to ratify the sustainability for a real increase, as well as for pensions. The political definition involves the inclusion of individuals in the market and in consumption, motivating elements of emerging and conservative economic thought, which is the basis of the reactions that lead to the weaknesses of universalist public policies. The challenge of social policy is to reduce poverty with political and economic inclusion.

In this sense, the focus attributed by Silva (2007) clarifies that:

> In Brazil, what has been seen previously is a large population contingent that has always been on the margins of society; who never had insertion in formal work or participated in ordinary sociability. The standard of the developed countries has not been reached, nor can we even admit that we have had a wage society. Not being included is a structural condition that has marked generation after generation. To speak of social exclusion in Brazil would be to admit a "virtual loss of a condition never achieved" (Sposati, 1999, p. 133). We have a society, in the words of Kowarick (1999), extremely marginalized from the economic and social point of view, which has constituted masses of self-employed or salaried workers with negligible incomes that lead them to a precarious life and without social protection, as a rule, stigmatized as potentially dangerous (SILVA, 2007, p. 07).

Agreeing with the author, systematically in the national scenario, as well as in the empirical field, it is observed the group of workers, represented by the trade unions, urban and rural social movements in the struggle around the wage issue. These, committed to the struggle for the maintenance of the minimum wage as a condition for exchanging the labor force for sustenance and survival, in the face of the constant crises in the capitalist economy.

The inequalities imposed and perceived in the empirical field are similar to exploitation, as a structural condition that marks social relations. The historicity of this process points to the dimension that the historical series between the years 2001 and 2004 points to in order to understand the fall in inequalities, as well as the growth of income. According to a survey by IPEA (2010b), using PNAD data, the following configuration is presented:

> From 2001 to 2004, there was little overall growth — total income grew by 3.6%, but the little that there was was distributed very differently among the twentieths. While the twentieth richest lost income and the next two remained practically in zero growth, the twentieth poorest saw their income increase by 64%. The 20th intermediaries also made intermediate gains. There is an almost perfect ladder going up from the richest twentieth to the poorest twentieth. From 2005 to 2009, all twentieth experienced strong income gains. People in the poorest half had the highest income growth, 31% and 35% (except for the poorest 5%). The income of people in the richest half grew from 13% to 30%, a good increase, but much lower than that of the poorest, characterizing income redistribution (IPEA, 2010b, p. 16).

There are two classifications of poverty that undergo changes in the formation of their original condition. The first concerns absolute poverty. When analyzed in the period from 2001 to 2004, a considerable population contingent can be perceived, about 12.8 million who left the condition of absolute poverty (those with a per capita household income of up to half a minimum wage), thus allowing the national rate of absolute poverty to fall by 33.6%, from 43.4% to 28.8% (IPEA, 2010b).

The surveys mentioned point to absolute results and cause a change in the social fabric, providing the opportunity for the insertion of 12.8 million people in a new category of

social organization, with regard to the indicators of the Family Development Index (IDF).[20] These people, until then — qualified as poor people accustomed to the ways of producing absences, devoid of capacities and opportunities — acquire a new social conformation: the ability to be qualified, belonging to a new process of affiliation, via social policies.

The second transformation in the social formation concerns extreme poverty (in which people with an average per capita household income of up to a quarter of the minimum wage are included), and about 13.1 million exceeded this line, making it possible to reduce the national rate of this category by 49.8%, going from 20.9% of the entire Brazilian population in 1995. to 10.5% in 2008[21].

Another situation to be analyzed is the income from salaried work. According to Soares (2010a), there are three very distinct situations that produced the data, these coming from labor income. The first situation reveals that the concentration of labor income not indexed to the minimum wage decreases much less than the labor income in total (mathematical consequence of the indexation or non-indexation of income to the minimum wage), and the real increase in wages in recent decades, following a trend of wage replacements, using indicators equal to or higher than those of inflation.

The second situation refers to retirements and pensions of the various public and private assistance systems. The trend shows an indicator of concentration of this income in the period between 1995 and 1999, with considerable stability in 2003, and which would only begin to approach the equality line in 2004. The document used to carry out this analysis, "PNAD 2009 — First Analyses: Income Distribution between 1995 and 2009" - makes it possible to understand that the dynamics of the concentration of social security income is due to the high regressivity of retirements and pensions, not indexed to the minimum wage.

[20] The Family Development Index (FDI) was developed by Barro, Carvalho & Franco, and can be consulted in the work: Family Development Index (2003), based on information from the 2001 PNAD. The limitations of this synthetic index are also pointed out by the authors themselves in the same work. The IDF data are from the Unified Registry for social programs of the federal government, organized by the Ministry of Social Development and Fight against Hunger (MDS), broken down into its dimensions, components and indicators. These dimensions refer to access to the means necessary to satisfy needs: a) vulnerability (demographic composition of families; b) access to knowledge; c) access to work; d) availability of resources (income for expenses and food); e) child development; f) housing conditions (access to basic public services such as water, sanitation and electricity).

[21] PNAD 2009 — First analyses: income distribution between 1995 and 2009. Brasília: IPEA, 2010. (IPEA Communiqué, no. 63, 05 Oct. 2010). Available in < http://www.ipea.gov.br/portal/images/_comunicadoipea63.pdf >. Accessed: jun.2024.

FINAL CONSIDERATIONS

In general, it is considered that the implementation of social policies has impacted the indicators of the fall in inequality. However, the production of impacts that could generate new bonds in the labor market was not perceived.

On the other hand, it is considered that the minimum wage plays an important role in correcting per capita income inequality. The policy of recomposing losses is seen as a policy that can add considerable gains to wages, understood as a mechanism for correcting distortions. If the monetary policy, to define the recomposition of the minimum wage, considers the inflation of the previous two years plus the variation in inflation of the period – this option results in a good indicator for the recomposition of inequality and the social fabric.

Income from salaried work acts as a strong indicator in the improvement of the inequality curve. This income is conceived as an aggregator of gains in the wage relationship: the greater the progressive concentration of income, the better the conditions for its aggregation, as, for example, in the historical series between the years 1995 and 2009, where the minimum wage obtained real gains.

However, it is not only direct public transfers that are responsible for the fall in inequality. The relevance of the labor market, via salaried employment, is noticeable in the fall in inequality, contributing in a more punctual way. Different positions are placed in the arena of this debate. Hoffmann (2005) states that income transfers are not the fundamental cause of the reduction of inequality. On the other hand, we have to consider the complexity of the debate and the research that assigns weight to the income indexed to the minimum wage and to those not indexed, also evaluating those incomes from other jobs.

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INTEGRATED PUBLIC SECURITY SERVICE CENTERS IN MATO GROSSO DO SUL: A PROPOSAL FOR SERVITIZATION

https://doi.org/10.56238/sevened2024.031-041

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ABSTRACT

The work proposes an analysis of the concept of servitization and its application in the public sector, specifically in the area of public security. The objective is to demonstrate the potential benefits of the implementation of Integrated Public Security Service Centers in Mato Grosso do Sul, applying the concept of servitization and the philosophy of Community Policing. The research uses a qualitative approach and describes the attributions of public security agencies in the State, presents a theoretical foundation on Community Police and servitization, and exposes examples of integrated service in public security in other states of Brazil and in Mato Grosso do Sul itself. The expected result is the proposal to implement a new model of public security service provision in the State.

Keywords: Public Security. Servitization. Community Police.

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INTRODUCTION

Public security is a duty of the State and a right of all, according to article 144 of the Federal Constitution/1988. This responsibility aims to preserve public order, the integrity of people and heritage, always based on the values of citizenship and human rights.

To this end, express principles governing public administration must be adopted, as established in article 37, *caput* of the same Constitution.

In this step, the National Public Security Plan (PNSP 2021-2030) recommends the Management of the Integrated Public Security Policy as one of the final chains of the Ministry of Justice and Public Security. This management aims to deliver the "Protection and Security of Society" through their respective processes.

In the private sphere, the concept of servitization has been gaining prominence, which consists of the transformation of a company that manufactures products into a company that offers solutions, integrating goods and services. This strategy has become common in the market, bringing innovation through private institutions.

However, even with the existence of legal evidence on the practice of governance in public administration through the integration of bodies, institutions and services, in general terms, it is possible to say that the concept of servitization is still not effectively applied in the public sector.

On the other hand, it is possible to observe examples of the provision of various services in an integrated manner by the State, such as the case of FÁCIL, in Mato Grosso do Sul, which provides services related to electricity, water and sewage, issuance of ID, among others.

In this context, the research aims to investigate the potential benefits of the implementation of Integrated Public Security Service Centers in the State of Mato Grosso do Sul, using the concept of servitization. The objective is to bring greater effectiveness in the provision of essential public security service to society, optimizing existing resources and promoting innovation in the service delivery model.

The specific objectives include describing the attributions of the public security agencies linked to the State Secretariat of Justice and Public Security of Mato Grosso do Sul, suggesting the creation of Integrated Public Security Service Centers in the State and exposing the potential benefits that society can obtain with these measures, based on the premise of servitization in the provision of public service and the philosophy of Community Policing, whose concept will be based on the theoretical foundation.

The importance of this research lies in the fact that public security forces represent the intervention of the State in sensitive moments of people's lives, such as criminal

occurrences, accidents and disasters. However, the compartmentalized and complementary structure of these forces can hinder the flow of information and the population's access to services.

From this perspective, servitization, which is an anglicism derived from the English word *servitization*, has been shown to be beneficial in the private sector, providing greater access to products and services, since it aims to deliver solutions to the customer/user.

According to Vandermerwe and Rada (1988, p.314): servitization is "the innovation of the organization's capabilities and processes to create better mutual value through a shift from the sale of products to the sale of Product Service Systems". However, this approach is not yet applied in the state provision of public security, given the differences in competence and attributions of the bodies responsible for these services, as well as the fact that these institutions have different administrative and organizational structures, since they were created separately, to carry out specific activities, even if complementary, as determined in the constitutional text.

Thus, the proposal to implement the Integrated Public Security Service Centers seeks to mitigate the difficulties of access and receipt of services by the population, improve the performance of institutions and optimize information flows. To support this proposal, theoretical concepts related to servitization, public administration and public security will be explored, in addition to presenting practical examples of integrated service in public security in other states of the Federation.

The methodology adopted in the research is qualitative, with a description of the attributions of public security agencies, theoretical foundations on Community Police and servitization, presentation of case studies and document analysis.

As a technical and technological product, it is expected to present a proposal for the implementation of a new model of public security service provision, based on the creation of the Integrated Public Security Service Centers in the state of Mato Grosso do Sul, applying the concept of servitization and following the philosophy of Community Police.

INTEGRATED PUBLIC SECURITY SERVICE CENTERS: A PROPOSAL FOR SERVITIZATION

This is a proposal for the implementation of a new model for offering public security services to Mato Grosso do Sul society through the creation and implementation of Integrated Public Security Service Centers, based on the concept of servitization, under the philosophy of community policing (FERREIRA, 1995, p.56).

In practice, it is proposed the creation of units to serve the population focused on public security, with the objective of uniting in one place human and material resources of the Civil Police, the Military Police, the Military Fire Department, the Criminal Police, the Forensics and Socio-educational Assistance, in order to operationalize these forces to act in an integrated manner, within the limits of its attributions, so that the delivery of public security by the State to the people is complete.

It so happens that today the provision of public security services through their linked bodies takes place in a compartmentalized manner, in which, in close synthesis, the Military Police and the Military Fire Brigade exercise the part of preventing crimes, fires, accidents, disasters and pre-hospital aid, the Civil Police exercises the part of repression of crimes that were not possible to prevent, In this case, the Forensic Investigation also acts within the scope of investigations, the Criminal Police and the Socio-Educational Assistance Agents start to act in the criminal part, exercising custody, internment and rehabilitation of criminals/minor offenders, respectively.

So, for example, if a citizen seeks the Military Police requesting support to verify a robbery situation, in which the alleged perpetrator is found in the act, by legal procedure, he is referred to a civil police station on duty, where the Military Police Occurrence Report will be drawn up, listing all the facts, objects and people involved for the delivery of the occurrence to the police authority, Civil Police Delegate on duty, who, together with his team of civil police officers, will receive the occurrence of the PM and draw up the respective hearings, Occurrence Report, Seizure Notice and Arrest Notice in Flagrante, duly grounded in the legal form, according to arts. 4 to 28 of the Code of Criminal Procedure, Decree-Law No. 3,689/1941 and in the light of article 144, CF/1988.

From this, any forensic examinations will be carried out elsewhere by the Forensic servers and then the alleged perpetrator of the fact is detained in the jail of the police station until he is transferred to a unit of the Penitentiary System, after a custody hearing. If the alleged offender is a minor, he must be received by the socio-educational agents in the Educational Internment Unit (UNEI), in accordance with arts. 90, 108 and 112 of the Statute of the Child and Adolescent, Law No. 8,069, of July 13, 1990.

If there are injuries, the Military Fire Department will also be activated, which will provide aid to possible victims, carrying out outpatient and/or pre-hospital referrals, depending on the situation.

This time, it is observed in the case in question the use of many material and human resources and many displacements, generating inconvenience to the servers, victims, witnesses and perpetrators involved, as well as adding expenses that could be suppressed

if the service occurred in a complementary and unified way, in the same place, and in less time, freeing up the teams involved more quickly to be able to provide new services.

In fact, it should be noted that the estimated average cost for the construction of a public security unit, whether it is the Civil Police, Military Police, Military Fire Department, Forensics, etc., considering a total area of 970 (nine hundred and seventy) m² is around R$ 5,500,000.00[3] (five million and five hundred thousand reais), a resource that would be better invested if it contemplated a unified service unit, since it would not be necessary to multiply this amount in the construction of a unit for each public security force.

Therefore, it is understood that the implementation of the integrated public security service from the creation of integrated centers, operating in shifts of 24 hours a day, could provide an improvement in the delivery of Public Security by the government to the citizen, reducing costs and making it more effective, efficient and effective.

In this vein, according to Façanha and Marinho (2001, p.2):

> In current use, effectiveness refers to the ability to promote intended results; efficiency would denote competence to produce results with minimal expenditure of resources and efforts; and efficacy, in turn, refers to controlled conditions and desired results.

To this end, procedurally, it is necessary to establish a Working Group (WG) within the scope of the State Secretariat of Justice and Public Security – Sejusp/MS, with representatives of the institutions involved (Military Police, Civil Police, Military Fire Department, General Coordination of Forensics, Criminal Police and Superintendence of Socio-Educational Assistance, in order to carry out the necessary alignment studies for the operationalization of the integrated centers, in order to unite in a cohesive way the inherent perspectives of each of these bodies and establish the guidelines for their unified functioning.

From this, it is suggested to indicate a place or region for the implementation of the pilot project of the Integrated Public Security Service Center (CAISP/MS) in its testing and adjustment phase, until a degree of excellence is obtained that gives rise to the institution of the others throughout the state, in order of priority, from technical studies and necessary statistical data.

[3] Source: CORRÊA, Fábio Alex, 2024. Informative Report of the Coordination of Projects and Maintenance of the State Secretariat of Justice and Public Security of Mato Grosso do Sul - COORDPROJ/SEJUSP/MS. (ATTACHED)

COMPETENCIES OF THE PUBLIC SECURITY ORGANS LINKED TO THE STATE SECRETARIAT OF JUSTICE AND PUBLIC SECURITY OF MATO GROSSO DO SUL AND THE SERVICE TO THE POPULATION

Public security is a crucial issue for social development and the guarantee of human rights in any society. In the State of Mato Grosso do Sul, the State Secretariat of Justice and Public Security (SEJUSP) is responsible, under the prism of article 20 of Law No. 6,035, of December 26, 2022, for coordinating and integrating the actions of the Civil and Military Police, the Military Fire Department, the Criminal Police, Socio-Educational Assistance, and Forensic Expertise. with the aim of ensuring public order and the safety of the population.

In this context, chapter III of the Constitution of the Federative Republic of Brazil of 1988 brings in its article 144. that public security, a duty of the State, a right and responsibility of all, is exercised for the preservation of public order and the safety of people and property, through the following bodies: I - federal police; II - federal highway police; III - federal railway police; IV - civil police; V – military police and military fire brigades. VI – federal, state and district criminal police.

Its constitutional attributions are provided for in paragraphs 4, 5 and 5-A of the aforementioned legal provision, as described below:

> Paragraph 4 - The civil police, headed by career police officers, are responsible, except for the competence of the Union, with the functions of judicial police and the investigation of criminal offenses, except for military ones.
> Paragraph 5 - The military police are responsible for the ostensive police and the preservation of public order; The Military Fire Departments, in addition to the attributions defined by law, are responsible for carrying out Civil Defense activities.
> Paragraph 5-A - The criminal police, linked to the administrative body of the penal system of the federative unit to which they belong, are responsible for the security of penal establishments. (Text given by Constitutional Amendment No. 104, of 2019)

The Superintendence of Socio-Educational Assistance established by Decree No. 12,710, of February 9, 2009, restructured by Decree No. 13,042, of September 13, 2010, subordinated to the Secretary of State for Justice and Public Security, aims to promote socio-education in the State of Mato Grosso do Sul, through articulation with the Rights Guarantee System and sectoral bodies of public and social policies, and the execution of judicial measures of deprivation and restriction of liberty, being its responsibility to safeguard, assist and monitor adolescents in compliance with socio-educational measures of internment and semi-liberty and those who are in provisional internment, in accordance with laws, norms, recommendations at the national and state levels, as well as the International Treaties to which Brazil is a signatory.

THE APPLICABILITY OF THE COMMUNITY POLICING PHILOSOPHY IN THE CONCEPT OF SERVITIZATION AND ITS EFFECTIVENESS WITH REGARD TO THE STRATEGIC MANAGEMENT OF THE ADMINISTRATION

Public security is one of the pillars of a cohesive and fair society. In this context, the philosophy of community policing, which emerged from the so-called oriental police school, more specifically in Japan (1870), and emphasizes the actions of public security agencies oriented to service to the community, as opposed to the so-called Anglo-Saxon (Western) police school, more oriented towards law enforcement and criminal prosecution, emerges as an innovative alternative for the management of public security. seeking to strengthen ties between the community and the security forces.

According to MUNIZ and ZACCHI (2005), this philosophy had its first drafts in Brazil in the 1980s, in Rio de Janeiro/RJ, having as one of its precursors the Military Police Colonel Carlos Magno Nazareth Cerqueira, gradually spreading to the other Federative Units, gaining strength with the creation of the National Public Security Fund, in the 2000s.

Thus, the philosophy of community policing emerges as a counterpoint to the traditional model of policing, which was characterized by repression and the distance between the police and the community (FERNANDES, 1994, p. 10). The model in question proposes a paradigm shift, focusing on crime prevention and building a relationship of trust between the community and public security forces.

In line with Trojanowicz and Bucqueroux (1994), its guiding principles are basically related to proximity, which deals with the physical and symbolic approximation between the police and the community; prevention, which deals with the emphasis on crime prophylaxis through proactive and educational actions; partnership, which is linked to building a relationship of trust and collaboration between the police and the community; responsibility, with regard to the sharing of responsibility for public safety between the police, the community and the government, and transparency, with regard to transparent and supervised actions by the community.

With regard to servitization, there is a management model that seeks to transform the public administration into a provider of services to the population. This model systematically implies orientation for citizens, focusing on their needs and expectations, quality of services provided, according to the concepts of quality, effectiveness, efficiency and effectiveness in management, with the optimization of public resources and the search for sustainability, transparency and *accountability*, a term of English origin that refers to accountability that, in a broader understanding of the concept, is used with the meaning of transparency, control, responsibility, in actions and accountability to the population and,

finally, social participation, stimulating the involvement of civil society in public management.

According to Bracker (1980), strategic management is related to the application of business strategy concepts directly in the organization, through analysis of the internal and external environments, with the objective of achieving the success of the organization through established goals, aiming at improvements in all aspects and thus enabling the improvement of the ability to deal with future uncertainties, in order to anticipate its actions on a preventive basis. Furthermore, strategic management in the public sector, according to Nogueira (2015):

> They have to establish priorities, relate to the environment, learn about the social scenario, diagnose their limitations, explore their strengths, develop culturally and educationally, "lead" negotiation, obtain resources and spend them efficiently, and plan their future and that of society itself.

Thus, in obedience to the constitutional principles of public administration present in article 37 of the CF/1988 (legality, impersonality, morality, publicity and efficiency), the governance policy in the public administration of Brazil was implemented, especially with regard to the efficiency of acts, as of Decree No. 9,203, of November 22, 2017. From this perspective, the term "governance" (and the act of "governing") refers mainly to the processes that make it possible to establish organized rules and promote joint actions in the public sphere (CHHOTRAY; STOKER, 2009), considering its administrative, political, economic, social, environmental, and legal structure, among others, whose basic principles include transparency, equity, compliance with laws, accountability and ethical conduct, with a view to an efficient, effective and effective State.

Thus, it is observed that the philosophy of community policing and the concept of servitization converge in several aspects, since both approaches place the citizen at the center of public security management and deal with prevention, with the purpose of achieving better results. They promote social participation and defend the transparency of actions and accountability to the population, demonstrating that, together, such approaches can become effective tools in the strategic management of public security.

EXAMPLES OF GOOD PRACTICES IN THE INTEGRATION OF PUBLIC SECURITY SERVICES THAT OCCUR IN MATO GROSSO DO SUL AND OTHER STATES OF THE FEDERATION

As already discussed in the previous lines, it is possible to infer that the meeting, or integration of services for the benefit of the end customer is a market trend, which has been

increasingly explored in the private context. In the scope of public administration, although on a smaller scale, it is no different, so that some examples of good practices of this nature in public security can be collected in some states of the Federation.

In Mato Grosso do Sul, through Decree No. 11,048, of December 27, 2002, amended by Decree No. 11,564, of March 22, 2004, the Integrated Security Operations Center (CIOPS) was created, headquartered in Campo Grande-MS, responsible for promoting the integration of public security institutions in the State of Mato Grosso do Sul, with the purpose of providing the necessary means for the operation of the Operations Centers of the security agencies, in order to receive and process the response to urgent and emergency calls, through the emergency telephones 190 (PM) and 193 (CBM), as well as other agencies and institutions involved in public security and civil defense actions, with the competence to gather, process and organize statistical information on attendances and occurrence records, with a view to optimizing resources aimed at fighting crime.

Another example of integrated action by the state's public security agencies is the General Coordination of Air Policing (CGPA/SEJUSP), created by State Decree No. 12,584, of July 17, 2008, as an Integrated Public Security Unit, made up of career civil servants from the Military Police, Civil Police, Military Fire Brigade and statutory employees designated by the Secretary of State. for the purpose of planning and executing air operations for public security, civil defense, transport of authorities and air support to other bodies, under the terms of arts. 1 and 2 of the aforementioned text of the law.

In the State of Rondônia-RO, from Decree No. 11,964, of January 2, 2006, the Integrated Public Security Unit (UNISP) was created, bringing together the performance of the Civil Police, Military Police and Military Fire Department, with daytime service and single record of occurrences.

Also, it is necessary to consign a pilot project of the State of Pará-PA, materialized with the installation of the so-called Integrated Public Security Unit (UISP), [4]through a cooperation agreement between the State Government, through the Secretariat of Public Security and Social Defense (Segup), with the mining company Vale, aiming at improving the infrastructure for the performance of security agents, as well as effective public security actions for the population of the region, specifically in the São Félix nucleus, integrating the Military Police, the Civil Police, the Military Fire Department and the Scientific Police in a complex of four buildings.

[4]Source: Civil Police of the State of Pará: From Brazil, Sentinela do Norte. ***Marabá receives a new Integrated Public Security Unit, which will benefit more than 70 thousand people.*** Published on 28 Apr. 2022. Available at: https://www.pc.pa.gov.br/noticia/102 > Accessed on: 22 Jan 2024.

DIALOGUE WITH STAKEHOLDERS

Despite presenting an innovative project regarding the implementation of a new model of public service provision, it is imperative to promote dialogue with *stakeholders*[5], a term created by philosopher and professor of management Robert Edward Freeman in 1983 in an internal memorandum at the Stanford Research Institute, which can be understood as "interested persons", or "actors involved" in a given project or process, in order to verify the sustainability of the proposal through actors who have *know-how* in working together between institutions, and the possibility of its validation in the phenomenal world.

To this end, three civil servants with extensive experience in the subject and who hold senior management positions in bodies of integrated action in the Public Security of the State of Mato Grosso do Sul were invited to the dialogue, they are the Colonel of the Military Fire Department Danilo Santos Moreira Leite, General Director of the Integrated Security Operations Center - CIOPS, Military Police Colonel Edimilson de Oliveira Ribeiro, Coordinator of the Coordination of Integrated Operations and Interagency Cooperation – COPI and Interim Coordinator of the Integrated Command and Control Center – CICC, and Police Chief Tiago Macedo dos Santos, Superintendent of Public Security – SSP/SEJUSP, in order to consign to this work a little of their experience in the integrated performance of public security, present them with the above-mentioned project and verify the opinion of these professionals on the subject.

Thus, the following questions were met with the guest actors:

1. Tell us a little about your experience in public security, especially in integrated action with other security forces and what is your perception of this integration in public security;
2. Regarding the project presented, I would like to check your opinion on the subject, including on:
3. If there is feasibility of implementing Integrated Public Security Service Centers in Mato Grosso do Sul; (Yes/No/Justify).

Respectively, Danilo Santos Moreira Leite declared to be "Colonel of the Military Fire Department of Mato Grosso do Sul, in the corporation for 26 years. From 2004 to 2015 he had the opportunity to work at the Integrated Security Operations Center (CIOPS), having returned to CIOPS in October 2023 to assume the role of Director-General." He asserted that "the CIOPS is an agency that is the result of a policy of integration of public security

[5] Source: Encyclopedia Meanings. Available at: https://www.significados.com.br/stakeholder/#:~:text=Stakeholders%20significa%20p%C3%BAblico%20estrat%C3%A9gico%20e,%2C%20projeto%2C%20empresa%20ou%20neg%C3%B3cio. > Accessed on: 29 Jun 2024.

agencies, concentrating the receipt of emergency calls 190, for the Military Police, and 193, for the Military Fire Department." He explained that "the response to these calls results in the registration of occurrences, which are automatically distributed to dispatch terminals, taking into account the location of the occurrence and the forces that must be activated. At this point, the integration of the Civil Police also occurs, which becomes aware of the crimes recorded, informing the police stations, as well as providing for the activation of forensic teams. The CIOPS generated agility in the service, since the operations centers of the security forces were separate and there was no integration of information, as well as resulting in savings, as the operations centers of the forces, integrated in the CIOPS, share the same physical space and the same structure."

Regarding the project presented, he said: "I understand that yes, the integration of services is very valid, and should be planned from the perspective of the service user. In the case of public security, I understand that services can be integrated with the issuance of an ID, a request for an inspection by the Military Fire Department, a request for a Police Operating and Control Permit is up to DEOPS, and the like."

As for the benefits, he concluded that "it is the citizen's satisfaction with the service provided by public security, as it is the reason for the existence of public agencies. It is expected that this satisfaction will result from the agility in the service and the fact of finding several services in one place, in addition, obviously, to having their needs met."

Subsequently, Edimilson de Oliveira Ribeiro, exposed that he is "Colonel PM of the Paid Reserve, but that he continues to work in a commissioned position at the State Secretariat of Justice and Public Security (SEJUSP-MS), in the same position and function that he held in active service. Since November 2015, I have assumed the role of Executive Secretary of the then Integrated Border Management Office (GGI-FRON) at SEJUSP. This Border Office had its legal framework in 2011 when the Strategic Border Plan was instituted and brought with it the ENAFRON Program (National Strategy for Public Security at the Borders), which provided strong investments in the years 2011 to 2013 on the borders of Mato Grosso do Sul. The mission of this office was precisely to foster integration at the state level between federal, state, and municipal public security forces, with integrated operations to confront and combat cross-border and/or transnational crimes on the borders with neighboring countries (Bolivia and Paraguay). From the legal framework of the Strategic Border Plan, inspections in the border strips were intensified, and 4 border poles were created in Mato Grosso do Sul, covering the municipalities: Corumbá, Ponta Porã (in 2011), Naviraí and Jardim (in 2012). In these centers, the 44 municipalities of the border

strip were distributed, where constant operations were carried out as part of a task force to combat organized crime on the borders."

He described that: "from 2015 to 2023 I remained in the Executive Secretariat of this Office, but over the years, its actions, scope and attributions have been expanded, and in 2017, after the Integrated Border Protection Program (PPIF) was instituted – Federal Decree No. 8,903/2016, in the state we started, in addition to border missions, to also carry out integrated actions on the borders with the states neighboring Mato Grosso do Sul. For this reason, in March 2017, through Decree 14,682/2017, in the administrative reform of SEJUSP, the name in the SEJUSP organizational chart was changed to Office of Integrated Management of Borders and Borders (GGI-FRON-DIV). In 2023, Decree No. 16,193, of May 18, 2023, reorganized the basic structure of the State Secretariat of Justice and Public Security – SEJUSP and restructured the SEJUSP organizational chart again, this time creating the Coordination of Integrated Operations and Interagency Cooperation (COPI), with the Executive Secretariat of the Office of Integrated Border and Border Management (GGI-FRON-DIV) being in accordance with item "VI" of Article 28 of Decree No. 16,193/2023 to have the activities of his competence coordinated by the COPI, and this PM Officer was appointed holder of the COPI portfolio, accumulating a function also with the Executive Secretariat of the GGI-FRON-DIV, where I remain exercising my functions in said portfolio until the present date. In addition, in these almost 8 and a half years at the head of integrated operations in the state, I can assure you that integration is the way to strengthen institutions, as the union and the sum of efforts provides a state presence with a greater scope of actions to combat organized crime for a longer period of time on the ground. Since then, this integration has provided a greater approximation that goes from the leaders of the institutions to the personnel who perform the missions at the end of the line, becoming a facilitating instrument and exchange of information and experiences between managers and operators who work in this confrontation."

As for the implementation of Integrated Public Security Service Centers, he argued: "I see it as a very interesting proposal, because it would be a place where all institutions would work together within their competencies and attributions, as is already the case today in the Casa da Mulher Brasileira, where Public Security Institutions and Assistance Agencies act in an integrated way in the same place, aiming to give speed and better support to women victims of domestic and family violence, where there she feels supported and safe when denouncing her aggressor partner. In practice, I understood that it would be a place where the institutions would work together: Military Police, Civil Police, Fire Departments, Forensics, Criminal Police and Socio-educational Assistance, in a 24-hour

service, with the registration of a single bulletin, where they would certainly have more speed in the proper referrals and the resources between the institutions would be better optimized, therefore fully feasible to seek this integration and sum of efforts in favor of public security in the state."

Regarding the benefits, he mentioned: "in my view, they would be quite interesting, as they would provide agility in the processing of the occurrences generated; enhancement of the resources employed and rework with the creation of a single bulletin; greater approximation on the part of public security operators acting in a joint and integrated manner in public security as a whole; would stimulate the approximation of the various sectors of public security, with the exchange of information and greater confidence of its members in a single environment of measures related to the field of public security and citizen security in this provision of service of the institutions."

Tiago Macedo dos Santos, Police Chief and Superintendent of Public Security, stated: "I have been working in the Justice system for twenty years, of which fourteen as a public security professional. I understand that integration between security forces is fundamental. Each institution plays a role, according to constitutional and legal attributions. Integration allows the exercise of these attributions to complement each other, strengthening the response to society, expanding the capacity for crime prevention and repression."

In addition, he argued: "public security institutions must act in this synergy and integration, respecting constitutional and legal attributions, as the result of the integrated action passes through the sieve of Justice, allowing the delivery of the jurisdictional provision. Thus, joint action from the activation of an occurrence, at crime scenes, in intelligence actions and in the search and arrest of criminals, allows the entire public security system to activate the criminal prosecution system, which will naturally result in the activation of the Criminal Justice, through a criminal action. Therefore, the result of integrated action allows the realization of Criminal Justice, bringing security and peace to society, because when public security institutions join forces, there is prevention, criminal repression and the realization of criminal justice."

Regarding the feasibility of the project, he argued: "it is possible, but it should be noted that each public security institution has different and complementary attributions and their performance must be guided within the strict constitutional and legal limits, because the product of the public security service inevitably results in a subsequent service, which is Criminal Justice, which confronts aspects of legality and constitutionality to promote a criminal conviction.

Objectively speaking, this integration must be studied within the legal and constitutional limits and within the margin of complementarity that exists and allows this integrated action. For example, the Integrated Security Operations Centers and the Integrated Command and Control Centers are mentioned, where the security forces act jointly and each one acts within its area of attribution. This is already a strong factor of integration and allows the joint action of the Military Police, the Civil Police (including its Forensic body), the Military Fire Brigade and when within the scope of the CICC, joint action with other bodies, such as the Army, Navy, Air Force, Federal Police, Federal Highway Police, Intelligence Agencies, Municipalities (SAMU, SEMADUR, other municipal bodies), Public Schools (as occurred in the case of the attacks on schools).

It should be noted that due to the constitutional and legal attributions of each institution, this integration could not overcome these limits, under penalty of unconstitutional and legal action and compromise of the application of criminal justice, which inevitably works with the product of the public security service. Thus, integration depends on a strong exchange of information, on the existence of integrated protocols, respecting the institutional attributions, which were designed in the Constitution and follow a pattern specific to the structure of the Brazilian State, with historical, cultural and local reality aspects."

Regarding the benefits, he concluded: "the integration of security agencies is something that has been promoted for more than two decades and in this period it has advanced more and more. Currently in Mato Grosso do Sul, for example, there are the examples brought in the previous lines as instruments of integration. What can be seen is that there are numerous advances, very positive results. Still in this perspective, there is a pioneer in Mato Grosso do Sul, an integrated service within SEJUSP between the Military Police and the Civil Police, as is the case of the DOF and DEFRON, police agencies that act together, respecting the attributions of each institution, preventing and repressing border crimes in the State. The results are absolutely positive. Both bodies operate in the same headquarters. Therefore, integration is an essential tool and these experiences mentioned above demonstrate this.

FINAL CONSIDERATIONS

Based on the concepts and principles addressed, under the aegis of governance in public administration, it is possible to see that the creation and implementation of the Integrated Public Security Service Centers by the State Secretariat of Justice and Public Security (SEJUSP/MS), can bring numerous benefits to the citizens of Mato Grosso do Sul,

especially because it will bring the public closer to the agents responsible for law enforcement and will provide a qualitative and quantitative improvement in the deliveries from the State to the population.

The article presented the proposal for the creation and implementation of the Integrated Public Security Service Centers in Mato Grosso do Sul, as well as the probable benefits of their implementation.

The characterized description of the public security forces operating in the State, in the form of the Federal Constitution of 1988, as well as their legal attributions and operation, was brought to the fore.

It dealt with the definition of strategic management, making a contribution of the philosophy of community policing, tracing a relationship with the concept of servitization, especially with regard to the benefits that can be obtained with its introduction, by means of a suggested change.

Some examples of good practices in the integration of public security services that occur in Mato Grosso do Sul and other states of the Federation were demonstrated, indicating, in theory, the feasibility in carrying out the project.

In the dialogues with the *stakeholdes,* it was clear in the conciseness and coherence found between the statements that "[...]the integration of services is very valid, and must be planned from the perspective of the service user" (Col. Danilo), "[...]they would certainly have more speed in the proper referrals and the resources between the institutions would be better optimized, therefore fully feasible to seek this integration and sum of efforts in favor of public security in the State." (Col. Edimilson) and "[...]The integration of security agencies is something that has been promoted for more than two decades and in this period it has advanced more and more.", "[...]It is an essential tool". (Dr. Tiago).

Nevertheless, it is stated that "[...] integration depends on a strong exchange of information, on the existence of integrated protocols, respecting the institutional attributions, which were designed in the Constitution and follow a pattern specific to the structure of the Brazilian State, with historical, cultural and local reality aspects." (Dr. Tiago).

Finally, it was possible to observe the existence of a movement towards making products and services increasingly accessible to the population with the integration of services in unique locations, which has been strengthening and gaining more and more space within the private sector and public administration, in order to foster governance, with a view to strategic management, making the public service more accessible, efficient, effective and effective.

In this vein, it is inferred that the creation of Integrated Public Security Service Centers in Mato Grosso do Sul (CAISP/MS), meets the desires of the community and the actors responsible for public security in the State, as well as the aforementioned trend of integration of services as an offer of solutions to the target public, under the bias of the concept of servitization, aligning itself with the philosophy of community policing that raises the approximation of security institutions with the population, in order to promote awareness, education and partnership, finding feasibility in its implementation.

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FRIENDSHIPS IN THE ADAPTATION OF THE LATIN AMERICAN IMMIGRANT

https://doi.org/10.56238/sevened2024.031-042

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ABSTRACT

Some studies on immigrant friendship relationships point out that these play a relevant role in the complex process of adaptation of immigrants to the new country. Therefore, the objective of this study was to analyze the role of new friendships with compatriots, natives or other foreigners for the adaptation of Latin American immigrants to the current country. 40 immigrants participated in the research, divided into four groups: A) 20 Latin Americans who lived in Brazil; B) three Brazilians who lived in another Latin American country; C) 12 Brazilians who lived in Spain; and D) five Brazilians who lived in Portugal. The instrument used was a questionnaire with open questions, sent and received by e-mail, which produced written reports, which underwent qualitative content analysis. The main results revealed that friends from their own country or from other countries are fundamental for adapting to the new country, to make up for the lack of their culture, to increase the sense of belonging, to provide emotional support and to alleviate loneliness. For most participants, friends do not replace relationships with family members in the country of origin, but fill the void left by the family. The vast majority of participants felt some social need such as welcoming, adjusting or adapting to the new culture. Finally, in parallel with the friends, the path most suggested by the participants of the four groups for a better adaptation and adjustment of the emigrant to new cultures was the approximation or openness to the new culture.

Keywords: Friendship. Immigrants. Latin Americans. Adaptation.

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INTRODUCTION

According to data from ECLAC's Population Division (Economic Commission for Latin America and the Caribbean, 2013), in recent years there has been a significant increase in the number of Latin American and Caribbean immigrants, from an estimated total of 21 million in 2000 to an estimated figure of around 30 million in 2010, which represents about 13% of the 232 million immigrants in the world. In terms of three contexts, Latin America, Spain and Portugal, in addition to receiving a large number of immigrants today (ECLAC, 2013; Gois, Marques, Padila & Peixoto, 2009; Hierro, 2013; Malheiros, 2007; Peixoto & Egreja, 2012), have possible cultural aspects in common due to the issue of the colonization of Spain and Portugal in Latin America (Machado, 2006).

On the other hand, together with affective relationships and family relationships, friendship currently represents one of the forms of relationship studied, becoming the subject of systematic investigation from the 1980s onwards (Garcia, 2005a; 2005b). Friendship arouses interest due to the various beneficial effects it arouses, including adaptation processes, such as harmonious and respectful coexistence with other ethnic groups (Antonio, 2004; Jacobson & Johnson, 2006), favoring social inclusion (Milem, Chang & Antonio, 2005), welcoming (Gomes & Silva-Junior, 2007) and adapting to new situations (Garcia, 2012a; Garcia, Bitencourt-Neto, Moura & Pepino, 2010; Garcia, Brandão, Costa & Togatlian, 2010; Garcia, Dettogni, Costa & Togatlian, 2010; Garcia & Goes, 2010). However, friendships related to the process of international migration, as well as friendships between people of different ethnicities, nationalities or cultures are still poorly investigated, especially in Latin America. In a recent review of inter-ethnic, interracial, intercultural and international friendships, Garcia and Miranda (2012) discuss the diversity of research on the subject, highlighting the social and cultural importance of these friendships. According to the authors, these friendships are still little known.

Among some of the topics investigated in interethnic and interracial friendships is the role of racial and ethnic identification in friend choices (Kao & Vaquera, 2006) and shared activities (Hunter & Elias, 1999). Related to social integration, some studies have focused on the role of ethnic or racial majorities and minorities and their influence on the relationships between members of these groups. Several studies relate ethnic and racial majorities and minorities and friendships. Fong and Isajiw (2000), for example, examined the determinants of patterns of inter-ethnic friendships between a minority group and the majority group and co-ethnic friendships. The analysis indicated that (1) participation in activities aimed at the ethnic minority group decreased the chances of developing friendships with the majority group; (2) individual socioeconomic characteristics strongly

affected co-ethnic friendships; (3) previous experiences of friendship with the majority group are related to the level of friendship ties with this group.

Schwartz, Galliher, and Domenech-Rodríguez (2011) investigated the self-disclosure in the inter- and intracultural friendships of Latinos and the links to collectivism, ethnic identity, and acculturation. The participants were 59 international Latinos (who lived outside the U.S.) and 73 Latin Americans living in the U.S. The results revealed that the type of relationship (friend vs. acquaintance) and the partner's ethnicity (Latino vs. white) were significantly associated with self-disclosure. Participants revealed more information to friends than acquaintances and more to Latinos than to white Americans.

Some studies on immigrant friendship relationships in Brazil point out that they play a relevant role in the process of adaptation of immigrants to the new country. An exploratory and descriptive research, of a quantitative nature, conducted by Garcia (2012a), aimed to describe some aspects of the friendships of foreign university students who lived and studied in Brazil, as well as to identify the role of these friendships in the social and cultural integration of the exchange students, according to them. A total of 100 foreign university students participated in the study, 50 males and 50 females. A questionnaire was applied, whose main results were: 1) most of the friends lived in the same city or metropolitan region; 2) personal contact/proximity were considered important for the establishment of the friendship relationship; 3) the main common interests and shared activities were associated with leisure, studies, scientific or cultural activities, sports, work and religion; 4) communication became less intense with friends from abroad, while it intensified with Brazilian friends, increasing their importance due to their availability and physical proximity; 5) the main difficulties in friendships were distance from friends, personal or personality differences, communication difficulties and cultural differences; and finally that 6) the friends were recognized as playing a relevant role both in the adaptation and in the vision they had of Brazil.

Garcia and Goes (2010) developed a qualitative research with the objective of describing some aspects of the friendships of foreign university students from Guinea-Bissau and São Tomé and Príncipe who lived in Brazil. Ten students from Guinea-Bissau and two from São Tomé and Príncipe, aged between 20 and 33 years, participated in the research. Semi-structured interviews were used, containing closed and open questions. The results referred to common interests (such as study, leisure, culture and relationships) and shared activities (such as talking, leisure, sports, studying, etc.), friendship difficulties (such as personal characteristics, communication, cultural differences, fights, among others) and remarkable episodes (related to leisure, help received, welcoming, help given

and daily events). Most of the friendships were relevant to adapting to Brazil, but only part influenced the way they see the country. It was concluded that friends are fundamental for the social and cultural adaptation of these students and serve as a basis for cultural and scientific cooperation.

Garcia and Rangel (2011) investigated the friendships of Cape Verdean university students living and studying in Brazil, through interviews with 12 undergraduate students. The participants mentioned 109 friends, 81 from Cape Verde, 18 Brazilians and six Angolans, in addition to four other friends, each of different nationality, with the most used languages being Creole and Portuguese. Most of the friends (72) lived in Greater Vitória, and among the 35 closest friends, 24 were acquaintances from Cape Verde. Among the results, it was highlighted that the main common interests and shared activities were related to study and leisure. Participants highlighted the value of friendship and the help received. The difficulties perceived in friendship were related to distance from friends, personal characteristics and difficulty in communication. The remarkable episodes were linked to leisure and help from his friend. Most of the friendships were considered relevant for the adaptation to Brazil, but only part of them influenced the way the students perceived Brazil.

Costa (2012) developed a qualitative study, whose objective was to describe the friendships in the life history of Greek immigrants living in Espírito Santo, with other Greeks, Brazilians or foreigners, with a view to understanding the relations between friendship and culture, also including intercultural friendships and the role of friendships in the process of adaptation or adjustment to life in Brazil. Ten Greek immigrants who came to Brazil at the age of ten or older participated in the research, and a script was used for the interview. The results indicated that friendships are part of the history of these immigrants in a new country. The meaning of friendship included breadth, freedom, spontaneity, disinterestedness, honesty, sincerity, fidelity, trust, and longevity. The main dimensions of friendship were similarities and differences, proximity and distance, support, reciprocity, and conflict. The relationships between friendship and sociocultural context included receptivity and rejection, adoption and adaptation, connection and disconnection, friendship and community abroad, democracy, family, work, and school. It was concluded, therefore, that friendship acts as a mediator of the foreigner's adaptation to the new country, despite its cultural variations, representing not only an active condition in the various traditions, but also allowing communication between these customs, contributing to immigrants feeling welcomed in the cultural bosom of the nation they chose to live in.

Garcia, Costa and Pereira-Oliveira (2016) conducted a study with five Portuguese and Spanish immigrants living in Brazil, who produced written accounts about their

experiences of international migration and friendship. The main results revealed that contact with friends who lived in the country of origin occurred through virtual social networks and internet communication sources (such as *Skype*, *WhatsApp*, *Facebook*, *Messenger*, *e-mails)* and in person when they traveled. The network of friends of the participants included compatriots who lived in Brazil, in their country of origin and in a third country. They also mentioned Brazilian and foreign friends, residing in their country of origin or in Brazil. Brazilian friendships began in the workplace, in social activities and were relatives of the spouse. Cultural influences were pointed out as benefiting friendships in the sense of cultural exchange and curiosity for the different. Shared activities included conversation, meals, and religious activities. The friends were indicated as playing a relevant role in adapting to the new country.

Some works on immigrants in Spain address friendship, however, with a focus on childhood and adolescence, such as the friendship networks of Spaniards and children of immigrants at school (Miguel-Luken & Carvajal-Gutiérrez, 2007). Herrero, Fuente and Garcia (2011) investigated the subjective well-being among Latin American immigrants in Spain and the role of social integration in the community. Latin Americans in Spain are seen as a group at risk of social exclusion. The authors conclude that there is a statistically significant relationship between social integration and social well-being and point to the need to promote the social integration of these immigrants in the community.

Entering Portugal or other European countries, such as Spain itself, has become cheaper and safer for Latin Americans than entering the US illegally (Gois *et al*, 2009). Brazilian immigration to Portugal is an old phenomenon, which has occurred since the nineteenth century, but the interest in its scientific study is much more recent, concentrating on the first decade of the twenty-first century. Despite this interest, the recent literature on Brazilian immigration in Portugal has focused mainly on insertion in the labor market (Gois *et al*, 2009; Machado, 2006).

Although Brazilian immigration takes place in several destination countries, there are similarities and differences regarding their insertion, adaptation and ways of life in these different contexts. When talking about support for immigrants, some authors use the term "social networks", and comment on associations of Brazilians in Portugal, such as the Casa do Brasil in Lisbon, for example (Gois *et al*, 2009). In this perspective, friendship relationships are inserted, as a strategy of support and collaboration for the immigrant.

Based on the above, the objective of this study was to analyze the role of new friendships with compatriots, natives or other foreigners for the adaptation of Latin American immigrants to the new country (Latin American countries, Spain and Portugal). The

relevance of the research lies in the originality of the theme, as well as in the direction of possible paths for a better adaptation and adjustment of the immigrant to new cultures, promoting their better quality of life in the nation they chose to live in.

METHOD

The present study can be considered a field research, of a qualitative nature, with descriptive characteristics. 40 immigrants participated in the research (70% women and 50% in the age group of 30 and 39 years), divided into four groups: A) 20 Latin Americans who lived in Brazil; B) three Brazilians who lived in another Latin American country; C) 12 Brazilians who lived in Spain; and D) five Brazilians who lived in Portugal.

Each participant was identified by the letter of the group to which he belonged (A, B, C, or D) and by a number, and their characterization is described below. group A (Latin Americans in Brazil) includes: A1, male, 40 years old, Colombia (country of origin), seven siblings, black, Colombian wife and Brazilian son, Catholic; A2, male, 30 years old, Peru, one brother, non-practicing Catholic; A3, male, 75 years old, Argentinean, married, one child from previous marriage, no religion; A4, female, 52 years old, Bolivia, two brothers, six-month-old son; A5, female, 40 years old, Argentinean, only child; A6, female, 30 years old, Peruvian, non-practicing Catholic; A7, male, 33 years old, Colombia, two brothers, lives with girlfriend, Catholic; A8, female, 37 years old, Colombia, one brother, non-practicing Catholic; A9, male, 32 years old, Colombia, divorced, one daughter; A10, female, 32 years old, Colombia, four siblings, childless, Christian; A11, female, 25 years old, Mexico, three siblings, single, evangelical; A12, male, 27 years old, Chile, four siblings, one son, own beliefs; A13, female, 26 years old, Colombia, two sisters, Catholic; A14, female, 32 years old, Colombia, one brother, married, six-month-old daughter born in Brazil, non-practicing Catholic; A15, female, 55 years old, Argentine, one Argentine daughter, Catholic; A16, female, 36 years old, Mexico, four siblings, married, one Mexican son, atheist; A17, female, 29 years old, Cuban, one brother, Catholic; A18, male, 30 years old, Peru, two brothers, Seventh-day Adventist; A19, female, 65 years old, Panama, five siblings, married, two children (one Brazilian and one American) and three grandchildren; A20, female, 40 years old, Peruvian, married, one Brazilian son, Catholic. Group B (Brazilians in other Latin American countries) includes: B1, female, 33 years old, lives in Chile, lives with a partner, has no children, has no religion; B2, female, 28 years old, resides in Mexico, married to a Mexican, one Mexican son, non-practicing Catholic; B3, female, 33 years old, lives in Mexico, a sister, married for the second time, has no children, agnostic. Group C (Brazilians in Spain) includes: C1, female, 35 years old, seven siblings, divorced, two daughters,

practicing Catholic; C2, female, 28 years old, only child, has no children, has no religion; C3, female, 33 years old, one sister, married, without children; C4, female, 30 years old, married, Catholic; C5, female, 37 years old, three siblings, single, childless, does not practice the Catholic religion; C6, female, 27 years old, only child, evangelical parents, doctrine with which she disagrees; C7, male, 28 years old, non-practicing Catholic; C8, male, 33 years old, only child, Protestant Christian; C9, male, 28 years old, lives with a friend, has no children, has no religion; C10, male, 36 years old, one brother, married, one Spanish son, no religion; C11, female, 41 years old, two sisters, Catholic, but identifies more with the Spiritist Doctrine, without children; C12, male, 54 years old, Brazilian children, agnostic. Group D (Brazilians in Portugal) includes: D1, female, 36 years old, no religion; D2, female, 41 years old, no children, non-practicing Catholic; D3, female, 34 years old, one brother, divorced, childless, practicing Catholic; D4, female, 29 years old, married, without children, without religion, but does not consider herself an atheist; D5, female, 32 years old, one sister, single, no religion.

The instrument used was a questionnaire with open questions, sent and received by *e-mail*, which produced written reports. A pilot procedure was carried out with a Brazilian volunteer who lived in Spain for approximately six years to test the instrument.

In total, direct contacts were made by *e-mail* with national and international universities and educational institutions, as well as by messages on social networks with approximately 1,000 people, between August 2014 and January 2016. In all direct contacts made, the "snowball" technique was used, i.e., each potential participant was asked to indicate others, who, in turn, would indicate others, and so on (Alves-Mazzoti and Gewandsznajder, 1999). After carrying out a previous reading, organizing and preparing the data, as well as reading them thoroughly several times, they were analyzed in detail with a process of coding (interpretation of the speeches), and subsequent organization of the material into categories, based on qualitative content analysis (Flick, 2004; Flick, 2009).

The research project was approved by the Research Ethics Committee of the Federal University of Espírito Santo – Goiabeiras Campus, under the CAAE (Certificate of Presentation of Ethical Appreciation) number 34551714.5.0000.5542 on 08/29/2014.

RESULTS

Participants in the four groups said that friends from their own country or from other countries are key to adapting to their new country, including making up for the lack of their culture. For all groups, these friends also mean a source of emotional support or support.

Participants from groups A, B and C commented on the importance of both friends from the country of origin and friends from the new country: those from the country of origin provide social support, security and welcome, ease homesickness and connect them with their culture; friends from the new country facilitate the adaptation and acceptance of the new culture, they ease loneliness and increase the feeling of acceptance. In fact, according to the literature (Costa, 2012; Garcia, 2012a; Garcia *et al*, 2016; Garcia & Goes, 2010; Garcia & Rangel, 2011) friends play an important role in adapting to the new country.

Regarding the question that dealt with the meaning of friendships for the perception of the country where they currently live, the participants in group A said that they are important, they are their family in Brazil, with whom one can spend time, superficial, that friendships have little or no meaning, among other specific characteristics.

For two participants in group B, friendships were important to enter the culture of the current country. This issue of greater adaptation and integration to the new culture was also brought up by participants from groups C and D, meaning that friends have an important role in this process of appropriation and immersion in the new culture. Also in the study by Garcia (2012a), friends were recognized as playing a relevant role in the vision of the new country. In the study by Garcia, Dettogni *et al* (2010), seven of the 20 interviewees did not perceive changes in the image they had of the country after friendship; for the others, the image improved.

Regarding the meaning of friendships in the life of the immigrant as someone who started to live in another country, participants from the four groups said that they are fundamental in several instances: in the adaptive process as a whole, for the issue of belonging to the country, to give emotional support and support, to give strength in the migration process and not to feel alone. For groups A and C, friends mean the family of the participants in the new country or at least make up for the longing for family and friends in Brazil (for group C).

A contradiction appeared among participants in groups A and D: for a Peruvian participant, physical distance hinders friendship, because even with virtual contact, nothing replaces physical contact with a friend; for a Brazilian participant in Portugal, physical distance brings people closer, because distance from family deconcentrates attention and contact with Brazilian friends becomes more of a connection with the country of origin. According to the literature (Garcia, 2012a; 2012b; Garcia, Brandão *et al*, 2010; Garcia, Dettogni *et al*, 2010), physical distance actually decreases the likelihood or makes it difficult to contact friends.

For the participants of the study by Garcia *et al* (2016), friendship is important not only in the context of migration, but in life in general. Friends help to get to know the destination country better and help immigrants adapt to a new country by providing information, companionship, help and even security.

For most participants in groups A (11 out of 20), C (nine out of 12) and D (four out of five), friends do not replace relationships with family members in their country of origin (in group D, for one participant they replace, for another it is relative and for another they do not replace). However, participants from the four groups who think that there is no such substitution, as they are different relationships, claimed that friends fill the void left by the family with love and affection, help to bear the absence of family members or to miss them less, as well as fulfill the role of the family in supporting, encouraging and making them happy. Still, for a participant in group C, the substitution exists, but only with Brazilian friends, indicating a greater approximation or intimacy with compatriots.

In any case, family and friends seem to be distinct categories, as the literature points out. For Bell (1981 apud Souza & Hutz, 2008), in friendship the absence of family ties is fundamental, justified by comparisons and competitions between family and friends and by the impossibility of choosing family members or relatives themselves.

The vast majority of the participants in the four groups felt some social need such as welcoming, adjusting or adapting to the new culture (17 out of 20 in group A; two out of three in group B; nine out of 12 in C; and four out of five in D). The term adaptation was the most mentioned by groups A and D and the term reception was the most mentioned by group C. Adaptation referred to aspects of the local culture, such as language (cited by groups A, B and D), customs, food, transportation and the place itself. Other terms used were: adjustment to the new culture, need for social acceptance, establishment of bonds and accommodation to the new culture. Regarding the adjustment to the new culture, a Panamanian participant (from group A) reported that she had to adjust her behavior, because the Brazilian culture is less liberal than the Panamanian one, "... leaving aside the thunderous laughter, the touching of people when he talked, the demonstrations of affection, the continuous dancing, the tough talking, etc." (A19). In this case, Brazilians seem to have less physical contact in their friendships than Panamanians.

Regarding how the participants dealt with these social needs of adaptation, welcoming, adjustment, acceptance, establishment of bonds and accommodation to the new culture, the form most cited by the four groups was through friendships, including Latin American friendships (in group A). This data shows again the importance of friends in the immigrant's adaptation process.

Knowing or being open to the new culture and people in the new country was pointed out by groups A, C and D as a way of coping with these initial social needs in the current country. Some aspects were also mentioned by groups A and C as a way of dealing with these new needs: family members, time, the support of natives and native family that they welcomed at home, information services for immigrants, daughters' schools and university classmates. The support of the church was mentioned by groups C and D, suggesting a religious rapprochement between Brazil, Spain and Portugal.

For the participants in the study by Garcia *et al* (2016), adaptation involves social relationships and social institutions. Regarding social relationships, the lack of loved ones left in the country of origin and the feeling of loneliness are difficulties encountered in the process of adapting to the new culture. With regard to Brazilian institutions, some participants in the study found it difficult to adapt to high levels of bureaucracy and disorganization. Bureaucracy was also pointed out as an unfavorable aspect in the opinion of Latin American immigrants about Brazil in this study.

Finally, in parallel with friends, the path most suggested by the participants of the four groups for a better adaptation and adjustment of the emigrant to new cultures was the approximation or openness to the new culture, with mention of new customs and cultural habits such as language, food, religion, history, music and arts. Another path that appeared as a suggestion in the four groups was not to compare the culture of the destination country with the culture of the country of origin, not to bring customs from the country of origin to the new one, not to impose these customs, not to demand that the culture of the current country change according to the culture of the country of origin, in short, to respect the new culture and accept the cultural differences between the two countries.

Regarding openness to the new culture, the study by Silva and Schiltz (2007) brings interesting data: that the majority of participants (62.9%) disagree that it is important for Brazilian immigrants to become similar to the Portuguese in the way they behave, dress and speak, and 88.8% agree that valuing the culture of origin is important for the integration of immigrants. However, 76.9% think that the children of immigrants should internalize the values of Portuguese society. So, according to the research of Silva and Schiltz (2007), elements of the culture of origin must be preserved, but cultural values and habits of the new context must also be incorporated for a better coexistence with it.

Another suggestion given by groups A, C and D was the approximation of natives and other foreigners, including notes to establish friendships with the natives (according to groups C and D). A possible path for a better adaptation and adjustment of the emigrant suggested by groups A, B and C was for the new country to provide guidance on migratory

procedures, or the bureaucratic and legal processes that the immigrant has to go through, preferably in the language of the immigrant, with important information about housing, transportation, communication, among others. In fact, as universities receive many immigrants, a participant in group A suggested that they offer "... monitoring people's needs and adaptation process." (A13). It was also suggested by groups A, C and D that maintaining ties with people from the country of origin helps in the processes of adaptation and adjustment to the new culture.

With regard to the immigrants in this research, despite referring to the preservation of elements of the culture of origin at times, most of the reports throughout the work show a tendency to superimpose the new culture on their culture of origin. This data also reflects, unfortunately, the existence of power relations and dominance of the majority culture over minority cultures, such as that of immigrants.

According to Berry (2005), "acculturation" is a process of cultural and psychological changes that involves various forms of mutual accommodation, the result of contact between two or more cultures and their members. Migration is a situation that requires these changes, both on an individual/psychological and a group/cultural level. While acculturation is a process that remains as long as there is contact between two different cultures, long-term adaptation to living in the new culture takes many forms, resulting in some accommodations within the new cultural group. This accommodation includes, for example, learning the new language, sharing gastronomic preferences, adopting ways of dressing and social interactions, characteristics of the new culture. Obviously, these adaptations can generate cultural conflicts and stress during intercultural interactions (Berry, 2005).

In a revised theory, Berry (2011) brings the concept of culturally plural societies, many of which are products of international phenomena such as colonization, slavery, and movements of immigrants and refugees. For this very reason, what usually happens is the imposition of the main or dominant culture on the cultures of ethnic minorities. However, the relationship between two cultures is not one-dimensional, but multidimensional, since intercultural relations are mutual and reciprocal. In this theory, an advance is perceived in relation to acculturation, the latter being permeated by power relations.

From the point of view of immigrant culture, when individuals do not wish to maintain their cultural identity and interact daily with the other culture (they are open to it), the defined strategy is assimilation. On the other hand, when individuals wish to maintain their culture of origin and avoid interaction with the new culture, the defined alternative is separation. When there is an interest in both maintaining the culture of origin and

interacting with the new culture, the option is integration. Finally, when there is little interest in maintaining the culture of origin (often for reasons of imposed cultural loss) and little interest in establishing relationships with the new culture (usually for reasons of exclusion or discrimination), marginalization is defined (Berry, 2011). In integration, the immigrant tends to have friends of his nationality and also native friends; in separation, the immigrant seems to prefer friendships from his own ethnic group (Berry, 2005).

For Berry (2005), integration is the best form of adaptation, and marginalization is the worst. Thus, assimilation and separation are intermediate adaptation strategies. Integration is assumed to be the best form of adaptation because, engaged in both cultures, individuals gain competence, support networks, and social support in both cultures during the changes of acculturation (Berry & Sabatier, 2011), including friends in the country of origin and in the country of destination.

However, unfortunately, the strategies of living in the new culture are not always freely chosen by the immigrant, but imposed by the dominant culture. For example, integration is only successfully achieved by minority groups when the dominant society is open and inclusive in its orientation towards cultural diversity. So, from the point of view of the dominant society, when assimilation is imposed by it, what happens to the immigrant is a fusion with the new culture; when the immigrant is forced to adopt the separation strategy, he suffers segregation; when the imposition happens in relation to integration, the process that occurs with the immigrant is multiculturalism; and when the dominant society imposes the process of marginalization, the immigrant suffers exclusion (Berry, 2011).

Both integration and multiculturalism are based on the acceptance of two underlying values: diversity and equity. If there is diversity without acceptance of equity, the result is separation/segregation; if there is equity without acceptance of diversity, the result is assimilation/fusion; If there is no acceptance of any value, the result is marginalization/exclusion. Only when there is a balance of the two values, between individuals and society in general, are integration and social multiculturalism achieved (Berry, 2011).

Thus, the term acculturation (Berry, 2005) was replaced by multiculturalism (Berry, 2011), emphasizing the value of cultural diversity in a context made up of several peoples, and the promotion of equal participation of all groups, majority and minority, in this context.

As with the term "acculturation", more recently, the concept of "multiculturalism" has also been replaced by that of "interculturality", which is "a set of proposals for democratic coexistence between different cultures, seeking integration between them without annulling their diversity" (Vasconcelos, 2017). In other words, interculturality implies a significant

interaction of cultures in contact, through dialogue and mutual knowledge. According to this perspective, each culture has its importance and together they are enriched, forming a common culture. Therefore, interculturality presupposes the recognition of the contributions of all, including immigrants and minorities (Bäckström & Castro-Pereira, 2012), and not the loss of the culture of origin and subordination to the culture of power, characteristics of acculturation.

The main difference between the concepts of multiculturalism and interculturality is that the former understands populations as culturally watertight (Bäckström & Castro-Pereira, 2012).

> "Each ethnic minority is seen as socially homogeneous and with well-defined borders, with ethnic diversity being overvalued and other factors such as social class, gender or religion ignored, which equally contribute to the construction of identities and introduce differences in values and lifestyles. Contrary to what multiculturalism defends, these factors combine in a complex way and are triggered by immigrants according to the context" (Bäckström & Castro-Pereira, 2012, p. 88).

In the case of this study, what is seen in practice is still a process of acculturation, in which the most adopted adaptation/accommodation strategies are 1) assimilation, when the participants defend the approximation/openness to the new culture and not the imposition of their culture on the new country, and partially 2) integration, when they reveal that they are proud of their origins, contact with their countries of origin, both compatriot and native friends and understanding that the two cultures must strive to get along well. However, integration is probably not allowed in its entirety by the majority groups in question and, consequently, multiculturalism (Berry, 2011) does not happen in practice. It seems, broadly speaking, that there is still no full respect for diversity or equity among the peoples treated here, which results in a process of marginalization/exclusion of immigrants, even if veiled. In other words, interculturality, which advocates respect for ethnic, religious, economic-social, relational, sexual diversity, among others, encompassing two or more cultures, is still far from being successfully achieved in the migratory process as a whole.

CONCLUSIONS

Two decades ago, Hinde (1997) already saw a reciprocal interaction between the individual and the culture in which he is inserted. According to his theory, the individual is built and formed by his interactions, relationships and groups to which he belongs (family, friendly, loving, professional, religious, social in general), in addition to being affected by the social structure and cultural environment in which he is inserted. Mutually, this individual also affects and influences their interactions, relationships, groups, and the sociocultural

structure that surrounds them. However, the author probably did not idealize that one culture would be predominant over the other when both were in contact. In view of this, the immigrant would have greater difficulty in influencing the dominant culture in which he is inserted.

When the immigrant leaves his cultural environment and inserts himself in another, with its idiosyncrasies, he is forced to develop a new behavioral repertoire of coping in order to adapt and live well. Undoubtedly, this is a very arduous process, as this immigrant has spent years of his life immersed in his culture, being molded by it and by the relationships established in his environment (and dialectically shaping them). In a short time, he needs to be open and incorporate into his behavioral pattern rules, values and cultural norms that he was unaware of or that were not familiar to him.

Hinde (1997) addresses this complexity of specific behaviors, interactions and relationships characteristic of each cultural and social context. However, the complexity becomes greater in an unknown cultural context, increasing even more when the majority society imposes its culture on minority groups.

According to the participants of this research, it is functional and healthy to incorporate elements of the new culture into their repertoire, that is, adaptation is really necessary, but with reciprocity. However, what is evidently clear is that the counterpart does not happen. In other words, it is only the immigrant who must open up and adapt to the predominant culture, because this culture, and consequently its natives, are not very open and willing to incorporate elements of the minority cultures with which they live. Perhaps the participants are not aware of this unequal relationship, and even if some are, they cannot express such a divergent opinion of what happens in practice. They would probably be segregated or excluded from the context.

So, what remains for immigrants to have a life with quality, mental health and peace is to use the available strategies: friends and openness to the local culture. When participants set out to be open to or approach the new culture as immigrants, they are being humble, as well as trailblazing and courageous. When they use their friends to favor themselves in this process of cultural insertion, they are being insightful.

Finally, this study pointed out that friends can mediate the process of insertion into the new culture in a more efficient and even pleasurable way, as they present cultural information in a more practical and accessible way to the newly arrived immigrant. The migration process is characterized by facing several new situations and, mainly, without the migrant having the social support he had in his country of origin. Therefore, friends emerge as a strong and functional coping strategy in the face of this new phase of life. This

information can support public, governmental, academic policies, among others, in the process of welcoming immigrants in the various countries, not only in the ones studied. Meetings aimed at immigrants could be promoted, in an attempt to stimulate friendly relations with natives, compatriots and other foreigners. In other words, friendship relationships could be a path to plural societies endowed with greater interculturality, with all the properties inherent to it: equity, respect for diversity, tolerance, empathy and solidarity.

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JUDICIAL ACTIVISM: A LIVING IMAGE OF LAW REFLECTED IN THE SOCIAL MIRROR

https://doi.org/10.56238/sevened2024.031-043

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ABSTRACT

The article analyzes the instrumentalization of the law for the purpose of promoting social emancipation. It hypothesizes whether the protagonism attributed to the Judiciary in the Democratic State of Law at the turn of the last century to the twenty-first century materializes the promises of modernity based on the theory of the social contract and driven by the Enlightenment ideology to make effective the freedom and social rights of the Constitution. To this end, first, legal positivism is presented, in search of the recognition of the subjects and equal participation; second, the historical bases of the constitutions are established, to confirm the metamorphosis of the law and the model of jurisdictional control by the main and incidental routes; to, third, show judicial activism, mapping the decisions of the Supreme Court. It concludes on the importance of the Judiciary in the realization of positive and negative rights. The article was guided by the hypothetical-deductive method and was based on books, scientific articles, legislation and jurisprudence.

Keywords: Legal Positivism. Emancipatory Promise. Time of Law. Constitutional Jurisdiction. Spectrum of Society.

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INTRODUCTION

This article summarizes the successive solutions adopted in the face of the transformations of law, the State and society.

In methodology, it is intended to refute or confirm the hypothesis of instrumentalization of the law as a promise for social emancipation, focusing on the rise and protagonism of the Judiciary in the model of the Democratic State of Law of the current Constitution of 1988.

The article is based on bibliographic research (legal works, scientific articles, legislation and jurisprudence), with a qualitative approach to judicial activism, in search of an answer to the problem and proof of the hypotheses raised.

For the development of the theme, the article was structured in four phases: The first phase is the inquiry phase. The second phase is the panoramic phase. The third phase is the "zoom" or approximation phase and the fourth phase is the final or reflective considerations phase.

The inquiry phase brings the motivations of the study and follows the path to follow during the development of the work. Thus, from the outset, the question arises: what is meant by emancipatory promise in the social contract and what is the role of the Judiciary in the Democratic State of Law due to the model of constitutional jurisdiction and the transformations of law, society and the State into judicial activism?

In the panoramic phase, to answer the question of the previous phase, theoretical and practical development will be carried out, with historical, political, social and legal notes. As a premise, it wants to present the social contract as a promise of the right to connect with the future, preserving the social conquests of perpetual peoples untouched, and it wants to demonstrate the successive transformations of the State, in self-regeneration, like a phoenix, to transform the law into a kind of social mirror capable of reflecting the image of society and, at the same time, to give it a life of its own to recognize the subjects and redistribute income.

Still in the panoramic phase, in counterpoint, from the classical theory of the separation of functions from the organs of the State, in the face of the political upheavals according to the Brazilian constitutions, it is intended to highlight the rise of the Judiciary power throughout the transformations of the liberal State to the Social State and from the Social State to the Moral State of Law of the 1988 Constitution and to present the model of control of constitutionality by the means of defense or incidental and by the concentrated way, identifying the procedural instruments of access to the Judiciary to guarantee all

constitutional rights violated, not recognized or not distributed by the other powers as a way of concretizing the promise of connecting the future.

In the third "zoom" phase, with a focus on the Judiciary, the image of judicial activism will be expanded, with the intention of presenting the Anglo-Saxon origin, the species (methodological judicial activism, procedural judicial activism, structural judicial activism, judicial activism by law and, finally, antidialogical judicial activism), the causes (technological advancement, transformations of society, dysfunctionality of the other powers and inaccuracies of the law) and the concept, as well as the divergence of understanding on the matter. In detail, in a kind of jurimetrics, we want to map some judgments in the Federal Supreme Court, involving the allocation of public resources, prohibition of nepotism, stem cell research, civil union between homosexuals, interruption of pregnancy of an anencephalic fetus, federal intervention, "ADPF of the favelas", racism, presumption of innocence and homeschooling.

In the phase of reflective considerations will be the conclusions of the work. The result is the confirmation of the leading role attributed to the Judiciary in the Democratic Rule of Law of the 1988 Constitution. Thus, when provoked by society and institutions, in the ideal of participatory democracy, the Judiciary is moved to the center of political decisions and must decide in search of the realization of fundamental constitutional rights, through creative interpretation and social transformation through law. The political aspect of the decisions was not analyzed, although the hypothesis of interference in the face of the model is not excluded.

EMANCIPATORY PROMISES

In premise, the entire legal order (constitution, laws, codes) is thought of as a promise, in the sense of a norm. Through the promise, the future becomes "*less unpredictable"* (OST, 2005, p. 61).

The social contract is a mutual promise. The people entrust to the government the task of establishing general and permanent laws, with a view to the public good, with the commitment of the rulers not to exceed or deviate from the terms of the contract (constitution), guaranteeing equality and freedom. They are considered reciprocal obligations.

The liberal State, centered on the social contract of the great revolutions – English (1689), American (1776) and French (1789) – promises free competition and non-intervention in social relations, with individualism at the center of the conflicts in the "status libertatis" (CORDEIRO, 2001, p 75-76).

At that time, freedom was associated with the idea of property, approaching John Locke's conception. Over time, however, freedom began to be associated with equality, approaching the conception of Jean-Jacques Rousseau (ANTERO, 1979, p. 83-84). New fundamental rights are conceived and other social rights become part of the idea of citizenship and democracy.

In the twentieth century, social movements and trade unions contested the liberal state, causing self-regeneration. The "Welfare State" emerges and, in it, the State begins to intervene in social relations, with the obligation to do and intervene, and is therefore called the Social State. However, the nomenclature does not reach the promises of social emancipation, requiring a new configuration.

The Democratic State is then perfected. It is the time of the "status civitatis". The State assumes the political promise, with the standardization of individual rights, social rights and collective rights in the Constitution. We are faced with a society marked by plurality. The right to demand information of collective interest and the right to democratic participation in decisions of interest to the community are guaranteed (FIGUEIREDO. 1989, p. 20-22).

For the promise to be emancipatory, it is necessary to recognize the individuals and social groups excluded by society and that there is the redistribution of income as part of the concept of citizenship (GALVÃO, 2015, p. 7-24). As a result of human construction, it is intended that the law imposes a progressive agenda to overcome economic determinism and to guarantee equality.

The rational-scientific approach to law occurs with the legal positivism of the twentieth century. Law is established by state norms, which have authority by virtue of their recognition by a higher legal rule. This matrix rule is recognized as a function of a convention. A "legal" norm detached from morality, but anchored in legal criteria of validity stipulated by the hypothetical fundamental norm (KELSEN, 2011, p. 221), which will serve as a ballast for the construction of the State and law.

The Constitution is the superior norm that establishes the constitutive rules of the State and of the law. It is the *"body"* of the State (TEMER, 1989, p. 17-20), marked by the complexity of changing its precepts and by the means of constitutional control. In a political sense, the content of the Constitution concerns the way of being of the State, the organs of power and government, and individual and collective rights. In a sociological sense, the constitution can represent effective social power or distance itself from it. In a legal sense, the rational will of man.

That traditional society, whose legal recognition depended on social status, is now, in modern society, replaced by the promise of equal treatment, with the law appearing with the function of defining a system of recognition and affirming fundamental rights and guarantees - negative rights (individual freedoms) and positive rights (political, economic and socio-environmental rights).

Law becomes dynamic through the rule of modification, allowing the alteration of the primary rules (rights and obligations) by official agents, as opposed to the static character of rules based on morality. From this perspective, morality is no longer conceived as an absolute truth and law has the power to regenerate values, prevent setbacks and promote social transformations.

It is as if the law were the "social mirror" (SANTOS, 2012). It reproduces the dominant images and, sometimes, the reflected image takes on a life of its own. Thus, it is said that law can reflect the changing morality of society; it can become a statue, reflecting conservative values that do not represent social reality; and, finally, it can reflect a more virtuous image to society, promoting social emancipation. This third image of law is the objective of progressive legal theory.

If, on the one hand, there are those who argue that the law can serve to foster transformation through social emancipation, on the other hand, there are adverse positions (DIMOULIS, 2017, p. 1-4), criticizing that the law is submissive to the interests of the dominant classes; that the role of the law is diverse, but it is not emancipatory; and that the law is a mere repository and that, Even if there is a change, this change happens only to privilege the "status quo". In any case**,** the law establishes rules that rule out other reasons for acting, even if they are contrary to moral convictions.

According to the theory, recognition must happen in three distinct spheres. In the sphere of love, in the sphere of law and in the sphere of the community of values. When this does not occur, however, in a paradoxical way, disrespect generates a feeling of injustice and works as a guiding idea for the struggle for recognition. With the advantage that, every time recognition is won for social reasons, it is incorporated into the company's assets, with the principle of prohibition of retrogression. Thus, it serves as a model for the emergence of new social struggles and for the evaluation of the moral development of a society.

The law can anticipate the demands for recognition, giving means for it to impact the social relations and culture of a society. Likewise, the law has the potential to redistribute income in the face of economic inequalities. It is not only a question of economic interest,

but, above all, of the principles of freedom and equality, by allowing individuals to participate in equal conditions in social life and to have access to the existential minimum.

All members of society are considered partners. If there is no recognition, or even if there is a poor distribution of income, we will be faced with institutionalized social subordination. Lack of recognition means denying the individual's participation. The poor distribution of income consists of preventing equal participation.

Thus, the law is the appropriate means for the remodeling of social subordination, with policies that enable the visibility of the subject as a member of society; and has the capacity for institutional restructuring capable of redistributing income for participation.

On the one hand, a society lacking in the realization of rights and, on the other hand, a Constitution that guarantees rights to all. This is the counterpoint. What is the role of the Judiciary?

THE RISE OF THE JUDICIARY

The Constitution is the presupposed and necessary paradigm for the investigation, bringing the theory of the distribution of functions to the organs of the State.

According to theory, the Legislature has the function of creating positive law. The Executive exercises the functions of head of state and government, implementing the general rules by its actions. The Judiciary reserves itself to the technical functions of applying the law in the resolution of conflicts.

In the liberal State, for a long time, it was understood that the Legislative power overrode the other powers, as it represented the general will (NEVES, 2001, p. 122). Once the law was created, it was up to the Executive to apply it and the Judiciary to assess the controversies arising from it, however, without interpreting the content of the law. He was a mere reproducer of the "will" already fixed.

The Political Constitution of the Empire of Brazil (1824) adopted the Judicial Power (Title VI), declaring it independent and composed of judges and jurors. However, the control of constitutionality was exercised in the Legislature, by the General Assembly, and it was responsible for making laws, interpreting them, suspending and repealing them and watching over the safeguarding of the Constitution, and not by the Judiciary. There was also the Moderating power, with the sanction of the Emperor, which concentrated several prerogatives and, therefore, was considered the key to political organization (article 13, VIII and IX).

The Constitution of the Republic of the United States of Brazil (1891), in its article 60, paragraph 1, paragraphs "a" and "b", instituted the federative regime, implemented the

federal and state courts and, influenced by the universal jurisdiction ("judicial review"), of North American law ("common law"), implemented the control of constitutionality by way of defense or exception (or incidental). Alongside the Legislative and the Executive, the Judiciary became a sovereign power of the Republic, however, at a time when Justice was not accessible to all, the vote was not universal and women did not vote, being still a mere reproducer of the will of the laws in the solution of disputes, as a rule, criminal and private rights.

The Constitution of the Republic of the United States of Brazil (1934) maintained the duality of Justice, expanded the forms for the control of constitutionality and instituted the Military Justice and the Electoral Justice, in the Judiciary, and inserted the Labor Court. There was an innovation in the representation of federal intervention, however, the Judiciary was prohibited from hearing political issues (Article 68).

The Constitution of the United States of Brazil (1937), of an authoritarian nature, extinguished the Federal Justice and the Electoral Justice, with strong political interference by the Executive in the other branches. During its validity, the prohibition of the Judiciary to hear political issues was maintained and the Moderating power was resurrected, with the supreme authority to the President (Article 73). The Supreme Court is weakened by reserved and limited functions (Article 96).

In the period of the Social State, the center of decision-making was extended to the Executive branch and, instead of correcting socioeconomic inequalities, it tended to *"hypertrophy"* (MACIEL, 2000, p. 67), legislating through provisional measures and prioritizing the opening of the market. In real life, the social promises of the formal plan do not materialize, requiring a new reconfiguration of the model.

After World War II, there was redemocratization. The Constitution of the United States of Brazil (1946) rescued the innovations and sensitive constitutional principles and instituted the possibility of federal intervention in the State to expunge the norm from the legal system, the suspension of the execution of unconstitutional laws after a decision of the Federal Supreme Court and the option of extraordinary appeal of the causes. The Judiciary was structured, adding the Labor Courts to its staff.

The Constitution of the Federative Republic of Brazil (1967) maintained the previous judicial organization. Institutional Act No. 5, of 12-13-1968, however, caused major changes in the Judiciary, emptying its power. The constitutional guarantees of the magistrates were suspended and the President of the Republic, by decree, had the power to dismiss, remove and retire the magistrates. In addition, the acts performed under the cloak of the institutional

act were excluded from the appreciation of the Judiciary, as well as the granting of "habeas corpus" (SIFUENTES, 2000, p. 97-99), differing from the current reality.

With the promulgation of the Constitution of the Federative Republic of Brazil, on October 5, 1988, like a phoenix, the Democratic Rule of Law was reborn. Now, the new Promethean Charter is called the "Citizen Constitution" and brings social rights and citizenship, structuring the Judiciary, in Title IV - "Organization of Powers" (TEIXEIRA, 1998, p. 82-83). Constitutional theory rescues the promise of modernity (equality, social justice and guarantee of fundamental human rights) and repositions the Judiciary in the classic relationship between the powers of the State, electing it as the protagonist of the democratic process and claiming its most effective presence in the solution of social and collective conflicts.

Although everyone recognizes the Judiciary in its strategic role, however, there are two groups with different arguments about the role of judges and courts. In the first group, called proceduralism, the Judiciary should be limited to the task of protecting the process of democratic creation of Law, guaranteeing the formal aspect. In the second group, called substantialism, the Constitution establishes the conditions of action as an explanation of the promises of the social contract (STRECK, 2014, p. 55-57). On the real-life level, finally, based on empirical data, the research group Judiciary and Democracy ("Jude") states that the judicialization of politics is the result of the model of the 1988 Constitutional Law (ARANTES, 2023, p. 1-3).

It is a fact that the constitutional model causes the Judiciary to be provoked to decide on issues relevant to society and that, as a political power, it recognizes the right to set obligations and to say those that do not exist. Constitutional jurisdiction derives from the application of the Constitution by judges and courts, in the exercise of control of the constitutionality of laws or public acts and in the interpretation of the infra-constitutional order in accordance with the Constitution in the various ways of access to the Judiciary (BARROSO, 2015, p. 383). In fact, in order to facilitate citizens' access to justice (SANTOS, 1999, p 189), in addition to the paradigm shift, procedural instruments emerge for the defense of diffuse, collective and homogeneous individual interests that are unavailable (ZAVASCKI, 2006, p. 88), for the verification of the unconstitutionality or illegality of the act of an agent of the Public Power (TUCCI, 1990, p. 38) and for the guarantee of the decisions of the Federal Supreme Court and for the preservation of its competence (OLIVEIRA, 2015, p. 6-7).

Among the procedural instruments, we can mention the popular action, the public civil action, the collective writ of mandamus, the "habeas data", the writ of injunction, the

direct actions (ADI, ADO, ADPF, ADC and IF) and, more recently, the constitutional complaint.

All are procedural instruments that value the functions of the Judiciary within the Democratic Rule of Law of the 1988 Constitution, with the attribution of powers of intervention to the judge and with the possibility of setting fines distinct from indemnities, even if ex officio, for the implementation of public policies.

The substantive due process of law and the universality of jurisdiction, enshrined in article 5, XXXV and LIV, of the 1988 Constitution, guarantee the interpretation within isonomy and legality and the application of constitutional principles, building an awareness of citizenship in the Democratic State of Law, to avoid the existence of illegal acts and arbitrary laws (RULLI, 2001, p. 132-137).

Constitutional jurisdiction, therefore, can be by incidental or exceptional means and by main or concentrated means (BARROSO, 1998, p. 103). In that incidental way, all judges and courts, as organs of the Judiciary, may fail to apply a rule that they deem unconstitutional. In this main route, control is exercised in a concentrated manner in the Federal Supreme Court, with binding decisions, "erga omnes", reaching cases different from the one in which the precedent was issued.

In this context, it can be said that the legitimacy of the Judiciary derives from the normative force of the Constitution and the laws. Thus, when provoked by society and institutions, it is incumbent upon it to resist the onslaughts of the other Executive and Legislative branches that render fundamental human rights ineffective and that represent a social setback (STRECK, 2014, p. 43-73), in the face of the principle of prohibition of retrogression, as a way of preserving the social achievements of past peoples, in an evident evolution towards the model of State and activist democracy.

JUDICIAL ACTIVISM ON "ZOOM"

In a humorous expression, activism is what the judge does and you don't agree with (SUANNES, 2002, p.107).

Judicial activism has to do with the role of judges and courts in the interpretation of the Constitution and in their relationship with the other political bodies of the State.

In the Democratic State, the independent judge is a fundamental condition (MACIEL, 2000, p. 67). It is understood that the independence of the court is a *sine quo non condition.*

The modern constitutional thesis requires that judges and courts – and legal operators, together with social actors – be creators of law and free interpreters of the law

(GAULIA, 2001, p. 142-145), aiming at the concretion and effectiveness of legal commands, justice and social peace.

If, before, the Judiciary was not accessible to laypeople and was alien to political issues, now, in the Democratic State of Law, it frees itself from the *"Abdullah syndrome"* (STRECK, 2014, p. 237) and is elevated to the center of political decisions, starting to interact with the community (PACHÁ, 2001, p. 236).

At the origin of judicial activism, when studying the decisions of the justices of the Supreme Court of North America, the following were identified: activist judges in the defense of the rights of minorities and the poorest; activist judges in the protection of freedom; self-restrictive judges; and judges of the balance of political force (CAMPOS, 2016, p. 60-62).

It can be seen, therefore, that judicial activism is opposed to judicial self-restraint. Through judicial activism, the will of the Judiciary prevails over the will of other political entities, given the need to act in defense of constitutional freedoms. By judicial self-restraint, however, there is no invasion in politics and preference is given to the Legislative power.

There are those who argue that there is no permission for judicial activism, even in the Democratic State of Law, and that the Judiciary should limit itself to ensuring citizenship and the means for resolving conflicts. When the Judiciary legislates or interferes in public policies, the invasion transforms it into an authoritarian instance and undermines representative democracy by usurping the other powers (DIAS, 2020, p. 177).

It should be noted that the law is not perfect and finished, needing adaptations according to reality. Thus, in order for the promise to connect with the future, the legislator establishes the principles, such as general clauses, brings blank references and indeterminate concepts. In many situations there is not even a conflict between the laws, but only a void to be filled by integration techniques (analogy, equity and principles). These are hypotheses considered as hard cases, which sometimes bring judges closer to a legislative function to settle the conflict (GAULIA, 2001, p. 144.).

If, for some, judicial activism is inappropriate, for others, at the other end, it serves to give completeness to the Democratic Rule of Law. The advancement of technologies and the emergence of new legal relations in society cause the Judiciary to be provoked to express itself on the facts that are placed in paradoxes (BEGALLI, 2001, p. 153). Judges and courts have a responsibility to give effect to constitutional freedoms and limitations of powers. In the political upheaval, one sees *"in justice the last refuge of a disenchanted democratic ideal" (*GARAPON, 1999, p. 26).

In addition, the discredit in relation to representative democracy highlights the urgency of the independence and strength of the Judiciary. Even if free elections, universal suffrage, multi-party politics, etc., are maintained, even so, it ends up raising doubts of legitimacy, given that the representatives of the people, after being elected, act motivated by *"petty interests",* often manipulated by *"economic power"* (FRIEDE, 2002, p.129) and by the *"media"* (GARAPON, 1999, p. 26).

In view of the possibility of control and invalidation of the acts of State organs, it can be said that the Judiciary has a counter-majoritarian function. In addition, in certain social demands, in the face of the risks of tyranny of the majority, distortions of the democratic process or oppression, the Judiciary has a representative function; and, finally, for freeing man from the crisis of representativeness and for functioning as a transforming agent, the Judiciary has the Enlightenment function (**HARTMANN,** 2023. p. 10-11). Judicial control of laws and public administration by the Judiciary favors participatory democracy and representative democracy. For example, "*minority parties, which are not in coalition with the Executive, can use the judicial process against the instances of power, that is, against the arbitrariness of the ruler on duty"* (SANTOS, 2002, p.146-147.)*element.*

If the interpretation is creative, expanding or limiting the meanings of the law, it is methodological judicial activism. If there is an expansion of decision-making power, through procedural instruments (e.g., complaint), this is procedural judicial activism. If the judicial decision interferes with the decisions of the other powers, such as the duty to legislate, the duty to carry out public policies and the duty to allocate public resources, etc., this is structural judicial activism. If there is progress in relation to indeterminate fundamental rights, we are faced with judicial activism by right. Finally, in the absence of deference to the other powers, by understanding that the Judiciary is the exclusive interpreter, this is antidialogical judicial activism (**HARTMANN,** 2023. p. 2-5).

This dimension of judicial activism (methodological, procedural, structural, and by law) becomes more evident when the judgments of the Federal Supreme Court are analyzed.

In Direct Action of Unconstitutionality No. 2925, on 12-19-2004, after deeming the concentrated control adequate, the Federal Supreme Court judged unconstitutional the interpretation of the budget law that implies the opening of supplementary credit in an item unrelated to the destination of the revenue.

Another case of judicial activism was the prohibition of nepotism in the Judiciary, with the judgment of the Declaratory Action of Constitutionality (ADC) 12, on February 16, 2006,

by the Federal Supreme Court. Subsequently, this understanding was extended to the other branches, with the issuance of Precedent No. 13.

In Direct Action of Unconstitutionality (ADI) No. 3510, on May 2, 2008, the Federal Supreme Court understood that the provision of the biosafety law for the use of embryonic stem cells in scientific research for therapeutic purposes is constitutional, based on constitutional norms that conform to the fundamental right, dismissing the action.

The recognition of civil unions between homosexuals is also another example of judicial activism. On 5-5-2011, the Federal Supreme Court judged the allegation of non-compliance with a precept (ADPF) No. 132 and the Direct Action of Unconstitutionality (ADI) No. 4277, declaring, in a methodological dimension, the constitutionality of civil unions between people of the same gender.

In the judgment of the Allegation of Non-Compliance with a Fundamental Precept (ADPF) n. 54, on April 12, 2012, the Federal Supreme Court declared unconstitutional the interpretation of the interruption of pregnancy of an anencephalic fetus as a crime, debating issues of sexual and reproductive freedoms, health, dignity, self-determination, in short, fundamental rights.

Federal intervention representation (IF) No. 5179 was filed, under the pretext of compromising the Executive and Legislative branches, in the face of the large corruption scheme in the Federal District, but, on June 30, 2010, the Federal Supreme Court dismissed the federal intervention, because, being an extreme and exceptional measure, at the time of the judgment, order had already been restored.

In ADPF No. 635, due to the public security plan implemented in Rio de Janeiro, civil society organizations presented recommendations, through direct action, to the Federal Supreme Court. Several precautionary measures were granted (such as prohibition of the use of armored helicopters as a shooting platform in police operations; prohibition of operations in school perimeters and hospitals; mandatory preservation of the crime scene; expeditious investigations; suspension of the effectiveness of the article that excludes homicides resulting from police intervention, etc.).

On 6-13-2019, the Federal Supreme Court judged the direct action of unconstitutionality by omission (ADO) 26-DF. In decision, homophobic and transphobic conducts, as they translate expressions of racism, by identity of reason and through typical adequacy, fit the primary precepts of incrimination in Law No. 7,716/1,989 and the qualifier in the hypothesis of intentional homicide.

There are situations in which the Federal Supreme Court protects the Powers, in the face of the verification of the progressive and effective march for the achievement of the

constitutional program. This is the case of the direct action of unconstitutionality by omission (ADO) n. 2, which sought to expand the staff of the Federal Public Defender's Office. Not all policies are ready and finished, on the contrary, many of them are complex and involve spending. In a decision, pointing out the competitions held and the forecast for the creation of new positions in a budget bill, the action was dismissed.

The case of the execution of the sentence based on conviction in the second instance changed the course of history. The 1988 Constitution inscribed the principle of the presumption of innocence, by which the definitive imprisonment of the defendant should take place after the final and unappealable judgment. However, in 2016, the Federal Supreme Court authorized the defendant's imprisonment from the conviction in the second instance. In view of this, direct actions of constitutionality (ADC) 43, 44 and 54 were filed in the Federal Supreme Court and, in the judgments, the actions were judged to be well founded, with the declaration of the constitutionality of the provision of the criminal procedural legislation, which regulates exactly the presumption of innocence by conditioning definitive imprisonment to res judicata.

In addition to these examples of direct actions, through concentrated control, there are also several precedents, from the Federal Supreme Court, of judicial activism in diffuse or incicental control. An interesting case is the extraordinary appeal (RE) 888815/RS, judged on 9-12-2018, in which the Federal Supreme Court judged unconstitutional any of the types of radical "unschooling", moderate "unschooling" and pure "homeschooling". According to Theme 822, homeschooling is not a subjective public right of the student or his family. However, nothing prevents regulation by federal law, in the "utilitarian" or "for circumstantial convenience" modality, as long as the obligation and the joint and several duty are complied with.

FINAL CONSIDERATIONS

In final reflections, on the promise of the social contract of connection with the future, it is concluded that the law can and should serve as an instrument for social emancipation.

It was found that, since the emergence of the modern State, the law has been transformed according to the social reality of each era, replacing one form with another, without breaking the thread that connects them.

To register the emergence and revocation of norms, the law presupposes being reborn reinvigorated, with each new edition, with the purpose of becoming effective. Over time, however, according to the needs of today's people, metamorphosis is inevitable in the face of new technologies, the influence of the media and the essence of democracy.

This phenomenon can be verified in the history of Brazil. Over the years, constitutions serve to prove the transformations of the State. It can be seen that most constitutions disguised an authoritarian and exclusionary regime (1824, 1891, 1937, 1967 and 1969), reflecting an image of the dominant ideology, and that there are few constitutions that are really considered democratic (1934, 1946 and 1988).

The Democratic Rule of Law of the 1988 Constitution is the practical result of successive solutions experienced by perpetual peoples until the current people. Moving from the model of "status libertatis" to the model of "status civitatis", we witness the promise of the realization and realization of individual and collective rights, making democratic recognition and participation in public life viable.

What stands out in the Citizen Constitution is the protagonism reserved for the Judiciary, elevated to the role of guardian of the Constitution. With the expansion of the procedural means of access and the encouragement of democratic participation, whether by concentrated control or by diffuse control, the Judiciary began to interfere in important political decisions of public life, for the recognition of subjects of rights and for the distribution of income, with the concretion of Promethean ethical and legal values.

Judicial activism is driven by a progressive jurisprudence. In the social mirror, it reflects an image with a life of its own, capable of making constitutional and legal precepts prevail to correct inequalities in issues as diverse as they are sensitive to society, but which need to be defined. Social rights are not conditioned by the will of the administrator and the principle of separation of powers cannot serve as an obstacle to the realization of social rights.

This was proven when analyzing some judgments of the Federal Supreme Court. Faced with the dysfunction of the other organs of the State, the Judiciary was provoked by society and institutions to express itself on important issues (embryonic research, same-sex marriage, public security, budget allocation, equalization of racism, the fight against nepotism, etc.), participating in the process of transforming the law, the State and society.

In a democratic society, all legitimate interests must have legal protection, especially those that have always been on the margins of legal guarantees (minorities). Thus, as a judicial body, society expects to find in the judge the jurist, the conciliator, the peacemaker of social relations and, in particular, the protagonist of public policy. Although it is joked that judicial activism is for those who do not agree with the judge's decision, in practice, however, it is presented as something desirable and, as long as it is not considered antidialogical, judicial activism must handle the law to overcome economic determinism and to produce a structural impact on society with the realization of the promises of social rights.

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CONTEMPORARY DEBATES ON CURRICULAR ADAPTATIONS: DIVERGENT OPINIONS AMONG TEACHERS

https://doi.org/10.56238/sevened2024.031-044

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ABSTRACT

Throughout the history of education, we have witnessed different theoretical positions on curricular adaptations. When referring to curricular adaptation for people with disabilities, the debate becomes more pronounced, as there is no consensus among teachers whether or not the curriculum should be adapted. The problem that guided the reflection was: why is there still resistance from teachers to make adaptations in school curricula? The objectives of this investigative process were: to understand, in the light of the theoretical references, the reasons why the teachers of the common school almost do not make the curricular adaptations; to analyze whether it is due to the lack of initial and permanent training that teachers find it difficult to make adaptations in the curriculum; identify the main pedagogical barriers that prevent curricular adaptations in schools at all levels. The option was for qualitative research, supported by bibliographic research and documents that support the theme of curricular adaptations. References put us in front of a question: the dilemma is - to adapt or not the curriculum, considering that in the *space-time* of the school students with Specific Educational Needs are occupying common schools at all levels. Results found in the literature have shown us that there is no consensus among teachers as to whether or not the curriculum should be adapted. Considerations, of course, not conclusive, led us to reflect on the vehement need to invest in the permanent training of teachers, with regard to curricular adaptations in schools.

Keywords: Curricular adaptation. Teacher training. Students with disabilities.

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INTRODUCTION

The unveiling of the new century is born, bringing to education the possibility of building in school at all levels, an education model that is capable of including in the same *space-times* all people, regardless of whether they are or are in a situation of disability.

The process of inclusion of people with disabilities, global developmental disorders, high abilities/giftedness has been configured as an education proposal that is capable of including blacks, indigenous people, quilombolas, street minors, and the dispossessed present in various social contexts in schools.

In the light of the literature that emphasizes this issue, we refer to some international movements that bubbled up, such as the World Declaration of Education for All, Jomtien, (Unesco, 1990); the Declaration of Salamanca, Spain (UNESCO, 1994); the Law of Guidelines and Bases of National Education – LDBEN 9394/96 (Brasil, 1996) and the National Policy on Special Education in the Perspective of Inclusive Education (Brasil, 2008), among others, contributed to the construction of new paradigms that, in Freire's (1992) perspective, need to be liberating, humane and humanizing.

The limits of inclusion in regular schools arise to the extent that our plans are homogeneous, the contents are rigid and the curriculum is inflexible, as if our students learned in the same way, in the same way, in short, at the same time. According to Glat (2004), the greatest challenge of the school today is to teach students with disabilities in a space whose contents, curriculum and teachers' planning are not and are not adapted to the different specific educational needs. Glat is incisive in stating that the inclusion we aim for tries to maintain itself in a deficient school, without structure, bankrupt and what is worse, teachers are not prepared to act with differences.

If one of the principles of inclusion is that students with disabilities can learn together regardless of the difficulties and differences in the classroom, then a question arises: is it possible to learn together, in the same way, at the same time, in the same way, if the curricula, content and teaching are not adapted? This question makes us reflect on another problem: the teacher has difficulties to adapt the curriculum, the contents and their planning, claiming that they have not been, are not and are not prepared to work in the classroom, when the enrollment of students with disabilities, global developmental disorders, high abilities/giftedness is registered in it.

When making use of the theoretical references that discuss curricular adaptations in schools at all levels, it is necessary to emphasize that according to educational legislation (Brasil, 1998) curricular adaptations are pedagogical measures that must be adopted in various areas, such as: in the pedagogical project of the school, in the classroom, in

activities in general and, only when absolutely necessary, should they apply to the individual student. We mean that when referring to the target audience of special education, these adaptations in the curricula are essential, because students with specific educational needs, as well as others, learn at different paces and times.

It is not our intention to conceptualize in this article what curriculum means. However, we need to point out that it, the curriculum, is a social construction, in which teachers, mediators of knowledge, organize themselves to make it more accessible to the dissemination of scientific knowledge. Sacristán (2000, p. 14) shares this premise, when he points out that "the curriculum is not a concept, but a cultural construction. That is, it is not an abstract concept that has some kind of existence outside and prior to human experience, it is rather a way of organizing a series of educational practices". What we want to warn is that at school, at all levels, the teacher needs to be clear that his students with and without disabilities do not learn in the same way, in the same way, at the same time, that is, our students are different, have different expectations and abilities.

In a liberating, humane and humanizing education, we would say that from the perspective of inclusion, there are many objectives of curricular adaptations. In this sense, we believe that the primary objective of the adaptations is to guarantee for all students access to and development of the curriculum, the contents taught in schools and the scientific concepts, necessary for all students with and without disabilities.

When referring to curricular adaptations in special education, we sometimes come across a great crossroads: what to do to build an adequate curriculum that is capable of housing in schools three groups of students with various disabilities such as: hearing, visual, physical and multiple; students with pervasive developmental disorders (autism and psychosis) and finally, students with high abilities/giftedness (Brazil, 2010).

The present work is the result of our concerns about the discourses for or against the promotion of curricular adaptations in schools. In this sense, we delve into references that discuss in the educational system whether it is possible to make adaptations in the curriculum in a school flanked by different social subjects.

Scholars of educational policies point out that the implementation in schools of a curriculum capable of meeting the diversity that exists in the education system today, generates a real problem, because the school filled with disciplines, fragmented content and people composed of indigenous, black, immigrant, elderly, disabled, among others, lead teachers to reflect: what to do to implement in the school a curriculum adapted to this multiplicity of subjects?

In the globalized world, without borders, connected by networks, whose subjects are increasingly present in schools, we are faced with a great problem: to adapt or not the curriculum to this varied universe of people who are entering the space-times of schools? At the same time that this question causes us doubts, it invites us to defend that the curriculum needs to be adapted to the needs of these new subjects who are coming to schools hungry for knowledge, with cede of knowledge, in short, in need of breaking with the alienating processes that exclude, marginalize and prevent our inclusion in the various educational spaces.

Obviously, we know that the implementation of an adapted curriculum in schools faces several problems, especially if we consider that we do not see teachers working on the curricular components in an interdisciplinary way. This, in our view, incurs a serious problem: on the one hand, we do not know what the teacher who preceded us worked; on the other hand, we also do not know what our colleague has planned and what he will work on.

Another problem we identified is the fragmentation of contents, which in addition to being decontextualized, do not arouse interest in the curricular component we are teaching. In view of the above, a question arises here: how to promote curricular adaptations in a shattered educational system disconnected from the reality that surrounds us?

In recent decades, our ears have become accustomed to the official government discourse: "inclusive education, school inclusion, people with disabilities". We do not see a problem in this discourse, because we are in favor of the inclusion of all people regardless of whether they are or are in a situation of disability.

In our view, the problem lies in the initial training of teachers in undergraduate courses, who sometimes leave universities without even knowing some didactic resources, teaching techniques and strategies, methodological procedures and curricula adapted to different specific educational needs. Faced with this premise, the reflection we make is: how to include these new social subjects, if we have not been trained? How to promote the mediation of knowledge if we were not allowed this mediation? How can we promote the socio-educational transformation of our students with and without disabilities, if we have not even started our own transformation? In short, how can we adapt the curriculum to the new demands of the globalized world, if we have not been guided to this arduous task? These questions bother us, as our training is fragmented, the contents are decontextualized, the disciplines are worked on in isolation, far from the reality of our students.

In the current educational situation, one of the biggest bottlenecks in education experienced by teachers, the main mentor of knowledge, is the need to adapt the curriculum

in school, especially when there are enrollments of students with disabilities, global developmental disorders, high abilities/giftedness. In view of the above, the research problem that guided this investigation was: why is there still resistance from teachers to make adaptations in school curricula?

OBJECTIVES

Our objectives in this reflection were to discuss, in the educational system, the possibilities of implementing, in schools, curricular adaptations, especially taking into account that there is a multiplicity of subjects from various realities. In this sense, we propose to achieve the following objectives: to understand, in the light of theoretical references, the political reasons why teachers in regular schools do not make curricular adaptations; to analyze whether it is due to the lack of initial and permanent training that teachers find it difficult to make adaptations in the curriculum; identify the main pedagogical barriers that prevent curricular adaptations in schools at all levels.

METHODOLOGY

Our option in this theoretical reflection was for qualitative research. To this end, we rely on Lüdke and André (1986, p. 11) when they mention that: "qualitative research has the natural environment as its direct source of data and the researcher as its main instrument".

As it is a bibliographic study, we use Severino (2016, p. 123), when he states that in bibliographic investigations "the researcher starts from existing research to support his work".

If we consider that our reflection also used documents to support this investigation, we rely on Piana (2009, p. 122) when he points out that "documentary research has some advantages because it is a 'rich and stable source of data': it does not imply high costs, does not require contact with the research subjects and allows an in-depth reading of the sources".

THEORETICAL CONSIDERATIONS

In regular schools, especially when students with disabilities, global developmental disorders, high abilities/giftedness are enrolled, many elements impede, or at least hinder, the process of school inclusion of these new subjects who are entering the school's space-time. This premise is shared by Mesquita, (2010, p. 312), when he points out that,

> [...] The idea of adaptation, posed by the curriculum policy, reveals the perspective not of unity, but of homogenizing the official curriculum. From how much the educational policy, despite the advances made possible by the proposal of inclusive

> education, still allows itself to be caught by the contradictions inherent to its discourses, such as the statement above "adaptation of the regular curriculum".

In the light of the references that discuss whether the curriculum should be adapted, adequate or differentiated in schools, especially if there is the presence of students with disabilities in them, different theoretical positions are denoted. Rodrigues (2003, p. 92) argues that the curriculum should be differentiated by claiming that

> [...] The curricular differentiation that is sought in inclusion is the one that takes place in the environment in which students are not separated based on certain categories, but in which students are educated together, seeking to take advantage of the educational potential of their differences, in short, a differentiation in the class assumed as a heterogeneous group.

We share this idea to the extent that our schools whose realities are different, we think that the curriculum should be differentiated, in order to serve all students, including the public of special education in an inclusive perspective.

Obviously, we know that in the new century inclusion is for us, like globalization, there is no turning back. The integrated classrooms are gone, we live in another reality, the one that defends the principle that all children with or without disabilities should learn together, without segregation, exclusion and social marginalization. This can be experienced in the writings of Mesquita (2010, p. 314), when he emphasizes that

> Based on the assumption that inclusion aims to value and respect diversity, it is therefore important to consider it as a starting point for the acceptance of difference, rather than its stigmatization. In this way, it will begin to break with segregationist practices, envisioning integrative actions that see "normality" in difference.

The democratization of the school, the discourse of education for all, all together for an inclusive education, are nomenclatures that we have come to hear in the twenty-first century. When referring to curricular adaptations, we defend this possibility, as our different students, coming from the most varied ethnic realities, specific educational needs, gender and diversity, we see in Sacristán, (2000, p. 16) that it is through the curriculum that we eliminate or at least reduce these barriers. In this sense, he points out that "It is also through it that we will be able to guide educational work from an inclusive perspective". This possibility can only be made effective at school if regular education teachers and special education teachers work in partnerships, exchanging experiences, being collaborative and cooperative with each other, because teaching in an inclusive perspective requires joint efforts and not isolated, decontextualized pedagogical action, out of the reality that surrounds us.

If we refer to the National Curriculum Parameters – PCN – (Brasil, 1998, p. 33), it is possible to point out that in order to make curricular adaptations, when these refer to the public of special education, we need to pay attention to the following criteria "what the student should learn; how and when to learn; which forms of teaching organization are more efficient for the learning process and how and when to evaluate the student". In our conception, if teachers in their initial and permanent training are well trained, they will certainly have no difficulties in making these adaptations, especially if their students are from special education in an inclusive perspective.

The reflections on curricular adaptations are justified by the need to adapt teaching and curriculum to the specificities of students with more severe disabilities. In our conception, this incurs a serious problem, not least because, in many situations, we run the risk of giving up content relevant to the process of its formation. This premise is shared by Michels (2006, p. 409) when he emphasizes that "we can, in this logic, fall into the trap according to which, in the name of respect for differences, students are excluded from their right to knowledge". This danger may occur, as we are not sure whether the curriculum should be adapted to those students who have some more severe special needs.

Today, one of the dilemmas that teachers face in their pedagogical daily life is the doubt: whether or not to adapt the curriculum to students with specific educational needs. In view of this assertion, Cenci and Damiani (2013 p. 722) point out that: "by defending curricular flexibility/adaptation, one may be legitimizing processes of exclusion in the scenario of education that is intended to be inclusive". In this context, it is the role of the school, the educational system and the teachers, of course, once well trained, to be able to teach all students, whether they are subjects with or without disabilities or not.

In the context of a school open to diversity, we have to be clear that our students need to be well instructed in their training process. The problem is that by defending differences, we sometimes deprive our students of mastering scientific concepts relevant to the construction of different knowledge, as well as to their intellectual development.

Scholars of school inclusion, spread across different countries, are incisive in affirming that curricular adaptations constitute the basis for making a true inclusive proposal effective in the educational system. In this sense, Heredeiro (2010) argues that the curriculum needs to be adequate, aiming not only at the inclusion of some, but also of all who are entering schools. We share this assumption, insofar as in our conception, curricular adaptation has brought advances to the work of teachers with students with disabilities.

As an educator, an advocate of school inclusion for all people, we need to be aware of the pitfalls that curricular adaptations can also bring us, to the extent that, once

implemented by unsuspecting pedagogical coordinators, managers and teachers, they can reinforce the formation of ghettos understood here as exclusionary, that is, what Rodrigues (2006) calls exclusionary inclusion.

What we intend, when we defend curricular adaptations in schools, we want our students, different, coming from diversity, to be able not only to enter schools, compose government statistics, thicken the distorted discourse of inclusion, we want these new subjects in an inclusive perspective, to succeed and remain at the various levels of education. This is not utopia, this is possible.

NOTAS (IN)CONCLUSIVAS

Our reflections on this theme are not final, nor at least conclusive, because the discussions on curricular adaptations still require many debates, studies and questions from teachers, who on the one hand propose that the curriculum be adapted to the specific needs of students with disabilities, on the other hand, there are many doubts about how to make these adaptations in schools at all levels.

The defense for the adoption of scientific concepts is not intended to condemn curricular adaptations. On the contrary, in the inclusive school, we think that adaptations are necessary for the concepts to have a greater power of scientificity, to the extent that our students do not learn at the same pace, in the same way, at the same time.

By returning to the question that guided the reflection, here called "why is there still resistance from teachers to make adaptations in school curricula?", the study showed us that in the space-time of the school there are still many doubts about whether or not to adapt the curriculum to students with specific educational needs. It is not a question of teachers needing to adapt the curriculum and content to each student with a different specific need. It is also not a matter of building a plan to meet each disability. We think that teachers need to understand that what must be adapted are the didactic resources, the methodological procedures, the teaching strategies, so that students, with and without disabilities, can learn from diversity in the classroom.

In the light of the specialized literature that defends adaptations in the school space, Silva and Moreira (2008, p. 2657) point out that

> [...] The curriculum should not be conceived in such a way that the student is the one who adapts to the molds that the school offers, but as a field open to diversity. This diversity is not in the sense that each student could learn different content, but rather learn content in different ways.

The authors mean that the curriculum needs to be open to different specific ethnic, cultural and social needs.

Our reflections in this study made us think that if the school insists on maintaining a rigid curriculum, loaded with content, it can become one of the greatest causes of exclusion and marginalization of students with disabilities included in regular schools. We want to say that it is not the students who have to adapt to this model of school that we have today. We cannot run the risk that the curriculum will become the stigma of differences, in which each student has a different curriculum and content, reduced to his or her specific educational needs.

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CONNECTING ELEMENTS: THE LEGITIMACY OF CHANGING NATIONALITY IN AN INTERNATIONAL PANORAMA

https://doi.org/10.56238/sevened2024.031-046

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ABSTRACT

The present study aims to demonstrate whether any change in nationality has legitimacy for international law or if it constitutes an exposed fraud to the guiding law. To achieve the proposed objective, it is intended to highlight, initially, the relationship between international law and the connecting elements, to analyze the legal institute of nationality, the reasons for changing nationality in the enforcement of fundamental rights and, finally, to demonstrate the legitimacy and possible fraud of nationality in an international panorama. To achieve the proposed objective, a bibliographic research was carried out, carried out through the review of theoretical materials related to the theme, as well as the analysis of journals and articles available on the internet, addressing the topic qualitatively, during the month of September 2024. The proposed objective was achieved by understanding the theme in the brief highlight between the relationship between the connecting elements and Private International Law. Then, an analysis of the legal institute of nationality was presented. Soon after, the reasons for changing nationality in the realization of fundamental rights were exposed and, finally, the legitimacy and possible fraud of nationality in the international panorama were demonstrated.

Keywords: Connecting Elements. Nationality. Legitimacy.

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INTRODUCTION

Renewal originates in the Latin *renovatio*, associated with the act or effect of renewing, making new, re-establishing. Law, as a social phenomenon, is in constant renewal, following the evolution of society, of which it is a product. This characteristic of continuous adaptation seeks to respond to new issues that arise and resolve conflicts that emerge daily, demanding innovative and fair solutions. The Greek philosopher Heraclitus already stated that "everything flows", highlighting the inevitability of change in all aspects of life, including Law, which must adapt to the ever-changing reality.

Private International Law (PIR), in turn, works as a true bridge between the conflicts of different jurisdictions and their respective solutions. Through its connecting elements, such as nationality and domicile, the DIPr carries out the complex work of directing the way for the application of substantive law, especially in cases where borders, created by human beings themselves to organize their relationships, become a barrier to the resolution of disputes. In this sense, the work of Hugo Grotius, considered the "father of International Law", already pointed out the importance of a common law that could be applied between nations (Grotius, 2004).

However, the individuals themselves end up generating new challenges for their creations. The legislative evolution in different countries is marked by particularities that sometimes generate conflicts or doubts regarding its applicability in the international scenario. With the advancement of technology and the intensification of human relations, regardless of the location or origin of those involved, it has become essential to regulate these interactions to avoid divergences in the legal systems of different nations.

In this context, in order to resolve disputes, the connecting elements in private international law arise, which consist of rules capable of determining which is the most appropriate criterion to define the norm applicable to a specific case. The specialized doctrine points out several connecting elements, highlighting territoriality, domicile and nationality. This research will focus the analysis on this last element. Thus, the question of the present study is brought to the fore: Is the change of nationality for the realization of fundamental rights legitimate for international law?

In view of the above question, this study aims to demonstrate whether any change in nationality has legitimacy for international law or if it constitutes a fraud to the guiding law. To achieve the proposed objective, it is intended to highlight, initially, the relationship between international law and the connecting elements, to analyze the legal institute of nationality, the reasons for changing nationality in the enforcement of fundamental rights

and, finally, to demonstrate the legitimacy and possible fraud of nationality in an international panorama.

The methodology used in this study was based on the technique of bibliographic research, with a qualitative approach. Information from the reading of books, academic articles, periodicals and consultations with databases available on the internet were analyzed, with the aim of achieving a comprehensive understanding of the subject. In order to deepen the topic, the contents of the discipline CommunitylawandOrganizations Master's Degree in International Law at MUST University were reviewed , in addition to the study of scientific works, during the month of September 2024.

DEVELOPMENT

For a better understanding of the theme, the development was divided into three parts. First, the relationship between the connecting elements and Private International Law is briefly highlighted. Next, an analysis of the legal institute of nationality is presented. Soon after, the reasons for changing nationality in the realization of fundamental rights are outlined and, finally, the legitimacy and possible fraud of nationality in the international panorama are demonstrated.

THE RELATIONSHIP OF CONNECTING FACTORS IN PRIVATE INTERNATIONAL LAW

Although Private International Law (DPI) gained this formal name in the nineteenth century, its roots are much older. Its significant evolution occurred between the fifteenth and eighteenth centuries, a period in which interactions between different locations intensified due to the growth of trade and cultural exchanges, especially with the beginning of the era of the Great Navigations. In this context, the DIPr still dealt mainly with interlocal conflicts, that is, between different regions or territories under the same sovereignty, being much simpler and more restricted in terms of volume and complexity.

Globalization, which began to take shape from the end of the fifteenth century with the process of commercial expansion, which began mainly with the maritime expeditions of Portugal and Spain, brought profound changes. This historical period, marked by a growing economic and cultural interconnection, required new legal solutions. The creation of international trade routes, as well as the emergence of colonies and exchanges between nations, increased the complexity of transnational litigation and forced an adaptation of the DIPr to deal with issues that crossed borders.

With the intensification of global interconnection in the following centuries, problems related to the legal regulation of transnational situations became increasingly evident. The

need arose to respect not only the norms of foreign states, but also emerging international treaties and institutes. Thus, the DIPr began to focus its study on three major challenges for the resolution of conflicts involving more than one sovereign State: the determination of the applicable law, international jurisdiction and the recognition of foreign decisions.

To solve the first of these challenges, the choice of the substantive law to be applied, the so-called connecting elements were developed. These elements act as bridges linking a transnational situation to the appropriate legal norm. The three main connecting elements are: territory (*Lex rei sitae*), domicile (*Lex domicili*) and nationality (*Lex patriae*). In the following topic, we will address in greater detail the last of them, nationality, discussing its standardization, who should define it and its relevance as a fundamental right.

Portela (2018) understands connecting elements as the primordial fact of national law, which must be applied in a conflict of laws involving a certain object, which may be, for example, the realization of a fundamental right, such as domicile, nationality or exercise of religious freedom. On the other hand, Silva et al (2017, p. 12) describe the institutes *in vogue* as "the support for private international law to determine compliance with norms in the real case. Aiming to indicate which legislation will be applied to resolve conflicts, where there is a connection of more than one legal system."

To this end, it is seen that the connecting elements are fundamental principles of private international law, and they are responsible for determining which legislation should be applied in situations involving more than one jurisdiction, that is, when there is some foreign element in the legal relationship. These connecting rules have the power to resolve conflicts of laws in different countries, establishing which right should be applied in the specific case.

THE ELEMENT OF NATIONALITY

Nationality is a legal-political bond that connects a person to a State, determining to whom they owe allegiance and what rights and duties are conferred on them in the context of the domestic and international legal order. It is a central element in the definition of an individual's legal identity, and its regulation is the exclusive competence of the States. According to Article 1 of the 1930 Hague Convention on Conflicts of Laws in Matters of Nationality, it is established that each State is responsible for defining, according to its own legislation, who its citizens are. Such legislation will be accepted by other States, provided that it is in accordance with international conventions, international custom and generally recognized principles of law in the field of nationality (UN, 2014).

The legal relevance of nationality is not limited to the relationship between the individual and the State to which he or she belongs, but also acquires an international dimension. In matters of international law, nationality is fundamental for the determination of legal competence, the application of treaties and diplomatic protection. In addition, nationality is an essential human right, as recognized in the Universal Declaration of Human Rights, as well as in legislative guidelines at the international level.

The enshrinement of this right in the Universal Declaration of Human Rights reinforces its importance not only as a matter of political identity, but also as a right inherent to human dignity. Statelessness, that is, the condition of a person without nationality, puts at risk the guarantee of other fundamental rights, making nationality a pillar for the full exercise of citizenship.

In this sense, Pontes de Miranda (1987) argues:

> Nor is there any rule in Private International Law on nationality laws; nor are the laws on nationality laws of Private Law. Therefore, they would lack either of the two characteristics of the rules of Private International Law: a) they are legal rules about legal rules, laws about laws, law about law; b) such legal rules, such laws, such right, are Private Law. The laws on the acquisition and loss of nationality belong to substantial law (substantive law and formal law), and not to any branch of law, whether private international or international administrative (1987, p. 344).

In this bias, it is worth noting that the Brazilian legal system also recognizes nationality as a fundamental right. The Federal Constitution of 1988 establishes the rules for obtaining and losing nationality, complemented by infra-constitutional legislation, such as Law 13.445/2017 (Migration Law). This normative framework reflects the importance of nationality in Brazil as a right that not only defines belonging to the State, but also ensures fundamental civil and political rights, such as voting and eligibility, ensuring the full participation of citizens in the public and legal life of the country.

At the international level, obtaining a new nationality usually requires compliance with certain requirements established by States, which vary according to the legislation of each country. However, there are widely accepted principles that guide the naturalization process, highlighting the need for the individual's demonstration of will. The desire to acquire a new nationality is a central factor, as it reflects the conscious desire for legal and political attachment to a new state.

In addition to this subjective requirement, States usually require compliance with objective criteria, such as a minimum period of residence in the country, mastery of the local language, cultural integration and respect for fundamental laws and values. In many cases, the individual is also required to renounce his or her previous nationality, although the recognition of dual nationality is allowed in several countries. At the international level,

instruments such as the 1997 European Convention on Nationality promote the standardization of criteria for the acquisition and loss of nationality, seeking to ensure that nationality is granted fairly, without discrimination and with respect for human rights. The will of the individual, therefore, becomes the starting point for the legal transition of his political identity, and is seen as essential for the effectiveness of the bond between the person and the State in the global scenario.

THE CHANGE OF NATIONALITY FOR THE REALIZATION OF FUNDAMENTAL RIGHTS

In view of the relevant concepts mentioned, it is clear that, in many countries, the rights recognized as fundamental at the international level, such as freedom of opinion and expression, rights to life, liberty and dignity, are not properly protected or promoted, neither at the constitutional level nor in ordinary legislation. This results in often inhumane living conditions for its citizens, leading them to seek refuge in other countries. The systematic violation of fundamental rights is one of the main causes that force individuals to leave their countries of origin in search of safety and better living conditions.

In addition to human rights violations, other factors also drive migration. Among the most common are the emergence of armed conflicts and economic destabilization, which can cause a significant drop in the supply of jobs and aggravate poverty. A recent example is the war in Syria, which began in 2011, initially as a peaceful uprising against the authoritarian regime, but which quickly escalated into a complex and devastating armed conflict. Millions of Syrians have been forced to flee the country, seeking shelter mainly in Europe and neighboring countries such as Lebanon and Turkey (Furtado *et al*, 2014). This is a clear example of how armed conflict can destabilize a region and force the population to seek refuge in other countries, often leading to the need for a new nationality.

After arriving in a new state, migrants tend to develop a sense of belonging, as they become part of local society and establish social, cultural, and economic ties. To consolidate this link, the acquisition of the nationality of the new country becomes essential, especially with regard to obtaining the full exercise of rights, such as the full exercise of political rights, both voting and eligibility. The change of nationality, therefore, has a fundamental role in guaranteeing the rights inherent to all human beings, which must be protected by the State where the individual resides and develops his social relations.

In this context, the right to human dignity, which is at the heart of fundamental rights, stands out as an essential prerequisite for equal opportunities. The link with the nationality of the new State not only facilitates access to civil and political rights, but also promotes

social inclusion and the full integration of the individual into the new society, contributing to their stability and well-being.

THE LEGITIMACY AND FRAUD OF NATIONALITY IN AN INTERNATIONAL PANORAMA

We must consider the existence of cases in which individuals seek to change the element of nationality for reasons other than those previously exposed, using this element as one of the methods to choose the substantive right to be applied in a given situation. This behavior has profound implications, as it allows people, in order to avoid sanctions in their country of origin after committing unlawful acts, or to obtain undue advantages and benefits, to resort to the application of the substantive law of another country, where these advantages are more easily accessible. Such use of nationality aims exclusively at personal benefits, without a legitimate justification, such as the search for protection of fundamental rights. Kao (2011) states:

> *Evasionoflaw or fraudulent creation of points of contact* refers to the parties to an international legal (civil and commercial) that artificially take advantage of a conflict rule and purposely create a connecting factor in order to evade the application of the domestic law that should be applied, and therefore, apply the foreign law that is most advantageous to themselves (Kao, 2011).

In the context described, when the individual resides in a country that respects his fundamental rights and does not face imminent risks to life or other justifiable reasons for migration, his behavior deviates from the principles of justice and equality. By forging a new connection with another state, the individual violates the integrity of the nationality system and compromises legal certainty. In addition, fraud in the change of nationality contributes to the creation of a hostile environment for real refugees and immigrants, who already face prejudice and social barriers in the countries in which they seek to settle. This type of abuse can intensify mistrust and make it even more difficult for people who genuinely need protection and a new nationality to exercise their fundamental rights to integrate.

In this line of intellect, it is of paramount importance to differentiate those who seek to change nationality to ensure the protection of a fundamental right, from those who use nationality as a means of avoiding legal responsibilities or obtaining benefits improperly. This is because treating both cases in the same way would not only be unfair, but also a setback in the defense of human rights and fundamental guarantees. Thus, it is evident that the Universal Declaration of Human Rights (UDHR) distinctly establishes that "no one shall be arbitrarily deprived of his nationality, nor of the right to change it" (Brasil, 2020). Therefore, this principle reinforces the importance of ensuring the right to change nationality as a legitimate tool to protect rights, while condemning fraudulent changes.

It should also be noted that the legislation of the States has an essential role in the prevention of these frauds, providing legal mechanisms to reverse changes of nationality obtained illicitly. An example of this are laws that allow the revocation of naturalization in cases of fraud. In the national scenario, from the perspective of Brazil, the Federal Constitution embodies in its article 12, § 4, item I (Brazil, 1988) the cancellation of naturalization by means of a judicial sentence in case of fraud in the process of obtaining nationality. Thus, the provisions are essential to guarantee legal certainty, preserving the legitimacy of the use of nationality and avoiding the violation of the principles of justice that underpin international law.

In this scenario, a possible change of nationality is in line with the idea presented by Campos (2023), according to which "the right to nationality is deeply linked to human dignity, ensuring the inclusion of the individual in the legal system of a State and the enjoyment of its protection". Therefore, the acquisition of a new nationality by an individual can be a way to safeguard their legitimate rights.

Additionally, many countries adopt international and national legislation to combat nationality-related fraud, ensuring that the naturalization process is transparent and fair. The European Convention on Nationality, for example, also establishes criteria to prevent abuse and fraud in the process of acquiring nationality, promoting cooperation between States to identify and punish irregular practices. Such measures are necessary to ensure that the right to nationality continues to serve as an instrument for the protection of human rights and the realization of the dignity of the human person, without becoming a means for fraud or abuse.

FINAL CONSIDERATIONS

The reflections developed throughout this work make it clear that the change of nationality to ensure the realization of fundamental rights is a legitimate measure, and in no way compares to frauds that seek to manipulate legal instruments to obtain undue benefits. Nationality must be a means of ensuring the dignity of the human person and its alteration, when motivated by the need to guarantee rights and a dignified life, is in full consonance with the principles of justice and equity that underpin international law. In contrast, fraud involving the change of nationality, aimed at escaping legal responsibilities or acquiring illicit advantages, undermines the integrity of the legal system and undermines trust in the institutions responsible for the protection of human rights.

This study, by clearly differentiating between legitimate situations of change of nationality and fraudulent abuses, highlights the importance of continuously improving

control and protection mechanisms, both nationally and internationally. The distinction between these scenarios not only preserves legal certainty, but also ensures that human rights are effectively protected in all circumstances.

Thus, the present study aimed to demonstrate whether any change in nationality has legitimacy for international law or if it constitutes an exposed fraud to the guiding law. In this sense, the proposed objective was achieved by understanding the theme in the brief highlight between the relationship between the connecting elements and Private International Law. Then, an analysis of the legal institute of nationality was presented. Soon after, the reasons for changing nationality in the realization of fundamental rights were exposed and, finally, the legitimacy and possible fraud of nationality in the international panorama were demonstrated.

Even with the various aspects addressed, it was not the objective of this study to exhaust all possibilities of legitimacy for changes in connecting elements. The possibilities are varied, and there is no better strategy than the other, not even a single one that is ideal to the detriment of the others. Hence the importance of knowledge and study of the subject by the jurist and an analysis from his perspective and local reality. It was also not intended to address all aspects of the change of nationality, these being extensive topics that may vary according to the reality of each country.

Only those aspects that I considered most relevant in my study were addressed in view of the analysis carried out. However, the theme has great richness, and it can still be explored in countless ways. In general, the present study constitutes a source of initial information about this complex theme, providing the reader with a basic understanding of the theme and stimulating the continuity of the research according to the need and interest of the same.

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PROCESS MANAGEMENT: A STUDY OF ICMS TAX ENTRIES EXECUTED BY THE STATE SECRETARIAT OF FINANCE OF RONDÔNIA

https://doi.org/10.56238/sevened2024.031-047

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ABSTRACT

Process Management in the public service is an important tool for the alignment of public management with the standards of current managerialism, enabling the reduction of procedural errors, rework, repetitive and unnecessary tasks, thus increasing efficiency in the provision of public service. The study aims to verify how Process Management can help reduce inconsistencies and rework in the activity of official entry of the Tax on the Circulation of Goods and Services of interstate and intermunicipal transport and communication (ICMS), executed by the State Secretariat of Finance of the State of Rondônia - SEFIN. The study with an applied purpose, based on a descriptive, quantitative-qualitative, documental, participant observation and case study research, was carried out within the scope of the Collection Management, a unit that makes up the State Revenue Coordination (CRE), linked to SEFIN. The survey identified 790 ICMS entries, registered in active debt, with inconsistencies. It was found that the requests for review of entries registered in overdue debt are automated entries, and the inconsistencies refer to the incorrect classification of products by the Border System. It was found that inconsistencies can be reduced through adjustments in the Border System, so that the information contained in the electronic invoices is recognized. Thus, the study resulted in a proposal with 13 adjustment interventions in the automated classification of the Border System, which will reduce by 43.67% the inconsistencies in the ICMS official entries.

Keywords: Process Management. Public Management. ICMS. Taxation. SEFIN.

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INTRODUCTION

With the technological advances that emerged from the 1990s onwards, followed by the process of economic globalization, organizations were impelled to review their work processes to obtain more significant and relevant results. In the current competitive scenario, the productive sectors seek to improve their business strategies to improve performance and remain in the market. To do so, they have been distancing themselves from the hierarchical functional view and approaching the process-oriented view (Hamanaka & Aganette, 2022). In the public sector, this evolutionary process gradually took shape in the form of structural reforms of the State.

As part of this process of modernization, restructuring and improvement of public management, Process Management began to be adopted in organizations as a new management tool, boosting the model known as Public Management Administration. Process Management in public administration seeks to achieve the principles of efficiency, productivity and entrepreneurship, and its main objective is to restructure processes to better serve citizens, promoting changes related to the debureaucratization of the public machine.

This process of modernization in public management should hit the tax administration more strongly, since the State Secretariat of Finance (SEFIN) that performs the activities of taxation, collection and tax inspection in the State of Rondônia, has the important mission of carrying resources to the Treasury, through the tax release, which is defined by article 142 of the National Tax Code (CTN), such as the "administrative procedure aimed at verifying the occurrence of the triggering event of the corresponding obligation, determining the taxable amount, calculating the amount of the tax due, identifying the taxable person and, if applicable, proposing the application of the applicable penalty".

At SEFIN, the automation of the tax entry process began around 2012; however, bottlenecks are perceived in the form of inconsistencies in the ICMS official entries, generating rework and loss of efficiency. The tax regularity sector of the Inspection Management, which analyzes requests for review of entry not registered in overdue debt, operates with a staff composed of six civil servants who, in the years 2021 and 2022, analyzed the number of 156,658 tax regularity processes dealing with ICMS official entries. Of this total, 790 cases dealt with entries already registered as overdue debt, contrary to the precept of the presumption of certainty and liquidity that is related to overdue debt. Thus, the present study seeks to answer the following question: **How can Process Management help to reduce inconsistencies and rework in the activities of ICMS official entry, performed by the State Department of Finance of the State of Rondônia?**

The records of the lawsuits no. 7008503-54.2023.8.22.0014 and no. 7005883-48.2023.8.22.0021 of the Special Court of the Public Treasury, with a request for annulment of tax debt and suspension of protest, show that the inconsistencies in the ICMS official entries cause misfortunes to the taxpayer, such as enrollment in overdue debt, protest of extrajudicial title, tax foreclosure. It is worth noting the growing understanding of the higher courts in Brazil about the application of the so-called Productive Deviation in civil liability for the unfair and intolerable loss of useful time to seek to resolve an unwanted situation, created by service providers in consumer relations (STJ — REsp: 1634851 RJ 2015/0226273-9, Rapporteur: Minister Nancy Andrighi, Judgment Date: 09/12/2017, T3 — Third Panel, Publication Date: DJe 02/15/2018), and which, by symmetry, may be applied in the relations between public authorities *and* taxpayers, in case of undue denials and protests.

Therefore, this study aims to verify how Process Management can help reduce inconsistencies and rework in the activities of ICMS official release, performed by the State Department of Finance of the State of Rondônia. Based on a descriptive research, with a quantitative-qualitative approach, using the methods of the case study, documentary research and participant observation, it will be identified in the period of 2021 and 2022, the tax entries registered as overdue debt, which were changed or excluded due to a request for review of the entry filed by the taxpayer. The inconsistencies in the ICMS official entries that triggered the changes or exclusions will be mapped, and, finally, improvements in the ICMS official entry process will be suggested, aiming at reducing inconsistencies and, consequently, requests for review.

THEORETICAL FRAMEWORK

BUSINESS PROCESS MANAGEMENT

The term Business Processes has its origin in the American school of business administration, with the translation from English *Business Process*, used to differentiate the procedures that produce goods and services from other types of processes (Turra, Juliani & Salla, 2018). The concept of Business Process Management widely recognized by the literature is that of ABPMP - International (Association of Business Process Management Professionals). Created in 2003 in the United States of America, this Association is represented in Brazil by ABPMP-Brazil. In its *Business Process Management Common Body of Knowledge* (BPM CBOK), ABPMP-Brazil defines Business Process Management as:

> "A managerial discipline that integrates an organization's strategies and objectives with customer expectations and needs, through a focus on end-to-end processes. BPM encompasses strategies, objectives, culture, organizational structures, roles, policies, methods and technologies to analyze, design, implement, manage performance, transform and establish process governance". (ABPMP/Brazil, 2013, p.40).

Still with regard to the conceptual aspects of BPM, it is worth noting the difference between process management and process management, although they are written in similar ways, they have different meanings. Process management is understood as the practice of analyzing, modeling and implementing business processes, changing the structure of the organization, disregarding hierarchies and organizational charts. Process management, on the other hand, has a simpler scope, since its application does not involve major changes in structures, only in the way tasks are performed (Sordi, 2008).

BPM PRACTICES, TECHNIQUES AND TOOLS

In this section, the main subdisciplines of Business Process Management will be described: Process Mapping, Analysis and Transformation.

Process mapping

According to Ramos, Montezano, Costa Júnior and Silva (2019), process mapping is defined as the technique used to record a process in a compact way, in order to enable its better understanding and subsequent improvement. It allows the organization to verify end-to-end process workflows, identifying the macro-processes, sub-processes, and activities involved throughout the workflow (Paula & Valls 2014).

This BPM technique enables an in-depth detailing of the production operation of a good or delivery of some service, consisting of the knowledge of the value stream formed by the set of activities that occur from the obtaining of the raw material to the delivery of the finished product (Ramos *et. al.*, 2019). Among the advantages that can be achieved with Process Mapping, Paula and Valls (2014) highlight the documentation and standardization of processes, the integration of processes, the simplification of routines, cost reduction, elimination of rework and activities that do not add value to the result. Along the same lines, Chinosi and Trombetta (2012) assert that, by visually analyzing workflows, it is possible to identify redundant activities, delays, bottlenecks, and other inefficiencies that can be eliminated or improved. Additionally, process mapping is the starting point for process automation, as it provides clear insights into which activities can be automated to increase efficiency and reduce errors.

Process analysis

Process analysis is the phase that aims to understand the functioning of processes, how they occur in their current state, verifying whether they are meeting the expected objectives and goals. The analysis is carried out in conjunction with the modeling of processes, as one understands how organizational activities are executed, it is possible to analyze them and identify which ones need to be improved, which ones are eliminated, and which ones should be maintained (Hamanaka & Aganette, 2022). For Almeida, Portela, and Silva (2021), process analysis involves understanding the organization's processes, encompassing their efficiency and effectiveness.

For Davenport (2013), the importance of process analysis lies in its ability to identify bottlenecks and inefficiencies in existing processes. Weske (2012) highlights that the thorough analysis of workflows allows the identification of redundant activities, unnecessary delays and bottlenecks that hinder operational efficiency. By eliminating or optimizing these bottlenecks, organizations can reduce costs, increase productivity, and improve the quality of the products and services offered.

However, Harmon and Wolf (2018) point out that process analysis must be continuous, allowing organizations to identify opportunities for innovation, new technologies, and emerging practices that can be incorporated to improve competitiveness and organizational agility. In the same sense, Rosenthal, Hoffmann and Nickel (2015) assert that analysis is not limited to a single evaluation, but is a constant cycle of identification, analysis, improvement and monitoring of processes. This ensures that organizations remain agile, adaptable, and able to respond to changing business environments.

Process transformation

Process Transformation involves the modification of processes, in a disciplined and idealized way, in order to ensure that the processes continue to support the business objectives (Almeida *et.al.,* 2021). In transformation, the goal is to find the best way for the process to perform its function. It can mean new production equipment, new applications, new information technology infrastructure or new business approaches. Transformation requires a significant investigation of what is feasible (ideas, techniques, concepts, tools), as well as the identification of the necessary organizational support (ABPMP, 2013).

In addition, process transformation allows for the implementation of more effective controls and monitoring mechanisms. For example, the integration of quality management systems can help identify deviations and errors in real time, enabling immediate corrective action to be taken (Rummler & Brache, 1995). Another important aspect is improving

operational efficiency, by eliminating unnecessary activities, streamlining workflows, and introducing automation, businesses can reduce the time it takes to complete tasks and increase overall productivity (Womack, Jones, & Roos, 1990).

By adopting process transformation practices, companies can proactively identify, analyze, and correct errors, ensuring efficiency and quality in their activities. According to Davenport (1993), process transformation involves restructuring and optimizing workflows to achieve better results. One of the main benefits of process transformation is the reduction of operational errors and failures. By reviewing and redesigning processes, organizations can identify vulnerabilities that can lead to errors, rework, or miscommunication. This is critical to ensuring consistency and accuracy in operations (Hammer & Champy, 1993).

METHODOLOGY

As for the purpose, the research is applied, since it aims to generate new knowledge for practical application, aimed at solving specific problems (Gerhardt; Silveira, 2009). As for the objectives, the study is descriptive, since it describes the characteristics of a given phenomenon under study. For Triviños (1987), descriptive research intends to describe the facts and phenomena of a given reality. In the present research, the objective is to describe the characteristics of the inconsistencies of entries, the rework generated by these inconsistencies, as well as the influence of the theory of Process Management in the mitigation of such occurrences.

Regarding the procedures, this is a case study, using participant observation and documentary research for data collection. For Gil (2008), the case study is characterized by the deep and exhaustive study of one or a few objects, in order to allow their broad and detailed knowledge. Triviños (1987), likewise, characterizes the case study as a category of research, whose object is a unit that is deeply analyzed.

The research adopts the quantitative-qualitative approach, regarding the treatment of the proposed problem. Quantitative-qualitative research combines quantitative and qualitative methods to provide a more comprehensive understanding of a phenomenon. The integrated use of these methods allows the limitations of one to be compensated by the forces of the other, enriching the results and ensuring greater validity and depth in the analysis (Creswell & Plano Clark, 2011).

The survey was carried out within the scope of the Collection Management, a unit that makes up the State Revenue Coordination (CRE), linked to the State Secretariat of Finance of the State of Rondônia (SEFIN). The extraction of all ex officio tax entries,

registered as overdue debt, which were subject to a tax regularity process, of the anticipated ICMS, ICMS differential rate and ICMS tax substitution, was carried out.

In this phase, a total of 790 entries were identified in the period of 2021 and 2022 that had the taxpayer's request met, with 650 exclusions of values released and 140 changes of entries. The extraction was carried out by searching the tables of the SEFIN database, selected by means of a query in the *Structured Query Language* (SQL). After selecting the data, a documentary analysis was carried out regarding the legislation that governs the entries, in order to map the inconsistencies that lead to the write-offs or changes, using Microsoft Excel spreadsheets.

RESULTS AND DISCUSSIONS

In the periods of 2021 and 2022, 4,122,939 ICMS official entries were made, of which 156,658 were excluded due to inconsistencies, that is, 3.79% of the ICMS official entries did not prosper. From the survey related to the Electronic Information System (SEI) Processes, sent in the period surveyed, by the tax regularization sector of the Collection Management to the Attorney General's Office of the State of Rondônia (PGE), it was found the number of 790 official entries, registered as overdue debt, which underwent changes or were excluded, as shown in Table 1:

Table 1. Completed postings versus deleted/changed postings in the 2021 and 2022 period

The. Total Ex Officio Entries	4.122.939	100%
B. Deletions/changes to postings	156.658	3.79% (B/A x 100)
C. Deletions/changes to postings enrolled in overdue debt	790	0.50% (C/B x 100) 0.019% (L/H x 100)

The entries questioned by taxpayers, registered in tax overdue debt, represent 0.5% of the entries with inconsistencies that were regularized before the registration in overdue debt. Of the total number of official entries made in the period surveyed, 0.019% were questioned by taxpayers only after being enrolled in active tax debt.

As for the 790 official entries, registered as overdue debt, when mapped and categorized, it was identified that 650 entries were excluded and 140 altered, as shown in Table 2. It should be noted that there were other cases of exclusions/changes in the SEI processes analyzed, however, they were not included in the analysis because they were not official entries made by the Department of Finance of the State of Rondônia.

From the analysis of the legal justification that guided the exclusions, 18 types of occurrences were verified; to support the changes, three occurrences, as shown in Table 2:

Table 2. Occurrences of exclusion of ICMS official entry

Posting Exclusion Occurrences	Incidence	Values excluded (R$)
1 - Article 16 RICMS, use and consumption or fixed asset with a differential of rates collected in SPED	133	676.723,94
2 - ICMS Convention 100/97, agricultural input - exemption	112	338.184,95
3 - Purchase in another state, over-the-counter sale final consumer - no incidence	81	87.893,32
4 - Agreement 93/15, final consumer - non-incidence	61	154.081,79
5 - ICMS Convention 35/77, registered cattle - exemption	56	244.298,72
6 - ICMS Convention 101/97, solar energy equipment - exemption	34	149.119,01
7 - Article 150, item VI of the FC/88 immunity books	31	11.123,27
8 - ICMS Convention 142/18, ICMS-Tax substitution already collected in the registration of substitute or in a national payment guide of state taxes (GNRE)	25	79.101,81
9 - Agreement 93/15, final consumer service provider company - Non-incidence	25	39.606,97
10 - ICMS Convention 52/91, intended for companies under the normal taxation	24	38.857,46
11 - Agreement 45/99, door-to-door resale with GNRE collected	13	1.189,65
12 - Immunity of a public entity Article 150, § 2. CF 1988	12	128.589,59
13 - ICMS Convention 70/92, bovine embryos - exemption	9	14.724,75
14 - ICMS Convention 110/07, fuel already collected by substitution tax or deferred	8	297.119,74
15 - ICMS Convention 66/94, fruit pulp - exemption	7	2.545,65
16 - ICMS Convention 44/75, fruit and vegetables - exemption	7	2.447,38
17 - Article 226 of Annex X of RICMS/RO, shipment for repair - no incidence	6	530.950,16
18 - Registration in duplicate overdue debt	6	11.339,66
Total	**650**	**2.807.897,82**
Occurrences of Change of Entries		
1 - ICMS Convention 15/81, used equipment - reduction of the base of calculation	60	36.232,29
2 - ICMS Convention 52/91, agricultural machinery and implements - reduction Calculation base	45	781.637,07
3 - Article 16 RICMS, ICMS tax substitution and ICMS in advance for ICMS rate differential	35	117.628,07
Total	**140**	**935.497,43**
GRAND TOTAL	**790**	**3.743.395,25**

It is verified that the inconsistency that presented the highest amount of excluded value (R$676,723.94) was also the one that presented the highest number of occurrences, being the entry related to goods intended for use and consumption or fixed asset with differential rates collected in the fiscal SPED. In second place are the exclusions related to the entry referring to goods sent for repair or repair, with a total value of R$530,950.16. It is observed that, even with only six occurrences, this inconsistency reached the second place in the overall value excluded, since these are shipments of capital goods for repair or repair, with generally high market value. The exclusions referring to the entries for agricultural inputs, exempt according to ICMS Convention 100/97, reached the amount of R$338,184.95, third place in total amount excluded and second place in number of occurrences.

As for the amounts excluded by changing entries, there is the highest value attributed to the change in entry resulting from the entry of agricultural machinery and implements contained in ICMS Convention 52/91, subject to the reduction of the calculation basis, reaching the amount of R$781,637.07. The total amount of tax credits excluded in the period analyzed, added to the exclusions and changes in entries, reached the amount of R$3,743,395.25.

PROCESS MANAGEMENT APPLIED TO THE ICMS OFFICIAL ENTRY

The techniques and tools of Process Management were important for the pursuit of the research objective. Based on the ABPMP (2013), the mapping of the tax collection process in the State of Rondônia was made, outlining the macro-processes, processes, sub-processes, activities and tasks performed (Table 1).

After the mapping, the ICMS official entry process was analyzed, in order to identify the causes that generate the inconsistencies in the entries. For Davenport (2013), the importance of process analysis lies in its ability to identify bottlenecks and inefficiencies in existing processes.

In the analysis, it was evidenced that the requests for review of entries registered in overdue debt are the result of automated entries, and the inconsistencies refer to the incorrect classification of products by the Border System. Products without ICMS incidence, exempt or immune, are classified as if they were taxed. At this point, there was an inefficient alignment between SEFIN's IT area, which performs the programming of the Border System, with the ICMS automated letter entry process.

By examining the information contained in the invoices that cover the operations taxed by the ICMS official entry, which were questioned by taxpayers through the tax

regularity process, it was verified, in many occurrences, that the entry could be inhibited, or made with the due reduction, taking into account the information regarding the NCM, CST and CFOP contained in the tax documents.

According to the Taxpayer Guidance Manual - Overview (2020) published by the National Meeting of Tax Coordinators and Administrators (ENCAT), the NCM, or Mercosur Common Nomenclature, is a code used to identify the nature of goods traded between Mercosur member countries. It consists of eight digits and serves to standardize the classification of products, facilitating international trade and the application of tariff policies.

Equally important for taxation, the Tax Code of Operations and Benefits (CFOP) is a system used in Brazil to classify the circulation of goods and services for tax purposes. It is composed of four digits and defines the nature of the business operations carried out by a company. Each CFOP code indicates whether the operation is inbound or outbound, whether it involves goods or services, whether it is within the same state or between different states, among other characteristics. The CFOP assists in the correct taxation of commercial transactions and in the fulfillment of tax obligations (Taxpayer Guidance Manual - Overview, ENCAT 2020).

With regard to the Tax Situation Code (CST), this is a fundamental element for the correct classification and taxation of ICMS, since it is used to classify operations and determine the tax rates to be applied. The CST has several categories that indicate the nature of the transaction and its particularities in relation to taxation. In the ICMS, for example, the tax situation codes represent internal, interstate, import operations, indicate exemptions, reductions in the calculation basis and other special taxation conditions. Each CST has a specific rate or a form of calculation determined by tax legislation (Taxpayer Guidance Manual - Overview, ENCAT 2020).

Finally, the Tax Substitution Specifier Code - CEST is a numerical code used in Brazil to identify and classify products subject to the ICMS tax substitution regime. It was created to facilitate the identification of products and define the responsibility for collecting the tax among taxpayers, thus simplifying the tax collection process and inspection. Each product has a specific CEST, determined by tax legislation, and its correct use is essential to ensure compliance with tax law (Taxpayer Guidance Manual - Overview, ENCAT, 2020).

The agreements that exempt or grant tax benefit from the reduction of the ICMS calculation basis bring, in their text, the description of the products that enjoy the tax benefit. Some agreements, such as ICMS Convention 101/97 (solar energy equipment) and ICMS Convention 52/91 (Agricultural machinery and industrial implements), even bring the NCM of the products to which they refer.

The Tax Situation Code (CST) was another important indicator verified in invoices with tax benefits. Products with CSTs in positions 40 (exempt) indicated that they were exempt from ICMS. On the other hand, products with CST in positions 20 (with a reduction in BC) had the indication of a reduction in the tax calculation basis.

Other operations contained CFOP 6107 (sales of industrialized products in the establishment, intended for non-taxpayers) and 6108 (Sale of merchandise acquired or received from third parties, intended for non-taxpayers) indicating that the receipts of goods were destined for final consumers who were not ICMS taxpayers, with the non-incidence of ICMS on the entry into the State of Rondônia, regulated by ICMS Convention 93/2015.

Thus, it is found that the inconsistencies in the automated ICMS entries can be reduced through adjustments in the Border System, causing the information contained in the electronic invoices (NCM, CFOP, CST) to be recognized, and thus, the taxation of products with an indication of exemption, immunity or non-incidence, does not occur. Making adjustments to computerized systems in process management is an essential practice to ensure the efficiency, adaptability, and continuous optimization of organizational operations (Davenport, 2013). Based on the data collected in the research, specifically the information contained in the invoices, and the laws that govern the taxation of ICMS, Table 3 was prepared, with the proposals for adjustments in the Border System:

Table 3. Proposals for adjustments to the Border System

Case 01: ICMS Convention 100/97, agricultural input - Exemption	Inhibit the launch for products with NCMs listed below, whenever it is intended for CPF with state registration (rural producer) and the CST is included in positions 020 and 040 (120, 220, 320, 420, 520, 620, 720, 820; 140, 240, 340, 440, 540, 640, 740 and 840) that indicate exemption or reduction of the calculation basis: 28365000; 25010019; 30049059; 5111000; 12019000; 12099900; 28365000; 25010019; 25102010; 23032000; 31059090; 31051000; 31055900; 10064000; 52029900; 12019000; 25182000; 12092900; 12092900; 25174900; 25010019; 25010019; 28332520; 28170010; 12072900; 12149000; 23099090; 25010019; 30044090; 25280000; 29304090; 10059010; 25010090; 25030090; 10059010; 28429000; 63051000; 12072900; 84451922; 28342190; 30045090; 30049059; 10059010; 30044090; 12099900; 30023070; 25182000; 25010019; 23099010; 29362190; 12081000; 38089199; 31055900; 29041020; 38089999; 31059090; 30049046; 31059090; 38089299; 12011000; 28365000; 28365000; 5119999; 25010090; 12011000; 30024280; 28352500; 23024000; 28299032; 12149000; 10059010.

Case 02: ICMS Convention 93/15, Final consumer - non-incidence	Inhibit the automatic entry when the recipient is a CPF or CNPJ not registered or CFOPs 6107 and 6108 appear on the invoice.
Case 03: ICMS Agreement 35/77, registered cattle - Exemption	Inhibit automatic launch for products with NCMs 1022190; 1022990; 1022919; 1029000 for CPF with state registration (rural producer) and the CST is included in position 040 (140, 240, 340, 440, 540, 640, 740 and 840) which indicates products exempt from ICMS.
Case 04: ICMS Convention 101/97, solar energy equipment - Exemption	Inhibit automatic launch for products with NCMs 85013220; 85414032; 85017210 with CSTs in heading 040 (140, 240, 340, 440, 540, 640, 740 and 840) which indicates products exempt from ICMS.
Case 05: Article 150, item VI of CF/88 immunity books	Inhibit the automatic entry for a product with NCM 49019900 and with CST in heading 040 (140, 240, 340, 440, 540, 640, 740 and 840) which indicates products exempt from ICMS.
Case 06: Immunity from public entity, article 150, § 2. CF 1988	Inhibit the automatic entry when the recipient is a CNPJ not registered and the CFOPs 6107 and 6108 are included in the tax document.
Case 07: ICMS Convention 70/92, bovine embryos - Exemption	Inhibit the automatic entry for products with NCMs 5111000; 5119910 and with CST in position 040 (140, 240, 340, 440, 540, 640, 740 and 840) which indicates products exempt from ICMS.
Case 08: ICMS Agreement 110/07, deferred biodiesel	Inhibit the automatic entry for products with NCM 38260000 and CST in position 051, which indicates deferral of ICMS levy.
Case 09: ICMS Convention 66/94, fruit pulp	Inhibit automatic posting for products with NCM 20089900 and CST in heading 040 (140, 240, 340, 440, 540, 640, 740 and 840) indicating products exempt from ICMS.
Case 10: Convênio ICMS 44/75, hortifruti (coco in nature)	Inhibit the automatic entry for products with NCM 8011200 and with CST in position 040 (140, 240, 340, 440, 540, 640, 740 and 840) which indicates products exempt from ICMS.
Case 11: Article 226 of Annex X of RICMS/RO, shipment of goods	Inhibit the automatic entry for operations with CFOPs 6915, 6916, 2914 and with CST in positions 040 and 041 (140, 240, 340, 440, 540, 640, 740 and 840; 141, 241, 341, 441, 541, 641, 741 and 841) which indicates products exempt from ICMS.
Case 12: ICM Agreement 15/81, used equipment – reduction of the calculation basis	Enter the rate differential with the calculation basis reduced by 80% whenever it comes to operations with CFOPs 6551 and 6552 and CST in headings 020 and 040 (120, 220, 320, 420, 520, 620, 720, 820; 140, 240, 340, 440, 540, 640, 740 and 840) that indicate exemption or reduction of the calculation basis: Enter the rate differential with the calculation basis reduced by 95% whenever it comes to operations with CFOPs 6551 and 6552 and CST in headings 020 and 040 (120, 220, 320, 420, 520, 620, 720, 820; 140, 240, 340, 440, 540, 640, 740 and 840) that indicate exemption or reduction of the calculation basis and the NCM of the product indicates vehicles (NCM 8703).
Case 13: ICMS Convention 52/91 Agricultural machinery and industrial implements - reduction of the calculation basis	Insert the NCMs contained in Annexes I and II of ICMS Convention 52/91 and apply: Rate differential of 3.66% for NCMs of Annex I from the south and southeast regions, except Espírito Santo, when intended for rural producers or simple nationals; Rate differential of 1.5% for NCMs of Annex II from the south and southeast regions, except Espírito Santo, when intended for rural producers or simple nationals; Inhibit the launch of Annex I NCMs from the North, Northeast, Midwest and Espírito Santo regions; Inhibit the launch of Annex II NCMs from the North, Northeast, Midwest and Espírito Santo regions; Inhibit the entry of the ICMS in advance for both annexes, whenever the recipient is a taxpayer under the normal tax regime.

It is noteworthy that, of the 790 cases analyzed of inconsistencies in the ICMS official entries registered as overdue debt, 345 would not occur with the implementation of the proposed adjustments in the Border System, with a correction rate of 43.67%. Considering that, in the years 2021 and 2022, the tax regularity sector of the Inspection Management analyzed 156 thousand inconsistencies in official entries not registered in overdue debt, with the implementation of the proposed adjustments in the system, the sector would have a reduction of almost 68 thousand inconsistencies in ICMS official entries.

It should be noted that 56.33% of the inconsistencies analyzed correspond to situations beyond SEFIN's control, either due to error or absence of data in the filling out of the tax document by the issuer, concerning the CST, CFOP and NCM, or situations in which the recipient taxpayer, by its liberality, disposes of the acquired and taxed products as if they were for resale. to its use and consumption or to its fixed assets, with the incidence of ICMS differential rates, in accordance with article 16 RICMS.

Adjustments in computerized systems are characterized as process transformation (Womack *et al*., 1990). By making adjustments and transforming the automated posting process, SEFIN will proactively minimize errors, ensuring efficiency and quality in the official posting activity (Davenport, 1993). The adjustments in automation will ensure a substantial increase in efficiency, since it will reduce, by 43.67%, the rework arising from requests for review of entries, and, consequently, by 43.67%, the undue enrollments in overdue debt, the protests of titles and the tax foreclosures of undue ICMS entries.

FINAL CONSIDERATIONS

The survey reported that, in the years 2021 and 2022, 4,122,939 ICMS official entries were made, of which 156,658 were excluded due to inconsistencies, that is, 3.79% of ICMS official entries did not prosper. Regarding the entries registered in tax overdue debt, 790 entries with inconsistencies were observed, of which 650 were excluded, in the total amount of R$2,807,897.82, and 140 entries were changed, with a reduction of R$935,497.43 in the amounts posted. The total amount of ICMS write-off due to inconsistency, between exclusions and changes, was R$3,743,395.25. As for the legal justifications that guided the analyses, 18 types of occurrences of inconsistencies for the exclusions and three types of justifications for the changes were verified.

It was evidenced, in the research, that the requests for review of entries registered in overdue debt are automated entries, and the inconsistencies refer to the incorrect classification of products by the Border System. Products without ICMS incidence, exempt or immune, are classified as if they were taxed. After compiling the data contained in the

invoices, it was found that the errors in the classification of the products, by the Border System, originate from the non-recognition of the information referring to the NCM, CST and CFOP of the electronic tax documents. Therefore, a misalignment was found between SEFIN's IT area, which performs the programming of the Border System, with the process of launching an automated ICMS letter.

Based on the data collected, it was found that inconsistencies can be reduced through adjustments in the Border System, so that the information contained in the electronic invoices (NCM, CFOP, CST) is recognized, and the taxation of products with an indication of exemption, immunity or non-incidence does not occur. Thus, through Process Management, a proposal was prepared, in the form of a Service Order (OS No. 77377), with 13 adjustments interventions in the Border System, with the aim of transforming the ICMS official release process, aiming at assertiveness and efficiency in the launch process, with full alignment with the managerial public administration and the constitutional principle of efficiency.

CONCLUSION

With the implementation of the proposed adjustments, there would be a reduction rate of 43.67% in inconsistencies in ICMS official entries, that is, 345 of the cases that generated rework and inconvenience to taxpayers, would not occur. Considering, also, that, in the years 2021 and 2022, the tax regularity sector of the Inspection Management analyzed 156 thousand inconsistencies in official entries not registered in overdue debt, there would be a reduction of another 68 thousand inconsistencies in ICMS official entries. Thus, the research achieved the proposed objective of verifying how Process Management can help reduce inconsistencies and rework in the activities of ICMS official entry, carried out by the State Department of Finance of the State of Rondônia.

As contributions of this study, it is highlighted, for society, a greater legal certainty in the performance of the State Tax Authorities. The increase in the assertiveness of the automated ICMS official entry will reduce the incidences of denials, tax foreclosures and extrajudicial protests related to improper entries. For the Public Administration, there will be a relevant reduction in the flow of tax regularity processes, thus reducing the rework related to the analysis of the entries subject to questioning by taxpayers. In this way, the tax regularity sector will be able to operate with a smaller workforce, relocating professionals to work in more productive activities in the State of Rondônia. For the academy, the study showed that Process Management is an important tool for increasing efficiency in the activity of automated ICMS official entry.

As a limitation to the study carried out, it is highlighted the impossibility of ascertaining the costs arising from the cancellations of notary protests and the payment of the burden of loss in the collections/executions of undue ICMS tax credits. The impossibility resulted, firstly, from the fact that the collection and management of tax credits registered as overdue debt are the responsibility of the Attorney General's Office of the State of Rondônia (PGE/RO), and, secondly, because these costs are presented in a global amount, not differentiating the collection of tax and non-tax overdue debt.

For future studies, research on the results of the implementation of the suggested changes in OS 77377 is recommended. In addition, it is recommended to study the critical success factors (CSF) in the implementation of solutions based on Process Management in the State Secretariat of Finance of the State of Rondônia, in order to evaluate the technological resources and tools, the support of senior management, communication and *feedback* between team members and agencies, the centralized management culture and the propagation of the culture of Process Management in the Agency.

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EXPLANTATION BY OSTEONECROSIS AFTER WISDOM TOOTH EXTRACTION

https://doi.org/10.56238/sevened2024.031-048

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ABSTRACT

Osteonecrosis, defined as the death of bone tissue due to lack of blood supply, is a pathological condition that, associated with predisposing factors, can affect the gnathic bones, exacerbating the inflammatory process due to the wide oral microbiota, and can significantly affect the quality of life of patients. Patients with skeletal disorders that induce bone loss, such as osteoporosis, make continuous use of antiresorptive drugs in order to alter bone remodeling. The objective of this study is to describe a case report of the treatment of osteonecrosis of the jaws induced by denosumab, discussing clinical-pathological aspects of the disease. This article highlights the case of patient R.S.B.K., 78 years old, who was affected by breast cancer, for whom she underwent chemotherapy treatment for 5 years. He suffered a pathological rib fracture, where he started treatment with an anti-resorptive drug called Denosunab. After dental extraction of element 28, a local infectious inflammatory process involving adjacent implants began, which culminated in unsuccessful surgical interventions. After the end of the half-life of the medication, the return of tissue functions was observed, evolving with bone coverage by the oral mucosa. It is concluded that the correct and early diagnosis is essential, combined with a resolutive treatment through a conservative approach, improving the quality of life of patients.

Keywords: Antiresorption. Denosumab. Bisphosphonate-associated osteonecrosis. Bone resorption.

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INTRODUCTION

Defined as "death of bone tissue due to lack of blood supply", osteonecrosis or aseptic necrosis is a pathological condition associated with predisposing factors such as the use of medications, radiotherapy therapies, alcoholism, and idiopathic alterations [1,2].

Studies show that this pathology is often associated with long bones, affecting the femur with a high incidence, followed by gnathic bones, whose inflammatory processes are exacerbated by a wide microbiota presented in the oral cavity [2,3].

In gnathic bones, osteonecrosis is more commonly present in the mandible, since it has anatomical and physiological characteristics that give it a lower blood supply and greater bone density, being affected in 65% of the cases to the detriment of the maxilla with 26% [4,5].

Osteonecrosis with continuous use drugs, such as antiresorptive drugs (bisphosphonates and denosomab) and antigens, are used in patients with skeletal disorders that induce bone loss or metastases associated with primary tumor [6,20].

Although they are drugs that inhibit osteoclast function and consequent decrease in bone remodeling, bisphosphonates and denosumab have different mechanisms of action, since the latter is an antibody and thus has a better distribution throughout the bone space, thus presenting advantages in treatment, especially in postmenopausal osteoporosis [6,7.]element.

Another difference observed is related to the potential for osteonecrosis formation, where studies show that patients submitted to extraction using bisphosphonates had poor bone remodeling, while denosumab, being an antibody, is transient, and as long as it is suspended, it is capable of allowing bone remodeling, since its half-life is short [8,9,] element.

The epidemiological profile of osteonecrosis of the jaws is uncertain, since its frequency is related to the duration of drug use, the molecule of origin, the dosage, and the route of administration. In relation to gender, it is more frequent in women, due to hormonal factors [10,11].

It can be stated that the highest prevalence is in patients who use bisphosphonates with intravenous administration (0.10%), when compared to oral use with 0.001% of the total cases [11,12].

The diagnosis in most cases is related to the signs and symptoms found and associated with the history of antiresorptive drug use [12]. Sometimes, it is necessary to use imaging tests such as radiographs or computed tomography, in order to measure the degree of extension and quality of remaining healthy bone [12,13]. Usually, after the sequelae caused by the loss of the implant, they trigger aesthetic limitations and also from the

biomechanical point of view21.

The main clinical feature associated with osteonecrosis includes an area of ulcerated mucosa with exposed bone without vitality. It also presents signs of infection with local pain and strong breath [14].

With the progression of the disease, an irregular bone surface and probable pathological fractures may be observed during chewing [15].

Radiographically, it presents with variations from radiolucent to radiopaque lesions, which are detectable only in more advanced stages, where it presents with an area of misshapen bone sequestration, surrounded by a radiolucent allus with well-defined boundaries [16,17,18]. As it is a pathology with infectious characteristics, professionals should be aware of possible differential diagnoses, among which alveolar osteitis, infectious osteomyelitis, periodontal diseases, and osteoradionecrosis can be highlighted18,19.

Specific alterations of the oral cavity can act as "triggers" for the development of drug osteonecrosis, such as the presence of active infectious processes such as carious lesions, periodontal diseases, or any alteration that may trigger an infectious process [2,3].

Preventive measures should be taken, whenever possible, before starting treatment with antiresorptive drugs, such as thorough evaluation and adequacy of the oral cavity medium [5,6].

The treatment of osteonecrosis differs as to the best therapy to be employed. Studies indicate that the combination of surgical techniques with adjuvant therapies is effective [7]. Surgical procedures must be well planned in advance, as they will generate new tissue trauma in regions with impaired healing [8,9]. Whenever possible, less invasive surgical procedures such as debridement and bone curettage associated with a broad-spectrum antimicrobial should be prioritized [6].

Alternative methods such as photodynamic therapy, hyperbaric chamber and the use of Platelet and Leukocytes-Rich Fibrin (L-PRF) have been shown to be effective in the treatment of early stages of the disease, as well as in association with surgical procedures [16,17].element.

LPRF is a concentrate of platelets and leukocytes that has a modulating capacity in the bone repair process by releasing growth factors. It acts to control inflammatory processes, stimulating osteogenesis and helping to repair compromised bone tissue [18,19].

CLINICAL CASE DESCRIPTION

Patient R.S.B.K., 78 years old, female, sought the private clinic for evaluation after the evolution of an abscess on the left side of the face. After clinical examination, a

computed tomography scan was requested to aid the diagnosis, since only one extraction of element 28 had been performed 8 months earlier. The patient reported that local discomfort persisted in the region of the third molar until the moment of the evolution of the pathological condition. In the medical history, it was found that the patient had been affected and treated for breast cancer approximately 10 years ago. She used a chemotherapy drug, Aromasim, for 5 years. 3 years ago, she was affected by a pathological fracture of the rib due to osteoporosis, starting the use of Denosunab On intraoral clinical examination, a strong painful sensitivity was evidenced on palpation of the maxillary rim of 28 and discretely on the buccal surface of the implant 27. After the removal of the implant crown 27, a peri-implant probe confirmed marked exposure of the turns and a smaller number of the implant 26; and, communication with the alveolus of element 28 (Figures 1a. and 1b). On CT scans, the presence of the lamina dura and bone rarefaction on the alveolar border were observed (Figures 2 a and 2b). With the diagnosis of drug osteonecrosis due to denosumab confirmed, the surgical planning was organized with a previous prescription of amoxicillin with clavulanate and non-steroidal anti-inflammatory drugs. The implants were removed and the entire bone region involved was decorated (Figure 3. The suture was performed after the installation of L-PRF (Figure 4). After 2 weeks, the surgical wound evolved with suture dehiscence, exposing the yellowish face of the necrotic bone. There was no spontaneous discomfort. Only during palpation in the palatine and vestibular region (Figure 5).

Figure 1. Peri-implant and alveolar catheterization.

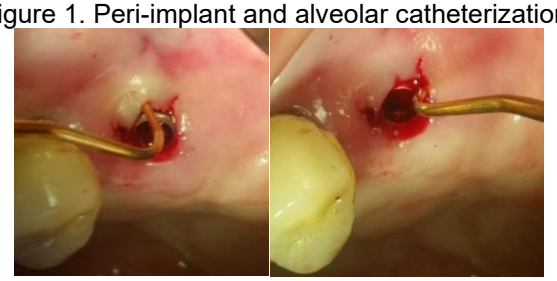


Figure 2. Panoramic image and tomographic sections.

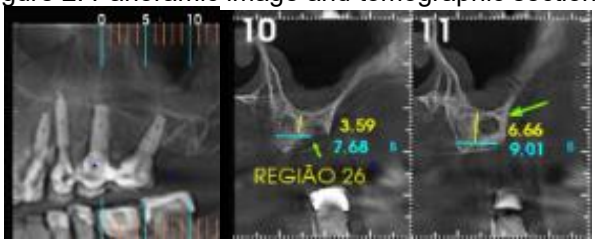


Figure 3. Explanting with decortication

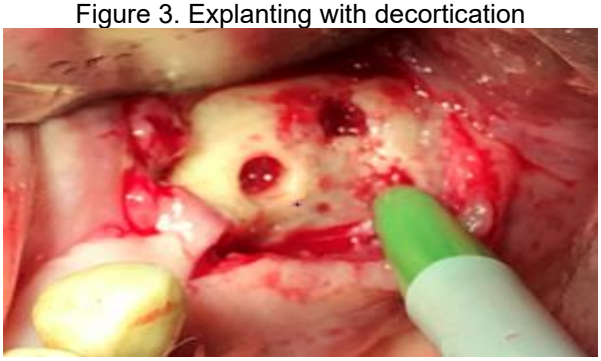
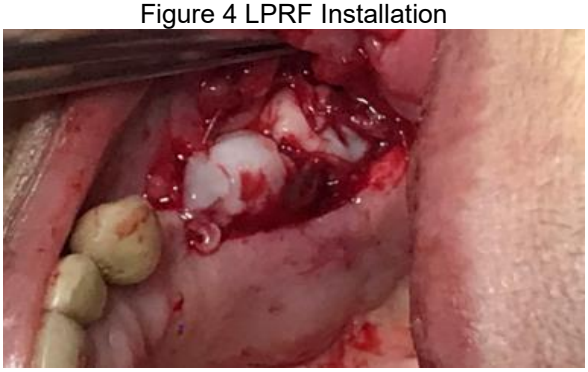
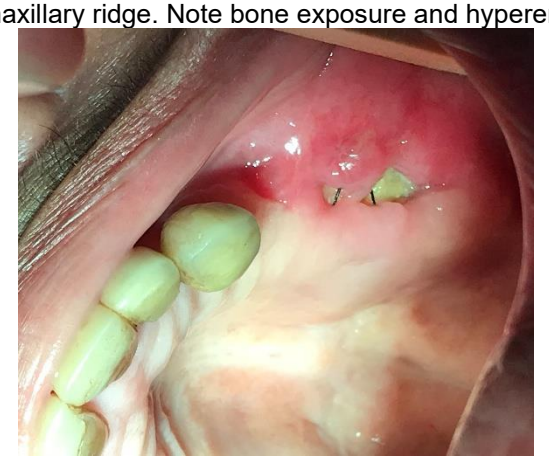


Figure 4 LPRF Installation



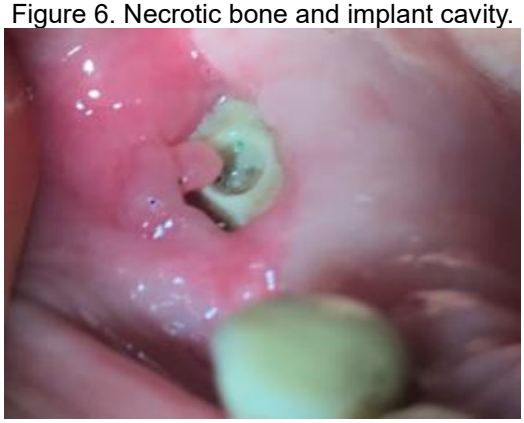
Due to the worsening of the patient's systemic condition with the appearance of liver metastasis, a surgical reapproach was postponed upon evaluation and release by the medical team. Palliative care through irrigation with 0.9% SF, mouthwash with 0.12% chlorhexidine gluconate and 10 sessions of laser therapy relieved symptoms. Thus, after 60 days, there was an increase in bone fenestration, evidencing the implant cavity 25 (Figure 6).

Figure 5. View of the maxillary ridge. Note bone exposure and hyperemia of the oral mucosa.



After palliative care was maintained, the evolution of fenestration remained stable despite the degenerative aspect of the exposed bone after 120 days.

Figure 6. Necrotic bone and implant cavity.



Recurrent and persistent use of mouthwashes such as 0.12% chlorhexidine gluconate required a change due to a complaint of decreased taste. Therefore, the use of a mouthwash of Dutch origin called Blue M with a high concentration of active oxygen, Xylitol and lactoferric, whose joint action prevents bacterial growth, was instituted. Once the taste complaint was reestablished and without medical clearance for surgical intervention, the fenestration evolved, exposing a little more bone in the maxillary rim with the appearance of a worn necrotic 150 days after the operation. (Figure 7).

After 180 days of the initial intervention, a soft tissue repair without bone adhesion was observed during periodontal probing, allowing the observation of a granulation tissue isolating the bone segment, transforming it into a sequestration. It is worth noting that since the half-life of denosumab is 6 months, it is possible to suggest that its active ingredient declined, due to the increase in the osteoclastic activity of monocytes. Thus, it was possible to highlight bone sequestration without major sequelae and without the involvement of the maxillary sinus (Figures 8a and 8b)

Figure 5.Appearance of bone degeneration



Figure 6.Bone exposure with decreased hyperemia

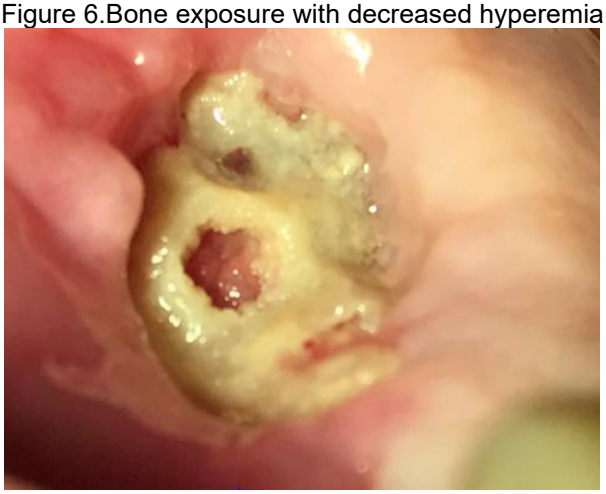


Figure 8a. Kidnapping removed.



Figure 8b after 10 days.

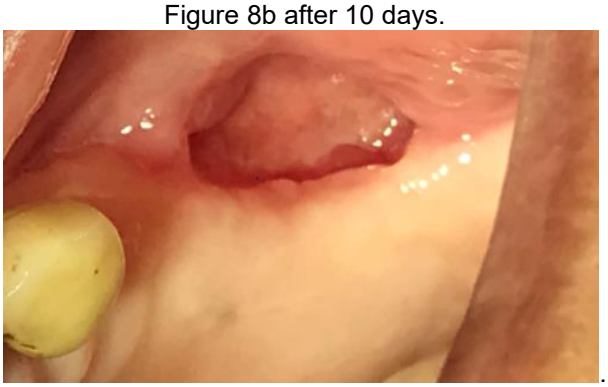


Figure 9. Panoramic image after 1 year



One year after the first surgical intervention, the operated region is in an excellent state of healing (Figure 9), with bone support on the floor of the maxillary sinus (Figure 10).

Figure 10. Wound healed after 1 year.



FINAL CONSIDERATIONS

Long- and short-term oral anti-resorptive drugs are currently a preventive alternative against osteoporosis, and are widely disseminated in the medical field. However, the lack of guidance regarding the adequacy of oral health is increasing the incidence of osteonecrotic lesions of odontogenic origin, and especially of traumatic dental interventions. The dental surgeon needs to perform an accurate clinical examination in order to detect patients using antiresorptive drugs, perform the appropriate technique or refer them to the most experienced professional.

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SCHOOL DROPOUT IN THE COUNTRYSIDE AND NEW EDUCATIONAL PROPOSALS

https://doi.org/10.56238/sevened2024.031-049

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ABSTRACT

In many rural areas, entire families often engage in hard work over long hours to ensure their livelihood. Especially on small farms, where the technology applied to production is sometimes obsolete, every help in the fulfillment of tasks is valued, including, not infrequently, child labor. This chapter examines the reality of children in rural areas and the factors that lead them to drop out of school, in addition to investigating the perception of families about access to education and the impacts of schooling in adult life. Education, as a fundamental pillar for human and social development, proves to be an essential tool in the search for more dignified and fair living conditions for these communities. However, it is observed that there are few studies and research that address this theme, revealing a significant gap in the available literature. To promote a deeper understanding of the dynamics that influence access to and permanence in school in the countryside, it is essential that there be greater investment in research and debates on the factors that contribute to school dropout in rural areas. This investigation is essential not only to inform more effective public policies, but also to foster educational practices that meet the specific realities and needs of rural communities. The study adopts a descriptive approach, based on reports of experiences of families in the region known as "Córrego da Perdida Grande", located between the municipalities of Tumiritinga and Capitão Andrade, in the state of Minas Gerais, Brazil.

Keywords: School dropout. Rural education. Family farming. Social development.

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INTRODUCTION

In many rural areas, entire families often engage in hard work over long hours to ensure their livelihood. Especially on small farms, where the technology applied to production is sometimes obsolete, every help in the fulfillment of tasks is valued, including, not infrequently, child labor. This chapter examines the reality of children in rural areas and the factors that lead them to drop out of school, in addition to investigating the perception of families about access to education and the impacts of schooling in adult life. Education, as a fundamental pillar for human and social development, proves to be an essential tool in the search for more dignified and fair living conditions for these communities. However, it is observed that there are few studies and research that address this theme, revealing a significant gap in the available literature. To promote a deeper understanding of the dynamics that influence access to and permanence in school in the countryside, it is essential that there be greater investment in research and debates on the factors that contribute to school dropout in rural areas. This investigation is essential not only to inform more effective public policies, but also to foster educational practices that meet the specific realities and needs of rural communities. The study adopts a descriptive approach, based on reports of experiences of families in the region known as "Córrego da Perdida Grande", located between the municipalities of Tumiritinga and Capitão Andrade, in the state of Minas Gerais, Brazil.

The demand for labor in the field leads children, from an early age, to perform rural tasks, ranging from feeding birds and irrigating gardens to more complex activities, such as milking, cattle management, harvesting and planting. In adolescence, responsibilities increase, prolonging the working day and causing school to be disregarded, since its schedule often coincides with that of essential activities.

According to OLIVEIRA (2008), it is essential to consider the role of the countryside within a vision of territorial development that is differentiated. This allows for the formulation of a rural education that not only asserts democracy, but also empowers individuals to claim their rights and position themselves as protagonists of their own stories. OLIVEIRA thus highlights the importance of integrating local knowledge into educational practices, allowing students to feel valued and connected to their culture. This approach is fundamental for strengthening the identity and autonomy of young people in the countryside. As highlighted by FERNANDES (2018), education is in continuous evolution, becoming one of the areas that have transformed the most over the centuries. The author emphasizes that, as it is a sector in constant change, education adapts to human development, ensuring its relevance. This dynamism allows the adaptation of curricula to local needs, promoting learning that

transcends the classroom and connects to the realities faced by students. Thus, education is configured not only as a path to insertion in the labor market, but also as a path to social empowerment and community transformation. While child-rearing is a priority for many families, it is important to recognize that not everyone shares this view, especially in challenging social contexts that limit access to and appreciation of education. In this context, CARNEIRO (2009) highlights that the advancement of the Brazilian educational system and the associated legislation have made free elementary and secondary education mandatory, configuring schooling as a shared duty between parents and the State. However, this responsibility is not yet reflected in the reality of all students, as many face obstacles in accessing and staying in school. In addition, education in its different stages is often not perceived as a goal by young people, evidencing the complexity of the educational scenario in Brazil.

The Perdida Grande Stream, located in the rural area between the municipalities of Tumiritinga and Capitão Andrade, in Minas Gerais, stands out for the relevance of family farming. This agricultural practice ensures the livelihood of local families and is fundamental to the region's economy. Despite recent innovations, such as the adoption of modern machinery and access to the internet, farmers still face significant challenges, such as scarcity of resources, difficulty accessing appropriate technologies, and lack of appropriate infrastructure. These obstacles impact agricultural production and, consequently, the quality of life of families, reflecting the need for strategies that ensure the sustainability and strengthening of family farming as an essential pillar for the community.

The intersection between the practice of family farming and the recognition of education as a fundamental aspect for the development of families is essential to understand the factors that contribute to school dropout in the region. The need for support in the field often leads families to prioritize work over education, since schooling is often perceived as an activity that does not offer an immediate prospect of improving living conditions. This reality highlights the importance of developing initiatives that integrate education with the needs of the rural community, promoting not only the permanence of young people in school, but also an education that dialogues with their experiences and challenges. By bringing the example of a family in the region, where three sons dropped out of school to help their father in tasks related to field management, and the only daughter, younger, shows complete disinterest in school activities, expressing her desire to leave school, even though she is still in the early years, it is possible to perceive the complexity of the educational situation in rural areas and the influence of the family environment. Furthermore, a significant portion of the families express varied opinions about the

permanence in agricultural activity. Many of them say they never even considered leaving the countryside, feeling deeply rooted in the traditions that shape their lives. On the other hand, there are those who nurture the dream of migrating to the United States, even though they are aware that opportunities there are also restricted to strenuous work activities. On the other hand, there are voices that claim that there is no sense in aiming for change, since their living condition is inherited from their ancestors and is perpetuated through the generations, forming a cycle that began with their parents and grandparents and that, it seems, will continue for many years. This scenario highlights the need for innovative and flexible approaches that integrate education with rural experiences, promoting a more promising future for children and young people.

For SILVA (2020), project pedagogy can be a way to solve the problems faced in rural education that lead to school dropout. In this context, it is essential that education is contextualized, reflecting the reality of rural communities and their specificities. The implementation of educational projects that dialogue with the experiences and challenges of students stimulates the appreciation of knowledge, promoting a learning environment that recognizes the importance of studies. In this way, it is possible to transform the perception of education as an essential tool for improving living conditions in the countryside, contributing to the formation of critical individuals who are aware of their rights.

Therefore, it is imperative that public policies be established that not only recognize, but also encourage contextualized education in rural communities. Project pedagogy, as pointed out by SILVA (2020), emerges not only as a methodology, but as a social commitment that aims to integrate education into the reality experienced by these families. Only through an approach that values and respects reality, experiences and local culture will it be possible to break the cycle of school dropout and promote a future in which rural children and young people can glimpse real possibilities for social ascension, contributing to the construction of a more just and equitable society.

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CONDEMNED BY THE MEDIA: INFLUENCE AND PERSPECTIVES OF CIVIL LIABILITY OF THE MEDIA FOR "PRE-CONVICTION" IN HIGH-PROFILE CRIMINAL CASES

https://doi.org/10.56238/sevened2024.031-050

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ABSTRACT

The objective of this article is to explore the influence of the media on public opinion in crimes of great repercussion, leading to the possible pre-conviction of the subject reported. Possible perspectives for holding the press accountable in the sphere of civil law will be addressed, after analysis and consideration of legal principles. The role of the media in the formation of public opinion will be analyzed, in addition to its influence on the perception of the guilt of the accused before a formal trial. To this end, concrete cases will be discussed, in order to illustrate how sensationalist and premature narratives, combined with the emphasis on emotions, can compromise the right to the presumption of innocence and the impartiality of the judicial process.

Keywords: Civil liability. Pre-conviction. Media. Cases of great repercussion.

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INTRODUCTION

The word "media" originates from the Latin term *medium*, adopted in the English language at the end of the nineteenth century and can be conceptualized as "the set of means of communication used by a society for the exchange of information" (LOPES *et al,* 2018).

With technological development over the years, the media has expanded and started to encompass any form of dissemination of information, whether oral, written, television, through social networks or other platforms that reach wide audiences. In this way, it has consolidated itself as a tool with significant influence in the formation and manipulation of opinions of large population groups.

In this regard, Lafer (1991, p. 201) states that "the right to information is a democratic freedom intended to allow an autonomous and equal participation of individuals in the public sphere". In fact, freedom of expression and the right to information are fundamental to modern democracy, especially in light of the restrictions imposed in historical periods marked by censorship and repression, such as the military dictatorship in Brazil between 1964 and 1985.

Over the years, the performance of the media has raised debates about the limits of this freedom, especially when its exercise, supported by article 5, item IV, of the Federal Constitution, clashes with other fundamental rights, such as the presumption of innocence, the right to an adversarial hearing and a full defense.

Frequently, news is broadcast in a fragmented or sensationalist way, decontextualizing facts, with the aim of attracting an audience and causing popular commotion. In high-profile criminal cases, these practices have the potential to directly influence public opinion, generating commotion and popular revolt and promoting "pre-convictions" that not only compromise the impartiality of the trials, but also generate irreparable damage to the image of those involved.

The growing demand for an audience in a society that is increasingly connected and eager for immediate novelties has intensified this practice, especially in intentional crimes against life, in which sensationalist coverage tends to induce hasty and distorted conclusions about events. In these cases, the press, by ignoring the right to an adversarial hearing and to a full defense, often offers the public a partial and biased version of the facts, without ensuring the multiplicity of perspectives and respect for the presumption of innocence, even generating the expectation of conviction of the accused regardless of the legal process.

The main consequence of this absence of guarantee is the limitation of people's ability to form their own judgments, since they are exposed only to a single version of the facts - chosen by the media - which facilitates adherence to the position conveyed by the media, forming a biased and biased opinion.

This article will address the impact of media action on the formation of public opinion and the social and legal consequences of a pre-conviction of accused individuals in high-profile criminal cases. Initially, the power of the influence of the media on the opinion of viewers will be analyzed, with emphasis on sensationalist coverage and preconceived narratives.

In addition, the expectation of condemnation generated by the media will be examined, preceding the due process of law, compromising the impartiality of the trial and affecting the right to image of the accused. Subsequently, legal principles that converge with each other will be exposed and debated, analyzing their prevalence in situations of pre-convictions.

Finally, the perspectives and legal bases for the civil liability of the media will be addressed, with the presentation of concrete cases, generating reflection on the limits and consequences of abusive practices by the media.

THE INFLUENCE OF THE MEDIA IN THE FORMATION OF PUBLIC OPINION

In this topic, one of the main forms of influence exerted by the media will be analyzed, which occurs through the construction of discourses and narratives. The media disseminates different worldviews, ideologies, values and stereotypes. These discourses and narratives have the potential to shape people's perception of reality, as well as to influence their thinking and behavior (ALVES, 2023, p. 4).

In this context, much of the media has been inserted in the legal sphere, especially with regard to judgments of great repercussion, that is, cases with greater gravity. In this regard, in the view of Sérgio Salomão Shecaira (SHECAIRA, 1995), the aforementioned fascination exerted by crime has two functions for the human being: firstly, it differentiates the "good man" from the criminal[5] and secondly, it manifests the factual incomprehensibility naturally inherent to the human person.

[5] According to Louk Hulsman and Jacqueline Bernati de Celis (1997, p. 56) the "traditional dramatic productions and part of the media tend to perpetuate the simple - and simplistic - idea that there are the good on one side and the bad on the other", evidencing a separation between good and evil.

Thus, considering that violence attracts the public, boosting the sale of newspapers and raising audience ratings, most of the information conveyed by the media focuses on the phenomenon of crime[6].

SENSATIONALIST COVERAGE AND THE FORMATION OF PRECONCEIVED NARRATIVES

Sensationalism, widely present in various media outlets and in Brazilian journalism, essentially consists of the exploration of themes capable of impacting and impressing the public, without any commitment to the authenticity of the facts (PEDROSO, 2001). In essence, it is about converting the truth into a "spectacle" (FILHO *et al*, 2022).

Thus, sensationalism is a set of communication tactics that seeks to create information capable of arousing the interest of the recipients (AGUIAR *et al*, 2016). In the same vein, in a sensationalist piece of news, its emotional and appealing charge is extracted so that they can be magnified, fabricating a new piece of news that after that starts to be sold by itself (FILHO, 1986).

Based on this, it is understood that, through strategic mechanisms, when conveying information, the press transforms viewers into targets to be reached, while the objective is to reach a larger audience through the impact and emotions caused by what is reported.

Thus, for this objective to be achieved, it is feasible to corrupt the authenticity of the facts, since the news is treated as a commodity, in order to transform a common fact into a flashy appearance, to generate a product and attract the attention of a large audience (FILHO *et al*, 2022).

Although freedom of the press is a fundamental prerequisite for any state that aspires to constitutionality and democracy, its use cannot occur indiscriminately, irresponsibly or recklessly. In so doing, several rights and guarantees guaranteed by the Brazilian Constitution will be violated.

That said, the press itself – with a few exceptions – that proclaims the need to respect the Constitution, is the first to disregard it, mistakenly making use of freedom of expression and the duty-right to inform in order to disseminate the most diverse news, without any prior verification of the veracity and credibility of the sources. In the context of sensationalist journalism, everything seems to be valid, as long as the story conquers an audience and generates profits. For Cláudio José Bahia (2008, p. 84), accepting this type of abuse of rights is "going back to the distant medieval time in which the figure of accuser, defender, judge and executioner was concentrated in a single person".

[6] Called, for a long time, as "brown press".

Sensationalist coverage, which is done selectively, therefore, by emphasizing certain aspects of a crime and omitting others, manipulates society's perception and directly influences legal decisions (OLIVEIRA *et al*, 2024). This makes the criminal process be transformed into a "spectacle", while it comes to be seen as an instrument of social control and immediate response to crimes that gain media notoriety.

In this way, the search for the truth, an essential characteristic of the criminal process, becomes challenging, which contributes to the expansion of factors that lead to misunderstandings and injustices in decision-making (PEREIRA, 2015), since, through appealing characteristics, the media shapes the opinion of the receiver, in order to create, with the support of sensationalism, stereotypes of criminality and violence (FILHO *et al*, 2022).

MEDIA NARRATIVE STRATEGIES AND THEIR INFLUENCE ON "SOCIAL PRE-CONDEMNATION"

The legal system is incumbent on the accusing State to demonstrate the guilt of the defendant, ensuring the right to an adversarial hearing and a full defense. The exclusion of individual rights and guarantees, as well as the imposition of sanctions without due process of law, is not admissible. This is the safeguard that no individual will be subjected to the consequences of a judicial decision without having been given the opportunity to participate effectively in the formation of the sentence (SOUZA *et al,* 2019).

Thus, the influence of the media is alarming, establishing a paradigm of criminality, punishment and judgment preceded by revenge, disregarding the analysis of the fundamental rights of individuals. This is because, with the increase in violence, issues related to public security and the judicial system began to be widely discussed in the social sphere, becoming one of the main topics addressed by the press.

However, the dissemination of violent and distorted images and news, which generate a significant impact, impresses viewers and intensifies feelings of insecurity and fear, resulting in the famous "culture of fear", which, fostered by the media, exerts a significant contribution to stereotyping, being intrinsically linked to the media criminology formulated by Zaffaroni[7] (2012). It is in times when society, already impacted by insecurity, such as the current one, that this culture gains space.

The intense coverage of certain cases, especially the emblematic ones, engenders a social demand for quick and rigorous responses, putting pressure on the legislator and the

[7] According to Zaffaroni, media communication about criminal facts is a kind of media criminology. He considers that the media is responsible for creating a stereotype of the criminal, associating physical, psychological and economic characteristics with the practice of a crime.

justice system - the so-called "criminal populism".[8] In this way, the media is not limited to reflecting, but also to reinforcing the idea that more severe punishments represent a synonym for increased security.

By sanctioning certain conducts, the State not only seeks to repress crimes, but also to signal to society that it adopts actions to maintain order and security. In this context, the media plays a crucial role in intensifying this symbolism, promoting a perception of justice that does not always match the reality of the facts.

Once the information is disseminated through the media, which are unaware of the structure and *modus faciendi* of the jurisdictional activity, society, stimulated and seduced by the information disseminated, positions itself in favor of the media, judging the case even before its due appreciation by the Judiciary (PEREIRA, 2013).

On the subject, Márcio Thomaz Bastos (1999, p. 115) states:

> (...) Judge hardly resists: there are decisions in which public order is made by pressure from the press. With the jurors it is worse: involved by public opinion, massively built by orchestrated and frenzied media campaigns, it is difficult to demand from them any other conduct than to follow the flow.

The consequences, according to the author, are disastrous (BASTOS, 1999): "Dozens of criminal cases, distorted and scrambled by this symbiosis, which destroys the possibility of reaching the truth or of doing justice".

In this regard, the author Ignacio Ramonet (2001, p. 45) argues that:

> In our intellectual environment, the truth that counts is the media truth. What is this truth? If, in connection with an event, the press, radio and television say that something is true, it will be established that it is true. Even if it's fake. Because from now on what the media as a whole believes as such is true. Now, the only means available to a citizen to verify whether information is true is to compare the discourses of the different media. So, if everyone says the same thing, there is nothing left but to admit this single discourse.

The media, in this sense, is not limited to informing, but also to influencing the social perception of what should be criminalized. Such a role becomes even more evident when news coverage turns defendants into guilty even before the verdict, imposing intense pressure on the judicial system.

Thus, the wide judicial media exposure results in the stigmatization of those involved, since it builds a narrative around the accused, presenting him as a villain in the eyes of society and compromising the principle of the presumption of innocence. In this way, the

[8] This concept refers to the implementation of criminal policies guided by popular appeal, often stimulated by sensationalist media coverage. The pressure exerted by the media can give rise to a legislative populism, in which the focus falls on quick and punitive responses, often to the detriment of essential principles of Criminal Law, such as proportionality and effectiveness of penalties.

dissemination of information alienates individuals, conditioning their reflections to what is exposed to them by the media, which present ideas and conceptions previously elaborated and concluded (NUNES, 2008, p. 53):

> The ideas, reflections and concepts of most people are supported, or rather, they are the result of a relationship between the ideologies present in society and personal convictions. People communicate and, increasingly, organize their points of view, with this they often form their opinions and make their choices based on what is informed to them through the media.

The media, by selecting certain cases for greater prominence, construct figures of enemies who need to be punished, creating pressure for the Law and the State to act in an exemplary manner, regardless of the complexity of the case, the reality of the facts and the analysis of the body of evidence.

Therefore, media influence can create an environment in which the defendant has already been convicted by public opinion and any judicial decision that does not follow this narrative is seen as unfair or insufficient. In other words, the power of the media can undermine trust in the judicial system and the fundamental rights of citizens.

THE EXPECTATION OF CONVICTION INDEPENDENT OF THE LEGAL PROCESS

Two of the basic principles of the Brazilian legal system are the principle of due process of law and full defense, essential when there is any legal discussion about convictions. Provided for in the Federal Constitution of 1988, in its article 5, item LIV, the principle of due process of law carries the title of a stony clause. In the context of criminal proceedings, both are extremely essential, since due process of law and full defense are the guarantee that all evidence is properly analyzed so that there is a fair conviction or, in the absence of these, the application of in *dubio pro reo* and the acquittal of the defendant.

In addition to these principles, another that proves to be very important is the principle of the presumption of innocence, which is defined by the famous phrase "everyone is innocent until proven guilty", taken directly from the Universal Declaration of Human Rights proclaimed by the United Nations General Assembly in 1948 (UNITED NATIONS, 1948), through its article 11[9]. This provision was mirrored in our Magna Carta, again in its article 5, item LVII, which defines that "no one shall be considered guilty until the final and unappealable criminal sentence of conviction".

[9]Article 11. Every human being accused of a criminal act has the right to be presumed innocent until his guilt has been proven in accordance with the law, in a public trial in which he has been assured all the guarantees necessary for his defense.

However, in practice, as already seen in the previous topics of this article, such principles are not always effective, in view of the media's lack of knowledge about the jurisdictional activity of the Judiciary and its nuances. Often one sees several reports reported by the media with titles such as "so-and-so committed homicide" on the same day that the alleged crime would have occurred, without even any legal process duly initiated, being still in the police investigation phase.

Such absence of due process prior to the publication of reports and news can seriously harm the defense of the defendants, demonstrating traces of bias, inducing the reader to understand that, regardless of the innocence or not of the individual, there is already the imputation and typification of the crime, a "pre-conviction". There is, in fact, an inversion of principles by the media, as if "innocent until proven guilty" now becomes "guilty until proven guilty", revealing a certain inquisitorialism in the media view. It is important to always emphasize that the influence of the media on the social perception of what should be criminalized is evident.

Such an expectation of conviction prior to any legal process is very harmful, directly influencing the public's understanding of the case. Even if the accused is acquitted in the future, the public view of the individual caused by the news will hardly be altered, since his opinions are rooted. Álvaro Felipe Oxley da Rocha (2008, p. 147) argues in relation to prior condemnation by the media "However, under the shield of "freedom of the press", the journalistic habitus in obsessive search for scandal produces many actions of collective and individual irresponsibility, extremely harmful to citizenship".

As it turned out, the media condemnation of cases harms a lot, causing several principled violations and even violations of fundamental and universal rights in criminal cases of great repercussion. The discussion about the conflict of essential constitutional principles caused by the media, however, is very deep, even related to civil liability, as will be seen in the next topic of this article.

LEGAL PRINCIPLES AND CIVIL LIABILITY OF THE MEDIA

The Federal Constitution of 1988 enshrines in its Title II (BRASIL, 1988) the fundamental rights and guarantees, subdividing them into five chapters that outline essential aspects of Brazilian democracy, acting as cornerstones of the modern legal system. Among these fundamental rights and guarantees are individual and collective rights; social rights; nationality; political rights and political parties.

In the doctrinal field, the evolution of the understanding of fundamental rights has led to their categorization into "generations", according to the order of historical recognition and

the nature of the interests protected by them. However, it is worth noting that the categorization of generations is nothing more than a historical organization, since the principles are indivisible and are not subordinated to each other.

The modern classification, widely accepted and debated, presents three major generations of fundamental rights, each of which represents a distinct stage in the development of legal guarantees and social requirements. As Manoel Gonçalves Ferreira Filho (1989) concludes, "the first generation would be that of the rights of freedom, the second, the rights of equality, the third, thus, would complement the motto of the French Revolution: liberty, equality and fraternity".

Thus, in this topic, a parallel will be drawn between the legal principles related to the right of personality and freedom of the press, how they relate to the concepts of civil liability, what are the perspectives of accountability of the media and the possibility of compensation, in addition to analyzing concrete cases, which interconnect and corroborate the factual exposition previously presented.

PRINCIPLE OF THE PRESUMPTION OF INNOCENCE *VERSUS* FREEDOM OF THE PRESS

As previously discussed, when it comes to the media's manifestation of criminal cases, there are often conflicts between various principles and fundamental rights. Freedom of the press is an extremely important and essential right for the good practice of democracy in society, being a very important aspect of the Democratic Rule of Law, as explained by the retired Minister of the Federal Supreme Court, Celso de Mello (n.d.):

> At this historical moment in which Brazil is situated between its past and its future, it is essential to emphasize the need to protect freedom of the press, since this political-legal prerogative, which is also a fundamental right of citizenship, represents one of the legitimizing assumptions of the very notion of the democratic rule of law.

Isabela Alves (2022) explains the concept of freedom of the press:

> Freedom of the press is fundamental to promote political and social change. The work of the press consists of producing information of interest to the whole society, such as denunciations in cases of corruption, the successes and failures of public policies and monitoring the work of the political groups that are in power.
> In addition, journalism also acts locally, that is, it updates citizens on the events in their region so that the population remains well informed and organizes itself in favor of changes for a better quality of life, when necessary.

As can be seen, freedom of the press is indispensable for the population to be properly informed of political issues and to monitor any issue on the subject. In addition, it is

important to mention the importance of updating citizens of regional and national events, keeping them well informed about events in the region where they live, as well as any relevant national and international event.

However, in the field of high-profile criminal cases, this principle clashes with another very important one: the principle of the presumption of innocence. Provided not only in the Federal Constitution but also in the Universal Declaration of Human Rights, the right to the presumption of innocence ends up being violated with several media statements, to the extent that the pre-convictions practiced by the press directly influence cases of, for example, Jury Trial. Considering that this Court discusses cases that involve human life, such as homicides, such cases generate extreme commotion, drawing the attention of the media.

However, when talking about a popular jury, we do not necessarily talk about jurists, since there is no need for any specific qualification for a person to appear on a jury (JURADOS, 2021). In this way, the jurors' understanding takes place, mostly, in facts presented to the jurors, either formally in a session of the Jury Court, or, previously, outside it, and the media can directly influence their view of the case analyzed.

Therefore, participating in a popular jury with an opinion formed about the case prior to the presentation of the accused's defense, brings up again the issue of media pre-conviction, not only by the press but also with its influence on the population. On this issue, Mendonça (2013, p. 377) says:

> It so happens that, lately, stripping oneself of prejudices, pre-judgments and previous experiences has been a challenge in the face of the appealing news broadcast by the media about intentional crimes against life. Since the people of the people - in their vast majority unenlightened people, targets of the mass media - will decide on the freedom of their fellow men in cases where there is a decision by the People's Jury, all the information sold by the media can greatly influence the jury's decision, making him act much more with the emotion and preconceptions disseminated by the media than with reason and impartiality in the evaluation of the information that is passed on to them during the trial.

It is necessary to limit the right to freedom of the press, so that there is no type of pre-condemnation by the media. Sidney Cesar Silva Guerra (1999, p. 80) talks about the limits of the media:

> (...) There is nothing to question about the role of the press. We do not dare here to raise the possibility of the non-existence of the press or of creating censorship of it. The question that must be asked consists exactly of the limits that the press can reach.

Thus, the media should not be censored, but limits should be imposed on freedom of the press. It is important to emphasize that there is no prevalence between one of the

fundamental principles and rights over another, there is no subordination, but rather the mutual coexistence between all in an equal way, that is, balancing the presumption of innocence and freedom of the press, making it clear through the media that the facts must be judicially ascertained so that any type of typified conduct can be carried out.

Freedom of the press is an essential principle for the Democratic Rule of Law, however there are several principled conflicts between this and the principle of the presumption of innocence, and the media can bring pre-convictions in reports, even affecting the trial of jurors in Jury Courts and the general understanding of the population about an individual prior to the legal process and any concrete conviction. With this, there should be a limitation of freedom of the press, not to cause censorship in the media, but to prevent such practice from violating fundamental principles, until there is a due final and unappealable judgment of the conviction.

OFFENSE TO THE PRINCIPLES OF HUMAN DIGNITY AND PROTECTION OF THE IMAGE OF THE ACCUSED

The Right to the Dignity of the Human Person stands out as one of the fundamental principles of the Brazilian Legal System, recognized as a second-generation right[10], since it is a right that reflects the essence of equality policies, requiring the State to act in order to ensure that all individuals have access to the basic conditions for a dignified life.

The dignity of the human person, therefore, is not limited to an abstract norm. The protection of this fundamental right imposes on the State the duty to adopt effective measures to reduce inequalities, ensure the existential minimum and promote social justice, in a permanent commitment to the transformation of constitutional ideals into tangible realities.

To understand the application of this principle in cases in which the media anticipates criminal trials, it is necessary to evaluate its definition, since the Brazilian legal system does not offer a precise and unified conceptualization. Due to this absence, the legal doctrine is in charge of providing different interpretations and approaches to the concept, the best known interpretations being those of Alexandre de Moraes and André Ramos Tavares.

According to the Minister of the Federal Supreme Court (MORAES, 2017):

[10] Second-generation rights, in turn, emerged at the beginning of the twentieth century as a response to the social demands arising from industrialization and growing economic inequalities, with the objective of seeking equality. Unlike the first-generation principles, these rights require positive action by the State, which must promote minimum material conditions for the realization of human dignity. This evolution deals with the inclusion of a new category of rights in the declarations of rights, addressing fundamental issues such as the right to work, health, education, social security, and protection against the adversities of life, such as illness and old age (CAVALCANTI, 1966, p. 202).

> A spiritual and moral value inherent to the person, which manifests itself singularly in the conscious and responsible self-determination of one's own life and which brings with it the claim to respect on the part of other persons, constituting an invulnerable minimum that every juridical statute must ensure so that, only exceptionally, limitations can be made to the exercise of fundamental rights, but always without underestimating the necessary esteem that all people deserve as human beings and the search for the Right to Happiness

In the same sense, the Minister of the Superior Electoral Court (TAVARES, 2017) states:

> Human dignity consists not only in the negative guarantee that the person will not be the target of offenses or humiliations, but also adds the positive affirmation of the full development of the personality of each individual. The full development of the personality presupposes, in turn, on the one hand, the recognition of the total self-availability, without interference or external impediments, of the possible actions proper to each man; on the other, self-determination (Selbstbestimmung des Menschen) that arises from the free historical projection of human reason, rather than from a predetermination given by nature.

According to the conceptions presented, human dignity transcends mere legal invulnerability, being, in fact, a spiritual and moral value almost intrinsic to man, which requires mutual respect and conscious self-determination (MORAES, 2017).

Thus, the legal system must ensure this "invulnerable minimum", without disregarding the importance of the free expression of human reason. With regard to the protection of the individual's image, Title II of the Federal Constitution, in its Chapter I (BRASIL, 1988), which deals with Individual and Collective Rights and Duties, as explained above, addresses the issue in a clear and forceful way:

> Article 5. All are equal before the law, without distinction of any kind, guaranteeing to Brazilians and foreigners residing in the country the inviolability of the right to life, liberty, equality, security and property, in the following terms: (...)
> V – the right of reply is ensured, proportional to the grievance, in addition to compensation for material, moral or image damage; (...)
> X – The intimacy, private life, honor and image of persons are inviolable, and the right to compensation for material or moral damage resulting from their violation is ensured; (...)
> XXVIII – The following are ensured, under the terms of the law: a) the protection of individual participation in collective works and the reproduction of the human image and voice, including in sports activities.

Thus, it is possible to infer from the legal text that, under the Brazilian legal system, every individual, regardless of their origins or actions, should be treated equally and have access to the protection of their fundamental rights, including those of image and intimacy. However, this normative provision often diverges from everyday reality.

As mentioned earlier, the violation of these rights has become an increasingly common practice, with the media often anticipating judgments and exposing personal information such as name, age, place of work, or image, even before guilt is legally proven.

This exposure without due process of law not only compromises the presumption of innocence, but can also cause irreparable damage.

It should be noted that media pre-condemnation is a dangerous practice, as it involves the risk of destroying essential aspects of a person's life – whether in their professional sphere or in the family sphere – without due certainty of their responsibility or guilt. In other words, by pre-condemning someone, the media takes the risk of ruining the life of an innocent person.

In short, it is possible to state, unequivocally, that the legal provisions of the Constitution, by establishing principles that ensure the fundamental rights of all individuals – whether they are suspected of crimes or not – make the dissemination of information that pre-condemns them a direct affront to the rights to human dignity and the protection of their image.

Therefore, those who practice such actions must be held accountable, although, unfortunately, no form of reparation can truly reverse the damage caused to the victims of this excessive exposure.

PERSPECTIVES OF CIVIL LIABILITY AND COMPENSATION BY THE MEDIA FOR PRE-CONVICTIONS OF THE ACCUSED

Since the beginning, life in society has generated constant conflicts of interest, especially when there is a violation of rights. Such conflicts, common to community life, result in attacks on the property of others, whether of a material nature, such as tangible goods, or of an immaterial order, which may involve the honor, privacy and reputation of people.

The word "responsibility" originates from the Latin *respondere*, bringing the idea of a security or guarantee of compensation for an asset that has been harmed or sacrificed. For Venosa (2019, p. 444), the term liability "is used in any situation in which some person, natural or legal, must bear the consequences of a harmful act, fact or business". The principles of civil liability seek, therefore, to restore a violated patrimonial and moral balance, since an unrepaired loss or damage is a factor of social unrest.

Entering the Brazilian legislation, it is extracted from arts. 186 and 927, of the Civil Code, the foundations and essential elements inherent to civil liability. Article 186 of the Civil Code (BRASIL, 2002) establishes that "anyone who, by voluntary action or omission, negligence or imprudence, violates rights and causes damage to others, even if exclusively moral, commits an unlawful act". Based on this provision, the essential elements of civil liability stand out: the action or omission of the agent, the fault or willful misconduct, the

causal link and the damage suffered by the victim. Article 927 of the Civil Code (BRASIL, 2002) teaches that "anyone who, by an unlawful act, causes damage to another, is obliged to repair it".

The characterization of civil liability may result from the non-compliance with a previously existing obligation between two parties, or even from the non-compliance with a legal duty, without there being a prior legal link between the one who caused the damage and the one who suffered it. The civil law, despite regulating a large number of special cases of strict liability (the one in which proof of guilt is not required), has been affiliated, as a rule, to the subjective theory. This institute is based on the assumption of latu *sensu guilt*, that is, the assessment of the presence of intent or fault in the conduct of the agent, who caused damage. For Cavalieri Filho (2010, p. 73), "damage is the subtraction or reduction of a legal good, whatever its nature (...)".

It can be said that the institute of civil reparation has a threefold function, which is to compensate for the damage suffered by the victim, punish the person responsible for the harmful act and socially discourage the practice of harmful conduct. Thus, the civil liability of the media in cases of pre-conviction proves to be a subject of great legal complexity, as it involves the subsumption of the fact to the norm, along with the examination of the right to freedom of expression and information, as opposed to the fundamental rights of individuals, such as presumption of innocence, dignity of the human person, due process, and protection of image and honor.

Having his principles and rights violated, could the accused hold the media civilly liable for the abuse of rights and interference in the due process of law? The right to inform and the role of the media as a vehicle of public interest are undeniably essential to democracy. However, excessive or sensationalist use of media coverage can result in abuses that compromise not only the reputation of the accused, but also the very impartiality of the judicial process.

The media initiates public scrutiny on how a high-profile case is being handled in the criminal justice system, and can influence the case's trial procedure, which includes the process of gathering and presenting evidence, as well as witnesses and other important court elements in a trial.

In the words of Judge Victor Ferreira, in the judgment of Infringing Motions No. 2011.052587-4 (BRASIL, 2011), in Florianópolis, "civil liability arising from abuses perpetrated through the press encompasses the collision of two fundamental rights: freedom of information and the protection of personality rights".

At this point, in order to address the liability of journalists who produce and exploit content with sensationalist content, it is always necessary to observe one of the essential elements for the characterization of civil liability: conduct. In order to prove damage and the consequent duty to indemnify, it is essential to investigate the conduct of the journalist or disseminator of the fact, in addition to the existence or not of fault in his action or omission.

When the agent chooses to narrate, tell or disseminate such news of great relevance, it is up to him to decide which headline will be used or which information will be broadcast, that is, he is free to choose how a certain fact will be transmitted to the public, so that, choosing the vexatious and offensive way, violating the right, honor and image of others, Intentional intent would be characterized by the intention of causing commotion and affecting the rights of the accused, regardless of the reality of the facts or the existing body of evidence.

Furthermore, it is understood that the journalist is the one who decides what information is contained therein, its relevance, the language to be used, making any damages resulting from this choice fall directly on the media outlet responsible for the broadcast. From another perspective, when disseminating such vexatious news or headlines — often untrue — and realizing that they cause a feeling of revolt in the population, which starts to clamor for the conviction of the accused, the decision to keep them on the air may constitute an omission, and is also one of the requirements for civil liability.

As a result, when the spread of untrue and vexatious news begins, the population starts to focus exclusively on the reported facts, without paying attention to the veracity or filtering the information received. Often, what happens is the presentation of the accused as guilty, without respecting the principle of the presumption of innocence or *in dubio pro reo*. The public allows itself to be influenced solely by what is propagated by the media, so that they start to have a biased view of the case, regardless of whether the body of evidence would be sufficient to lead to a future conviction of the accused.

Moved by a common sense of justice, many clamor for conviction, which can hinder the formation of a totally impartial jury at the time of trial, compromising the final result and violating several legal principles provided for in the Magna Carta and previously cited in this article. In addition, it is common for the media to rescue old facts from the life of the accused in an attempt to reinforce the previously disclosed narratives, even when these facts have no connection with the crime allegedly committed, distorting his image. This informative bias, which sometimes influences public opinion and the progress of the trial,

stems directly from what is promoted by the media, generating the causal link between the conduct and the damage suffered by the accused.

Therefore, the action or omission is translated by the dissemination of headlines that seek to treat the accused as guilty, or, in the case of omission, not to remove them from the air in the face of a negative result on the part of the public; the damage such as the destruction of the image and honor of the accused and his conviction in the face of the bias to which the jurors are subjected, regardless of the veracity of the facts and set of evidence; a causal link that connects the first two elements, since, if there were no disclosure by journalists, sensationalism and the treatment of the suspect as convicted, there would be no harmful result, since a fair trial could occur, without preconceived ideas and within what is prescribed by the fundamental legal principles, such as adversarial and ample defense and the presumption of innocence.

Thus, it is feasible that the defendant, when his image and dignity are compromised, seeks to hold the media responsible for the damages suffered, claiming compensation for moral damages. Such a request is justified by the direct impact on his honor and the extent of the damage, materialized in the losses arising from the public trial promoted by the media. Even if the accused is later acquitted, the stigma remains indelible, being continuously associated with the headlines and disclosures published, which, by propagating erroneous or distorted information, compromise his reputation and his life definitively.

In this regard, citing the original judgment of the appeal[11], the Honorable Minister Carmen Lúcia (BRASIL, 2013) states "in the presence of the violation of the right of personality, caused by abuse in the exercise of freedom of expression and information, the reparation of the corresponding damage is imperative". The media and journalists involved may even be held jointly and severally liable for the losses resulting from their performance, when they jointly contribute to the unleashing of the damage.

It is concluded, therefore, that when they meet the criteria of civil liability — willful misconduct, conduct, damage and causal link — based on the disclosure of sensationalist, untrue or biased information, with the intention of fueling public commotion and influencing the perception of the case, there is a configuration of the duty to indemnify, in view of the compromise not only of the right to honor and image of the accused, but also because it affects the right to a fair and impartial trial.

[11] Extraordinary Appeal, RE 646671/AL

FROM ACCUSATION TO CONVICTION: ANALYSIS OF CONCRETE CASES

In order to address the complex relationship between media action and the pre-conviction of defendants, it is essential to analyze concrete cases, which illustrate the effects of the public exposure of defendants before the final judgment of mainly criminal cases. The observation of practical examples allows us to verify how media openness can influence public opinion and, potentially, the judgment of a given case, putting in check the impartiality of the process and the rights and principles favorable to the accused, such as the presumption of innocence.

Through emblematic and widely reported cases, it is possible to identify patterns of media behavior and the legal consequences that arise from these practices. This topic, therefore, examines real-world examples in which sensationalist disclosure anticipated the outcome of trials before the public. The path from prosecution to conviction in cases of great media repercussion, whether national or international, shows how the public exposure of processes is a dangerous element and can take away the most precious asset of the accused: their freedom.

For Wermuth (2015, p. 15), "the media represent important mechanisms of the consumer society which, in turn, transforms the fear of crime into a commodity of the cultural industry". This time, the broadcasters and the media would be feeding the public's thirst for sensationalist news, transforming it into a cultural commodity, even aiming at financial results.

O Evandro case

In the Brazilian legal scenario, the Evandro Case, popularly known as the case of the "Witches of Guaratuba" that occurred in 1992, is a notorious example of the deleterious impacts that media sensationalism can cause in the procedural sphere and in the public perception of justice. On 04/06/1992, the minor Evandro Ramos Caetano disappeared in the city of Guaratuba, located on the coast of Paraná. From the beginning, the disappearance attracted wide media coverage, which intensified after the child's body was located in a thicket near his residence five days later, showing evident signs of violence and mutilation, with missing limbs and organs, which contributed to an immediate social commotion.

From the identification of the body, speculation arose about the involvement of Celina Abagge and Beatriz Abagge, respectively wife and daughter of the then mayor of Guaratuba/PR, Aldo Abagge, in the crime. Rumors circulated that the murder would have

occurred in the context of a "black magic ritual" offering the blood, organs and limbs of the minor as an offering, with the purpose of promoting the growth of the family in politics.

Based on assumptions and without concrete evidence, the media began to publicize them as "witches", imputing to them religious practices contrary to Catholic values, which would have motivated the alleged ritual of sacrifice. Along with them, five other men - pais de santo - would have participated in the crime, and would also be responsible for the death of the minor. Such a narrative quickly made headlines in several national media outlets, attributing value judgments and exploiting the case from a sensationalist perspective. The resulting social repercussions generated pressure on the justice system and the police forces which, without robust evidence, promoted the arrest of the seven suspects in July 1992.

Headlines with popular appeal were disseminated, with titles such as "Witches will be released in Praça Popular", which was on the cover of the newspaper Diário Popular[12], on 08/07/1992, in which the State Secretary at the time stated that he would release the accused so that the population could chase them in the public square. Another sensationalist headline was the cover of Manchete Magazine[13], which had the title "This boy was the victim of a satanic crime".

The partial media treatment of the case fostered a climate of hysteria and moral panic in the population, consolidating a public opinion that presumed the guilt of the accused based solely on their beliefs, even before the trial began. As a result, the media not only distorted public perception of the facts, but also directly influenced judicial and police authorities, weakening the defendants' rights to an impartial and fair trial.

There were several factors that led to the process of mediatization of the Evandro Case, one of the main ones being the fact that suspicions fell on two women of high social position, something that shocked the society of the time and further fed the narrative of a barbaric crime in the name of a supposed subversive cause contrary to traditional values. The intense media coverage and sensationalist focus of the national press led to a series of procedural violations, including the torture of the accused to obtain confessions, in response to public pressure for a punitive resolution, even in the absence of conclusive evidence.

Media speculation, political disputes and spectacularization of the criminal process resulted in the conviction of the seven accused for the crime, after the longest jury in Brazil, with the principle of *in dubio pro reo being completely ignored*, since both society, the media

[12] https://www.projetohumanos.com.br/wikipedia/episodio-02/
[13]https://pipocamoderna.com.br/2019/06/diretor-de-ferrugem-prepara-serie-baseada-no-podcast-do-caso-evandro/1992-07-18-manchete-01/

and the prosecution tirelessly sought the guilt of the suspects, despite the insufficiency of evidence.

It was only in 2023 that the Court of Justice of the State of Paraná recognized the irregularities in the investigations and trial, annulling the convictions imposed on those accused of the disappearance and death of Evandro Ramos Caetano. This case exemplifies in an emblematic way the harmful effects of media sensationalism, which compromises the presumption of innocence of the accused and contributes to the construction of harmful narratives of cases that have not yet been properly judged.

O Caso Amanda Knox

At the international level, the case of Amanda Knox can be cited, an example to demonstrate the harmful impacts of media exposure and sensationalism in the course of criminal proceedings. Accused of murdering her roommate, Meredith Kercher, during her exchange in Italy, in the city of Perugia, in 2007, Amanda and her boyfriend Raffaele Sollecito, were quickly arrested and charged with involvement in the crime. Her name emerged as a suspicion after a series of sensationalist articles were linked to her, placing her in a negative light, resulting from the lifestyle she had, attacking her nature, sex life and personality.

Amanda was constantly called a *"femme fatale"* (cold killer), as well as accused by the media of being a drug user and practicing that got out of control. In addition, the fact that the accused stayed for long periods of time at Raffaele's house, whom she had just met, was treated by the press as libertine and promiscuous acts.

Even without indications or conclusive evidence of involvement in the case, the media coverage and consequently the population did not rest until they saw Amanda and Raffaele sitting in the dock, tried for the crime of murder. As a result, in 2009, both defendants were convicted of the crime. Subsequently, in 2015, the former couple was acquitted and released, after finding flaws in the trial and insufficient evidence.

It can be seen, therefore, that the media actions, through penal populism, convey a Manichean idea in relation to the criminal and prison system, in which the victim is transformed into a hero and the suspects into villains with no chance of redemption. This perspective is opposed to democratic and constitutional principles, since it is not up to the press to formulate value judgments, and its primary role is in the dissemination of information. (FERNANDES; ROCHA, 2015, p. 120-121).

FINAL CONSIDERATIONS

From the present work, it was possible to show that the vast media power is capable of influencing the masses and can end up leading to the conviction of innocent people, even before their trial. Thus, it was observed that the incessant search for the hearing, combined with the sensationalist and selective approach to information, leads to the pre-conviction of the accused, compromising the fundamental principles and rights protected by the Federal Constitution, such as the presumption of innocence, the dignity of the human person and the impartiality of the trial.

The central role of media coverage in shaping collective perceptions was highlighted and how the media, by emphasizing certain aspects and omitting others, constructs stereotypes that modify the reality of the facts. In addition, the spectacle set up by the media transforms the figure of the accused into a villain, violating his dignity and generating moral damage that can be perpetuated even after acquittal. Through the pressure of the media, the exercise of due process becomes difficult.

From the analysis of Legal Principles and Civil Liability of the Media, it was concluded that the media, by infringing fundamental rights, can be held civilly liable for the damages caused. As explored, the legal principles of freedom of the press and the right to dignity must coexist in a balanced way, in order to ensure that the disclosure of information relevant to society does not violate the personality rights of the accused. The application of civil liability, in this sense, emerges as an important tool to repair any damage to the image and dignity of the accused and, at the same time, to encourage more ethical and respectful communication practices.

Finally, with the analysis of concrete cases, such as the Evandro case, in Brazil, and the Amanda Knox case, on the international scene, the irreparable damage that media pre-conviction can cause are exemplified. These cases show how much a narrative preconceived by the media can compromise the right to a fair trial and influence society's own verdict, regardless of the judicial decision.

Therefore, it is essential, although challenging, that the way in which the facts are addressed by the media be substantially modified, since, if on the one hand there is, unquestionably, the right and even the duty to inform society about relevant events, on the other hand, it is equally imperative that this exercise be conducted in order to preserve the dignity and life of the people mentioned in the reports. From another perspective, it is equally necessary that police authorities, lawyers, members of the Public Prosecutor's Office and magistrates do not allow themselves to be intimidated by media pressure and perform their functions with serenity and respect for the individual.

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RECREATIONAL MATHEMATICS IN THE TRAINING OF MATHEMATICS TEACHERS FROM THE PERSPECTIVE OF THE THEORY OF OBJECTIFICATION

https://doi.org/10.56238/sevened2024.031-051

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ABSTRACT

Recreational Mathematics is a methodological approach in Mathematics Education and involves games, puzzles, Recreational Problems, topological curiosities, magic, art, origami, in addition to other tasks of a playful-pedagogical nature. Thus, our research aimed to investigate the contributions of Recreational Mathematics to the training of Mathematics teachers, using the Objectification Theory as a theoretical and methodological basis. To achieve our objective, the methodology used was qualitative and exploratory. In this way, we are based on the theoretical-methodological references of authors who deal with Recreational Mathematics and the Theory of Objectification, such as Bártlová (2016), Nunes (2019), Bezerra (2021; 2022; 2023) and Radford (2018; 2020; 2021). The results demonstrated the interrelationship between the Objectification Theory and Recreational Mathematics, evidencing its implications in teacher training and future pedagogical practice.

Keywords: Recreational Mathematics. Theory of Objectification. Mathematics Teacher Training.

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INTRODUCTION

Teacher training is a complex process, however, crucial for the development and professional performance of the Mathematics teacher. In addition, both the initial and continuing training of teachers are marked by problems such as the distance between research, teaching and extension, in which it strengthens educational practices that dissociate theory from practice (Albuquerque; Gontijo, 2013). For the authors, the non-incorporation of research results in the area of Mathematics Education disfavors teacher training.

We defend an emancipatory education, where teachers are understood as unfinished human beings, in movement and in constant evolution; for this, we chose the Theory of Objectification as a theoretical-methodological contribution. Why the Theory of Objectification? Because it is a theory of teaching and learning belonging to the field of contemporary sociocultural theories, which considers learning as a simultaneous process, in which teachers and students work collectively, for the mobilization and encounter with knowledge (objectification process) and the transformation and co-production of subjects (subjectivation process), idealized by professor and researcher Luis Radford.

The Theory of Objectification can offer Mathematics teachers in initial and/or continuing education opportunities to think, dialogue and produce reflections on teacher training based on the fundamental principles of joint work and Community Ethics. From this perspective, the Theory of Objectification offers modes of human collaboration, responsibility, commitment and care for the other.

Thus, a methodological approach in Mathematics Education that we chose to work on in the training of Mathematics teachers, based on the Theory of Objectification, was Recreational Mathematics that can contribute to more general purposes, for example: to promote learning; relate contents studied in the classroom with the History of Mathematics; to provide entertainment and enthusiasm, inside and outside the classroom, and to serve as a means of popularizing Mathematics. However, we want to highlight some potentialities that Recreational Mathematics can promote in pedagogical practice: pleasure, joy, fun, and other positive dimensions in the classroom (Bezerra, 2021).

In this context, Recreational Mathematics provides a variety of tasks of a recreational, pedagogical and historical nature that can be used at different levels of education. In this way, it presents itself as an important methodological approach to show students that Mathematics can be fun and pleasurable. Therefore, the use of this tool in classes can promote changes, both in the structure of the classroom, as well as in the way

of teaching and learning mathematical content, showing the playful and creative side of Mathematics.

As for the insertion of Recreational Mathematics in the teaching of Mathematics, it is justified, not only aiming at the application and/or exploration of specific contents of Mathematics, but aiming at the development of skills such as: concentration, persistence, intuition, creativity and dialogue that will help prepare students, not only for more advanced levels of schooling, but to act as critical citizens, reflective, conscious, and participative in the face of the challenges that life proposes to them (Bezerra, 2021; 2022).

In this circumstance, we intend to present and propose the Theory of Objectification and Recreational Mathematics in the training process of Mathematics teachers, based on the principles that involve joint work and Community Ethics.

Thus, considering the arguments exposed, the guiding question of our investigation is: *what contributions of Recreational Mathematics to the training of Mathematics teachers, having as theoretical-methodological support the Theory of Objectification?* In this context, to answer this question, the central objective of the investigation was to *investigate the contributions of Recreational Mathematics to the training of Mathematics teachers, using the Objectification Theory as a theoretical and methodological basis.*

As can be seen, the set of ideas and choices outlined so far is based on the articulation between the Theory of Objectification and Recreational Mathematics in the training of Mathematics teachers. Next, we will present a deepening of these two theoretical axes.

OBJECTIFICATION THEORY AND RECREATIONAL MATHEMATICS

Our theoretical-methodological options are based on the Theory of Objectification and Recreational Mathematics from researchers such as Bártlová (2016), Radford (2018; 2020; 2021), Bezerra (2021; 2022; 2023), Paiva and Bezerra (2024), Bezerra and Silva (2024), among others; that seek in their studies and research, to promote a reflection on the practice of the Mathematics teacher regarding their professional skills, their social role as an educator and the ability to insert themselves in the various realities with sensitivity to interpret the actions of the students.

The Theory of Objectification (OT) is a contemporary sociocultural educational theory, inspired by the philosophical works of Hegel (1770 – 1831), Marx (1818 – 1883), contemporary philosophers such as Ilyenkov (1924 – 1979) and the historical-cultural school of Vygotsky (1896 – 1934).

> The Theory of Objectification (OT) is situated in a different educational project: it sees the objective of Mathematics Education as a political, social, historical and cultural effort that aims at the dialectical creation of reflective and ethical subjects who take a critical position in historically and culturally constituted mathematical discourses and practices, and who ponder new possibilities of action and thought (Radford, 2021, p. 38).

The Theory of Objectification brings contributions to the organization of teaching practice in Mathematics Education and is applicable, in general, in Education. The Objectification Theory considers learning as a simultaneous process, in which teachers and students work collectively – Joint Labor (Radford, 2020).

Learning Mathematics involves emotions and affections in ways that affect us as human beings. For this reason, in the classroom, we not only produce knowledge, but also subjectivities. The processes of subjectivation, in turn, are those of the incessant creation of the subject, the continuous creation of a historically and culturally singular, unique subject (Radford, 2018).

The Theory of Objectification elaborated a concept of activity in the classroom coherent with a historical-cultural view of the human being. Activity is, therefore, the process by which knowledge is materialized in knowledge. This activity actualizes knowledge and brings it to life (Radford 2020). Thus, what makes learning possible is human and practical activity. In this way, the processes of objectification and subjectivation occur simultaneously in a continuous and intertwined way during the activity considered social, historical and cultural.

The classroom activity, according to Radford (2020), is called joint labor. Thus, joint labor is the main ontological and epistemological category of the Theory of Objectification, considering the classroom activity as its unit of analysis. However, the role of language, signs, artifacts and the body is not discarded in the processes of transformation of knowledge into knowledge. In this theory, language, signs, artifacts and the body are understood not as mediators, but as part of the activity of individuals.

Joint Labor, according to Bezerra (2021), is the work by which teachers and students assert themselves in their production and act as human beings in what they do, therefore, joint Labor is the type of activity that is not alienating, as its characteristic is the practice of a Community Ethic and it is this ethics that guides the didactic action in Mathematics classes.

From the perspective of the Theory of Objectification, there is the possibility of thinking about the teaching and learning of Mathematics, incorporating the ethical dimension with the understanding of didactic relations and the constitution of subjectivities. Community Ethics is based on three vectors: responsibility, commitment, and care for others (Radford, 2021). Community Ethics can allow forms of collaboration that are granted

to the extent that there is a commitment to work together, to care for others and to assume responsibility towards others.

Recreational Mathematics is a methodological approach in Mathematics Education that we have chosen to work on in the initial and/or continuing training of Mathematics teachers. Recreational Mathematics, in turn, is a strand that can associate Problem Solving, the use of Games, the History of Mathematics, Investigations and Argumentation in Mathematics, Digital Technologies, among others.

Recreational Mathematics can be an important methodological approach to the teaching of Mathematics, because it can be seen as a playful way of presenting Recreational Problems, games, puzzles, in addition to other tasks of a playful-pedagogical nature and not only for fun, but also to arouse curiosity and the challenge to develop logical-mathematical reasoning (Bezerra, 2022). In this sense, its use can contribute to making Mathematics classes more dynamic and collaborative for students, and helping them to perceive Mathematics as a science, whose practice can be pleasurable.

Costa (2014), presents us with the following definition of Recreational Mathematics: "[...] recreational mathematics is that mathematics that challenges us to think, entertains us and amuses us when we think about it" (2014, p. 6). As Nunes (2019, p. 23) argues, "Recreational Mathematics (MR) is a part of the usual mathematics, "serious" mathematics, which carries a trace of fun". In this way, Recreational Mathematics can serve as a bridge for the elaboration of mathematical concepts and its scope goes beyond games, puzzles, problems, challenges and competitions, as Recreational Mathematics is very broad in the field of Mathematics.

Recreational Mathematics is on the border between the four aspects: the scientific-popular, the fun (entertainment), the pedagogical and the historical – which are interconnected and influence each other. The four aspects overlap considerably, so that there are no clear boundaries between them and serious mathematics (Bezerra, 2021).

The scientific-popular aspect makes Recreational Mathematics fun and popular, that is, the corresponding problems must be understandable to an interested layman, although the solutions may be more difficult. In the context of the second aspect, fun (entertainment), Recreational Mathematics is understood as a Mathematics that is used as a detour to serious Mathematics, that is, for fun.

In the third aspect, the pedagogical one, Recreational Mathematics can be used for teaching purposes. Recreational Mathematics can provide a variety of problems for investigations in the training of Mathematics teachers and in the classroom in Basic Education. The historical aspect refers to the fact that Recreational Mathematics is old and

there are indications that this tool originated thousands of years ago (Bartlová, 2016). Another meaning that we can attribute to the historical aspect is the possibility of being able to use Recreational Mathematics tasks to study the History of Mathematics.

It is important to highlight that the Objectification Theory helps to materialize Recreational Mathematics in the classroom, for example, Recreational Mathematics tasks are, in general, open, because they help to promote a deepening of mathematical thinking in relation to a certain content; it stimulates collective discussion and motivates: student participation in the process; in the interaction with knowledge, with other colleagues and the teacher, and in reflections on the actions carried out in the problem-solving process. In addition, Recreational Mathematics can contain elements of a historical and social nature that promote the discussion of ethical and reflective positions, among others.

To guide the elaboration of the main tasks of Recreational Mathematics: mathematical games, mathematical puzzles and Recreational Problems, the Theory of Objectification was in charge. Thus, to present Recreational Mathematics to the students of the Mathematics Degree Course, at the Federal Institute of Rio Grande do Norte (IFRN), Ceará-Mirim Campus, aiming at the knowledge of this methodological approach and its application in the classroom.

Therefore, Recreational Mathematics tasks should provide didactic possibilities beyond the playful, recreational, and motivational aspects, focusing on mathematical investigation, problem-solving strategies, in addition to inducing the search for strategies and exploring mathematical concepts involved in the tasks (Bezerra, 2022; 2023). The teacher must feel prepared to elaborate the Recreational Mathematics tasks and explore them in the classroom.

In the next section, we present the methodology of this research.

METHODOLOGY

The work developed in this study is characterized by a methodological-qualitative approach, of an exploratory nature, because according to Gil (2008, p. 41), this type of research "[...] aim to provide greater familiarity with the problem, with a view to making it more explicit or to constitute hypotheses".

Therefore, it is a qualitative research that presents a methodological alternative by proposing the Theory of Objectification as a theoretical-methodological framework. The Theory of Objectification presents its own methodology for the analysis of the teaching and learning process and in the understanding of how students become aware of scientific

knowledge and position themselves critically and ethically during and after interactions in the classroom.

The research was developed in 2023, with the undergraduates of the Mathematics Teaching Degree Course, enrolled in the disciplines of Mathematics Teaching Methodology I and II, at the Federal Institute of Rio Grande do Norte (IFRN), Ceará-Mirim Campus. Thus, we developed our research, according to the following steps.

- Theoretical study on Recreational Mathematics, for this, we carried out a bibliographic survey in Theses and Dissertations on the website of the National Base of the Digital Library of Theses and Dissertations (BDTD).
- Selection of Recreational Mathematics tasks in Theses and Dissertations related to Recreational Mathematics, to constitute a corpus to present to Mathematics teachers, in initial training.
- Analysis, creation, construction and application of Recreational Mathematics tasks from the perspective of the Objectification Theory.
- Analysis of the results produced during the research in the light of the fundamental principles of joint labor and the Community Ethics of the Theory of Objectification.

Therefore, we will present the results and discussions of this research.

RESULTS AND DISCUSSIONS

In this section, we present the results of some actions that were developed in the disciplines of Mathematics Teaching Methodology I and II, using Recreational Mathematics tasks based on the Theory of Objectification, in the Mathematics Teaching Degree Course, IFRN, Ceará-Mirim Campus, in the initial training of Mathematics teachers.

In 2023, we carried out a bibliographic survey of Theses and Dissertations to learn more about research related to Recreational Mathematics. Subsequently, the most relevant studies to our study were analyzed (Costa, 2014; Bartlová, 2016; Nunes, 2019; Bezerra, 2021). Thus, we obtained the conceptions and aspects of Recreational Mathematics, the main tasks of Recreational Mathematics (games, mathematical puzzles and Recreational Problems), as well as works and authors that contributed to the dissemination of Recreational Mathematics. Thus, the theoretical bias on Recreational Mathematics is one of the contributions of our research.

Following the readings and reflections related to Recreational Mathematics, it was possible to observe that some of the studies already bring experiences of tasks applied in the classroom at different levels of education (Bezerra, 2021). In this way, we have the

material of Recreational Mathematics to present to Mathematics teachers, in initial training, having as a theoretical-methodological contribution the Theory of Objectification.

Thus, in the disciplines mentioned above, we work with tasks involving the Game Cover Twelve, Tangram, Tower of Hanoi, Origami, Recreational Problems extracted from the work *Problems to stimulate young people* by Alcuin of York (735 – 804), the work *De Viribus Quantitatis* by Luca Pacioli (1445 – 1517), the work *Liber Abaci* by Leonardo Pisano (1170 – 1250) and the work *The Man Who Calculated* de Mello e Sousa – Malba Tahan (1895 – 1974), so that teachers in initial training understand mathematical content and the potential of Recreational Mathematics. In this perspective, Bártlová (2016) states that games, puzzles and Recreational Problems satisfy the need for fun, joy and pleasure, in addition to the desire to achieve mastery over challenging subjects, or simply test our intellectual capacities.

In this way, by incorporating Recreational Mathematics into their methodologies, teachers can develop more dynamic and collaborative didactic approaches. This fosters a learning environment where students feel more motivated to participate and explore mathematical concepts.

With regard to the development of Recreational Mathematics tasks, we were able to observe potentialities that Recreational Mathematics promotes: joy, pleasure, motivation, entertainment, enthusiasm and fun. A diversion that can provide an experience of cooperation between Mathematics Degree students, thus facilitating the awareness of the mathematical elements mobilized in the joint Labor (Bezerra, 2021). In this way, the activity in the classroom is seen as a joint work of teacher-students and student-students and supported by a Community Ethic.

We observed that the Mathematics undergraduates, during the development of the Recreational Mathematics tasks, worked through the shoulder to shoulder activity (Joint Labor), with commitment, dialogue, responsibility and care for the other. Commitment to the fulfillment of the task, respect, care for others and responsibility (response) towards the other, which Radford (2021) calls Community Ethics.

The Theory of Objectification values the joint work between teachers and students, favoring knowledge and the transformation of the subject. Therefore, we reaffirm the importance of the Objectification Theory for our investigation, mainly as an object of pedagogical reflections so that Mathematics teachers can get to know Recreational Mathematics and position themselves on how and why this methodological approach should be present in Mathematics classes.

In view of the above, we highlight some contributions of Recreational Mathematics to the training of Mathematics teachers from the perspective of the Objectification Theory: to offer teachers a notion of what the Objectification Theory and Recreational Mathematics are; the Objectification Theory contributes to the training of more critical and reflective teachers, in the improvement of the quality of Mathematics teaching and learning, in addition to the expansion of the use of pedagogical methods in public schools; work on recreational, historical and pedagogical aspects of Recreational Mathematics; development of mathematical topics; logical reasoning; playful, recreational and pedagogical character and; possibilities and proposals for the insertion of Recreational Mathematics tasks in the training of Mathematics teachers.

As a result, we expect that Mathematics teachers acquire skills and abilities to use Recreational Mathematics tasks in a critical and responsible way. In addition, understand the potentialities, advantages and disadvantages of implementing Recreational Mathematics in the Mathematics classroom, with the objective of improving the quality of teaching and learning.

CONCLUSION

In this work, we seek to broaden the view on the following question: *what contributions of Recreational Mathematics to the training of Mathematics teachers, having the Theory of Objectification as theoretical-methodological* support?To answer it, we outlined as our main objective: *to investigate the contributions of Recreational Mathematics to the training of Mathematics teachers, using the Theory of Objectification as a theoretical and methodological basis.*

The Theory of Objectification provides a new perspective for teacher education, understanding it as a dynamic, collective and creative process. This approach has the potential to produce modes of human collaboration and interaction that promote: critical posture, ethics, solidarity, responsibility, and care for the other. In this sense, the Theory of Objectification is configured as a proposal for improvement in the teaching and learning of Mathematics based on the forms of human collaboration – on joint work and on Community Ethics.

Recreational Mathematics encourages teachers to explore problems in an unconventional way, promoting critical thinking and problem-solving skills. This helps in the training of Mathematics teachers who can teach students to approach mathematical situations in a creative way.

Another outcome is to contribute to the training of critical, reflective and ethical teachers and students. Thus, we hope that this work is useful, both for students of the Mathematics Teaching Degree Course, as well as for teachers, researchers, but also for other people interested in teacher training. Therefore, in the field of teacher training there is still a lot of potential to be explored about Recreational Mathematics in the light of the Theory of Objectification.

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REVIEW OF THE MAIN ASPECTS OF SYSTEMIC LUPUS ERYTHEMATOSUS IN SMALL ANIMALS

https://doi.org/10.56238/sevened2024.031-052

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ABSTRACT

Objective: The aim of this study is to analyze Systemic Lupus Erythematosus (SLE) in dogs and cats, highlighting its etiology, clinical manifestations, diagnosis, treatment and prognosis. SLE is a complex autoimmune condition, mainly affecting the joint, renal, and skin systems, and its identification is challenging due to the diversity of clinical signs, which may include fever, polyarthritis, skin manifestations, and indications of renal involvement. Diagnosis is made through laboratory tests, including ANA testing and biopsies, to detect autoantibodies. Treatment involves using corticosteroids and immunosuppressants, although these can increase the risk of infections. In addition, the prognosis of SLE is often poor, especially in cases with renal or hematologic impairment. Neutering is recommended as a preventive measure. This study emphasizes the importance of integrated approaches in veterinary medicine to improve the diagnosis and management of SLE, aiming to provide a better quality of life to affected animals and reinforcing the need for continuous monitoring of patients.

Keywords: Autoimmune diseases. Pets. Clinical manifestations.

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INTRODUCTION

Systemic Lupus Erythematosus is an immune-mediated, multisystem condition. Its cause is believed to be multifactorial, involving genetic factors, viral infections, immune problems, exposure to ultraviolet radiation, hormonal imbalance, and drug responses (LARSSON C.E. & OTSUKA M, 2000). This rare immune disease can affect both dogs and cats. In addition, clinical manifestations include skin lesions (usually on the face and ears), pain, claudication, polyarthritis, polymyositis, hyperthermia, anorexia, weakness, signs of glomerulonephritis, and mouth ulcers (HOGENESCH, 2014).

Autoimmune skin diseases result from disturbances in the patient's immune system, resulting in the destruction of skin cells by the body itself (VAL, 2006). Through immunological processes, SLE results in the creation of immune complexes that, when installed in the tissues, cause their clinical manifestations, which are more common in the kidneys, joints and skin. The glomeruli suffer damage due to the accumulation of fat. The development of immune complexes can occur, resulting in chronic kidney disease (PATTERSON & HLINICA, 2016). Environmental aspects, contact with infectious agents and the use of medications can facilitate the appearance of SLE (SNYDER, 2013).

The diagnosis of SLE is based on clinical and immunological analyses, as well as histopathology of the skin and kidneys, and the identification of circulating autoantibodies. The goal of treatment is to modulate immunity, starting with the use of corticosteroids and continuing with immunomodulators such as azathioprine, cyclosporine, and cyclophosphamide. The outcome is uncertain, and simultaneous infections are quite common, due to the immunomodulatory treatment to which the animal is exposed (VASSALO, 2011).

LITERATURE REVIEW

ETIOLOGY AND PATHOGENIOLOGY

Systemic Lupus Erythematosus is a common immune-mediated condition in humans, particularly in women in the fertile phase. However, in dogs, the influence of sex on the incidence of the disease is debated. The breeds with the greatest tendency are the Shetland Shepherd, the German Shepherd, the Old English Sheepdog, the Afghanhound, the Beagle, the Collie, the Irish Setter and the Poodle. In felines, detection is more complex, leading to underreporting of cases. In dogs, the diagnosis usually occurs between 2 and 9 years of age, although it can happen at any age (SCOTT-MONCRIEFF, 2015; SNYDER, 2013)

In humans, the cause of SLE is linked to the consumption of certain medications and sex hormones. In pets, in addition to genetic inheritance, an immune dysfunction destabilizes T lymphocytes, resulting in the formation of autoantibodies. SLE can also be triggered by environmental factors, contact with infectious agents, and medications. For example, in cats, the use of methimazole has been linked to the emergence of antinuclear antibodies, even without showing symptoms of SLE; In dogs, hydralazine has a similar effect. Ultraviolet radiation also intensifies the dermatological manifestations of the disease (SCOTT-MONCRIEFF, 2015; SNYDER, 2013; STONE, 2005).

In SLE, there is the formation of immune complexes that are deposited in the tissues, characterizing a type III hypersensitivity reaction. The disease is seen as multisystemic, characterized by the production of several autoantibodies, such as antinuclear antibodies (ANA), rheumatoid factor, and anti-erythrocyte antibodies. These autoantibodies originate immune complexes that accumulate in the basal membranes of white blood cells, synovial membranes, skin, blood vessels, and other tissues, causing inflammation and tissue damage (PATTERSON & HLINICA, 2016)

CLINICAL SIGNS

Clinical signs of SLE include fever, nonerosive polyarthritis with joint swelling and claudication, cutaneous manifestations (such as alopecia, erythema, ulceration, crusting, and hyperkeratosis, particularly in areas exposed to sunlight), and indications of kidney disease, such as weight loss, nausea, polyuria, and polydipsia, being the most frequent. Usually, the simultaneous existence of three or more clinical signs occurs in advanced situations and is linked to an adverse prognosis. In the more advanced stages, neurological signs such as behavioral changes, proprioceptive problems, and nystagmus may appear due to the participation of the central nervous system. Additionally, changes in laboratory tests often include hemolytic anemia, thrombocytopenia, and leukopenia. In addition, skin lesions are common and changeable, and may include erosions, mucocutaneous ulcers, scaling, erythema, alopecia, and crusts. These injuries usually affect areas such as the face, ears, and extremities of the limbs. These symptoms are frequent and usually appear and disappear over time, which can delay the diagnosis until owners notice the clinical symptoms and seek veterinary assistance (SCOTT-MONCRIEFF, 2010; STONE, 2005; LATORRE, 2011).

Ultraviolet radiation potentiates skin lesions, and SLE can impact the nasal plane, causing depigmentation, erythema, and desquamation, as well as hyperkeratosis in the pads, resistant secondary bacterial pyoderma, and panniculitis. Polyarthritis is characterized

by lethargy, stiffness and problems standing or standing, mainly affecting the intervertebral, carpal and tarsal joints and, in more severe situations, the temporomandibular joint (RHODES, 2003; HOGENESCH, 2005) Other clinical symptoms include petechiae and ecchymoses, resulting from thrombocytopenia or vasculitis. In felines, SLE is less common and presents through fever, glomerulonephritis, dermatitis, and hemolytic anemia, accompanied by lymphadenomegaly, splenomegaly, and polyarthritis when it manifests itself in a generalized form (STULL et al., 2008; CHABANNE et al., 1999).

DIAGNOSIS

To diagnose SLE, it is crucial to perform a series of clinical and laboratory tests, which include blood count, blood biochemistry, urinalysis with protein quantification, as well as specific tests such as the Coombs test, ANA (Antinuclear Antibody) and ANA (Antinuclear Factor) (SCOTT-MONCRIEFF, 2015). The ANA test is seen as the most revealing of SLE, identifying antibodies against DNA, which are present in about 90% of cases of canine SLE, even though some cases may be negative (FORRESTER & LEES, 1995). The ANA test, performed by immunofluorescence, is also used and provides greater accuracy in certain situations (LATORRE, 2015).

Additional tests, such as skin and kidney biopsy, can help differentiate the diagnosis, especially when there is proteinuria associated with glomerulonephritis. Contact dermatitis and depigmentation can be identified on skin biopsies (PALUMBO et al., 2010b; SCOTT et al., 2001). Arthrocentesis is recommended in situations of claudication, showing healthy neutrophils and reduced viscosity of the synovial fluid (HOGENESCH, 2003).

The differential diagnosis encompasses conditions such as ehrlichiosis, multiple myeloma, and bacterial and viral infections. Such conditions should be ruled out through specific tests, such as serology for rickettsial diseases and PCR for *Ehrlichia canis* (PATTERSON & HLINICA, 2016). Normally, when the animal exhibits two or more main clinical symptoms (fever, polyarthritis, glomerulonephritis, dermatitis, cytopenia) and the ANA test is positive, the diagnosis of SLE is made, enabling appropriate treatment (SCOTT-MANCRIFE, 2015).

TREATMENT

Treatment of SLE aims to control inflammation, reduce immune activity, and prevent progression to chronic kidney disease. The corticosteroid prednisone (1 to 2 mg/kg every 12 hours) is the most commonly used drug, which is progressively tapered after clinical symptoms improve. More severe or resistant cases can be treated with

immunosuppressants, such as azathioprine, cyclophosphamide, and cyclosporine, contributing to the reduction of the dose of corticosteroids (SCOTT-MANCRIEFF, 2010).

The therapeutic strategy also encompasses a balanced diet, sun protection and the control of associated conditions, such as hypertension and obesity, using ACE inhibitors for renoprotection. To reduce local inflammation in skin lesions, topical corticosteroids or tacrolimus can be applied. The use of non-steroidal analgesics or anti-inflammatory drugs to relieve joint pain is limited due to the danger of side effects, such as gastric ulcers (BORBA et al., 2008; GRAUER, 2010; HOGENESCH, 2003).

It is crucial to regularly monitor blood counts and serum biochemistry to tailor treatment, considering the continued use of immunosuppressants and the risk of secondary infections. Animals that show joint or skin signs generally respond more effectively to treatment, while those that show hematological changes may require more intensive treatment (GERONYMO et al., 2005; SCOTT et al., 2001).

PROGNOSIS

The prognosis of Systemic Lupus Erythematosus (SLE) in small animals, in most cases, is considered unfavorable, with frequent relapses, regardless of therapy. Immunosuppressive therapy, often necessary long-term or lifelong, increases the risk of serious infections, such as bronchopneumonia and septicemia, which are the main causes of death. Kidney failure and steroid-induced pancreatitis also influence the adverse outcome. The existence of chronic kidney damage and high creatinine levels are related to a poor prognosis (MARTINS et al., 2000; SCOTT-MONCRIEFF, 2015). Castration of carrier animals is recommended as a preventive measure, due to the hereditary risk of the disease (RHODES, 2003).

FINAL CONSIDERATIONS

Systemic Lupus Erythematosus (SLE) is a complex autoimmune disease in dogs and cats, marked by several clinical manifestations that mainly impact the joint, renal and cutaneous systems. Identification is complex and requires laboratory tests, such as ANA testing and biopsies. The goal of treatment is to manage symptoms and adjust the immune system response by employing corticosteroids and immunosuppressants. However, these procedures can increase the danger of infections. Generally, the prognosis of SLE is uncertain, particularly in situations of renal or hematologic compromise, which makes continuous monitoring of patients crucial. Neutering is advised to prevent the genetic spread of the disease. This research highlights the relevance of integrated strategies in veterinary

medicine to improve the diagnosis and treatment of SLE, with the objective of providing a higher quality of life to affected animals.

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POST-CONCUSSION VESTIBULAR CHANGES

https://doi.org/10.56238/sevened2024.031-053

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ABSTRACT

Concussion refers to a pathophysiological state resulting from mild traumatic brain injury. It is a functional, non-structural brain injury characterized by changes in brain function after a sudden blow to the cephalic, facial or cervical region. Rotational and acceleration forces, especially in the frontotemporal region and in children, increase the risk of diffuse brain injury. The main causes of concussion include domestic and automobile accidents, falls, sports, and violence. Since the year 2000, there has been a significant increase in the diagnosis of concussion in young people, especially during sports. Concussion is a global public health issue due to its prevalence and for affecting long-term quality of life. It is estimated that up to 1.9 million young athletes suffer concussion annually, of which 50% are concussions in the child population. However, about 10% face prolonged recovery, with possible complications such as post-traumatic migraine and neurocognitive deficits. Common symptoms include headache, disorientation, dizziness, vertigo, body imbalance and memory changes, and the affected brain region is closely related to clinical manifestations. Diagnosis in children is challenging, as many symptoms may be subtle or underestimated. Initial treatment involves adequate sleep, physical and cognitive rest for 24 to 48 hours, followed by a gradual, individualized return. Evaluation of the vestibular system is essential, as about 25% of pediatric dizziness cases are associated with post-concussion. Rehabilitation of vestibular function, with personalized exercises, is recommended for patients with persistent symptoms. Management should be multidisciplinary at all stages of clinical evolution, with attentive, qualified clinical guidance that considers post-concussion vestibular changes.

Keywords: Concussion. Cerebral Concussion. Vertigo. Vestibular System.

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INTRODUCTION

The term concussion is often used in the medical literature as a synonym for mild head injury, but more specifically describes a pathophysiological state that results in the characteristic symptoms and signs that individuals may present after a mild traumatic brain injury (TBI).

Concussion is a biomechanically induced clinical condition, related to changes in brain function, and is considered a functional brain injury, not a structural one. This is classified as a mild traumatic brain injury, i.e. it involves a disruption in normal brain function caused by a sudden blow to the cephalic, facial or cervical regions or by a blow to another site of the body with force transmitted to the head, which results in a period (of any duration) of decreased or loss of consciousness, neurological deficits or any change in mental status (Rose *et al.*, 2015; Rotter; Kamat, 2019; Sleifer; Borges, 2023; Sleifer *et al.*, 2024).

Rotational forces, acceleration and deceleration, especially in the frontotemporal region, and associated with the disproportion of the size of the head in relation to the trunk and incomplete myelination in the pediatric age group, have their effects enhanced, increasing the frequency of diffuse brain lesions (Zeitel; Flintz; Nogueras, 2017).

The main causes of concussion are related to domestic accidents, falls from one's own height, car accidents, sports and violence (shaken child syndrome). Beginning in the year 2000, there has been a considerable increase in concussion diagnoses in this population, with sports and recreational activities accounting for 25 to 50 percent of all concussions. Observational studies suggest that the incidence of sports-related concussion is higher in females, who attend high school and university, than in male athletes, when sports are governed by similar practices (Meehan; O'Brien, 2020).

It should be noted that concussion is considered a global public health issue, because it has a considerable prevalence, despite often being underdiagnosed, and because of the consequences it has for the quality of life of individuals in the long term (Mastrangelo; Midulla, 2017; Sleifer; Borges, 2023). It is estimated that up to 1.9 million young athletes suffer concussion annually, of which 50% are concussions in the child population. Most post-concussion patients have a rapid recovery (on average one month), due to compensation or adaptation of the central nervous system (Toledo; Rolnik, 2015). However, about 10% of patients have prolonged recovery, which may eventually progress to long-term complications, such as: post-traumatic migraine, neurocognitive deficits, poor school performance, and behavioral changes (Price *et al.*, 2022, Sleifer *et al.*, 2024).

The most common post-concussion symptoms include headache, confusion, inattention and disorientation, memory or speech changes, dizziness, nausea, vomiting, and

gait abnormalities. The affected brain region is closely related to certain symptoms. For example, a direct impact on the temporoparietal or parietooccipital regions can cause a vestibular concussion, producing nausea, vertigo, and nystagmus, in addition to the classic symptoms of a concussion. An impact that causes a fracture of the temporal bone can damage the labyrinth, cause hemotympanum and hearing deficit. In the past, lesions with a hyperflexion and extension mechanism ("whiplash") can injure the basilar artery, which partially irrigates the labyrinth, and also lead to vestibular symptoms. Blunt or penetrating trauma to the middle ear can rupture the oval window where the stapes articulates with the inner ear, causing a perilymph fistula (Walls; Teach, 2020).

One-minute loss of consciousness and seizures are uncommon among children and adolescents with sports-related concussions, occurring in less than 10 percent and approximately 1 percent of patients, respectively. Thus, the presence of these findings warrants immediate evaluation for a possible intracranial lesion (hemorrhages/hematomas).

Vestibular symptoms are common in pediatric post-concussion patients, accounting for about 25% of pediatric dizziness. Unresolved post-concussion vestibular and visual symptoms increase vulnerability to orthopedic injuries, highlighting the importance of diagnosing and treating such alterations (Rodriguez; Chiao; Spencer, 2021). It should be noted that studies show that children with a history of concussion have a four-fold increased risk of having a new injury, in addition to being more likely to develop vestibular disorders, such as benign paroxysmal positional vertigo (Van Lerssel *et al.*, 2021; Wang *et al.*, 2021).

The diagnosis of pediatric concussion is challenging, considering that in many cases the symptoms can be subtle or poorly reported, especially in younger age groups, as they are unaware of the symptoms and potential severity of concussions and can also disguise or hide some symptoms, so the physical examination plays an important role in the evaluation. The patient should undergo a detailed neurological evaluation, including mental status, gait, and body balance. Sensory, motor, and cranial nerve-related findings usually do not show changes in post-concussion children and adolescents.

Initial treatment of concussion focuses on avoiding further injury (second impact syndrome), restriction of physical activity, and relative neurocognitive rest. A study (Meehan; O'Brien, 2020) notes that no medication has been proven to speed up recovery from a post-concussion or prevent the long-term effects of injuries. Furthermore, the researchers described that, for children and adolescents with concussions, a period of physical rest lasting 24 to 48 hours followed by a gradual, individualized and supervised return to activities, avoiding symptomatic exacerbation and new traumas until complete recovery,

proved to be more efficient and with faster resolution of symptoms when compared to those children with a longer rest period and no prescribed activity (Meehan; O'Brien, 2020).

Cognitive rest is to avoid overloading a functionally injured brain and prevent metabolic overload. Studies have shown that patients benefit from one to two days of rest before returning to school. Once patients are able to concentrate, tolerating visual and auditory stimulation for 30 to 45 minutes, they should return to school with adjustments until full recovery. In cases where correct cognitive rest was not performed, there was a higher rate of prolonged and recurrent symptoms (Meehan; O'Brien, 2020).

Although symptomatic medications may be helpful, dependence and overuse should be avoided. For the treatment of headache, paracetamol and non-steroidal anti-inflammatory drugs should be used beyond the first few days after the injury, as they can cause headache as a rebound effect. Ondansetron is a reasonable therapy for nausea during the first two days after trauma, however, headaches, drowsiness, and dizziness are possible adverse effects that may aggravate other concussion symptoms (Meehan; O'Brien, 2024).

The emphasis on adequate sleep provides the best initial treatment for pediatric patients, given the high prevalence of post-concussion sleep disorders. If pharmacotherapy is required, a melatonin test of 3 mg in older children and 5 mg in adolescents is indicated. Benzodiazepines should be avoided due to daytime sleepiness and memory impairment, which makes it difficult to assess recovery.

Neuroimaging tests are usually avoided. However, if there is worsening and persistence (lasting more than three to four weeks) of symptoms, loss of consciousness, change in mental status, signs of fractures, or worrying factors, tomography or MRI should be performed, differential diagnoses investigated, and a multidisciplinary approach implemented.

In a randomized trial (McCarty *et al.* , 2016) with 49 children (11 to 17 years of age) with concussion and persistent symptoms ≥ 1 month after a sports-related concussion, collaborative treatment consisting of care management, cognitive behavioral therapy, and, when necessary, psychopharmacologic therapy was associated with significant reductions in post-concussive and depression symptoms at six months, when compared with usual care (87 vs. 58 percent of patients without elevated symptom levels and 78 vs. 46 percent of patients with ≥50 percent reduction in depression symptoms, respectively).

Regarding vestibular evaluations for post-concussion cases, studies refer to the importance and contribution to the diagnosis, in particular the analysis of ocular motility and the function of the semicircular canals. However, little is known about the damage caused to

the otolithic organs and their brainstem-mediated pathways. It is known, however, that otoliths are vulnerable in traumatic brain injury, as they are in a fluid-soaked space, whose sensitivity to excessive pressurization is remarkable. Such vulnerabilities, therefore, increase the risk of structural damage in the case of concussions and traumatic brain injuries (Rodriguez; Chiao; Spencer, 2021; Sleifer *et al*., 2024). In this context, vestibular myogenic evoked potentials (VEMPs) have been shown to be appropriate in the investigation of the functioning of the otolithic vestibular pathway and central pathways (aiding in diagnosis) unilaterally or bilaterally, and in monitoring the clinical evolution of patients (Santos Filha: Sleifer, 2024).

Zhou and Brodsky (2015) conducted a study with 42 post-concussion children and identified that 21% of the children tested had vestibular alterations, and 18% had abnormal cervical VEMP results. With this, researchers concluded that injuries involving linear acceleration as opposed to angular acceleration can affect otoliths.

Rodriguez, Chiao, and Spencer (2021) performed VEMPs on 76 individuals diagnosed with concussion, with a mean age of 15.64 years. The findings of the study demonstrate that children and adolescents with a history of concussion had a significantly higher prevalence of absent responses in the evaluation of VEMPs, when compared to the control group. In addition, they observed that children with a history of concussion and who played contact sports had a higher prevalence of absent responses when compared to those with concussion who did not practice contact sports. Thus, the study concluded that the otolytic organs, specifically the utricles and their pathways, are more prone to post-concussion injuries and reinforce that VEMP proved to be sensitive in identifying and quantifying these injuries (Rodriguez; Chiao; Spencer, 2021).

Based on the data presented above, it is possible to observe that some studies report a strong association of utricular alterations in post-concussion individuals. In addition, researchers report that VEMP is relevant for the screening, diagnosis, and treatment of post-concussion vestibular alterations in the child population.

Patients with visual and vestibular symptoms can benefit from rehabilitation of vestibular function, performed with personalized exercises and monitored by a speech therapist.

CONCLUSION

The care of children and adolescents after concussion must necessarily include multidisciplinary action at all stages of clinical evolution. Considering the advances in otoneurology regarding diagnostic and intervention methods, the need for attentive,

qualified clinical management that considers post-concussion vestibular alterations is reinforced.

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DUPILUMAB: A NEW ALLY FOR THE TREATMENT OF EOSINOPHILIC ESOPHAGITIS?

https://doi.org/10.56238/sevened2024.031-054

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ABSTRACT

INTRODUCTION: Eosinophilic esophagitis is a chronic and immune-mediated disease of the gastrointestinal tract, resulting from the interaction between genetic, environmental and immunological factors of the affected patient. The clinical picture is characterized by esophageal dysfunction, which may present as dysphagia, chest pain, upper abdominal pain or food impaction. Treatment aims to improve clinical symptoms and prevent disease progression and subsequent complications. In this context, immunobiologicals are emerging and promising therapies, with Dupilumab being the first specific treatment approved by the FDA. It is an IgG4 monoclonal antibody, which targets IL-4R alpha and, from this, reduces protein transforylation, transcription, and the T helper 2-regulated response. The objective of this systematic review is to evaluate the efficacy of this drug in the treatment of eosinophilic esophagitis, in comparison with the options already available on the market. METHODS: PubMed searches were performed using the keywords "eosinophilic esophagitis dupilumab" and "dupilumab treatment esophagitis eosinophilic". At first, 60 results were obtained, but after exclusion by title and abstract, and by full text, 14 articles were included. RESULTS: all the articles analyzed showed improvement in patients using Dupilumab, 13 of which showed a reduction in the eosinophil count, 8 showed clinical improvement of symptoms, 8 indicated histological improvement, 7 denoted improvement in the endoscopic pattern, according to the Endoscopic Reference for Eosinophilic Esophagitis, and 4 indicated a reduction in the Dysphagia Symptom Questionnaire (QSD) score. DISCUSSION: Eosinophilic esophagitis is a rare disease, but it has the potential to progress, negatively interfering with the patient's quality of life. Thus, as the current drug therapy is nonspecific, the use of Dupilumab presents itself as an innovative and optimistic solution for the future, because it modifies the understanding of the management of the disease, expands the therapeutic options and improves the prognosis. CONCLUSION: The use of Dupilumab in the treatment of eosinophilic esophagitis has been shown to be effective. However, for treatment to be well established with regard to the doses used, frequency of administration and longitudinal monitoring, further studies are still needed.

Keywords: Dupilumab. Eosinophilic esophagitis. Immunobiological.

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INTRODUCTION

DEFINITION

Eosinophilic GI disorders (EGIDs) are chronic and immune-mediated diseases, characterized by inflammation triggered by eosinophils along the gastrointestinal tract, without there being a known cause for this eosinophilia, as would be the case with drug reactions, parasitic infections or malignancy, for example. This condition is associated with symptoms related to the gastrointestinal tract, which is primarily affected. This group of diseases includes eosinophilic esophagitis (EoE), eosinophilic gastritis (EG), eosinophilic enteritis, and eosinophilic colitis (EC). When more than one segment of the gastrointestinal tract is affected, it is called eosinophilic gastroenteritis [1].

Eosinophilic esophagitis is the most prevalent and studied, so there is more information regarding diagnosis and treatment. Studies have suggested that this pathology results from the interaction between genetic factors, such as polymorphisms, environmental risk factors (such as diet) and the defense factors of the immune system of the affected patient [1].

In healthy patients, eosinophils are present, in small amounts, in various tissues of the gastrointestinal tract, as well as in the spleen, lymph node, thymus, and adipose tissue. Eosinophilic infiltration has only been associated with degranulation in the gastrointestinal tract, however. The amount of eosinophils increases progressively from the proximal to the distal part of the intestine. In rat biopsy, eosinophils are usually found in the lamina propria of the stomach, intestine, cecum, and colon, but not in Peyer's slide or intraepithelial locations. However, the difference between inflammatory and non-inflammatory conditions lies in the concentration of cytokines bound to the T Helper 2 lymphocyte [1].

EPIDEMIOLOGY

The incidence of gastrointestinal eosinophilic diseases has not been accurately calculated, but it is estimated that there has been a small epidemic of these diseases in recent decades. The prevalence is approximately 0.1 to 0.2 per 10,000 people, with eosinophilic esophagitis being the second most common cause of chronic esophagitis [1]. One meta-analysis estimated a pooled overall prevalence of eosinophilic esophagitis at 22.7 per 100,000 (95% CI, 12.4–36.0), with a higher rate in adults (43.4/100,000; 95% CI, 22.5–71.2) than in children (29.5/100,000; 95% CI, 17.5–44.7) [2].

Eosinophilic esophagitis was first described in the late 1970s, but the disease, as it is defined today, only became known in the mid-1990s. Currently, it is a reasonably common finding in clinical and endoscopy and represents one of the main causes of upper

gastrointestinal morbidity. With the recent introduction of the Gastrointestinal Eosinophilic Diseases Consortium (CEGIR), it was possible to estimate the prevalence of eosinophilic esophagitis in the USA, which is approximately 39 to 56.7 cases per 100,000 people, and can reach up to 105 or 150 cases [1]. It is, therefore, a rare disease, despite the aforementioned increase in prevalence in the last two decades.

One report suggested an increase in incidence of 40% over a 4-year period between 2000 and 2003 [3]. It is likely that this increase in incidence is not only due to the greater recognition of the disease, from the performance of endoscopy with biopsy, since several studies suggest that this increase in incidence does not exceed the relatively small increase in biopsies [4]. Therefore, there may be related genetic and environmental factors. It is, therefore, a global health problem, identified in Australia, Brazil, England, Italy, Israel, Japan, Spain and Switzerland. There are still no reports of the disease in sub-Saharan Africa or India [5].

Eosinophilic esophagitis is detected in 2.4 to 6.6% of patients undergoing endoscopy for any indication [6], while in patients with dysphagia, these rates rise to 12 to 23% [7]. In this same context, in people with esophageal food bolus impaction, the identification rate is 50%, and this is the most frequent cause of such a finding in emergency services [8].

It is a pathology more common in male patients, with evidence of atopy. The ratio between affected men and women is 3 to 1 [9]. A study conducted in the United States suggested a constant increase in prevalence with age, until reaching a maximum value between 30 and 44 years; then, the prevalence decreased considerably. [10]

ETIOPATOGENIA

The etiopathogenesis of eosinophilic esophagitis is still poorly understood, but food allergies have been implicated as a major contributing factor [1]. In this sense, most patients have evidence of food allergy and sensitization to aeroallergens, identified by prick tests and/or specific allergen-IgE tests [1]. There is also a relationship between eosinophilic inflammation of the esophagus with pulmonary inflammation, presence of allergic rhinitis, hypersensitivity to grass, and atopy [1].

In addition, there are indications of a strong family component and genetic factors involved, with an increased risk of developing EEo in first-degree relatives and in the presence of certain genes, such as TSLP, CAPN14, EMSY, and eotaxin-3 [11]. In this context, ALEXANDER's study detected that monozygotic twins have a disease concordance of 44%, which represents a 2-fold increase when compared to dizigotic twins, revealing a complex genetic component [12]. This complex etiology is due to the effect of

multiple genetic loci, which affect gene expression, leading to structural and physiological changes in the function of epithelial and immune cells, increasing the risk of developing the disease, with contributions from genetic factors and environmental exposures [13].

Such exposures are more related to unknown environmental factors early in life, as well as to antibiotic use during childhood and formula feeding [13]. There are also studies that show an increased risk of developing EE when there is an association with prenatal and intrapartum factors, such as preterm labor, maternal fever, and cesarean delivery [13]. In addition, other factors that may contribute to the increase in the incidence of EE are: the decrease in the frequency of infection by *H. pylori*, a bacterium that increases the populations of Th1 and Th17, negatively regulating Th2; gastroesophageal reflux disease, which leads to injury to the intraepithelial junctions, causing greater allergenic permeability in the esophageal epithelium; and the hypothesis of bacterial hygiene and dysbiosis, relating a lower incidence of infections and bacterial exposure to microbiota alteration and epithelial permeability [1]. In contrast, having a furry pet during childhood was associated with decreased risk of developing the disease [13].

PATHOPHYSIOLOGY

The pathophysiology of eosinophilic esophagitis mainly involves the interaction between immunoglobulin E (IgE) and T-helper lymphocyte type 2, but also includes the participation of allergens, cytokines (such as IL-5 and IL-3), microRNA, and chemokines (such as eotaxins), in addition to the loss of the functional barrier and the imbalance between protease action and inhibition, favoring pathophysiological activation [14].

Eosinophils have cytokines and chemokines that regulate the innate and adaptive immune response, such as those linked to T-helper lymphocyte 2 (IL-4, IL-5 and IL-13), T-helper 1 (such as interferon-gamma), pro-inflammatory cytokines (such as TNF, IL-6 and IL-8) and inhibitory cytokines (TGF-beta and IL-10, as well as their receptors) [14].

The type 2 inflammatory response involves the participation of T helper 2 lymphocytes, mainly for defense against parasites, worms, and toxins, and also for action in allergic diseases. Atopic diseases are based on the IgE-dependent response, so that when they encounter allergens, antigen-presenting cells pick them up and process them into peptides. They then go to the lymph nodes, where allergens are introduced to CD4 T lymphocytes [14].

In the adaptive immune response, when IL-4 dominates in that particular antigen, T helper 2 lymphocytes are recruited, capable of recognizing the cytokines IL-4, IL-5, IL-9 and IL-13. From this, B lymphocytes are called, which then initiate the production of specific IgE

antibodies, which sensitize the receptors found in basophils and mast cells. Thus, in the face of a second encounter with the allergen, these cells undergo degranulation, with the consequent release of histamine, proteoglycans, leukotrienes, and prostaglandins, which trigger the characteristic allergic clinical picture. This inflammatory response, mostly linked to Th 2, is present in several pathologies, such as asthma, rhinosinusitis with nasal polyps, atopic dermatitis, food allergies and eosinophilic esophagitis [14].

In the innate immune response, on the other hand, the epithelium activates innate ILC2 lymphoid cells, which secrete large amounts of IL-5, IL-9, and IL-13, with consequent activation of effector cells, such as eosinophils, macrophages, basophils, and mast cells. Mast cells and basophils also secrete cytokines, such as IL-4 and IL-13 [14].

Eosinophils, central to atopic diseases, are produced in the bone marrow, from the regulation of the transcription of the cytokines IL-3 and IL-5, in addition to the action of the stimulating factor of granulocyte and macrophage colonies. They have granules with proteins of toxic content to various tissues, including the intestinal epithelium. [14].

IL-5 is the most important cytokine and responsible for the differentiation of eosinophils, as well as for their exit from the spinal cord, for their arrival in the circulation and for survival, so that, in the face of high levels of IL-5, there is an increase in blood eosinophilia, while reduced levels help to decrease these cells in the blood, lung and gastrointestinal tract [14].

IL-4 and IL-13 indirectly recruit eosinophils, encouraging migration to sites of inflammation, and increase their survival, through several mechanisms, such as inhibition of apoptosis. They also influence the permeability of the epithelial barrier. They induce endothelial expression of adhesion molecules that bind to beta-1 and beta-2 integrins in eosinophils, as well as chemokines (such as eotaxins). In addition, IL-4 and IL-13 have a common signaling pathway, from the alpha subunit of the IL-4R receptor. This receptor, in its subtype II, has two portions: IL-4 alpha, to which IL-4 binds, and IL-13 alpha, to which IL-13 binds. It is present in both hematopoietic and non-hematopoietic cells. From the binding of IL-4 or IL-13 to the receptor, transforylation and activation of protein kinase begins, which uses the *Janus quiase transducer* and the transcription activator STAT-6, initiating transcription [14].

CLINICAL PICTURE

Clinically, the condition is characterized by esophageal dysfunction and, histologically, by inflammation with a predominance of eosinophils. Initial symptoms include difficulty eating, reduced growth velocity, abdominal and/or chest pain, dysphagia, and food

impaction (defined as the retention of food, requiring extraction by endoscopy). In general, these symptoms are chronological, depending on the patient's age, so childhood eosinophilic esophagitis can progress to the adult form [1].

Babies typically have difficulty eating or nursing, while school-age children often have vomiting or pain. Dysphagia predominates in adolescents. In general, in children, eosinophilic esophagitis usually manifests itself in conjunction with other atopy, such as food allergy, asthma, eczema, chronic rhinitis, and environmental allergies, which also follow a chronological order, in the so-called atopic march [1].

In adults, symptoms are often quite characteristic, including dysphagia, chest pain not linked to swallowing, food impaction, and upper abdominal pain. Dysphagia related to solid foods remains the most common symptom. Food impaction requiring endoscopy to remove the bolus occurs in 33 to 54% of adult patients with esophagitis [1].

There are no pathognomonic findings of eosinophilic esophagitis on examination or in the oropharynx, but some children may have laryngeal symptoms. In addition, there may be esophageal abnormalities on endoscopy, such as fixed esophageal rings (trachealization), exudates, edema, narrow esophageal caliber, and endoscopic-induced laceration [1].

DIAGNOSIS

Because it is a clinical-pathological disorder, the diagnosis of eosinophilic esophagitis is based on the association of the clinical manifestations of the disease, which depend on the age of presentation (childhood or adulthood), with the endoscopic and histological findings of esophageal mucosal biopsies, and these factors should not be considered separately [15]. Thus, the gold standard for diagnosis involves esophageal biopsy findings, which demonstrate eosinophilic enlargement, requiring at least 15 eosinophils per maximal augmentation field, without concomitant infiltration in the stomach or duodenum [16]. This value has been shown to be 100% sensitive and 96% specific for diagnosis [11].

In this context, upper gastrointestinal endoscopy is the most used test, as it allows biopsies to be performed, as well as to evaluate the macroscopic characteristics of the esophagus. Thus, endoscopic findings in patients with OE consist of linear sulci, which appear as vertical lines within the esophageal mucosa; trachealization, which are concentric rings of esophageal narrowing; whitish exudates, visualized as white plaques; edema due to decreased mucosal vasculature and stenosis of esophageal size [11]. Importantly, the endoscopic appearance may be normal in 10-25% of patients with O.E. [11]. Still in relation

to endoscopy, the American College of Gastroenterology (ACG) recommends obtaining a minimum of six samples, which should be collected from the upper, middle and distal third of the esophagus, for biopsy of any patient with suspected OE [11].

The ACG established the following diagnostic criteria for O.E.: (1) Symptoms of esophageal dysfunction; (2) Concomitant atopic conditions; (3) Endoscopic findings of rings, grooves, exudate, stenosis, luminal narrowing, and mucosal fragility or crepe mucosa; (4) ≥ 15 eosinophils by HPF (60 eosinophils/mm2) in esophageal biopsy; (5) Eosinophilic infiltration should be isolated in the esophagus; and (6) Evaluation of disorders other than EEo that potentially contribute to esophageal eosinophilia [15].

TREATMENT

The treatment of EEo aims to improve clinical symptoms and prevent disease progression and subsequent complications. To this end, it is based on three pillars, which are drug therapy with proton pump inhibitors (PPIs) or topical glucocorticoids, dietary changes to control the interaction of environmental factors, and esophageal dilation in cases of endoscopic complications [15]. As only the immunobiological Dupilumab was approved by the US Food and Drug Administration (FDA) on May 22, 2022, for the treatment of eosinophilic esophagitis, the choice of therapy already consolidated in the market should be made based on efficacy, ease of administration, cost, and patient preference, sharing the decision and analyzing advantages and disadvantages of each option [11, 17].

The initial dietary options for treatment of EEo are elemental diets, elimination diets guided by food allergy testing, and empirical elimination diets [11]. The elemental diet is based on a liquid formula of nutrition composed of amino acids, which is readily assimilated and absorbed; It is associated with improvement of symptoms and histological remission, but also with limitations such as poor palatability, which can lead to the need for tube use, psychological and social disorders, changes in quality of life due to lack of food, and high cost [11, 15].

The elimination diet directed by allergy tests is based on atopy tests to detect possible triggers of EEo, which will later be eliminated from the diet; The biggest triggers for adults, in order of concern, are wheat, cow's milk, soybeans, nuts and eggs, while for children, they are milk, eggs, wheat and soy, so the reintroduction should follow the opposite sequence to that of this list. A retrospective study with children associated the elimination of positive foods in allergy tests with histological response in 53% of patients, while the agreement and success of this diet were low in adults [18].

Finalizing dietary changes, the empirical elimination diet, or SFED, is based on the elimination of 6 food groups, which are cow's milk, soy, wheat, eggs, peanuts/tree nuts, and shellfish/fish, i.e., the most common allergens in the US, lasting 6 to 8 weeks [16].

Regarding drug therapy, proton pump inhibitors (PPIs) can lead to histological and symptomatic remission in 50 and 60% of cases, respectively [15]. In addition, they can be used as a first-line treatment, in high dosages, due to their low cost, tolerability, generally favorable safety profile, and ease of administration [11]. In this context, topical glucocorticoid therapy can also be used for long-term control, as is the case with inhaled fluticasone and budesonide, requiring the patient to swallow the dose for deposit to occur in the esophageal mucosa [11]. As adverse effects, glucocorticoids can cause adrenal suppression or eosinophilic candidiasis [15].

Endoscopic dilation is used in the treatment of complications subsequent to O.E., such as esophageal strictures, rings, and narrow-bore esophagus [11]. In addition, it may be a therapeutic option for patients with persistent dysphagia even after medical treatment has achieved remission of inflammation and in patients with severe dysphagia and a history of food impaction [15].

The emerging treatments that are in the clinical trial phase for EEo are immunobiologicals, and the best known are IL-5 expression modulators, such as Reslizumab and Mepolizumab, two drugs that have already been approved by the FDA for the treatment of eosinophilic asthma and probably have additional applications in the treatment of atopy. The first is a neutralizing antibody against IL-5, which significantly reduced eosinophil counts in children and adults with eosinophilic esophagitis. Mepolizumab, on the other hand, drastically decreased blood eosinophilia and esophageal infiltration, but had variable effects on symptoms. In addition to these, anti-IL-13 and anti-IL-4 antibodies are also being studied, which have shown reduction of eosinophilic esophagitis and histological, endoscopic and clinical improvement. IL-13 regulates the recruitment of eosinophils at inflammatory sites, which seems to be an interesting therapeutic site, based on the antibody Iebrikuzumab, recently studied for asthma; The problem is that there seems to be a variable effect on tissue eosinophilia, leading to increased peripheral eosinophilia [19].

DUPILUMAB

Dupilumab, the central drug of this article, was already used in the treatment of moderate/severe atopic dermatitis in uncontrolled patients and eosinophilic asthma, both of which are FDA-approved. In May 2022, this same body approved Dupilumab for the

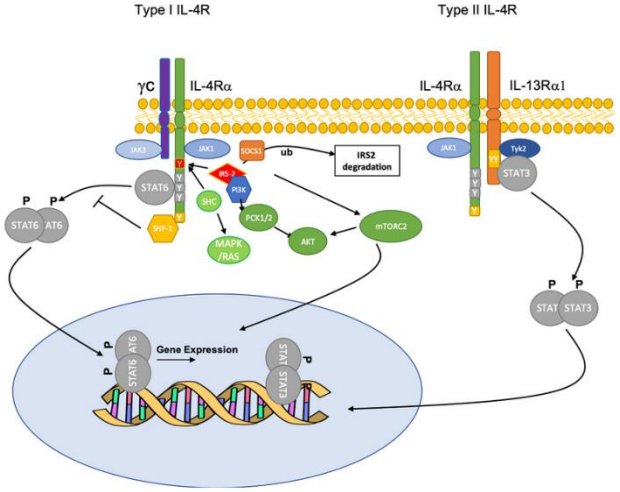
treatment of eosinophilic esophagitis in adults and adolescents over 26 years old, weighing at least 40kg, in a regimen of 300mg weekly. On January 26, 2024, FDA approval was extended to children aged 1 to 11 years, weighing at least 15kg. ANVISA (National Health Surveillance Agency) approved Dupilumab for the treatment of EoE in patients aged 12 and over, weighing 40kg or more, in April 2023. In Brazil, this drug has been marketed under the name Dupixent.

As side effects, Dupilumab can cause conjunctivitis, infection at the injection site, and localized herpes simplex infection. A small group of patients may have transient blood eosinophilia, possibly due to inhibition of the passage of eosinophils from the blood into the inflamed tissues of the skin. [14]

It is an IgG4 monoclonal antibody that targets the IL-4 receptor alpha chain (IL-4R alpha). Type I of this receptor is specific for IL-4 and is expressed only in hematopoietic cells, predominantly in T lymphocytes, mast cells, and basophils. Type I also has the gamma portion, which interacts with other interleukins. On the other hand, the type II receptor binds to IL-4 and IL-13 (so it has two moieties: IL-4 alpha and IL-13 alpha-1) and is expressed in hematopoietic and non-hematopoietic cells, such as in the airway epithelium. Both are cytokines linked to Th2, that is, fundamental in the pathogenesis of allergy. This is because the IL-4/IL-13/IL-4R axis is related to the differentiation of Th2 cells, which modulate a pro-allergic immune response and, in addition, activate effector pathways in target tissues, such as lungs, skin, and intestines, triggering the disease phenotype [20].

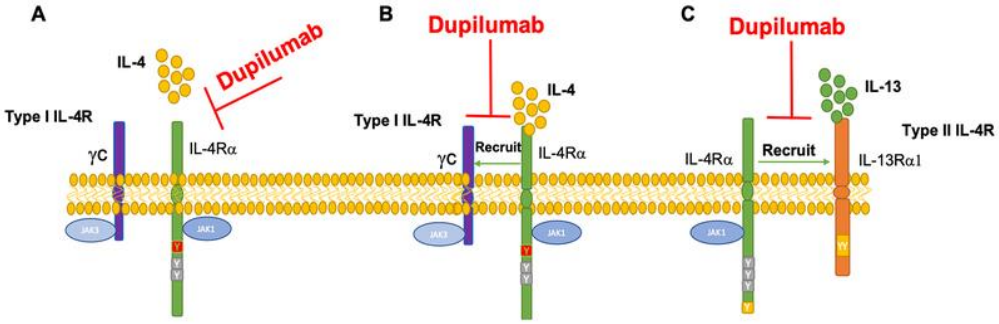
As cited in the pathophysiology of eosinophilic esophagitis, when IL-4 or IL-13 binds to receptors, transforylation and activation of receptor subunit-associated *Janus* family protein kinases (JAKs) such as JAK1 and JAK3 at the type I receptor and JAK1 or Tyk2 at the type II receptor occurs. a cascade of phosphorylation of tyrosine residues into IL-4R alpha occurs. Some tyrosine residues, such as human Y585 and Y603, allow recruitment of the transcription factor signal transducer and transcription factor 6, called STAT6, from the SH2 domain, which triggers the initiation of transcription. In addition to STAT 6, IRS/PI3K, mTORC2, AKT, SCH/MAPK and Ship-1 are also activated. The Box1 region and the C-terminal tail of IL-13R alpha 1 allow Tyk2 binding, with consequent phosphorylation of it and activation of STAT3 [20].

Image 1 - pathophysiological mechanism of eosiophilic esophagitis [25].



Therefore, Dupilumab is an IgG4 antibody that binds to the alpha portion of the IL-4 receptor, with consequent inhibition of both IL-4 and IL-13-induced signaling, which decreases the T helper 2-regulated inflammatory response in allergic diseases. The mechanism of action is not yet completely known, because it is not known whether it inhibits the binding of IL-4 to the type I receptor or whether it inhibits the assembly of the type II receptor (preventing the recruitment of the alpha subunit of this receptor by the alpha portion of the IL-13 receptor, after its binding to IL-13) [20].

Image 2 - possible mechanisms of action of Dupilumab [25].



The results of the use of Dupilumab in the treatment of eosinophilic esophagitis seem to be promising. In 2017, a phase II clinical trial was carried out for the use of Dupilumab in this pathology, which showed a 3-point reduction in the score of the Straumann Dysphagia Instrument, which assesses patients' swallowing difficulty, from the use of 300mg of Dupilumab weekly, compared to 1.3 points reduction in the placebo group [21].

JUSTIFICATION

This research on the use of Dupilumab in the treatment of eosinophilic esophagitis is justified because it is a rare disease, but considered a global health problem, with an increase in prevalence and incidence in recent years. In addition, eosinophilic esophagitis is the second most common cause of chronic esophagitis and a leading cause of upper gastrointestinal morbidity. If not treated properly, its progression can progress to esophageal stenosis, severe dysphagia, and food impaction, greatly affecting the patient's quality of life. Dupilumab is an innovation in the treatment of eosinophilic esophagitis and shows promising results in clinical trials, which may change the treatment perspective and prognosis of the disease.

OBJECTIVES

General objective: to evaluate the efficacy of the drug Dupilumab in the treatment of eosinophilic esophagitis, in comparison with the treatments already consolidated and available on the market.

Specific objectives:

- To analyze the indications for the use of Dupilumab;
- To evaluate the main advantages and disadvantages of the use of Dupilumab in relation to treatments with diet, proton pump inhibitors, topical glucocorticoids and endoscopic dilatation, which are already consolidated, in the context of eosinophy esophagitis;
- To compare Dupilumab with other immunobiologicals available for the treatment of the pathology, such as IL-5 expression modulators, such as Reslizumab.

METHOD

Initially, two simultaneous searches were carried out using PubMed (https://pubmed.ncbi.nlm.nih.gov/) by two different researchers. The first of them used the keywords "eosinophilic esophagitis dupilumab", while the second used "dupilumab treatment esophagitis eosinophilic". Both were carried out between September 12 and 13, 2023 and added, as a filter, articles published in the period between 2020 and 2023.

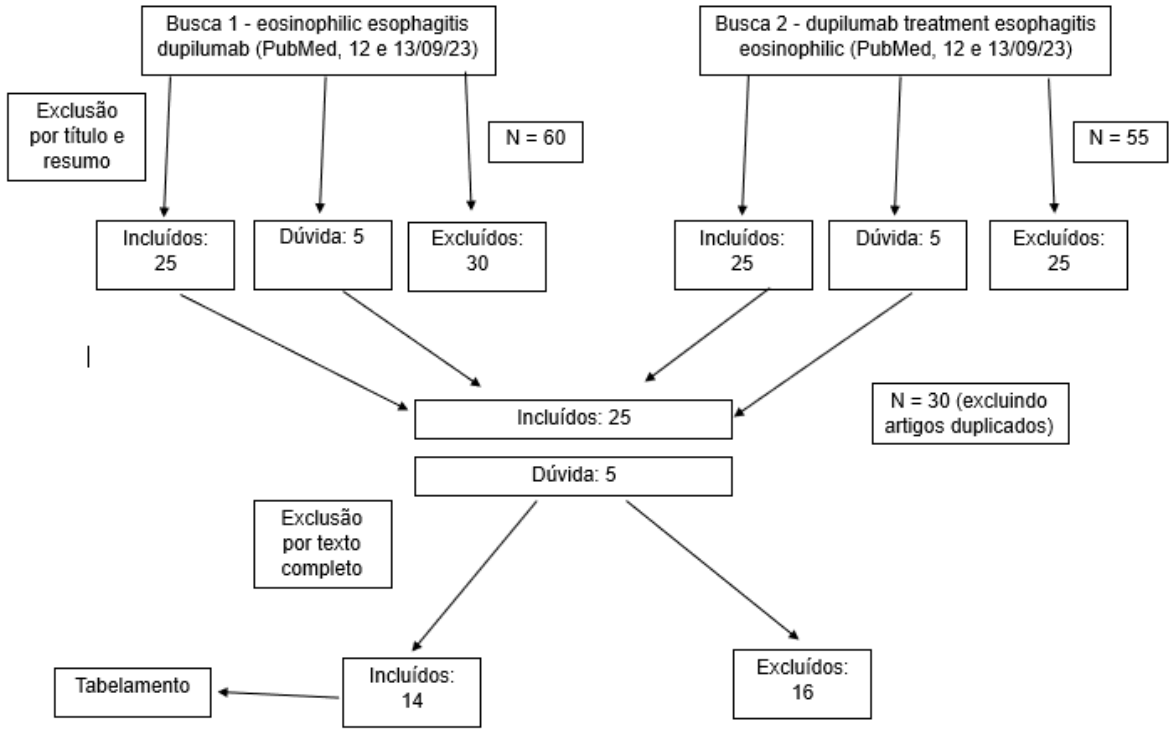
The exclusion, at this initial moment, was carried out based on the reading of the title and abstract of the articles. The inclusion criteria involved: approach to the results of the treatment of eosinophilic esophagitis with Dupilumab, articles in English and studies of adults and/or children. The exclusion criteria, on the other hand, were: articles in languages other than English, lack of consideration of Dupilumab or the outcome of treatment with this

drug, articles dealing only with esophagitis (not the drug under study), focus on other atopic diseases, and texts structured as comments. In the first search, 60 articles were initially obtained, 25 of which were included in the study, 30 were excluded and 5 left doubts. In the second search, 55 articles were found, of which 25 were included, 25 were excluded, and 5 left doubts. All of these 55 articles obtained in the second search were repeated, compared to the first search, including, in the sum of the two title and abstract analyses, 25 articles categorized as included and 5 in doubt.

These 30 articles were read in their entirety below. Each of the principal investigators was responsible for 15 of them. From this, 14 were considered adequate to be included in the tabulation, and 16 were not included, and 9 of these exclusions were due to being paid articles, while the others were made using the same criteria described in the previous paragraph.

Finally, these 14 articles were analyzed in greater depth and included in a table collecting the following information: title, DOI, year of publication, origin of the article, type of study, total number of patients studied, classification of the study population (age group, gender, ethnicity, and presence of comorbidities), treatment prior to Dupilumab, and results with the use of medication (which were subdivided into improvement and recurrence/side effect).

Image 3 – illustrative scheme referring to the method adopted in the work.



RESULT

A total of 14 articles were analyzed, after applying the exclusion criteria detailed in the study methodology. Of these, one was published in 2023, 8 in 2022, one in 2021, three in 2020 and one in 2019. This denotes that the application of Dupilumab in the treatment of eosinophilic esophagitis is quite recent, a context in which a relationship was established between the pathophysiology of EoE and the mechanism of action of the drug, which was already used in the treatment of other pathologies with atopic characteristics, such as asthma and atopic dermatitis.

Regarding the origin of the article, three continents (Europe, America and Oceania) were considered. However, there was a predominance of studies carried out in the United States, since 13 of the 14 articles were carried out, at least partially, in that country, one of which was multicenter (also applied in Australia, Canada and Europe) and another involved both Europe and North America, while the others were carried out only in the United States. One of the tabulated articles did not specify the origin.

In terms of the type of study, there was a predominance of reviews and case reports, with 5 of each of these, in all. There were also 3 double-blind randomized clinical trials, one of them phase 3, another phase 2 and a third unspecified. A retrospective study of medical record review was also found.

The total number of patients studied ranged from 1 in 4 of the 5 case reports found to 321 in the multicenter study. In the phase 2 clinical trial, there were 47 patients; in another clinical trial, whose phase was not specified, 240 people were studied; in the retrospective study, 7 were contemplated; In the only case report that did not include a single patient, there were 3 in all. Three of the review articles did not specify the number of patients covered. The other two review articles covered 47 patients in the analyses.

Regarding the age group, the clinical trials covered patients aged 12 years and over, 18 to 65 years and 12 to 66 years, while the case reports analyzed patients aged 7, 9, 14, 17 and 42 years; The retrospective study had a range from 6.9 to 25.4 years. Three articles did not specify the age of the patients under study and two classified only as "adults", without further details.

With regard to gender, of the 7 patients studied in clinical trials, there was only one female patient (14.2%) compared to 6 males (85.7%), while in the retrospective study, there were 5 boys (71.4%) and 2 girls (28.5%). In the clinical trials, there was a predominance of male participants, ranging from 57, 60, 68 and 73% depending on the study, while women represented 32, 37, 40 and 43%. 5 articles did not provide data on the gender of the patients.

Of the articles analyzed, 11 did not specify the race of the patients in question, and only 3 detailed this information. Of these articles, one clinical trial had 100% of the white patients in the Dupilumab group and 87.5% in the placebo group, while a second trial had a great predominance of white race (96% in part A and 90% in part B of the study); One of the case reports involved a Caucasian patient.

Regarding the presence of comorbidities, the data are presented in the following table. Only 5 articles did not report on comorbidities

Table 1 – Comorbidities of the patients included in the articles analyzed.

Study design and total patients	**Presence of comorbidities**
Phase 3, randomized, double-blind clinical trial with 321 patients [22]	285 (89%) had a history of allergic disease with type 2 inflammatory response, 217 (67%) with allergic rhinitis, 175 (54%) with food allergy, 115 (36%) with asthma, and 63 (20%) with atopic dermatitis
Randomized double-blind phase 2 clinical trial with 47 patients [23]	79% (19 patients) of the placebo group and 87% (20 patients) of the Dupilumab group had 1 or more additional atopic diseases, 31 (66%) with food allergy and the same amount with allergic rhinitis, 20 (43%) with asthma, 10 (21%) with chronic rhinosinusitis, 8 (17%) with atopic dermatitis, and 6 (13%) with allergic conjunctivitis
Case report of 1 patient [24]	Atopic dermatitis, asthma and allergic rhinitis
Case report of 3 patients [25]	Patient 1: severe atopic dermatitis and food allergy Patient 2: severe asthma Patient 3: severe atopic dermatitis.
Case report of 1 patient [26]	Rhinitis allergy and asthma
Case report of 1 patient [27]	Asthma, chronic urticaria, allergic rhinitis, and eczema/atopic dermatitis. Food impaction.
Retrospective study of 7 patients [28]	Asthma or atopic dermatitis
Case report of 1 patient [29]	Tracheostomy, gastrostomy, extreme prematurity (26 weeks gestational age), chronic lung disease, tracheal and subglottic stenosis. No personal or family history of atopy
Phase 2, Randomized, Double-blind, Placebo-controlled Study With Dupilumab With 47 Patients [30]	Allergic rhinitis or food allergy

In the context of previous treatment, all clinical trials included the use of proton pump inhibitors (PPIs), and in one of them, 38% (7 patients) had already used PPIs in high doses or twice a day for at least 8 weeks [23]. In a second study, 71% (231 patients) had previously used high-dose PPIs for 8 weeks, and the pump inhibitor was maintained

throughout the study; In addition, 38% (122) of patients already had a previous esophageal dilatation and 38% (122) had a history of diet with elimination of certain foods [22]. Regarding the retrospective study, topical corticosteroid therapy, including budesonide, fluticasone, and mometasone, was used in 85.7% of the patients, PPIs were used in 100% of the cases, elementary formula in 33.3%, and esophageal dilatations in 16.6% of the patients [28]. In the randomized, double-blind, parallel-group, multicenter, placebo-controlled study, 43% of the subjects in part A and 37% of the subjects in part B had a history of previous esophageal dilatations [17].

Finally, in the case reports, the first included previous use of PPIs, which was maintained during the study, in addition to Betanecol and Fluticasone, which was changed to Budesonide [24]; in a second report with 3 patients, the first used Budesonide, PPIs, milk and gluten elimination, 6-food elimination diet (milk, gluten, soy, fish/shellfish, peanuts, tree nuts, and egg) and glucocorticoids; the second, PPIs and budesonide; and the third had undergone previous treatment only for severe atopic dermatitis, whose medication was not informed [25]. In a third case report, PPIs, topical glucocorticoids, milk-elimination diets, and esophageal dilatations were previously used [26]; in the last report, only ingested fluticasone (110 µg/performance), 2 oral inhalations twice a day, and esomeprazole 20 mg a day [29] were used. 5 articles did not provide information on prior treatment.

All the articles analyzed demonstrated improvement in patients using Dupilumab, 13 of which showed a reduction in the eosinophil count, 8 showed clinical improvement of symptoms, 8 indicated histological improvement, 7 denoted improvement in the endoscopic pattern, according to the Endoscopic Reference for Eosinophilic Esophagitis, and 4 indicated a reduction in the Dysphagia Symptom Questionnaire (QSD) score.

HIRANO [23] indicated that the mean QSD score was 6.4 at baseline involving 47 patients, and was reduced to a mean value of 3 at week 10 in the group that received 300 mg of dupilumab weekly, compared to the 1.3 reduction in placebo. In addition, 9 patients treated with Dupilumab (39%) had a reduction of 3 points or more in the Dysphagia Symptom Questionnaire (QSD) compared to 3 patients on placebo. At week 12, compared with placebo, Dupilumab reduced peak eosinophil count by an average of 86.8 per high-rise field; The histological score was reduced by 68.3% and the endoscopic reference by 1.6. In addition, there was an increase in esophageal distensibility in 18% of those who received Dupilumab. Finally, 13% of patients treated with Dupilumab had histological and symptomatic remission, compared with none on placebo, at week 10.

BEVERIDGE [31] studied patients who received subcutaneous injections of placebo or dupilumab with a loading dose of 600 mg and then maintenance with 300 mg weekly for

12 weeks. Of the patients who received Dupilumab, 83% achieved an eosinophil count of less than 15 per high-magnification field, at week 12, compared to 0% of those receiving placebo. 39% of patients who received Dupilumab had symptomatic improvement at week 10, compared to 13% who received placebo. Oesophageal distensibility also improved significantly with Dupilumab, compared with placebo at week 12.

Al-HORANI [17] conducted a randomized study in which, in parts A and B, patients received 300 mg of Dupilumab or placebo for 24 weeks. In part A, 60% of patients achieved less than 6 eosinophils per high-magnification field, compared to 5% in the placebo group, and achieved an average improvement of 22 points in the QSD score, compared to only 10 points for patients in the placebo group. In part B, 59% of patients achieved less than 6 eosinophils per high-magnification field, compared to 6% of the placebo group. The average improvement was 24 points in the QSD score, compared to only 14 points for patients in the placebo group. In this same context, LUCENDO [32] studied the use of placebo compared to a loading dose of 600mg, followed by 300mg of Dupilumab weekly, for 12 weeks. As a result, the maximum eosinophil count was reduced by 91.8% with Dupilumab, compared with 15.1% with placebo. In addition, 82.6% of patients treated with Dupilumab achieved less than 15 eosinophils per high-magnification field, and 65.2% achieved less than 6 eosinophils. There was also improvement in endoscopic scores and symptomatic improvement of dysphagia in 45% of patients, compared to 19% of the placebo group, according to QSD.

Still with regard to clinical improvement, it is interesting to note that the multicenter clinical trial concluded that histological and symptomatic remission was evident only in the weekly treatment with Dupilumab, since, in the biweekly regimen, the results were not considered significant, since there was no difference at baseline of the Dysphagia Symptoms Questionnaire (QSD) between those who took Dupilumab fortnightly and those who received placebo. perhaps due to the divergence of serum concentration between the weekly and fortnightly regimens [22]. In part A of this study, 25 of 42 patients (60%) who received 300mg of Dupilumab weekly had histological remission, as did 2 of 39 who received placebo, while in part B, 47 of 80 patients (59%) who received Dupilumab weekly had histological remission, as did 49 of 80 (60%) who received 300mg of Dupilumab every 2 weeks and 5 of 79 (6%) who received placebo. On the Dysphagia Symptom Questionnaire (QSD), the score improved with weekly Dupilumab, compared with placebo (difference of -12.32 in part A and -9.92 in part B); on the QOD scale, there was no significant improvement with biweekly dupilumab. The reduction in eosinophil count was greater in those who received Dupilumab weekly, in part A, than in placebo, with a

difference of 68.3 percentage points. In part B, the difference was 88.6 points between those who received the weekly drug and the placebo, and 79.2 between those who received the biweekly treatment and the placebo. Regarding the ERFES endoscopic score, in part A, the difference between patients who received weekly Dupilumab and those who took placebo was -2.9; in part B, -3.8 in the weekly regime and -3.9 in the biweekly regime. The serum concentration of the drug in weekly use was more than double that of the biweekly drug. These findings are consistent with the FDA's recommendation of 300 mg of Dupilumab weekly for the treatment of EoE.

The case reports also had promising results. NAMBIAR [26] studied a 14-year-old patient who was admitted to the ER with esophageal food impaction, inability to tolerate oral secretions and progressive dysphagia for 2 years, and esophageal stenosis and ring trachealization were observed at endoscopy. The narrowest portion of the esophagus was smaller than 5.4 mm. Glucocorticoids and PPIs were started at high doses thereafter, but stenosis remitted after 3 months. New treatments were tried the following year, without symptomatic, histological and stenotic resolution, which culminated in the initiation of Dupilumab. As a result, EREFS went from 7, in July/20, when it was admitted to the ER, to 5, in March/22, with the patient using 300mg of Dupilumab weekly since December/21.

The use of Dupilumab, even as a primary indication for other pathologies, allowed the remission of eosinophilic esophagitis, as demonstrated by SYVERSON [28], in which 7 patients with EoE were treated with subcutaneous Dupilumab 200mg (4/7) or 300mg (3/7), every 2 weeks, for the primary indication of asthma or atopic dermatitis. At follow-up endoscopy performed during Dupilumab therapy, the median maximum esophageal eosinophil count was 2 eosinophils per high-power field (IQR 0–5 eos/CGA), with the presence of edema and exudate in 2 patients and absence of rings, grooves, or strictures in all of them. Follow-up endoscopy was performed on average 5.3 months (IQR 4.6–9.8) after initiation of Dupilumab, with all patients off topical corticosteroid therapy, 4 of 7 had reintroduced one or more food groups into their diet, and 6 of 7 had dysphagia improvement. In this same context, BUENDIA [24] demonstrated a patient with atopic dermatitis and EoE, who had clinical and histological remission of EoE, after 4 months of use of Dupilumab as the primary indication for atopic dermatitis. A loading dosage of 600 mg was performed, followed by maintenance with 300 mg fortnightly. The number of eosinophils per field reached 12, and it had already been close to 105.

Regarding relapse and adverse effects, Dupilumab was well tolerated, with no serious adverse events or deaths. In clinical trials, the most frequent were injection site reaction (ranging from 2.36%, 35%, and 38%) and nasopharyngitis in two studies (17% of

patients in both); conjunctivitis (3.1%), upper respiratory tract infection (18%), arthralgia (2%), and herpes viral infections (2%) were recorded in a single trial; One of the clinical trials showed no adverse effects and there are no records of recurrences in all of them. Only 1 patient discontinued treatment for a serious non-study related event (nail disorder).

Also in this context, the case reports presented varied results, including two cases without recurrence and without side effects; one case of a patient who relapsed twice after starting Dupilumab, with worsening dysphagia and an eosinophilic count of 55 per high-power field, requiring the association of low-dose Budesonide and maintenance of PPI for complete resolution and histological remission (10 eosinophils/CGA) after a 4-month follow-up [24]; and one case without histological remission after initiation of Dupilumab, with normal eosinophil count, but active EoE in the distal esophagus, with improvement of symptoms and esophageal appearance, with no identification of new stenosis; the patient had been on Dupilumab for 1 year, without any side effects other than lack of appetite [26]. Finally, a review article cited adverse reactions such as injection site reactions, upper respiratory tract infections, herpes viral infections, and arthralgias, without further details [19]; 4 articles did not provide data on adverse reactions and relapses.

DISCUSSION

The results of this research found that the studies included patients in a variable age range between 7 and 66 years. With this, it is possible to infer that Dupilumab was safely used from the pediatric population to the adult population. In addition, as suggested in previous studies, there was a predominance of males [10] and a great relationship with other atopic diseases, such as allergic rhinitis and asthma [9]. Regarding previous treatments, there was a preponderance of the use of proton pump inhibitors (PPIs).

The results demonstrated by Dupilumab are undoubtedly promising, in the context of EoE, in terms of histological, clinical, endoscopic remission and eosinophil count, which can have a great impact on improving the quality of life of these patients. In addition, there were no serious adverse effects recorded.

However, there was divergence among the studies regarding the dose and appropriate frequency of treatment, considering that HIRANO [23] and AL-HORANI [17] proposed a weekly regimen of 300 mg of Dupilumab, as recommended by the FDA, while BEVERIDGE [31] and LUCENDO [32] used 600 mg of loading dose, with maintenance at 300 mg for 12 weeks. These two regimens were well effective in terms of clinical, histological, and endoscopic remission. However, the biweekly treatment regimen with 300mg of Dupilumab did not modify the baseline Dysphagia Symptom Questionnaire (QSD)

score, compared to placebo, despite the fact that there was histological improvement and reduction in endoscopic score, as demonstrated by DELLON [22].

Longitudinal monitoring of patients with this pathology is essential, even for the introduction of new therapies, when necessary, such as immunobiologicals. However, there is a lack of studies that deal with the transition from conventional pathologies to Dupilumab. It is also worth mentioning that, as much as the weekly treatment with 300mg of Dupilumab, as approved by ANVISA and the FDA, has shown superior results, compared to the biweekly regime, this drug has been marketed, under the name of Dupixent, for approximately 10 thousand reais and, from what was ascertained, it is not distributed in the Unified Health System (SUS) as a primary indication for the treatment of EoE, so that access to it becomes quite limited.

CONCLUSION

In summary, the pathophysiology of eosinophilic eosphagitis is mainly permeated by the action of the T-heper 2 lymphocyte, the recognition of interleukins (especially IL-4, IL-5 and IL-13, with regard to allergic diseases), the differentiation of eosinophils and the production of IgE antibodies [14]. Dupilumab, the central drug of this study, targets the alpha chain of the IL-4 receptor, called IL-4R alpha. From this, Dupilumab inhibits IL-4 and IL-13 induced responses, so as to reduce protein transforylation, transcription (sustained mainly from STAT 6) and T helper 2-regulated response, in the context of atopic diseases [20].

The primary objective of this systematic review was to evaluate the efficacy of Dupilumab in the treatment of EoE. It is a chronic and immune-mediated disease, probably triggered by the relationship between genetic factors, environmental risks and the patient's defense system. The results were promising, with evidence of improvement in all patients included in the studies analyzed, with no association with serious adverse effects.

However, it is worth noting that further studies are needed to better clarify the longitudinal monitoring of patients with eosinophilic esophagitis, with regard to both the transition from conventional treatment to immunobiologicals and the appropriate treatment time with Dupilumab and subsequent maintenance therapy. Despite having been approved by ANVISA and having had very promising results, in research, this drug has not been distributed by the Brazilian Unified Health System, which makes access to it quite restricted, due to its high price, so that, for its use to be expanded, it is necessary to wait for it to become available in the health system.

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DYNAMICS OF MN AVAILABILITY OF AERATED SOILS BY ENVIRONMENTAL CONDITION

https://doi.org/10.56238/sevened2024.031-055

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ABSTRACT

Manganese is a micronutrient absorbed by the plant in the form of Mn2+, the available content of soils is between 1 and 10 $mg.kg^{-1}$, but it is the only element that undergoes major changes with climate changes (temperature, humidity, solar radiation) of tropical soils. The other nutrients do not change with climatic conditions. There is still no consensus on the mechanism of the dynamics of Mn solubilization in aerated soil. The known reactions are neutralization of Mn2+ toxicity by liming, forming $Mn(OH)_2$ and the other is increased solubilization by reducing MnO2 to Mn2+ by anaerobic microorganism.

This article presents the results of research on the dynamics of Mn2+, Mn-disp, availability of aerated soils. The soil temperature below 20 ºC remains unchanged for a long time. But when the soil is heated and dried by solar radiation, a temperature > 50 ºC, the Mn-disp increases from 5 to 70 $mg.kg^{-1}$. However, when the soil is moistened with rainwater, after a few days, the Mn-disp content returns to the initial value, 5$mg.kg^{-1}$. Showing that, in order to remain stable Mn-disp content, it requires soil cover with vegetables, keeps it moist and keeps temperature fluctuations minimal to favor the development of microorganisms.

The complementary research of the study of the dynamics of Mn-disp in soils, no reduction of MnO2 to Mn2+ or oxidation of Mn2+ to MnO2 was observed. That is, the increase or decrease in the availability of Mn does not alter the total levels of Mn2+ or MnO2 in the soils.

Keywords: Mn toxicity. Soil microorganisms. Soil management. Chemical analysis of soils. Soil micronutrient.

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INTRODUCTION

Manganese is a micronutrient that belongs to the class of transition metals Cr, Mn, Fe, Co, Ni and Cu, it has oxidation states: Mn0, Mn2+, Mn3+, Mn4+, Mn5+ and Mn7+, but in the soil it is predominantly Mn2+ and Mn4+. Mn2+ is found in the soil in different forms: free Mn2+, organic complexes, precipitates of OH^-, CO32-, S2-, and others, and Mn4+ is found in the soil in the form of insoluble MnO2. The total Mn content in the soil ranges from 100 to 3000 mg/kg and the bioavailable content ranges from 2 to 50 mg/kg (extractable in NH4OAc 1.0M). Most of the soil Mn is found in the form of insoluble MnO2 and a smaller fraction in the form of Mn2+ (Miyazawa et al. 1993).

The chemical analysis of the soil for fertility purposes follows the protocol of the procedure described in the "Manual of Soil Analysis Methods" (Pavan et al, 1996; Raij et al., 1987; Silva, 2009). The chemical fertility analysis of soils determines the levels of nutrients available or absorbable by the plants, so they are not absolute values.

For soil fertility analysis, samples are collected in the field, dried in the shade or in the greenhouse at 60 ºC, passed through a 2.0 mm sieve (fine air-dried earth, TFSA). The samples are dried in the oven for 24 to 72 hours and analyzed after one to 30 days, according to sample demand.

They were observed in the laboratory of the Agronomic Institute of Paraná, IAPAR, in the results of Cu, Zn, Mn and Fe of the soils, when repeated analyses, the values of Cu, Zn and Fe showed few changes, less than 5%, but the values of Mn of some soils increased more than 200%. To verify these differences, analyses of some soil samples from the IAPAR Soil Laboratory were repeated. The results confirmed, the longer the storage time, the higher the manganese values, some exceeded 100 $^{mg.kg-1}$ (> 300% increase), but the contents of other metals, Cu, Zn and Fe with minimal changes. To understand this increase in Mn, a literature review and some experiments on the dynamics of Mn availability in aerated soils were carried out.

Some Mn reactions in the soils are agreed upon by all, they are: decrease in Mn toxicity by the application of CaCO3 by the formation of $Mn(OH)_2$ of low solubility and another reaction to increase the availability of Mn by reduction of MnO2 in anaerobic medium to Mn2+ by reducing microorganisms (Ponnamperuma, 1972).

But there are still contradictions about the increase in the availability of Mn from aerated soil, some attribute to the microbiological reduction of MnO2 after high-intensity rain (Jackson, 2019). Others attribute it by the breakdown of organic substances in the release of Mn2+ from the compounds (Christensen et al. 1950).

Analysis of available Mn from the soil - Most laboratories in Brazil use Mehlich 1 solution for Mn extraction for convenience, because this solution is also used in the extraction of P, Cu, Zn and Fe, but NH4OAc 1.0 M pH 7.0 solution is also used. The Mn content extracted by Mehlich 1 can find values higher than 100 $^{mg.kg-1}$, equivalent values macro nutrients, P and K. On the other hand, the NH4OAc 1.0 M pH 7.0 solution extracts smaller amounts, between 1 and 10 $^{mg.kg-1}$ of available Mn from agricultural soils. Therefore, in these studies of the dynamics of Mn availability from soils, they were extracted with NH4OAc 1.0 M pH 7.0.

The analytical procedure was: 2.0 g of sample was transferred to a 50.0 mL Falcon tube, 20 mL of solution was added and stirred for one hour. The suspension was centrifuged and the Mn was determined by atomic absorption, EAA.

In this work we present our long-term results, since 1980, and completed with some results that have not yet been published to understand the mechanism of the dynamics of Mn availability in aerated soils of tropical climate.

Some terms used in this text:

Mn-available (Mn-disp)- Mn extracted with NH4OAc solution 1.0 M pH 7.0.

Moist soil-soil with moisture field capacity, 1/3 MPa.

DRYING TEMPERATURE AND STORAGE TIME OF SOILS

Different environmental conditions and storage time of soil samples in Mn-disp were evaluated. Soil samples of Dystrophic Dark Red Latosol, LEd and Terra Roxa, TR, were collected at the depth of 0 to 20 cm. The samples were dried under the following conditions: TFSA (60 oC); dry at room temperature (25 oC); humid 10 oC (refrigerator); and humid at -5 oC (refrigerator). The Mn-disp was determined monthly for six months.

The Mn-disp levels of LEd stored in the refrigerator for 6 months at -5 oC and 10 oC remained unchanged, around 1.0 mg.kg-1. And the soil dried in the shade, 25 oC showed a slight increase at the end of 6 months, 1.3 mg.kg-1. However, in the TFSA, dry at 60 oC caused an increase to 8.0 mg.kg-1 at the beginning of the evaluation (month 0) and a gradual increase until the end of 6 months, 18.0 mgkg-1 (Table 1).

The Mn-disp contents of the wet RT also did not show changes in the two storage conditions, refrigerator at -5 oC and 10 oC, around 1.8 mg.kg-1. And the sample dried in the shade at 25 oC also caused only a slight increase at the end of 6 months, from 2.2 mg.kg-1 to 4.5 mg.kg-1. Dry soil at 60 oC (TFSA) increased to 10.0 mg.kg-1 over time, 0 months, and gradually increased until the end of 6 months, 58.8 mg.kg-1.

Table 1. Soils stored under the following conditions, wet, dry at 25 ºC and 60 oC (TFSA) and determined Mn-disp for 6 months (unpublished data).

Soil	Drying	0 month	1 month	2 months	4 months	6 months
		---------- Mn, mg^{-1} ----------				
Led	agel. - 5 ºC	1,0	0,9	0,9	1,0	1,0
	bgel. 10 ºC	1,0	1,0	0,9	1,0	0,9
	cseco 25 ºC	1,0	0,9	1,0	1,2	1,3
	TFSA	8,0	10,1	13,0	15,5	18,0
TR	agel. - 5 ºC	1,8	1,9	1,7	1,9	1,7
	bgel. 10 ºC	1,9	1,7	1,6	1,8	1,7
	cseco 25 ºC	2,2	2,3	2,2	3,5	4,5
	TFSA	10,1	20,1	40,5	52,1	58,8

a) refrigerator at -5 ºC; b) refrigerator at 10 oC; c) dried in a laboratory environment.

Samples of moist soils stored in the refrigerator at -5 oC to 10 oC did not alter Mn-disp contents and those dried in the shade (25 oC) may cause a slight increase after 4 months of storage. The Mn-disp contents of the TFSA samples (dried at 60 oC) cause constant increases during the entire storage period, from the beginning to 6 months, causing increases of 18 to 30 times of the original moist soil.

The Mn-disp contents of the soils stored moist in the refrigerator or environmental condition, remained stable. The TFSA samples stored in the ambient condition, the Mn-disp contents increase continuously. Confirming the results in the repetitions of the samples made at the IAPAR Laboratory, in 1980. Webb et al. (1993) also observed an increase in Mn in the dry soil of Australia in four years stored.

These results show that the Mn analyses of the producers' soils do not represent real plant conditions in the field, for the following reasons: soil sample preparation process (time from collection to analysis, drying) and soil environment with plants (soil moisture and temperature.

MN-AVAILABLE MONITORING IN THE FIELD

The objective of this study was to evaluate the effect of climate on the dynamics of the Mn-disp of the bare soil. The Mn-disp content of the aerated soil (Dystrophic Purple Latosol) was monitored for one year at the IAPAR Experimental Station, Londrina - PR, Brazil, at the depths of 0 to 5 cm, 5 to 10 cm and 10 to 20 cm, collected monthly. The following parameters were determined: humidity, temperature and Mn-disp extracted with NH4OAn 1.0 M, pH 7.0.

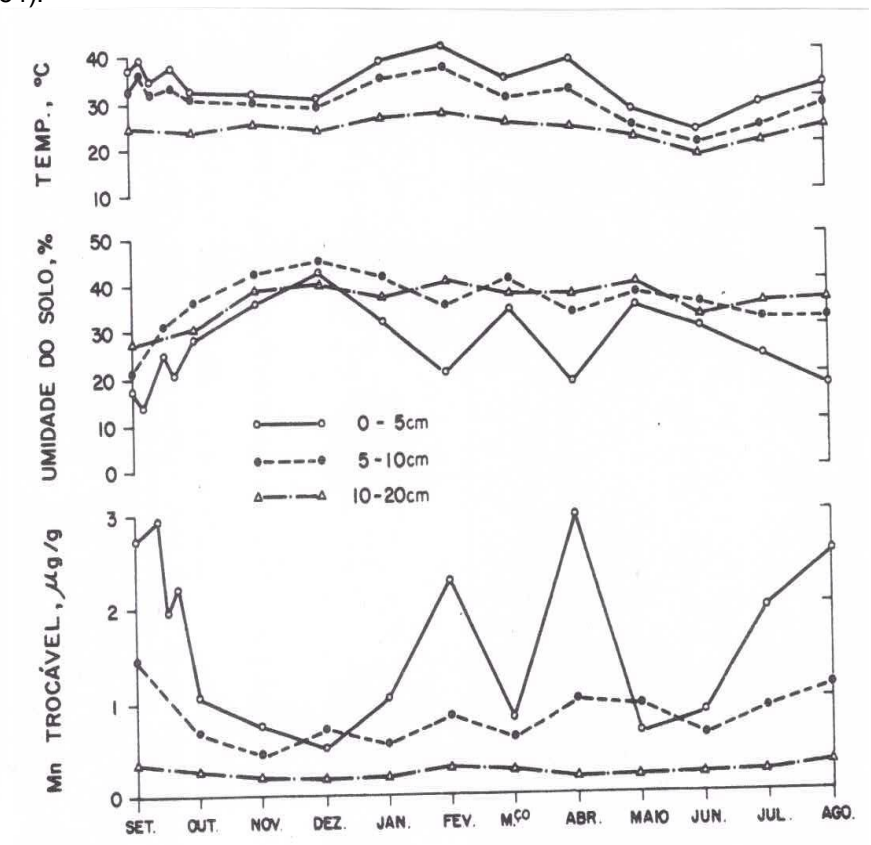
The Mn-disp contents of the 0 to 5 cm layer showed greater variations during the year, from 0.3 to 3.0 $^{mg.kg-1}$ and the moisture contents were 40% and 19%, these were the samples collected in Dec/82 and Apr/83, respectively. In the other periods, they presented intermediate values (Figure 1). And in the samples of the 10 to 20 cm layer, they showed

smaller variations in: temperatures, humidity and Mn-disp contents during the evaluated period.

The Mn-disp contents increased in the superficial layer of the soil, 0 to 5 cm, in the dry season (dry period) and decreased after wetting with rain. In the 10 to 20 cm layer, there were minimal changes in Mn-disp, because the temperature and humidity oscillations were minimal.

Fujimoto and Sherman (1945) observed in the soil of the Island of Hawaii an increase in Mn toxicity to plants in the hot and dry summer period, but it may disappear in the rainy spring and low temperature. Therefore, they concluded that the Mn oxidation/reduction reaction does not explain the increase and decrease of available soil Mn. Khan and Soltanpour (1978) evaluated 5 mMol DTPA-soluble Mn, pH 7.3, in soils of Colorado, USA, the 1st was immediately after 7 days of incubation and the 2nd was 7 days after drying at 110 oC for 48 hours. The soluble Mn content of the moist soil was 1.9 mg.kg-1 and of the dry soil at 110 oC was 4.4 mg.kg-1, an increase of 130%. They concluded that the solubility of Mn increases with soil warming to 110 oC. And the alfalfa plant showed severe Mn toxicity grown during hot summers and prolonged droughts (Leeper, 1970; Conyers, et al, 1997).

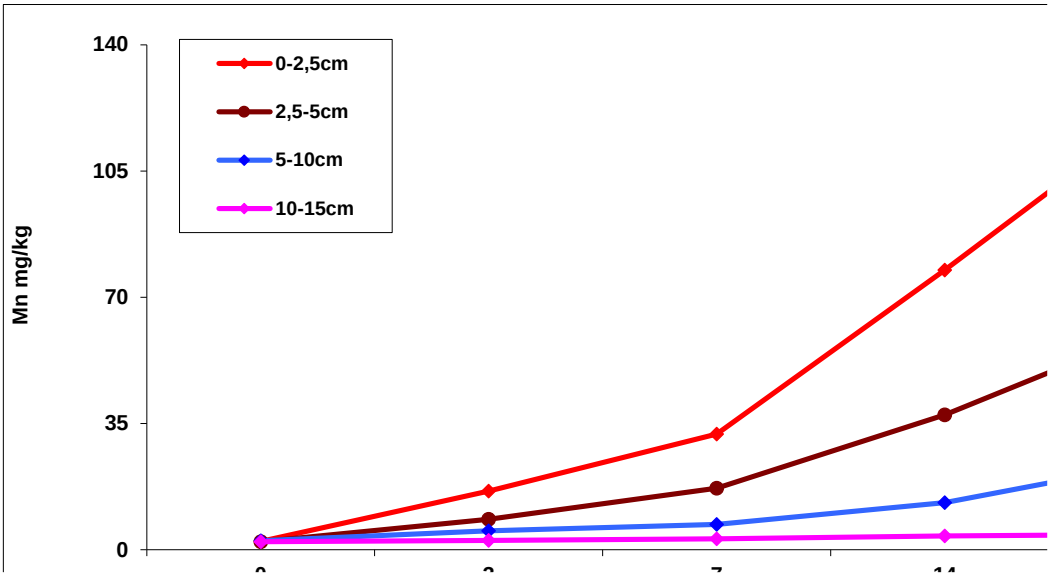
Figure 1. Monthly soil temperature, humidity and Mn-disp data monitored from Sept/1982 to Aug/1983 (Pavan and Miyazawa, 1984).



SOIL WITHOUT VEGETATION COVER IN MN-DISP IN THE SOIL PROFILE

The effect of direct solar radiation on the soil without vegetation cover in Mn-disp was evaluated, simulating dry conditions in conventional tillage (Miyazawa et al. 1993). Dystrophic Purple Latosol, LEd, was collected in the 0 to 20 cm layer, dried in the shade, sieved through a 2.0 mm sieve and homogenized. The soil was transferred to a plastic box with a depth of 25 cm and maintains the moisture field capacity. The soil was exposed to solar radiation and was covered with transparent plastic tarpaulin on rainy days. The following were determined: Mn-disp at 0, 3, 7, 14 and 21 days at depths from 0 to 2.5; 2.5 to 5.0; 5.0 to 10 and 10 to 15 cm, soil moisture and surface layer temperature at 14; 00 hours.

Figure 2. Contents of Mn-disp, $^{mg.kg-1}$, in the soil profile under solar radiation for 21 days (Miyazawa et al. 1993).



The concentrations of Mn-disp increased with the time of exposure to solar radiation, the greatest change was in the layer from 0.0 to 2.5 cm, from 3.0 $^{mg.kg-1}$ at the beginning to 121.0 $^{mg.kg-1}$ (21 days) and the smallest change was in the layer from 10.0 to 15.0 cm, from 3.0 to 3.2 $^{mg.kg-1}$. Soil moisture in the 1st layer decreased from 33% to 12% at 21 days of radiation, and in the layer from 10.0 to 15.0 cm the decrease was almost nil. And the soil surface temperature at the beginning of the experiment (0 day) was 39 ^{o}C and on the last day (21 day) it was 67 oC, this temperature increase was due to a decrease in subsoil moisture (figure 2).

The Mn-disp content of the soil, without cover, increases on the surface with the heating and decrease of soil moisture by solar radiation, on the other hand, in the lower layers the effect of solar radiation is minimal. This result shows the importance of vegetation cover in the chemical and microbiological property of soils. Makino et al. (2000) evaluated

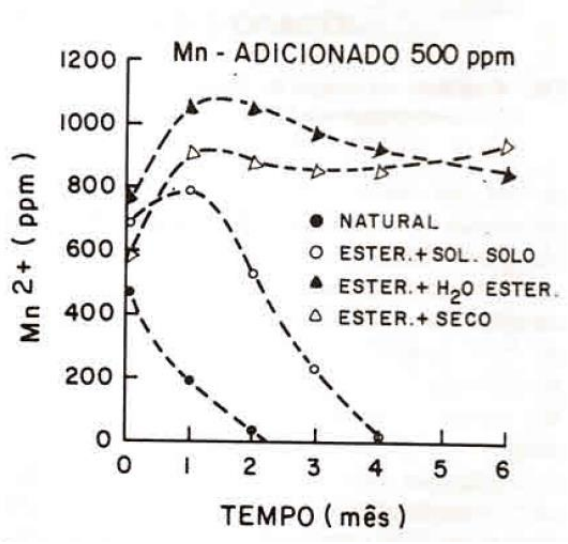
exchangeable Mn in four soil layers of Yawara – Japan, on three occasions: beginning, during and end of the 25-day summer. The exchangeable Mn content in the 0.0 to 1.0 cm layer, at the beginning of the summer it was 7 $^{mg.kg-1}$ and at 25 days of the dry spell (period without rain) it increased to 75 $^{mg.kg-1}$, but after four days of rain, the exchangeable Mn content returned to the value close to the beginning and in the 10.0 to 20 cm layer there were no changes in the Mn and in the other layers, 1.0 to 5.0 cm and 5.0 to 10.0 cm, the changes were minimal.

INCUBATION OF STERILIZED SOIL WITH DIFFERENT CONDITIONS IN THE MN-AVAILABLE

Autoclaved soil incubation with the addition of Mn2+ in the dynamics in Mn-available was evaluated. The sample of Dystrophic Purple Latosol, LRd, was collected from about 10 kg of soil at the depth of 0 to 20 cm, dried in the shade and passed through a 2.0 mm sieve. The soil had a pH of 4.2; sum of bases 2.87 $^{cmol.kg-1}$ and Al 1.62 $^{cmol.kg-1}$.

It was added on the basis of 500 $^{mg.kg-1}$ of Mn (MnSO4) in 5.00 kg of dry soil in the shade and separated into: a) 1.00 kg of natural soil was incubated with distilled water; and the remaining 3.00 kg of soil was autoclaved (120 ^{o}C) one hour, twice with an interval of one day, dried in the shade and separated into three parts of 1.00 kg each; b) kept dry; c) autoclaved + sterilized water; d) autoclaved + native soil solution; and were incubated for 6 months with moisture field capacity. The Mn-disp was determined at: 0 (immediate), 1, 2, 4 and 6 months.

Figure 3. Available Mn-content of soil with the addition of 500 $^{mg.kg-1}$ Mn2+ and incubated for 6 months with different environments (Miyazawa et al. 1993).



The Mn-disp content of the original soil was 7.0 $^{mg.kg-1}$. Natural soil incubation with a dition of 500 $^{mg.kg-1}$ of Mn2+, at the beginning the value of Mn-disp was 405 $^{mg.kg-1}$ (t = 0 month) and after two months of incubation it decreased to < 10 $^{mg.kg-1}$.

The Mn-disp content of autoclaved soil, incubated with natural soil solution, at the beginning was 700 $^{mg.kg-1}$ (t = 0 month), after one month, it increased to 800 $^{mg.kg-1}$ and after 4 months of incubation, it returned to the natural soil value, < 10 mgkg-1.

In autoclaved soils, kept dry and incubated with sterilized water, the average Mn-available content at the beginning (t = 0 month) was around 700 $^{mg.kg-1}$ and at 2 month it increased to around 1,000 $^{mg.kg-1}$ and maintained until the end of the experiment, 6 months (figure 4). Showing that simple soil wetting (sterilized water) does not decrease Mn-disp content, showing that the decrease of Mn-disp in the soil is not a simple chemical reaction. Showing that the possible chemical reactions of Mn2+ in the soil, for example: precipitation (OH-, CO32-, PO43-), oxidation (MnO2) and complexation (humic acid, fulvic) did not occur. The increase in Mn-disp of autoclaved soils up to two months of incubation suggests the solubilization of MnO.nH2O and Mn(OH)2.nH2O hydration.

By adding 500 $^{mg.kg-1}$ of Mn2+ to the natural soil, after 4 months of incubation, the Mn-disp value decreased to near the control soil, < 10 $^{mg.kg-1}$. But in the soil autoclaved and incubated with natural soil solution, it took six months of incubation to decrease to < 10 $^{mg.kg-1}$. The longest time spent to decrease Mn-disp of this treatment was the time needed for repopulation of microorganisms.

This soil, Dystrophic Purple Latosol, LRd, contains more than 1,500 $^{mg.kg-1}$ of total Mn, even addition of 500 $^{mg.kg-1}$ in natural or autoclaved soil + natural soil solution, after an incubation time, decreases to value less than 10 $^{mg.kg-1}$ of Mn-disp, is the value of a normal soil, which develops most plants.

These results show that in sterilized soil, absence of microorganism activities (autoclaved soil, sterilized water) increases Mn-disp and does not decrease with incubation. On the other hand, reactivation of microorganisms (or inoculation with soil microorganisms), the Mn-disp value, returns to the normal value of the natural soil.

DRYING AND INCINERATION TEMPERATURE OF SOILS IN MN-AVAILABLE

Heating temperature between 25 ^{o}C and 800 oC of the soils was evaluated in Mn solubility in NH4OAc 1.0 M, pH 7.0 and EDTA 0.1M. Two samples of agricultural soils from Paraná were collected, at the depth of 0 to 20 cm, dried in the shade and passed through a 2.0 mm sieve, the soils were: Londrina (LEd) and Irati (PVAd). The soils were heated from 25 oC to 800 oC and soluble Mn contents in NH4OAc 1.0 M and EDTA 0.1 M were

evaluated. The drying temperatures in the greenhouse for 24 hours were: 25 oC; 60 oC and 105 oC; and incinerated for two hours at temperatures of: 220 oC; 400 oC; 600 oC; and 800 oC . The soluble Mn was extracted with NH4OAc 1.0 M, pH 7.0 (Mn-OAc), the same procedure used in the available Mn and the weights were corrected for dry soil at 60 oC.

The EDTA-soluble Mn2+ was determined with three successive extractions with 0.1 M EDTA solution (Mn-EDTA). The procedure was: 1.0 g of soil + 20 mL of 0.1M EDTA in a 50 mL Falcon tube, stirred for one hour at 150 rpm, centrifuged for 15 min at 3,000 rpm. The supernatant was transferred to a 200 mL vial and the three extracts were combined, homogenized and the Mn determined by AAS.

The Mn-OAc contents of the soils increased with the increase in temperature from 25 ºC to 105 ºC, the smallest increase was in Londrina, from 2.5 $^{mg.kg-1}$ to 131 $^{mg.kg-1}$ and the largest increase was in Irati, from 6.0 $^{mg.kg-1}$ to 296 $^{mg.kg-1}$. However, in all soils, temperatures above 220 ºC gradually decreased to 800 ºC, the smallest change was from Londrina 73 $^{mg.kg-1}$ to 26 $^{mg.kg-1}$ and the greatest decrease was in Irati, from 267.0 $^{mg.kg-1}$ to 8.6 $^{mg.kg-1}$ (Table 2).

The Mn-EDTA values of all soils were higher than Mn-OAc, but the contents of dry soils from 25 ºC to 105 oC did not increase with the increase in temperature, as observed in Mn-OAc, i.e., the values were almost constant. However, for temperatures between 220 °C and 800 °C of all soils, the Mn-EDTA contents decreased with the increase in temperature, the lowest values were in Londrina, 281 $^{mg.kg-1}$ and 50 $^{mg.kg-1}$, respectively, and the highest values were in Irati, 359 $^{mg.kg-1}$ and 56 $^{mg.kg-1}$, respectively.

Table 2. Teores of MnOAc and Mn-EDTA of heated soils between 25 ºC to 800 oC (Miyazawa et al. 2014).

	Mn-OAc, $mg.kg^{-1}$						
Soil	25 oC	60 oC	105 oC	220 oC	400 oC	600 oC	800 oC
	---------- $mg.kg^{-1}$ ----------						
Londrina, LEd	2,5	43	131	73	14	24	26
Irati, PVAd	6,0	49	296	267	41	22	8,6
	Mn-EDTA, $mg.kg^{-1}$						
Londrina, LEd	315	301	328	281	262	85	50
Irati, PVAd	426	417	447	359	415	162	56

The Mn-OAc contents at temperatures between 25 oC and 105 oC increased with increasing temperatures and between 220 oC and 800 oC decreased with increasing temperature. On the other hand, the Mn-EDTA contents between 25 oC and 105 oC remained almost constant and at temperatures between 220 oC and 800 oC decreased, as observed in Mn-OAc.

The Mn-EDTA contents for temperature above 220 oC gradually decreased up to 800 oC, in relation to room temperature, there was a decrease of 13 to 30%. As EDTA is a

ligand they form complexes of high stability with cations of the soils Fe3+, Al3+, Mn2+, Zn2+, Cu2+, Co2+ and Ni2+. But they do not solubilize precipitates of low solubility: oxides, hydroxides, sulfides, silicates, carbonates and others.

As there were no differences in the concentrations of Mn-EDTA of the dry soils from 25 oC to 105 oC, they show that there was no oxidation or reduction of Mn. On the other hand, the values from 220 oC to 800 oC showed a gradual decrease in Mn with the increase in temperature, showing that there was oxidation of Mn2+ to insoluble MnO2 with an increase in temperature.

According to Gibbs' free energy diagram, Mn2+ has lower energy and Mn4+ (MnO2) is higher energy, that is, to oxidize Mn2+ to MnO2 requires energy supply, it does not occur spontaneously. On the other hand, since the free energy of MnO2 is greater than Mn2+, reduction can occur without external energy supply (Mackay and Mackay, 1974). Therefore, the reduction reaction occurs spontaneously in the area of soil flooded by anaerobic microorganisms, reduces MnO2 to Mn2+ and uses released energy.

On the other hand, the 1.0 M NH4OAc solution is a neutral salt, it extracts only weakly adsorbed ions by van der Walls force on the surfaces of the clay particles, so it extracts forms of Mn readily absorbable by plants. But, EDTA forms very stable complexes with polyvalent metals, capable of displacing metals from other complexes.

Therefore, the increase in Mn-disp of soils by warming from 25 ^{o}C to 120 oC is not by the reduction of MnO^{2}, but by the destabilization of organic Mn-by warming.

CONCLUSIONS

* The levels of available Mn of tropical soils increase with the dry spell when there is little vegetation cover, due to the direct incidence of solar radiation, causing heating and drying mainly in the surface layer.

* The increase in temperature and storage time of dry soils continuously increases the availability of soil Mn.

* Improper environmental conditions (heating by solar radiation - T > 30 ^{o}C, low humidity) such as summer, for the development of microorganisms, increase the availability of Mn in the soils. However, when a favorable environment for soil microbiota returns, the Mn-disp levels also return to values < 10 mg.kg-1.

* The Mn content of autoclaved soil can exceed 1,000 $^{mg.kg-1}$ and remains unchanged indefinitely. And incubation with sterile water also does not decrease Mn-disp. But incubation of autoclaved soil by inoculating with natural soil microorganisms, the Mn-disp content returns to the original soil value, < 10 $^{mg.kg-1}$.

* The increase in Mn availability by heating and drying and the decrease by wetting with rainwater do not alter the total levels of Mn2+ and MnO2 of aerated soils.

* The dynamics of soil Mn availability is a function of the activities of soil microorganisms.

* It is unlikely that microorganisms from soils capable of absorbing (accumulating in the body) more than 1,000 $^{mg.kg-1}$ amount of Mn2+ from soils.

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THE BATTLE OF IDEAS: AN ANALYSIS OF THE ECONOMIC POLICIES OF CUBA'S DEVELOPMENT MODEL

https://doi.org/10.56238/sevened2024.031-056

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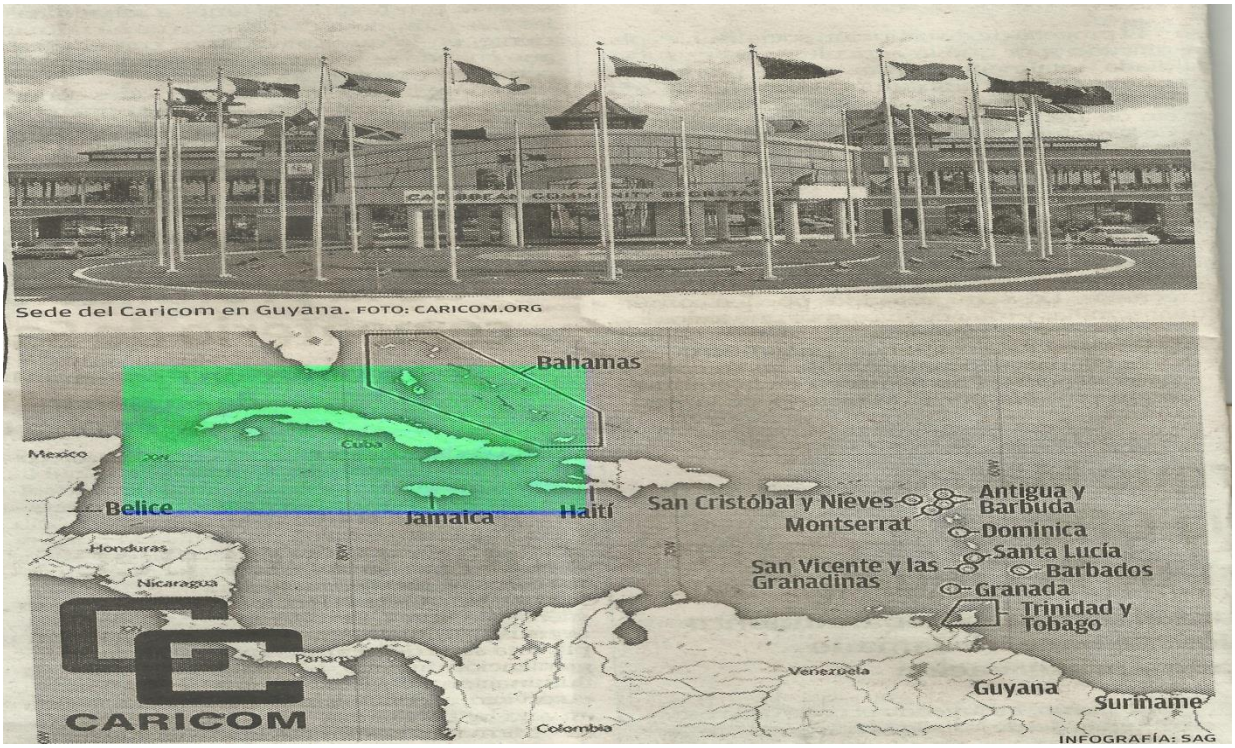
ABSTRACT

The disputed models of society that were established at the end of the nineteenth century and the beginning of the twentieth century arrived in the last decade of the millennium with an unpredictable and brutal reality: capitalism considered the satanic mill of social ills became hegemonic in the planetary escalation as the most successful model of socioeconomic development; On the other hand, socialism, self-styled as the highest phase of capitalism, for upholding honorable principles of solidarity and social protection, by a hair's breadth, did not completely collapse in all the countries where it had access to political power. This controversial scenario, although quite evident, did not make it clear what the socio-economic development potential of both systems was, insofar as capitalism was still seen as a promoter of exploitation and social exclusion on a global scale, at the same time that socialism continued to sustain the argument in favour of human equality in few places. although he was weakened. In the midst of this environment, the question that is pertinent to investigate was: what are the socioeconomic material conditions of the socialist models that work with them if they are considered promoters of collective well-being. In particular, we investigate the experience of socialism in Cuba, seeking to identify how its economic development policy appropriates its socialist principles to achieve the dignity of man and, therefore, whether the degree of its development legitimizes its assumptions of a society situated at a higher level. stage to capitalism. Under the socioeconomic development approach, the research data revealed low economic and productive efficiency, marked by a backward and obsolete technological base, high external indebtedness, levels of regional and social inequality, with an incidence of poverty being the income of workers. quite depreciated monetarily. It was concluded that socialist principles – precisely the consideration of market functions and social/state ownership of the means of production – are methodologically erratic and were poorly treated in the formulation of Cuban economic policy, and therefore, cannot guarantee well-being. which they profess so strongly because of their theoretical insufficiency and practical inapplicability.

Keywords: Social sciences. Epistemology-methodology. Development. Rationality.

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INTRODUCTION[3]



The fundamental question that guides the objectives of this text is a very simple question that seeks to know if socialism is really presented as a model or phase of society superior to capitalism as prophesied by the German Ideology of Karl Marx and Friedrich Engels? Although Marxism is full of affirmations about the historical necessity of socialism as the only alternative capable of promoting the overcoming of the contradictions, injustices, exploitations and inequalities that the capitalist system has been implementing since its consolidation in modern societies since the nineteenth century, its acceptance as a historical necessity of the oppressed classes is not a complete achievement until today. nor is it a finding that is easy to accept as true through empirical reality.

However, as we are interested in verifying where Marxist literature finds connection with the material and historical reality that it announces, we ask ourselves what substantial modifications, profound transformations in the fields of social protection and economic

[3] This article is a partial requirement for the international exchange carried out between the University of Havana and the Federal University of Acre – UFAC, signed through the postdoctoral course offered by the Faculty of Philosophy and History of this Cuban Institution of Higher Education. I am grateful for the opportunity provided by UFAC through the director of the Center for Philosophy and Human Sciences of the UFAC, Prof. Dr. Jacó Cesar Piccoli and Antônio Pitalunga, Vice Dean of International Relations of the University of Havana. In particular, my sincere thanks to Porf. Dr. Carlos Cabrera, whom I follow as scientific coordinator, is the research process and guide of all the phases of this work. However, I reiterate that the results and production of the text that we now make available to the public are the sole responsibility of the author.

development have been able to produce in socialist societies. the present, making coherent their theoretical assumptions and probabilistic predictions.

With the intention of investigating the nature of socialist societies and their material and social conditions, clearing this controversial terrain full of contradictions, our purpose in this text is to analyze the experience of the Socialist Republic of Cuba, created in 1959, under the auspices of the principles of Marxist socialism as a way of contributing to the debate on the real experience of socialism that, Despite the immense academic production, little is known about its empirical and material reality.

We seek to understand these issues by taking up the theme of development, especially in its version of sustainable development that began to dominate the discourses and/or actions of governments in practically all countries, including socialist ones, from the mid-1990s, when environmental issues entered the political debate. In particular, we will address the development process by addressing the problem of the market and its associative relationship with the government's economic policy as a specific cut to characterize the degree of the political-economic circuit of the Republic of Cuba and its link with the material and social relations of well-being of its people. From this research angle, the notion of development that we adopt in the analysis is linked to ethical motivations and moral regulations that define the naturalness of economic exchanges in such a way that the development process consists of overcoming economic and social deprivations (scarcity of resources, hunger, lack of education, unemployment, diseases, freedom, etc.). material standard of living) that limit the expansion of substantive freedoms, intervening in the possibility of living well in basic conditions of social existence (SEN, 1999; SEN, 2000) that serve the enjoyment of current and future generations. The place of the market is more than the space for the production of economic values that are realized through the production, supply and material consumption of goods responsible for the growth of income, of GDP, it is defined by attributes of normative efficiency that safeguard mercantile exchanges against *"exploitation and in favor of the public welfare"* (BRANDT, 1979, p. 12).

Proceeding in this way, we refer to the research, from a theoretical point of view, placing it within the sociological tradition that studies social relations as a result of the dimensions of economics and politics. This option is justified because Fernand Braudel (1985\1986), José Fiori (1999), Karl Polanyi (1944\2000), Max Weber (1972\2000), Antônio Gramsci (1987) and Gramsci (by SEMERARO, 1999), Amartia Sen (1999; 2000) among others, tell us that social development processes as well as markets are entangled in ethical ramifications and political motivations of social orders.

In this sense, Max Weber (2000) defines the specific methodology of sociology for the understanding and empirical explanation of the causes and effects of relationships, conceiving as a primordial principle the idea that social action[4] between men is loaded with meanings constituted, at times, for multiple motivations that, in the case studied here, they privilege economic and political relations. One line of his exposition, for example, seeks to establish connections between the social actions of the economy and social orders, since such relations between economics and politics explain mutual dependence and the effects of these relations in terms of the effects that are sought to be achieved.

We insist on the theoretical referent defined by the connection between economy and politics or between market and state because socialist systems are referenced to a large extent by the differentiated planning with which the socialist state relates to the market sphere of its territory and how this relationship is the primary basis. the cause of the intended effects of material and social well-being and the justification for the consolidation of a model of sociability free of contradictions.

In this sense, thinking about how market socialization is processed means considering its connection with established political communities, because according to Sen (1999) there are sufficient empirical reasons that indicate the systematic move away from social motivation based solely on self-interest, as exemplified by the case of Japanese industry in which behaviors are close to values such as duty, loyalty and goodwill. These same aspects have been identified by Giovanni Arrighi and Beverly Silver (2001) as the Asian responses of India, Japan, and China to Western domination. And why also in the decision of socialist societies like Cuba that seek to anchor their relationship with the market on the basis of principles such as justice, equality and the social welfare of their people and define their regulation by social objectives that contribute to the improvement of life. and social self-determination?

The analysis, therefore, of the process of mutual dependence and its practical effects must be seen through the meaning of the action of social groups, the primary objective-empirical principle for the study of any objective of society, through which it is possible to reach understanding. of the intertwining of socialization established by the identification of

[4] Max Weber understands "action" as "human behavior (regardless of whether it is an external or internal act of omission or permission) as long as the agent or agents relate it to a subjective meaning. Social action, in turn, means an action which, in terms of the meaning intended by the agent or agents, refers to the conduct of others, guided by it in its course (...). Meaning is the meaning subjectively sought: a) in reality "a" or in a historically given case, by an agent, or in "b" on average and approximately, in a given number of cases, by agents or; b) in a conceptually pure type, constructed by the agent or agents conceived as typical. This is by no means an objectively "correct" meaning or a "true" meaning obtained through metaphysical research. Therein lies the difference between the empirical sciences of action, Sociology and History, and all the dogmatic sciences, Jurisprudence, Logic, Ethics and Aesthetics, which aim to investigate the 'correct' and 'valid' meaning of their objects" (WEBER, 2000, pp. 3-4).

evidence of the intended meaning of the action. Max Weber (2000) exemplifies the evidence of the meaning of social action that is understandably possible when referring to the production, use, and function of socially used artifacts:

> ... Every artifact, a machine, for example, can only be interpreted and understood from the meaning of the human action (with a possibly very different purpose) that provided (or intends to provide) its production and use; without recourse to this meaning it will remain entirely incomprehensible. What is understandable in it is, therefore, its reference to human action, either as a means or as an end conceived by the agent or agents and which guides their actions. Only in these categories is the understanding of this class of objects oriented. We understand the actions of picking up firewood or pointing a rifle not only in a current way, but also for the reasons, when we know that the woodcutter performs this action to earn a salary or for personal consumption, or for recreation (...) or when we know that the shooter acts in this way obeying an order to execute someone, or fighting against a (rational) enemy or for revenge (in an affective, and in this sense, irrational way) (...) all of these are understandable connections of meaning, the understanding of which we consider an explanation of the effective course of action (Ibid., p. 5-6).

In summary, the foundations of Max Weber's integral sociology, constituted in the relationship of social action in interaction with the social formations developed in them, allow us to grasp the connections of meaning established – the interests represented – between the instituted orders of political associations, such as the State, in correspondence with the motivations of economic associations. such as the market, and its different agents involved, as well as to understand the mutual practical effects that result from this relationship, in terms of the results of the functioning of economic policy.

In fact, the socialist experiences in general, and that of Cuba in particular, are quite eloquent, for the reasons that we explore synthetically for their consideration, from which we can observe how the relationship between economic exchanges and normative statutes is established throughout their socialist life, training, allowing us to investigate the intertwining of economic motivations with the devices and political conventions of the productive agents that operate in the constitution of the governmental economic policy for the development of Cuba to achieve the material and social well-being of its people, making evident from there the socialist principles defended and the expected material results that they demonstrate as a response to the connection of the causal processes and their empirical effects that emerge.

We consider it essential, however, to take into account the correlation between the State and the market for the analysis of Cuba, because, as we have indicated, historically there are no markets, and therefore no material development, without political and economic orders to which they are subject. inserted. Giovanni Semeraro (1999, p. 88), translating Antonio Gramsci, says that in his concept of civil society, the idea of "'homo oeconômicus' and the 'determined' market of civil society are not separable from the State

and its superstructural complex". In Gramsci's view, according to this author, the dichotomy introduced by liberalism with the association of free economic initiative linked to civil society and legal-governmental activities linked to political society is part of an important methodological error that must always be unmasked, pus de concorddo with "all liberalism (...) it is a regulation of the State; privatization and nationalization are always state interventions. The State is the preliminary condition of any collective economic activity, it is the element of the market, it is even the market itself, the very political-legal expression by which a commodity (labor) is preliminarily devalued" (SEMERARO, 1999, p. 88). In this sense, there is no separation between the State and the economy, since the political order has the attribute of establishing the standard of economic exchanges, of regulating commercial disturbances (DAHRENDORF, 1997; SEMERARO, 1999; POLANYI, 2000).

This study, in this way, seeks to analyze the current situation of the Republic of Cuba from the investigation of its degree of economic and social development as an expression of the strong planned relationship between the market and the State that socialist systems attribute and impute to themselves as traces that provide the distinctive features of their model of society to the overcoming of capitalist contradictions. its main objective and reason for its existence. In particular, it seeks to correlate the socialist principles underlying its postulates with material, economic, and social objectives, and how they are instrumented by government economic policy to achieve these concrete objectives and results.

The research is limited to studying the Republic of Cuba and presenting a general scenario of its economic policy and the results achieved since 1959 when socialism was promulgated on the island. The database we used sought to cover the socioeconomic conditions of the Cuban territory, seeking to emphasize the results and impacts of government policies for the social well-being of its people. The materials consulted were academic papers, theses, dissertations, scientific articles, magazines, newspapers (Granma, Rebelde, Trabajadores); consultations on information websites (www.cubacontemporanea.com); We also conduct informal conversations, participant observation, participation in meetings and thematic conferences on socialism.

The methodological procedures of the research were based on the following steps: *i) elaboration of the research objectives; ii) collection of empirical material, bibliographic sources, documents, regional works; (iii) cataloguing of statistical data; (iv) informal conversations and participant observation; (v) systematization of the information collected; (vi) preliminary drafting of the article; v) and finally, the concluding drafting of the text*.

The work is organized into two main parts in addition to this Introduction and Conclusion. The first part briefly addresses the socio-historical context of the emergence of

socialism. Its main purpose is to outline the fundamental principles and theoretical-practical assumptions that define the field of socialist systems in general, and of Cuba, in particular.

The second part deals specifically with the empirical results achieved from the formulation of government economic policy throughout the socialist period. It precisely aims to verify the correlation of socialist principles with their concrete material results and their connection of meaning with the expected effects or developments.

Finally, we have some conclusive findings on the current state of the socialist camp in the Republic of Cuba.

CONCEPTUAL CONTRIBUTION. THE ASSOCIATIVE ORIGINS BETWEEN ECONOMIC MANAGEMENT AND POLITICAL POWER RELATED TO THE FORMATION OF INTERNAL MARKETS AND POLITICAL POWER (STATE)[5]

As we announced at the beginning of this Introduction in a very synthetic way, one of the main controversies between the capitalist camp and socialism is based on the way in which the sphere of the market is viewed. The forceful critiques of socialism that situate exploitation, injustices, social inequalities, income concentrations and privatizations of the good point to the logic of how the market runs capitalist systems and how it is governed exclusively by one's own economic interest without taking into account the needs of others. their communities. It is precisely here that socialism asserts itself as an alternative model of human sociability, calling itself the highest stage of society to the extent that it defines itself as a promoter of social protection, equality, justice and the social redistribution of resources for collective well-being. being, therefore, affirming everything that the capitalist order had apparently denied to human society.

The main source of opposition between two systems is based on exactly the way the market operates. The economic determination of the market would explain all the ills of the capitalist camp, laissez faire or not, the subordination of politics to economics, and the regulation of the market, on the contrary, would justify the socialist euphoria of a higher presumption of leadership. of human society, in terms of quality and way of living well.

What happens is that in the theoretical field, as we have shown in a very summarized way, this dichotomy has been overcome very consistently by several authors such as Max Weber. Ferdinand Braudel, Karl Polanyi, Gramsci who guarantees that the

[5] It is worth noting that the theoretical foundations that support this work, as well as this preamble, refer mainly to the political-economic contributions of José Fiori, Ferdinand Braudel, Max Weber, Karl Polanyi. Despite being aware of the different approaches and perspectives of these authors, we use what unites them, namely, in the arguments that markets and political orders develop intertwined.

market and the state conform to a very specific field of intertwining that defines the very nature of modern societies, capitalist or socialist, and therefore, that there are no states without markets and there are no markets without states. In this way, in fact, it is not the predominance or absence of one over the other that ensures the material and social progress of human systems, but the particular way in which this intertwining of the search for balance or equalization between more liberalization and/or social protection is connected. The material and empirical results of well-being would be effects of the "double movement" to use a very precise expression of Karl Polanyi (2001) in one of his main scientific works: *The Great Transformation: The Origins of Our Time*.

With the same point of view, Braudel (1986\1989) understands that the relations of economic exchange constitute the primordial feature of the existence of societies, possibly because without the substratum of material life there would be no possibility of any social survival, since it is basically through relations of economic exchange that allow the liberalization of the isolation of individuals and the satisfaction of their basic needs. In this sense, in the broad support of social and commercial life and of economic action aimed at satisfying primary needs, connecting everyone with everyone, they became the very reference on which the foundations of society were developed. But the historical nature of economic exchanges never meant the preponderance of markets in the orientation of social life, aimed at the acquisition of profitability, negotiation and profit. In many cases, the market relationship probably assumed a different, sometimes even accidental, role in many social formations (POLANYI, 2000).

So there are sufficient reasons to consider that the presence of the economy in social life does not mean sufficient reason to deduce from it the premise that a relation of profit necessarily arises from it. Max Weber (2000) states that economic action is guided by the search for the satisfaction of the most elementary needs of social existence, and considering that the availability of available means, resources, to satisfy them is limited, to the extent that it may imply, perhaps, restrictions on the satisfaction of the needs of third parties, since he postulates that economic action aimed at the immediate appropriation of resources to satisfy material needs uses other forms of non-economic means, such as political, religious, ethical and moral constellations, with a view to ensuring, through physical or peaceful coercion, the guarantee of subsistence and social reproduction of its members.

Although the typical, specifically modern market economy created in the nineteenth century, the self-regulating market that theoretically and by definition functions without extra-economic motivations, has operated under tension due to the double movement that, according to Karl Polanyi, pressures, at the same time, on the one hand, for an excessive

liberalization from the "satanic mill" of the market, and on the other, for reasons of social protection derived from guidelines of security, justice, equality and improvement of the material life of the group of most unprotected people.

These considerations lead us to observe, therefore, that in the historical scenario the connection between the market and political orders predominated different forms of motivations that configured different political-economic associations. Before the end of feudalism, there were different associative modalities of economic action that guided the commercial exchanges established (internally and externally) between different peoples, through the market, and were directed, at different times, by the principles of domesticity, reciprocity and distribution, or the combination of the three, regardless of the nature of political power. it has been the patriarchal, local head of the domestic community, territorial lord, principalities, city-states with centralized power and even with a certain hierarchy in their social organization. It is true that the primacy of commercial exchanges was embedded in the substratum of the social relations that were inherent to it, such as religion, morality, and the political order, which guided commercial exchange mainly to guarantee the symmetry of the maintenance of the supply for the social reproduction of its members, since the principle of profit, business, accumulation, and negotiation rarely figured as the main element of economic action, because behavioral motivations were predominantly extraeconomic (Polanyi, 2000).

According to Karl Polanyi (2000, p. 76), the "market is the meeting place between producers and buyers for the purpose of exchange, purchase or sale (...) [whereas] exchange, negotiation and exchange constitute a principle of behavioral economy that depends on market standards." The market standard, in itself, creates a specific institution, the market, which functions with its own goal of exchange and profit. The presence of the market standard, for example, depends on the definition of prices. But the mere existence or absence of a market in a given society does not define the complexity of its economic relations nor does it necessarily indicate the degree of productive development in modern terms as we understand it today, because, ultimately, markets have always existed as places that supply communities, provide diverse supplies, and/or even function as an essential element of a profitable activity.

Thus, the explanatory elements that led to the creation of the domestic market are associated with several interrelated factors. In the context of the medieval period, European political formations found their borders quite fluid, with their political power decentralized, and internally, within their precariously defined boundaries, cities were still well differentiated in relation to the countryside. In the sphere of local commerce, the economic

activities carried out by the emerging bourgeois class were entirely regulated by a policy concerned with controlling production as a way of maintaining the equilibrium of the prices of products, which implied, in the commercial sphere, barriers in relation to entry. of external goods. However, foreign trade, carried out by merchants and intermediaries who negotiated a large volume of products, escaped the commercial control of the cities and this had an impact on the supply and demand of products, which could cause losses to local merchants. or even increase the price of products of primary necessities of community life. These factors, listed in a general way, support the fact that the development of local trade and long-distance trade occurred separately, in a scenario woven by localized autonomous economies and decentralized political power, precariously articulated by long-distance trade that pressured local spaces. seeking to link them commercially with each other. This pendulum tension found an adequate response, with state action that, in a growing movement of political centralization, involved all economies, leading to the formation of the modern internal market or national economy.

Taking some fragments of Polanyi's (2000) analysis, we can see how he describes this process of origin of the internal market or national economy, in which state action is projected as a political instrument, to regulate the limits of economic exchanges, within the scope of national territories, in the face of the perception that exacerbated competition could lead to the proliferation of commercial disturbances and generate difficulties in the supply of populations, including rising prices and/or shortages of products that constitute basic needs of local populations, such as food.

> In Western Europe, internal trade was actually created by state intervention. (...) By maintaining the principle of non-competitive local trade and equally non-competitive long-distance trade, carried out from city to city, the bourgeoisie made it difficult, by all means at its disposal, to include the countryside in the rhythm of trade and to open up indiscriminate trade between town and country. It was this development that forced the territorial State to project itself as an instrument of "nationalization" of the market and creator of internal trade. (...) The action of the State, which had freed trade from the limits of the privileged city, was now called upon to face two closely related dangers, which the city had already avoided, at that time, to which competition would finally lead. monopoly, but monopoly was even more feared than later, as it was often linked to the necessities of life and could therefore easily become a danger to the community. The remedy found was the total regulation of economic life, but now on a national scale and no longer only at the municipal level. (...) [because] any temporary intrusion of buyers or sellers into the market could destroy the equilibrium and disappoint the usual buyers and sellers, and the result would be the cessation of market functioning. The old suppliers stopped offering their products because they did not have a guaranteed price and the market, without sufficient supplies, would become a prey to monopoly (ibid., p. 84,87).

It is important to emphasize that the flourishing of the competitive, capitalist-type market did not occur outside the mechanisms of political power that, on the contrary, gave it structure and norms, although state power conditioned the limits of its operationalization.

And even more so, if the impulse of state power allowed the flourishing of the self-regulated market and was subordinated, at various times, to the dictates of the exclusive treatment of profit, as also happened in the nineteenth and early twentieth centuries. analyzed by Karl Marx (1998), in Capital, it was precisely through the resource of politics that social forces tried to ensure the tense balance, throughout the history of modern societies, between the movement of market liberalization and that of self-protection, which between economic dynamics and social stability, progress with the associative life of political communities. The post-war European social welfare states and even the turn towards the end of the 1990s in Latin America indicate that the double movement has effectively operated in the modelling of the capitalist system, allowing it to adapt to different modalities of social welfare systems.

In short, the whole process of transformation of social life that led to the growing expansion of the use of procurement-oriented calculability, expressed in the market relationship, and which resulted in the dissolution of the functioning of economies driven by the principles of trade agreements. of mutual obligations was strongly influenced by the interconnections between different local spaces (villages, towns, cities) caused by the broad advance of the market and the centralizing territorial political tendency. On a certain level, this was linked, on the cultural level, to prolonged marriage relationships and the consequent distribution of goods that contributed to the dissolution of the domestic and community order to the extent that it detached individuals from their places of production and collective references. They linked them in broader social networks, economically, through trade, and politically, through state coverage of centralized territories.

On a more general level, this cultural development spread through the growth of cities, resulting in the opening of new administrative jobs, public functions, valorization of the individual through fiscal interest, creation of schools, cultural-recreational spaces, health system, businesses. All this, at the same time, caused, little by little, a progressive displacement of learning possibilities and social references that slipped from the domestic space to the wider territory. The members of the groups, for example, no longer found protection and security in the community association, just as their moral guidelines ceased to be local customs or laws, while the institutionalized political power that was centralized opened new fronts of links through wage labor, making the community, now politically united to the state territory, it is no longer the central place of production, but the associated space of production and consumption (WEBER, 2000).

The economic trajectory of structuring the state management of planning the Cuban market and the guidelines of the economic policy aimed at the social protection of the

development of this country, for these reasons, is the way in which we will approach this relationship to understand a socialist system. It will undoubtedly allow us to reinforce the empirical support base that people's material prosperity, economic dynamics, social stability, have never been incompatible dimensions and that, therefore, they only find refuge when political power is at stake. concerned with giving direction to a project of sociability reconcilable with the market in the right measure of protection of the wide range of material and social life of the different interests it represents.

These preliminary considerations allow us to make some sociologically pertinent interpretative observations based on the theoretical material consulted that we have the opportunity to deepen throughout the text, justifying them from an empirical point of view. In this sense, what we have exposed explicitly demonstrates that the name attributed to social systems, for the cases evidenced here, socialism or capitalism, by itself, does not guarantee their exploitative or social protection character in the contemporary era, no matter how hard Karl Marx tried. very precisely to diagnose the nature of the capitalist system as eminently exploitative in the emergence of this system in the nineteenth century. If its validity still exists, it is partial and we have the opportunity to clarify it, since we have pointed out that the capitalist system itself has incorporated so many transformations in favor of social protection that classical Marxism is insufficient to explain its contemporary essence. The European Social Welfare States were as self-protective as they were economically and technologically developed, so that the existence of exploitation and inequalities were so peripheral that they did not affect the structural cohesion of the national social system, and indeed, instability. of their social cohesion mechanisms were produced by their own success and prosperity and could attract a series of migratory processes that would jeopardize the balance of the system by exerting too much pressure on their jobs and the social security of their nations.

In his recent research, Eli Diniz (2009) has identified five typologies of social models classified as capitalist systems that take into account values such as social justice, equality, redistribution of resources, environmental preservation driven by moral motivations and social duty, which, in other words, appear as socioeconomic constellations based on characteristics of nationalism and cultural traits that reconfigure the old vision of the liberalized market and its link with the State. According to this same author, one of the most characteristic features of the turbulence and dissatisfaction of the 1990s that characterized world politics and the situation of nation states would be the profile of the approaches to the concept of development which, by inverting the neoliberal vision, gains legitimacy the argument that the development process cannot take place if it incorporates ideas of

economic stability. ethics and social justice, environmental sustainability as inseparable components to achieve collective well-being (DINIZ, 2009).

The last version of the self-regulated market collapsed along with the neoliberal fallacy that contradicted its predictions, which imposed the need to build another development model, capable of correcting and readjusting the errors and mistakes of the previous phase of pro-market development. From then on, a new ethos for development emerged, modeled on the version called sustained development (Sachs, 2000), whose main challenge would be to equate economic development with the preservation of environmental resources and social justice, so that dissatisfaction would be resolved. growth of large sectors of the Latin American population, due to the deterioration of living conditions since the 1990s.

Eli Diniz (2009) comments that this turning point of liberalism, without reins, inverted contemporary approaches, recovering the importance of the role of the State as regulator, inducer and coordinator of development: *"the nature and quality of State interventionism thus take up a prominent role in the discussion on the paths of development, in the context of globalized capitalism, recognizing the relevance of different types of state action. In addition, it must be added (...) the importance of the function of state coordination to achieve greater growth and competitiveness of national economies (...)*. Instead of thinking, as in the heyday of neoliberal thought, in terms of polarities, such as the contrast between the statist-protectionist model versus the market economy; export model versus model aimed at the domestic market; developmentalist matrix versus neo-developmentalism, I believe that the proposal of a close complementary relationship between the market, associative activity, economic micro-agents and the central aspects of current institutionality, that is, productive regimes refer to the organization of production through markets and related institutions, is more fruitful" (DINIZ, 2009, p. 12).

In summary, Eli Diniz's argument highlights the centrality of the State in the coordination of economic agents, public and/or private, to direct development strategies, aimed at "achieving collective objectives"; reversing this trajectory of "growth, associated with inequality in income distribution, a hallmark of the old pattern of development." The author concludes by saying that it is no longer possible "to emphasize economic expansion to the detriment of environmental resources. On the contrary, they represent inseparable aspects of a national project, which responds to the aspirations of the population as a whole" (DINIZ, 2009, p. 13).

However, even in the face of so much evidence, economic and social discrepancies persist in many global regions that justify the attribution that modern capitalist systems can

assume as a constitutive aspect of their operating mechanisms the trace of exploitation, misery and the other social problems of criminality and prostitution that are their main traces as a social system because they often occur far from the national borders of the United States. The most developed capitalist systems through the processes of transnational or long-distance exchanges, but even in the most developed countries , he perseveres, those same problems continue to exist as the other less developed countries, only on a smaller, more partial scale, but with the same latent potential of capitalism, that is, its condition of self-annihilation. Even with problems within their reach, capitalism and its systems do not operate in international trade with the same logic that manages their domestic or national policies and, in addition, their unequal power – and their problems on a smaller scale – serve to impute to them the surplus of domination and that is why they are proving very useful outside their national territories.

Today, in summary, the references lead us to decide that the exploitation and domination attributed to capitalist systems are mechanisms and instruments used but in all their national territories – and most likely in those that are economically and socially weak and politically fragmented – and not in their national spaces that enjoy a high rate of development. both economic and social protection, which, by far, are not behind the social security system that socialist systems claim to offer their peoples.

PART I – MAPPING THE SOCIO-HISTORICAL SCENARIO OF THE CONSTRUCTION OF SOCIALIST ASSUMPTIONS

THE SOCIO-HISTORICAL CONTEXT OF THE FORMULATION OF SOCIALIST THOUGHT

The hegemonic transitions, therefore, that occurred with the constitution of high modernity from the nineteenth century, passing through the French and industrial revolutions, in Europe and that put an end to the old feudal regime, followed by the Russian Revolution of 1917, consolidated the civilizational models that have subsisted today in a conflictive manner: capitalism and socialism. Both political-economic orders, due to their own antagonistic character, promoted a dispute between them about which of them would be the most successful in putting into practice their objectives of coexistence and good social status among the communities in order to find consensus and governmental legitimacy among their political-economic assumptions.

Capitalism based on its fundamental principles of bourgeois revolutions was based on free economic initiative, individual freedom, free expression, private ownership of the means of production, free wage labor, technological and industrial progress, managed to

reach levels of development with a high rate of material, technological and industrial progress with material levels of social life greatly increased in terms of social protection, as in the thirty glorious years, in Europe, 1940-1970, with the social welfare state (Polanyi, 2001). However, throughout many of the years of its civilizational experience, it has also produced, on the contrary, in many cases, levels of inequality and social exclusion, unemployment, income concentration and highly extreme poverty, although on a smaller scale, in less intensity, and more partial, as we have already said, in the countries considered more developed. In the latter, their dynamics are different because their domestic policy is specific to the other countries of the capitalist system – especially those considered less developed or underdeveloped.

In the last twenty years, for example, the neoliberal policy of "development" has produced a more drastic abyss of social exclusion since the 1990s, and the increase in poverty and social exclusion persists, on a planetary scale, where more people died in the world than in all the previous decades of the last century (Santos, 2001). More than 2/3 (approximately 4 billion inhabitants) of the world's population survive, at some point fall into a common pit of deprivation of "substantive freedoms" [conditions of health, education, social security, etc.] (Amartia Sen, 2000). In effect, there was an increase in the concentration of income and wealth by the hegemonic nuclei, followed by the socialization of losses for a large part of society (particularly for workers) with the growth of unemployment, the precariousness and flexibility of the economy, labor relations, accelerated expansion of informal work. All these variables have repercussions in different ways in weakening the process of political legitimization of capitalist state governments.

However, as we understand, although capitalism has suffered many criticisms of its civilizing project due to the exploitation it generates, it remains hegemonic against socialism at the international level, despite presenting different configurations in the different continents in which it develops. These combinations make it quite plastic and adaptable to the local conditions and social forces where it is established. Its mobile and changing character was able to liberate servile work for free and salaried work, incorporating feminist demands from the 1960s/1970s, assuming commitments to environmental concerns since the 1990s, valuing the culture of the peoples and allowing social mobility through work and education. and incorporating concepts of social justice, equal rights, redistribution of resources and promoting robust systems of social protection that make their societies quite socially cohesive with a very stable homeostatic mechanism of external and internal balance.

If capitalism finds its intellectual support in the positivist sociological currents (from Saint-Simon to Emile Durkheim) and in the classical economists (from David Ricardo to Hayek), the socialist model finds its main theoretical formulators in Karl Marx and Fridrich Engels. Unlike capitalism, socialism had its various assumptions that the inequality of society was not a condition of nature or a providential desideratum, but rather a social production. By placing in capitalism all forms of exploitation and social exclusion, its model of society consisted exactly of defending a social order based on social justice and the democratization of economic relations (BLANCO, 2014) and positioning itself as a negation and overcoming of the power of capital (LOUREDA, 2014).

It is in this sense that more than a few years later Marino Jorge (2014, p. 8) warned that the renewal of socialism should maintain the essential features of the socialist model, so it would tend to defend the following guidelines: i) full dignity of man; (ii) socialism means freedom of rights and equal opportunities for all citizens; iii) the predominance of social ownership over the means of production and the state enterprise as the main form of economic organization; iv) the regulation of the concentration of property in legal persons in such a way that it does not violate the limits compatible with the values of justice and social equity of socialism; v) the socialist principle of distribution with the collection of the results of work.

In the same vein, Margarida García Rabelo (2012) asks: *what defines a socialist society?* The same author responds to the Cuban model as follows:

> In our country we also end up identifying socialist socialization with nationalization (nationalization); The incompatibility between planning and the market was assumed, by establishing a highly centralized planning, whose mandates were given as directives from the highest spheres of the economy to its lower levels, so that it would assume a vertical organization of production, without realizing the horizontal connections. A representation of the socialist economy was reached constituted by majority state ownership and cooperative ownership, as a minor form, a productive structure oriented preferably towards industry and planned centralization. Economic integration into the socialist system of the world economy is becoming more and more rapidly incorporated (ibid., p. 34).

However, despite the noble values of socialism, it ended at the end of the twentieth century in a deep crisis to maintain the proposed objectives. This crisis was accompanied by capitalist advances that led to a set of reforms through neoliberal policy, since the 1980s, in which many governments began to suffer the effects of the expansion of the market that led to their collapse. With the implementation of neoliberal policy[6] , the prophecy of the end

[6] In general terms, the neoliberal vision, which emerged in the 1980s with the exhaustion of the economic development model, is based on the following assumptions: a) reduction of the State due to its inefficiency in promoting development and public and social welfare; b) "expansion of Civil Society" as a control mechanism; and c) the free market as a stimulus for natural development (Sachs, 2000).

of history was spread. This entire political process was strengthened with the fall of the Berlin Wall in 1989 and the collapse of the socialist experiences of Eastern Europe and the Soviet Union[7]. That was reason enough to pronounce on the centrality of the "economy/market" as a regulatory element of social relations, in particular, of the commodification of the political sphere. Fiscal adjustments, cuts in social spending, privatizations, as well as the spread of corruption in the public sphere, the informality of work, the precariousness of wages, the purchase of votes, were the most visible signs of this process of planetary ascent.

Thus, if capitalism expanded towards socialist models, leading them to their collapse despite being held responsible, so to speak, for imposing the most severe social sacrifices on the cities, it nevertheless presented itself as the most successful model of society that contradictorily encountered the alignment of its former opponents. On the other hand, in some regions where socialism was still standing, upholding its noble principles of human dignity, it was seriously weakened and at the cost of difficult social costs it continued to remain in operation, as is the case of the Cuban experience, for example, the object of analysis in this study.

In other words, in this highly controversial scenario, a very simple question arises*: if capitalism, hegemonic on an international scale, is very weakened in various areas of social life, as has been said, how is it able to remain unshakable in current times? Is it considered the most optimistic solution to the various social ills? And if, on the other hand, the socialist experiences that believed themselves to be the most promising alternative to correct the abandonment of social protection – the highest phase of human societies – were to show themselves explicitly fragile to keep their own social system functioning, from where does*

[7] The political system of the Union of Soviet Socialist Republics was created in the context of World War II and with intense internal political disputes of a civil war against the power of tsarism. The system of the USSR was officially constituted with the Congress of Union Soviets represented by Russia, Ukraine, Belarus, Latvia, Lithuania and Transcaucasia (Georgia, Armenia, Azerbaijan and Crimea) in which the Declaration and Treaty on the Formation of the Union of Soviet Socialist Republics was signed on December 30, 1922, with the presence of its three main leaders of the time: Lenin, Trotisky and Stalin (AGUIAR, 2003, p. 159) and with the Constitution of 1924, when the political system of the USSR was made official. The Soviet Socialist Republics (called Federated) were formed, 15 in total, followed by their territorial division: Armenia – No territorial division; Azerbaijan – 1 Autonomous Republic and 1 Autonomous Region; Belarus – 6 regions; Estonia – No territorial division; Georgia: 2 Autonomous Republics and 1 Autonomous Region; Kazakhstan – 19 regions; Kyrgyzstan – 3 regions; Latvia – No territorial division; Lithuania – No territorial division; Moldova – No territorial division; Russia: 16 autonomous republics, 5 autonomous regions, 47 regions, 10 nationality districts and 6 territories; Tajikistan – 5 regions; Turkmenistan – 5 regions; Ukraine – 25 regions; and Uzbekistan – 1 Autonomous Republic and 11 Regions (AGUIAR, 2003, p. 308). Aguiar (2003) presents three main causes of the disintegration of the USSR: i) Greek culture, with its rationalism, which, with equality and freedom, gave importance to individual rights by recognizing the importance of the social group; ii) Roman Law with its importance of individual law; iii) and the religious aspect. These three aspects were the main causes that led to the disintegration of the USSR in 1991. Associated with these three causal factors responsible for human social progress, the economic aspect would have been an event that would also have determined this disintegration due to the lack of importance given to the market: internal and external, in their relationship of coexistence and correspondence in the definition of the processes of human development and its material and social progress.

their strength come from to stand and sustain the belief, in the midst of so many obstacles, that the principles of high social protection are exclusively theirs? And if it is – which is not clear – what are the reasons for the development that indicate its superiority?

What coherent and disinterested interpretation could be able to explain these highly controversial transitions in their most apparent manifestations that discredit "good people" and present bad capitalist systems as the best model of human development? The essence of our first study is to indicate at least some aspects for the clarification of these important contemporary issues.

SYNOPSIS OF THEORETICAL-PRACTICAL PRESUPPOSITIONS OF SOCIALISM

The objective of this topic is to identify the main theoretical-practical assumptions that guided the movements for the construction of socialist models that would be implemented from the beginning of the twentieth century in some European countries. The identification of them will allow us to understand what were the guidelines that the Cuban socialist model, in particular, adopted or appropriated for the implementation of its paradigm of society that it put into practice after its revolutionary conquest in 1959, on this island that rises in undulating lands in the middle of the green waters of the Caribbean Sea.

As we have said, the hegemonic transitions that took place in the nineteenth century in Europe with the consolidation of the capitalist system and the end of the old feudal regime led to the creation of the self-regulating market, and with it, the subordination of social relations. to the assumption of individual greed. According to Karl Polanyi (2001), this promoted the dispossession, displacement and destruction of human relations that previously conformed to the promotion of livelihoods, social status and cultural expressions, resulting in further degradation, exploitation and social inequalities with the enclosure of the countryside, rural exodus, concentration of the means of production, low salary payments, etc. All this at the same time broke the static equilibrium enjoyed by ancient societies and the self-regulated market prevailed, subordinating under the logic of accumulation at any price all the social relations that presented themselves in front of them, which with their acquisitive fury limited the conditions of existence of the villages and the satisfaction of their basic needs.

However, the exploitative characteristics of the capitalist production society are its main critical point in Marxist writings. Karl Marx and Friedrich Engels exposed capitalist nature, saying that this system had as its main attribute the exploitation of labor through private property, which resulted in injustice and social inequalities that restricted the pressing conditions of human existence. The theoretical concepts that were formulated

served as support to think about another alternative model of society that could put an end to capitalism, which according to them, would be socialist and/or communist societies.

Marxism, following the tradition of utopian thought and perfecting its theoretical interpretation, formulates the main conditions for the process of transition to the socialist model and the overcoming of the contradictions of capitalist relations. In German Ideology (1987), Karl Marx and Friedrich Engels identified that the engine of social history is the class struggle and that in the case of capitalist society, the working class would have a leading role in promoting the process of socialist transition, because according to them, two basic characteristics behaved: i) first, because of the amount it represented for the industrial order with an international character; ii) second, because their conditions of material existence based on scarcity, could allow the creation of a class consciousness, with the formulation of their interests, due to experience and experience the contrast of the unequal conditions of capital and labor expressed by wealth and poverty that is placed in extreme limits vis-à-vis the most oppressed class.

The constitution of the class consciousness necessary for the process of revolutionary transition could not occur without an institutional apparatus that would allow it to have its political existence: the political party. The Modern Prince, according to Antonio Gramsci, would be the party that would have the responsibility of exercising the vanguard of the working class for the achievement of socialist objectives. Socialist objectives meant the transformation of the general state of affairs by which exploitation and inequality were imposed on the working class, so that men had to understand the entire state of affairs in which the worker felt humiliated, overwhelmed, powerless, despised (CABRERA, 2015). Carlos Cabrera (2015) affirms that one of the main objectives of revolutionary action foreseen by Marxism in the *Economic-Philosophical Manuscripts* would be to overcome all forms of alienation through the liquidation of the private property of production, and that this role would not be the work of the proletariat itself and the industrial proletariat that should promote the seizure of political power and the destruction of the bourgeois state machine. It is precisely here with the seizure of political power that socialism associates as the final objective of its intentions the promotion of ideas of equality, social justice and democracy.

The fertile field for the conquest of revolutionary victory, according to Carlos Cabrera (2015), would be in the most developed capitalist societies, since there the productive forces had reached the level of socialization necessary to replace private property with social property and would find their most conscious condition of organization capable of putting an end to capitalist society and bringing socialist society to completion. Lenin, however, added that the revolutionary process could also take place in those groups of

countries that represented the weakest conditions, in which the capitalist system had produced a degree of more acute material scarcity, which linked the most underdeveloped areas, the inequality of development, therefore, was an indispensable condition for socialism. The Russian Revolution, in October 1917, took place in this context.

With the victory of socialism, some practical conditions for its implementation were presupposed. Since the modern socialist experience consisted of an innovative alternative in terms of social orders, the theoretical-practical apparatus of Marxism-Leninism only presents general schemas given the genuine character of the project, although they are quite useful for our initial purpose of understanding the referents. of the socialist model that would be built, starting in Russia, then in Cuba.

We can summarize the main contributions to the implementation of socialism:

i) Destruction of the bourgeois state machine;

ii) state centralization of the economy;

iii) Replacement of private property by social property

iv) To increase the participation of the People in State affairs

(v) Acceptance of different forms of socialist property;

(vi) The development of the principle of remuneration in accordance with the quality and quantity of work;

vii) Development of individual and material interest associated with collective and moral interest

(viii) The use of trade and commercial monetary relations within the framework of the State plan and the use of economic calculation.

(ix) The construction of a federalization of national republics on the basis of law and self-determination

x) The leading role of the party as the political vanguard of the working class (p. 30).

Margarida García Rabelo (2012) complements with other words and summarizes that

> The socialist character of the economic system, strictly speaking, is defined on the basis of the form of ownership over the fundamental means of production, which determines what is the objective function of the feedback system, the character and mode adopted by the production, distribution, exchange and consumption of the results of social production, as well as the socioclassical interests that govern the economy and the prevailing ideology. The socialist character of a society is defined on the basis of socialist ownership of the fundamental means of production. Which is a relationship that defines the rights of an individual or group with respect to the use, enjoyment and possession of a good, in relation to other individuals (ibid., p. 36).

Raúl Castro himself, the current president of the country, reaffirms the synthesis of these premises, on the occasion of the closing of the IV Ordinary Period of Sessions of the VIII Legislature of the National Assembly of People's Power, on December 20, 2014, saying that it has a socialist character that will continue to be "the economic system that will prevail in our country based on the socialist ownership of the entire population over the means of production, from which the socialist principle must govern every second of its capacity and every second of its work" (GRANMA, December 22, Monday, 2014, p. 4)

PART II. THE PRODUCTIVE AND SOCIAL BASE OF CUBA'S ECONOMY

THE SOCIALIST EXPERIENCE OF THE CUBAN REPUBLIC: THE RELATIONSHIP BETWEEN SOCIALIST PRINCIPLES AND STATE ECONOMIC POLICY

As our interest is to analyze the experience of Cuba, which occurred in 1959, we will seek to study how the model of its economic policy appropriates the theoretical-practical supports of Marxism-Leninism to achieve the socialist objectives of well-being, equality, social justice and liberation of men from all the processes of human exploitation and inequality that degrade their existence. Considering that we have pointed out sufficient elements of its guidelines, we will focus the reflection by putting more evidence on what is the fundamental center of the constitutive concept. of a socialist society, whatever the form of relationship between the State and the market and the different types of forms of property.

With the intention of presenting its guidelines in the most reliable way possible and leaving no room for partisanship, we will adopt the assumptions contained in the Constitution of the Republic of Cuba (2013).

The Constitution (2013) empties itself by pointing out that political regimes that are *"based on the exploitation of men by men determine the humiliation of the exploited and the degradation of the condition of the exploiters"* (p. 09), and that therefore, only socialism or communism when man has been freed from all forms of exploitation, slavery, servitude and capitalism, the entire dignity of the human being is achieved and our Revolution chose the dignity of the homeland and of the Cuban as the highest height."

In this text I summarize the core of Cuban socialism that is associated with human dignity, against all forms of exploitation or humiliation of man and at the service of dignity. Here the understanding of social systems is very explicit and leaves no room for doubt: capitalism symbolizes human slavery and socialism represents the overcoming of all forms of social degradation, that is, human liberation.

The Constitution places great emphasis on the fact that the motto of Cuban socialism is the full dignity of the human being (p. 10) and as a Socialist Republic it enjoys sovereignty and independence having as one of its main political values.the democratic process (Art. 1) as a mechanism to enjoy freedom of expression, social justice and individual and collective good existence under the support of human solidarity. The socialist character, according to the Constitution, is irrevocable, and capitalism is its main enemy, it will never contaminate its political or economic sociability, because socialism has sufficient capacity for transformation from which it promotes the integral development of the human being (Art. 2), his well-being, his character and personality.

As a means of achieving the necessary degree of transformation of the material conditions for the promotion of socialism, the constitutional text defends that the economic system will be based on socialist property under state planning, in which the entire population owns the means of production, and therefore, the exploitation of men over men will be eliminated. The distribution of resources will be governed by the principle that each second has his capacity, each second his work (art. 14, p. 19).

It is noted, therefore, that the entire political and economic system of the Cuban socialist order appropriates exactly all the presuppositions and guidelines provided for in the theoretical thought of Marxism-Leninism, which, in summary, we can provide in the following formulations: i) the centrality of the State in the political-economic order; ii) social property, leasing, state property; (iii) the redistribution of resources based on the principle of each according to his or her ability and according to his or her work; (iv) democratization of political processes; (v) the elimination of the exploitation of man over men by guaranteeing social protection: health, education, security; vi) and finally, with the ultimate goal, to promote the full dignity of man, from his material well-being, social justice, equality of rights and opportunities.

This confirmation of the regular predominance of general socialist assumptions finds a theoretical foundation based on the fact that the notion of model was considered revisionist and the Marxist schools did not accept the argument that each country built socialism according to its conditions and particularities, since socialism had regularities that it had to comply with throughout the world (HERNÁNDEZ, et. al., 2004). Thus, the general socialist guidelines, with exceptions, were based on the presuppositions of their main interpretative matrix that sustains them today: in the theoretical thought of Marxism-Leninism.

IMPLEMENTATIONS OF ECONOMIC POLICY STRATEGIES: FROM THEORY TO PRACTICE

Taking into account, therefore, the lines of Cuban socialism, its presuppositions and its objectives, we are now interested in identifying what economic policies were adopted so that it could achieve its predefined purposes and how its presuppositions were incorporated to instrumentalize the conquest. of such intentions.

Let us consider that in general terms the economic policy of Cuban socialism is defined by the centrality of the State in the planning of the economy and in the social ownership of the means of production – leasing of state property – as a way of promoting the human good – being of the Cuban people. However, according to Julio Vázquez (2013) in the first phase of economic policy strategies, Cuba lived with a mixed economy in which,

> "Agro-industrial units, majority commerce and part of minority businesses, (banks, transport, etc.), and state-owned, there were cooperatives and a private sector (shops, warehouses, kiosks, small workshops, artisanal industries and individual producers) in its area, until the end of the 1960s, which is articulated through the semi-presence market that integrates the necessary relations between the different economic sectors. The introduction of normal food consumption and another two years, in March 1962, and the revolutionary offensive eliminated all private and individual property (except in the agricultural and transport market) and, in practice, stripped the market of all its economic functions" (Ibid., p. 61).

From then on, in the institutional political plan, after the first Congress of the PCC (1975), the policy of economic development was characterized by the state centralization of the economy, the exclusion of market signals and the passive role of the currency. The political party is closely aligned with the State in the economic and social direction, so that social policy is incorporated as a whole into the model of economic development: education, health, work, housing, rest and security in the lives of all citizens. The centrality of the State in the economy can be represented by its hegemonic participation as the owner of the means of production. Until 1989, for example, the State represented 92% of the basic funds in agriculture; in industry, construction and transport – except for a small group of private operators – in major, retail and foreign trade, as well as in banking, it had a 100% share. Here is a demonstration that socialism and state ownership symbolized being the same thing and the rejection of the market and commodity relations because of their identification with capitalism (VÁZQUEZ, 2013, p. 61/62).

In summary, we can decide that from the point of view of Cuba's economic policy, its strategy is configured by two movements that have remained in force since the revolutionary period in a mixed way, alternating over time: i) a first movement after 1959, of greater state centralization and annulment of the role of the market in trade relations, although it coexisted with private activities ii) and the other, since 1989, of considering the

market as an indispensable factor for economic and social development and semi-decentralization, despite the indispensability of the state figure, it has not been displaced from the center of the direction of the economy. From this framework, it is proposed that the economy and the different properties be more or less centralized, with more or less centralization of commercial activities. The development plan was therefore formed from this relationship between the market and the State, and since 1959, the orientation of economic policy has been guided, in a generalized way, by the beginning of industrialization and import substitution as a measure to increase the capacity of industrial capital and promote the creation of a national internal market with consumption capacity and self-sufficiency.

Margarida Rabelo (2012) helps us understand this periodization when she considers that the Cuban economic model moves from the basic models of the revolutionary moment to the current one:

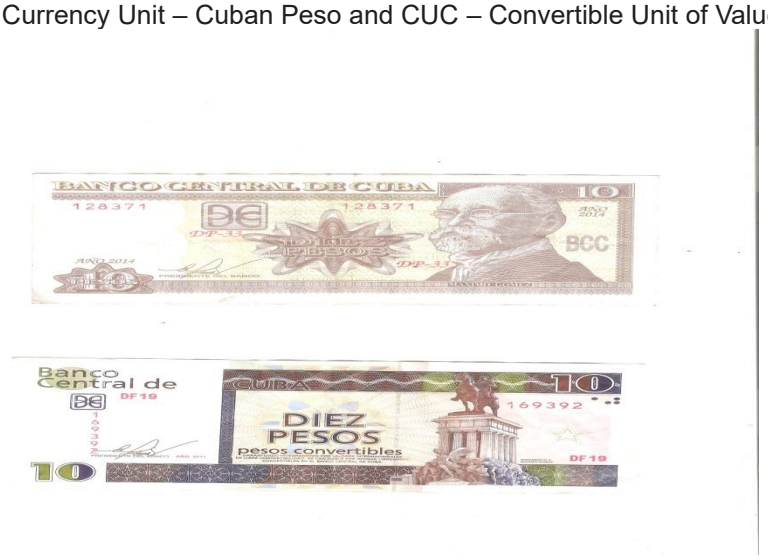
> (...) the first model was the structure of monopolistic state ownership, which functioned until 1989, according to which 90% of the means of production were in the hands of the state and an equal proportion of employment lay in the hands of the state, a highly centralized planning (...) and the passive role of the commodity forms [with an advantageous insertion of the socialist economy in the international sphere, good prices for sugar and oil]. The second moment could be defined as a semi-decentralized model of social property, predominantly formed in the mid-1990s, as a result of several economic reforms aimed at curbing and stabilizing the great imbalances in the balance of payments after the collapse of the USSR (p. 29/30).

According to the author, the current economic model does not favor a positive insertion in the international market, despite the fact that the global scenario seems favorable to Cuban development – which is why economic growth is boosted by the good relations between the countries of the Center and the BRICS (Brazil, Russia, India and China) – due to obstacles that do not encourage exports or technological innovation and do not attract foreign investment. I conclude by saying that the Cuban economy operates with a high degree of centralization that limits the development of initiatives by companies and territorial governments, restricting the generation of endogenous means of accumulation or the mobilization of internal resources. Trade imbalances and economic inefficiencies structure these constraints (RABELO, 2012).

As an example of this scenario, it seems that the purchasing power of exports has decreased, at the same time that the values of food imports have increased pari pasu, with the substitution of land, as well as the decapitalization of several productive sectors. In addition to this, an excess of rules and regulations persists, prevailing a verticalized productive organization, with low articulation with networks or production chains of goods and services, especially those destined for export. In addition, workers' incomes are not

clearly correlated with the economic performance of companies. The explanation for this economic imbalance lies in the duality of the Cuban market that operates with a dual currency: commercial relations are processed in CUC (convertible peso) which is anchored in the dollar and payments are made in Cuban pesos, a currency with a rather devalued exchange rate, devalued in relation to the convertible pesos (CUC) (RABELO, 2012). The following figure shows the two monetary units of the Cuban economy: the Cuban peso (CAP) and the convertible peso (CUC), where 24 CAP = 1 CUC.

Figure 1. CAP Currency Unit – Cuban Peso and CUC – Convertible Unit of Value



The lucid analysis of Margarita Rabelo (2012) in explaining the low efficiency of the Cuban economy, technological backwardness and social problems, today, identifies its main contradiction, that is, the scarce understanding of the relationship between market and State that has not yet been understood, overcome, by the socialism of that country that assumed the incompatibility of this relationship. Julio Vázquez (2004), referring to the Soviet model of the same nature, in another way, showed the same problem of backwardness in trade relations when he stressed that in Moscow, on the social level, it did not solve elementary problems. He mentioned an experience in which, when he was returning from a scientific conference in Warsaw with several experts, he asked the secretary of the Cavre Institute, who was accompanying him in his own car, what he had bought in Poland, to which he replied: '*a pair of shoes for my grandchildren, because I can't find them in Moscow'*. And he added in Russian, which in English we could translate as: 'you can't live like this' (p. 109). This experience, according to Vázquez, reflects the magnitude of the problems of socialist development and he concluded by saying that *"I shared with Marxism that what replaced capitalism had to be superior to what capitalism had given us"* (p. 109).

Margarida García Rabelo (2012) concludes by deciding that the set of these problems is explained by the knowledge that, although the planned direction of social production constitutes the defining element of the socialist economic system, it has now been interpreted in Cuba under a single and highly centralized form. However, it would be possible to see it differently through different indirect forms of regulation, with the active role of the market[8], without replacing the direction of state institutions and other economic actors, exclusively through the use of administrative methods. The author concludes by stating that,

> Experience has shown that incorporating the market into the social planning process allows for a better perception of demand, and a more varied menu of alternatives to respond to it. It can be an instrument at the service of socialism. [In the same way] without alienating it, there are various forms of existence of properties, as well as their management: the state ownership of productive enterprises and services; public property (municipal); joint ventures (not only of the State with foreign capital, but also with national private capital or cooperatives); the participation (wholesale or not) of the State in shares of large joint ventures; cooperative ownership; the delivery in usufruct of the state property; management contracts and many others (Ibid., p. 36)

The methodological error expressed by this content consists in highlighting that its negative balance reflects the belief that socialism is accessed by a traced path and the erroneous identification of the market with capitalism, of planning with state planning, as well as of the ultimate goal of socialism with the task of transition and not as a socialist society in itself. There has also been an overvaluation of the extra-economic power of the state and a one-way emphasis on the economic relations of social production. Although there are doubts in its implementation, these erroneous interpretations are being reviewed,

[8] The notion of the market, beyond what we present through the concept presented by Karl Polanyi (2000), refers to a factarization of the person and political systems. Economic factorization actually includes the characteristic aspect of the market in which such factorization is presented in institutional terms of economic exchange relations and the purchase and sale of market spaces. Economic factorization is responsible for the process of production and maintenance of the survival of the person and of political systems, therefore, of the supply and production of material wealth for the survival of political systems in conditions of human dignity. Labor is the main characteristic property of economic factorization, it is what provides the processes of material production and material prosperity. In short, economic fanatization occurs in the institutional form of the market, as we have already said, in its two spheres of commercialization: the domestic or domestic market and the external market. These two spheres of markets are complementary, coexist and operate simultaneously. However, the internal sphere is of great importance for the economic and material stability of the political system, since it constitutes the basis on which the possibilities of an economic and material situation are established, which can guarantee the conditions of dignity of the person in the political systems in which it operates. Its internal policy has different contours since it protects the forms of internal cooperation and sociability and opposes the forms of the current processes of exploitation that can arise from external negotiations if the political system does not have its internal market as the basis of its national economy as a reference, the external market representing simply the possibility of complementing the internal market and increasing wealth through forms of international cooperation without turning the foreign market into a
without making the external market a form of competition with the internal market that occurs when national internal social groups function as a transmission belt for international economic interests and are contradictory to the national economy that encompasses the market in its two spheres of correspondence and complementary coexistence: the internal market and the external market, which are the same market of the National State.

so the Guidelines approved at the VI Congress of the PCC (2011) seek to correct them by proposing an improvement of the socioeconomic model:

> In the first place, with regard to socio-economic heterogeneity, Guideline No. 2 defines not only recognition, but also the promotion of a diversity of forms of property, while the state enterprise will be maintained as the main form of economy. Guideline No. 1 defines: the socialist planning system will continue to be the main way for the direction of the national economy and must be transformed in its methodological, organizational and control aspects. Planning will take into account the market, influencing it and considering its characteristics (RABELO, 2012, p. 38).

In this particular aspect of the relationship between market and state, we can decide, lies one of the main differences between socialism and other capitalist systems. One of the fundamental characteristics of capitalism is that there is no contradiction between its economic policy and its main function of maximizing profits through the socio-economic system, including its social protection system; on the contrary, economic policy ensures socio-economic benefits. This is because there are different models of market economies, and market relations do not necessarily mean less solidarity, social justice or concern for poverty, on the other hand, as Karl Polanyi (2001) shows about the European states in the 30 glorious years and in the North American (RABELO, 2012) there has been a great rhythm of economic and social development that has been mixed by the horizon and objectives pursued by the state economic policy.

Today, for example, many analysts are unaware of the recognition that "the American model is markedly different from the European, Japanese and Scandinavian models, but that it is recognized by a greater emphasis on solidarity and social justice, as well as by concern for poverty" – through high tax rates – and innovation, an area that boasts the highest standards in the world ranking (STIGLITZ, 2011 apud RABELO, 2012, p. 35).

It is a matter of understanding, as we emphasized, that modern political orders, in short, do not appear without their market configurations, so that economic models obey the political constellations that their societies collectively share, adjusted in turn with the values and principles that they define themselves as shaping their social relations and determining the practices of their behaviors in search of objective goals.

CONDITIONS OF THE MATERIAL INDICATORS OF HUMAN WELL-BEING: PRODUCTION, INCOME, GDP, ECONOMIC AND SOCIAL INFRASTRUCTURE, HDI.

Once it was defined that the main objectives of socialism in general, and of Cuba, in particular, should be the search for the dignity of man through the promotion of social justice and socioeconomic development to the extent that its purposes were defined as a counterpoint to capitalism considered as an unequal and exploitative social system of men

– although modern capitalist societies are the most developed in the contemporary world – this It does not yet authorize any number of social systems – capitalist or socialist – to overlap each other in terms of the welfare produced or which of the systems are best for societies for their improvements to communities in a way of living well.

For this reason, our purpose in this topic is to present a set of socioeconomic indicators with the aim of verifying whether Cuban socialism has managed to achieve, through its socioeconomic guidelines of state planning, the promised material and life improvement of the Cuban population, resolving the typical contradictions of capitalism, such as inequality, exploitation, political restrictions and conditions of poverty.

However, the way to verify the socio-economic increase of socialism cannot be done without a basic unit of verification that allows an acceptable and sufficient comparison of analysis. It is in this sense that the notion of development is a fairly appropriate theoretical category to typify the level of socioeconomic dynamics of modern societies independently of the economic models evidenced, despite the fact that the concept of development has been produced by capitalist societies to measure the progress of development in their social systems. It may also be very necessary to assess the degree of material and social progress of socialist systems, simply because both systems have as their ultimate goal the promotion of the development of society as a whole. In addition, the notion of development is used by both social systems because of its integral nature and rational validity because it allows for the verification of economic, political, social and environmental aspects. The HDI is added to the indicators of GDP, per capita income, salary ranges, the level of political participation, environmental indicators, and the cultural background of the nations.

The concept of development that guides this study is well defined by the argument of Amartia Sen (2000), who conceives it as the process by which societies promote the overcoming of scarcity and the reduction of substantive deficiencies in order to raise the expansion of the material standard of living and the conditions of human freedom. The relevance of the concept of development is also exclusive to what we propose because it implies a certain level of rationality, insofar as it is a deliberate process, a conscious, planned, intentional action, with objectives and goals at the end of which one wants to achieve; It involves time and resources (material and human), it requires a certain level of responsibility with respect to the guarantee of its purposes.

In this way, the process of development is presented as a by-product of the conscious action of the men in charge, in particular, and of society as a whole, in general. If socialism, therefore, announces itself as a society based on the dignity of man through social protection, social justice, equality, freedom and better material living conditions as a

way of maximizing the potential of human resources, it is important from now on to check the link between its main indicators so that we can analyze to what extent it is achieving conscious action and profit developmental.

We will provide a summary of the period prior to the revolution of the productive and industrial system of 1959 to compare the dynamics of the period of socialism in Cuba.

Antonio Ricardi (1959) makes an intense analysis of the productive system in Cuba since the period of colonization and records that the main products exploited were linked to the production of the land. Agriculture occupied more than 45% of the active labor force on the island, and sugar production reached 50% of the cultivated land, followed by 11% of sugar cane, 9% of tobacco, 8% of bananas, 7% of corn, the remaining percentage was. occupied by taro, cassava, coffee, coconuts, rice, yams, potatoes, pineapple, oranges and onions. Although there was a lot of political effort, the lands remained in the hands of large estates. The two world wars stimulated the production of sugar and its expansion over larger tracts of land, which led to the abandonment of agriculture, the cultivation of coffee and the so-called minor fruits. In the 1950s there was an increase in the areas dedicated to the cultivation of tobacco, rice, fruit and vegetables and, above all, coffee.

Table 1 – The Ownership of the Earth in 1949

La propriedade de la tierra en 1949, estaban asi distribuídas:	
Latifúndio aczucareros	219,526 horses
Livestock and coffee plantations	248,498 horses
Small farms grown	119,279 caballerias
Uncultivated land	140,094 horses
Cities, roads, mountains	105,889 horses
Total	833,288 caballerias

Source: Antonio Ricardini (1959)

The proof of the existence of the latifundia could be verified by verifying that 75% of the 486,176 caballerias were owned by 1,167 people and companies. Despite the monopoly of the land, sugar production had a certain productivity, in 1902, for example, it had 171 mills and an annual production of 850,181 tons. In 1952, 161 engineers produced 6,000,000 tons.

The maintenance of livestock activities is equally important. Having been virtually wiped out in 1902 when it declined from about 2.5 million head of cattle to 800,000, it reached a recovery with World War II that served as a stimulus for livestock to serve as one of the main sources of food supply. In 1952, for example, cattle ranching occupied 459,020 cattle ranches, with more than 51,000 cattle ranchers, far exceeding the situation in 1902, when it had 197,000 cattle ranchers and 459,020 head of cattle.

In terms of economic importance, there is also tobacco. From 9% of the territorial extension it occupied in 1902, in 1952 it began to occupy about 20% of the productive area, having approximately 5,200 spaces that produced 80 million pounds of nicotine, with a declared value of $ 40.5 million, with exports for a total of $ 39. million. In the same year of 1952, there were about 3,900 large, medium and small tobacco factories and 17 large and medium cigarette factories.

Coffee, in turn, in 1902 occupied only 1.6% of the cultivated area. In 1952 it occupied 6,800 caballerias with around 19,721 farms and a production of 700,000 quintals. It maintained some 522 roasting, industrialization and packaging work centers. In the ranking, coffee ranked fourth in productive importance. The agricultural reform of 1927 made a significant contribution to the development of coffee with the suppression of imports and the stimulation of exports. With the formation of the Cuban domestic market, coffee began to become more attractive to the local economy and exports were abandoned.

In addition to the main products such as sugar, livestock, tobacco and coffee, minerals (iron, copper, manganese, asphalt, gold), forestry production (cedar, mahogany and the like), poultry farming, beekeeping, fishing (canned lobster, crabs, bonito, shark, frog leg, etc.) and various manufactures such as fabrics, shoes, vegetable oil, paints, milk, preserves, pampadas de ponce and glass are included.

At the end of the study of the structure of Cuba's industrial economy, Antonio Riccardini (1959) listed the main branches of economic activities, which can be summarized in the following list:

Table 1 – Main Branches of Economic Activities 1949

Gupos	Work Centers	Classification	Estimated Investment ($)	Busy workers
1	257	Cane, Sugar and derivatives	1.091.800.000	484.777
2	2.328	Tobacco, derivatives and annexes	51.140.000	127.500
3.	321	Livestock, derivatives and attachments	14.939.800	8.744
4	522	Coffee, cocoa and annexes	10.890.000	6.550
5	13.341	Agricultural Industries and Annexes	51.766.000	45.135
6	788	Forests, timbers and annexes	11.968.360	12.465
7	341	Mining, metals and metallurgy	369.770.340	15.858
8	260	Marine and related industries	7.481.500	10.721
9	114	Fuels and Attachments	51.184.800	4.210
10	290	Motive power, gas, water	227.388.906	7.220
11	2.119	Transport and communications	554.418.500	48.470
12	472	Chemical-pharmaceutical and annexes	27.482.160	9.147
13	404	Buildings and annexes	19.937.900	18.325
14	51	Machinery, mechanics and appliances	4.682.800	959
15	11	Raw materials and basic resources	206.300	147
16	2.991	Food, beverages and annexes	51.245.000	32.897
17	1.154	Textiles, apparel and related products	67.870.000	23.833
18	1.254	Clothing, dressing table and annexes	8.533.300	23.833
19	1.228	Printing industry and annexes	32.570.100	11.047

20	119	Paper, cardboard, attachments and derivatives	7.278.500	2.571
21	1.372	Leather, fur and related industries	21.808.100	16.539
22	171	Kitchenware, toys and bazaar	2.141.930	1.910
23	61	Orthotics, Scientific	855.500	510
24	268	Youth, goldsmithing, costume jewellery	4.349.900	2.696
25	145	Alfareria, vitrio, ceramics	3.012.700	2.015
26	120	Miscellaneous industry in the classified	2.561.670	1.501
30.502		**$ 2.697.281.566**	**903.344**	

Source: Antonio Ricardini (1959).

The commercial system that articulated Cuban production, between 1902 and 1959, moved figures around 24,539 million dollars, of which 14,193 million corresponded to exports and 10,000 million to imports, producing a trade balance of 3,847 dollars. Sugar was the largest participant in total exports, corresponding to 82%, tobacco with 11% and other articles and products added the remaining participation, 7%. Foreign trade relations were established mainly with Spain, Portugal, France, Italy, England, Chile, Argentina and Canada. But the most important commercial exchange was with the United States, regulated by the Arancellaria reform of 1927.

Antonio Riccardi (1959) points out that the configuration of the Cuban internal market occurred during the first 50 years of the Republic when it occurred with the population increase that, together with the conditions of modernity, allowed the growth of cities, the concentration of people in urban centers and, with it, the appearance of various liberal work professions that at some point favored the diversification of production. The author records the emergence of hundreds of establishments and tents that generated approximately $2,000 million annually in sales volumes, in the domestic market, both wholesale and retail.

In 1900 the island had 1,672,797 inhabitants and in 1952 it had a total of 5,415,000 inhabitants. In 1952, 39.9% corresponded to farmers, weighers and miners; 23.4% of construction workers are engaged in commerce and transport; 30% worked in manufacturing and mechanical industries; 2.8% professional services; 1.6%, in domestic and personal services; and 2.2% were classified as unemployed. Salary conditions vary between $7.0 and $11.0 per day, with 42.99% of workers earning this percentage; 27% of them received salaries of $5.0 to $6.0 per day and the rest, 29.92%, received salaries of $3.0 to $4.99 per day. As you can see, the income of the workers wasn't that bad at all. They also enjoyed a set of rights that regulated their activities, which Antonio Riccardini (1959) summarized as follows: i) they received high salaries and consequently a high standard and quality of life; (ii) one month of paid vacation for each year of service, but 9 days each year for illness; iii) to enjoy the so-called Summer Shift, the average day of paid rest, two days a week, during the months of July, August and September; (iv) freedom of

association; v) freedom to work wherever you want; (vi) retirement and pension benefits upon reaching the maximum age limit due to supervening causes; (vii) benefit from compulsory insurance against accidents at work and medical assistance in any case; viii) maximum working day of 8 hours, benefiting from an extra periodic when it is necessary to work longer or on public holidays (p. 174).

These enumerated aspects of Cuba's economic structure, in addition to its productive factors, interest us because of what they represent for the development process, as they indicate the beginnings of the configuration of the internal market of this country. The existence of the internal market is important because it allows, from the point of view of economic policy, to visualize the existence of a planned coordination that centralizes all commercial activities in the same direction, which means that it can lead to the realization of its social objectives in a planned way for national self-determination. In general, the colonial period did not produce an internal market because the colonial communities functioned as commercial warehouses of the large metropolises that drained all their resources, not allowing conditions for internal development, and also because the colonized peoples fell into a situation of slavery or servitude, which did not provide the capacity for consumption. Modernity, according to Florestan Fernandes (1979) – *Mudanças sociais no Brasil: aspectos do desenvolvimento da sociedade brasileira – no Topic: Atitudes e motivações desvavoráveis ao desenvolvimento,* produced a set of transformations that impacted all social relations; moved people from agricultural areas to urban centers; created conditions of freedom for the labor force, wages; produced population concentration; created an internal demand for consumption; it allowed the emergence of various jobs collaborating with the administrative facilities of the modern state apparatus, in municipalities, provinces and departments; He created a libertarian consciousness based on a pragmatic instrumental rationality capable of guiding the behavior of individuals in search of improving life. It can be said that the very existence of the internal market means a certain guarantee of the functioning of the development process and a guarantee of the survival of the society of which it is a part. It functions as the material base that makes possible the production of wealth at the national level by processing its own local capacities and resources and seeking, through long-distance trade, goods that are absent in its territory. This operates in two dimensions: domestic and foreign trade. And indeed, its robustness occurs when its trade relations achieve a balance in the operations of its major economic spheres.

However, in the first 50 years of the Republic, the presence of the domestic market would not have been possible if Cuba had not had means of transport connecting its main administrative centers. Transmission lines are indispensable for connecting internal trade

circuits and the substrate necessary for the constitution of the external market. Through rail, sea, air, and railroad, the Cuban nation connected its trading cities and promoted its internal exchanges and international trade. In 1952 it had 133,085 thousand motor vehicles, 60 airports throughout the country and 4,860 kilometers of railroads; 50 tons of ships ranging from 500 to 2,000 tons were proposed for transport with the foreign market.

Law No. 13 of 1948 specified the materialization of the internal or national market from the normative point of view, establishing in that year the aforementioned legislation the creation of the National Bank of Cuba with the purpose of reorganizing the Monetary Stabilization and also promoting funds for the promotion of industrial and commercial activities, directing and centralizing economic policy in the same administrative direction on the basis of Cuban nationality. As a concluding proposal of the general economic policy of this first period, we can say that it was driven by two main guidelines: i) the promotion of the process of industrialization of agro-export monocultures (sugar, tobacco, minerals); (ii) and imports of industrialized goods.

Despite the constitution of the Cuban internal market and economic planning aimed at import substitution as a way to enhance local productive capacities through industrialization, Alodia Alemán and Rosa Heredia (2013) confirmed that an export policy of few primary products such as sugar, coffee, tobacco, and some minerals still predominated. Agriculture was the predominant activity that, in 1958, estimated its costs at around 1,420 million pesos. Livestock accounted for 41.5 per cent of economic activity and agriculture for 23.2 per cent; the manufacturing industry contributed 46.5% of total production, with the sugar industry representing 14.3%, with the sugar sector totaling 38% of material production (ALEMAN and HEREDIA, 2013, p. 111).

The socialist model of production that emerged after 1959 reconfigured economic relations from another perspective of development with the aim of correcting the republican period guided by capitalist logic that had left in its wake territorial inequalities, economic and social backwardness in rural and suburban areas, until later promoting a more equitable and egalitarian social and economic development for its community.

Although we have clearly established the main socialist guidelines through which socio-economic policy will be conducted, it is necessary to reiterate its budget in order to follow its material results. Under the responsibility of the Communist Party of Cuba – PCC, it is in charge of defining the guidelines of the country's economic policy. In general, the assumptions formulated followed a paradigmatic line that has been maintained to the present day, except for particular variations. However, before the leadership of the PCC, the coordination of economic policy was directed by the Central Planning Board – JUCEPLAN,

created in 1960. This institution was formulated as the first economic orientation and the process of territorial decentralization of development may have occurred unevenly among the different provinces during the republican period, with productive investments concentrated in Havana, Santa Clara and Santiago de Cuba, considered the three main national productive poles. The results achieved were restricted to the implementation of infrastructure, logistics, educational services, health, sources of employment, and raising the standard of living, with the limits of their achievements being diminished by financial scarcity and the absence of state institutions.

From 1975 onwards, the PCC began to define development policies by reorganizing institutional and economic conditions. The new policy prioritizes economic planning and political-administrative division, structuring the country into 14 provinces and 169 municipalities, plus the special municipality of the Isle of Youth. The results of this policy were debilitating and had little economic effect in territorial terms.

Thus, between 1976-1990, the territorial space was conceived as a physical support for productive sectors where the economic and social activities of men were carried out. In this period, the distribution of productive activities, of the labor force, was promoted; more attention was paid to the social aspect; state farms were created, the expansion of the road network, the construction of towns, the orientation of industrial investments (iron and steel, food, construction) and school equipment (ALEMAN and HEREDIA, 2013). Despite the effort to decentralize territorial development, economic and industrial stimuli have seen their main investments concentrated in the West, with 40.9% of investments, the Center (29.0%) and the East (30.1%). Alodia Alemãn and Rosa Heredia (2013) found, however, that the direction of investments by prioritizing projects and plans aimed at promoting agriculture, industry and mining – activities that depended on resources and political decisions – ended up concentrating spending in certain territories, resulting in decentralizing effects on economic spaces, so that in the following years the territorial concentration of investments in them persisted spaces, producing, among other things, differentiated job offers and employment for the same territories, as can be seen in the following tables.

Table 10 – Volume of Investments in Millions of Pesos, by Territory, in the Period 1995-2001.

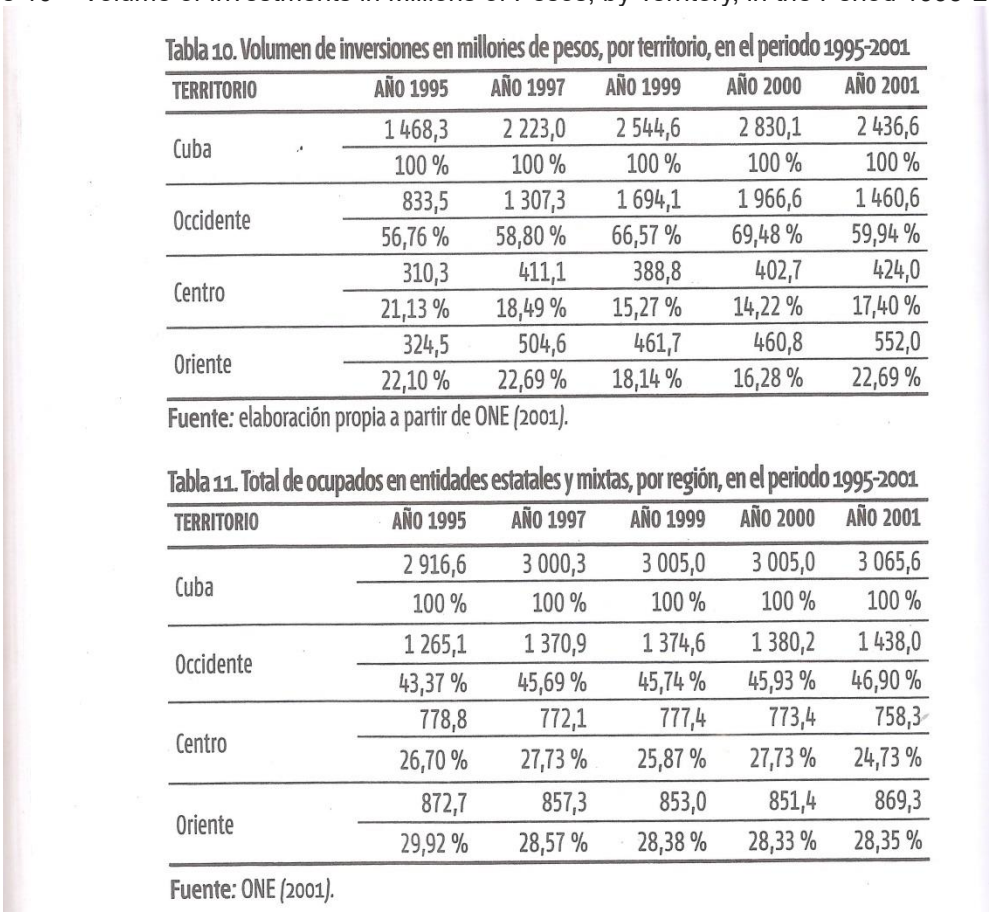


Tabla 10. Volumen de inversiones en millones de pesos, por territorio, en el periodo 1995-2001

TERRITORIO	AÑO 1995	AÑO 1997	AÑO 1999	AÑO 2000	AÑO 2001
Cuba	1 468,3	2 223,0	2 544,6	2 830,1	2 436,6
	100 %	100 %	100 %	100 %	100 %
Occidente	833,5	1 307,3	1 694,1	1 966,6	1 460,6
	56,76 %	58,80 %	66,57 %	69,48 %	59,94 %
Centro	310,3	411,1	388,8	402,7	424,0
	21,13 %	18,49 %	15,27 %	14,22 %	17,40 %
Oriente	324,5	504,6	461,7	460,8	552,0
	22,10 %	22,69 %	18,14 %	16,28 %	22,69 %

Fuente: elaboración propia a partir de ONE (2001).

Tabla 11. Total de ocupados en entidades estatales y mixtas, por región, en el periodo 1995-2001

TERRITORIO	AÑO 1995	AÑO 1997	AÑO 1999	AÑO 2000	AÑO 2001
Cuba	2 916,6	3 000,3	3 005,0	3 005,0	3 065,6
	100 %	100 %	100 %	100 %	100 %
Occidente	1 265,1	1 370,9	1 374,6	1 380,2	1 438,0
	43,37 %	45,69 %	45,74 %	45,93 %	46,90 %
Centro	778,8	772,1	777,4	773,4	758,3
	26,70 %	27,73 %	25,87 %	27,73 %	24,73 %
Oriente	872,7	857,3	853,0	851,4	869,3
	29,92 %	28,57 %	28,38 %	28,33 %	28,35 %

Fuente: ONE (2001).

Source: ALEMAN AND HEREDIA, 2013, p. 118-119)

The economic dynamics suffered multiple difficulties with the overthrow of the socialist system in 1990, particularly in the former USSR, and with this trade relations were disrupted, resulting in a decrease in economic activities. This situation is aggravated by the accumulation of problems facing the country, such as excess money in circulation, insufficient production equipment and technological absolescence. To face the crisis, the country established a strategy to resist the socialist model, seek a new insertion into the world economy and safeguard fundamental social achievements. From then on, a plan was proposed to adapt the economy to the new scenario, adjusting the necessary measures for its dynamization. On the external front, a strategy was developed to promote: (i) traditional exports; non-traditional exports; and services, mainly tourism. Internally, three basic actions were defined: i) food; (ii) energy; iii) and one of spare parts and advanced technology (ALEMAN & HEREDIA, 2013, p. 118-119).

The guidelines for economic policy based on these proposed guidelines established the fundamental features that differentiated them from the period before the fall of European socialism, namely, a movement in consideration of the role of the market in reconceiving its economic functions and another in the sense of undoing the role of the state in the

monopoly of economic activities. allowing activities at the expense of private agents without the social function of the market perceiving its economic capacity of human sociability.

The set of political-economic actions was defined as follows:

(...) the acceleration of the process of opening up to foreign investment in search of capital, technology and market; the restructuring of foreign trade (geographical diversification); the search for new paths and forms of negotiation of external data; the legalization of the possession and use of foreign currency and the authorization of the entry of remittances from abroad; the adoption of a programme to improve domestic finances; the creation of basic units of cooperative production; the legal recognition of self-employment; the opening of agricultural markets and artisanal industrial products; the reorganization of the central administration of the State; the delivery of idle land to families for exploitation under conditions of usufruct; the partial reform of prices and the accounting system; the reform of the banking system; the territorialization of decisions; the improvement of business management and changes in the legal system (ALEMAN & HEREDIA, 2013, p. 119).

The negative effects of the economic slowdown of the 1990s were not only reduced to technological absolescence, production backwardness and excess money in circulation, but were also expressed in the deterioration of the standard of living in relation to the fall in wages (where the wage pyramid remained inverted), social differentiation – territorial socio-economic inequality has deepened, with signs of social poverty – and visible levels of poverty: beggars in the streets, beggars collecting garbage in Havana. The average salary ranged from 194 pesos to 177 pesos in all Cuban provinces in 1994. In the City of Havana there was the highest salary (194 pesos) and in Guantamano the lowest was 177 pesos. However, from 2001 to 2011 wages maintained a relative growth. For this 2001-2011 time series, the salaries of workers in state-owned companies varied, in the City of Havana, between 266 pesos in 2001 and 456 pesos in 2011, an increase of 71.42% in value in a decade. Overall, the average increase was in the order of 63.82% for the country, for the 2001-2011 time series, of which the amount paid in 2001 was 284 pesos and in 2011, totaled 445 Cuban pesos (CUP). For all provinces, salaries were above 200 pesos in 2001 and closed in 2011 in the range of more than 400 pesos, as can be seen in the following table.

Table 2 – Average monthly salary in state and mixed entities by most important provinces (in CAP)

Territory	Anus										
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Cuba	----	----	----	284	330	387	408	415	429	448	445
Havana	244	264	266	276	316	377	397	391	417	434	---
Villa Clara	245	252	262	276	327	376	399	406	430	458	456
Cienfuegos	257	280	286	285	332	389	407	420	424	458	470
Santiago de Cuba	234	241	251	260	310	360	390	382	399	450	436
Guantanamo	222	240	249	262	311	359	376	378	396	421	431

Source: compilation ALEMÁN Y HEREDIA, 2013.

Although nominal wages have increased by about 70% in the country in the last fifteen years, their real purchasing power has suffered a steady decline. José Luiz Rodrigues (2015) in his periodic writings on the web:cubacontemporanea.com site, in the thematic series *"Key factors in Cuba's current economic strategy" (II)* has shown that in order to understand the dynamics of productivity it is necessary to take into account the increase in wages. And they have accumulated real losses in their purchasing power, despite the nominal increases achieved. According to the author, if we look at the dynamics of the estimated minority prices for the period 1989 to 2013, we will see that the nominal value of wages in 2013 (471 pesos) has purchasing power equivalent to the nominal wages of 1989, with the value of 188 pesos. What the author highlights is the great deterioration in the purchasing power of workers' wages, which impacts labor productivity. Although a deterioration in wages has been demonstrated, it is important to remember that the salaries of garment workers are also increased through temporary stimuli from the state sector (in general, in CUC) that can include food, clothing, footwear and personal hygiene items (RODRIGUES, April 28, 2015, p. 1-2-3). If we want to have an idea of the wage level of the revolutionary period, it is enough to compare with the incomes of the workers from 1952 onwards who received salaries that varied between 90 dollars per month and 300 dollars per month to verify their monetary inferiority.

Despite the economic deterioration, the social protection system remained reasonable. In general, all provinces enjoyed basic sanitation coverage of more than 80 per cent in 1995, with the exception of Granma, which maintained 77.9 per cent sanitation coverage, Guantánamo (62.5 per cent) and Santiago de Cuba, which had the lowest level of sanitation, 51.1 per cent. The supply of drinking water also reached over 80% for the entire population, except in the cases of Holguín (76.7%) of available drinking water service, Guantánamo, 76.2% and Granma with 72.2% this service is available (ALEMAN AND HEREDIA, 2013). .

In terms of economic activity, some 60,000 industrial jobs (34 per cent of the sugar industry's labour force) were lost in 2002. During 2007, 24 more mills were closed and a

total of 94 mills were deactivated. Agricultural land was also allocated to other occupations and in total around 90,000 jobs were lost. The unemployment rate for 1997 was in the range of 38% of the economically active labor force, that is, available for employment. Of the 6,657.4 workers in working conditions, only 4,173.3 were employed, which indicates a high unemployment rate (ALEMAN AND HEREDIA, 2013).

But a decade later, in 2011, the strategic plan designed by the PCC for economic policy consisted precisely of increasing economic efficiency by increasing labor productivity, which between 1959 and 2009 had reached 0.4% productivity. Although according to José Luis Rodrigues (2015, May 4, p. 1-2-3) he found that one of the most important factors that impact labor productivity is related to economic investment, it was not this guideline that the country applied to try to produce economic efficiency since gross capital investments have fallen from 5,264 million pesos to 4,729 million. a reduction of 535 million, equivalent to 10% at current prices, at the same time that payments of the external debt had grown by about 97% - from 1,571 million to 3,106 million dollars (increase of 1,535 million dollars). In reality, the increase in labour productivity, which was recorded at around 10.7% between 2009 and 2013, is not explained by investments in hexa but by the reduction in state underemployment, i.e. layoffs of workers and the opening of self-employed economic activities. From 2009 to 2014, for example, the State laid off 596,500 workers from its administrative staff, which corresponds to 10% of total State employment (approximately 5,965,000 jobs). At the same time, self-employed activities grew in 2014, with approximately 473,475 workers, including around 144,595 women workers (RODRIGUES, 2015, May 4, p. 1-2-3).

The set of these problems of the Cuban socialist model was summarized very precisely by Vilma Hidalgo de los Santos (2012, p. 49) in her article *Fiscality, External and Internal Balance in the Cuban Economy: Advances and Challenges*. The author demonstrates how the imbalance of its economic policy is expressed asymmetrically by an imbalance between the fiscal dimension and the productive dynamics, provoking an attack on fiscal sustainability, creating a fragile situation of external finances and the loss of its purchasing power currency. The low industrial productivity of the domestic market, insufficient to meet the demand of the population, has raised the price levels of products, generating infringement processes and, consequently, has lost the purchasing power of the Cuban peso. This monetary excess is in circulation without a productive trail that balances the supply-demand relationship, producing the hyperinflation that characterized the 1990s, generating the need to replace the Cuban peso with a foreign currency: partial dollarization.

Vilma Hidalgo de los Santos (2012) describes this process as follows:

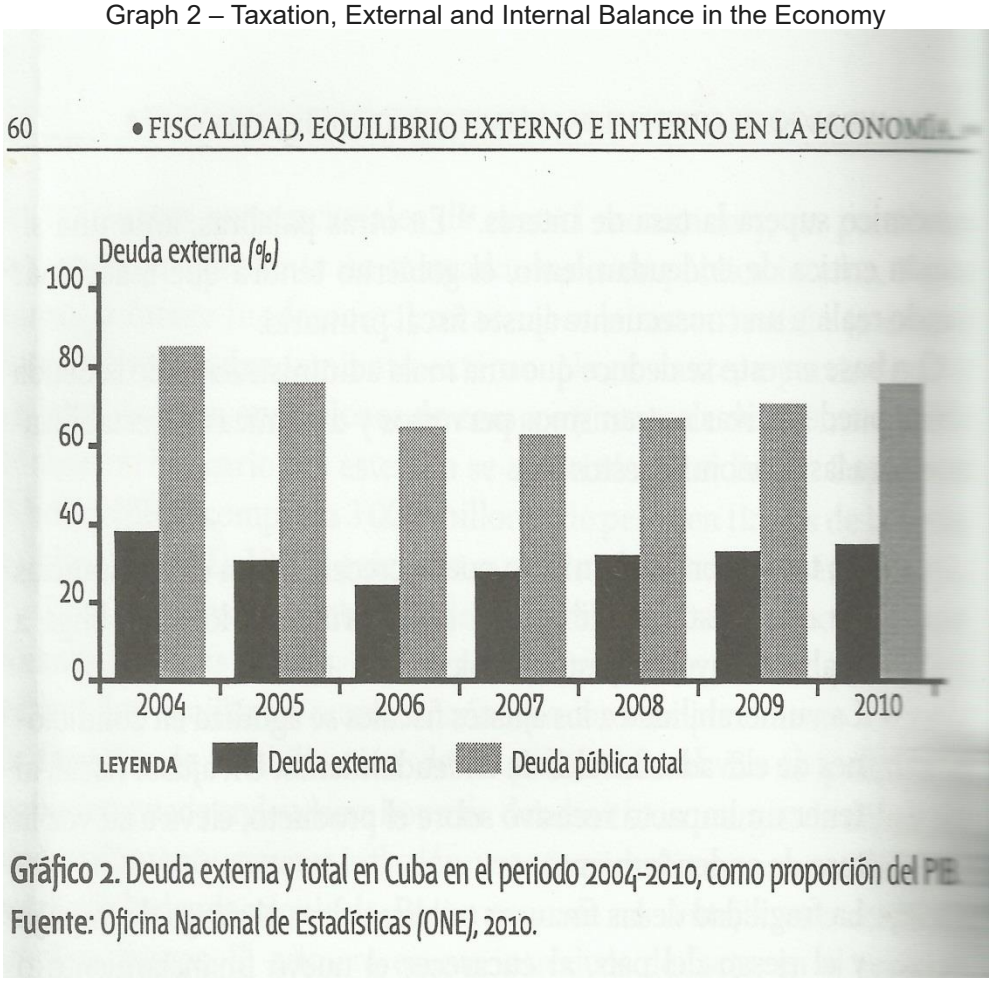
> At the beginning of the 1990s, in the face of the abrupt fall in gross domestic product – GDP – associated with the collapse of the socialist camp – an inevitable situation of imbalance occurred. The policy of employment protection and the consequent fiscal deficits generated an injection of uncompensated circulating goods and services that eroded – manifestly or implicitly – the purchasing power of the Cuban peso (CAP) and, consequently, the real income of families (...), but a distinctive aspect of this phase was the substitution of the currency. As the flows of dollars through remersas and tourism increased, the classic conditions emerged that gave way to the partial dollarization of the economy. Subsequently, the duality scheme was introduced as part of the economic program in the face of the crisis (Ibid., p. 49).

The monetary duplicity of the Cuban economy in this period synthesizes and responds to the socioeconomic imbalances of later periods that we are demonstrating in various ways. This, for example, has a direct impact on the direction of the economic policy of the domestic market, which has a great emphasis on the export of goods and services with high added value in the field of foreign policy, stimulating above all tourism and imports, mainly of food, with the consequent restrictions on domestic production expenditure that feeds technological backwardness. the deterioration of the purchasing power of workers' incomes in Cuban pesos and cuts in spending on social protection. The fiscal insolvency of the State tends to deteriorate its capacity to promote the development process, putting at risk its socialist principles in the face of an internal market marked by two commercial circuits that represent nothing more than economic and social inequality: i) a circuit that operates with a very devalued currency (Cuban pesos) in a context of technological backwardness, low productivity, low state subsidies and regulated prices, with a supply of goods that does not meet the demand of the national population; ii) an overvalued dollarized market circuit (CUC) that operates with inflated international prices to serve mainly the tourism sector, creating a market space that is quite restricted to foreigners and a few segments of the population that carry out activities that generate foreign exchange income.

According to Vilma Hidalgo de los Santos (2012, p. 52) in these conditions "the effect of imbalances – is expressed in inflationary tensions – and immediately falls on the loss of purchasing power of national currencies, limiting their ability to meet current expenditures (imported inputs) and capital". This situation could even worsen in inflationary macroeconomic terms with the mobilization of bank loans for non-state sectors in a scenario of non-payments by the business sector and immobilization of savings of Cuban families in the face of a demand for imported products that does not generate products or domestic currency, which generates more circulation without a corresponding trace of

goods and services, in addition to increasing the fiscal deficits of the State, as we can see in the dynamics of public debt in the following table, as a result of this script.

Graph 2 – Taxation, External and Internal Balance in the Economy



(Source: DE LOS SANTOS, 2012, p. 60)

In geographical terms, the volume of investments in Cuban pesos (CAP) maintained the distortion between the three main regions. The highest level of investment is concentrated in the West, varying in 2001, from 1,460.6 million pesos to 2,835.1 million in 2011. For the same period (2001-2011), the Central provinces received 424.0 million in 2001 and reached it in 2011, with 551.4 million in state investments. Oriente, from 552.0 in 2001, reached 2011, receiving 928.1 million pesos. Overall, Cuba increased its investments from 2,436.6 billion pesos in 2001 to 4,341.1 billion in 2011, a growth in investments on the island of practically 100% in a decade. However, investments in 2014 were reduced by 535 million pesos, which represents a reduction of 10.2%, compared to previous years. If we take 1989 as a reference, for example, we will also see that investments were decreasing. In this period the investment rate was 24%, ten years later, in 1999, it was 6.8%, and in 2010, around 10%.

Vilma Hidalgo de los Santos (2012, p. 67) also concludes that this investment situation

> explains the paradox in relation to the asymmetry between human capital investment and the technological environment (...). [And he ends his argument by stressing] that we are witnessing a vicious circle in which the Cuban economy finds itself and it will be necessary to overcome. The starting situation is characterized by slow growth, as a result of a low productivity of labor, a dependent and technologically backward productive structure, which coexists with an oversizing of the public sector that threatens fiscal sustainability, a fragile situation of external finances and losses of purchasing power of the domestic currency (Ibid., p 67).

As a perspective to solve the problems presented, the author presents the two main problems and their other deployments: i) to solve, on the one hand, the imbalance between the fiscal dimension and the productive dynamics as one of the main sources of imbalances; ii) on the other hand, to resolve over time the inert monetary scheme that results in a system of prices, wages and costs that constitute a brake on efficiency and economic growth.

In addition, it considers it necessary, in the field of economic policy, to correct the financial situation which, in addition to requiring the elimination of the dual currency, requires the correction of the structural factors that explain it, that is: the lack of definition of the boundaries between state and business functions; lack of a law on the liquidation of the business sector, deficient system of invoicing and payments; treasury practices between companies within the same entity; excess of administrative mechanisms that limit business management and delays in the production process as a result of failures in the planning process. The same priority is to review the level of wages, because their significant decline in recent years has had a negative impact on the social structure and conspires to reduce labour productivity and monetary equilibrium: *labour must be considered the main source of income for the economic model balanced in fair measure with the increase in productivity. whose increase must focus on updating the redistribution of wealth produced in the form of wages*.

Meanwhile, at the end of the 1990s, in 1999, the social equity development index in Cuba remained at 0.93 for the City of Havana, indicating a good quality of life. The other indices were medium and included the cities of Santiago de Cuba (0.76), Guantánamo (0.73) and Granma (0.71) (ALEMAN AND HEREDIA, 2013). The gross domestic product – GDP of the country that accumulated negative growth since 1989 (-3%), 1991, (-11%), began to generate positive GDP indicators since 1994, with 1995 growing around 8%, 1999, growth of 5%, finally reaching 2001 with a weak performance of 0.5% of GDP. And in the previous period, that is, from 1970 to 1989, the average development of the national

economy was 5.6% of positive GDP growth. Between 2013 and 2014, the average annual circular growth rate was 7%. For the year 2015, an average GDP growth rate of 4% is projected (RODRIGUES, 2015, March 4, p. 1-2). The following graph shows the dynamics of the gross domestic product for the 1989-2001 time series.

Graph 6 – GDP dynamics – period 1989-2002.

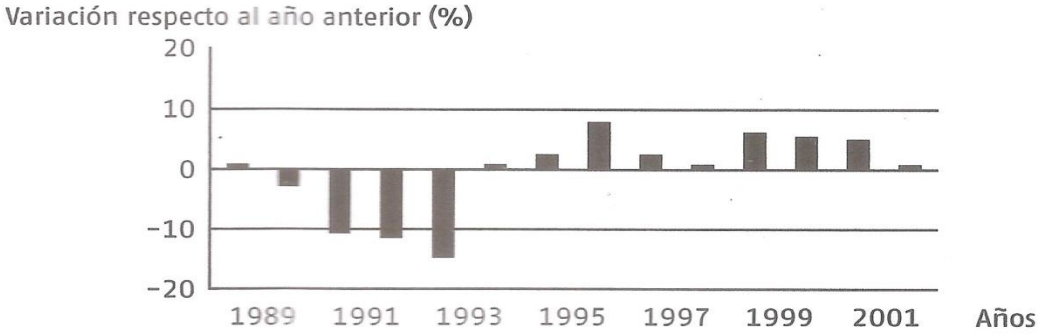


Figura 6. Dinámica del PIB *(periodo 1989-2002).*
Fuente: Oficina Nacional de Estadística –ONE– *(2002),* «Documentos presentados en la Asamblea Nacional del Poder Popular» *(1996, 1999).*

Source (Alemán & Heredia, 2013, p. 118)

The dynamics of GDP and national economic growth during these periods were greatly influenced by the total public debt and the capacity of the State to pay its debts and to have the credibility to assume new loans for national investments. What is perceived is that the debt has produced limitations in the development process due to its evident growth in the post-revolutionary years, which weakens the capacity to invest in development, since the expenses to pay debts and divisions are becoming more and more. Between 2008 and 2014, the payment service went from $1,171 million to $3,106 million, $1,535 million or more, which represents a 97.7% increase in the payment service as indicated above (RODRIGUES, 2015, May 4, p. 1-2).

But once José Luis Rodrigues (2015, March 2, p. 1-2-3) reminded us that in the 1960s the external debt was practically non-existent, totaling only 291 million dollars in 1969. In 1982 the external debt was 2,914 million dollars, reaching a value of 6,165 million in 1989. Since then, it has increased considerably, in 1994, to reach 9,083 million dollars, in 2004, to compute an external debt of 13,802 million, which represents 33.6% of GDP. It increased again, in 2009, to a value of $20,606 million (37% of GDP) and then in 2004 to $25,512 million, or 40% of GDP.

The financial problems caused by external debts together with the decrease in investments, in recent years, have impacted the correlation of the country's trade balance and the dynamics of productive activities. If, on the one hand, between 2008 and 2013, imports fell from 32.4% to 18.8% of GDP, on the other, exports increased from 18.4% to 21.5% of GDP. The trade balance deficit of $1.736 billion in 2008 turned into a positive balance of $1.591 billion in 2013, representing 1.9% of the trade surplus. The report on the construction of the Port of Mariel[9] in the vicinity of the City of Havana shows the flow of export/import correlation for the year 2014, according to which 51% of port movements were imports compared to 49% of exports. Trade balance balances are sometimes independent of the percentage of imports/exports, which may have more to do with the prices of negotiable products (www.cubacontemporanea.com, 2015, April 15, p. 1-2).

In addition, economic sectors and social protection services suffered asymmetric effects. The construction business segments received investments, between 2008-2014, which increased from 6% to 16%, also business services/rental/real estate grew from 3.5% to 31.8% of investments. However, infrastructure (electricity/gas/water) was reduced from 18.4% to 13%. Likewise, the agricultural sector remained practically immobile with 8.3% of investments, with investments in industry (6.2% to 5.4%), mining (12.7% to 5.2%), hotels and restaurants (from 8.6% to 2.8%) decreasing.

If we take the period 2003-2010, for example, we will see the same economic dynamics. The gross domestic product (GDP) grew at an average annual rate of 6% with the following participation of the productive sectors: i) the branches of goods and services that make up the productive sector remained relatively stagnant; (ii) the segments that contributed to the increase in GDP were the so-called "other services" sector, which included the areas of trade and repair of personal effects, hotels and restaurants, financial intermediation, business services, real estate/rental activities, public administration and social security, science and technological innovation, education, public health and social assistance, culture, sports, other communal and personal service activities, as well as import duties (CASTELLANO, 2012, p. 23). Lázaro Peña Castellanos (2012) corroborated that there was a significant change in the composition of GDP in the 2000-2010 time series. In 2000, the goods production sector accounted for 25% of the country's GDP, while the basic services sector accounted for 16.9% and the other services sector for 58.1%. At the

[9] The Port of Mariel is a container terminal that was inaugurated in January 2014, located west of Havana, in order to promote commercial exchange on the island and with foreigners. The terminal has a 702-metre quay, a draught of 17.9 metres on the sides of the quay, 4 super-cranes for ships and a 27.7-hectare container stand with a total capacity of 820,000 tonnes. In 2014, the Port of Mariel moved 230,000 tons. The forecast for 2015 is that I will reach 260,000 tons of transiable goods (www.cubacontemporanea., 2015, April 15, p.1-2-3).

end of the decade, 2010, the participation of the three sectors remained at the following level: production, 18%; basic services, 16.7%; and other services, 65% of GDP. This dynamic also modifies the structure of export trade: i) the services segment – goods and services – which represented 42% of the country's total exports in 1993, until 2000, participating in 64% and in 2010, reached 69%. of exports. In 2008, professional services, mainly medical services, accounted for 47% of export earnings in this segment (goods and services), while tourism, in the same period, contributed 21% of external earnings.

The author concludes that this economic model, due to the low production slowness, tends to prioritize exports of services, with a very specific emphasis on defining the obtaining of external income as the fundamental objective of its economic policy, but forgets to consider with equal urgency that the activity needs internal savings and investment for its balance and development. This is why the operating model of the economy during the period 2000-2010 is quite vulnerable to the context of increasingly specialized, demanding, and technologically innovative markets. And assuming external income as the main economic perspective – if the production of the internal market is balanced – means considering that the specialization of the branches selected for such a process will fall on the distribution of employment, the distribution of income and the definition of consumption (CASTELLANOS, 2012), which could generate social inequalities.

As for the social protection system, it suffered from less economic development. The newspaper Granma of November 2014 (*Headline: Water supply and sanitation: a strategy to follow*, p. 5) reveals difficulties in the supply of basic sanitation due to insufficient resources, although state policy indicates that work is being done to improve it. The newspaper reports that 73.5% of the entire Cuban population has access to drinking water through water pipes and that despite the fact that a large number of people receive water by other means, this does not guarantee the quality of the water. As of November 2014, 125 pieces of equipment from the INRH system have been recovered, while 117 remain to be recovered. Septic tank cleaning services cover approximately 50% of the population, but they are not enough, currently receiving 40,000 records a day from people who require service. The deputy director of the Aqueduct and Sewerage Business Group, Leonel Díaz, explains that of the 228 cleaning carts that exist, only 116 are operational and concluded that around 4,000 are needed to meet the country's demand. The same situation occurs with high-pressure cars, of which there are 46, although 80 are needed. The Director pointed out that the government's intention is to continue with the execution of pipelines by building more than 2,700 kilometers of conductors and some 13,200 kilometers of networks for prioritized cities: Havana, Camagüey, Las Tunas, Holguín, Santiago de Cuba, Trinidad,

Manzanillo, Bayamo, Baracoa, Nueva Gerona, Guantánamo and San Pedrito (GRANMA, November 2014, p. 5).

Low investment in the social protection system is also reflected in energy infrastructure. To get an idea of the energy problems, it is enough to look at how many times the lights are cut in the City of Havana, the capital of the country, sometimes causing days without electricity in a large part of the city. From this we can infer some findings for the local economy that ends up losing money due to lack of energy, automatic machines are deactivated and refrigerated stations can suffer losses due to loss of food that requires refrigeration for maintenance, in addition to the fact that the recurrence of blackouts can, quite efficiently, damage residential and commercial appliances.

The recurrence of productive insufficiency can be seen in the sugar sector, which has suffered absolescence and technological backwardness with repeated harvests with low efficiency. In Mayabeque, after repeated harvests without complying with the productivity plan, it is expected that in 2014 the harvest will be successful but prosperous, producing 54,966 tons of crude oil and 37,281 tons of final grain, in its three sugar mills (GRANMA, October 30, 2014, p. 6. *Headline: Will Mayabeque return to efficient harvests?*). In the 2013 harvest, of the 27 mills, some reached the plan, others more or less some came close (GRANMA, October 29, 2014, p. 3. *Headline: There is a possibility of increasing the number of compliers*). In this regard, suffice it to say that its figures were not very close to the 6 million tons produced in 1952, by the 171 mills of that period.

Figure 2 – Sweet News – Fulfill Sugar Bowls Small Safra Plan



Source: Granma, Wednesday, December 31, 2014, p. 1)

Figure 3 – There are possibilities of increasing the number of compliers



ACELERAN PREPARATIVOS DE ZAFRA

Hay posibilidades de aumentar los cumplidores

Juan Varela Pérez

La implementación de las medidas técnico-organizativas que dejó la experiencia de la pasada zafra debe incrementar esta vez el número de centrales cumplidores. En total fueron 27 los ingenios que, en un trabajo cohesionado, alcanzaron sus planes en mayor o menor cuantía y otros se aproximaron.

La relación de esta avanzada se distribuyó en las empresas azucareras de Cienfuegos, Sancti Spíritus, Ciego de Ávila, Holguín, Santiago de Cuba y Guantánamo. Todos aspiran a repetir la historia e incluso ganar más en eficiencia para respaldar integralmente la probada calidad del azúcar cubana.

El programa en marcha busca.

Realizar bien las reparaciones es primordial para evitar el tiempo perdido en la zafra. FOTO: ARCHIVO

(Source: Granma, October 29, Wednesday 2014)

These examples that we have just mentioned, typical of the current model of Cuban economic development, find resonance from the political point of view in the speech of the Secretary General of the CTC and member of the Central Committee, in the conclusions of the First National Assembly Conference of the Association of Innovators and Rationalizers – ANIR, Ulises Guilarte de Nascimento, who stated in his speech that the current context of the Cuban economy faces difficulties such as the technological absolescence of the industrial plant, the lack of financial resources to acquire spare parts and resources to increase production and the intensification of the economic, commercial and financial blockade maintained by the United States against Cuba that prevents the acquisition of many means for different sectors. The Secretary agrees with the guidelines of the Sixth Congress of the PCC, which defined as a strategy for the exit from the crisis to promote a policy of import substitution, encourage audacity, increase labor productivity and the policy of science, technology and innovation and the environment (TRABAJADORES, October 13, 2014, p.6. *Headline: Anir has the ability to capture the infinite creative potential of our workers*).

As we say, the explanation for GDP growth in recent years comes from measures to reduce underemployment, cut social spending, the opening of migration for Cubans to travel abroad for work reasons – which generates cash flow for the family – and the economic opening for activities on their own. account, distribution of land and not for

productive investments. We also reported earlier that the state sector, for example, reduced its labor force, in 2011, by 14.7% of public underemployment (cutting 624,000 employees) and a growth of the state sector by 471,000 workers, corresponding to a growth of 57.2%. of the economically active labor force, carrying out activities such as preparation and sale of food, transportation of cargo and travel, rental of houses, homes and spaces, services of telecommunications agents. Cooperatives that work under a new form of management also collaborate with the increase in production. There are 498 business cooperatives, mainly engaged in gastronomic activities, retail trade in agricultural products, construction and technical services. Of these, 73% are in the City of Havana, Artemisia and Matanzas.

If we take the example of the Vehicle Reconstructor Cooperative (CRV) created eight years ago, we can see that the economic opening to self-financed activities tends to boost the productive sectors. In 2014, the CRV rebuilt around 300 vehicles belonging to the state's tourism and health sector. Workers who initially received an average of 2,500 CUP (104.16 CUC) now earn an average of 10,000 CUP (400.16 CUC), much higher salaries than those received in state sectors (www.cubacontemporanea, 2015, March 18, p. 1-2-3). Written by: Lisset Izqueiro Ferrer. Manchete: *Cuban cooperatives, with benefits and overcoming challenges*). Even if this example is successful, it is spontaneous and does not constitute the rule of the economic dynamics of the country and in a very simple way it is able to prove the existence of economic activities by the control of nationalization. It does not mean less socialism, but quite the opposite, it represents better wage incomes and a better perspective of material and social life for the workers.

In any case, the state strategy to boost economic efficiency in the face of a scenario of reductions in productive investments due to financial problems or trade restrictions includes as one of its objectives to promote economic openness for self-employed activities and stimulate foreign investment. The government itself has produced a reorientation of the conception of the market as a fundamental sector for economic dynamics. Since then, it has promoted greater space for state ownership and management mechanisms, with greater worker participation in the decision-making process, as illustrated by the case of the Cooperation for the Reconstruction of Vehicles. Law 118 of 2014, which sanctions foreign reinvestment, also expresses this economic course. Today, 200 joint ventures operate on the island, mainly dedicated to activities such as tourism, the production and marketing of nickel, petroleum derivatives, iron and tobacco. The State is obviously the majority shareholder (it owns 51% of the shares), but decisions are made jointly between the parties.

CONCLUSIONS

The objective of this study was to carry out an articulated analysis of the theoretical assumptions that constituted the conceptual apparatus of socialism and how they were appropriated or instrumentalized by the experience of Cuban economic policy to achieve its social and economic purposes of raising living standards and promoting the dignity of men.

The arguments presented and the empirical data collected for this purpose allowed us to reach some conclusive conclusions.

PROPOSITION 1. FIRST METHODOLOGICAL ERROR: CONSIDERATION OF THE INCOMPATIBILITY OF THE RELATIONSHIP BETWEEN THE STATE AND THE MARKET

The authors presented who referenced their theoretical arguments authorized us to say, as the first conclusive proposition, that the mixed character of market mechanisms with the political orders associated with them were methodologically interpreted in a wrong way by the experience of Cuban economic policy, which explains its main economic and social weaknesses. The contempt for the economic functions of the market as a strength of social processes, expressed, among other aspects, by the weak entry of workers, the deficiency of the minority internal market (PAC) associated with the monetary devaluation of the Cuban peso fully demonstrate the inconsistencies of the island's economic development. This political error of the Cuban government, in fact, is the effect of the Marxist consideration that the market, because of its link with the capitalist system, is responsible for all social ills. However, it is exactly there where the enigma that hides the success and prosperity of hegemonic capitalist systems and reveals the social fragility (territorial and social inequalities, poverty levels, low wage income) and economic inefficiency (technological backwardness, high doubts in external current accounts, low labor productivity) of Caribbean socialism is located. Here specifically, their political presuppositions find an obstacle to achieving their social purposes because of the simple belief that it is incompatible to think of the development process to raise material well-being without considering the economic functions of the market. That is to say, there is no development without the market, nor is there a State without a market, the State is the market itself.

PROPOSITION 2. SECOND METHODOLOGICAL ERROR: THE INCOMPATIBILITY OF PRIVATE PROPERTY WITH SOCIALISM

The second methodological error of Cuban socialism with a double effect and resulting from the first is to argue that private property in economic activity is incompatible

with socialism, or otherwise, that all economy must be exclusively state-owned. Marxism had considered private property to be responsible for exploitation and social exclusion based on the analysis of the reality of the nineteenth century, on the principle of consolidation of capitalism when it was motivated by typical patterns of a (self-regulating) market economy in which the essentially profitable orientation was the foundation of its logic and its operational dynamics and when social values were not yet densely consolidated with sufficient levels of social pressure. The most contemporary contexts of social configurations such as European states have shown that different modalities of economic management of property can coexist, because in truth, all economic activity is a form of political regulation. Which means deciding that the name of economic activity, whether private or social, does not strictly define the modality of the system – whether capitalism or socialism – but the type of regulation. The central problem here is economic regulation. It is the regulation of these domains that guarantees or is the way to avoid precisely the large ownership or concentration of economic means, so that the regulation obeys extra-economic fines or takes into account socially established principles and values. The trajectory of the last decade of socialism in Cuba was pressured by the overthrow of Eastern European socialism and was forced to undertake different modalities of economic management (private property, social property, mixed property, cooperatives, state property; reduction of the state sector and expansion of the particular segment) which, despite being incorporated into the strategies of the economic policy guidelines in a rather hesitant way, serves to show the Truth of the double methodological error: in truth there is no incompatibility of socialist systems or with the active presence of the market or with the multiplicity of forms of management of economic activities.

PROPOSITION 3. ASYMMETRIC EFFECTS OF ECONOMIC POLICY IN THE SPHERE OF MATERIAL AND SOCIAL LIFE

The methodological errors that we identified in the first conclusive propositions, their inconsistencies, produced deleterious effects that do not reach the proper account echoes in the Cuban literature and are entirely incomprehensible due to the regional sociological interpretation that tends to silence or attribute the causal factors to secondary events that do not contain explanatory power to elucidate their true reasons. If we observe the conditions of material and social life lightly or hastily and without paying attention, we have the following results: the dynamics of GDP for 1970-1989 were an average growth of 5.6%; between 1990-2001, average growth of 3.5%; 2013-2014, average of 7%; and projection for 2015 of an average annual growth of 4%. The HDI of the City of Havana

reached a figure of 0.92, which means a good quality of life. The rest of the cities were within the range of 0.80, and the lowest indicators were presented in the cities of Santiago de Cuba (0.76), Guantánamo (0.73) and Granma (0.71). Salaries ranged from more than 200 CAP to less than 500 CAP in the 2001-2011 series. Social protection coverage (sanitation, water and electricity) reaches just over 80% of the entire population; education (100%), health (100%), housing (100%) (UNDP, 2021). Productive and social investments, as we have seen, decreased and the external debt reached 37% of GDP in 2004, totaling 25,512 million dollars. In regional terms, inequalities persist in the level of development at the territorial level with the concentration of investments in the West and lower expenditures in the Center and East. If we cross the aforementioned data, we will observe that average GDP growth, although it has been reasonable at around 4-5% per year in recent decades, is still blocked in terms of productive and social investments with the decrease in investments. due to the significant increase in external data. In short, there is a vicious circle of growth in public debt that limits productive and social investments, making the aspiration for a productive dynamic and efficiency that is incapable of increasing its productivity with low investments and using obsolete and backward technologies increasingly agonizing. In fact, it was this reality that forced the decentralization of productive activities in favor of wage earners, the reduction of state centralization with cuts to public employees and the reduction of social spending, in addition to forcing the market to be considered as a vehicle for development. economic.

PROPOSITION 4. THE THREE LOGICS OF THE FUNCTIONING OF THE INTERNAL OR NATIONAL MARKET

Although the economic and social indicators that we present indicate reasonable conditions of material and social life, in the areas of health, education, housing and the employment situation, seen from the point of view of critical sociology, reflect profound deficiencies, which is why it only serves for Cubans to live on the island. If we consider that the social protection of health, education, and housing services has good population coverage with acceptable quality of it, the question that does not want to remain silent is: how do *they survive with such low levels of remuneration to the extent that social assistance services do not buy food, clothing, material goods to guarantee material well-being?*Or if not, if you have a house, if you have an education, if you have a home, if you have housing, but you have conditions of food, clothing, and reasonable situations of material comfort? The observation we have made allows us to decide that the conditions

are scarcity, especially of food and consumption, for a large part of the population, in particular, those who operate in Cuban pesos.

The audacity of our findings for the supporters is not arbitrary because they find a descriptive explanation based on an empirical reality that is loaded with sociological sense that we will seek to explain based on the three logics of the functioning of the internal or national market to answer the very conscious question of how Cubans with such low incomes – practically the smallest in the world – survive.

The first level of the domestic market operates in convertible pesos indexed to the dollar exchange rate (CUC) allowing the exchange of goods in the main export/print trade that is articulated in a coordinated manner, stimulating the production of goods with high commercial value at international prices such as iron, tobacco, minerals (oil) and medicines and consumption of imported products to serve the commercial tourism sector at the local level (restaurants, restaurants, etc.). hotels, medium-sized stores, etc.), as well as inputs to supply the export industry or for joint ventures that demand artifacts for their commercial businesses in these aforementioned segments. This entire market level does not accept CAP, and only operates, in convertible pesos (CUC), which in some way indicates that it is restricted to foreign currency, therefore, in the tourism or international trade sector, and for people who do business or manage them.

The second level of the domestic market operates in Cuban pesos (CAP), a currency that is quite devalued in exchange terms (1 CUC = 24 CAP) that is for the exclusive use of the resident population, and acceptable in small stores that offer products generally subsidized by the state sector that guarantees low prices for products such as bread, eggs, local food, etc. sugar, salt, coffee, various fruits, clothing and appliances in general. Parallel to this low-cost domestic trade, social assistance stores operate that subsidize food and merchandise for the entire population through monthly installments for families, with the main objective of complementing the average wage income of the moment, the main products of the ration book being: rice, cereals, oil, sugar, salt, coffee, jams, toiletries, washing products, personal hygiene products. The main aspect of this economic level is that the salary payments of workers, whether state or counterpart, are computed in Cuban pesos, payments that devalue the exchange rate and greatly depreciate their purchasing power, not finding the worst situation, due to the state subsidy, which allows their relative consumption power to move the gears of this market level.

In truth, it is very dangerous to talk about the third level of the internal market because it is not formally recognized by the national authorities and operates in a cladestinity, at that social level of negation, especially in a socialist country, but all tourists

or foreigners at some point must address it: it *is the dark* market. The same market that Gabriel García Márquez found in his initial formative stage, at the beginning of the revolutionary period, in 1962, when he visited the island for the second time as an international reporter. It emerged, therefore, in a very specific context of absence of everything in Cuba, in which no eggs were found in the stores, as soon as the U.S. blockade was decreed, controlling the first items that appeared in local commerce through its silent engineering. There you can find all kinds of businesses, mainly the sale of tobacco and the most expensive, but precisely prostitution. Prostitution, in particular, is the activity that today most mobilizes the clandestine dark market on the island. Since prostitution is a prohibited activity in Cuba, there are no statistical data to prove it, so our analysis is based on participant observation and informal accounts of Cuban citizens who, for their safety, remained incognito. However, its prohibition is not sufficient reason to suppose that it does not exist, on the contrary, it is precisely there where its most visible manifestation is hidden, so it developed a strategy to operate in the streets of Havana in a diluted, diffuse and silent way without it identifying it, unless it recognizes its way of being. its features and characteristics. If we want to verify its impact on the national economy even though we do not have formal statistical figures available, we can decide that it moves sums infinitely higher than state payments for its workers or joint ventures with high economic efficiency and we can do the calculations. In the first place, it only operates with foreign currency (dollar or euro and its counterpart in CUC) with values that vary from 10 to 100 (CUC) per hour, in normal trading situations, being able to reach higher values in special cases or with excellent merchandise. The number of women involved in this profitable business is indefinite and indeterminate, but the truth is that there are many, and its main cascade effect is to question the work motivations of the formal segments by confronting their monetary income. To get an idea of the attractiveness that his body is selling, it is enough to compare the salary of a doctor at the University of Havana with many years of academic work or that of a worker at any state or mixed institution to conclude that the ticket to prostitution is infinitely superior to them. If my professor, who is a doctor, earns 50 CUC a month, I can make a lot of money two or three times more in one or two hours of fun. This indeterminate number of women who are dedicated to this type of business has had an impact on the local economy. They move the rental trade, shops and commerce in general that operate in CUC, in addition to helping their families in Cuban pesos (CAP). If, on the one hand, they are the guarantee of the force of gravity of the "unofficial spending" of the tourism sector or the magnet of attraction that makes the foreign currency that enters the island not want to return, on the other, the clandestine nature of their business means that

they cannot retain their hands on their resources and their money and need to spend them on goods that cannot be proven due to the impossibility of proving the origin of income, which reduces the scope of consumption to two edible years. or basic needs of low durability.

What we intend to decide is that if the character of the dark market is cladestinity, its generated income is illicit and that, therefore, a girl cannot get rich through informal work and if there is no source that accredits or justifies the origin of her money and that for that reason they have to get rid of them and lose money with superfluous expenses (food, clothing, articles of low durability) that are not the subject of state investigation. And the magic of the system, of course, consists in incorporating all these expenses derived from prostitution as tourist expenses if there is no concern to discriminate the chain of the social segment that is managed in the second instance, as is officially the prostitution it generates. Forbidden, it was as if it had never existed, appearing only in the first part of the expenses: the tourist sector, foreigners.

In summary, these three levels of functioning of the internal or national market in Cuba comprehensively explain its current socioeconomic situation. A first level that operates in dollarized currency carrying out commercial export/import transactions for the greatest trade of international attraction and good prices that guarantee state financial support for its territorial investments and mobilizes, internally, facilities and companies to serve the tourism sector with the same overvalued currency, although its business potential is increasingly eroded by the progressive deficits of public debt, which has an impact on the decrease in social protection coverage.

A second level of market that handles the Cuban peso currency in trade subsidized by the state sector, which means that this currency, although quite devalued, generates purchasing power for workers who receive their salary income in the CAP in an internal market that offers differentiated national products to provide opportunities. for the level of consumption that the currency allows. This market stratum conspires to maintain low wages and, consequently, the technological backwardness and inefficiency of labor productivity in this local industry to the extent that it is considered sufficient to maintain the supply-demand of a devalued commercial circuit that only serves to adjust the possible guarantee for the pure and simple social reproduction of those Cubans who only have access to financial income in Cuban pesos. At this level is the explanation of social inequality, the exploitation of labor and the low dignity of man that contrasts, for example, with the artistic, literary or sports segments that lead in one way or another to income -through their by-products-: the records. , films, books, medals/awards – in convertible pesos at current international prices.

The third level of the market, *the dark market, in fact, is the invisible hand* that like a key merges and operates, at the local level, the two previous strata, on the one hand, stimulating the greatest possible retention of foreign spending in the country, on the other hand, it serves as a catapult to heat up trade in convertible pesos and/or Cuban pesos. allowing better levels of material well-being for the people involved in it without putting pressure on state spending. Its commercial circuit of operation has the capacity to relax the pressure on the formal labor market through the search for employment – although there may be compatibility of functions for convenience or by legitimization of personal income – turning inactive workers into hands with strong consumption potential, I decide otherwise, creating the purchasing power of many people considered formally unemployed.

APPENDIX. THE U.S. ECONOMIC BLOCKADE AGAINST CUBA: THE REASON WHY CUBAN SOCIALISM DID NOT FALL AS WELL

Figure 4 – Fidel in 1959 at the Habana Hilton Hotel



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Fidel el fin del año 1959
en el hotel Habana Hilton

Entrada de Fidel en el Pavillón, tocado con un sombrero de Yarey.

El vicepresidente de la Auto Sales Agency, de New York le solicita un autógrafo a Fidel.

(Source: Granma, Wednesday, December 31, 2014, p. 3)

Fidel's delight in the comfortable Havana Hilton Hotel receiving personalities who asked him for autographs on the occasion of the revolutionary party suggests, by its gentle and carefree air, a prophetic consolation that leads his thought to project that he knew the intentions of the United States against his homeland, that therefore he had sufficient

guarantees in advance of the continuation of his socialist project. From this brutal impression we will begin this topic.

The main argument that we will present here in the form of a brief essay – it is not just any argument – is to affirm that the United States economic blockade against Cuba established in 1961, through a series of prohibitive mechanisms that restrict international exchange, has been, from the beginning, the main dynamo, the engine that feeds and inflates the Cuban people's spirits to resist and defend their socialist principles. His noblest feelings of struggle, resistance, patriotism and pride in being Cuban, by irony of fate, had been brought to light by his main enemy: the Americans.

The blockade is defined by a series of political instruments of economic boycott that prohibit U.S. companies and their signatories, even those based in other countries, from establishing commercial, financial and/or scientific relations with the island under penalty of monetary fines for them. According to Odette Díaz Fumero, among the main guidelines of the extraterritoriality policy is the prohibition of subsidiary companies of U.S. companies located in third countries from maintaining any type of agreement with companies on the island, as well as selling goods and/or services whose technology contains more than 10% of components produced in this nation. even if the owners are from other regions. It also prohibits third parties from providing coverage to legal or natural persons in dollars, or from carrying out transactions in currency with Cuban entities or persons (Periódico-Trabajadores. Monday, October 13, 2014. *Headline: Extrateritoriality: Kidnapped Sovereignty, p.14).*

The title of his journalistic text: *Extraterritorialid: Kidnapped Sovereignty* is illustrative of the political appeal that exalts the sentiment of a heroic people who, with great honor, managed to free their people from oppression and foreign exploitation through the blood of their revolutionaries. Certainly we do not intend to deny the merit of the revolutionary process or its heroes, but we are interested in understanding the reasons that keep socialist principles alive in the face of a second-generation population that in reality does not know its own history because it did not participate in its ideals or why it is indifferent to it. This question is not far-fetched because it is common today – although it has been more common in previous times – the constant clandestine escapes to exactly the American territory. Miame, the target of many Cubans, sustains this observation from there, also the journalistic news is ordinary of the protest of Cubans against their own homeland.

Gabriel García Márquez in a very simple and very lucid way points out in an article written in 1978 the key to understanding the demands of the Cuban government against the blockade, presenting an argument that is quite absent in the debates, but with a headline

that contains the same political appeal that inspires resistance and political resignation: *How does a people suffocate without removing a cannon?* Nor is it a question here of legitimizing the blockade and safeguarding the international contravention against anyone, but of putting things in debt at home. Without ignoring the limit of the democratic process and national sovereignty, but problematizing the limit of politics, we can consider as quite reasonable the recourse of the United States to establish commercial relations with Cuba, as well as its institutions based in other countries or the same organizations that maintain them to strengthen economic relations with it. For a very simple reason: *they are fierce political enemies because of their models of society, considered opponents and in a situation of silent strategic war*. It is important to decide that in a war situation you do not negotiate with the enemy to satisfy his needs. It would also be dishonorable for Cuba to request the right to negotiate with its declared enemy as well as to operate with its currency, an expression of everything that the island condemns. If it did not seem so ironic, the U.S. measure could have been proclaimed in the same way by Cuba because it considered that everything that came from there would not be good news.

But, above all, this is the issue that has been the subject of complaints for some time and which, in a zigzagging effect, replaces everything that we have already had the opportunity to talk about in this text: the fragility of its economy and its scarce productive potential capable of allowing national authorities self-determination. If that is not clear to you, then let's follow the descriptive account of Gabriel García Marqués and let everyone clarify their doubts:

> On that night, the first of the blockade (1961), there were some 482,560 automobiles, 343,300 refrigerators, 549,700 radio receivers, 303,500 televisions, 352,900 electric irons, 286,400 fans, 41,800 automatic washing machines, 3,500,000 wristwatches, 63 locomotives and 12 merchant ships in Cuba. All that except for the wristwatches, which were Swiss, had been made in the USA. Apparently, a certain amount of time had to pass before most Cubans did realize what those deadly numbers meant in their lives. From the point of view of production, Cuba suddenly found that it was not a distinct country but a commercial peninsula of the United States. In addition to the fact that the sugar and tobacco industry depended entirely on Yankee agreements, everything consumed on the island was manufactured by the United States, either in its own territory or in the territory of Cuba itself. Havana and two or three other cities in the interior gave the impression of the happiness of abundance, but in reality there was nothing that was not foreign, from toothbrushes to the 20-story glass hotels on the Malecón. Cuba imported from the United States almost 30,000 useful and useless articles for daily life. Even the best customers of that market of illusions were the same tourists who arrived on the West Palm Beach Ferry Boat and by the Sea Train from New Orleans, because they also preferred to buy the items imported from their own land without taxes. Creole papayas, which were discovered in Cuba by Christopher Columbus from his first voyage, were sold in refrigerated stores with the yellow label of Bahamian growers. The artificial eggs that housewives despised for their languid yolk and pharmaceutical flavor had the factory seal of the North Carolina farmers imprinted on the skin, but some clever winemakers washed them with solvent and smeared them with chicken poop to sell them more expensive as if they were

Creoles. There was no consumer sector that was not dependent on the United States. The few factories of easy goods that had been set up in Cuba to make use of cheap labor were piled up with second-hand machinery that had already gone out of fashion in their country of origin. The best qualified technicians were Americans, and most of the few Cuban technicians gave in to the luminous offers of their foreign employers and went with them to the United States. There was also no spare parts deposit, since Cuba's illusory industry retorted on the basis that its spare parts were only 90 miles away, and a telephone call was enough for the most difficult part to arrive on the next plane without customs duties or delays. Despite such a state of dependence, the inhabitants of the cities continued to spend without measure when the blockade was already a brutal reality. Even many Cubans who were in the race to die for the Revolution, and some undoubtedly who really died for it, continued to consume with childish joy. Moreover, the pioneering measures of the Revolution had immediately increased the purchasing power of the poorer classes, and they had no other notion of happiness than the simple pleasure of consuming. Many dreams postponed for half a lifetime and even for entire lifetimes were suddenly realized. Only that the things that were sold out in the market were not immediately replaced, and some would not be replaced for many years, so that the dazzling stores of the previous month were left without remedies in the pure bones. Cuba was in those early years the kingdom of improvisation and disorder. In the absence of a new morality – which would still take a long time to form in the consciousness of the population – Caribbean machismo had still found a reason for being in that general state of emergence. The national sentiment was so stirred up by this irrepressible gale of novelty and autonomy, and at the same time the threats of the wounded reaction were so real and imminent, that many people confused one thing with the other and seemed to think that even the scarcity of milk could be solved by shooting. The impression of a phenomenal party that Cuba at that time aroused among foreign visitors had a true basis in reality and in the spirit of Cubans, but in an innocent drunkenness on the verge of disaster (...). [later, with the weather] in the commercial center the first queues had appeared and an incipient but very active black market began to control the articles (...). After a night of work at the Prensa Latina Office, I went alone and was in a hurry in search of something to eat (...) I finally found a store (...) and a man was polishing the glasses on the counter. I asked for something to eat: I ordered fried eggs with ham, coffee with milk and bread with butter, and a fresh juice of any fruit. The man told me with a suspicious precision that there had been no eggs or ham for a week, no milk for three days, and that the only thing he could serve me was a cup of black coffee and bread without butter, and perhaps a little reheated macaroni from the night before. (...) It was an accurate prognosis. On March 12, 1962, when 322 days had already elapsed since the beginning of the blockade, the drastic rationing of food items was promoted. Each adult was assigned a monthly ration of three pounds of meat, one of chicken, six of rice, two of lard, one and a half of beans, four ounces of butter and five eggs. It was a ration calculated so that each Cuban consumed a normal quota of calories per day. There were special rations for children, depending on their age, and all children under 14 years of age were entitled to one litre of milk a day. (...) It was only in August 1963, when almost all the stores were closed because there was nothing materially to sell, that the distribution of clothes was regulated. (...) Despite the intense Soviet aid and the help of the People's Republic of China, and despite the assistance of numerous socialist and Latin American technicians, the blockade was then a reality. (...) And no one could have imagined, on the uncertain New Year's Day of 1964, that the worst times of that ironclad and soulless blockade were still to come, and that it would have to reach the extremes that even drinking water would run out in many homes and in almost all public establishments. (Published in Proceso N. 0090 – 01. July 24, 1978).

Gabriel García Márquez's precise description leaves no doubt about the island's economic dependence on international trade and particularly on trade with the United States, since there was no national industry that was a commercial warehouse between the Yankees. The consummate knowledge that this situation had been imposed by previous

governments would not have the effect of holding the revolutionary process responsible and serving as a safe-conduct to the Revolution if the brutal truth that today leads to the process that Cuba's economic policy follows were not complied with. it renews the prioritization of external dependence on foreign capital in the face of a weak domestic/national industrial market that is insufficient to meet the needs of the population without the support of imports, especially food, which grow every day except for the country's supply.

Technically, the blockade has an innocuous effect to the extent that since its implementation the socialist camp that at that time was quite developed in the desire to maintain (such as the People's China, the USSR, the Latin American countries) helps Cuba. And despite the decline of Eastern European socialism, Cuba has maintained bilateral agreements with European (France, Spain, Germany), Eastern (China, Vietnam) and Latin American (Brazil, Bolivia, Venezuela, Mexico) governments and marketed through free trade consortiums such as Caricon (Central America-Caribbean countries) and the Bolivarian Alliance for the Peoples of Our America – People's Trade Treaty – ALBA-TCP. The only negative response to the blockade, it is clear, consists of the negativity that Cuba assumed for itself by not prioritizing its economic and social self-determination based on its own resources and with the ample trade available to promote its development. What is not said is the need to verify that the blockade simply served to maintain the functioning of the island itself by serving as a promoter of the political stimulus of the feelings of resistance and resignation that it needs: *socialist conformism in a situation of scarcity – and basic material insufficiencies*[10] *– to remain standing in a context of ideological* war. It also serves the Cuban government's purpose of appealing to international feelings of mutual aid toward the unjustified who are oppressed by a global superpower and who therefore do not develop as they should because they are oppressed for no reason. This served for Mexico to recently cancel the payment of 70% of a debt of around 500 million dollars and Russia 90% of a debt estimated at 35 million dollars, requesting payment from the former USSR. In March 2015, the president of the Paris Club, Bruno Bézard, announced that within weeks or months the renegotiation of the debt for that amount of between 15 and 16,000 million, which had remained unresolved since 1986, would begin (RODRIGUES, 2015, March 2, p. 1-2-3).

[10] Under the workers' demand for better wage incomes, President Raul Castro's reputation is illustrative of the need to resist and defend socialism in conditions of scarcity and resignation. He says: "(...) We cannot leave room for selfishness and condition to develop and strengthen among our workers. We all want better salaries, but first we have to create wealth and then distribute it according to the contribution of each one (...) The economy must be placed at the height of the political prestige that this small Caribbean island has conquered thanks to the Revolution, the heroism and the capacity for resistance of our people. The economy is the main pending issue and we have the duty to face it definitively towards the sustainable and irreversible development of socialism in Cuba" (GRANMA, December 22, Monday, 2014, p. 5).

In truth, the most authentic option for Cuba would be to thank the United States for adopting such a beneficial measure that, throughout all these years, has only served as a boomerang effect whose only result has been to produce the support of its main political enemy: socialism. Here is the explanation of why Cuba does not fall either.

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MIGRATIONS IN CONTEXT: HISTORY AND FUNDAMENTAL CONCEPTS

https://doi.org/10.56238/sevened2024.031-057

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ABSTRACT

This article explores the history and complexity of migration. It examines the concepts and origins of migratory phenomena, addressing the historical, linguistic and cultural aspects involved. However, it informs that the understanding of words such as "refugee" and "immigrant" goes beyond terminological definitions, as full understanding requires reflection on the complexities and subtleties of human interaction with the other throughout the ages. Then, it presents in chronological order some events responsible for significant human displacements, tracing an overview of migrations up to the present day. Among the events raised are mainly wars, which in addition to large numbers of deaths and displacements, are generally responsible for humanitarian crises. It then presents the most recent numerical data related to the global situation of refugees, asylum seekers, internally displaced persons and stateless persons, offering a quantifiable perspective on this global phenomenon. A literature review, research in specialized publications and websites were used for data collection.

Keywords: Migrations. Refuge. Displaced. Stateless persons. Asylum seekers.

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INTRODUCTION

Migration is a social and historical phenomenon that has accompanied humanity since the earliest times, reflecting economic, political, social and environmental changes. This bibliographic and documentary review article aims to explore, from a historical and conceptual perspective, the aspects of migration, addressing its roots and definitions, in addition to presenting relevant numerical data on the subject.

The central question of this research is: how have migratory flows developed throughout history and what are the main concepts associated with this phenomenon? Understanding these dynamics is crucial for a deeper analysis of the impact of migration on contemporary global society.

The rationale for this research lies in the importance of understanding the historical contexts and fundamental concepts that involve migration. The article was written based on the following objectives: (1) to analyze migration flows historically, (2) to define and contextualize the concepts of migration and refuge, and (3) to examine numerical data on recent migrations. These objectives have been formulated in a specific and measurable manner, seeking to ensure that the reader fully understands the scope of the study and the topics that will be addressed and evaluated.

Finally, this analysis can not only provide a robust and well-founded theoretical basis for future investigations, but also act as a crucial building block for formulating more effective public policies. By deeply understanding the historical contexts and fundamental concepts surrounding migration, policymakers and researchers will be better equipped to address contemporary challenges related to human mobility, thereby promoting solutions that are both just and sustainable.

HISTORICAL AND CONCEPTUAL PERSPECTIVES OF MIGRATION

In this section, we will explore the concepts and origins of migration and refuge, addressing definitions and the historical and cultural aspects involved. Then, we will present in chronological order some events responsible for significant human displacements, tracing an overview of migrations to the present day. Next, we will present the most recent numerical data related to migration, offering a quantifiable perspective on this global phenomenon.

FROM MIGRATION TO REFUGE: CONCEPTS AND ROOTS

The word "foreigner" has roots in the French language, derived from the term *étranger*. This, in turn, has its origin in the Latin *extraneus*, which means "what is outside" or

"strange". It attributes the sense of perceiving the foreigner as different or unknown. The Greek equivalent term for foreigner is *xeno* (Houaiss, 2001), often used to indicate something strange or different, as in "xenophobia", which is the fear or aversion to foreigners.

Taking the Hellenic society of Antiquity as a starting point, the *polis* is commonly associated with an administrative structure composed of a group of Greek citizens (free men), a definition that excluded, among others, foreigners. The *Metecs*, foreigners residing in Athens, had no access to the cults of the gods in the temples, could not marry Athenian citizens, own land, participate in assemblies, courts, or political life; on the other hand, they were authorized to develop, for taxes, economic activities related to education, arts, commerce, and manufacturing. Morales (2008) argues that since *metics* were excluded from political participation, they were not considered an integral part of the *polis*, except with respect to their economic contribution. Foreigners were not considered citizens, but only inhabitants of the *polis*. This view of the foreigner, however, is not unanimous in the ancient world.

Jubilut (2007) informs that, when analyzing the Old Testament of the Bible (Hebrew Scriptures), it is possible to verify several passages in which a differentiated and merciful treatment is imposed on foreigners, who should be treated as equals.

Barbosa (2011) analyzes, from the perspective of the life of the god Dionysus, the antagonism between the Greek concepts of autochthonous and foreign. He states that for the Athenians of the fifth century B.C., what made an individual be considered a barbarian, foreigner or non-Hellenic was the lack of knowledge and adherence to Greek customs, and not necessarily the non-Hellenic ethnicity. Dionysus, the bastard son of Zeus, was born in the Greek city of Thebes, but due to a forced detachment, he took on oriental characteristics in a physical and behavioral sense. In this way, he is considered by the Greeks as a foreign deity, because although his birth was in Greek lands, he emptied himself of his own culture.

Borges (2015), in an article on the use and significance of the word foreigner in Portuguese and Brazilian dictionaries, points out that there has been a transformation in the meaning of this term over time. There was a change in the definition of foreigner, who was no longer considered as one who is not originally from the place, but rather as one who does not have the native language. The author explains that this change established a conception of separation between individuals who speak the official language of a country and speakers of a foreign language. Thus, language is presented as a materialization of the division between subjects, in such a way as to point to a state of foreignness, making it possible for an individual to be considered a foreigner within his own country. This condition

can even be applied to indigenous peoples in the face of the phenomenon of delegitimization of their languages.

As noted, the term "foreigner" embodies a deep linguistic and cultural history that mirrors the complexities and subtleties of human interaction with another. Such a context shows how culture and language have an active participation in social identity and in the acceptance or exclusion of an individual in a given society or group.

Another important phenomenon in which significance is necessary for this study is migration. From Latin *migratio*, *Onis*, whose meaning is "passage from one place to another", is related to the movement of individuals. In this way, an emigrant is a person who leaves his homeland to settle in another country, while an immigrant is a person who has settled in another country. The same individual is an emigrant in his or her home country and an immigrant in the destination country. Regarding the term refuge, from Latin *refuge*, brings the sense of space or place that one resorts to to escape from danger; Consequently, a refugee is one who has taken refuge, or sought protection elsewhere. Stateless, from Latin *Apatris*, *Gone* It means "without a country" and refers to someone who has no nationality (Houaiss, 2001).

The understanding of the words "refugee" and "immigrant" goes beyond terminological definitions, entering the origin of the social and legal complexities that permeate the concepts. Although these words are commonly used synonymously, they have distinct practical implications and are intrinsically linked to the context in which they occur, reflecting the individual and collective circumstances that lead people to move, as well as the legal and social consequences.

Within the scope of international law, the Refugee Statute of 1951 defines a refugee as a person who "fears being persecuted for reasons of race, religion, nationality, social group or political opinions, is outside the country of his nationality and who cannot or does not want to avail himself of the protection of that country" (UNHCR, 1951, p. 2). According to Law No. 9,474/1997, called the Brazilian Refugee Law, refugees are also considered those who left their country due to the deep and widespread violation of human rights (Brasil, 1997).

The 1954 Statute of Stateless Persons is an international legal framework that establishes definitions for statelessness. According to the document, stateless is "any person who is not considered by any State, according to its legislation, as its national" (UNHCR, 1954, p. 1), a definition that covers individuals who, for various reasons, do not have nationality recognized by any State. This condition can occur due to some circumstances, including conflict between countries, legal discrimination based on ethnic

origin, conflicts between countries, renunciation or deprivation of nationality, and cases of succession of states.

Although there is no international definition for the word "migrant", it is commonly understood as anyone who moves from a region or country, often in search of better living conditions. Law No. 13,445/2017, known as the Migration Law, states that a person from another country who temporarily or permanently settles in Brazil, and who works or resides in the country, can be considered an immigrant, while an emigrant is a Brazilian who resides abroad, permanently or temporarily (Brasil, 2017).

Immigration, as noted, is not necessarily associated with threats to life or persecution. In many cases, individuals choose to immigrate in search of economic opportunities, education, family reunification, among other reasons that do not involve risks to security or freedom. It is important to highlight that the legal status of immigrants is predominantly determined by the national laws of the host country; Thus, these laws establish the rights and duties of immigrants, as well as the procedures for their admission and stay.

In contrast to the above conditions, refugees and stateless persons, whose situation is often the result of conflict, persecution or denial of nationality, are protected by a set of international laws and agreements. These instruments aim to ensure safe and dignified conditions, recognizing the need for international protection when security and human rights cannot be ensured in the country of origin, and will be further discussed later in this dissertation.

Social and humanitarian issues related to migration and refuge have historical roots and persist to the present day. Although it is essential to understand the definitions for the analysis of migratory phenomena, it is important to take into account the historical context of the facts. Migration and refuge are not isolated events; rather, they are intrinsically connected to historical, social, political, and economic factors. By analyzing the past, it becomes possible to identify patterns, causes, and consequences that have influenced migratory trajectories and refugee conditions throughout history.

BETWEEN YESTERDAY AND TOMORROW

Since ancient times, the history of humanity has been marked by compulsory migrations. These are driven by a range of factors, ranging from armed conflict and humanitarian crises to religious persecution and ethnic cleansing. In addition, natural disasters and environmental changes, the construction of large-scale infrastructure, the

expansion of agricultural and grazing areas, as well as the subjugation and enslavement of populations, also contributed to such movements.

An important episode linked to migrations in the first century was the siege of the city of Jerusalem. In 63 BC, Rome began to rule Palestine, after the annexation of Syria as a province. Decades later, a civil war and an uprising against the Romans in 66 AD were motivated by the imposition of the cult of the emperor, high tax burden, resistance to Roman cultural domination, and the loss of socio-political-religious independence. Four years later, in 70 A.D., about 2.5 million people were in Jerusalem for the Jewish Passover celebration. The city was besieged by Roman legions led by Titus and more than a million Jews died; among the survivors, 96 thousand were enslaved and scattered in the Jewish diaspora; others, forced to fight with animals in Roman arenas (Lobianco, 1999; Rocha, 2004).

Bringing light to the events of the twentieth century, in the period between 1939 and 1945, the Second World War caused the death of 70 million people, in addition to mass displacements. This exodus, of approximately 40 million people, was particularly intense in the regions where the main European fighting took place. Hostilities, along with racial and ethnic policies of extermination of non-Aryan peoples, and subsequent post-war border changes, contributed to the intense movement of people seeking refuge. In order to establish regulations to protect this population, in 1950 the United Nations High Commissioner for Refugees (UNHCR) was founded.

In 1948, independence from the State of Israel was declared, marking the culmination of decades of displacement. During this period, thousands of Jews migrated to Palestine, laying the groundwork for the subsequent formation of the State of Israel. The establishment of a new national state, in territory until then inhabited by Palestinian communities , generated the forced exodus of thousands of Palestinians to neighboring regions, and marked the beginning of the Arab-Israeli conflict (Gomes, 2001).

During the Cold War period, from 1950 to 1970, conflicts intensified in Asia and Africa, driven by decolonization processes. Such processes resulted in a significant increase in the number of refugees, due to political and ideological divergences in the newly emancipated countries. In several Latin American countries, the presence of dictatorial governments and the violation of human rights have intensified local refugee crises (Jubilut, 2007). As a result of the great global conflicts, humanity has witnessed some of the most intense episodes of violation of human dignity, manifested through ethnic cleansing and humanitarian crises.

Although there is no consolidated international definition of ethnic cleansing, it is commonly associated with the action of violently removing people from an area to make it

ethnically homogeneous. The most prevalent forms include forced migration, resulting from mass deportations and relocation of populations to concentration or control camps. Although the primary intention of ethnic cleansing is not necessarily the systematic extermination of persecuted minorities, in practice, the process that begins with expulsions is often intensified to killings and destruction, in whole or in part, of a group (Trindade, 2003). An example of ethnic cleansing that can be highlighted relates to Armenia. After the Ottoman defeat by the Russians in World War I, the Ottoman government attributed the military failure to an alleged support of the Armenian population for the Tsar. In retaliation, 1.5 million Armenians were killed and another 1.2 million deported (Mourenza, 2015).

Although they are not the only ones, three recent events have played a crucial role in the context of forced migration: the war in Ukraine, which began in February 2022, the war in the Gaza Strip, which began in October 2023, and the attacks on Lebanon, which began in December 2024. These conflicts, still ongoing, have resulted in significant humanitarian crises and mass displacement.

In Ukraine, although it is difficult to quantify precisely, it is estimated that the Russian invasion has caused at least 500 thousand deaths, internal displacement of 9.7 million Ukrainians and 6 million refugees. Simultaneously, in the Gaza Strip, the invasion by Israel resulted in 30,000 deaths, six million refugees and internal displacement of almost two million people. It is estimated that approximately 80% of the population of Gaza has been forced to flee their homes. The region is facing a severe humanitarian crisis, with virtually all inhabitants facing acute food insecurity and the imminent threat of famine (UNHCR, 2024a).

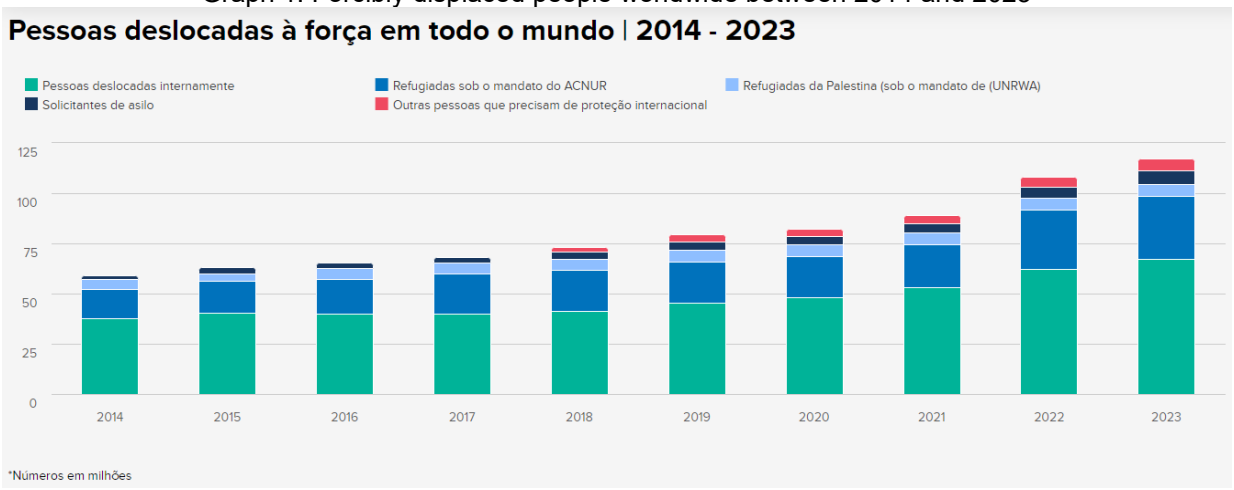
The recent escalation of violence and attacks in Lebanon has generated serious humanitarian consequences, forcing thousands of people to flee. Since September 23, 2024, one million people have been affected by the conflicts, more than 540 thousand people have been displaced and 185 thousand people have crossed the border from Lebanon to Syria. Among these are Syrian refugees, who were already in a situation of vulnerability.

MIGRATIONS IN NUMBERS

The Global *Trends - Forced Displacement in 2023* (UNHCR, 2024a) report presents the latest statistical trends on the global situation of refugees, asylum seekers, internally displaced persons and stateless persons, as well as the number of refugees who have returned to their countries or areas of origin. Published annually in June, it analyses changes and trends in forcibly displaced populations in the previous calendar year (1 January to 31 December).

According to the report, the world's forced displacements – including persecution, conflict, violence, human rights violations, and events that disrupted public order – totaled 117.3 million people at the end of 2023 (Chart 1). This figure represents an increase of 8%, or 8.9 million people compared to the end of 2022. In other words, one in every 69 people worldwide, or 1.5% of the world's population, was displaced.

Graph 1. Forcibly displaced people worldwide between 2014 and 2023



Source: Adapted from UNHCR, 2024a.

It is important to note that the calculation of the number of forcibly displaced people in 2023 included refugees (36.4 million), internally displaced people (68.3 million), asylum seekers (6.9 million) and other people who needed international aid (5.8 million) in the migratory flows.

The total number of refugees in the world increased by 7% in 2023. This increase has been influenced in large part by the conflicts in Afghanistan and Syria, which together account for one-third of all refugees under UNHCR's mandate.

Syria is the country with the largest number of refugees in need of international protection (6.5 million refugees), followed by Afghanistan (6.1 million), Ukraine (6 million), Venezuela (5.6 million) and South Sudan (2.2 million); Together, they represent 73% of the world's total refugees. Among the countries that received the most refugees are Iran (3.8 million), Turkey (3.3 million), Colombia (2.9 million), Germany (2.6 million) and Pakistan (2 million); Together, they received 40% of the refugees in 2023.

In 2023, people under the age of 18 made up 40% of the forcibly displaced population (47 million), while 2 million children were born refugees, with an average of 400 thousand children being born as refugees between 2018 and 2023.

Most of the people who had to flee did not cross an international border, but moved within their countries; In this way, they are considered internally displaced persons. In 2023,

68.3 million people were forcibly displaced internally, accounting for 58.2% of all forcibly displaced persons. The nations with the highest number of internally displaced people in 2023 were Sudan (9.1 million), Syria (7.2 million) and the Democratic Republic of Congo (6.7 million).

In addition to wars, conflicts, and violence, natural disasters also played a role in the forced internal displacement of people in 2023. By the end of the year, 4.3 million refugees, 580,100 asylum seekers and 50.6 million internally displaced people will reside in countries subject to high, severe or extreme levels of climate risks, while simultaneously facing conflict. Approximately one in ten refugees and asylum seekers, and about three in four internally displaced people lived in areas highly exposed to extreme weather risks.

The group of other people in need of international assistance in 2023 refers to those who are residing outside their country or territory of origin, usually because they have been forcibly displaced across international borders, do not fit into the categories of asylum seekers, refugees, people in situations analogous to refugees, but still need international protection, including protection against forced return, as well as access to basic services on a temporary or long-term basis.

In previous periods, voluntary repatriation, local integration and resettlement were effective solutions for millions of people in situations of refuge or internal displacement, who due to the end or mitigation of conflicts, were able to return to their homes. However, the persistence of some conflicts and the emergence of new ones make voluntary returns increasingly complex. In 2023, approximately 7 million internally displaced people and 1 million refugees returned to their homes. In addition, 6.1 million displaced people and 1 million refugees returned to their areas or countries of origin in 2023. In addition, 158,000 refugees were resettled in a third country and 30,000 refugees obtained citizenship in the host country.

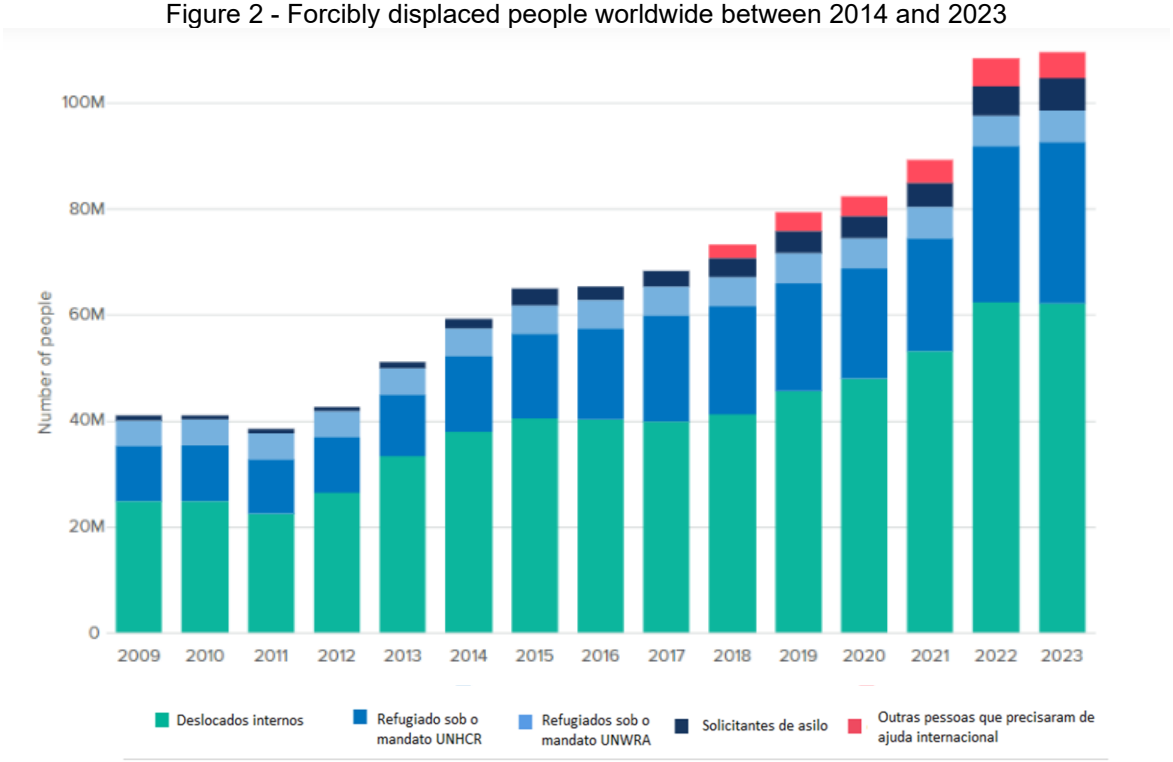
Regarding the condition of statelessness, the calculations take into account two population groups. The first group is made up of people who meet the definition of statelessness in the 1954 Convention because they are not considered nationals of any State. The second group includes people with indeterminate nationality. By the end of 2023, there was a 1% drop in the number of stateless people in the world compared to 2022, totaling approximately 4.4 million people.

Another important UNHCR document is the *Mid-Year Trends* 2024 (UNHCR, 2024b) report. This document analyzes the main displacement trends in the first half of 2024, and serves as a partial update of the Global *Trends - Forced Displacement in 2023* report. In October each year, the biannual trends report is released to provide up-to-date figures on

the first six months of the current year. These results are preliminary, and the final data are included in the subsequent Global Trends report, released in June of the following year.

As presented by the document, at the end of June 2024, approximately 122.6 million people in the world were forcibly displaced from their homes (Chart 2), which represents an increase of 5%, or 5 million people, compared to the end of 2023.

Figure 2 - Forcibly displaced people worldwide between 2014 and 2023



Source: Adapted from UNHCR, 2024b.

It should be noted that the calculation of forcibly displaced persons in 2024 included internally displaced persons (72.1 million), refugees (36.7 million), asylum seekers (8 million) and other persons in need of international assistance (5.8 million).

In the first six months of the year, seven major displacement situations accounted for around 90% of new displacements worldwide. These include new and ongoing conflicts and humanitarian situations in Latin America, the Caribbean, Myanmar, Congo, Mozambique, Sudan and Ukraine.

The global refugee population reached 38 million in mid-2024, a 1% increase from the end of 2023. Syria remains the leading country of origin for refugees and other people in need of international protection (6.3 million refugees), followed by Venezuela (6.2 million), Ukraine (6.1 million) and Afghanistan (6.1 million).

Among the countries that received the most refugees are Iran (3.8 million), Turkey (3.1 million), Colombia (2.8 million), Germany (2.7 million) and Uganda (1.7 million).

An estimated 72.1 million people were forcibly displaced within their own countries, which represents 59% of all forced displacement, and a 6% increase from the end of 2023. An estimated 4.7 million new internal displacements occurred during the first six months of 2024, mainly in Sudan, Myanmar, the Democratic Republic of Congo, Ukraine, Haiti, and Mozambique.

In relation to statelessness, the number of 4.4 million stateless people remained, who, because they do not have any recognized nationality, have difficulties in accessing basic rights such as education, health and employment.

In the first half of 2024, 85,000 refugees were resettled in a third country and 26,000 refugees obtained citizenship in the host country. Just over 2.2 million people have returned to their places of origin, including 430,000 refugees and 1.8 million internally displaced people.

CONCLUSION

This article reviewed conceptual, historical, and quantitative aspects related to migrations, highlighting the complexity and diversity of migratory movements from Antiquity to the present day. The analysis of the origin and concepts constructed of terms such as "foreigner", "refugee", "immigrant" and "stateless" exposed the linguistic and cultural depth that shaped humanity's perception of these subjects.

The historical review addressed significant events such as the siege of Jerusalem, World War II, and the Cold War, which caused humanitarian crises, armed conflicts, political and social changes, as well as resulted in major human displacements. The prevalence of internal displacement over other migratory phenomena was highlighted, and the impacts of recent conflicts in Ukraine, the Gaza Strip and Lebanon were cited.

The latest data indicate a significant increase in forced displacements, reaching 117.3 million people at the end of 2023 and 122.6 million people in the first half of 2024.

It is understood that this study provided an understanding of the historical and conceptual contexts of migrations, in addition to offering updated information on these displacements. The elements presented emphasize the need for effective actions to address the challenges related to forced migration.

In short, the article synthesized a wide range of relevant aspects in order to provide readers and researchers with a solid basis for future discussions on the inclusion and protection of migrants and refugees.

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FROM FELIPE TO DIOGO CAMARÃO: THE CREATION AND INSTITUTIONALIZATION OF THE POSITION OF GOVERNOR OF THE INDIANS IN THE STATE OF BRAZIL

https://doi.org/10.56238/sevened2024.031-058

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ABSTRACT

This article examines the process of institutionalization of the position of Governor of the Indians in the State of Brazil. Created in 1636, during the Portuguese-Dutch wars, this post was initially granted to Felipe Camarão and, after his death, to his cousin Diogo Camarão. The main objective is to understand the performance of Diogo Pinheiro Camarão, who led the government of the Indians between 1648 and 1677. Through a historiographical review and the analysis of unpublished sources, the thesis is defended that the administration of Diogo Camarão represented a milestone in the relationship between the indigenous leaders and the agents of the Portuguese crown, consolidating the role of the governors of the Indians as intermediaries between the settlements and the royal authorities. In addition, it seeks to understand the political-administrative and military actions of these indigenous leaders, which materialized definitively at the end of the administration of the first two governors.

Keywords: Colonial Pernambuco. Governors of the Indians. Camarão Family. Diogo Camarão. Indigenous History.

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INTRODUCTION[2]

The decisive participation of the Indians in the wars that culminated in the expulsion of the Dutch from the captaincies of the North made it possible to build new spaces of alliance and negotiation between the "main" Indians, the colonial administrators and the Portuguese crown. Armed with various "roles of service", the allied indigenous leaders went through a true process of mobility, ascending socially and economically and occupying spaces of power and prestige in the American colony.

In particular, members of the Camarão and Arcoverde families took turns in power for many decades, consolidating themselves as the local indigenous elites. In addition, these agents received various honors and favors, held positions, earned salaries and continued to act in war contexts, reaffirming, in each generation, the alliances established in this colonial world.

For about 100 years, between 1636 and 1733, these indigenous lineages held the position of governor of the Indians in their respective areas of domain, playing an essential role for the colonial government and administration in those hinterlands. The governors of the Indians were true intermediaries between the Portuguese and the indigenous world and, as royal administrators, they were responsible for various functions, such as: recruitment for the troops, distribution for work, bringing the Indians back to their villages and missions, defending the towns and camps, carrying out diligences, resolving conflicts, among others.

The position of governor of the Indians was created in 1636 and had as its initial purpose to decorate the most important indigenous leader who was acting in the wars against the Dutch. For this reason, the first "principal" to occupy the position of governor of the Indians was Antônio Felipe Camarão, still at the beginning of that conflict. In the royal charter that made official the appointment of Felipe Camarão, the king informed that "the position of captain-general and governor of the Indians should be offered as soon as possible to the said principal[3]" and he should also be decorated with a habit of the Order of Christ. This strategy aimed to keep the Indians active on the battlefields; With this, the Lusitanian authorities used all possible means to favor them.

It can be said that this first moment marked the process of ascension of the "main" Indians as governors, with Felipe Camarão (1636-1648) and his cousin and successor Diogo Pinheiro Camarão (1648-1677) as representatives. Both were chiefs of the third of the Indians, notable for the management of the troops in guerrilla and ambush activities, especially during the well-known Battle of Guararapes. Then, around 1677, with the

[2] Text based on the author's doctoral thesis defended at the Federal University of Minas Gerais (UFMG) in 2022.
[3] Record of a letter from His Majesty written to Mathias de Albuquerque about the Indians and Camarão, *May 14, 1633*. In: Historical Documents 1631-1637. vol. XVI, Rio de Janeiro: Typografia Monroe, 1930, p. 466 - 467.

appointment of Antônio João Camarão, the process of consolidation of these leaderships began more clearly, gaining greater prominence with governors Antônio Pessoa Arcoverde and Sebastião Pinheiro Camarão. And, finally, between 1728-1733, with the ascension of the sixth governor Antônio Domingos Camarão Arcoverde, a process of overthrow of these leaders began, culminating in their dismissal and the extinction of the position of governor of the Indians. Thus, three distinct phases can be clearly perceived over these hundred years that characterize the position of governor of the Indians: the rise during the Dutch wars, which lasted until 1677; consolidation, in which new demands arise and new agreements are established, a period circumscribed between 1677 and 1727; and, finally, decadence, represented by the management of Antônio Domingos Camarão.

Table 1: List of governors of the Indians of Pernambuco

Governor of the Indians	**Government period**
Antônio Felipe Camarão	1636 - 1648
Diogo Pinheiro Camarão	1648 - 1677
Antônio João Camarão	1677 - 1682
Antônio Pessoa Arcoverde	1683 - 1692
Sebastião Pinheiro Camarão	1694 - 1722
Antônio Domingos Camarão Arcoverde	1722 - 1733

Source: Prepared by the authors.

Each of these phases was marked by situations and demands that caused a constant updating of the pacts, agreements and alliances signed, representing both the new interests of the Indians and those of the Lusitanians in this context. Thus, analyzing the performance of each of the "principals" in the position of governor of the Indians involves understanding the demands, interests and all the changes caused by the historical context and the deepening of the colonization process in American lands. For this reason, the attributions that these governors had were in practice, little by little, generation by generation, shaping themselves over these hundred years in which the post existed, and only with a joint investigation of these trajectories will it be possible to delimit more precisely the real meaning of this position and its functions.

This article analyzes the first four decades of the existence of the position of governor of the Indians, a period that corresponds to the administration of Felipe and Diogo Camarão, with emphasis on the process of institutionalization of the position. In this sense, it seeks to understand the changes that occurred in the pacts and negotiations that, in the end, provided the establishment of a political-administrative and military action by the governors of the Indians.

The negotiations brought by the Indians are analyzed within the scope of this article as a historical assumption, based on sociocultural, political and conjunctural relations, being

understood from the indigenous perspective. For this reason, they are not seen from the perspective of submission/imposition, as traditionally established by historiography. To say this does not mean to deny the existence of an unequal relationship between the parties, but to take into account that each relational context of negotiation builds possibilities that put the actors on the scene in positions to bargain for better agreements and conditions.

THE POSITION OF GOVERNOR OF THE INDIANS AND THE PERFORMANCE OF FELIPE CAMARÃO: BRIEF HISTORIOGRAPHICAL COMMENTS

The participation of indigenous leaders as governors of the Indians and their role as colonial administrators has been little addressed by Brazilian historiography. Most of the studies that touch on the subject have Antônio Felipe Camarão as their object of research and are focused on analyzing his performance during the wars against the Dutch[4]. Local and more traditional historiography gave little importance to the indigenous presence *lato sensu* in the formation of the colonial world, rarely appearing any information in broader analyses of the colonization process. In these cases, the Indians were seen only as secondary pieces and almost unimportant for the unfolding of historical events and the emphasis fell only on these leaders considered important. For this reason, Antônio Felipe Camarão is, without a doubt, the Brazilian Indian most studied by historiography.

Felipe Camarão's first appearances in historiography date back to the mid-nineteenth century in the journals of regional historical and geographical institutes. There are a series of short articles at the IAHGP (Archaeological, Historical and Geographical Institute of Pernambuco), at the IHGRN (Historical and Geographical Institute of Rio Grande do Norte) in Natal and at the IHGB (Brazilian Historical and Geographical Institute). The interest of these institutes in studying Camarão is consistent with the historiographical movement of the time, in which the indigenous element was romanticized, as well as its presence in the formation of nationality and the Brazilian state. For this reason, Felipe Camarão and his wife Clara Camarão were the subject of some articles for the scientific journals of these institutes. It sought to analyze the components that would form the Brazilian nationality, as well as the intention to create a pantheon of national heroes. However, despite this interest in the "heroes of the homeland", as mentioned, the indigenous presence was not relevant, in the broad sense, neither in the analyses of the Dutch wars nor in historiography in general.

[4] Cf. MELLO, José Antônio Gonsalves de. Dom Antônio Filipe Camarão. Captain-General of the Indians of the Northeast Coast of Brazil. Recife, Editora da Universidade de Recife, 1954.

The articles that deal with Camarão, for the most part, have the purpose of investigating his birthplace, that is, the place of his birth in order to then link him to a captaincy/province[5]. There were, at the time, three hypotheses of where Camarão would have been born: Pernambuco, Cerará and Rio Grande. The defense of each of these hypotheses intensified the debates among some Brazilian literati in the nineteenth century, which was built following several lines of argument and based on different documents, basically reports and chronicles produced in the colonial period[6]. However, regardless of which hypothesis is correct, it is worth noting here that the debate placed Felipe Camarão at the center of local historical research, enabling the knowledge of a varied set of sources that greatly help in understanding his trajectory.

In addition to these works, there are a few studies that deal with the descendants of Felipe Camarão, but these have the purpose of investigating the participation of the third of the Indians in the colonial war enterprises[7] and/or the receipt of habits from military orders by these leaders[8]. These, for the most part, are serious works based on documentary research and with academic ballast, being important for the reflections of this article. However, these studies did not address the role of these agents when it comes to the colonial government and administration.

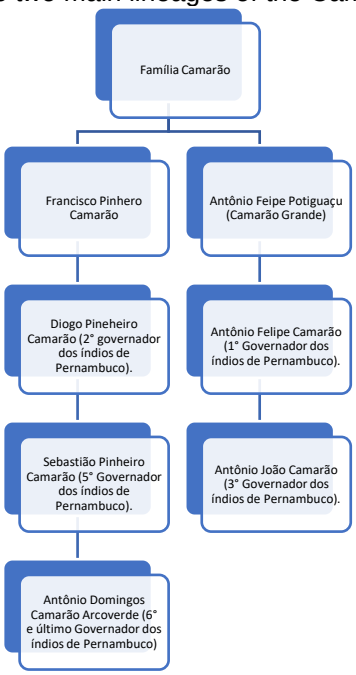
[5] VARNHAGEN, Francisco Adolfo de. Biographia dos Brasileiros distinctos por armas, letras, virtudes, etc. Birthplace of Dom Antonio Filippe Camarão. In: Journal of the Brazilian Historical and Geographic Institute, Rio de Janeiro. Volume XXX, 1867 (Part One); VARNHAGEN, Francisco Adolfo de. Biographia dos Brasileiros distinctos por armas, letras, virtudes, etc. Birthplace of Dom Antonio Filippe Camarão. Journal of the Brazilian Historical and Geographic Institute, Rio de Janeiro. Volume XXX, 1867 (Part Two).

[6] Cf. MELLO, Antonio Joaquim de. Biographies of some poets, and illustrious men of the province of Pernambuco. Volume I. Recife: Typographia Universal, 1856; MELLO, Antonio Joaquim de. Biographies of some poets, and illustrious men of the province of Pernambuco. Tomo II. Recife: Typographia Universal, 1858.

[7] ELIAS, Juliana Lopes. Indigenous militarization in the Captaincy of Pernambuco in the seventeenth century: the Camarão case. Thesis (Doctorate in History) - Federal University of Pernambuco. Recife, 2005.

[8] RAMINELLI, Ronald. Nobilities of the New World: Brazil and hispanic ultramar, seventeenth and eighteenth centuries. Rio de Janeiro: Editora FGV, 2015.

Figure 1: The two main lineages of the Camarão family.



Source: Prepared by the authors.

In general, the performance of indigenous leaders in the captaincy of Pernambuco has been treated in multiple ways over time. Some works have approached it in terms of "co-optation" and "subjugation", considering the "main" Indians and governors as true "accomplices of the colonial plots", [9]as if they represented only Lusitanian interests. In these cases, it can be said that there was an analysis of the context of alliances, agreements and negotiations between indigenous people and Portuguese, in which only one side of the coin was considered, delegitimizing the indigenous view of these processes and reducing the power of choice and action of these agents.

It is undeniable that colonization caused significant changes in indigenous societies; However, it is essential to consider the role of the Indians in this process, in addition to their actions and interests, which in no context were static and varied from many factors.

The diversity of indigenous peoples and cultures is an important element to consider when dealing with their histories, as this multiplicity can also be seen in the forms of interaction with the colonial world and with Europeans, whether Portuguese, Dutch, French, Spanish, among others. For this reason, when looking at the indigenous actions in the face of contact, it is clear that some chose to ally, others tended to make some concessions, but did not accept the settlement or life away from the forests, and still others rejected any and all forms of interaction and resisted in the most varied ways.

[9] SILVA, Geyza Kelly Alves. Web of alliances, loyalty and dependence: Tabajaras and Potiguaras allies/villages in the captaincy of Pernambuco. CLIO. Revista de Pesquisa Histórico, Recife, n. 25-2, p. 187-214, 2007.

Is it possible to say which of these actions/choices were correct at that point? No. The indigenous choices were based on their own cultural repertoire and on the circumstances that the historical context provided. However, for a long time, those who opted for a more direct and effective resistance were "valued" and other forms of relationship and action were "rejected".

There is today, in historiography, a contrary movement to seek to understand indigenous actions beyond pure and simple resistance. That is, to understand the various forms of indigenous agency or protagonism in history. Does this mean rejecting the concept of resistance altogether? Not either. It is only an attempt to understand the other forms of relationship developed between Indians and non-Indians. In particular, attention has been paid to alliances and adaptations – remembering that adaptation does not mean submission and/or passivity. After all, current research has shown how the indigenous people who settled in villages constantly fought for spaces of freedom and rights.

For now, for the argument in question, it is important to recognize that today's indigenous movements show that speaking Portuguese, participating in political discussions, claiming rights through the judicial system, in short, participating intensely in the "society of the whites" and learning its functioning mechanisms does not mean leaving aside indigenous identity, but on the contrary, as this represents the possibility of acting, survive and defend their rights.

And so did the indigenous people in the past, they sought at all costs to fight for their survival, acting in the most varied ways, including accepting the settlement, learning the general language, Portuguese and many of the mechanisms of colonial society, aiming at the rights that were guaranteed to them by the Lusitanian laws.

The governors of the Indians were intermediaries between the indigenous and the Portuguese world, so much so that the investiture in office required the candidates to fulfill certain prerogatives that met the interests of the Portuguese allies and the Indians themselves. In the first place, it should be noted that the position should be occupied by indigenous leaders ("main" Indians) or mestizos of Indians with other qualities (whites and blacks). In this way, subjects who did not have an indigenous ancestry were not accepted in this position, especially by the Indians themselves.

Secondly, it can be said that power was generally centralized in the hands of the same family, that is, it was hereditary. The heredity related to this position can be considered a significant change from the "traditional" logic of the Indians for the choice of their leaders. That said, it is inferred that this characteristic is closely linked to the function of "principal", established post-conquest and contact.

Thirdly, it can be seen that the governors of the Indians were the "main" allies of the Portuguese who participated, above all, in the various colonial war enterprises. As a result, they had military ranks, titles and/or other royal graces to delimit their position and guarantee their power before their followers and the colonial society in which they were inserted. Finally, the governors of the Indians had authority in broader areas, encompassing various settlements and peoples. Each colonial village had its own chief, the "principal" Indian, and this was hierarchically subordinated to the political and military command of the governors.

The governors of the Indians of Pernambuco, due to their connection with Felipe Camarão and their intense collaboration in the wars against the Dutch, gained more prominence and acquired a greater power of influence, encompassing almost the entire captaincy and its annexes. It is clear from the documentation that the authority of these leaders was circumscribed to "all the Indians of this coast of Brazil from Maranhão to the São Francisco River".[10] The space of power of the governors of the Indians of Bahia, for example, began, soon after, to encompass the entire region of the São Francisco, including the areas that were located in the captaincy of Pernambuco, but did not expand beyond that.

DIOGO CAMARÃO AND THE INSTITUTIONALIZATION OF THE POSITION OF GOVERNOR OF THE INDIANS

The attributions related to the position of governor were delimited over time not only based on the needs imposed by local and regional demands, but also by royal interests. The figure of the governor, initially, represented only war interests, as can be seen from the performance of Antônio Felipe Camarão. However, since the ascension of Diogo Pinheiro Camarão to the post, the incorporation of other functions can be perceived, these being of a more administrative and bureaucratic nature and which indelibly marked the performance of the governors of the Indians.

In 1655, Diogo Pinheiro Camarão received the task of providing the post of captain of the "village of Camarão", a reference to the village where Felipe Camarão resided in the last years of his life, the Indian lieutenant Simão Rodrigues. In this correspondence, there is a strong indication on the part of the Portuguese Crown that this would be a practice adopted from then on to meet the defensive needs of the captaincy of Pernambuco and annexes. Vieira Ravasco stated that "because it is convenient to provide as captain all the Indians of the villages of Camarão, and others [...] to more readily attend to the obligations offered by

[10] AHU_CU_PERNAMBUCO, Cx. 11, D. 1027.

the service of His Majesty".[11] Those appointed to the post should enjoy all the privileges that directly belong to them and the other Indians were decreed to "obey, and fulfill, and keep their [the captains'] orders as punctually and entirely as they should and are obliged".[12]

There are two interesting situations to analyze here; Initially, it is possible to perceive a direction of the action of the Governor of the Indians towards an administrative action, which involved much more than simply the management of the troops of the Third of the Indians. There is an increasing involvement of the governors in the definition of the "main" Indians who would occupy the positions of village captains, in addition to their appointment to this position, consolidating a clear hierarchy. This division accompanied the entire period in which the position of governor of the Indians existed. At the local level, in the village or community, the representative was the "main" Indian, appointed as village captain and at the broader, regional level, encompassing the entire captaincy and annexes, were the governors of the Indians.

Soon after the end of the war against the Dutch, in many villages relatives or people close to Felipe Camarão were appointed to the position of captain. In 1658, Ravasco ceded the rank of captain to the Indian Amaro Correia de Miranda, "a relative who is of the same Dom Antonio Felippe Camarão",[13] to work in the village of Jacuípe. Ravasco ordered that all the Indians who had been soldiers of the third of Camarão and who were dispersed throughout the captaincies of Bahia and Pernambuco be returned to the said village under the command of Miranda to assist in diligences when they were requested: "I will appoint (as I do for the present time) captain of the said village of Indians, and I give her power to gather and bring to her [the Indians] from whatever part or farm they are."[14] This ended up becoming a common practice in the post-war context, so that several settlements were established in the hinterlands of the captaincies of Bahia and Pernambuco, with the massive presence of former members of the third of the Indians. Another example that can be cited here is that of the village of Natuba, in Bahia, which was also composed of Indians who fought in these wars, as will be seen in the next chapter.

In addition, from the 1660s onwards, the third of the Indians were redirected to carry out various diligences and act on other war fronts, giving new contours to the actions of the

[11] Rank of the Indians of the land, I mean captain of the Indians of the land of the Village of Camarão and others who withdraw from the Captaincy of Pernambuco, provided by the Ensign of it Simão Rodrigues. In: Historical Documents 1650-1693. Provisions, Patents and Permits vol. XXXI, Rio de Janeiro: Typografia Arch. de Hist. Brasileira, 1936, p. 171-172.
[12] Ditto.
[13] Rank of Captain of the Village of Jacuípe, and of all the Indians who are in this captaincy, who were of the Rosary of Dom Antônio Felipe Camarão, filled in the person of Amaro Correia de Miranda. In: Historical Documents 1650-1693. Provisions, Patents and Permits vol. XXXI, Rio de Janeiro: Typografia Arch. de Hist. Brasileira, 1936, p. 223-224.
[14] Ditto.

governors. The wars against the mocambos and quilombos had an intense participation of the indigenous villagers, and the presence of the governors was decisive in this process. The troops were composed of Indians and mestizos, especially Mamelukes, and the leadership fell on the captains of villages. These troops could be recruited individually, to carry out some activity, or together, to participate in larger conflicts; In this case, the leadership of the group was under the tutelage of the governor of the Indians.

In conflicts against quilombos and/or mocambos, there was usually a rule that determined the redirection of captured slaves to large centers, such as Salvador, Olinda and Recife. For example, in 1664, the Count of Óbidos ordered the Captain of Campo Simão Fernandes Madeira to bring together the Indians of the Torre de Garcia D'ávila and the Indians who had gone from the third of Camarão for a diligence against some mocambos in the region; in the missive it was decreed that all rescued slaves should be redirected to Salvador and that the captain would not allow "any [slave] to go astray, nor to create any".[15]

Another function of the governors was to control the entry and exit of the Indians from the villages. There is a series of letters warning the governors to avoid these departures, especially since many settlers took advantage of it to enslave the indigenous villagers and did not allow them to return to the villages. This was a recurring concern that was repeated in several regions, becoming a crucial element of vigilance and observance by the Indian governorate. Cases such as that of the village of Joacoca are very illustrative of this situation, as there is an express order from the Count of Óbidos to Diogo Camarão to "find strange the excess of wanting to secretly remove the Indians from the village"[16] and determining that the governor should not consent "in any way [...]. that no Indian be taken from it [the village of Jacoaca], and that Sergeant-Major Domingos Tavares be entrusted with the observance of this order".[17]

In addition to military activities, the governor of the Indians, together with the "principals" of the villages and the missionaries, commanded other aspects of the life of their followers, such as, for example, the daily work routine. These leaders were essential in the activities of recruitment and distribution of indigenous labor. Thus, they guaranteed the supply of Indians for royal activities, such as postal services, the construction of fortresses

[15] Order that was given to the Captain of the Field Simão Fernandes Madeira to go to the mocambos. In: Historical Documents 1670-1678. Ordinance and letters from the Governors General vol. VII, Rio de Janeiro: Augusto Porto & Praça dos Governors nº 6, 1929, p. 185 – 186.
[16] Letter to João do Rego Barros Capitão-mor. In: Historical Documents 1663-1685. Correspondence of the Viceroy: Count of Óbidos. vol. IX, Rio de Janeiro: Augusto Porto & Praça dos Governadores nº 6, 1929, p. 222-223.
[17] Ditto.

and mining activities, as well as for private services to the plantation owners and cattle ranchers, especially in the herding of cattle.

There were also many quarrels involving the governors of the Indians and the settlers, especially in disputes over the use of indigenous labor[18]. On several occasions, the settlers complained to the authorities that the governors moved the Indians from the villages, making it difficult to provide services. The villagers were responsible for the security of the urban centers scattered throughout the hinterlands and worked for the settlers in the fields. In many cases, they served as a protective barrier to the "enemy tapuyas",[19] participating intensely in the seizing and rescue troops. In addition, these attacks into the hinterland served to boost the capture and trafficking of Indian slaves and to supply urban and rural centers that had a certain demand for labor. That is why having control of these workers was such an important element, after all, it guaranteed their controller a certain power, prestige and status in those spaces. However, despite the complaints of the settlers, the governors of the Indians continued to have full powers in the settlements and were responsible for controlling the entry and exit of the Indians.

As the most important indigenous leader, the governors of the Indians could, if summoned, participate in the meetings of the Board of Missions[20]. In this way, they would be responsible for bringing privileged information to the members of the Board and assisting in decision-making on indigenous issues. It is in these contexts that one can perceive the performance of the governors as an active voice of the interests of the Indians. Denunciations of illegal enslavements, requests for freedom, requests for land grabs and/or demarcation, interference in criminal matters – assisting the Indians in cases of arrests, appeals and requests for reduction or mitigation of sentences – are perceptible in the documentation. The prestige that the governors of the Indians enjoyed before the colonial authorities made it possible to have a better outcome in the cases and guaranteed certain rights to the Indians. For example, when Governor Diogo Pinheiro Camarão intervened on behalf of the Indian Fortuoso Moreira, son of a "principal" and an Indian woman from the same nation, who was in the irregular condition of captive. Camarão requested his immediate release and that of all the other indigenous people who were in the same situation, "according to the laws".[21]

[18] AHU_CU_PERNAMBUCO, Cx. 5, D. 404
[19] Letter to the Captain-General Dom Diogo Pinheiro Camarão about the Indians. In: Historical Documents 1663-1685. Correspondence of the Viceroy: Count of Óbidos. vol. IX, Rio de Janeiro: Augusto Porto & Praça dos Governadores nº 6, 1929, p. 224 – 225.
[20] Book of the accents of the board of missions, ordinary letters, orders and bands that were written in Pernambuco at the time of Governor Felix José Machado. BNP, Codex 115, Pombaline Collection.
[21] AUC_Coleção Conde dos Arcos, VI-III-1-1-3.

In addition, the governors of the Indians should nominate names to occupy the positions of captain-general of villages, village administrators, among others. Because they were dealing directly with the communities, they were considered the most apt to organize these appointments. However, the names chosen for captain of the villages followed the choice of the Indians who lived in it, and the governor rarely intervened in order to delegitimize the locally established leadership. In the case of these captains, the governor could also be summoned to "swear" them in front of his followers, confirming the rank received[22]. As for the function of village administrator, which encompassed more than one locality, the appointment was usually made by a person trusted by the local authorities, as this was an intermediate position between the governor of the Indians and the villages[23].

Around 1672, Bernardo Vieira Ravasco addressed a letter to the "governors of the Captaincies of Pernambuco" requesting that priority be given to the appointment of "meritorious persons" from the Tabajara and Potiguara nations to the positions of village administrators or village captains[24]. He stressed the confidence he placed in the performance of Diogo Pinheiro Camarão and determined that Diogo, in the figure of governor of the Indians, would be the main link between the local and regional powers:

> By the confidence I have in Dom Diogo Pinheiro Camarão, I order you to order the Governors of the Squares of the Captaincies of Pernambuco not to propose in the Villages of their official war jurisdictions that they govern them except the meritorious persons of the Tavaxara and Petiguera nations, who are natives of the same Captaincies and who are touched by the Government of the Indians of each of the villages, for which the first information from Dom Diogo Pinheiro will precede, all being subordinate to him as the same Dom Diogo to the Governors of those squares, to whom he will give an account of everything he wants to do, of which he seemed to warn you to dispose of it.[25]

It can be inferred, from this missive by Ravasco, that the governor of the Indians would in fact be the bridge between the governors of the captaincies and the other agents who worked directly with the Indians in the villages. Thus, when thinking about the establishment of the government of the Indians and the spheres of power instituted, it can

[22] Rank of Captain-General of the Village of Jacoaqua, of the Captaincy of Parayba, filled in Antônio Nunes do Rego. In: Historical Documents 1668-1677. Patents and Provisions. vol. XII, Rio de Janeiro: Augusto Porto & Praça dos governadores nº 6, 1929, p. 300.
[23] Letter from His Highness about Francisco de Almeida Vena, requesting the position of Administrator of the villages of Rio Grande. In: Historical Documents. Royal Letters 1681 – 1690 & Ordinances 1719 – 1720. vol. LXVIII, Rio de Janeiro: Typ. Batista de Souza, 1945, p. 82-83.
[24] Letter that was written to the governor of Pernambuco and to the captain-general of the captaincy of Rio Grande about the people who should propose themselves in the villages of D. Diogo Pinheiro Camarão. In: Historical Documents 1663-1685. Correspondence of the governors general. vol. X, Rio de Janeiro: Augusto Porto & Praça dos governadores nº 6, 1929, p. 73.
[25] Letter from His Highness that war officers should not be placed in the villages of Dom Diogo Pinheiro Camarão to govern them. In: Historical Documents. Royal Letters 1667 – 1681. vol. LXVII, Rio de Janeiro: Typ. Batista de Souza, 1945, p. 161-162.

be projected that the hierarchies among these colonial agents were organized as follows: at the top was the General Government based in Bahia, which was ultimately responsible for the indigenous question in the overseas space; just below came the governors of the captaincies of the State of Brazil, who made decisions of a more regional nature; then there were the governors of the Indians, who represented the intermediary power between these agents; then there were the village administrators, a kind of assistant to the governors and trusted figures in the management of the indigenous question; Finally, there were the "main" Indians and village captains, who represented the village and the interests of the Indians who lived in them. Nor can we forget the figure of the missionaries, who have always played a central role in the spiritual and administrative management of the colonial villages; These, despite also representing the local sphere, had direct contact both with the governors of the Indians and with the other spheres of power.

It is also clear from this letter that the relevance of Diogo Camarão in that context was significant and his power and influence in the colonial world can be considered even greater than that of his cousin and predecessor Felipe, after all, he gathered around him not only the military, but also the political and administrative command over the Indians and the villages. To affirm this does not mean to minimize the relevance of Antônio Felipe Camarão, but to reaffirm that, over the years, the position of governor of the Indians has been restructured, gaining new contours.

These attributions given to Diogo Pinheiro Camarão were gradually incorporated into the position of governor of the Indians. Initially, they were nothing more than urgent demands that should be carried out by a competent colonial administrator; however, over time, they have become obligations inherent to the position as a whole and will be observed not only in the governorship of Pernambuco, but also in Bahia and in the other jurisdictions in which the position was exercised.

As governor of the Indians, Diogo was awarded by the Lusitanian Crown with several favors. In addition to the habit of the order of Santiago[26], obtained during the war against the Dutch, Diogo Camarão received income that exceeded 100,000 réis, of which 60,000 réis for a "mercy of commendation of lot", [27]received at the end of the conflict with the Batavians, and 40,000 réis for the rank of captain-general and governor of the Indians of Pernambuco[28]. Diogo was literate and had a recognized command of the Portuguese language; Throughout his life, he wrote many letters and signed several service papers for his subordinates. In his signature, he presented himself based on the positions he held and

[26] ANTT, Habilitation of the Order of Santiago – Diogo Pinheiro Camarão – Letter D, Pack 2, Nº 26.
[27] ANTT, General Registry of Mercy, Orders, liv. 9, fl. 279v.
[28] ANTT, General Registry of Mercês, D. Afonso VI, liv. 19, fl. 464.

titles he had obtained, representing himself as: "Dom Diogo Pinheiro Camarão nobleman of the house of His Majesty, professed knight of the order of Santiago, captain-general and governor of all the Indians of the State of Brazil from the Rio de São Francisco to Maranhão".[29]

Diogo Camarão was in charge of the position of governor of the Indians from the death of Antônio Felipe Camarão in 1648 until the year 1677, when he was replaced by Dom Antônio João Camarão, son of Felipe. Gefferson Rodrigues[30], in a recent article on the trajectory of the sixth governor of the Indians Domingos Camarão, stated that Diogo was promoted to the post only in 1669; however, in the historical documentation, he had already been treated as captain-general and governor of the Indians since 1648, so much so that, in the correspondence referring to the war against the Dutch, he himself had already signed the certificates identifying himself as such.

However, his charter was only registered later in 1672 in the reign of Dom Afonso IV.[31] The document contains a summary of Diogo's trajectory, pointing out the positions he held and briefly describing the main battles he participated in. Thus confirmed the King that he would do the "mercy (among others) of confirming him in the post he occupies as captain-general and governor of the Indians of the captaincies of Pernambuco and the others he had, and governed his predecessor",[32] guaranteeing that he should enjoy "all the honors, privileges, freedoms, exemptions and frankness that by reason of the same post belongs to him"[33]. He also warned that they should honor and esteem Diogo Camarão in the figure of captain major and governor of the Indians, enabling him to "exercise the aforementioned post in the way in which Tégora did, and have the said salary".[34] And to the other captains, officers and soldiers who were his subordinates, he ordered "to obey him in everything and to carry out his orders as they should, and are obliged".[35] Finally, he warned that when it comes to the "conservation, benefit, and increase" of the Indians of the

[29] AHU_CU_PERNAMBUCO, Cx. 11, D. 1027
[30] RODRIGUES, Gefferson. The attempted uprising of the Indian Antônio Domingos Camarão in Pernambuco (1730). Acervo, Rio de Janeiro, v. 34, n. 2, p. 1-13, May/Aug, 2021.
[31] ANTT, General Registry of Mercês, D. Afonso VI, liv. 19, fl. 464; Registration of a Patent in which His Highness granted D. Diogo Pinheiro Camarão the opportunity to confirm him in the post he occupies as Captain-General and Governor of the Indians. In: Historical Documents. 1672 – 1675. Provisions, Patents, Permits, Sesmarias, Warrants etc. vol. XXV, Rio de Janeiro: Typografia Arch. de Hist. Brasileira, 1934, p. 249-253.
[32] Registration of a Patent in which His Highness granted D. Diogo Pinheiro Camarão the opportunity to confirm him in the post he occupies as Captain-General and Governor of the Indians. In: Historical Documents. 1672 – 1675. Provisions, Patents, Permits, Sesmarias, Writs etc. vol. XXV, Rio de Janeiro: Typografia Arch. de Hist. Brasileira, 1934, p. 250.
[33] Ditto.
[34] Ditto.
[35] Registration of a Patent in which His Highness granted D. Diogo Pinheiro Camarão the opportunity to confirm him in the post he occupies as Captain-General and Governor of the Indians. Op. Cit., p. 251.

Tabajaras and Potiguara nations "there should be a place to do them mercy very equal to what their zeal and merit[36]" will be".

In these 29 years that he was in charge of the position of governor, Diogo was absent only once in 1671, when he went to Lisbon to personally follow the development of his processes of mercy[37]. During this period in which he was absent, the exercise of the position was in the hands of his immediate lieutenant Antônio Pessoa Arcoverde, and Diogo Camarão issued a provisional patent attesting that Arcoverde would fulfill the function "with the same jurisdiction, authority and power"[38] that he enjoyed. This document is very interesting and demonstrates the level of commitment of Diogo Camarão to the position and function he occupied in the colonial world. For this reason, it was decided to transcribe it in full below:

> Dom Diogo Pinheiro Camarão professed knight of the order of Santiago, captain major and governor of all the Indians of this captaincy of Pernambuco and of the most annexed by His Majesty may God keep Your Lordship for the time that on the present occasion of the fleet that is about to depart, I embark for the kingdom, to deal with my requests, and to achieve this Mr. Fernão de Souza Coutinho grants me permission and agrees to the service of His Highness that my lieutenant Antônio Pessoa to govern the Indians of these captaincies with the same jurisdiction, authority and power as the said gentleman, grants me I will for the good and service of His Highness that the said Antônio Pessoa Camarão govern in my place the said Indians, so I order that I entrust a lot on the part of the said gentleman to the said lieutenant to do what is expected of him there and in the way that has always happened in the real service and even so, I order the sergeant major, captain, and soldiers to obey in the service of God, and of His Highness whose [letter I entrust him?] and do much of the mercy to the lord governor so that he will be seen as a person who [illegible] some of the Indians in my absence, and to have in the said lieutenant, the parts, sufficiency and services to exercise it, and if there is any person who disobeys him, which I do not believe, he can punish him, as his faults deserve to be substantiated to the governor, to act as he seems, and for the firmness of the said I ordered the signature of my hand and sealed, the sign of my arms, Recife de Pernambuco August 29, 1671// Dom Diogo Camarão.[39]

It was as a result of this period of absence, in which he was able to be in Lisbon taking care of the forwarding of his favors, that Diogo was able to formalize the positions and salaries he already had. On that same trip, he also secured a captain's rank for his son, Sebastião Pinheiro Camarão in the Pernambuco Infantry Company[40], with the right to pay and the promise of new positions in the future – a promise that came true a few years later,

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[36] Ditto.
[37] AHU_CU_CONSULTAS DE PARTES, Cod. 47, fl. 154.
[38] Rank of Governor of the Indians in the absence of Camarão, when he passed to the kingdom of Portugal. AHU_ CU_PERNAMBUCO, Cx. 11, D. 1027.
[39] Ditto.
[40] Record of His Highness's provision, because it was provided to provide (sic) confirm to Dom Sebastião Pinheiro Camarão son of Dom Diogo Pinheiro Camarão in the Infantry Company that he exercises in Pernambuco. In: Historical Documents 1672–1675. Provisions, Patents, Permits, Sesmarias, Warrants, etc. vol. XXV, Rio de Janeiro: Typografia Arch. de Hist. Brasileira, 1934, p. 253-255.

since Sebastião occupied his father's post, becoming the fifth governor of the Indians of Pernambuco.

Still from this period of absence, there is another rank of infantry captain sent by Diogo to Mathias Fernandes, an Indian from Paraíba, son of Belchior Fernandes who served as a soldier, lieutenant and captain of the third of the Indians between 1642 and 1671[41]. Fernandes received, in addition to the title of captain, a salary of "1200 réis each month paid to the mezadas in the tithes of Pernambuco".[42] In the registered patents there was always a reference to the decisive participation of these indigenous people in the battle of Guararapes and in the "recovery of the fortresses of Recife",[43] demonstrating how decisive the presence of these agents was during the Dutch wars.

Upon returning from Lisbon, Diogo resumed the post of governor of the Indians of Pernambuco and soon after his return he was requested for new war attacks against the Mocambos. Assistance in the overthrow of quilombos was a determined attribution of the governors of the Indians since the end of the war against the Dutch; however, this call aimed to "listen [Diogo Camarão] about the entry that could be made to the Mocambos dos Palmares".[44] Because he was an experienced military man and had already acted in several similar diligences, Diogo Camarão was considered a necessary figure for the elaboration of strategies and in the leadership of the troops, which, as it turned out, were composed mostly of Indians, blacks and mestizos.

At the time, a large expedition against the quilombo of Palmares was being prepared. The governor of Pernambuco had the intention of giving Diogo Camarão, as captain-general and governor of the Indians, the command of this enterprise. A series of preparations were made for this purpose; Diogo's presence was requested "with some of his captains" in Olinda to discuss details of the expedition and supplies and weapons were released for the troops[45]. There was intense discussion about the need to "give the Indians [of the villages] to the said conquest",[46] especially those who were "capable of taking up arms [...] because

[41] Registration of a Patent in which His Highness provided as Captain to Mathias Fernandes dos Índios that he is [subordinate to] Captain-General and Governor Dom Diogo Pinheiro Camarão. In: Historical Documents 1672–1675. Provisions, Patents, Permits, Sesmarias, Writs etc. vol. XXV, Rio de Janeiro: Typografia Arch. de Hist. Brasileira, 1934, p. 194-195.
[42] Ditto.
[43] Ditto.
[44] Ordinance that was passed to pay D. Diogo Pinheiro Camarão and more Indians passage. In: Historical Documents 1670-1678. Ordinances and Letters of the Governors General. vol. XIII, Rio de Janeiro: Augusto Porto & Praça dos Governadores nº 6, 1929, p. 187-188.
[45] Ditto.
[46] Letter from the Governor of Paraíba Manuel Pereira de Lacerda about giving the Indians the said conquest. In: Historical Documents 1663-1685. Correspondence of the governors general. vol. X, Rio de Janeiro: Augusto Porto & Praça dos governadores nº 6, 1929, p. 117.

they are very necessary for the conquest of Palmares".[47] It was then ordered that only "the less fit and their wives should remain in the settlements, planting their gardens and preserving the villages for the duration of that war".[48] And, finally, in an attempt to expand the preliminary measures necessary for the expedition, the possession of the position of captain of the Indians was determined to Antônio Nunes do Rego, previously appointed by Diogo Camarão[49].

Since the expulsion of the Dutch in 1655, colonial war attacks have been directed to other fronts, transforming the so-called "internal enemies" into their privileged targets. It is for this reason that there was a significant increase, from the 1660s onwards, in the number of entries and conflicts against the aquilombados blacks and Indians hostile to colonization. In response, it is known that, between 1667 and 1677, there were a series of attacks by the Palmares to the coast of Pernambuco aimed at obtaining weapons, freeing captives and vengeance on their former masters and overseers[50]. Around 1670, the Palmares attacked and destroyed some cattle ranches in the region where Garanhuns is located today, further expanding this resistance movement against colonial society. In addition, the attacks occurred on several fronts, such as in the captaincies of Rio Grande and Alagoas, which in the early 1670s went through a "supreme squeeze", with the "repeated entries made to them [the aquilombados], with robberies and deaths".[51]

The reaction of the agents of the Portuguese crown occurred soon after, directing a series of entries to Palmares, among them this expedition organized with the help of Diogo Camarão in 1674. It was believed at that time that the "remedy" to contain the onslaught of the quilombos would come from the massive aid of the Indians living in villages under the tutelage of the third of the Indians. For this reason, in September 1674, an opinion of the Overseas Council on the destruction of Palmares determined the mobilization of the "villages of the Indians who govern Camarão with one hundred white soldiers and put them in seat in opposition to Palmares, with which the said villages would remain in this form, covering those two captaincies [Rio Grande and Alagoas], preventing the blacks from lowering and others from entering them"[52]. This movement would also count on the help of other Indians coming from the region of Rodelas on the São Francisco River, led by the "main" Indian Francisco Dias Mataroã, who would occupy the position of governor of the

[47] Ditto.
[48] Letter from the Governor of Paraíba Manuel Pereira de Lacerda about giving the Indians the conquest of Palmares. In: Historical Documents 1663-1685. Correspondence of the governors general. vol. X, Rio de Janeiro: Augusto Porto & Praça dos Governadores nº 6, 1929, p. 124.
[49] Ditto.
[50] LARA, Silvia Hunould. Palmares & Cucaú. The learning of domination. São Paulo, EDUSP, 2021.
[51] AHU_CU_CONSULTAS DE PERNAMBUCO, Cod. 265, fls. 3v – 4v.
[52] AHU_CU_CONSULTAS DE PERNAMBUCO, Cod. 265, fl. 4.

Indians of the São Francisco a few years later, a jurisdiction linked to the captaincy of Bahia[53].

These forces would act together in the destruction of the quilombo of Palmares, while waiting for the arrival of the "people of S. Paulo" to assist in the conquest. The strategy was simple: they aimed to "make continuous entries" with the 100 (one hundred) white soldiers and together with the troops of the Indians[54]. In addition, they would make use of Brazilian war tactics to block the entrances and exits of the quilombo. The presence of the indigenous people was justified mainly by their extensive mastery of war tactics and their accurate knowledge of the local geography, which facilitated both displacement and ambushes.

During this period, there was a repeated effort on the part of the General Government in Bahia to activate the captains-majors of the captaincies to send "the Indians [villages] to conquer Palmares".[55] In a movement almost unanimous with the guidelines of the Overseas Council in Lisbon, the captaincies of Pernambuco[56], Paraíba[57], Alagoas[58] and Rio Grande[59] mobilized to participate in the great expedition to Palmares under the command of Diogo Camarão[60]. There was also concern about the future of the missions of these captaincies, since most of the villages would remain for a relative period of time with a small population. The guidelines given to the captains-mores followed the same script: gather and send the indigenous people able to participate in the conflict; to keep in the villages women, children, the elderly and other Indians who might not be able to participate in the expedition; to keep the missionary active in these spaces with a view to their conservation; and ensure the maintenance of subsistence activities such as plantations, gardens, among others. In

[53] AHU_CU_CONSULTAS DE PERNAMBUCO, Cod. 265, fl. 4v.
[54] Ditto.
[55] Letter that was written to Fernão de Sousa Coutinho, Governor of Pernambuco, about Palmares. In: Historical Documents 1663-1685. Correspondence of the governors general. vol. X, Rio de Janeiro: Augusto Porto & Praça dos governadores nº 6, 1929, p. 79-80.
[56] Letter that was written to the Governor of Pernambuco D. Pedro de Almeida about the conquest of Palmares. In: Historical Documents 1663-1685. Correspondence of the governors general. vol. X, Rio de Janeiro: Augusto Porto & Praça dos governadores nº 6, 1929, p. 113-115.
[57] Cf. Letter to the Governor of Parahiba, Manuel Pereira Lacerda, about giving the Indians to the said conquest. In: Historical Documents 1663-1685. Correspondence of the governors general. vol. X, Rio de Janeiro: Augusto Porto & Praça dos Governadores nº 6, 1929, p. 117; Letters to the Officers of the City Council of Parahiba about... Villages of the Indians who go to conquer Palmares. In: Historical Documents 1663-1685. Correspondence of the governors general. vol. X, Rio de Janeiro: Augusto Porto & Praça dos governadores nº 6, 1929, p. 124-125.
[58] Letter that was written to the Governor of Pernambuco D. Pedro de Almeida about the conquest of Palmares. In: Historical Documents 1663-1685. Correspondence of the governors general. vol. X, Rio de Janeiro: Augusto Porto & Praça dos governadores nº 6, 1929, p. 114.
[59] Letter to the Captain-General of Rio Grande Antônio Vás Gondim to send the Indians to the conquest of Palmares. In: Historical Documents 1663-1685. Correspondence of the governors general. vol. X, Rio de Janeiro: Augusto Porto & Praça dos governadores nº 6, 1929, p. 116-117.
[60] Letter that was written to D. Diogo Camarão. In: Historical Documents 1670-1678. Ordinances and Letters of the Governors General. vol. XIII, Rio de Janeiro: Augusto Porto & Praça dos governadores nº 6, 1929, p. 364-365.

addition, there was also a concern to "return" the Indians to the settlements as soon as the war ended.

Then, still in 1674, the Count of Barbacena and governor general of Brazil, Afonso Furtado de Castro do Rio de Mendonça, wrote a letter to Pedro de Almeida, governor of Pernambuco, clarifying some questions about the expedition to Palmares[61]. In the letter, he confirmed that the interest of the Portuguese Crown in that context was to take charge of "both the war of the gentile Barbarian, and the destruction of the mocambos of the blacks", and that they should do everything in their power to guarantee this objective[62]. He also reported on the construction of strong houses to store supplies for the troops and suggested the formation of a camp with the planting of gardens to help the soldiers who would act in Palmares.

However, Mendonça advised against keeping Diogo Camarão in the main command post of the expedition, even though he was "a very necessary person to accompany them in the conquest [...] a man of great value and a very brave soldier to carry out what he is ordered."[63] The governor general's distrust stemmed from the large presence of white officers and soldiers who would participate in the entry and that among them Diogo did not have the "authority and respect" necessary to maintain obedience[64]. For this reason, despite the massive presence of the Indians in villages, the command of the expedition left the hands of the governor of the Indians and was delegated to a white officer.

This was a common orientation and one would rarely see a non-white captain directing white officers. Most of the time, the appointment of indigenous leaders to the management of the troops and government of the Indians was privileged, as well as black people for the troops of blacks. What is striking in this case is that, for a long time, the expedition was built under the guidance, advice and experience of Diogo Camarão, being designed to be led by him.

Probably, the opinion of the Overseas Council changed all the planning that had been drawn up by the General Government in partnership with the captains-majors of the captaincies of the North, after all, it was only in this document that the presence of the 100 (one hundred) white officers in the expedition was included. It is possible that the initial plan

[61] Letter that was written to Dom Pedro de Almeida, governor of Pernambuco, about the conquest of Palmares. In: Historical Documents 1663-1685. Correspondence of the governors general. vol. X, Rio de Janeiro: Augusto Porto & Praça dos Governadores nº 6, 1929, p. 106 – 109; This letter is transcribed in other funds of sources about Palmares. Cf. FREITAS, Décio. Republic of Palmares. Maceió: Edufal, 2004, p. 278-279; GOMES, Flávio (org). Mocambos de Palmares. Histories and sources (sixteenth-nineteenth centuries). Rio de Janeiro: 7 Letras, 2010, p. 205-206.
[62] Ditto.
[63] Ditto.
[64] Ditto.

was being formulated with only the presence of Indian, black and mestizo soldiers in the expedition, which would justify the presence of Diogo Camarão as the maximum leader of the enterprise. Based on the correspondence of the governors of Pernambuco between 1671 and 1674, this is attested, as there is an intense movement on the part of the Pernambuco government to redo the military rosaries and enlist the "men capable of war" in Palmares. And, in a letter dated July 1, 1671, there was a declared intention to include "the Indians of Camarão and the blacks of Henrique Dias with their corporals because they were sertanejos and had disposition and courage"[65] in the expeditions against "the blacks raised from the mocambos and palmares".[66]

Although he was not the general commander of the expedition, Diogo Camarão led the troops of the villages with the help of Francisco Dias Mataroã, who was the "main" Indian of Rodelas[67]. In addition to them, lieutenants Antônio Pessoa Arcoverde and Sebastião Pinheiro Camarão, future governors of the Indians of Pernambuco, also participated in this expedition. These leaders were later recognized and decorated for their presence in this conflict, despite not having obtained the desired intent, after all, the Palmares strongly resisted the onslaughts of colonial society until the 1690s.

The participation of Indians in the conflicts in Palmares has appeared in a very timid way in historiography, usually highlighting the presence of these agents in the expeditions commanded by the Paulistas, acting as soldiers in the troops, guides, among others[68]. However, what draws attention in the case described is the remarkable presence of Diogo Camarão in the organization and management of the expedition, so much so that in the decades that followed the governors of the Indians who succeeded Diogo also had to "take care of the entrances to Palmares".[69]

This expedition also marked the end of Diogo Camarão's administration at the head of the position of governor of the Indians, having been replaced by his nephew Antônio João

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[65] AHU_CU_PERNAMBUCO, Cx. 10, D. 917. There is a partial version of this document transcribed in the book: LARA, Silvia Hunold; FACHIN, Phablo Roberto Marchis (eds.). War against Palmares: the manuscript of 1678. São Paulo: Chão Editora, 2021.
[66] AHU_CU_PERNAMBUCO, Cx. 10, D. 917.
[67] Ditto.
[68] About Palmares: ALMEIDA, Luiz Sávio (ed.). Mata and Palmares in Alagoas. Arapiraca: Edual, 2004; ENNES, Ernesto. The wars in Palmares. Subsidies for its history. São Paulo: Companhia Editora Nacional, 1938; CARNEIRO, Edison. O Quilombo dos Palmares, 1630-1695. São Paulo: Brasiliense, 1947; FREITAS, Décio. Republic of Palmares. Research and comments on historical documents from the seventeenth century. Maceió: EDUFAL, 2004; DAMASCENO, Felipe Aguiar. The occupation of the lands of Palmares de Pernambuco (seventeenth and eighteenth centuries). Thesis (Doctorate in History). UFRJ: Rio de Janeiro, 2018; GOMES, Flávio. Palmares: slavery and freedom in the South Atlantic. São Paulo: Contexto, 2019; LARA, Silvia Hunold; FACHIN, Phablo Roberto Marchis (eds.). War against Palmares: the manuscript of 1678. São Paulo: Chão Editora, 2021; LARA, Silvia Hunould. Palmares & Cucaú. The learning of domination. São Paulo, EDUSP, 2021.
[69] "RELAÇÃO das guerras feito aos Palmares de Pernambuco no tempo do governador dom Pedro de Almeida de 1675 a 1678 (M. S. offered by Exm. Mr. Counselor Drummond)". In: Revista do Instituto Histórico e Geográfico Brasileiro (RIHGB), v. 22, 1859.

Camarão, son of Antônio Felipe Camarão in 1677. The replacement of Diogo Camarão did not occur due to old age or some other impediment, but because of his death in the same year of 1677. The circumstances of Diogo's death are not known. The last information we have of him in the documentation is from the year 1676, still during the expedition in Palmares. It is known that he died in 1677 because there is a brief reference to his death in a request for royal mercy sent to the king by his son, Sebastião Pinheiro Camarão, in 1688[70].

In the book "*Desagravos do Brasil e glórias de Pernambuco*", in chapter 9 "Memories of the natural Indians of Pernambuco who after the restoration of the homeland, will become famous for their arms and occupy a position of higher rank[71]" by Domingos do Loureto Couto, there is a brief biography of Diogo Camarão, from which it can be inferred that he had died on the battlefields, probably during some attack against Palmares. According to Loreto Couto:

> D. Diogo Pinheiro Camarão, nobleman of the royal caza, knight in the order of Christ, succeeded in the post of governor general of all the Indians to his cousin the famous D. Antonio Felippe Camarão, who died after the victory of the Guararapes, shortly before the restoration of Pernambuco, and of whom we have made an illustrious memory in the fourth book. Foy this great captain to his soldiers, example, and to the haunting enemies. His actions will negotiate him with credits of valuableness, and prudent, and will make him worthy of completely filling that place that had been occupied by such an illustrious man. The difficult enterprises in which his valor was committed in the war of the Olandezes do not fit in consideration. In the service of his homeland, he then wandered through various lands with immense work, running over dangers, planting thorns of contradiction with a firm plant, until he ended his life for the benefit of the monarchy.[72]

Loreto Couto's book was written about 80 years after the death of Diogo Camarão and was intended to be a kind of "memory" about the "heroes of Pernambuco's restoration".[73] However, despite the effort to biograph the governors of the Indians and the most "prominent" "principals" in this period between 1630 and 1750, Couto ended up listing in his memoirs a lot of inaccurate information about these subjects, which raises certain uncertainties about the statements made by him. In any case, as for the death of Diogo Camarão, there is no doubt that if he did not die fighting on the battlefields he died as a result of it, either by injury or for any other reason.

[70] AHU_CU_CONSULTAS DE MERCÊS GERAIS, Cod. 86, fl. 05
[71] COUTO, Domingos do Loreto. Desagravos do Brasil e glórias de Pernambuco. Rio de Janeiro: Officina Typográfica da Biblioteca Nacional, 1904, p. 449.
[72] COUTO, Domingos do Loreto. Op. Cit., p. 449-450.
[73] COUTO, Domingos do Loreto. Op. Cit., p. 5.

CONCLUSION

Finally, it is believed that when Diogo Camarão passed away, he was between 62 and 70 years old. It is known that he began his military career in 1630 and that he already held the rank of sergeant-major of the third of the Indians in 1638. For 47 years, Diogo Camarão worked on the battlefields alongside the troops of Indians, whites, blacks and mestizos. His military career was long and recognized by the Portuguese crown, which reserved for him several favors and benefits. In addition, his performance as governor of the Indians was decisive for the construction of new agreements and alliances, causing a reformulation of the attributions related to the position which, at the end of his administration, came to be characterized by a more political-administrative function in the colonial world.

Thus, as we have seen, between the years 1636 and 1677 the "main" Indians rose as governors of the Indians and consolidated themselves as officials of the Portuguese crown in the colonial enterprises. In this context, there was a reorganization of pacts and alliances, formalizing a political-administrative action of these agents, established, especially, after the administration of Diogo Camarão. This does not mean that there was an exclusion from military efforts, but that there was a restructuring of the post, incorporating new functions and establishing other forms of management of the indigenous villages.

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Fontes Arquivísticas

20. Arquivo Histórico Ultramarino. AHU_CU_PERNAMBUCO, Cx. 5, D. 404.

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USE OF AI IN THE ICU FOR MONITORING CRITICALLY ILL PATIENTS: A LITERATURE REVIEW

https://doi.org/10.56238/sevened2024.031-059

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ABSTRACT

INTRODUCTION: The advancement of artificial intelligence (AI) has revolutionized the management of critically ill patients, especially in Intensive Care Units (ICUs). Through predictive algorithms, AI enables real-time analysis of large volumes of data, helping to identify serious conditions early and personalize treatments. This has provided faster diagnoses and more accurate interventions, in addition to optimizing clinical decision-making. OBJECTIVE: With this in mind, the objective of this study was to analyze the impact of the main artificial intelligences for the optimization of intensive care. METHODOLOGY: The present work is an integrative literature review, in view of the need to agglutinate the main types of scientific works and analyze their impact related to the theme under discussion. The search was carried out in an exploratory manner in the main databases of the medical literature, such as PubMED, Cochrane, SciELO and Web of Science. RESULTS: The results obtained reinforce the importance of the use of artificial intelligence (AI) in monitoring, early diagnosis, and personalization of care in ICUs. Several studies highlight the positive impacts of AI, particularly in the continuous monitoring of vital signs and the early detection of critical conditions such as sepsis, organ failure, and other complications in critically ill patients. CONCLUSION: The use of AI in intensive care medicine has already demonstrated its value in improving clinical outcomes, reducing mortality, and personalizing the treatment of critically ill patients, as long as it continues to be implemented as a clinical decision support and not as a substitute for medical judgment.

Keywords: Artificial intelligence. Intensive Care Unit. Machine Learning. Monitoring. Personalized treatment.

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INTRODUCTION

The advancement of artificial intelligence (AI) has revolutionized the management of critically ill patients, especially in Intensive Care Units (ICUs). Through predictive algorithms, AI enables real-time analysis of large volumes of data, helping to identify serious conditions early and personalize treatments. This has provided faster diagnoses and more accurate interventions, in addition to optimizing clinical decision-making (DOE, J *et al.*, 2022; WU, T *et al.*, 2023; DOE, J *et al.*, 2024).

Among the most important applications of AI is the early detection of sepsis, acute kidney injury, gastroenterology diagnoses, imperceptible findings on imaging exams and others, which enables the adequacy, anticipation of medical conducts, increasing the prognosis of patients and offering health professionals the opportunity to intervene before the appearance of clinical symptoms. Other studies, such as that of Alanazi *et al.,* 2022, confirm that AI systems applied to the monitoring of vital signs and some other studies demonstrate the use of this tool for treatment personalization, reinforcing the essential role of these technologies in critical care settings (SHAWWA, K *et al.*, 2020; Kwak, G. H . *et al.,* 2020; WANG, X *et al.*, 2023; GARCIA, H *et al.*, 2023).

From this perspective, the personalization of treatment and support tools has been a promising area for AI in ICUs. Pelosi *et al.*, 2021, reported that using algorithms to automatically adjust mechanical ventilation parameters resulted in a significant reduction in ventilation time, as well as minimizing respiratory complications. Some other studies bring the possibility of adjusting vasopressor medications, in the case of septic shock, for example, demonstrating that this personalization of care, adjusted in real time, demonstrates the ability of AI to improve clinical outcomes by individualizing treatments according to the needs of each patient (Otaguro T, *et al.,* 2021; Choi, H *et al.,* 2023; Huang, CY *et al.*, 2023; Ates HC, *et al.,* 2024).

The search in the literature currently demonstrates several tools, from the use of machine learning, ChatGPT, XGBoost, Random Forest, Neural Circuits and several other data automation and predictive synthesis tools, all of which demonstrate the effectiveness of the tools when used as a complement to professional performance. Thus, this paper reviews the most recent contributions of AI in monitoring and personalizing the care of critically ill patients, analyzing the most relevant clinical outcomes and the impact of these innovations on the daily practice of ICUs (Li, X *et al.*, 2020; Shashikumar SP, *et al.*, 2021; Burns, J *et al.,* 2022; Hsu, CC *et al.,* 2023).

GENERAL OBJECTIVE

Analyze the impact of key artificial intelligences for critical care optimization.

SPECIFIC OBJECTIVES

- Analyze the impact of AI on the agility of early diagnosis of sepsis;
- To assess the effectiveness of predicting worse outcomes in patients;
- Compare the monitoring capacity of the various algorithms;
- Evaluate the personalization of treatments performed by AI;

METHODOLOGY

The present work is an integrative literature review, in view of the need to agglutinate the main types of scientific works and analyze their impact related to the theme under discussion. To this end, the following question was used as a guiding principle: "What are the contributions of artificial intelligence in monitoring and personalizing the care of critically ill patients in ICUs, with a focus on predictive algorithms and clinical outcomes?". The search was carried out in an exploratory manner in the main databases of the medical literature, such as PubMED, Cochrane, SciELO and Web of Science.

The study used the descriptors in health sciences in their English version (MeSH), to locate the main studies related to the theme, *"Artificial Intelligence", "Machine Learning", "Intensive Care Unit", "Monitoring" and "Treatment Personalization".* The search used as inclusion criteria the results of studies published from 2014 to the present year, 2024, quantitative and qualitative studies that addressed FI in intensive care medicine, randomized clinical trials, systematic reviews without data overlap and observational studies, and articles included in the previously scored databases.

The exclusion criteria were based on studies with a methodology that was unclear or different from the recommended designs, studies that did not address FI in the ICU context, non-systematic literature reviews were also excluded, and duplicate studies were removed in the end. After defining the structure of the study, the screening process based on titles and abstracts was initiated, duplicates and systematic reviews with overlapping studies were removed. The analysis of the methodological quality of the included studies was carried out according to the *Critical Appraisal Skills Programme* (CASP) tool to evaluate quantitative and qualitative studies

RESULTS

After analyzing the included studies, it was evident that the studies presented good outcomes for the use of artificial intelligence, especially in the monitoring of vital signs for the detection of physiological changes of clinical importance and in the early accuracy of differential diagnoses, based on preclinical organic changes.

A retrospective cohort study demonstrated that the use of AI based on deep neural networks as monitoring of critically ill patients was able to predict the occurrence of sepsis with a sensitivity of 85% and specificity of 92%, detection occurred about 24 hours in advance of the appearance of detectable clinical symptoms for the application of the Diagnostic Scores. In another retrospective study, decision trees were used to identify patterns of variation in heart rate and body temperature, demonstrating a reduction of up to 20% in sepsis-related mortality based on the implementation of an AI-powered alert system (Giannini, H.M. et al., 2019; Alanazi, A, et al., 2022).

In addition to these, algorithms such as XGBoost proved to be effective in integrating multiple data sources, such as laboratory tests, clinical observations, and continuous monitoring data, demonstrating more accurate diagnoses and early interventions, the proof of this effectiveness was demonstrated by a multicenter study involving 50 ICUs, the results of the study showed that the use of this tool decreased the average time to start antibiotic therapy by up to 12 hours, positively impacting the survival of septic patients (Gupta A, 2024).

The use of AI in treatment personalization was proposed due to the heterogeneity of the clinical response of critically ill patients to standardized treatment protocols, the main ways of including this tool for treatment personalization were based on individual characteristics, medication dosage, mechanical ventilation, previous use of other treatments, and choice of vasopressor therapies. A pioneering study conducted in 2020 developed an AI system that used reinforcement learning to adjust the mechanical ventilation of patients with Acute Respiratory Distress Syndrome (ARDS), the results showed that ventilation time was reduced by 15% and the occurrence of ventilator-induced lung injuries was reduced (Pelosi, P. et al., 2021).

Another multicenter study applied AI-based predictive models to adjust the dose of vasopressors in patients with septic shock, the study demonstrated a 10% reduction in the need for vasopressors without compromising tissue perfusion. Some other studies have scored on fluid management in critically ill patients, such as the study by Rodriguez, *et al.*, 2023, which demonstrated that volume replacement performed by AI led to a reduction in

the incidence of pulmonary edema and in the duration of hospital stay (Kwak, GH et al., 2020; Rodriguez, et al., 2023).

Regarding the monitoring of patients admitted to the ICU, the use of artificial intelligence was based on the prediction of vital signs, laboratory tests, and other vital parameters. In this regard, a cohort study used a machine learning algorithm to predict kidney failure up to 48 hours in advance, an accuracy of 87 percent was indicated. This positive outcome allowed medical teams to implement preventive interventions, such as adjusting nephrotoxic medications and early administration of renal replacement therapies. Another study focused on the prediction of cardiorespiratory arrests by AI, this study demonstrated that the algorithm used was able to predict events 12 hours in advance, enabling early interventions that reduced mortality by 18%, these systems proved to be useful, also in monitoring MV, detecting signs of respiratory fatigue and suggesting adjustments in parameters before the patient had clinical deterioration (Shawwa, K. *et al.*, 2020; Nguyen, *et al.*, 2022).

Table 1. Types of AI and their outcomes

IDENTIFICATION	**WOULD**	**INTERVENTION**	**RESULTS**	**Mortality Improvement Rate (%)**	**Rate of Improvement in Length of Stay (%)**
Zheng R, 2023	Machine Learning (ML)	Early diagnosis of sepse	Significant reduction in time to diagnosis of sepsis	25	18
Wang D, 2021	Deep Learning (DL)	Prediction of multiple organ failure	Accurate prediction of serious complications in critically ill patients	30	22
Shi YY, 2021	Logistic Regression	Risk analysis for clinical deterioration	Ability to identify patients at risk of death with 95% accuracy	28	20
Liu F, 2023	Random Forest	Continuous monitoring of vital signs	Continuous monitoring adjusted treatments in real time, with better responses	35	25
Stone GW, 2023	Artificial Neural Networks	Mechanical ventilation customization	Customized ventilation, reducing the need for manual	22	15

			adjustments		
Alanazi A, 2023	Machine Learning (ML)	Prediction of sepsis in ICU	High accuracy in predicting sepsis in critically ill patients	27	19
Ates HC, 2024	Machine Learning (ML)	Monitoring of drug therapy in sepsis	Positive impact on the effectiveness of sepsis treatment	29	21
Burns J, 2022	Advanced Analysis Software	Early detection of acute diseases	Improved treatment response and detection time	26	17
Choi H, 2023	Machine Learning (ML)	Prediction of acute kidney injury	Accurate prediction of kidney injury risk	24	20
Giannini HM, 2019	Machine Learning (ML)	Prediction of severe sepsis and septic shock	Accurate prediction of septic outcomes in critically ill patients	31	23
Handel C, 2024	XGBoost	Prediction and simulation of PEEP fit effects	Improved customization of ventilation fit with more efficient responses	24	21
Pan X, 2023	XGBoost	Evaluation of the accuracy of the SOFA score for prognosis	Improvement in prognostic accuracy and outcome of septic patients	26	20
Rodriguez A, 2023	XGBoost	Fluid management in critically ill patients	Optimized fluid handling, with reduced complications	25	22
Kwak GH, 2020	XGBoost	Prediction of vasopressor use in ICU	More reliable prediction of vasopressor need in critical care	28	19

Source: by the authors themselves.

DISCUSSION

The results obtained reinforce the importance of using artificial intelligence (AI) in monitoring, early diagnosis, and personalization of care in ICUs. Several studies highlight the positive impacts of AI, particularly in the continuous monitoring of vital signs and the

early detection of critical conditions such as sepsis, organ failure, and other complications in critically ill patients.

The use of artificial intelligence based on deep neural networks as demonstrated by Giannini, H.M. *et al*. (2019), was crucial in predicting the occurrence of sepsis with a sensitivity of 85% and specificity of 92%, allowing interventions up to 24 hours before the onset of clinical symptoms. Subsequent studies, such as those by Wang D. *et al.* (2021), corroborate the effectiveness of predictive models, highlighting the role of AI in anticipating complications. These algorithms have been especially effective at integrating vital signs and clinical data in real-time, resulting in more accurate diagnoses and faster interventions, as also described by Zheng R. *et al.* (2023).

The reduction in sepsis-related mortality, by up to 20%, was also evidenced through the use of decision trees to identify patterns of variation in heart rate and body temperature, which is reported in the study by Alanazi, A. *et al.*, 2022. In addition, algorithms such as XGBoost have demonstrated remarkable efficiency in integrating diverse clinical data, resulting in faster diagnosis and reduced time to start treatments, such as antibiotic therapy, reducing this interval by up to 12 hours (Gupta A, *et al.,* 2024).

Another point highlighted in the reviewed studies is the ability of AI to personalize treatment based on the unique characteristics of each patient. Pelosi, P. *et al.,* 2021, for example, describe how an AI system based on reinforcement learning adjusted mechanical ventilation, reducing ventilation time by 15% and decreasing the incidence of induced lung injury. The multicenter study conducted by Stone GW. *et al.,* 2023 also noted that the use of AI in adjusting vasopressor doses in patients with septic shock led to a 10% reduction in the need for these drugs without compromising tissue perfusion.

The customization of fluid handling is equally remarkable. According to Rodriguez et al. (2023), AI-guided volume replacement reduced the incidence of pulmonary edema and shortened the length of hospital stay, evidence of the value of personalized treatments in ICUs. These results were complemented by Liu F. et al. (2023), who highlighted the effectiveness of AI in integrating data to monitor patients and adjust treatments in real-time, resulting in a reduction in serious complications.

The AI's ability to predict critical outcomes was another highlight. A study by Wang D. et al. (2021) showed that machine learning algorithms predicted kidney failure with 87% accuracy up to 48 hours before clinical manifestation, allowing early interventions. Nguyen, et al. (2022) reported similar results for the prediction of cardiorespiratory arrests, allowing interventions to be applied up to 12 hours in advance, reducing mortality by 18%.

Although the results are promising, caution is needed in the practical implementation of these technologies. Many studies are still retrospective, such as that of Shi YY et al. (2021), and the applicability of these algorithms in real clinical settings requires broader validation. In addition, the implementation of complex AI systems requires investments in technological infrastructure, which can be a challenge in ICUs with few resources.

However, with the increasing integration of AI in critical care, there is an expectation that algorithms will become increasingly sophisticated, providing even more accurate diagnoses and treatments. The continued evolution of AI will enable proactive and personalized interventions, which could revolutionize the way critically ill patients are treated in ICUs.

CONCLUSION

The use of AI in critical care medicine has already demonstrated its value in improving clinical outcomes, reducing mortality, and personalizing the treatment of critically ill patients. The future of AI-assisted critical care medicine looks promising, with the potential to significantly transform healthcare, provided it continues to be implemented as a clinical decision support rather than a substitute for medical judgment.

The main limitations of the present study were the difficulty of accessing guidelines for the use of artificial intelligence, which allows for a disorderly and unsafe use of this type of tool, the small portion of randomized clinical trials for effective implementation of AI, and the methodological flaw of most of the observational studies listed in the screening process, which makes it difficult to access quality information.

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PSYCHE, BODY AND ENVIRONMENT: INTEGRATIONS OF THE SELF IN TIMES OF CLIMATE CHANGE

https://doi.org/10.56238/sevened2024.031-060

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ABSTRACT

Climate change is the most evident expression of the socio-environmental crisis that is intensifying around the world. The emergence of this phenomenon coincides with the emergence of a condition of psychic suffering called ecoanxiety. To deal with this context that involves the dissociation between human beings and nature, different areas of knowledge point to the importance of the integration between psyche, body and environment, an element that finds correspondence in the Jungian perspective of the self as a totality. Neuroscience, philosophy, ecology, somatic education and ecopsychology are among the fields that address the integrated character of the human being from binomials such as psyche-body, body-environment, psyche-environment. The Jungian perspective of the self as a psyche-body-environment triad dialogues with these areas of knowledge and offers an additional reference for understanding the relationship between society and the climate crisis. At the same time, it finds in the connection with the new field of ecosomatics the possibility of a clinic that is especially sensitive to the challenge of climate change, through a psychotherapeutic approach that dialogues with the human-nature dissociation not only through words.

Keywords: Corporeality. Eco-anxiety. Echosomatics. Climate change. Psyche.

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INTRODUCTION

From a topic restricted to niches of science and the environmental movement in the twentieth century, climate change has become a daily agenda due to the intensification of extreme events and the horizon portrayed in the scientific reports of the United Nations Intergovernmental Panel on Climate Change, which speaks of a "climate emergency" (IPCC, 2023). In this context, several areas of knowledge approached the themes of ecology and sustainability, reflecting the integrated character of the problem itself. Among the range of subjects, the psychic effects of climate change have gained attention, since anguish in the face of the environmental crisis scenario multiplies, which has been called ecoanxiety. Although this is not a formal diagnosis, this is a growing condition that especially affects children around the world (HICKMAN et al, 2021).

Different lines of study of the psyche have approached socio-environmental issues, with emphasis on ecopsychology which, from a Jungian perspective, addresses how symbolic aspects can be recognized in representations of ecology and the environment; and how there is a relationship between environmental destruction and psychic disturbance (RAYLAND, 2000). This approach focuses on the psyche-environment relationship as part of the self. However, it pays less attention to another aspect of the totality of the self, which is integration with the body. By realizing this gap, I became interested in how the integrated perspective of the self, as referred to by Jung (2013a), that is, the totality involving psyche-body-environment, can contribute to the debate on climate change beyond ecopsychology and provide other references for the care of people in suffering associated with the socio-environmental crisis.

To do so, it is necessary to dialogue with a challenge made explicit by Jung himself, who in his works mentions the psyche-body-environment integration – especially through the binomials psyche-body, psyche-environment – as an appropriate conception for which, in his time, he would not have detailed arguments or data to prove it. It is in this sense that I bring in the present work references from other areas of knowledge to corroborate Jung's view of the totality of the self, based on contemporary authors.

It is through this movement of updating that I seek to answer the question: How does the perspective of the self as a totality dialogue with the challenge of climate change? The hypothesis I raise is that the Jungian conception both supports the understanding of the context of the socio-environmental crisis in the twenty-first century, and offers conceptual support for the deepening of a psychotherapeutic reflection and a clinical practice of an integrated nature – compatible with the complex challenge of climate change – once associated with other praxis and knowledge.

To this end, I explain Jung's reflections that deal with the notion of simultaneity of body and mind processes, as well as the body-mind connection that is evident in the relationship between complexes and physiological reactions (Jung, 2015b). Similarly, I highlight observations about the similarity between dynamics of nature and dynamics of the body (Jung, 2016). And I include, based on the concept of libido as life energy (Jung, 2015a), the view that the integrated body is an expression of biological dynamics not only within it, but in the environment that affects it and is impacted by it (Jung, 2015a), at the same time that the living body expresses the transformation of energy into other manifestations, notably those of a cultural nature (Jung, 2015b). This perspective is connected with the importance that Jung attributes to the reconnection with nature and the valorization of the subjects' worldviews, as well as to stimulate therapeutic resources and life experiences that dialogue with the human-totality relationship. Always recognizing the link between the uniqueness of each person's life and the great problems of the time in which they live (Jung, 2013).

In the second part of the discussion, I bring, in an illustrative way, contemporary perspectives that confirm, complement and deepen the perspective of psyche-body/psyche-environment integration. A first focus is on references about the body intertwined with the mind, as in the neuroscience of Damasio (2012, 2015, 2023), in the philosophy of Morin (2008), in the sociology of Santos (2018) and in the approaches of somatic education and body practices, as pointed out by Lima (2023), Maluf (2023) and Souza (2020). The intention of locating the same reference in four different areas of knowledge is to show how Jung's cautious speculation in pointing out a unity between psyche and body was confirmed by the interdisciplinary knowledge that emerged later.

Similarly, the integrated character between human beings and nature, proposed by Jung, is now well contemplated by theories of ecology and sustainability, the most famous being Lovelock's Gaia Hypothesis (2020), which presents the Earth as a living and integrated organism and clarifies the interconnected character of the socio-environmental crisis we are experiencing. This critical view is updated by Solón (2019) and Ferdinand (2022), from the perspective of intersectionalities, gains an experiential focus under the lens of somatic education and body practices, with Vianna (2005) and Maluf (2023), and, from a more philosophical perspective, perpetuates reflections by Bergson (1948) and Merleau-Ponty (1971).

Krenak's (2022) provocative gaze also gains, which dialogues scientific and socioeconomic knowledge with the knowledge of indigenous peoples. And, specifically in the psyche-environment relationship, it receives contributions from ecopsychology, starting

with Rayland (2000), which brings Jung's concepts closer to deep ecology. And also the focus of Duarte (2017) who highlights an ecological character in Jung's approach to the self.

Having made these correlations, I will contemplate them in the third part of the discussion, no longer by binomials, but by the psyche-body-environment triad, having as a connective plot the notion of ecosomatics, as presented by Barder, Clavel and Ginot (2019), contextualized by Billo (2011) and commented on by Lima (2022). This field born in the twenty-first century investigates the intertwining between *soma*, affections and nature, in a perspective that integrates theory and body practice, and that amplifies the debate on the relationship between the subject and climate change.

In this way, I address how ecosomatics establishes bridges for reflections and psychotherapeutic practices that include the intertwined aspect of the integral human being with nature, bringing body and environment not as supporting actors or references of discourse, but as effective elements in a psyche-body-environment triad in the clinic.

METHODOLOGY

The present research has a qualitative approach and is developed from a narrative literature review, which focuses on two focuses. The first is the Jungian concept of the self as a totality that integrates psyche, body and environment. To this end, seven works by Carl Gustav Jung were selected that approach the concept from different angles. The second focus of the literature review focuses on contributions of contemporary thought on at least one of the binomials that make up the triad of the totality of the self: psyche-body, psyche-environment, body-environment.

These binomials and corresponding concepts are presented from the perspective of the socio-environmental crisis that encompasses climate change. This stage of the review is non-exhaustive and aims to provide illustrative examples of how Jung's concept appears in recent references of contemporary thought.

The ideas highlighted in the survey carried out on both fronts of the literature review serve as a basis for the discussion of the possible contributions of the Jungian concept of self to deal with the issue of climate change.

RESULTS

When investigating how the Jungian perspective of the self – totality that involves psyche, body and environment – provides for dealing with the challenge of climate change, three contributions can be highlighted: (1) the concept of totality supports another reading of the context of the climate crisis, including subjective aspects among its causes; (2)

recognizing the human being through the psyche-body-environment triad allows a better understanding of the suffering associated with climate change; and (3) the psychotherapeutic clinic can find reinforcement in ecosomatic practices to deal with patients in situations of ecoanxiety.

DISCUSSION

THE JUNGIAN PERSPECTIVE OF THE SELF CONNECTING PSYCHE, BODY, AND ENVIRONMENT

Although the notion of the self as a totality that integrates psyche, body and environment is recurrent in Jung's work, the author does not dedicate a specific work or even chapters to deal directly with the theme. The references appear in excerpts throughout different publications and organized into the binomials psyche-body, psyche-environment.

In order to bring together important notions from this perspective of Jungian theory and provide a more direct understanding of the self as psyche-body-environment integration, I bring here the survey I made of Jung's mentions of this in different works. My option was to first present the notion of totality and then organize the ideas from the binomials referred to by Jung, and then condense them in the perspective of the psyche-body-environment triad.

The self as totality

The starting point that seems to me most appropriate to understand the psyche-body-environment integration according to Jung is the notion of totality, which would be a translation of the self that brings together conscious and unconscious, individual and collective, human and non-human:

> The deepest layer we can reach in the mind of the unconscious is the one in which man "loses" his particular individuality, but where his mind expands into the mind of humanity – not consciousness, but the unconscious, where we are all equal. As the body has its anatomical conformation with two eyes, two ears, a nose, and so on, and only slight individual differences, so does the mind in its basic conformation. On this collective level we are no longer separate entities, we are one. We can understand this when we study the psychology of primitive peoples. The fact that stands out the most in the primitive mentality is this lack of differentiation between individuals, this union of subject and object, this "participation mystique," as Lévy-Bruhl calls it. (JUNG, 2015a, pp. 67-68).

The understanding of the self as totality implies the human drinking in perceptions of oneself and of relations with the world around one in order to conceive of oneself. "Psychologically, the self has been defined as the psychic totality of man. Everything that man supposes to constitute, in itself, a wider totality, can become a symbol of the self." (JUNG, 2013a, p. 57)

The constant dialogue between conscious and unconscious and experiences with the world around offers human beings the possibility of dealing with their complexes and building new meanings in life. Hence the relevance of the term totality to designate the self, since the root "total" refers to making sacred, healing. For Jung, the descent to the depth brings healing. (JUNG, 2015a, p. 166)

Here I ponder that totality does not imply universality. Jung states that practical psychology should not deal with a universal human soul, but with individualized men and women, crossed by problems and challenges that directly afflict them (JUNG, p. 140). Therefore, Jung says, a psychology that satisfies only the intellect is impractical, since the intellect alone is not capable of encompassing the whole soul.

It is essential, therefore, to address other aspects of the human condition of integrated existence, from the body to the surrounding world: "Whether we like it or not, sooner or later the worldview factor will have to be taken into account, because the soul is in search of the expression of its totality" (JUNG, 2013b, p. 140)

Such an integrated perspective, however, is a challenge to human understanding. Jung observes, as I will highlight below, that the modern mind has difficulty conceiving a non-separation between body and mind, as well as between subject and collective, and between human and nature. For Jung, the constant focus of the human being is on the ego. Hence, the purpose of psychological evolution is, as in biological evolution, self-realization, that is, individuation:

> Since man perceives himself only as an ego, and the self as a totality, is something indescribable, indistinguishable from an image of God, self-realization is nothing other in metaphysical and religious language than the divine incarnation. It is precisely this that is expressed in Christ's sonship. As individuation means a heroic or tragic task, that is, a very difficult mission, it implies suffering, the passion of the ego, that is, of the empirical man, of the common, current man, when given over to a wider domain and stripped of his own will, who considers himself free from any coercion. He is as if violated by the self. (JUNG, 2013a, p. 58).

The reference to God as a totality is frequent in Jung and helps to understand maxims such as 'God is in all things' as a reference to a continuity between psyche, body and environment. It reinforces the importance of the symbol as an element that expresses the contents of the unconscious in the conscious and supports the construction of meaning over the totality:

> In the face of this, the analogical passion of Christ means that God suffers from the injustice of the world, from the darkness that envelops man. Man's suffering and God's suffering form a complementarity, which results in a compensating effect: thanks to the symbol, man can know the true meaning of his suffering: he knows that he is on the way to realizing his totality, through which his ego is introduced into the sphere of the "divine"

> as a consequence of the integration of the unconscious into consciousness. (JUNG, 2013a, p. 58)

Jung explains, therefore, how the integrated character of human existence, even if not consciously recognized, will be decisive in constituting suffering and the processes of individuation. Phenomena that will be associated with the condition of the self that connects psyche, body, and environment at the same time, as Molina (2023) helps to clarify:

> Jung considers that the psyche can only be described in terms of antinomies. For him, two antinomies are fundamental: the psyche depends on the body/the body depends on the psyche and the individual means nothing from the perspective of the general/the general means nothing from the perspective of the individual. (MOLINA, 2023, p.1)

Having observed these references of how Jung understands the sense of totality of the self, I now explain his reflection on the binomials psyche-body and psyche-environment.

The relationship between body and self

Regarding physicality as an integral element of the self, a first aspect that deserves attention concerns Jung's perception that there was a simultaneity of body processes and mental processes. At the time, a non-dissociation between body and mind seemed difficult to conceive, but Jung seeks to illustrate his understanding from the reference of quantum physics that light has an ambivalent character, behaving sometimes as a wave, sometimes as a particle:

> All that can be observed empirically is that processes of the body and mental processes unfold simultaneously and in a manner that is quite mysterious to us. It is because of our pitiful head that we cannot conceive of body and psyche as being one and the same thing; They are probably one thing, but we are unable to conceive of it. Modern physics is subject to the same difficulty: let's look at what happens to light! (JUNG, 2015a, pp. 56-57)

In making this observation, Jung points out that he felt, at that moment, "totally incapable of stating whether it is the body or the psyche that prevails, or whether they coexist" (JUNG, 2015a, p. 58). This suggests why the theme did not receive specific attention in Jungian work, even though it was present in several of his reflections.

Another important reference that Jung brings about the relationship between physicality and the self concerns his understanding of consciousness. For the author, consciousness can be defined as the relationship of psychic facts with the self: "But what is the self? It is a complex datum formed first by a general perception of our body and existence and, then, by the records of our memory" (JUNG, 2015a, p. 27).

For Jung, these are the two main factors that make up the self, "which enable us to consider it as a complex of psychic facts" (JUNG, 2015a, p.28). The author observes that both the unconscious mind and the body are depositories of relics and memories of the past: "A study of the structure of the collective unconscious would reveal the same discoveries that are made in comparative anatomy. We don't need to think about the existence of a mystical factor or something that is worth it" (JUNG, 2015a, p.66).

Jung's reflections on the relationship between self and body were exposed from his studies, observations, and intuition, but decades later they would find support in neuroscience discoveries, as presented in section 4.2.

The a posteriori contribution of neuroscience also dialogues, as I indicate in the next section, with another element of Jung's observations that concerns the relationship between complexes and physiological reactions. For him, there is an evident psychophysical parallel, for example, in the physiological differences between a conscious and an unconscious reaction (JUNG, 2015a, p. 95). This parallel was considered controversial by Jung at the time, since it was beyond the reach of human knowledge at the time – but which leads him to believe that body and psyche are "two different aspects only for our intelligence, and not in reality" (JUNG, 2015a, p. 95). As evidence of this perception, Jung makes the following explanation:

> An inadequate functioning of the psyche can cause tremendous damage to the body, in the same way that, conversely, bodily suffering can affect the soul, because soul and body are not separate, but animated by the same life. Therefore, it is rare for a disease of the body, even if it is not of psychic origin, that does not have implications for the soul. (JUNG, 2013b, pp. 135-136).

I recognize here both the understanding of the character of the intertwined existence of the psyche and the body, as well as the indication of the psychosomatic phenomenon – which is perhaps the most evident and well-known aspect of Jungian thought about the connection between psyche and physicality, through which symptoms also emerge as embodied expressions:

> The indirect manifestation of the unconscious takes place in the form of disturbances of the conscious flow, in the experience of associations, in the form of indications of complexes, or in the form of symptomatic behaviors first described by Freud, in neurotic states, in the form of symptoms. (JUNG, 2014, pp. 54-55)

Jung details the psyche-body relationship as follows, whose psychosomatic expression of emotions implies physiological changes:

> Such disturbances are due to complexes – even if the subject dealt with does not refer to a complex of mine. It is simply an important subject, everything that is

> strongly felt becomes difficult to be approached, because these contents are, in one way or another, connected with physiological reactions, with cardiac processes, with the tone of blood vessels, with the condition of the intestines, with the innervation of the skin, with breathing. When there is a high tone, it will be as if this particular complex had a body of its own and to some extent located in my body, which will make it uncontrollable because it is ingrained, ending up irritating my nerves. That which is endowed with little tone and little emotional value can easily be set aside because it has no roots. It is not adherent. (JUNG, 2015a, pp. 102-103)

In this sense, Jung associates the constitution of psychic contents with human experience and, therefore, includes the body in the process of formation of the psyche, since everything that is experienced by the human being happens through the body. Here the author offers a field for understanding how subjects who experience the effects of climate change bodily are also marked psychically, given the affects that the experience of extreme climate events generates in human beings.

This dynamic of constitution of psychic contents from the bodily experience is likely to occur not only in the individual and through the intricacies of the personal unconscious, but also in society as a whole and through the expressions of the collective unconscious, notably the archetypes:

> (...) archetype is a kind of aptitude for constantly reproducing the same mythical ideas; if not the same, at least similar. It seems, therefore, that what is impregnated in the unconscious is exclusively the idea of subjective fantasy provoked by the physical process. Therefore, it is possible to suppose that the archetypes are the impressions recorded by repetition and subjective reactions. (JUNG, 2013b, p. 85)

As an example of this dynamic, Jung mentions that "every time an archetype appears in a dream, in fantasy or in life, it brings with it a specific 'influence' or a force that gives it a numinous and fascinating effect or that impels it to action" (JUNG, 2013b, p. 86). And every action implies some movement of the body, no matter what its intensity. Jung reinforces this conception when he states: "(...) archetypes not only adjust to external situations (just as animal patterns of behavior adjust to their environment), but, deep down, tend to manifest themselves in a synchronized "arrangement" that includes both the psyche and the matter" (JUNG, 2016a, p. 566).

It is from this notion of body-psyche integration that Jung (2013b, p. 44) ponders that if we deny our body, we not only fail to recognize the signals that the psyche emits through physicality, but also "we lose our three-dimensionality, becoming flat and illusory". Jung warns of attempts to distance oneself from the body and its instinctive nature, both by the ascetic morality of religions such as Christianity, and by the movements of science. For the author, the very reference of language metaphors to physiological facts indicates the

integration between body and psyche in the dimensions of the personal and collective unconscious (JUNG, 2013b, p. 50).

At the same time, there is a dark aspect related to the body, according to Jung:

> The body is the most doubtful friend, because it produces things that we do not like; There are numerous facts connected with it that cannot even be mentioned. That is why he is often the embodiment of the dark side of the self. Sometimes it represents the "skeleton hidden in the closet," and everyone, of course, wants to get rid of it. (JUNG, 2015a, p. 43)

The body-psyche integration as an element of the self also appears when Jung emphasizes the importance of therapeutic resources and life experiences that dialogue with the human-totality relationship. He speaks, for example, of the possibility of "(...) an adequate and impressive symbol to mobilize the forces of the unconscious to such an extent that even the nervous system is affected, leading the body to react in a normal way again" (JUNG, 2015a, p.142). It is in this sense that he locates the field of work of the psychotherapist in the critical sphere of the interaction of body and soul and that makes it seem to him...

> (...) It is extremely probable that the psychic and the corporeal are not two processes which run side by side, but are connected by an interaction, even though the very nature of these processes still escapes, so to speak, entirely from our experience. (JUNG, 2014, pp. 31-32)

At that moment, Jung added, the discussion should be left to the philosophers. But the future would bring important references for the verification of this perception, both in the field of neuroscience and in the experiential approach to somatic education, as I present in the following sections. Regarding Jung's perceptions about the integration of body and psyche, it is also relevant to keep in mind the concept of libido as life energy that is not restricted to the psychic realm and that assimilates the conception of body and soul as intertwined phenomena.

> (...) We have extended the narrow concept of a psychic energy to the broader concept of a life energy, which encompasses the so-called psychic energy as a specific component. With this we obtain the advantage of being able to extend quantitative relations, beyond the restricted scope of the psychic to biological functions. Thus, if this is the case, we can do justice to the "body and soul" relationship, undoubtedly existing and already much discussed. (JUNG, 2014, p. 32)

Jung clarifies that libido as a concept of life energy does not correspond to what is called vital force, which refers to a universal energy. The libido comes precisely to fill the "abyss between the physical process and the process of life", locating this integration from the psychic dynamics of the subject. (JUNG, 2014, pp. 30-31)

And it is in this context that I highlight the reference he makes about how the ways of understanding the self are not restricted to an intellectual understanding, but allude to an understanding through experience. And the human experience always happens with the body present, with its senses, physiology, tonic qualities, sensibilities and internal flows (JUNG, 2014, pp. 20-21). In this way, external phenomena experienced by human beings, such as climate change, will also have a crossing in the body.

Relationship between environment and self

Jung reflects that human beings are influenced by biological dynamics not only within them, but also by those that cross them and influence their existence in different environments. Something evident in the way cultures of native peoples deal with nature as a living entity, which expresses the meanings and paths of the subject and the collectivity.

Jung (2013b, 84) recognizes that scientists of the time, such as Taylor and Frazer, interpreted the idea as animism. However, he explains that there is a mistake here, since he considers the way primitive peoples refer to souls or spirits in line with the idea of "primitive energetics", as postulated by the philosopher Arthur Lovejoy:

> To this concept corresponds the idea of soul, spirit, god, health, bodily strength, fertility, magical power, influence, power, respect, medicine, as well as certain states of mind characterized by the liberation of affections. "Mulungu" (precisely this primitive concept of energy) means, for certain Polynesians, spirit, soul, demonic being, magical power, respect; And when something astonishing happens, people exclaim "Mulungu. (JUNG, 2013b, p. 84)

It is in this context that one of the fundamental elements of the concept of totality for Jung deserves to be highlighted here: the understanding of the self must go beyond the conscious and unconscious elements and also include the worldview of the subjects and the collectivity (JUNG, 2013b, p. 140). The worldview involves subjective perceptions about the world in which one lives, including the relationship with nature, which creates a bridge between the psyche and the environment. And an inescapable connection between human beings and climate change today.

Another important reference, especially for today, is Jung's conception of how the psyche and the challenges of the world are connected.

> We always find in the sick a conflict which is connected at a certain point with the great problems of society; when the analysis reaches that point, the apparently individual conflict reveals itself to be a universal conflict of its environment and of its epoch. Neurosis is therefore an individual and unsuccessful attempt to solve a general problem; But this general problem, this question is not an *ens per se*, existing only in the hearts of individuals. (JUNG, 2013b, p. 161)

In this way, the urgent issue of climate change can be understood not only as a historical ecological crisis experienced by today's society but also as an unfolding of the contemporary psyche. Just as apparently individual conflicts can be influenced by the socio-environmental dynamics that exist today on the planet. It is no wonder that expressions such as eco-anxiety and climate anxiety arise these days to designate the suffering resulting from living in a world in environmental emergency. Jung offers a synthesis for this type of context: "(...) we have to be satisfied with the antinomic postulate and consider the world also as a psychic phenomenon" (JUNG, 2014, p. 39).

Another aspect of this intertwining between human and nature is in the libido itself, the energy of life that for Jung is an expression of nature in the subject: "Eros is not the totality of nature in us, but it is at least one of its main aspects" (JUNG, 2013b, p. 41).

In this same sense of libido, Jung understands that "the path of life only continues where the natural flow is", which implies the emergence of tensions, because "no energy is produced where there is no tension between opposites" and in this aspect that the connection with nature is accompanied by a dialogue with the unconscious, which is the opposite of the conscious attitude, that is, the recognition of the relationship between opposites. (JUNG, 2013b, p.68)

Just as in the perspective of the body integrated into the psyche Jung recognized an element of ancestry and manifestation of archetypes, with regard to the connection with nature he establishes a similar bridge:

> (...) The contents of the collective unconscious are not only the residues of archaic modes of specifically human functions, but also the residues of the functions of the succession of man's animal ancestors, the duration of which was infinitely longer than the comparatively short epoch of specifically human existence. (JUNG, 2013b, pp. 116-117)

The very aspect of transgressiveness of the archetypes indicates a relationship of intertwining between psyche and environment. Since archetypes are at the same time associated with causal processes and continuously exceed their limits, they are not restricted to the psychic sphere and "can also occur in non-psychic circumstances" (JUNG, 2016b, p. 104), as in the equivalence of an external physical process with an internal psychic process.

Finally, it is worth noting how Jung also brings to the context of psyche-environment integration the relevance of the symbol, as a path of reconnection between the human and nature, in response to the dissociation that emerges in the process of formation of culture:

> The human being freed himself from these fears through the progressive symbolic formation that led to culture. The return to nature must necessarily be accompanied by

> a synthetic reconstruction of the symbol. Reduction brings us back to the primitive natural man and to his own mentality. Freud directed his focus above all to the irreverent desire for pleasure; Adler, to the "psychology of prestige". These are, without a doubt, two essential peculiarities of the primitive psyche, but by far not the only ones. (JUNG, 2014, p. 75)

Therefore, the reconnection with nature that today remains an imperative for the subject, in the Jungian perspective, becomes even more crucial in the era of climate change, when society must integrate the signals of nature and reduce emissions of gases that interfere with the planet's natural greenhouse effect. As well as it must adapt to the effects that climate impacts generate and will generate more and more. All this, based on the idea of symbol in Jung (2014) must happen in a process that is also of symbolic construction and not just of understanding and rational action.

Relationship between body and environment from the perspective of totality

Throughout this section, I have tried to expose references to how Jungian thought expresses the psyche-body and psyche-environment connection as part of its understanding of self and totality. This peer approach had the purpose of rescuing the connections as made by Jung, but not of dismembering them.

On the contrary, Jung's conception of totality is evident in the way the binomials psyche-body and psyche-environment are connected in an integrated notion of the self through concepts central to Jung, such as symbol, archetype, libido, antinomies, symptoms, culture, nature...

Following this path, I now consolidate the perspective of the psyche-body-environment triad that integrates the self and its sense of totality for Jung. As a starting point, I bring the references that express the idea of the human intertwined with nature. For the author, this condition is revealed in the ways in which conscious and unconscious reactions generate different physiological manifestations in the body (JUNG, 2015a, p. 95), in how biophysical suffering can affect the soul (JUNG, 2013b, p. 135) and in the antinomic postulate that the world around us is also a psychic phenomenon (Jung, 2014 p.39), something that makes a lot of sense in the context of climate change, which would be a symptom of contemporary society.

I highlight here another fundamental reference, which is that of libido as an element that evidences the psyche-body-environment connection. Jung shows that vital energy encompasses both psychic energy and the biological functions of the human, which for Jung does justice to the "body and soul" relationship (Jung, 2014 p. 32). At the same time, he states that the energy of life is the expression of nature in the subject (Jung, 2014 p. 41).

In relation to culture, the self as a psyche-body-environment integration is expressed from the metaphors of oral language, which allude to physiological and natural phenomena (JUNG, 2013b, p. 50), to the subjects' worldview (JUNG, 2013b, p. 140). Since this involves the perception of the world from conscious and unconscious elements that dialogue with nature and culture at the same time.

At this point, I observe that contemporary consumerist culture loses sight of the relationship between what it produces (goods and services that are also symbols of a worldview) and the associated natural conditions, generating very serious environmental impacts such as climate change. This gives an ecosystem character to Jung's understanding of the relationship between culture and nature: "Culture is tolerable only to a certain extent, the endless dilemma between culture and nature, in the end always a matter of insufficiency or excess, never an option between one or the other" (JUNG, 2014, p. 47).

I then rescue another basal aspect of the Jungian perspective, which is the symbolic construction. For Jung, the symbol is an essential resource to reestablish connections that culture has stifled both in the relationship between psyche and body and between psyche and environment (JUNG, 2014, p. 75). These dissociations are at the heart of the climate change crisis. To reintegrate what is dissociated, new experiences and symbols are needed that give meaning to an integrated existence of the psyche with the body and nature: "(...) thanks to the symbol, man can know the true meaning of his suffering: he knows that he is on the way to realizing his totality (...)" (JUNG, 2013a, p. 58).

Finally, I highlight the archetypes, about which Jung observes that both the unconscious mind and the body are depositories of relics and memories of the past – not only with regard to the archaic modes of human functions, but also in what he calls "residues of the functions of the succession of animal ancestors of man" (JUNG, 2013b, pp. 116-117). This refers to a memory imprinted in the human being that is related to the evolutionary history of all nature.

I close here by inviting a look at the very form of Jung's reflections. They carry an appreciation of the psyche-body-environment intertwining, indicating that more than a hypothesis or theoretical perspective, totality suggests a way of existing and understanding life. This is what I emphasize with the following example, in which Jung reflects on enantiodromia:

> Our life is compared to the path of the sun. In the morning the sun acquires more and more strength until it reaches the brightness and warmth of the midday apogee. Then comes the enantiodromia. Its constant advance does not mean more increase but decrease in strength. Therefore, our role with the young person differs from the one we play with a more mature person. With regard to the first, it is enough to remove all the obstacles that hinder its expansion and ascension. As for the latter,

however, we must encourage everything that sustains its descent. (JUNG, 2014, p. 90)

TOTALITY AND NEW PERSPECTIVES ON BODY AND ENVIRONMENT

Jung's reflections on the psyche-body-environment connection, implicit in the concept of totality, are often accompanied in his writings by caveats that indicate that such a conception was in the realm of assumptions or even intuition. Decades later, different authors and areas of thought offer arguments and scientific verification that support Jung's claims.

In this section, I bring together contemporary concepts that corroborate Jung's understanding. I highlight references from neuroscience, philosophy, sociology, somatic education and ecology that show how psyche, body and environment can, in fact, be understood as the same system. The intention is not to scrutinize all the connections of each of these areas with Jungian thought. But to illustrate in an interdisciplinary way the consistency and relevance today of Jung's proposition about psyche-body-environment integration. This helps to recognize important links between the self and natural phenomena, such as climate change, and stimulates new ways of looking at the great emergence of the twenty-first century.

Just as Jung did in his time, many of these references tend to approach the triad in question from the binomials that compose it: psyche and body, psyche and environment, body and environment. I thus organize the section based on these three topics, whose references I return to in section 4.3 to make explicit a seam between them in the light of ecosomatics.

Contemporary references on the integrated body

Jung's reflection on the inseparability between psyche and body has found, since the turn of the twenty-first century, a series of correspondences in different areas of knowledge. Perhaps the most striking of these comes from neuroscience, which has sought to understand the phenomenon of the human mind and how it emerges from an integration between cognitive functions and the physicality of the body.

An author who has become a reference in this area is Antonio Damasio, a neuroscientist who presents in "Descartes' Error" the perspective that the mind emerges from the integration between the nervous system, other structures and functions of the body, environmental stimuli and the subject's emotional repertoire: "The soul breathes through the body, and suffering, whether it begins in the skin or in a mental image, happens

in the flesh" (DAMASIO, 2012, p. 17). In another study, Damasio goes further, praising the ancestral knowledge that already alluded to this configuration:

> I am amazed at the ancient wisdom of designating what we now call mind by the word psyche, which was also used to denote breath and blood. I think that the ebb and flow of internal states of the organism, highly repressed, innately controlled by the brain and continuously signaled within it, constitutes the background for the mind and, more specifically, the foundation for the hard-to-define entity we call the self. I also believe that these internal states — which occur naturally along a spectrum whose extremes are pain and pleasure and which are caused by internal or external objects and events — become non-verbal, unpremeditated signifiers of the good or bad quality of situations, in relation to the set of values inherent in the organism. (DAMASIO, 2015, pp. 47-48).

In a more recent work, Damasio (2022) brings evidence about another phenomenon of integration between body and psyche alluded to by Jung, which are the physiological changes that occur from affects. According to the neuroscientist, "emotional responses modify the organism and, as a consequence, change what must be converted into images" in the mind, which integrates emotional aspects with the dynamics of the body's homeostasis, giving rise to "affective states corresponding to the process". (DAMÁSIO, 2022, pp. 65-66)

This contemporary approach to neuroscience embeds an allusion to the incompatibility between the Cartesian logic of separation between body and mind and the living condition of the human being that it reveals in its complexity. Damasio (2012, 2015, 2022) has dedicated himself to writing about the fundamental integrations for human beings, such as between mind and body, emotion and rationality, physicality and learning.

A more integrated conception of the human has also been the focus of attention of philosophy and finds in Edgar Morin an emblematic voice of the so-called complex thinking. Morin (2015) warns that the Cartesian paradigm follows a principle of disjunction that has isolated the three major fields of scientific knowledge: Physics, Biology, and Human Sciences. As a result, it reduced the complex of life to the simple, led to the hyperspecialization of thought and to an increasingly mathematical ordering of reality. This leads to a fragmentation of the complex fabric of the living and the conjunction of the one and the multiple, as well as the connection between the observer and what is observed, says Morin (2015).

This panorama matches Jung's suspicions that the human being should be understood from the integration of psyche and body and no longer by the separation of these elements, as I show in the previous section.

The more connective perception of the body-mind binomial has also been the focus of the social sciences in a movement of valorization of knowledge outside the Cartesian

Western logic, especially those coming from the Southern Hemisphere. This is what Santos (2018) advocates when he points to the incompatibility between assimilating the body in all its emotional density and the tendency of Western thought to make the body an object of study before embracing it, without conceiving it, therefore, as a somatic narrative. (SANTOS, 2018 p. 88)

For the author, the body is a victim of epistemicide promoted by Cartesian thinking, which despises or eliminates everything that does not fit into its formatting. Thus, the body becomes an absent presence and bodily emancipation and subversion become impossible, even when the body produces a discourse of emancipation and subversion. (SANTOS, 2018 p. 88)

This social emancipation related to a resumption of the presence of the body as part of the subject's vitality strongly corroborates Jung's idea (2013b, p. 161) that the process of individuation is made from the self and in the movement of integration of unconscious contents with the conscious, and whose specificities dialogue both with the integration of psyche-body-environment and with the social dynamics of the world in which one lives.

Finally, I refer to the field of somatic education, which encompasses techniques of body awareness and movement organization created from the mid-twentieth century onwards.

These reflections and technical approaches aim to access the bodily phenomenon perceived from within, as well as its relational aspect with the other and the perspective of external observation of bodies as objects of the world. "I think that somatic education is related to an idea of liberating education, which generates autonomy," explains Lima (2023, p.63), for whom the core of somatic practices and reflections is in bodily experience.

It is a movement to rescue the integrated aspect of the human being: "When we deny our embodied and visceral existence, we close ourselves to the crossing of the forces of the world in us and start to live only inside our heads" (LIMA, 2023, p.284).

I recognize in this a sign of how important it is to take the body out of a supporting role in psychotherapeutic practice, especially in the context of climate change, in which the body is crossed by images that are beyond the limits of reason.

> In this sense, working with the psyche through the body is the possibility of mobilizing the psychic energy of the individual's totality in a playful way, allowing the ego to relate to sensations and images evoked at that moment. It helps the ego in managing complexes in a less one-sided way. The Self uses the body to take the ego out of the monotheism of reason. (MALUF, 2023, p. 66)

And this inclusion of the power of physicality in the psychotherapeutic approach, based on its intertwining in the Self, is also an opportunity for symbolic construction:

> The body is a space in which subjectivity is expressed through symbolic and sensitive language, it can be perceived as part of psychic life and as a means of connection with the Self, that is, the totality. The use of body work is part of the Jungian proposal and thought, the creative-body and meditative practices appear as a method and instrument of accessibility and elaboration of contents of the unconscious through symbolic expression, development of the being and integration. Psychic and corporeal processes are essentially interconnected processes, and thus, it can be inferred that these practices should influence self-regulation and organismic balance, as well as contribute to the process of individuation, that is, to the realization of the self and in totality. (SOUZA, 2020, p.33)

Contemporary references on human-nature integration

As I observed in relation to body-mind integration, Jung's perception of the integration between subject and environment is the focus today of different areas of knowledge that corroborate Jung's reflections in the last century. In this section, I focus on the body-environment binomial, which is not dealt with directly by Jung, but implicit in passages I presented in section 4.1. Similarly, the psyche is not the primary focus of the reflection of the following authors. But as a binomial that makes up the psyche-body-mind triad and as a fundamental reference for contemporary reflections on ecology, I understand that it deserves the space. In the next section, I take a specific look at the psyche-environment binomial.

I would first like to highlight the field of deep ecology and related areas, which dialogues with the idea of sustainability and has as one of its foundations the notion of interdependence between humans and nature. Among a great diversity of concepts in this field, it is worth highlighting one that has become a seminal reference. This is the Gaia Hypothesis (LOVELOCK, 1998), which recognizes an interaction of organisms on Earth with inorganic surroundings, forming a complex self-regulating system that contributes to maintaining the conditions for life on the planet.

In this way, the Earth would be more than a place inhabited by living beings, it would constitute a large organism on which the human being is part and depends, at the same time that it impacts and influences. In other words, the changes in this great system impact the human being in all its aspects, including the psyche. And the expression of the human psyche in actions exerts modifications on the system.

The principles brought by the Gaia Hypothesis, as well as its socio-historical biases, were analyzed over time through the prism of other readings of reality, which helped to update the concept and associate it with sociopolitical and economic perspectives, with emphasis on the Systemic Alternatives: "(...) when we talk about building systemic alternatives, we are referring not only to overcoming capitalism, but to strategies that are capable of confronting and overcoming patriarchy, productivism-extractivism, and anthropo-

centrism" (SOLÓN, 2019, p.15). Or, still, more critical perspectives such as that of Ferdinand (2022, p. 349), who understands the confrontation with the environmental degradation of the Earth as a continuation of anti-racist, decolonial, and feminist struggles, which reintegrate body and nature in a movement that moves away from the original environmentalism, preaching paradises without people.

For the present study, I am particularly interested in how the conception of these readings dialogues to different degrees with ways of native peoples understanding the human-nature relationship, something that already drew Jung's attention and that he indicated as a learning experience for modern civilization. An author who gives voice to this view is Ailton Krenak:

> For a long time, we were lulled with the story that we are humanity and we have alienated ourselves from this organism of which we are a part, the Earth, starting to think that it is one thing and we are another: the Earth and humanity. I don't realize that there is anything other than nature. Everything is nature. The cosmos is nature. All I can think about is nature. (Krenak, 2020, p.5)

When I read about the intertwining between subject and environment in the words of different authors, I often notice references such as Krenak's, which also speak from an experiential perspective. This, in turn, dialogues with Jung's idea (2013b, p. 128) of the development of the psyche from experience. In this sense, I bring here a reflection by Klauss Vianna, a somatic educator who explains how the experience of the interaction between psyche and environment is felt in the body:

> Summarized in compression and expansion, human movement is both a reflection of man's interior and a translation of the external world. Everything that happens in the universe happens to me, and to every cell in my body. The growing spiral, the universe, has a starting point in each one of us, and it is from our interior, from our conception of time and space, that we establish an exchange with the exterior, a relationship with life" (VIANNA, 2005, p.101-103).

I notice how these references are very close to reflections by authors who founded phenomenology – a line of thought that had a lot of influence on Jung. A pertinent illustration comes with Bergson's reflection on the relationship between the body and things, conditioning the interaction of the human being with the environment: "For if our body is the matter to which our consciousness applies, it is coextensive with our consciousness, it comprehends everything we perceive, it goes to the stars" (BERGSON, 1948, p. 138). In the same vein, Merleau-Ponty makes the following provocation: "I organize with my body an understanding of the world, and the relationship with my body is not that of a pure I, which would successively have two objects, my body and the thing, but I inhabit my body and through it I inhabit things" (MERLEAU-PONTY, 1971, p. 106).

The contributions of phenomenology and Jungian thought indicate other possibilities for the inclusion of the body-nature in its dialogue with the psyche, in the clinical context:

> It is the body that expresses symptom as language and creative expression of the unconscious. It is the expression of man in the world, who carries within himself the symbolic, social and historical body. Everything is part of the totality and manifests itself in life, which is movement and does not allow stagnation.
> We start from the totality of the solar system to the planet, the continents, the countries, states, neighborhoods, associations, families, couples and individual, where everything contains and is intimately related to everything. Everyone relates to each other and speaks many languages that, at some level, are universal and, therefore, common, thus forming a larger body, with a more ecological awareness in the sense of recognition and proximity, strengthening the connection of one body with all others and with the Earth. (MALUF, 2023, p. 33)

Finally, it is worth identifying that – whether in philosophy, ancestral knowledge or environmental sciences – contemporary thinking that assimilates psyche-environment integration expresses a perception of life that is already natural to bodily existence, through which emotions, physicality and the environment are in constant and interdependent dialogue, as neuroscience brings us:

> In other words, the biological "purpose" of emotions is clear, and emotions are not an expendable luxury. Emotions are unique adaptations that are part of the mechanism with which organisms regulate their survival. Even though emotions are quite old on the evolutionary scale, they are a fairly high-level component of life-regulating mechanisms. (DAMÁSIO, 2015, p. 78).

Contemporary references on psyche and environment

In the first part of the discussion, I presented some elements that support Jung's understanding that the environment integrates the totality expressed by the self and, therefore, is intertwined with the psyche. I listed as highlights the following points: the influence of biological dynamics on the human being, not only within him/her; vital energy as part of nature's flows; the worldview of the subject composing the psyche; and the reverberations of the dynamics of the world on society and the subject – such as climate change today.

While for the other two binomials of psyche-body-environment integration, I pointed out correspondences between Jungian theory and concepts in different areas of knowledge – which are not necessarily based on Jung – in the specific case of the psyche-environment relationship, the author's ideas are the basis for a new perspective that was born at the end of the twentieth century. in addition to phenomenology and concepts of deep ecology.

A reference work in this area of knowledge is Gaia Rising, by Elisabeth Ryland. She rescues authors who built this neo-Jungian strand, showing how Jung's work dialogues with nature and, thus, supports the understanding of how symbolic aspects can be recognized in

representations of ecology and the environment; how environmental destruction relates to the psyche; and how archetypes relate to sustainability.

For the focus of this work, I look at what I understand as the main perspective of ecopsychology, which is the understanding that human-nature dissociation generates complexes, as it happens in human relations (RYLAND, 2000).

The author points to a picture of individual feelings of helplessness and lack of control and indicates that in the face of the growing presence of environmental dangers, people typically respond with passivity, while showing a great tendency to anxiety, fear, pessimism and helplessness. An arrangement that makes the rational approach to the issue insufficient. As a result, there are initiatives by ecopsychologists, who look at the connection between the planet and the psyche, and ecotherapists, who work with environmental feelings with the purpose of healing both the mind and the environment. (RYLAND, 2000, p 382)

The author also shows the importance of symbolic construction, considering individual and collective contexts, based on dialogue such as nature. As well as the recognition of archetypal images, the strongest of which is that of the Earth itself as Gaia – both the one seen from space and the one presented by the Gaia Hypothesis:

> (...) From this perspective, life has not adapted to planetary conditions but constitutes a self-regulating superorganism that defines and maintains the conditions necessary for survival – a very maternal idea. This theory qualifies as a Jungian symbol. The language used by Lovelock testifies to the illumination and fascination that emanate from the manifest archetype. Gaia also evokes the entirety of the Mother Earth archetype, containing the nutrition-destruction opposites implied in the maternal. Gaia is not a fragile and delicate mother under the threat of a brutal humanity. Gaia is a tender and tough caretaker, who keeps the world warm and comfortable for those who obey the rules, but is ruthless for transgressors. (RYLAND, 2000, p. 390)[2]

Ecopsychology follows principles of deep ecology by emphasizing the importance of a shift from anthropocentric to ecocentric logic, and advocating a deep identification of the human with nature, explains Ryland (2000, p. 393).

I note here that, although ecopsychology has constituted a field dedicated to reflection and practice around the psyche-environment relationship, there are references to it outside this field, although they continue to drink from Jung, as pointed out by educator

[2] Livre tradução para o trecho a seguir: "(...) In this view, life did not adapt to planetary conditions but rather constitutes a parto f a self-regulated super organismo that defines and maintains the conditions necessary for survival – a very maternal idea. The theory qualifies as a Jungian symbol. The language used by Lovelock testifies to the illumination and fascination emanating from the manifested archetype. Gaia also evokes the totality of the archetype of Mother Earth by containing both the nourishing and the destructive opposites implied inte maternal. Gaia, to Lovelock (1988, p.212), is no doting mother or fragile and delicate damsel in danger from brutal mankind. Rather, Gaia is a tern and tough parente who keeps the world warm and comofrtable for those sho obey the rules but is ruthless toward trangressors."

and analytical psychologist Alisson Duarte: "After all, through Jung's depth psychology, it is perceived that the internal reality of human beings is closely grounded on the bases and laws that govern the cyclical reality of nature and linked to them" (DUARTE, 2017, p. 17).

And it is in this sense that the psyche-environment relationship contained in the self is a fundamental reference for the understanding of climate change as a contemporary phenomenon:

> The environmental crisis reflects the state of the human psyche. Everything that belongs to external reality occupies an internal place in us: the sun, the moon, the water, the plants, the animals, everything lives in us, in the form of archetypes that populate our intrapsychic world through images, symbols, and values. (DUARTE, 2017, p. 6)

It is possible to recognize in this an implicit reference to the body in this relationship with the psyche and the environment. This type of implicit reference also appears with some frequency in ecopsychology reflections, as presented by Ryland (2000). However, in any case, it is not customary to locate or delve into the ways in which the body – an essential element of the totality of the self that also involves the psyche and environment – enhances the process of reintegration or proves to be fundamental for it to happen. In the path of what Duarte (2017, p. 8) values in Jung's view: "psychotherapy was not seen only as a process of eliminating symptoms, but rather a direction of the patient to a renewal of attitude towards his own life".

In the next section I take a look at this integration, bringing together and approximating the different arguments pointed out in this section, in the light of Jung's perception of self and totality. And bringing ecosomatic epistemology as a guide.

TOTALITY AND ECOSOMATICS

Climate change brings the need for a more integrated approach to the human being who suffers its effects, including modes of care that consider the context of the socio-environmental crisis. In this sense, Jung's conceptions about the self as a totality that integrates psyche, body and environment are valuable references, along with new concepts in other areas of knowledge that confirm, complement and amplify his propositions.

Both in Jung's work and in the contemporary references that corroborate his arguments, I observe a theoretical exploration of the elements of totality based on binomials (psyche-body, psyche-environment, body-environment), as I have shown earlier. There is, however, a new field of study that proposes an integrated reflection on body, mind and nature, very much in tune with the debate on the link between humans and climate change.

It is a complementary path to Jungian conceptions of the self – in the reflective and clinical sense.

This epistemological movement called ecosomatics is constituted from the twenty-first century onwards supported by references such as phenomenology, analytical psychology, somatic education, complexity, deep ecology and the arts. The focus of ecosomatics is to reconcile theory and practice around the connection between physicality and mind as an expression of an intelligence specific to the body that originates from the intimate relationship between *soma* and environment, as explained by Billo (2011). Such a condition goes back to the fact that the body has developed over thousands of years with nature, from common experiences that are at the root of archetypes that cross the human psyche:

> But the archetypal dimension does not only protect the psyche, but involves our entire organism in its manifestation. Our body evolved in close relationship with the natural environment, which entailed a continuous adaptation to the environment, for which there was a continuous specialization of body schemes adapted to survival. (BILLO, 2011, p. 2)

In this sense, Billo (2011) associates locomotion, apprehension, vocalization and other physiological repertoires of the body as archetypal expressions of human physicality. In this context, according to the author, ecosomatics considers that mental models of separation between body and mind generate enormous harm to the human being, as it disassociates him from his multidimensional archetypal origin. I understand that it would be a departure from the idea of self-realization as the purpose of both biological and psychological evolution (JUNG, 2013a, p. 58).

On the other hand, the rescue of body-nature integration represents a very beneficial impact on the psyche: ecosomatics values the creative body as a way to reestablish the connection between psyche and environment, offering a basis for the construction of a new ethics in relation to the planet and a path to mental health (BILLO, 2011).

While different authors around the world have been dedicated to reflecting on the new field of ecosomatics, the referential work on its episteme is organized by Banet, Clavel, and Ginot (2019) and brings together articles by several authors, some of which will be cited below, with free translation from French. Clavel and Legrand (2019, pp. 23-44) clarify that, by combining reflection with practice, ecosomatics seeks to shift the understanding of bodily experience from a merely sensorial aspect to a larger phenomenon that generates the construction of meanings.

For example, when he identifies breathing not only as an individual action of maintaining life, renewal of internal states, meditation and well-being. But also "collective

practice of continuity with the world" (CLAVEL AND LEGRAND, 2019, p. 28). Or by seeing the body as an inner ecosystem, valuing ontogenetics as an element of a human ancestry that goes beyond primates. Somatic experience as a "path to change the relationship with the world" (CLAVEL AND LEGRAND, 2019, p. 43).

In this context, Clavel and Legrand (2019) allude to the philosophy of Bruno Latour to indicate the abolition of the boundary between interior and exterior, since ecology is a basic condition for the existence of the body in the world (Clavel and Legrand, 2019, p. 48). "Somatic interiority" is at the same time a continuity of the environment, integrating the living and the relational.

"The body learns through affections and relates by communicating", says Rolnik (2019, p. 193) when explaining the idea of transverberation and knowledge of the body. In this way, the integration of body and environment points to space as a place of praxis and care, and the environment as the dimension of the common (SALVATIERRA, 2019, pp.241-250).

When reflecting on the ideas of ecosomatics and bringing them to the Brazilian context of ideas about the body, ecology, and human relations, Lima (2022) makes the following statement: "Our body integrates us into a comprehensive ecosystem and is a direct channel for the cultivation of links with the lives of other human and more than human beings" (LIMA, 2022, p. 293)

These references philosophize about the psyche-body-environment triad that is the focus of ecosomatics and is close to Jung's understanding of the self as a totality. But the distinctive element of ecosomatics is the intertwining of reflection with bodily experience (BANET, CLAVEL AND GINOT, 2019). On the one hand, every somatic experience reveals expressions of the psyche in dialogue with the environment; on the other hand, all mental elaboration about the self can be transformed into a bodily experience, helping the understanding of the body.

It is at this point that ecosomatics offers the Jungian clinic more than an additional angle to understand the self as a totality. It sets new references for clinical work, within Jung's orientation (2013b, p.128) of "understanding through experience". The common thread is the notion of interiority and its support for various somatic education techniques that develop the human capacity to perceive, experience and be guided by the universe of sensations, flows, layers, structures and cycles of the body. Not only recognizing the physicality of these elements, but also the images associated with them, which makes the experience of interiority a phenomenon of symbolic construction, according to Banet, Clavel and Ginot (2019)

Feldenkrais and Body-Mind Centering are two examples of techniques explored in "Ecosomatiques", which lists somatic practices, meditation, sports, and the arts as possibilities for "listening to oneself and the environment" (HAARD, 2019, p. 94). The importance of these experiences for the present debate is that they materialize the concept of self as a totality, displacing it from the place of ideas to something that is actually and consciously lived.

It thus constitutes a dimension of self-knowledge, belonging, and empowerment, which indicates a somatolithic quality of the body, according to Clavel and Legrand (2019, p. 50-59). And the inside-outside dialogue as an ethical emanation of body-mind-environment integration (YADORI-GAUTHIER, 2019, p. 66-75).

It is interesting to note how the two keywords are precisely the ones that are absent when the topic is eco-anxiety. A great climate anguish comes from the uncertainty in the face of extreme events, bringing a feeling of disaggregation in relation to the place in which one lives and also of impotence in the face of the magnitude of the challenge it imposes (HICKMAN et al, 2021).

In addition to this element of internal reorganization – physical and psychic – there are others associated with interiority that dialogue with Jung's antinomic postulate (2014, p. 39) that envisions the world as a psychic phenomenon. According to Vadori-Gauthier (2019), somatic practice brings developments that go beyond the subject and encompass ethics and collectivity, by awakening the feeling of the human integrated around them. At the same time, somatic learning is transposed to everyday life and contaminates others around it (HAARD, 2019, p. 109).

In times of climate change, the recognition of interiority as a psychophysical ecosystem and as an extension of the environment strengthens the degree of involvement of the subject in nature, whether to recognize how it contributes to generating impacts on the environment, or to build ways of existing compatible with nature in harmony.

> When we devalue the knowledge of the body, we deprive ourselves of a primordial channel of connection with an ecology much larger than ourselves. This alienation of one's own body can lead to the forgetfulness of the relationship of reciprocity and dependence that we have with the entire community of living beings on earth. The project of objectification begins in the way we deal with our body, and extends to all beings and things in the world, as if they were all determinable, quantifiable and hierarchical objects, without subjectivity and without desiring life, waiting to be used by us. (LIMA, 2022, p. 283)

The references I bring here corroborate the Jungian conception of the self as a totality. In this sense, ecosomatics comes as an additional and potentiating reference for the expansion of thinking about self and totality, bringing it closer to new ideas and practices in the context of climate change and the reconnection between human and nature.

CONCLUSION

In the contemporary world, the destabilization of cycles and ecosystems in nature has been increasingly configured as a threat to the quality of life of people in their daily lives, as well as to the perpetuation of the human species itself on Earth, in the long term. This reality, which has climate change as the most evident phenomenon, represents a new source of suffering for human beings (eco-anxiety). It is the apex of the context warned by Jung that the dissociation between human and nature generates important psychic disturbances.

In this sense, when seeking to understand how the Jungian perspective of the self involving psyche, body and environment helps to deal with the challenge of climate change, I find some contributions that allow me to verify the initial hypothesis: (1) the concept of totality supports the reading of the context of the climate crisis, (2) the understanding of the self as a psyche-body-environment triad helps to understand the suffering of the climate emergency and (3) the concept of self as totality expands the possibilities of the Jungian-inspired psychotherapeutic clinic. Always based on a dialogue with ideas from contemporary authors in different areas of knowledge, according to the objective established for this study.

Below, I outline some notions to illustrate each of these items based on the references brought throughout this study. I am aware, however, that a more detailed and consistent exercise would deserve more space, as well as should be forwarded from more specific clippings and contexts.

Regarding the contribution about the reading of context, I point out Jung's perspective that the great global crises correspond to psychic disturbances in the subject. It is the world as a psychic phenomenon and the change of climate as a symptom of the relationship between the human being and the world, just as it happens in the human body when there is psychic disturbance of the subject. I am talking here about the dissociation between human beings and nature that is expressed in the perception that the environment is a supplier of resources and landscapes – an objectification of nature that ignores its character as an integrated organism of which humans are a part.

I recognize in this an archetypal behavior of appropriation and destruction, whose effects are enhanced by population growth, inequality, socio-environmental injustice and the technological capacity of today's world.

As for how the perspective of the self as a totality helps to understand the suffering associated with climate change, I first highlight the distancing from the body itself simultaneously with the distancing from nature. If the human being deprives himself of living part of his totality, this tends to generate suffering. In this context, there is also libido as an

integration between psychic energy and biological functions. Limiting this flow, either due to the direct impact of climate change or the fear of its occurrence, means generating suffering.

Here I add the possibility of climate change as an object in a projection dynamic, in which unconscious non-integrated contents are associated with the symbology of climate change, even if they are not part of its context. This phenomenon can be associated with attitudes of denial, prostration, anger, etc.

In this sense, I also highlight the phenomenon of somatization, through which mutual impacts arise between body and soul, either from a body that experiences trauma and physical impacts resulting from a situation of extreme event, or from the soul that is affected by what it lives, by what it sees, by what it imagines, by what it fears in relation to climate change. Finally, I refer to a point much reinforced by Jung, which is: the understanding of the self must go beyond the conscious-unconscious link and encompass the subject's worldview. Everyone's ways of understanding the world around us can influence the degree of suffering that emerges in the face of climate change.

I then move on to the third point, which is psychotherapeutic practice. The understanding that the self encompasses the psyche, body and environment invites the therapist in times of climate change to seek approaches that dialogue with this totality not only in discourse, but with practices that activate the relationship with the body and nature. A valuable reference in this sense comes from ecosomatics, which proposes a dialogue between different somatic education techniques, the interiority of the body and affectivity with natural environments – focusing on bringing belonging, self-care, self-knowledge, empowerment.

I understand that this type of resource – which can be as diverse as breathing practices, mindfulness, self-massage, body and environmental awareness, mobility in space, etc. – can be fundamental for trauma situations, but also to reconfigure the human experience in the world and the human experience in the human. Just as a proper symbolic construction path can mobilize the psyche in a process interconnected with the body and the environment, which can help to re-establish flows of libido as psychic energy integrated with biological functions.

I emphasize Jung's conception of psychotherapy not only as a process to overcome symptoms, but also as a direction for the client to reorganize his attitude towards his own life. A movement that may include the integration of contents of the collective unconscious that bring the ancestry of the human as a species and of the human as a continuity of the

evolution of the planet as a whole. It is the invitation that arises, for example, in the dialogue with the archetype of Gaia.

The reading possibilities that I bring to these three large sets are only references to how the perspective of the self as a totality can play a relevant role in the context of climate change. The study I presented here has a sense of calling for deepening on each of the suggested fronts – context reading, understanding of suffering and psychotherapeutic practices – both from Jung's work, and including references from contemporary authors who dialogue with the author's concepts, in different areas of knowledge.

Finally, the invitation is also to apply the Jungian perspective of the self in the context of climate change in other areas of activity, such as education, for example. If the climate crisis is an unfolding of individual and collective ways of living, we are talking about a paradigm crisis and, as such, it crosses society as a whole, in the most different areas. In all of them and for all human beings there is a call, therefore, for another worldview connecting the planet to the integrated condition of human existence that intertwines psyche and body with the environment.

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MINIMALLY INVASIVE ANIMAL MODEL FOR IMPLANTATION IN RABBIT FEMORAL CONDYLES

https://doi.org/10.56238/sevened2024.031-061

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ABSTRACT

Objective: The main purpose of the present study was to create an Animal Model that would allow the evaluation of bone reaction in implants in a minimally invasive manner. Methods: In the lateral and medial condylar region of the femur in a rabbit knee, a 7 x 2.5 mm intraosseous implant was fixed with a specific guide. Results and discussion: Rabbits are well-known animals and widely used for bone reaction evaluation. Their inflammatory response (periosteal reaction) bone mineral density of long bones are comparable to those of humans. Making an Animal Model with less aggression and standardization in the implants would reward less damage to the animal and greater replicability in the researched sample. Conclusion: It was possible to format an Animal Model that proved to be simple and reproducible.

Keywords: Animal model in rabbit. Femoral condyles. Bone implants.

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INTRODUCTION

With the evolution of science and technology, especially in the field of medicine, the use of Animal Models for the evolution of techniques and treatments has become of paramount importance. Galen (129-210 A.D.), a precursor of experimental medical research with the use of animals, inspired adherents to this plan of study, but it was Claude Bernard in 1865 who launched the principles of its use in the work "Introduction to the Study of Experimental Medicine" establishing the rules and principles for it. From then on, the significance of the use of animal models gained greater attention and relevance.[1]

In orthopedics, an anatomy with greater proximity to the human is necessary, in addition to a similar pathophysiological and histological composition in order to present relevant results.[2]

Several animal test models, such as rats/mice3,4,5, rabbits3,6,7, dogs3,8,9, sheep3,10,11, goats3,12,13 and pigs3,14,15, have been developed to simulate environment and physical conditions by testing the biocompatibility of biosubstitute biomaterials for human bones "*in vivo".* In order to simulate various orthopedic situations, many defect sites were explored, such as calvaria3,16,17, femur/tibia3,18,19 and ulna3,20,21,22.

Factors must be considered to select a specific animal species as a test model. First, the animal model chosen must clearly demonstrate significant physiological and pathophysiological analogies compared to humans. Secondly, it should assess whether it is possible to operate and observe a multiplicity of study objects after surgery over a period of time23. Other selection criteria include acquisition and care costs, availability of the animal, acceptability by society, tolerance to captivity, and ease of housing24. According to the international standard, we must also consider the size of the implant test specimens, number of implants per animal, intended duration of the test, and possible differences between species when correlated with biological responses.[25]

In the present study, rabbits were preferred to be used as anatomical models for reasons discussed in this article.

A new procedure will be presented in this work that will facilitate the evaluation of biocompatibility and recovery after spongy cortical implants in Medicine and Veterinary Medicine in the specialties of Orthopedics, Traumatology, Dentistry and Neurology in a minimally invasive way.

MATERIAL AND METHODS

Study carried out at the Veterinary Surgical Center of the Mafra Campus of UNC – Fundação Universidade do Contestado (Figures 1 A and 1 B) under protocol CEUA 03/24.

Fig. 1 A – UNC Veterinary Surgical Center (Campus Mafra - SC)
Fig. 1 B – Procedure Room with specific lighting, instrumentation and anesthesia equipment.



A piece of the left lower limb of a New Zealand rabbit with a weight of 256 grams was used. Preparation and arrangement of materials and surgical specimens (Figure 2).

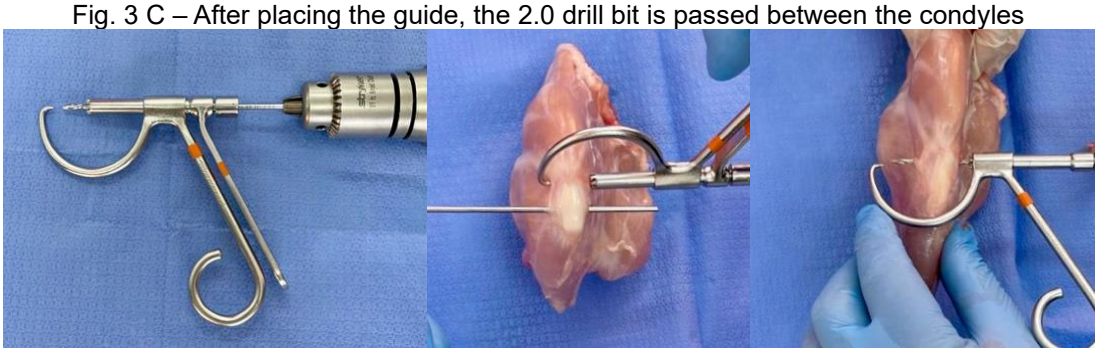
Fig. 2 – Prepared materials and part



After locating the knee joint with Kirschner 2.0 wire, the lateral condyle of the femur is palpated and a 1-cm incision is made in the skin, subcutaneous and periosteum, with a 4-handle scalpel with a 23 blade. Instrumental positioning is placed on the lateral anterolateral

surface and guides on the medial condyle. The first cortical is perforated, spongy until it transfixes through the medial condyle. (Figures 3 A, 3 B and 3 C)

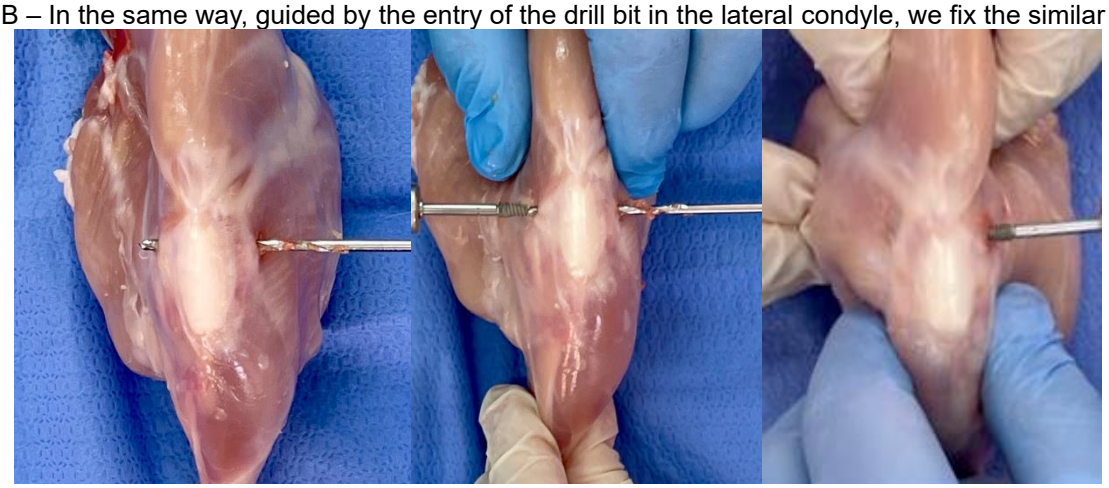
Fig. 3 A – instrument created for the passage of the drill and introduction of metal screws to allow a minimally invasive technique.
Fig. 3 B – After passing the Kirschner Wire 2.0 in the knee joint, the guide is positioned.
Fig. 3 C – After placing the guide, the 2.0 drill bit is passed between the condyles



The guide is removed and, using the orientation of the drill outlet, a 1 cm skin, subcutaneous and periosteal incision is made in the region of the medial condyle.

Visualizing the perforation of the medial condyle, we fixed the 2.5 x 7 mm screw until it aligned with the cortical surface of the femoral condyle. In the same way, following the orientation of the drill bit entry in the side condyle, we fix the other screw. (Figures 4 A, 4 B and 4 C)

Fig. 4 A – after removing the guide, the drill remains in the trans condylian position of the distal femur.
Fig. 4 B – Guided by the drill outlet in the medial condyle of the femur, we fixed the 2.5 x 7 mm threaded screw.
Fig. 4 B – In the same way, guided by the entry of the drill bit in the lateral condyle, we fix the similar screw.

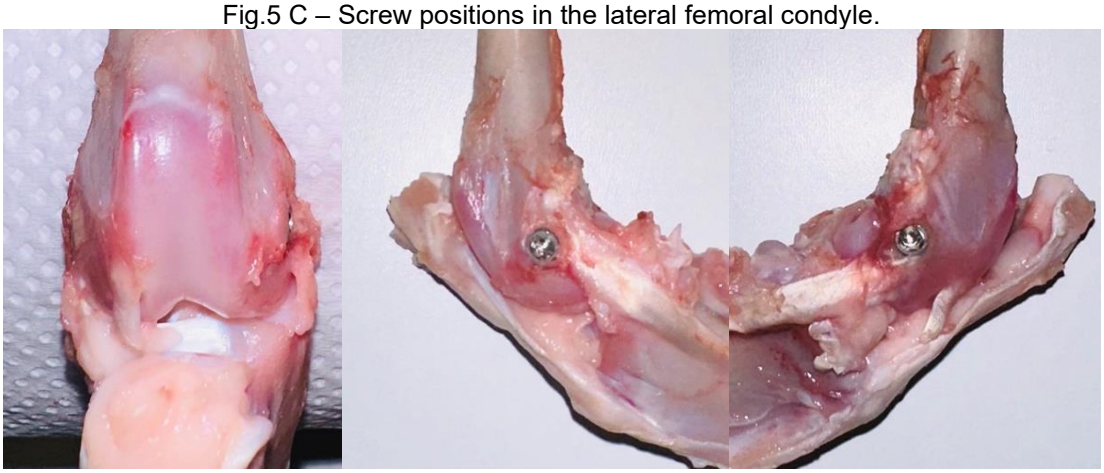


When performed in a live and anesthetized animal, after fixation of the screws, skin is sutured with single mononylon 2.0 sutures.

Duration of the procedure in a model is 5 minutes, it is estimated that in vivo after anesthetic plan and placement of drapes can last 10 to 15 minutes.

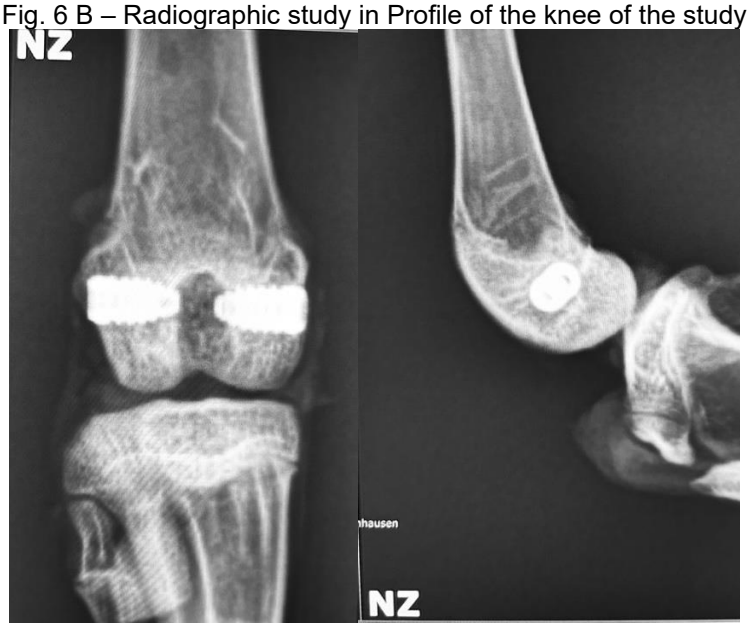
Below we see the final post-implant appearance of the metal screws (Figures 5 A, 5 B and 5 C)

Fig.5 A – Screw placements in the femoral condyles seen from the front,
Fig.5 B – Screw positions in the medial femoral condyle.
Fig.5 C – Screw positions in the lateral femoral condyle.



After the procedure, to visualize the positioning of the implants, an image study was performed in an Agfa Apolo Digital X-ray equipment with a flat panel model EVS 3643. (Figures 6 A in Posterior Antero and 6 B in Profile)

Fig. 6 A – Radiographic study in AP (Anteroposterior Posterior) of the study knee
Fig. 6 B – Radiographic study in Profile of the knee of the study



RESULTS AND DISCUSSION

A model must have sufficient characteristics to be similar to the imitated object and have sufficient ability to be manipulated without the limitations of the imitated object.

It must meet the assumptions of:

a- To allow the study of biological phenomena or animal behavior;

b- That a spontaneous or induced pathological process can be investigated;

c- That the phenomenon, in one or more aspects, is similar to the phenomenon in human beings.[26]

The rabbit is one of the most widely used animal species in musculoskeletal research, appearing in 35% of all studies reported in this area.[27,28] They are very available and easy to house and handle29,30. Costs associated with its handling and surgical facilities are less onerous than those of large animals. Their size and minimal phylogenetic development satisfy the requirements of orthopedic implant dimensions and ethical acceptability29, thus bridging the gap between rodents and large and expensive animal models for translational research.[30]

Despite the large differences in bone shape, mechanical loading, and bone microstructure, major similarities have been reported in terms of bone mineral density of rabbit long bones compared to humans.[31,32] In addition, compared to other species, such as primates or some rodents, rabbits have faster skeletal change and bone turnover.[33]

Regarding the host response, the rabbit immune system is genetically more similar to that of humans than the genes of rodents34 and the inflammatory response (periosteal reaction in long bones in rabbits are comparable to those in humans.[35]

The size of the rabbits allows the implantation of orthopedic devices similar to the human situation such as implants (pins, screws, etc...), partial arthroplasty of the joint (silicon elastomer devices) and fracture synthesis (plates and screws). Despite their adequate dimensions, multiple, bulky implants are clearly limited, requiring rabbits weighing more than 3 kg or larger species, with the exception of femoral condyles, which can receive multiple small-sized implants or wide cylindrical implants.[These] characteristics make rabbits the first choice when researchers develop an animal model for the *in vivo* testing of a new bone substitute biomaterial.[37]

Among several advantages over other species they reach sexual and skeletal maturity around 5-6 months of age, thus allowing easy and fast reproduction and providing a mature bone structure for orthopedic purposes. Males are used more often because they grow faster than females and reach larger dimensions. (Males gain 1 and 0.7 mm in femoral and tibial length, respectively, every 2 weeks of age, compared to 0.2 and 0.4 mm for females).[38]

Both genetic standardization and the large number of individuals available for research purposes make the rabbit useful for multiple investigations. To meet the above-mentioned requirements, the New Zealand rabbit is the most suitable strain in orthopaedic research, and has been reported to be used in 99% of the studies.[39.40]

CONCLUSION

The present animal model in rabbits allows the technique to be formatted for simple spongy cortical implants. Being reproducible and minimally invasive, it may contribute to studies of the physiological interaction of implants in bone tissue.

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COLLABORATIVE TEACHING PRACTICES: AN ANALYSIS IN THE LIGHT OF THE HISTORICAL-CULTURAL PERSPECTIVE

https://doi.org/10.56238/sevened2024.031-062

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ABSTRACT

This article, initially published in the journal Contribuciones a Las Ciencias Sociales, addresses school inclusion from the perspective of Lev Vygotsky's Historical-Cultural Theory, seeking to offer theoretical subsidies for the understanding of the relationship between learning and language development by relating the interlocutions with a pedagogical practice in the public school of Espírito Santo. It highlights the World Conference on Education for All, which defends school inclusion, and legal measures, such as Law No. 10,436/02, which aims to guarantee school access and participation for all. The research, carried out through the participatory methodology, reports the experience with a deaf student and her multi-segregated class, in a settlement school, located in the state of

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Espírito Santo, Brazil. It highlights the importance of collaborative work between teachers of Specialized Educational Service (AEE), regular teaching and Libras interpreter to promote the psychic development of students in signifying the cultural and social. It reaffirms the relevance of the school as a space for learning and mediation in the process of hominization.

Keywords: Historical-cultural. Deafness. Field. Apprenticeship.

INTRODUCTION

This work was originally published in the journal Contribuciones a Las Ciencias Sociales. The emergence of the Historical-Cultural Theory, presented in a brief historical, cultural and philosophical contextualization, is supported by historical-dialectical materialism, based on Marxist bases and brings as its main contributions the understanding of how human development occurs from the perspective of its precursor, Vygotsky, with emphasis on the way in which its concepts and assumptions reflect on the vast reflections on the understanding of the human psyche and the process of hominization, as well as its implications in the field of Special Education.

At this juncture, it is essential to resume the World Conference on Education for All, held in Jomtien (Thailand) in 1990, with the proclamation that education favors personal and social progress and, among other findings, refers to the idea of "satisfaction of basic learning needs ". And, in order to provide an adequate environment for learning in the field of public policies for the school inclusion of deaf students, measures were adopted to ensure their participation in the interactions of the school context so that they are part of the interlocutions that permeate this scenario.

Among these measures, Law No. 10,436/02 and Decree 5,626/05 are included. I also highlight Decree **No. 7,611/2011, which provides for the Specialized Educational Service (AEE) and the Operational Guidelines for Special Education in the state of Espírito Santo with a proposal for the work of the SEA articulated with common education, that is, the collaborative work of the specialist teacher.**

In compliance with this current legislation, this study carried out through the participatory methodology of the experience report type with the collaborative work lived in a multigrade class of 7th and 8th grade, where a deaf student studies, aims to contribute to the reflections on the inclusive processes that take place in the education networks to ensure the learning of public students of Special Education.

Thus, the interlocutions between the Historical-Cultural theory with the pedagogical practice are focused on a perspective of articulation between the SEA teacher in the area of hearing impairment and the regular school teacher, mediated by the Libras interpreter, in stimuli to expand the expressiveness of the deaf student in the learning context.

HISTORICAL-CULTURAL THEORY AND EDUCATION

Lev Seminovich Vygotsky was born in the city of Orsha in 1896 and died in 1934, before he was even 38 years old, due to tuberculosis. Despite the short production time, his

works brought revolutionary contributions, especially to the explanation of how human development occurs.

And this Historical-Cultural theory is born from a nonconformity, or rather, it arises from an attempt to overcome the explanations coming from two strong philosophical currents of the time, which are described as follows by Rego (1995),

> On the one hand, there was a group that, based on the assumptions of an empiricist philosophy, saw psychology as a natural science that should stop at describing the external forms of behavior, understood as mechanically constituted abilities. This group limited itself to the analysis of the most elementary processes and ignored the complex phenomena of conscious, specifically human activity. On the other hand, the other group, inspired by the principles of philosophy, understood psychology as a mental science, believing that human psychic life could not be the object of study of objective science, since it was a manifestation of the spirit (Rego 1995, p. 28).

These theories were no longer able to explain and understand the differentiation between the development of man and animals and how the process of hominization of man occurs. It was precisely in an attempt to overcome this crisis in psychology that Vygotsky, together with his group of researchers, mainly Leontiev and Luria, sought a new approach that would enable the junction between these two predominant approaches at that time.

This search to understand the development of the human psyche was then called Historical-Cultural Psychology. For this, it is important to consider as a fundamental aspect in Vygotsky's ideas, the intertwining between these two processes: the biological and the cultural, as "[...] a development immersed in history and culture, in nature and society, in the reciprocal constitution between man and the world [...]" (Andrade and Smolka, 2012, p.700). This means that man humanizes himself in the relationship with the other and with the environment, through instruments and signs constructed by himself, throughout the process of hominization.

There is also an emphasis on the contribution of culture, cultural integration and the historical dimension, with a strong Marxist influence and the historical-dialectical materialism theory, being understood as a theory of human activity placed in opposition to naturalism and the passive receptivity of the empiricist tradition, whereas:

> The change, the dynamics and the transformation in nature, in man, in conceptions and in knowledge become causes and effects, motives and objects of the many changes in the functioning of the subject who, (con)living, creates different ways of acting in the world and of changing himself and the other (Andrade and Smolka, 2012, p.702).

Vygotsky's production infers the human being always related to his historical-cultural context. For the social environment, the relations built by man in history and by history,

constitute man. Thus, in order to understand the great contributions of this author, it is essential to emphasize the moment in which his theories were elaborated.

DEVELOPMENT IN THE VYGOTSKYAN VIEW

Understanding that human development is cultural and historical, that is, it reveals the long process of human formation of man, who operates in nature and in himself as part of this nature, as a historical and cultural being, can contribute to reflect on development from school spaces.

The child is born a social being and his singulization as a person occurs concomitantly with his learning as a member of the culture, that is, the development occurs in the emergence of the culture and later in the field of individualization.

In his general law of development, Vygotsky explains the importance of the collective in the lives of children, regardless of whether there is any deficiency.

> All functions in the child's development appear twice: first, at the social level, and then at the individual level; first, between people (interpsychological), and then within the child (intrapsychological). This applies equally to voluntary attention, logical memory, and concept formation. All higher functions originate from the real relationships between human individuals (Vygotsky, 1991, p. 64).

In this way, it is stated that the higher psychic functions need relationships to exist. They are not born. But they are constructed and developed from intrapsychic processes, from the conditions made available to each subject in particular, as Rego (1995) explains:

> Vygotsky dedicated himself to the studies of the so-called higher psychological functions, which consist of the typically human mode of psychological functioning, such as the capacity for planning, voluntary memory, imagination, etc. These mental processes are considered sophisticated and "superior" because they refer to intentional mechanisms, consciously controlled actions, voluntary processes that give the individual the possibility of independence in relation to the characteristics of the present moment and space (Rego, 1995, p.39).

It is then understood that all higher functions, originating from the relationships between individuals, are the basis of the human learning process, which also applies to the formation and development of concepts. This implies that in school activity, in tasks, in action, in challenges, in problems, it is that higher psychic activities are carried out. Thus, it is possible to affirm that the school space is the privileged locus for the development of maximum human possibilities.

And, in this context, the role of the teacher as an organizing agent of the learning conditions of his students is of paramount importance. Because mediated activities cause a series of transformations in each student, where their understanding of reality and their

ways of acting are mediated by the other, by signs and instruments, that is, they are constituted by mediation (Rego, 1995).

CONTRIBUTIONS TO SPECIAL EDUCATION

In the theses and assumptions defended by Vygotsky during the beginning of the twentieth century, the theoretical and conceptual foundation is found, the relevance of the participation of each and every child in the production of culture, emphasizing the unique contribution of each one to the social dynamics. In this sense, the problematization of the student with disabilities and their participation in an integral way in the social, cultural and historical environment is presented as the basis for the object of study, necessary for the discussion about the child with disabilities and their development.

Throughout history, children with disabilities have hardly been able to effectively occupy the place of student in regular school. It has always been difficult for them to participate in school practices, when considered a premise of a priori disability. And the places destined for them were the specialized institutions, whose essential social function was welcoming, caring and even tutelage. These were environments marked by segregation, which prioritized activities of daily living, work and manual development, which characterized the participation of these children in social practices. However, such actions sometimes limited the production of knowledge and development characteristic of the schooling process, in favor of a lesser pedagogy.

The school is a propitious space with multiple relationships, for the production of diverse knowledge, with the potential to expand the role of people with disabilities in broader social practice. This presupposes a space for human formation that values the differences and peculiarities of each individual. In this way, the teaching experiences lived in the school environment become the driving force of human development.

The author argues that psychic functions are internalized social relations, that is, that the experiences signified are constitutive of the personality, admitting that, in the process of development, the functional structure and the brain organization are distant from the innate biological mechanisms, to the extent that they are dynamized with the creation of new connections, provided by the relationships with others and mediated by the instruments built and modified throughout history by the brain itself. humanity. And these psychic functions, socially developed, overlap with biological mechanisms, coming to predominate in the orientation of behavior.

In this sense, in his book "The Construction of Thought and Language", Vygostky states: "Meaning mediates thought in its path towards verbal expression, that is, the path

between thought and word is an indirect path, internally mediated" (Vygotsky, 2001, p. 479). Therefore, it defends the idea of internalization of social relations, based on the assumption that each person, in their singularity, internalizes their relationships with the cultural environment and constitutes themselves through this interaction, contributing to the formation of higher psychological functions that, inherent to the human being, are developed through the relationship with the social environment. According to the Vygotskyan manuscripts of 1929: "[...] Personality is the set of social relations. The higher psychic functions are created in the collective" (Vygotsky, 2000, p. 35).

Vygotsky (2022) highlights the importance of social relationships in the formation and development of people with disabilities by the conception that these relationships are higher than the limits of disability. On the other hand, the organic limitations imposed by the disease are confronted by the infinite possibilities of development of the person from their sociocultural environment, regardless of their physical, intellectual or mental condition.

From this perspective, it is necessary to understand the existing possibilities in the educational space and enable the interaction between all students as a determining factor in their formation and constitution, strengthening the concept of inclusion and avoiding school segregation based on the categorization of "normal" and "abnormal".

METHODOLOGY

The participatory methodology of the experience report type is what anchors the work in question, which was developed during the proposal of collaborative activity experienced in the professional trajectory of one of the authors with a deaf student, enrolled in a multigrade class (7th and 8th grade), in a settlement school, in the municipality of Conceição da Barra, located in the north of the state of Espírito Santo, 250 km away from the capital Vitória, Brazil.

The choice of the institution, a small public school in the state network, which offers elementary education, was made by considering the difficulties faced by the school community regarding inclusive processes.

Therefore, the following report preserves the ethical aspects and intends to contribute to the reflections on these processes that take place in the education networks, aiming to ensure the learning of public students of Special Education.

EXPERIENCE REPORT

When considering the National Policy on Special Education from the perspective of Inclusive Education (2008), which proposes that Special Education acts in conjunction with

regular education in order to meet the specificities of its students within schools, it is also noted that the reception of deaf students is always treated as a challenge. Because, according to Fagundes and Nunes, "it implies accessibility, not only architectural, but in the aspect of providing possibilities, approximation, breaking down barriers, including communication that in many cases schools do not yet have" (Fagundes and Nunes, 2023, p.4).

That said, it is worth reinforcing the format of the practice and its context. The teaching experience that this report deals with was a collaborative work, more specifically the presentation of a seminar, with evaluative weight, articulated between the teacher in charge of Natural Sciences – Natural Sciences being a component of the school's curricular organization and not as a reference to the area in a generalized way – and the SEA teacher, specialist in Hearing Impairment. This articulation aimed to verify the students' ability to understand and transmit the content to other colleagues.

As for the place where the practice took place, it is a rural institution, linked to the Landless Rural Workers Movement (MST), which values the pedagogies of Rural Education, with a curricular matrix based on the principle of collectivity and self-organization, valuing collaboration, partnership, dialogue and collectivity. This school has thematic rooms and, in the routine, it is the students who change environments in each class. And, to serve the community, the school works in three shifts, with the municipal network, in the provision of Early Childhood Education, and the state network, in the provision of Elementary Education and Youth and Adult Education. Due to its location, it includes educators and students living in the settlement itself, for the most part.

The organization of the SEA in this school unit is based on the Operational Guidelines for Special Education of the state network of Espírito Santo and describes some specificities for rural education schools, with the purpose of achieving differentiated forms of communication in all stages and modality of education. Thus, seeking to ensure a specialized educational service that plans "[...] actions that contemplate the sociocultural differences and specificities of each group, providing resources and services necessary for the development of the potential of these students" (Espírito Santo, 2023, p.08). This also implies the orientation that the services in the resource room, in rural and full-time schools, take place in classes of the Diversified Part of the curriculum, in order to ensure the National Common Curriculum Base (BNCC).

Flor (fictitious name of the deaf student) is in adolescence, at the age of 14, and lost her hearing in childhood, due to complications from meningitis. She studies in the eighth grade of elementary school in a multigrade classroom (7th and 8th grade), as already

mentioned. This class has an average of 14 to 15 students and has a sign language interpreter in its organization.

This student has learned Libras and, although she already uses it, her vocabulary repertoire is restricted, which is attributed to the absence of professionals in her school career. She has a greater affinity with the Science component and still has many difficulties, especially due to the delay in language acquisition. This knowledge is essential for the development process of every human being. After all, it is through language that the world is signified and in its social relations, as a student, I did not have access to language. And these signs are belatedly being signified.

In this regard, Vygotsky (2001) in his studies, defines the relationship between man and the world as a relationship mediated through signs, with language being the main mediating element in the formation and development of higher psychological functions.

By understanding the formation of the human being through a mediated relationship, Vygotsky (2001) highlights the importance of language in social relations, emphasizing the importance of the representations and meanings we give to the word, because "The word devoid of meaning is not a word, it is an empty sound. Therefore, meaning is an indispensable constitutive trait of the word. It is the word itself seen in its inner aspect" (Vygotsky, 2001, p. 398). In this sense,

> The meaning of the word is a phenomenon of thought only in so far as thought is related to the word and materialized in it, and vice versa: it is a phenomenon of speech only in so far as speech is linked to thought and focused by its light. It is a phenomenon of discursive thought or of the conscious word, it is the unity of the word with thought (Vygotsky, 2001, p. 398).

For the author, meaning is responsible for mediating thought in its path towards verbal expression, that is, the path between thought and word is an internally mediated path (Vygotsky, 2001). In this understanding, the person internalizes his relations with the cultural environment through signs and instruments, and constitutes himself through this interaction, contributing to the formation of higher psychological functions.

And, it is understood that the relationships that make this internalization feasible appear in different stages of the reported activity. One of these moments was the division of the class into groups chosen through the draw. Flor composed with four students. And, as it is a collaborative work, the SEA teacher and the Libras interpreter were responsible for guiding and assisting the group of the student in evidence, while the regent teacher divided the time of attendance to the groups in general. However, she paid attention to the doubts that arose in Flor's group, especially in the process of understanding the content.

Flor and her group were responsible for four themes that were equally divided among the four components of the group. Flor was left with the theme: Climate change and environmental imbalance. And, in the division of responsibilities, the interpreter mainly helped the other students in the group while the SEA teacher mainly helped the student Flor. And in order for the theme to be explored in a visual way, in addition to the hours of service in the AEE, the classes of the curricular component in question were also used. And so, a model was built contemplating basically four scenarios.

In order to address climate change and environmental imbalance, the following scenarios were set up: a dry river; a forest burned with dead animals; the advance of the sea; and the floods. All these realities that affect not only Brazil, but several places in the world. With special attention to two of these scenarios due to the proximity to the student's experiences. Because, in periods of heavy rain, the place of settlement, the plantations and the school are flooded. Based on this, the student built her own school environment, including the yellow color that characterizes her. The other close scenario is the advance of the sea, being a reality that the student experiences in Conceição da Barra.

The content was not taught in a single moment, but talked about at different times and at different stages in the construction of the model. In addition, the student also had access to videos in Libras on the subject. And, within her possibilities, she sought to research to understand what was proposed.

In reference to this, it is important to understand what Vigotsky (2022) points out, as the objectives must be the same for students, with or without disabilities. The issue is accessibility to the curriculum. And, in this regard, the model was not the only path chosen. She also resorted to slide presentations, and like the other students, it was necessary for her to choose which contents would be present on the slide, as well as it was necessary to expand the research and analyze what would be said in the presentation of the work.

The other colleagues were also studying and researching her themes, although not all of them interacted with Flor. And, in order to stimulate interaction and highlight mediators who favored the understanding of the content during the presentations, the SEA teacher and the interpreter guided strategies so that the presentation dynamics were more visual, which would contemplate not only Flor, but all the other students. Thus, with the help of the Natural Sciences teacher, more visual experiences were developed. One of them was over the air and had the use of a syringe and, by pulling the back, placing a finger on the front and then pushing, it was possible to perceive that the air was present.

Education is a properly human phenomenon and the child has always been a social being. Thus, the formation of the singularization of this subject occurs in learning,

development and emotions, that is, in the emergence of the cultural, social and historical environment, in which the school space is inserted. This environment is loaded with meanings and needs to be accessible and truly meaningful, inclusive, that promotes the development of students with disabilities in an integral way, based on their peculiarities and possibilities, in no way focusing on their limitations, but valuing their potential.

During the realization of the proposal, not all moments were harmonious, sometimes the student did not want to study the theme, preferring to build the model, which is attributed to the affection she has for manual work, playful activities and production, considering her artistic skills or, possibly, to the lack of knowledge of the meanings of words, in addition to having a learning deficit linked to the delay in language acquisition. And, in this observation, both in the conception of Vygotsky (2022) and Bakhtim (2006), words contribute in the sense of signifying the world, they are part of the process of human constitution that occurs through language.

And, in order to bring meaning to the multitude of ideological threads and to contribute to the constitution of the student, sometimes, during the production of the model, the SEA teacher dialogued about the theme, about the representations of the scenario and the possible facts that contextualized each one of them. This is done by alternating the use of videos and written research.

Arriving at the presentation of the seminar, although Flor had sought with the interpreter and the SEA teacher a work already ready and was unsuccessful, she traveled her own paths supported by the meaningful words with which she built her presentation. She took the model to the class and explored the theme, making herself understandable to her colleagues, fulfilling the objectives of collaborative work. In this regard, Padilha states that: "It is up to the school, however, to have non-uniform resources and procedures so that students have the possibility of walking beyond their limits" (Padilha, 2004, p. 77).

It is in this perspective that schools must conceive their pedagogical practices, providing deaf students with the meaning of the ideological threads that constitute the world around them, investing in their capacity, with stimuli that enable learning. In order to, thus, signify the cultural, the social, often emptied around it, seeking to contribute to the development of the human psyche and to the process of hominization of each student.

CONCLUSION

Vygotsky, when formulating the Historical-Cultural Theory, states that human development is constituted by the junction of natural and social aspects, by which he

announces a vital issue in the process of hominization, the primary source of psychic development: culture.

The featured author makes it clear that he was a scholar beyond his time and with ideas that underlie current theories and continues to contribute to reflections on mediation and interaction for learning, in school spaces, as well as the importance of the environment in the development of the subject.

Therefore, understanding its main assumptions implies understanding the need to break with paths that privilege exclusionary educational models and trace new paths towards a society that allows all individuals maximum humanization. All this, through appropriations of material and intellectual goods produced by humanity historically and culturally, that is, through the equitable appropriation of the culture in which the subject is inserted. It is at the service of the right of a subject that is not limited to its limitations, but in the conception that it is endowed with possibilities, which must permeate the understanding of Inclusive Education.

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MAJOR BRAND ATABIACHIN: MISMATCHES BETWEEN THE ETHICAL AND THE EMIC

https://doi.org/10.56238/sevened2024.031-063

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ABSTRACT

Afro-Brazilian cults have long aroused interest in various areas of scientific knowledge, not only in Brazil, but also in other poles of academic production in the fields of social sciences and humanities, with emphasis on approaches to sociology, anthropology, education, musicology, ethnomusicology, linguistics, pedagogy, artistic expressions, and history. The concept of Afro-Brazilianness activates a complex of values and meanings that dialogue with the notion of national identity present in the literature of the segments mentioned above. This article then pursues the problem that emerges from the mismatch between the ethical voice of academic approaches and the emic voice of the population with African oral tradition cultures in Brazil.

Keywords: Afro-Brazilian. Oral Tradition. Ethnomusicology. Identity.

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INTRODUCTION

TRUTHS OR LIES?: DIVERGENCES BETWEEN THE ETHICAL AND THE EMIC

The concepts and lines of understanding of values and practices of Brazilian tradition disseminated by the media and entertainment arenas and cultural policies are structured in studies systematized by methodologies that are reliable for their scientific content. However, there are divergences between the fruits of these studies and the truths defended by representatives of cultural expressions of oral tradition in Pernambuco. This data proved to be more expressive in my eyes when the testimony of an active pai de santo from the metropolitan region of Recife pointed out to me that in the recent past it was common to omit data during academic records, also highlighting that much of the information passed on in academic research and journalistic interviews would have an unreal content with the truth of the aforementioned cults in scientific observation. This revelation had been pointed out to me as a recurrent and legitimate form of resistance of local Afro-Brazilian cults to possible harmful actions of the dominant society on their peripheral realities.

Mariana Schlikmann (2016), in her article entitled 'the trajectory of African studies in Brazil', points out that in the process of "inventing" a nation, the black element emerged as a politically necessary factor. This author (Ibid, p. 418) refers to Gilson Brandão de Oliveira Júnior (2010, p. 14) when this author identified that at the beginning of the institutional process of African studies in Brazil, there was a predominant attempt to construct standard references centered on a Portuguese link, "associating the emergence of our country with contact with Europeans/Portuguese" (OLIVEIRA JUNIOR, 2010, p. 14). This approach also pointed out that, supposedly, the Portuguese element was responsible for the "discovery and ethnic amalgamation" that characterized the formation of a national identity (Ibid). From this perspective, according to Oliveira Junior, "Brazil's roots were rooted in Europe, and, in this conception, Brazil was born due to Portugal, with its traditions and cultural habits coming from the old continent" (Ibid). This author, in Schlikmann (2016, p. 418), also observed that, in 1845, Carl Friedrich Philipp Von Martius, and later in 1877, Francisco Adolfo de Varnhagen, considered that there was in Colonial Brazil an ideological tendency to reinforce "Brazil's European traits and ties, minimizing the African presence in the country and the miscegenation of the Brazilian population", as observed by Bittencourt and Correa (2011, p. 8).

However, as Schlikmann (2016, p. 418) observed, Von Martius became the first to recognize Africans as a significantly influential part of Brazil's identity history, even though for this author the role of Africans was considered 'small and inferior' (SCHLIKMANN, 2016, p. 418). From this perspective, as pointed out by Lilia Moritz (1993), in Schlikmann (Ibid),

the theories developed in the 19th century revealed a tendency towards scientific racism, as they considered that there were distinct races among men. Such approaches reveal that in the process of constructing national identity, the white cultural element began to be hierarchically inserted as more "evolved", while the black came to be characterized "only in negative terms" (MORITZ, 1993, p. 82). These data pointed out here indicate the multifaceted content that governs the history of perspectives that emerge from ideas about the term Afro-Brazilianness.

In its origin, the term Afro-Brazilian emerged in the mid-20th century after the Brazilian elite strategically perceived some African cultural aspects as representatives of national identity. Thinking about present values, arising from or consequent to cultural manifestations of African origin, implies considering multifaceted social arenas between social inclusion and exclusion. This complex of relations that emerged from the process of construction of an African identity in Brazil is projected in the imaginary and in the symbolic that governs, in the common sense of Brazilian society, the ways of being, feeling or perceiving oneself as bearers of black culture. This specific data represented trends in theoretical approaches around the transatlantic mobility of African cultural matrices, and respective contexts of cultural intersection and interracial conflicts.

In Brazil, the lines of interest associated with the presence of peoples and cultures of African origin were marked by the conception of miscegenation of races. The Brazilian people would then have in their culture determining elements of an expressive pattern projected and represented in behavior. Music, like other expressive modes of a Brazilian identity, was then constituted of structural value under references of tradition and customs coming from Africa and inserted in Brazil. Expressiveness of singing, dancing and rhythmic sounds to the beat of drums have since then constituted the hallmarks of customs and traditions of African peoples, which public policies have tended to consider predominant among the classes of political minority in Brazil. As stated in historiographical studies, these customs historically tended to be considered primitive and savage by cultural perspectives of European origin, mainly because they could be associated with religious rituals designated as pagan according to a Judeo-Christian view of the dominant class.

The concept of Afro-Brazilianness emerged in addition to terms such as 'negro' and 'negritude', among others coming from the root 'neg' to indicate dark-skinned people or carriers of cultures associated with them. Such a relationship between the skin color of Africans and their descendants nourished value judgments in different senses, predominantly pejorative, in addition to skin tone, being associated with unwanted values of the behavior of subaltern classes.

In this regard, Debora Dettman Matos (2010), in her studies in the fields of legal sciences, observed the occurrence of a theoretical logic of differentiation of human groups based on the biological and anthropological sciences under the designation of bioanthropological theories. This branch of studies, as attested by Jacques Maritain (...), came to be postulated with the objective of defending the ideology of racial superiority. Dettman, in his article, "Scientific racism: the legacy of bioanthropological theories in the stigmatization of blacks as delinquents" points out that, although there were records of discriminatory conceptions since antiquity, it was only from the end of the 19th century that the logic of discrimination emerged in defense of the real race on a scientific basis. This author allows us to understand that interracial confrontation has historically tended to stimulate political actions of social defense against supposedly dangerous ethnic groups. Dettman states that these theories, "although they had a great variety, were characterized by the use of the inductive method (observation of the delinquent) and in the formulation of laws that related cause (biotype) and effect (crime committed)". And in his argument, Dettman also observes that "it is not a mere coincidence that the stigmatized groups are precisely the groups once called 'inferior' or 'potentially criminal'", as happened with blacks and Indians [among other human groups] in Brazil.

Etymologically, the word "negro", in Greek, means nekros in association with ideas and imaginaries alluding to concepts of "death", "dead", "corpse". From the Latin niger and nigur, the term negro comes to mean black, dark, tenebrous, of bad omen, funereal, cursed, unhappy, bad, perverse, malevolent, perfidious. These planes of meaning have become fertile for distinct and diverse forms of daily relationship of society's common sense with individuals representative of an African origin in Brazilian expressive behavior.

I also note that part of this category officially recognized as Afro-Brazilian, and identified as blacks, did not inherit or does not have direct links with a cultural and expressive pattern of identity of the peoples who came from Africa as slaves. The latter (Indians, descendants of Indians, gypsies, new Christians, etc.), in fact, became invisible to the eyes of the dominant portion of society, which built only interests around conflicting arenas between white individuals and black-skinned individuals. Thus, some people included in the list of blacks and Afro-descendants, bothered by their susceptibilities (and consequent social disadvantages added to the so-called blacks), do not accept to be confused or called blacks, while others do not accept to be literally called blacks; these degrees of reactions are consequently linked to prejudices and respective stereotypes that each term carries from place to place.

The imprecision of conceptual terms of categories arbitrated by the intellectual elite has been revealed, over time, as inconsistent, from the perspective of individuals included in categories marked by racial prejudice. This data also points out that the arenas of relationship between Afro-descendants and society are open, partial and imprecise, generating friction and forms of identity resistance.

This category of finding, as a problem induced in an investigative terrain, emerged to my eyes during my ethnographic visits in the capital and in the interior of Pernambuco since 2003, in studies developed in the fields of ethnomusicology, when testimonies and testimonies pointed out the existence of disparities between ethical concepts conveyed in the academic literature and in cultural policies, and emic concepts that are based on empirical conceptions and orally inherited from practitioners of expressive activities, designated by the scientific literature as Afro-Brazilian. On the one hand, theorists attribute values and meanings to the actions and behaviors of Afro-Brazilians based on findings published in the literature of folklorist and Africanist studies. And on the other hand, the emic practitioners, predominantly older in expressive activities of oral tradition [such as coco de roda, rural maracatu, maracatu de baque virado, mazuca, caboclinho, ciranda, umbanda, xangôs, etc.] told me, based on the legitimacy of their voices, that their respective empirical experiences and cultural heritage acquired by orality, point to errors in the literature.

These data have been chosen as guidelines for argumentation because they problematize the flow of relations and truths between academia and orality. Methodologically, I resort to the use of the terms ethical and emic as categories of distinction between formal thought of globalized official origin and local thought linked to tradition and oral culture. I point out that the title "Atabiachin de Marca Maior", and the respective theme of approach, emerged in my analysis from the oral expression of the daily life of the xangô from Pernambuco revealed to me during testimonies of the oluôu Manuel Barbosa da Silva, Pai Dodê, between 2003 and 2004. This babalorixá who lived in the neighborhood of Casa Amarela, in Recife, Pernambuco, revealed to me the ways and strategies of resistance even when the practitioners of the xangô collaborated as informants of the ways of life and relations with the dominant society in the 20th century. Music, ringtones, celebrations and liturgical rites became, in these terms, to be understood and described by researchers and reporters as their informants initiated in the xangôs of Recife decided to reveal. What was true in such accounts? What has really come to be systematized by science?

In the light of this case reported by Pai Dodê about the testimonies and revelations of the perspective universe and resistance of black groups, this article seeks to problematize

the veracity of reports and the fragility of the academic records that have come to guide the scientific knowledge of African heritages in Brazil.

BRIEF LITERATURE REVIEW OF AFRICAN CULTS

From extensive experience in the technical function of the Mental Hygiene Service and as Interim Assistant of Assistance to Psychopaths of the State of Pernambuco, during the Federal Intervention of 1937, Fernandes writes about the black-fetishist cults of Recife, elaborating a broad approach and deep synchronic ethnography of the xangô, his relations with the police in a state of repression of the spiritist cults/house of fortune tellers/gypsies/etc; their magical practices, the process of enrollment in federations of African cults, some of which are the rivalries between terreiros; giving voice to the babalorixás in the framings of possession, state of saint, medical witchcraft and syncretism. This work becomes an ethnographic landmark in the literature on blacks in the Northeast and especially in Pernambuco, among other reasons for the emic approach of an observer, who from the officiality of his function at the political level begins to have a technical and influential proximity in the heart of the African cults established here.

In 1950, based on information recorded by the Folklore Research Mission (MPF) from extensive documentation in newspapers, documentary records, photos, field notebooks and records, Alvarenga wrote about the ritual, the ceremonies, the lyrics of the toadas, the instruments, the orixás and caboclos worshipped. In the same year, Merrian studied the Afro-Brazilian ritual in Bahia. Ribeiro (1952) carried out a study of the process of social adjustment of the Afro-Brazilian cults of Recife. Valente (1954) analyzes Muslim marks on the xangôs of Pernambuco. Koetting (1970) analyzes and creates notation for percussion used in West Africa. Wa Mukuna (1970) studies the influence of Bantu music on Brazilian music. Motta (1973/1975/1976/1980) provides a dense anthropological panorama through various approaches to Afro-Recife religions. Bastide (1978) studies candomblé in Bahia. Blacking (1978) studies musical changes. Kubik (1979) analyzed Afro-Brazilian music by pointing out parameters of African music in the wrists of 12, peculiar to the Yorùbá culture, and 16 of the Bantu.

Guerra-Peixe (1980) built a model and musical analysis of African matrices in the maracatus of Recife. Verger (1981) delves into mythological and comparative aspects of rituals in Africa and Brazil. Nettl (1983) musical studies in general on musical change. Andrade (1983) addresses the music of cults in the Northeast of Brazil. Augras (1983) studied how the mythical Nago religious traditions act on the personality of the individual. Carvalho (1984/1987/1991/1993), studied the cult of Xangô in Recife, its aesthetics,

meaning and function in the liturgical-musical ritual. Brandão (1986) analyzes the economic organization of the Xangôs of Recife. Behague (1986) studies the process of change from an ethnomusicological perspective of contextualization of the musical event. Lody (1987) addresses the religious ethnography of the material culture of the Xangôs and Candomblés. Carneiro (1988/1991) studies the xangô in the process of identifying the orixás in Bahian candomblé.

D'Anunciação (1990) develops a notation system for percussion instruments in Brazilian music. Lühning (1990) develops an emic study on Afro-Brazilian music in Salvador. Aron (1991) develops a view of West African music and makes a study of rhythm, formulating comparisons of African standards in Western music. Carlini (1994) deals with the volume and locations through an analysis of the field notebooks of the Folklore Research Mission of 1937, with historical data of the xangô. Segato (1995) analyzes the relations between the mythology of the xangô and the premises of contemporary society. Brasil (2000) studies musical changes in babassuê based on the MPF of 1937. Oliveira (2001) studies percussion of black-African origin. Cardoso (2001) describes some aspects of symbolism in Candomblé Ketu. Vatin (2001) comparison between nations of candomblé in Bahia. Carcenac (2002) studies traces of musical miscegenation between Africa and Brazil. Marc Gidal (2013) comparatively observes the control of the musical creativity of devotees of candomblé, umbanda and quimbanda, concluding that candomblé presents a rigid vertical regulation in the expressiveness of its representations, so that the faithful tend to discipline their conduct according to a more orthodox order than among all other Afro-Brazilian religions. Gidal points out that umbanda tends to reveal a more horizontal structure of regulation, as it becomes more syncretized. In its classification, Umbanda composes a set of heterodox liturgies, of a wide and differentiated variation from Candomblé by a syncretic character, according to a greater or lesser degree of hybridism with Catholicism, Kardecism and, let's say, popular Catholicism. In this criterion, flexible levels of permissibility are revealed in the face of the musicality expressed, tolerating or promoting innovation in syncretic and hybrid liturgies, and this fact is underlined by Gidal as decisive for the adhesion of new faithful. Another significant fact of this study is that musical participation in these religious, orthodox or heterodox confraternities of African origin includes the sharing of behaviors and ideas, and there are even hierarchical levels in this field. For Gidal, sharing influences everyone to have an equivalent devotional commitment to the liturgy, in private life. This commitment is watched over and regulated ostensibly by guiding spirits, who punish or protect. Gidal observed that in Candomblé the musical structure was centered on the circular dance in a counterclockwise direction, with chants in pentatonic melody and with

a question-and-answer structure in a speech that seeks fluency in African languages, predominantly in Yoruba. This musical structure, says the author, was accompanied by the percussion of three drums, peculiar bells and bells, and by ritualistic processes of incorporation of spiritual entities (Ibid.). His approach alludes to people trained for the trance of spirits. This data needs to be reviewed since this state of immersion in the psychosensory and psychosomatic sphere induced by *music and suggestive context* is not achieved by just anyone, but only by those who have didactic or methodological instruction. Matory deals with the problem of ambivalent and polarized relations in studies of Afro-Brazilian religion (2009). In his speech, this author demonstrates how individuals, whether priestesses, merchants or academics, can make and influence the religious practices of Candomblé through individual ideas, interests and motivations. And he also points out problems about concepts of African purity in his studies. This is how it is summarized what I have considered, since the first references, for the design of the state of the art about the studies associated with xangô in the perspective that I pursue.

The data that emerge from these and other studies indicate that there are still hidden truths to be unveiled, and that they nurture taboos and fears in the imagination of society's common sense. Were they truths or myths?

THE VOICE OF THE INVESTIGATIVE TERRAIN

The documents used in this analysis were the field notebooks of the Folklore Research Mission (MPF) organized by Mario de Andrade in the first half of the 20th century. These data were collected from 1938 and 1998, and are part of the MPF collection organized by Oneyda Alvarenga, and which are currently managed by the São Paulo Cultural Center, which has the originals of this important research recently made available on DVD-ROM with the support of Caixa Econômica Federal and other agencies.

All the information pointed out here follows ethnomusicological conceptions referring to those recorded in 1938 in an effort to contextualize the musical practices of the Afro-Brazilian cult under appreciation of the Nagô and Jeje-Nagô tradition, in the voice of the memory of Pai Dodê. The data revealed in testimonies and testimonies emerged in interviews during the object of recording toadas and respective toques aos orixás, verifying the points of continuity and change in the liturgical practices of candomblé houses located in Alto Santa Izabel, Casa Amarela, a neighborhood in the metropolitan region of Recife. This academic investigation conferred the respective return to the sources as an integral and fundamental part of this musical research work. The methodology used was the comparative analysis of the practice of candomblé registered in 1938 with that practiced in

the years 2003 and 2004, after 66 years of the MPF records. The central points of this approach, of ethnographic comparison between data collected in the first half of the 20th century and testimonies collected at the beginning of the 21st century, started from topics listed in the notebooks of the respective MPF collection, based on the methodological basis of an ethno-historical appreciation elaborated by Merrian, in the search to identify, as defined by John Blacking (1973:17), the processes of musical and extramusical cognition of this rite for an understanding at the structural and functional level of the musical production of the xangôs in Pernambuco.

The field research was basically carried out in Alto Santa Izabel, Casa Amarela, Recife, Pernambuco, using open and participant observation, semi-structured interviews guided by the informant's voice, which gave me a certain freedom in the use and order of questions about the daily life of the xangôs in order to better contextualize the universe of the cult of the orixás, making use of the oral and life history of Pai Dodê.

Born on April 3, 1923, Manoel Barbosa da Silva, Oluôu named Pai Dodê [Mané Dodê], was the son of Severino Dionísio de Albuquerque (deceased in 1932 when Pai Dodê was 9 years old) and Maria Barbosa da Silva (deceased at the age of 84). In his memoirs, he said that on June 23, 2005, he would complete 50 years of Ìyáwó à Iyemojá Dodê (the date of his initiation into the liturgy of the xangô). His reports pointed out that it was made (initiated) at the White House of Engenho Velho (the first Candomblé House in Brazil), Salvador, Bahia. And that its initiator, also referred to as mãe de santo was Juliana Baraúna, Mãe Tété. He also mentioned that he had been initiated into the cult of the Sacred Jurema and Umbanda by Maria Isabel de Santana, known as Maria Gola da Mustardinha. These data are significant for us to situate his life path in Afro-Brazilian cults, and consequently to consider his revelations about the ways of relating to scholars and collecting scientific data.

Considering it necessary to better understand the documentary information and the facts arising from the field research, I sought to expand the field of collection, through complementary interviews with people from other local terreiros, such as: José dos Santos, babalorixá named Zezo de Xangô, born on December 8, 1947, and initiated in the cult of the orixás in 1959 as a rodante ogan (the one who always manifests himself); José Antônio, born in the city of Carpina/PE in 1929, bearer of the religious title of babalaô ibualama, with more than 50 years as a babalorixá; and Diva da Silva Santos, iyalorixá named Diva DE Iyemọjá [Mother Diva], born on July 6, 1944, initiated in xangô in 1954. I also sought to expand data about Pai Dodê's testimonies through complementary interviews with people who did not belong to the circumscribed area of observation, such as: Amaro Paulo Dias, known as Paulo Dias, Interim President of the Federation of Afro-Brazilian Cults of

Pernambuco, located at Rua José Bonifácio, 650, 1st floor, Torre, in the city of Recife. Communication Professional; Manuel Salustino Cândido, known as Manuel Maiá, former President of the Federation of Afro-Brazilian Cults of Pernambuco, who lived at Rua Marcílio Dias 27-A, Água Fria, in the city of Recife; Tony Mayowa Lawson, born on December 10, 1982 in the city of Lagos, former capital of Nigeria, who in 2004 was in transit in the city of Recife due to a scholarship in Portuguese Language carried out at the Federal University of Pernambuco, with the purpose of studying Accounting Sciences at USP.

INHERITED STIGMAS

The terrain revealed, through testimonies and testimonies, that the initiates of African religious cults in Pernambuco feel uncomfortable with stereotypes directed at them by the common sense of the dominant society, even though there are programs and actions of cultural policies disseminating values of inclusion of this category of people in the social daily life. However, the emic reports point to dissatisfaction in the way they predominantly see themselves conceived as a danger and an example of social stain. This way of looking was indicated by the interviewees as a mark of a personality created under white and Judeo-Christian reference. In such emic reflections, this way of perceiving them by the common sense of society was evidenced in value judgments that predominantly place on their heads a derogatory stigma of worshippers of demonic manifestations. This state of affairs, in their perspectives, indicates that initiated practitioners and sympathizers of religions of African origin have experienced repressions and social conflicts with strong repercussions in the depths of their ego, in part, through the discourse of those who, not believing in the orixás, point out the existence of a common pattern of the psychic unconscious in all those who identify themselves and/or who are arbitrarily identified as "xangozeiros"[2]. This typology of classification has in its use a diversity of applicability, with a predominance of those that designate the people of xangô as true sorcerers capable of atrocities at the physical, psychic and spiritual levels, because, in the eyes of the dominant society, they are supposed to be carriers of all kinds of moral and personality disorders.

Such modes of representation witnessed to me in the field by those who feel excluded took on a new meaning after Pai Dodê indicated the existence of the common resource among Afro-Brazilians who were members of African rituals, which covered or made invisible their truths before the observer lenses of scientific methodologies. In their perspectives, reporters and researchers were curious intruders who asked too many

[2] According to Carl G. Jung, terms such as *xangozeiro* are products of the collective unconscious that generate non-personal processes of the individual acquiring real and/or pejoratively conduct and personality, which in turn are potentially constituted by a racial and ethnic inheritance of memories and typical behaviors.

questions and, because they did not know the secrets of their orally inherited traditions, could be deceived by false statements. At this point in my investigation I discovered the emic resource of resistance called 'atabiachin', and the possible and imaginable reality of an imprecision and deception present in the literature since the first scientific records. After all, what is true in what we know about our culture?

PROBLEMS OF AN ATABIACHIN

Candomblé is the crystallization of an entire cultural synthesis of African mythology. In it we find marks peculiar to different nations. In the construct of this verification, I came across, at first, a complex and intricate arsenal of classification nomenclatures that said little by themselves, as if codified for a few to understand; certainly, the result of the effort of those who do not share the world of relationship between the faithful and the orixás, to unveil the secrets that separate intellectuals from the bearers of ancestral knowledge. As Pai Dodê (2004) always said, "the whites and scholars who think they have the right to speak for us are great atabiachins, ignorant of the highest mark, who think they know everything, but know nothing [...]".

The filhos-de-santo are born, grow up and live in an environment physically and culturally determined by a past that transcends the material plane. They participate in this environment and make changes within a traditionally standardized conception, accepted, elected and corroborated by all equals. As understood by the literature and by the practitioners of the tradition of faith to the orixás, in this conceptual universe there is no room for conceptions guided by knowledge external to a ritual reality. In this order of perceiving this assertion, consequently the presence of researchers in the physical and conceptual space of Afro-descendants is given as an intrusion by those who, in the eyes of the people of Xangô, throughout an entire history of life, sought to disaggregate a sacred knowledge of African identity in Brazil.

The search for an understanding of this hidden reality that transcends the Western world, factually falls back on an arbitrary tendency to write what has never been written, to transcribe what has never been transcribed, to conceptualize, on Western bases, what has not been orally understood outside a dogmatic sense of oral tradition. The initiates of the xangô reported that the internal rule of their beliefs did not allow an uncontrolled opening of truths about the causal relations, influences and competing and consequent tendencies of their rituals and celebrations to the African deities. And in this sense there is the functionality of individuals committed to the zeal of the tradition of inherited secrets. These individuals

are those designated as caretakers of the orixás, also commonly called 'caretakers of the saint' or 'fathers of the saint'.

The conflicting obscurity of truths accessible to common sense represents for investigators a great effort to determine the amplitude of facts, phenomena and operations that enter this sphere of action. This reveals the mystical side that still lingers over part of the life stories of Afro-descendants. Would this be a feature of continuity? Or simply an effort of resistance?

Faced with the problem of a diversity and breadth of approaches and understandings of Afro-fetishist cults in Brazil, a certain abyss between emic truth and ethical truth has been revealed that makes articles and methodological approaches of the Brazilian African tradition seem mythical. The themes developed by academia, as well as by the media, carry something mysterious and insurmountable, further expanding a scientific mysticism around themes that seem fragmented from an African tradition, like pieces of a puzzle.

However, as Roberto Motta pointed out in a seminar in the specialization course in ethnomusicology held at UFPE in 2004, the people of the terreiro who enter the academic universe of universities and start to consider literature as a reference, tend to adopt as truth the possible lies recorded in the field, and the authoritative voice of oral knowledge, in the eagerness for resistance, it runs the risk of authorizing possible untruths as truth and tradition.

Do the revelations and scientific records of African rituals among Afro-descendants thus point to a course of terminological and semantic mismatches with the truths of the past? What is the content of truth and the power of lies?

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SYSTEMATIC REVIEW STUDY (BASED ON THE PRISMA METHOD) ON THE HARM CAUSED BY THE USE OF ANABOLIC STEROIDS

https://doi.org/10.56238/sevened2024.031-064

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ABSTRACT

Beauty standards and the search for a perfect body today have led to the use of substances that can facilitate the acquisition of bulky muscles and decrease body fat. Thus, many individuals have sought the use of Anabolic Androgen Steroids (AAS), since these substances play an anabolic role, about the synthesis of contractile proteins (increases muscle volume and strength) and catabolic, in relation to lipid metabolism (stimulates lipolysis). In sports, AAS have been widely used, since they develop greater strength capacity in the athlete and, therefore, bring improvement in speed, power and also cardiorespiratory capacity, since they can lead to a better recovery, thus influencing sports performance. However, the responses are not always beneficial, and can trigger considerable problems in users of AEAs, both at the physical level such as cardiovascular, metabolic and endocrine changes, and at the psychological and social level, through changes in mood, cognition and behavior. Therefore, seeking, compiling and understanding the possible harms triggered by the indiscriminate use of AAS is of great importance for the academic community and society as a whole. Thus, the objective of the present systematic review was to search, through the PRISMA method, for primary studies that present the harm caused by the use of AAS. Results: After applying the exclusion and inclusion criteria, eleven articles were found relating various harms in AAS users in the last 5 years. Among the harms, physiological changes were found such as increased blood pressure, cardiac arrhythmias and increased shear rate, heart diseases, atrial fibrillation, cardiac depolarization problems, thrombi, infertility, decreased testosterone and erectile dysfunction; metabolic factors such as an increase in low-density lipoproteins (LDL) and very low-density lipoproteins (VLDL), creatinine, urea, liver enzymes in the blood; such as suicidal ideation, increased verbal and non-verbal aggressiveness, cognitive and memory impairments. Conclusion: Therefore, it was possible to conclude, through the present systematic review, that the use of anabolic steroids can trigger harm involving the physiology, metabolism, behavior and social life of users.

Keywords: Anabolic steroids. Injuries. Diseases.

INTRODUCTION

Beauty standards and the search for a perfect body today have led to the use of substances that can facilitate the acquisition of bulky muscles and decrease body fat. Thus, many individuals have sought methods of using Anabolic Androgen Steroids (EAAs), since these substances play an anabolic role with regard to the synthesis of contractile proteins (increases muscle volume and strength) and catabolic, in relation to lipid metabolism (stimulates lipolysis). These processes thus allow the acquisition of the body pattern so dreamed of by many today (Fares et al., 1019; Reggiani et al., 2019).

In sports, AAEs have been widely used, since they develop greater strength capacity in the athlete and, therefore, bring improvement in speed, power, and also cardiorespiratory capacity, since they can lead to better recovery, thus influencing sports performance (Long et al., 2019; Souza et al., 2018a).

However, the responses are not always beneficial, and can trigger considerable problems in users of AEAs, both at the physical level such as cardiovascular, metabolic, and endocrine changes, as well as at the psychological and social level, through changes in mood, cognition, and behavior (Kaufman et al., 2019; Zhong et al., 2024).

Therefore, it is necessary to seek to collect and understand the possible harm triggered by the indiscriminate use of EAAs, after all they are very important for the academic community and for society as a whole.

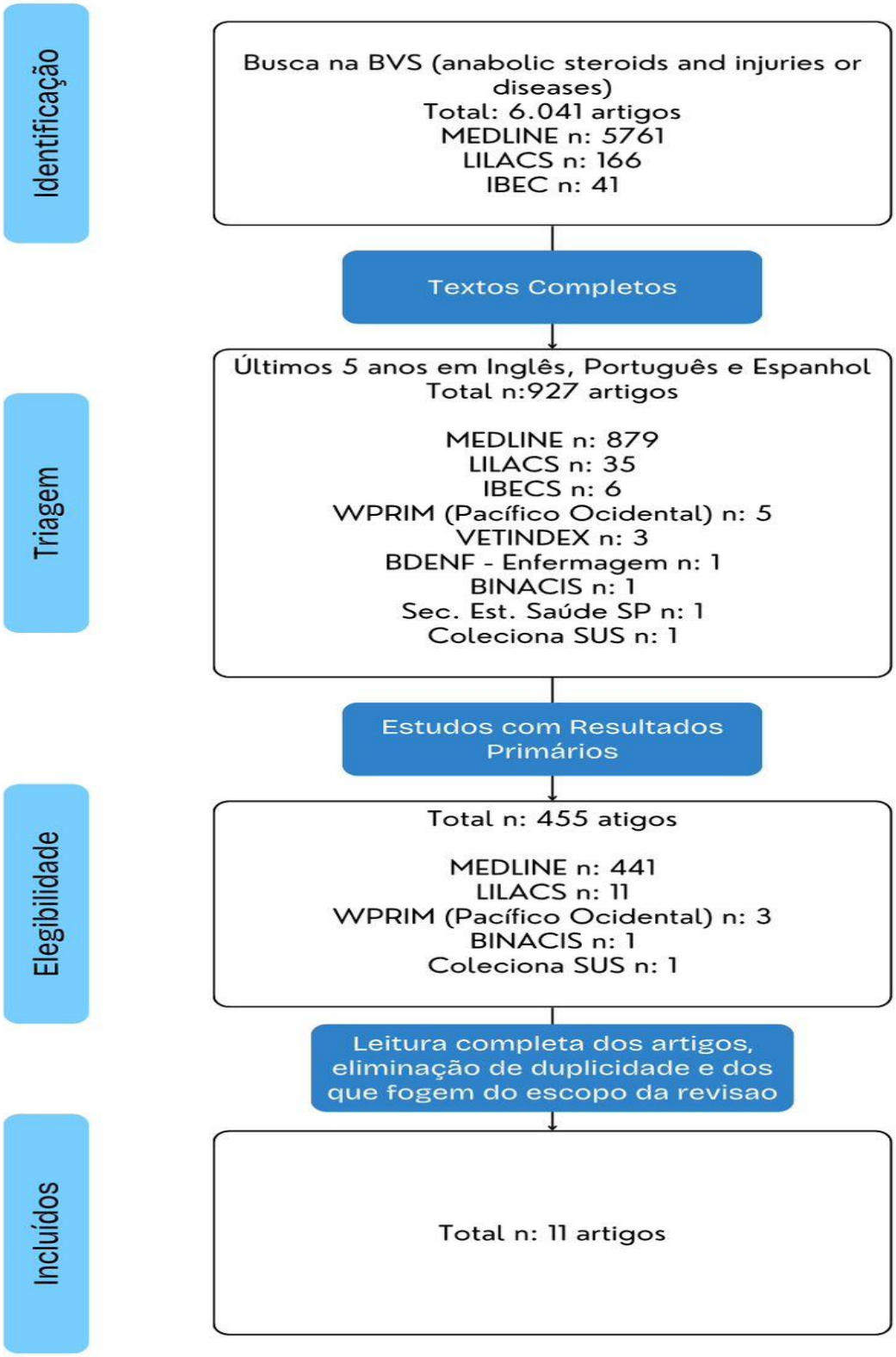
In view of this, the main objective of this systematic review is to seek, through the PRISMA method (Preferred Reporting Items for Systematic Reviews and Meta-analyses) and the PICO strategy (acronym for P: population/patients; I: intervention; C: comparison/control; 0: outcome), evidence in the literature of studies with primary data on the harm caused by the use of AEAs.

METHODOLOGY

To carry out this systematic review, the Methodological Guidelines for the Elaboration of Systematic Reviews were used in the study, following the determinations for the central question, for the selection and identification of the bibliography, maintaining well-established definitions for the inclusion and exclusion criteria of the articles (Donato & Donato, 2019). Considering that a systematic review is an interrogative research method, which makes use of scientific evidence already published, this proposal brings, with this, the integration of specific data in a certain area. To this end, therefore, the guidelines of the 2020 PRISMA protocol were followed in the present study, which are composed of a detailed checklist with elements considered fundamental.

Non-italicized elements are considered "essential" and should be reported in the main report or as supplementary material for all systematic reviews (Donato & Donato, 2019). To this end, on March 15, 2024 at 8:30 pm, searches were carried out on the VHL (Virtual Health Library) website (https://bvsalud.org/) by two authors concomitantly, the keywords: "anabolic steroids" and "injuries" or "illnesses". Then, the inclusion and exclusion criteria were applied, namely: Articles published in the last five years, in English, Portuguese and Spanish. Next, only the articles in which the full texts were found and that were part of studies with primary data were considered, excluding review articles and those that obtained secondary data. After reading the chosen articles in full (for which it was possible to find the keywords in the title or abstract), those that did not include the information related to the objective of the present study were excluded. It is then possible to recognize this analysis, as shown in figure 1, which represents the detailed flowchart of the search stages carried out in the present study. To this end, the methodology was divided into four stages in order to follow the PRISMA protocol, whose first stage included the identification from the searches of the terms in the databases presented, and, after collecting the complete texts, they went through the second stage, which would be the screening, in which the eligibility criteria were applied in the search in the databases. The third stage then proceeded with the selection of clinical and experimental studies with primary results, consisting of the selection made at screening, and, finally, those selected after complete reading to eliminate the articles outside the context of the review and confirm the analysis, in addition to eliminating the duplicateness, in which the included ones were obtained (Donato & Donato, 2019).

Figure 1 - Search flowchart. It presents the logical sequence of Identification, Screening, Eligibility and Inclusion of the articles found in the search.



Legend: VHL (Virtual Health Library; MEDLINE (Medical Literature Analysis and Retrieval System Online); LILACS (Latin American and Caribbean Literature in Health Sciences); IBECS (Spanish Bibliographic Index in Health Sciences); WPRIM (Index Medicus for the Western Pacific); VETINDEX (Brazilian Journals in Veterinary Medicine and Animal Science); BDENF (Nursing Database); BINACIS (Bibliografía Nacional en Ciencias de la Salud Argentina); Sec. Est. Saude SP (São Paulo State Health Secretariat); He collects SUS (Unified Health System). Source: Authors.

RESULTS AND DISCUSSION

After defining the theme to be searched, the searches were started from the keywords already described previously in the methodology. Having applied the inclusion and exclusion criteria, only thirty-seven articles were used for the present systematized review, which presented information directly aimed at the objectives of the present search. In turn, these articles are presented in Chart 1 below and their results will be discussed below. It is worth mentioning that the PRISMA methodology was used for the development of this review, to search and extract the results of the articles.

Huger and his collaborators (2019) found significantly important differences in androgen anabolic steroid (EAA)-dependent users. When compared to dependent users, non-dependent users used the substance approximately two years less and presented fewer problems in several areas, among which are presented in this review in classes of variables, namely: Psychological Variables: Lower values of Depression, Fatigue, Anxiety, Aggression, Report of Short Temper, Sleep Problems and Reduced Appetite. Medical Variables: Fewer Liver Problems, Hypertension, Reduced Sex Drive, and Sexual Dysfunction. Cognitive Variable: Fewer Memory Problems. Variable – Cerebral Volume and Cortex Thickness in area: Smaller volume of the Nucleus Accumbens, Left Lobe (Orbital, Mid-Temporal, Lingual, Caudal Mid-Forehead) and Right Lobe (Cuneus, Caudal Mid-Front, Supremarginal, Superior Front and Minor Lingual).

When evaluating the personality domains as well as the levels of impulsivity, Ability to Delay Gratification, Acceptance of Infidelity, Neuroticism and Extraversion, Argibay (2018) observed in his study changes that were quite expressed in users of AEAs. Among the results, the author found low Gratification scores, high attitudes of Infidelity, greater Neuroticism, Openness, Extraversion, and Impulsivity in the volunteers who used AAS.

In a cross-sectional experimental study, Reggiani and colleagues (2019) investigated possible differences in glycemic control, lipid profile, adipose tissue, expression of genes involved in energy metabolism, and skeletal muscle microstructure and pancreas of female mice that consumed a diet rich in trans fatty acids (TFAs) combined with AAS. As a result, they observed an increase in the body mass of the animals that consumed a standard diet combined with EAA and an increase in energy intake in the animals with a diet rich in trans fat, mainly combined with EAA. Regarding glucose kinetics, the authors reported an increase in blood glucose and a smaller area on the curve in the animals that consumed a diet rich in trans fat without combination with AAS. However, when fed with a standard diet and with low intake of AAS, the animals showed a greater and faster glucose decay in the intolerance test. In the pancreas, the authors observed higher gene expression of the

glucose transporter (GLUT-2) and the enzyme Glucokinase (important in the uptake and regulation of the glycolytic pathway) in animals that consumed a diet rich in TFA, especially when combined with AAS. When they evaluated the changes in the skeletal muscle of the animals, they observed an increase in mass, greater parenchymal distribution and in the diameter of the myocytes of the animals, in addition to increasing the gene expression of the glucose transporter in this tissue (GLUT-4) and the protein carnitine-palmitoyl transferase (CPT) (important in the lipolysis process) in the animals that consumed a standard diet in combination with EAA and in the animals that consumed a diet rich in AGT, especially when combined with AAS. When evaluating the lipid profile, the authors observed an increase in triacylglycerol and a decrease in high-density lipoprotein (HDL) in total cholesterol and low-density lipoprotein (LDL) in plasma, especially when the animals consumed a diet rich in TFA combined with AAS. Regarding white and brown adipose tissues, the same authors observed an increase in the gene expression of Acetyl-CoA Carboxylase (ACC) and Fatty Acids Synthase (AGS) (brown adipose tissue) in white adipose tissue in animals that consumed a standard diet, however, when combined with AAS and with the consumption of a diet rich in AGT, the expression of these same genes decreased. Finally, they observed an increase in uncoupling protein 1 (UCP-1) (important in the thermogenic characteristic of brown adipose tissue) in animals that consumed a diet rich in TFA, especially when combined with the use of AAS.

In a clinical study with young adult recreational weightlifters and recreational bodybuilding athletes, Souza and his collaborators (2019a) observed important changes in shear rate, cardiovascular behavior in response to Sympathetic Neuromuscular Activity (MSNA), and C-reactive protein at high sensitivities (CRP) in AAS users when compared to volunteers who did not use it. In this study, increased values were found in Heart Rate (HR), Systolic Blood Pressure (SBP), Diastolic Blood Pressure (DBP) and Mean Heart Rate (MAP), in MSNA per minute and per 100m heartbeat, in addition to increases in LDL and CRP in young people who used AAS when compared to those who also performed the same exercise modalities, however, did not use this substance. In addition to these findings, the authors recorded a decrease in foot-and-mouth disease and an increase in the retrograde and oscillatory shear rate, in the dilation mediated by the resting diameter and peak flow of the brachial artery in young AAS users.

Ganson & Cadet (2018), through a cross-sectional study with secondary data, evaluated whether there was a correlation between young male AAS users and dating violence. This study included 2080 young people (n=2080) and, when working with the data, the authors found a 1.1 times higher proportion of dating violence in men who used or

used AAS at least once when compared to their peers who never used it. In addition, it was possible to observe in AAS users at least one suicide attempt, violence against the person they met and unjustified sexual contact when compared to those who had never consumed these substances at least once.

In a cohort study by Horwitz et al. (2019), the authors aimed to investigate the morbidity and mortality of male gym-goers in Denmark who were users (n= 545) or not (n=5450) of AAS. Their findings were quite relevant and frightening at the same time. They had a thirteen-fold mortality rate in AAS users when compared to those who did not use this substance. Regarding cardiovascular disorders, the risks were three times higher in the occurrence of cardiomyopathies and atrial fibrillation and five times higher in thrombotic disorder users when compared to their peers who did not use this substance. In addition, in that same study, considerable recurrent changes in the disorders of the reproductive system of volunteers who used AAS were demonstrated. Of these, infertility had a 2.4 times higher risk, while the use of erectile dysfunction medication showed a three-fold increase and the appearance of gynecomastia thirteen times higher in these same individuals.

Chegeni et al. (2019), when evaluating through a longitudinal study possible associations between the use of AAS and physical or verbal aggression in Norwegian adolescents, did not find occurrences of such violence.

In a pilot study, Almaiman and his collaborators (2019) found decreased levels of testosterone, HDL, and Vitamin D in blood serum, followed by increases in LDL, Creatinine and urea levels, as well as increases in plasma liver (Alanine Amino Tranferase (ALT), Aspartate Amino Transferase (AST)), muscle (Creatine Kinase (CK) cardiac, skeletal muscle) and brain (CK) enzymes. They also observed changes in the hematological parameter of AAS users, such as increased hemoglobin, RBC (erythrocytes) and platelets, as well as alpha 2 proteins in the blood (nephrotic syndrome indicator).

When evaluating the functionality of HDL and the prevalence of Coronary Artery Disease (CAD) in AAS users, Souza and his collaborators (2019b) observed that volunteers who used AAS had increased SBP and DBP values and creatine, in addition to having lower HDL cholesterol efflux. In the same study, the authors reported that the number of people with CAD was 25% for arterial calcium plaques, 58% for fibrolipid plaques, 27% for lipid platelets, and 15% for calcium platelets. According to the authors, AAS users have increased two clinical cardiovascular risk indices (Castelli and Framingham Index).

In an experimental study, with the objective of investigating cardiac electrical and mechanical dysfunctions caused by chronic AAS, Seara and his collaborators (2019) observed important occurrences in male Wistars rats when exposed to an overdose of

nandrolone decanoate (DECA). The authors observed a decrease in the power of the high-frequency band concomitantly with the increase in the low-frequency band. In addition, they observed a decrease in the levels of messenger ribonucleic acid (mRNA) of the muscarinic receptor type 2 (M2R), an increase in the interval between depolarization and repolarization of the cardiac ventricles (QTc interval), in the action potential by 30% (APD30) and by 90% (APD90) in the animals that were submitted to AAS overdose. They also observed a decrease in the density of the L-type calcium stream and the transient potassium outflow, the calcium release charge by the sarcoplasmic reticulum and an increase in the sensitivity of calcium contractil. In view of these findings, the authors conclude that DECA overdose induced the cardiac rhythmic and mechanical abnormalities described above.

In an experimental study, in which they evaluated the effect of an AAS in atherosclerosis model mice (LDLrÿ/ÿ), Andrade and his collaborators (2019) observed an increase in TG in non-HDL cholesterol in lipid peroxidation, in oxidized LDL, in Tumor Necrosis Factor alpha (TNF-alpha) corroborating the lipid deposition by area in the aortic wall and atheromatous plaque in LDLry/y mice submitted to the use of AAS.

SUMMARY AND FINAL CONSIDERATIONS

As already described, the search for a perfect body in the molds of contemporaneity (with voluminous and defined muscles) has led a large part of society to the use of AAS. A significant increase in this use could be observed in populations, especially young people and adults. However, little is said about the harm related to the indiscriminate use of these substances. Thus, the importance of the present review is indisputable, since it presents valuable information about the harm that the indiscriminate use of AAS can cause to the individual. In order to compile and synthesize the findings made in this review, the authors' considerations were presented here. Through the evidence presented by the studies, it was possible to separate the changes promoted by the use of AAS into the following groups:

- Behavioral changes; -Changes in the Structure of the Central Nervous System; - Changes in Intermediate Metabolism; - Indicators of Tissue Injury and Inflammation; - Indicators of Vascular Changes; - Cardiac Risk Indicators; •Indicators of Gonadal Changes (shown in figure 2).

BEHAVIORAL CHANGES:

- ↑from Depression, ↑Fatigue, ↑Anxiety, ↑Aggression, ↑Reports of Short Temper, ↑Lack of sleep, ↑lack of appetite, ↓sexual desire (Hauger et al., 2019; Chegeni et al., 2019);

- ↓Gratification, ↑attitude of Infidelity, ↑Neuroticism, ↑Openness, Extraversion, and Impulsivity (Long et al., 2018);
- ↑Dating violence, ↑attempted suicide, ↑dating violence with sexual partners (Ganson & Cadet, 2018).

CHANGES IN THE STRUCTURE OF THE CENTRAL NERVOUS SYSTEM:

- ↓Menor volume do Núcleo Accumbens (Hauger et al., 2019);
- ↓Left Lobe (Orbital Pars, Temporal Middle, Lingual, Mid-Forehead Caudal Smaller) (Hauger et al., 2019);
- ↓Right lobe (Cuneus, Middle Caudal Front, Supremarginal, Superior Front, and Lingual minor) (Hauger et al., 2019).

ALTERATIONS IN INTERMEDIATE METABOLISM:

- ↑Glicemia, ↑GLUT 2/4, ↑Glicoquinase e CPT (Reggiani et al., 2019;
- ↑TG/LDL/LDLox (Reggiani et al., 2019; Almaiman et al., 2019; Souza et al., 2019b; (Andrade et al., 2019); Colesterol Total (Reggiani et al., 2019), Colesterol não HDL na peroxidação lipídica (Andrade et al., 2019); ↓Diminui HDL (Reggiani et al., 2019; Almaiman et al., 2019; Souza et al., 2019b; e Vitamina D (Almaiman et al., 2019);
- ↑Expressão de ACC/AGS/UCP1 (Reggiani et al., 2019);
- ↑ Clinical cardiovascular risk indices (Castelli and Framingham Index) (Souza et al., 2019b).

INDICATORS OF TISSUE DAMAGE AND INFLAMMATION:

- ↑Diâmetro do monócito (Reggiani et al., 2019);
- ↑Creatinina, ureia e Proteína α-2 (Andrade et al., 2019);
- Hemoglobin, erythrocyte and platelets (Almaiman et al., 2019);
- ↑PCR (Souza et al., 2019a);
- ↑ ALT/AST (Hepáticas no Sangue) (Almaiman et al., 2019);
- CK (Cardiac, skeletal and brain muscle creatine kinase) (Almaiman et al., 2019);
- ↑TNF alfa (Andrade et al., 2019).;
- ↑Proteína α-2 (Andrade et al., 2019).

INDICATORS OF VASCULAR CHANGES:

- ↑PAS/PAD/PAM (Souza et al., 2019a; Souza et a., 2019b);
- ↑Fibrilação Atrial (Horwitz et al., 2019);
- ↑trombose (Horwitz et al., 2019; 16, (Seara et al., 2019);
- ↑25% increase in arterial calcium plaque (Andrade et al., 2019).;
- ↑in 58% fibrolipidic plaque (Seara et al., 2019);
- ↑in 27% lipid plaque (Seara et al., 2019);
- ↑in 15% calcium plaque (Seara et al., 2019);
- ↑lipid deposition by area in the wall of the aorta artery and atheromatous plaque (Andrade et al., 2019);
- ↑the retrograde and oscillatory shear rate, the median dilation by the flow diameter at rest, the peak of the brachial artery (Souza et al., 2019a);
- ↑DAC (Souza et al., 2019b);
- ↑ Clinical cardiovascular risk indices (Castelli and Framingham Index) (Souza et al., 2019).

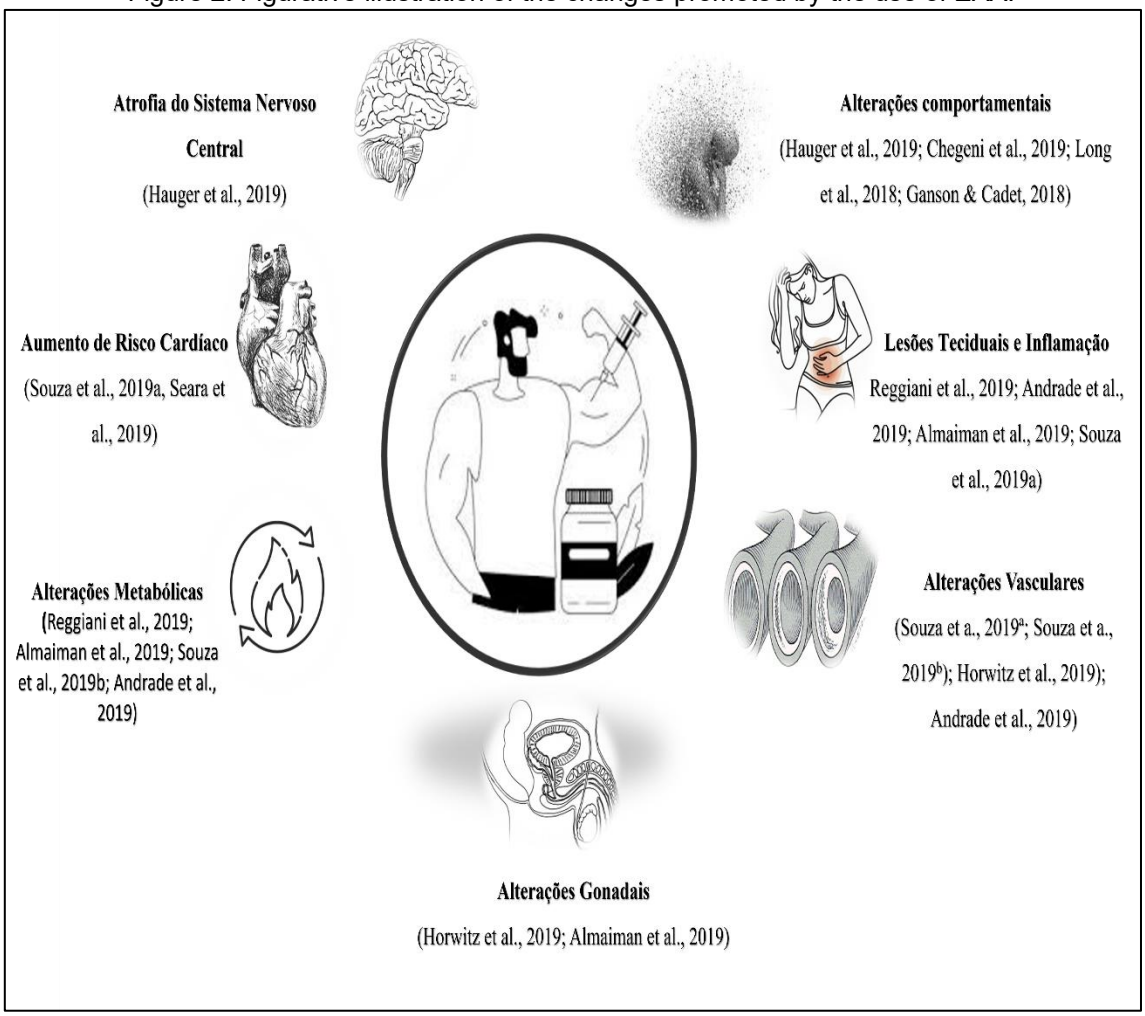
HEART RISK INDICATORS:

- ↑ FC (Souza et al., 2019a, Seara et al., 2019);
- ↑3 X more heart disease atrial fibrillation (Seara et al., 2019);
- ↑MSNA and MSNA per min. with each beat (Souza et al., 2019a);
- ↓the power of the high-frequency band concomitantly with the low-frequency band (Seara et al., 2019);
- ↓ nível de M2R (Seara et al., 2019);
- ↑QTc, of APD30 and APD90, the contractile sensitivity of calcium (Seara et al., 2019);
- ↓density of the calcium L stream and transient potassium outflow, of the calcium release charge by the sarcoplasmic reticulum (Seara et al., 2019).

INDICATORS OF GONADAL CHANGES:

- ↑2,4 X mais infertilidade (Horwitz et al., 2019; Almaiman et al., 2019);
- ↓ Testosterona endógena (Almaiman et al., 2019).

Figure 2. Figurative illustration of the changes promoted by the use of EAA.



Source: Authors

CONCLUSION

In this systematic review, it was concluded that the use of AAS can promote potential psychobehavioral changes in the structure of the central nervous system and energy metabolism, as well as promote an increase in systemic inflammatory indicators, liver, kidney and nerve tissue damage, in addition to an increase in indicators of vascular, cardiac and gonadal changes.

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TABLE 1. Characterization of the studies used for the construction of this work.

Author	Title	Objective	Nature of the Study	Sample	Key findings	Conclusion
Hauger, Lisa E. et. Al (2019)	Brain Structural Features of Anabolic-Androgenic Steroid Dependence in Men	To identify differences in brain morphology between male anabolic-androgenic steroid (AAS)-dependent and non-dependent users.	Cross-sectional study.	Eighty volunteers who were anabolic-androgenic steroid users who were dependent (n = 43) and non-dependent (n = 38).	Psychological Variables: Lower values of Depression (p<0.020), Fatigue (p=0.003), Anxiety (p=0.003), Aggression (p<0.001), Report of Short Fuse (p=0.028), Sleep Problems (p=0.009) and Reduced Appetite (p<0.001). Medical Variables: Fewer Liver Problems (p=0.007), Hypertension (p=0.026), Reduced Sexual Desire (p=0.038) and Sexual Dysfunction (p=0.031). Cognitive Variable: Fewer memory problems (p=0.001). Variable – Cerebral Volume and Cortex Thickness in area: Smaller volume of the Nucleus Accumbens (p=0.025), Left Lobe (Orbital Pars, Mid-Temporal, Lingual, Mid-Caudal Forehead) and Right Lobe (Cuneus, Middle Caudal Front, Supremarginal, Superior Front and Lingual Smaller).	Male-dependent anabolic-androgenic steroid users appear to have thinner cortex in generalized regions, specifically in prefrontal areas involved in inhibitory control and emotion regulation, in comparison to users not dependent on anabolic-androgenic steroids.
Argibay, Miguel G. (2018)	The relationship between the big five personalities, characteristics, impulsivity and anabolic steroid use	The aim of this study was to: (a) determine the differences between users and non-users of EAAs regarding their personality traits, as well as their scores on impulsivity, delay in gratification, and attitudes toward infidelity and (b) predict the use of EAAs based on these variables	Longitudinal Study	Two hundred and twenty-five male volunteers aged between 21 and 36 years, who frequented a gym.	Negative correlation between the ability to delay gratification (higher scores represent a greater ability) and impulsivity (r = 0.69, p < 0.001) and a moderate to weak negative association with infidelity (r = 0.32, p = 0.002). Openness and neuroticism showed a weak correlation with the ability to delay gratification (r = 0.22, p = 0.001; r = 0.36, p < 0.001, respectively). Impulsivity was moderately positively correlated with attitudes toward infidelity (r1/4 0.54, p < 0.001), neuroticism (r1/4 0.53, p < 0.001), and openness (r = 0.31, p = 0.004), and negatively with extraversion (r = 0.32, p = 0.003). Regarding personality traits, extraversion was negatively correlated with neuroticism (r = 0.39, p < 0.001) and positively correlated with agreeableness (r = 0.41, p < 0.001). Neuroticism showed a negative association between agreeableness and conscientiousness (r = 0.26, p = 0.019; r = 0.32, p = 0.003, respectively). Agreeableness showed a positive relationship between conscientiousness and	The results of this research highlight a key implication of impulsivity in AAS use in conjunction with traits of neuroticism, openness, and extraversion.

					openness (r = 0.34, p = 0.002; r = 0.40, p < 0.001, respectively).	
Gonçalvesa, Reggiani V. et. Al (2019)	Trans fatty acids aggravate anabolic steroid-induced metabolic disorders and differential gene expression in muscle, pancreas, and adipose tissue	To investigate the impact of a diet rich in trans fatty acids (HD) combined with EA on glycemic control, lipid profile, adipose tissue, skeletal muscle and pancreas microstructure, and expression of genes involved in energy metabolism.	Randomized cross-sectional experimental study	C57BL/6 female 12-week-old mice were maintained under controlled environmental conditions (temperature 22 ± 2 °C, air humidity 60-70%, and daily light/dark cycles of 12/12 hours).	Our results indicated that AS improved glycemic control, upregulated gene expression of Glut-4 and CPT-1 in skeletal muscle, FAS, ACC and UCP-1 in adipose tissue. AS also reduced total and LDL cholesterol in SD-fed mice. When combined with HFD, AS was unable to induce microstructural adaptations in adipose tissue, pancreatic islets, and ÿ cells, but it potentiated the upregulation of GCK and Glut-2 (pancreas) and Glut-4 and CPT-1 (skeletal muscle). HFD plus AS also downregulated the expression of FAS and ACC genes in adipose tissue. Combined with HD, AS increased circulating triacylglycerol levels, improved insulin sensitivity and glycemic control in mice.	The results indicated that AS improved glycemic control, upregulated the gene expression of Glut-4 and CPT-1 in skeletal muscle, FAS, ACC and UCP-1 in adipose tissue. AS also reduced total and LDL cholesterol in SD-fed mice. When combined with HFD, AS was unable to induce microstructural adaptations in adipose tissue, pancreatic islets, and ÿ cells, but it potentiated the upregulation of GCK and Glut-2 (pancreas) and Glut-4 and CPT-1 (skeletal muscle). HFD plus AS also downregulated the expression of FAS and ACC genes in adipose tissue. Combined with HD, AS increased circulating triacylglycerol levels, improved insulin sensitivity and glycemic control in mice.
Souza, Francis Ribeiro et. Al (2019)	Retrograde and oscillatory shear rate in young anabolic androgenic steroid users	To study the shear rate, muscle sympathetic nerve activity and C-reactive protein of young recreational weightlifters and amateur bodybuilding athletes who use (n=10) or not AAS (n=10).	Clinical study.	Twenty volunteers aged 18 to 40 years male, AAS users (AASU) (n=10) or 10 non-AAS (n=10), recreational weightlifters or amateur bodybuilding athletes.	The evaluation of doping control was negative in the UNSA group (mean T/E less than 1). In contrast, nandrolone decanoate, boldenone undecylenate, testosterone, Stanozolol were found in the AASU group. In addition, the mean T/E concentration ratio in urine was 50.75±24.46. The lifetime of AAS use was 5±3 years. The drug test assessment was positive for MD MA and amphetamine for a participant in the AASU group, and positive for cocaine for a participant in the AASNU group. In addition, both groups had similar years of resistance training (10±4 vs. 10±4 years, p=0.90)	AAS present brachial involvement, retrograde artery, and oscillatory RS, which are associated with increased ANSM. Therefore, these findings are clinically relevant because they suggest that young AAS users may be at risk for early development of atherosclerotic cardiovascular disease.

Kyle T. Ganson e Tamara J. Cadet (2018)	Exploring the use of anabolic androgenic steroids and Violence in adolescent dating among adolescent males	The objective of this secondary data analysis was to understand the relationship between AAS use and TDV in evils of adolescence. Based on the conceptual framework, the hypothesis that the ailments of adolescents who used aspirin at least once in their lives would be more likely to get involved in TDV was supported.	Cross-sectional analysis of secondary data.	This analysis included high school students from the research years of 2013 and 2015. The total number 2013 Combined Interviewee (n = 2,801) and 2015 (n = 2,618) was 5,419. be included in this analytical sample, the interviewees identified themselves as men and answered the following questions involving the use of aspirin, TDV, body image, and suicide attempts. 1.7 A final sample of 2,080 observations was used for this analysis.	The results suggested that male adolescents who used steroids at least once in their lifetime, compared to those who did not, were 1.1 times more likely to engage in adolescent dating violence. In addition, men who identified as a sexual minority were 1.1 times more likely to use anabolic androgenic steroids, as were those who had at least one suicide attempt in the previous 12 months.	The use of AAS by adolescent males is associated with multiple psychosocial factors that professionals, school staff, and parents should be aware of
Horwitz, H et. Al (2019)	Health Consequences of Anabolic Androgenic Steroid Use	To investigate mortality and morbidity among anabolic androgenic steroid (AAS) users.	This was a matched retrospective cohort study.	In this retrospective matched cohort study, 545 male subjects tested	Mortality was three times higher among AAS users than among non-user controls (hazard ratio 3.0, 95% CI 1.3–7.0). The median annual number of hospital contacts was 0.81 in the AAS user cohort and 0.36 in the control cohort (P < 0.0001). Acne, gynecomastia, and	Users of anabolic androgenic steroids have an increased risk of death and significantly more hospital admissions than their non-user peers. Side effects of ASAs and their

				positive for ASA in Danish fitness centers during the period from January 3, 2006, to March 1, 2018.	erectile dysfunction affected more than 10% of anabolic androgenic steroid users, and the prevalence of these disorders was significantly higher than in the control group (P<0.0001).	metabolites were highly prevalent. Given the high rate of abuse of anabolic androgenic steroids, these side effects are a public health problem.
Chegeni , R et. Al (2019)	Aggression and Anabolic-Androgenic Steroid Use Intention in Adolescents: A Longitudinal Study	We conducted a longitudinal investigation of the factors associated with intention to use AAS from 18 to 19 years of age, particularly examining the role of physical and verbal aggression. A sample of Norwegians completed questionnaires containing demographics, ASA use and intention, other addictions, aggression, and health measures at age 18 (N = 1,333, females = 58.9%) and 19 (N = 1,277, females = 61.7%).	A longitudinal study	From an initial sample of 3,000 (1,500 women) 17-year-olds randomly selected from the Norwegian National Institute. Registration and invitation to participate in a survey on addiction in 2012 (wave 1), 2055 (women1/4 53.0%) returned completed questionnaires (response rate 1/4 70.4%). In 2013, those who responded were contacted again (18 years old). A total of 1,333 people responded (wave 2: women = 58.9%, retention rate = 64.9%).	The third and final model, composed of all independent variables, explained 15% of the variance in the attempt to use AAS in wave 3: F (16,957) = 13.36, p < 0.01. Here, men (sex: b 1/4 0.066, p < 0.01) and individuals living alone (b 1/4 0.068, p < 0.05) had a higher intention to use AAS in wave 3. In addition, last year, the use of AAS in wave 2 had a positive association (b = 0.296, p < 0.05) with the intention to use AAS in wave 3	Our findings indicate temporal stability in the intention to use AAS, as well as the influence of demographic and health factors on the intention to use AAS between 18 and 19 years of age. The implications of the results for practice and future research are discussed.

				One year later (wave 3), participants were contacted again. A total of 1277 individuals (women = 61.7%) responded (retention rate = 62.1%).		
Almaiman, A A et. Al (2018)	Side effects of anabolic steroids used by athletes in Unaizah Gyms, Saudi Arabia: a pilot study	The present study aimed to investigate the abuse of anabolic steroids among athletes in the city of Unaizah, Qassim, Saudi Arabia.	Cross-sectional pilot study	A cross-sectional study was carried out, in which 16 regular gym goers, 12 (?)	Subjects reported having taken a 3-month course of an AAS composed of three compounds (testosterone enanthate, nandrolone decanoate, and methandienone). A two-week interval separated each of the courses, during which tamoxifen citrate (40 mg per day) and clomiphene citrate (10 mg per day) were taken to control serum testosterone levels. Ingestion of a course of AAS had notable effects on some parameters related to kidney function. However, three courses or more treatments of ASA showed abnormal liver and heart enzymes. In addition, endogenous testosterone levels decreased dramatically with long-term use of AAS (more than 10 courses). Increased alpha 2 protein taking more than 10 cycles, which can cause acute phase reaction of infection or inflammation of the liver.	AAS products should be controlled by the Saudi Ministry of Health and should not be taken randomly without the supervision of the healthcare professional.
Souzaa, F R et. Al (20190)	Decreased HDL-Mediated Cholesterol efflux and Coronary Artery Disease in Young Male Anabolic Androgenic Steroid Users	In the present study, we evaluated the functionality of HDL, which could be one of the mechanisms of the atherosclerotic process. We also evaluated the prevalence of subclinical CAD in AAS users.	This was a cross-sectional study.	68 healthy male participants. 50 participants of the same age were evaluated and allocated: 20 AAS users (AASU group), 20 non-AAS users (AASNU group).	Cholesterol efflux was lower in SUA compared to UNSA and SC (20 vs. 23 vs. 24%, respectively, $p < 0.001$). However, the latency time for LDL oxidation was longer in AASU compared to AASNU and SC (41 vs. 13 vs. 11 min, respectively, $p < 0.001$). We found at least 2 coronary arteries with plaques in 25% of SUA. None of the AASNU and SC had license plates. The duration of AAS use was negatively associated with cholesterol efflux.	This study indicates that AAS abuse impairs HDL-mediated cholesterol efflux. Long-term AAS use appears to be correlated with lower cholesterol efflux and early subclinical CAD in this population.

				Both groups (AASU and AASNU) were either recreational weightlifters or amateur bodybuilding athletes recruited from gyms.		
Seara, F A C et. Al (2019)	Cardiac electrical and contractile disturbances promoted by anabolic steroid overdose are associated with delayed autonomic imbalance and Ca2+ deficiency management	To investigate cardiac electrical and mechanical dysfunctions caused by chronic anabolic steroids (AS). overdose.	Longitudinal experimental study	Male Wistar rats were treated with nandrolone decanoate (DECA) or vehicle (CTL) for 8 weeks.	Compared with the CTL group, the DECA group exhibited decreased high-frequency band power density (HF) and increased low-frequency (LF) power density, the mRNA level of cardiac M2R was decreased. QTc interval at the 2nd, 4th, and 8th weeks, as well as APD30 and APD90 were increased by DECA. The density of Ito decreased, while ICaL density was increased by DECA. The charge and release of Ca2+ in the SR were decreased by DECA, while the contractile sensitivity to Ca2+ was increased in relation to the CTL group.	DECA overdose induced cardiac rhythmic and mechanical abnormalities that may be associated with autonomic imbalance, upregulated ICaL and negative-regulated Ito, abnormal Ca2+ SR mobilization, and increased contractile sensitivity to Ca2+.
Andrade, T U et. Al (2019)	Stanozolol promotes lipid deposition in the aorta through an imbalance in inflammatory cytokines and oxidative status in LDLr knockout mice fed normal diet	The aim of this study was to evaluate the effect of an anabolic steroid, stanozolol, in a model of atherosclerosis and to investigate the involvement of inflammatory cytokine modulation and oxidative stress in vascular lipid deposition.	Cross-sectional experimental study	This study used male LDL receptor knockout mice (LDLrÿ/ÿ)	Our results suggest that the anabolic steroid stanozolol, in the absence of functional LDL receptors, by increasing systemic inflammation and oxidative stress, may increase the risk of development and progression of atherosclerosis.	This study demonstrated for the first time that treatment with stanozolol for 8 weeks was able to increase vascular lipid deposition in LDLr-/ÿ mice. This effect can be attributed, at least in part, to a change in the lipid profile and probably to systemic inflammation and oxidative stress, all independent of a Western-type diet.

THE INTERCONNECTION BETWEEN DIABETES AND PERIODONTAL DISEASE

https://doi.org/10.56238/sevened2024.031-065

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ABSTRACT

This chapter explores the bidirectional relationship between diabetes mellitus and periodontal disease. Diabetes, with its systemic complications, increases the risk of periodontal infections and affects oral health. Periodontal disease, in turn, can make it difficult to control diabetes. The chapter highlights the importance of an integrated approach in dental practice, addressing the physiological and pathological bases of these conditions and effective management strategies, which is essential for dental students.

Keywords: Diabetes mellitus. Periodontal disease. Glycemic control.

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INTRODUCTION

Diabetes mellitus, characterized by impaired blood sugar regulation, has systemic implications that go beyond simple glycemic control. Its effects on the immune system and wound healing have direct implications for oral health, increasing the risk of periodontal infections and complicating dental treatment. On the other hand, periodontal disease, a chronic inflammatory condition that affects the supporting tissues of the teeth, is not just a consequence of poor glycemic control in diabetics. It can also influence diabetes management, creating a challenging cycle that requires careful management.

The interaction between diabetes and periodontal disease is a classic example of how systemic conditions and oral health are intertwined. This two-way relationship underscores the importance of a holistic view in dental practice, where treatment does not only focus on the teeth and gums but also takes into account the patient's overall health. For future dentists, understanding this dynamic is crucial to providing comprehensive and effective care.

In this chapter, we will address the physiological and pathological underpinnings of these two conditions, exploring how they influence each other. We will also discuss strategies for the effective management of these diseases, emphasizing the importance of patient education, prevention, and a multidisciplinary treatment approach. This knowledge is vital for dental students, as it equips future professionals with the tools they need to treat not only oral disease, but also to understand and manage its systemic implications.

DIABETES MELLITUS: AN OVERVIEW

Diabetes mellitus is a chronic condition that affects millions of people worldwide and has significant implications for oral health. Understanding this disease is critical for the dental professional, given its influence on periodontal health and dental treatment strategies.

DEFINITION AND TYPES

Diabetes mellitus is characterized by high blood glucose levels due to problems in the production or action of insulin, a hormone produced by the pancreas. There are several types of diabetes, each with its own characteristics:

- **Type 1 diabetes**: This autoimmune form of the disease results in the destruction of the beta cells of the pancreas, which produce insulin. Therefore, individuals with type 1 diabetes require insulin therapy to control their blood glucose levels.

- **Type 2 diabetes**: Most common, it occurs when the body becomes insulin resistant or does not produce enough insulin. Lifestyle factors such as obesity and physical inactivity play an important role in its development.
- **Gestational Diabetes**: It develops in some women during pregnancy and usually resolves after delivery. However, it increases the risk of developing type 2 diabetes in the future.

PATHOPHYSIOLOGY

In diabetes, the inability to properly regulate blood glucose can lead to chronic hyperglycemia, which, over time, causes damage to various organs, blood vessels, and nerves. These systemic effects include:

- **Microvascular Complications**: Such as retinopathy, which can lead to blindness, and nephropathy, which can result in kidney failure.
- **Macrovascular Complications**: Such as heart disease and stroke.
- **Neuropathies**: Which can cause pain and numbness in the limbs, in addition to other problems.

IMPACT ON ORAL HEALTH

For dentists, it's crucial to understand how diabetes affects the mouth. Diabetic patients are at higher risk of:

- **Periodontal Disease**: Due to increased susceptibility to infection and impaired healing, patients with diabetes have an increased risk of developing periodontal disease, which can be more severe and progress more rapidly.
- **Xerostomia (Dry Mouth):** Diabetes can decrease saliva production, leading to dry mouth, which increases the risk of cavities, infections, and oral discomfort.
- **Oral thrush**: A fungal condition that is more common in people with diabetes, due to changes in the composition of saliva and reduced ability to fight infections.

CLINICAL MANAGEMENT

The management of diabetes in the dental context involves:

- **Thorough Evaluation**: Understanding the patient's medical history and current diabetes management is crucial for any dental treatment.
- **Communication with Healthcare Professionals**: Collaborating with physicians to ensure that the patient's glycemic control is optimized prior to dental procedures, especially surgeries.

- **Patient Education**: Instruct patients on the importance of oral hygiene and regular blood glucose control to prevent oral complications.

PERIODONTAL DISEASE: DEFINITION AND CAUSES

Periodontal disease is one of the most common and serious oral problems, affecting a large proportion of the population. Understanding it is essential for dental students, as it involves not only oral health but also has connections to systemic conditions such as diabetes.

DEFINITION AND PROGRESSION

Periodontal disease refers to a group of inflammatory conditions that affect the supporting tissues of the teeth. This disease typically begins with gingivitis, an inflammation of the gums, and can progress to periodontitis, a more serious condition that affects the bone and ligaments that support the teeth.

GENGIVITY

- **Cause**: Plaque buildup due to poor oral hygiene.
- **Symptoms**: Red, swollen gums and bleeding during brushing or flossing.

PERIODONTITIS

- **Progression**: If gingivitis is left untreated, it can develop into periodontitis. At this stage, the gums begin to pull away from the teeth, forming "pockets" that become infected.
- **Consequences**: Infection and the body's immune response can destroy connective tissue and alveolar bone, leading to mobility and possible tooth loss.

RISK FACTORS

Several risk factors are associated with the development of periodontal disease, including:

- **Poor Oral Hygiene**: Lack of brushing and flossing regularly allows plaque to build up and harden, forming tartar.
- **Smoking**: One of the most significant risk factors for the development of periodontal disease. Smoking also decreases the effectiveness of treatment.

- **Diabetes**: Patients with diabetes, especially those with inadequate glycemic control, have an increased risk of developing periodontal disease. Hyperglycemia contributes to greater inflammation and difficulties in healing.
- **Other Factors**: Advanced age, genetics, stress, hormonal fluctuations, inadequate nutrition, and certain medications can also contribute to the risk of periodontal disease.

CLINICAL AND TREATMENT IMPLICATIONS

Early diagnosis and treatment of periodontal disease is crucial. Treatment can vary depending on the severity of the disease and includes:

- **Professional Cleaning**: Removal of plaque and tartar above and below the gum line.
- **Scaling and Root Planing**: Non-surgical procedures to clean the roots of the teeth and reduce periodontal pockets.
- **Education and Oral Hygiene**: Teaching patients proper oral hygiene techniques to keep the disease under control.
- **Surgical Interventions**: In advanced cases, tissue grafts, bone regeneration, or other surgical procedures may be necessary.

THE CONNECTION BETWEEN DIABETES AND PERIODONTAL DISEASE

EFFECTS OF DIABETES ON PERIODONTAL HEALTH

Relationship Between Diabetes and Periodontal Inflammation

Diabetes, especially when poorly controlled, significantly increases the risk of developing and progressing periodontal disease. This risk is driven by several physiological changes associated with diabetes:

- **Vascular Changes**: Chronic hyperglycemia can lead to changes in blood vessels, reducing blood flow to periodontal tissues. This results in a reduction in nutrient supply and the ability to remove waste, harming gum health.
- **Compromised Immune Function**: Diabetes can compromise the function of leukocytes (white blood cells), which are essential in the fight against periodontal infections. This makes the elimination of bacteria in the periodontal area less effective.
- **Exacerbated Inflammatory Response**: Diabetic patients often exhibit an increased inflammatory response. This exacerbated inflammation can accelerate the degradation of periodontal tissues.

Studies show that inadequate blood glucose control is directly related to the severity of periodontal disease. Therefore, effective diabetes management is a crucial component in the treatment of periodontal disease in diabetic patients.

THE INFLUENCE OF PERIODONTAL DISEASE ON DIABETES CONTROL

Impact of Periodontal Health on Glucose Metabolism

Periodontal disease is not only more prevalent and severe in patients with diabetes, but it can also influence the control of diabetes itself. The bidirectional relationship between these conditions creates a challenging cycle:

- **Insulin Resistance**: The systemic inflammation resulting from periodontitis can contribute to insulin resistance, a key factor in the development and progression of type 2 diabetes.
- **Difficulty in Glycemic Control**: The chronic inflammation associated with periodontal disease can make it difficult to control blood sugar levels, making diabetes management more challenging.
- **Inflammatory Cycle**: The presence of chronic inflammation in periodontal disease can aggravate the systemic inflammatory response, exacerbating both periodontal disease and diabetes.

Research indicates that effective treatment of periodontal disease may have beneficial effects on glycemic control in diabetic patients, suggesting that periodontal management is an integral part of diabetes management.

MANAGEMENT AND TREATMENT STRATEGIES

Effective management of patients with diabetes and periodontal disease requires an integrated approach that encompasses both oral health and diabetes management.

EFFECTIVE DIABETES MANAGEMENT

Glucose Regulation

- **Frequent Blood Glucose Monitoring**: Essential for the appropriate adjustment of therapies and prevention of complications.
- **Drug and insulin therapy**: Adjustments to medication and insulin are crucial and should be done in a personalized way, under medical guidance.
- **Nutrition and Physical Activity**: Adherence to a nutritionally balanced diet and regular exercise are essential for maintaining glycemic balance.

Patient Self-Care Education

- **Self-Management Skills**: Teach patients effective methods for monitoring their blood glucose and highlight the importance of a healthy lifestyle.
- **Risk Awareness**: Inform patients about the dangers related to diabetes, including the consequences for oral health.

TREATMENT OF PERIODONTAL DISEASE

Oral Hygiene Practices

- **Brushing and Flossing Techniques**: Emphasize the importance of proper oral hygiene practices for plaque removal and prevention of periodontal disease progression.
- **Dental Visits for Professional Cleaning**: Periodic visits to the dentist are essential for maintaining periodontal health.

Professional Interventions

- **Scaling and Root Planing**: Techniques to eliminate plaque and tartar
- **Advanced Periodontitis Treatment**: In more severe situations, surgical procedures may be necessary to recover damaged tissues.

Inflammation Management

- **Use of Antibiotics and Antimicrobial Agents**: These can be applied to control infection and inflammation.
- **Pain and Inflammation Management**: Prescribing anti-inflammatory medications to manage symptoms associated with periodontal disease.

COLLABORATIVE APPROACH IN HEALTH

Integration between Health Professionals

- **Dialogue between Dentists and Doctors**: Effective communication between professionals is vital to ensure a complete and synchronized treatment.
- **Integrated Care**: The treatment plan should cover both oral health and diabetes management, with each specialist aware of the impact of their area on the patient's overall health.

PREVENTION AND EDUCATION

Patient Instruction

Knowledge is Power

- **Elevation of Consciousness**: It is imperative that patients are informed about the risks of periodontal disease linked to diabetes and, conversely, the diabetic risks associated with periodontitis.
- **Empowerment through Self-Management**: Guiding patients in the effective management of diabetes and maintaining optimal oral hygiene is crucial.

Communication Tactics

- **Educational Resources**: Employ brochures, videos, and hands-on demonstrations to teach correct oral care.
- **Educational Programs**: Conduct information sessions for vulnerable groups, with a focus on prevention and proper management.

Multidisciplinary Education

- **Workshops and Seminars**: Encourage participation in educational programs that address both oral health and diabetes.
- **Collaboration among Specialists**: Promote educational events that integrate dentists and other health professionals.

CONCLUSION

Understanding the dynamics between diabetes and periodontal disease is crucial for modern dentistry. This two-way interrelationship underlines the need for a holistic and integrated approach to health. Dental professionals must be equipped not only to treat oral conditions, but also to identify and manage the complex interactions between oral and systemic health. Ongoing patient education and collaboration across the various healthcare disciplines are vital to the effective management of these interlinked conditions.

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IMPACT OF ASBESTOS EXPOSURE ON THE PROGRESSION OF PLEURAL MESOTHELIOMA

https://doi.org/10.56238/sevened2024.031-066

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ABSTRACT

This paper addresses the relationship between asbestos exposure and the development of malignant pleural mesothelioma, a neoplasm that is difficult to diagnose and has a poor

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prognosis. The aim of the study is to analyze the effects of asbestos on the progression of pleural mesothelioma, describing its pathogenic mechanisms, clinical and diagnostic manifestations and therapeutic options. The methodology used consisted of a review of the scientific literature and the analysis of 10 studies that investigate the etiology, pathophysiology, histopathological findings and treatments of pleural mesothelioma. The results show that exposure to asbestos is the main risk factor for this disease, and that its inhalation causes chronic inflammation, oxidative damage and genetic mutations that culminate in the malignant transformation of mesothelial cells. Clinically, mesothelioma presents insidiously with nonspecific symptoms such as progressive dyspnea, chest pain, and pleural effusion, making it difficult to diagnose early. Histopathological analysis is essential to identify epithelioid, sarcomatoid and biphasic subtypes, which determine prognosis and therapeutic options. Although imaging techniques and immunohistochemical studies are useful for diagnosis, patients are usually diagnosed in advanced stages, limiting treatment options to combinations of chemotherapy with pemetrexed and cisplatin, or to radical surgical procedures that pose high risks. Despite advances in immunotherapy and targeted therapies, the survival rate remains low. In the final considerations, the importance of developing better prevention, early detection and more effective treatment strategies is highlighted, as well as the need to continue with rigorous policies for the control and elimination of asbestos in the workplace and environment. This study reaffirms the urgent need to face this disease in a multidisciplinary manner and improve the quality of life of affected patients.

Keywords: Occupational exposure. Carcinogenesis. Asbestos. Pleural mesothelioma. Asbestos.

INTRODUCTION

Exposure to asbestos has been widely recognized as a major risk factor in the development of various respiratory pathologies, with pleural mesothelioma being one of the most serious and with the worst prognosis. Asbestos is a group of fibrous minerals that, due to its heat resistance and durability properties, was widely used in the construction industry and in manufactured products. However, asbestos fibers are extremely dangerous when inhaled, as they are deposited in lung and pleural tissues, generating a chronic inflammatory process that can lead to the development of malignant diseases, such as pleural mesothelioma. [Acts 1, 2]

This type of cancer, which mainly affects the pleura, is characterized by its direct relationship with the inhalation of asbestos fibers, which can remain in the body for decades before manifesting clinical signs. Despite restrictions on the use of asbestos in many countries, its industrial use and occupational exposure continue to pose a public health challenge, particularly in regions where regulations are less stringent or non-existent. The persistence of this exposure remains a determining factor in the incidence of mesothelioma, and its ability to induce malignant transformation in mesothelial cells has been extensively studied. [3]

From a pathophysiological point of view, asbestos inhalation leads to the activation of chronic inflammatory processes, cell damage and the eventual malignant transformation of mesothelial cells. Asbestos fibers, when inhaled, are deposited in the pleura and, over time, induce inflammatory responses that can evolve into an oncogenic environment. Pleural mesothelioma is distinguished by its aggressive progression and resistance to conventional therapies, underscoring the importance of understanding the mechanisms underlying its development in order to improve diagnostic and treatment strategies. [Acts 4, 5]

In the field of pathological anatomy, pleural mesothelioma is characterized by the proliferation of malignant mesothelial cells that infiltrate the pleura, generating pleural thickening, pleural effusion and, in advanced stages, involvement of lung tissue and adjacent structures. Histopathological and immunohistochemical techniques are essential to differentiate mesothelioma from other pleural neoplasms, given its morphological variability and the coexistence of epithelial, sarcomatoid and biphasic patterns. [6]

Therefore, the present work aims to analyze the impact of asbestos exposure on the progression of pleural mesothelioma, focusing on the semiology, pathophysiology and pathological anatomy aspects of the disease. Likewise, it will seek to identify the factors that influence the aggressiveness of mesothelioma and its resistance to current treatments, in order to provide new perspectives for its clinical approach.

MATERIALS AND METHODS

The present study was developed under a literature review approach, with the aim of analyzing and synthesizing the available scientific evidence on the impact of asbestos exposure on the progression of pleural mesothelioma. To this end, a search of scientific articles was carried out in internationally recognized databases, such as the Virtual Health Library (VHL) and SciELO. The descriptors used for the search included 'asbestos', 'pleural mesothelioma', 'pathophysiology', 'pathological anatomy', and 'occupational exposure', which were used in combination using Boolean operators to refine the results and ensure the relevance of the selected studies.

The selection of articles was limited to publications in English, Spanish and Portuguese, covering a period of five years, from 2019 to 2024. Studies that specifically addressed the relationship between asbestos exposure and the development or progression of pleural mesothelioma were established as inclusion criteria. Articles that did not have full access or that did not meet the previously established criteria were excluded.

Once the results were obtained, the articles were critically evaluated through a detailed reading of the abstracts and, if relevant, of the full text. A data collection table designed specifically for the study was used, in which relevant aspects such as the type of study, the sample, the main findings and the conclusions about the relationship between asbestos exposure and the progression of pleural mesothelioma were recorded. This table allowed an adequate systematization of the information for subsequent analysis and discussion.

Finally, the extracted data were organized and presented according to the key variables of the study: semiology, pathophysiology and pathological anatomy of pleural mesothelioma, with emphasis on how these dimensions are affected by asbestos exposure. The information collected was discussed and compared with previous literature, in order to establish robust conclusions on the topic in question.

THEORETICAL FRAMEWORK

Malignant pleural mesothelioma is a rare and highly aggressive neoplasm that originates in the mesothelial cells that line the pleura, the membrane that surrounds the lungs. His medical history is closely related to exposure to asbestos, a material that has been widely used in industry for its insulating and heat-resistant properties. Over the decades, a strong association between asbestos exposure and the development of pleural mesothelioma has been documented, especially in individuals exposed occupationally in factories, mines, or in the construction industry. [Acts 1, 2]

This type of cancer has a long latency period, usually between 20 and 50 years, which complicates early diagnosis and, in many cases, reduces effective therapeutic options. Clinical presentation usually includes dyspnea, chest pain, and, in more advanced stages, pleural effusion, leading to progressive deterioration of respiratory function. The causes of mesothelioma are almost exclusively linked to exposure to asbestos fibers. [7]

This mineral, when inhaled, is deposited in the pleura, which generates a chronic inflammatory process that, over time, can induce the malignant transformation of mesothelial cells. Other risk factors, although less common, include exposure to ionizing radiation or certain chemicals, as well as inherited genetic mutations, such as those related to the BAP1 gene, which may predispose to the development of the disease. The incidence of mesothelioma has decreased in some regions following the ban on asbestos use, but it remains a clinical concern due to cases that continue to emerge from past exposures. [Acts 8, 9]

Asbestos, or asbestos, is a group of fibrous minerals composed primarily of silicates. There are different types of asbestos, the most common being chrysotile, crocidolite and amosite. The toxicity of asbestos lies in its ability to fragment into small fibers that, when inhaled, penetrate deep into the lungs. These fibers are biologically active and resistant to degradation, causing them to remain in lung tissue for years or even decades. In addition to its association with mesothelioma, asbestos is linked to other respiratory pathologies such as asbestosis, diffuse pulmonary fibrosis, and lung cancer.[8]

The use of asbestos was widespread globally during the 20th century in various industries, including construction, the manufacture of insulation materials, and the automotive industry. However, over time, its danger was recognized, and many countries have banned or severely limited its use. Despite this, asbestos is still present in many old structures and materials, which implies a continuous risk of exposure, particularly in demolition work, renovation or in contaminated areas. Medical surveillance of exposed workers and proper management of asbestos waste are essential to minimise new cases of related diseases. [8]

This mineral continues to be a challenge for both public health and clinical medicine. Research into the mechanisms of action of asbestos, methods of early detection of its effects and therapeutic strategies for the diseases it causes are crucial to improve the prognosis of those affected and prevent new exposures. [8]

In this sense, understanding the pathophysiology of cancer induced by asbestos exposure is essential, as it involves several complex mechanisms that develop over time. Firstly, when asbestos fibres are inhaled, due to their small size and ability to resist

biological degradation, they pass through the defences of the respiratory system and are deposited in the pleura or in the pulmonary alveoli. At these sites, the fibers generate a chronic inflammatory response, which is the basis for many of asbestos' pathogenic effects. [4, 5, 10]

Alveolar macrophages attempt to phagocytose these fibers, but given their size and shape, they fail to eliminate them completely, resulting in sustained activation of these macrophages and the release of pro-inflammatory mediators, such as cytokines and reactive oxygen species (ROS). This prolonged inflammatory process creates a favorable local environment for tissue damage, contributing to the development of fibrosis and, in the long term, to the malignant transformation of mesothelial cells. [4, 5, 10]

At a second level, oxidative damage caused by chronic inflammation and the presence of asbestos fibers contributes to the genetic instability of cells. Reactive oxygen species generated by inflammation induce mutations in cellular DNA, which interferes with normal DNA repair mechanisms and causes cumulative genetic alterations. [4, 5, 10]

Among the most relevant mutations are those that affect tumor suppressor genes such as BAP1, which plays a crucial role in the regulation of the cell cycle and the response to DNA damage. The loss of BAP1 function has been directly related to the predisposition to mesothelioma. Other affected genes include CDKN2A and NF2, which are also involved in the regulation of cell growth and differentiation, and whose alteration facilitates the uncontrolled proliferation of affected cells.[Acts 9, 11, 12]

Finally, asbestos' ability to trigger carcinogenesis is not limited to direct DNA damage. The fibers can also stimulate processes such as angiogenesis and the activation of pro-oncogenic signaling pathways, which favor the survival and expansion of malignant cells. In addition, recent studies suggest that asbestos fibers induce epigenetic changes, altering gene expression without modifying the DNA sequence, further contributing to the malignancy of cells. This pro-tumor environment, sustained by chronic inflammation, oxidative damage, and genetic and epigenetic alterations, creates an ideal substrate for the development of pleural mesothelioma and other neoplasms related to asbestos exposure. [Acts 9, 11, 12]

Understanding the pathophysiological mechanisms underlying pleural mesothelioma is key to adequately addressing its clinical manifestations and diagnosis. The clinical symptoms of mesothelioma often present in an insidious manner, with symptoms that can be mistaken for other common respiratory conditions, delaying diagnosis in many cases. Common signs and symptoms include progressive dyspnea, persistent chest pain, and in many cases, recurrent pleural effusion. [Acts 13, 14]

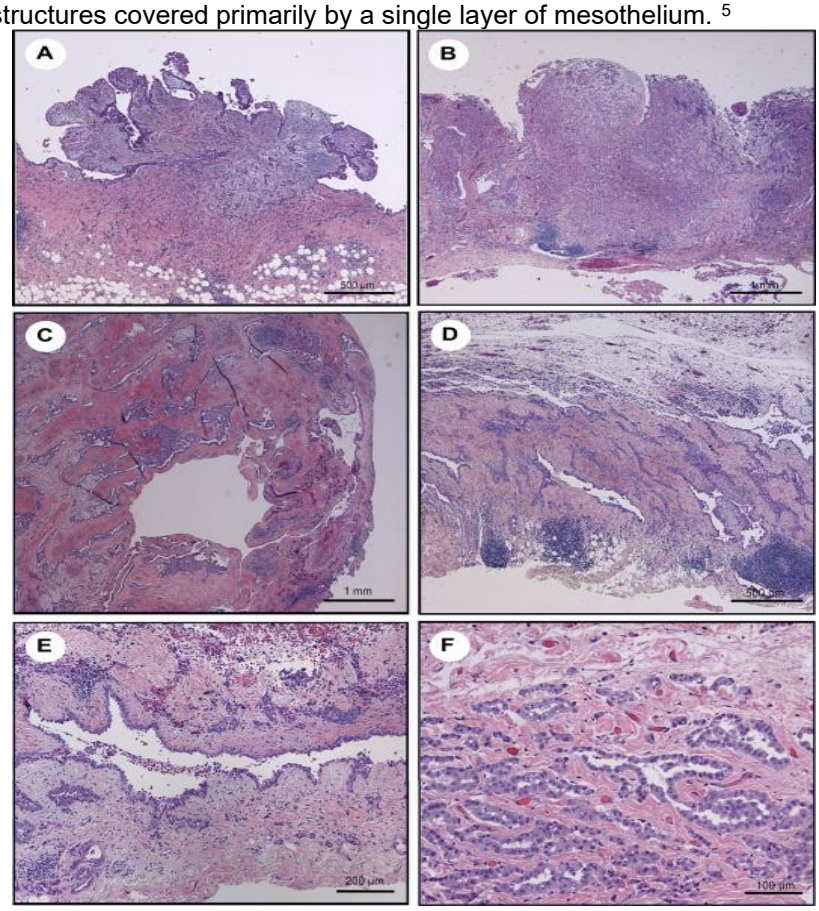
These symptoms are usually associated with local invasion of the tumour into the pleura and, in advanced stages, there may be weight loss, fatigue and non-productive coughing. The semiology of pleural mesothelioma is crucial, since physical examination can detect decreased breath sounds, dullness to percussion due to pleural effusion, and signs of pulmonary restriction. Once suspicious clinical symptoms are established, diagnosing pleural mesothelioma requires a combination of imaging methods and invasive testing. [Acts 13, 14]

Chest x-rays are usually the first test requested, revealing the presence of pleural effusion or pleural thickening. However, computed tomography (CT) and magnetic resonance imaging (MRI) are more accurate tools for assessing tumor extent and characteristics. Pleural biopsy is the definitive diagnostic method, as it allows tissue samples to be obtained for histopathological analysis. [Acts 13, 14]

Histopathological findings in malignant pleural mesothelioma are essential for its definitive diagnosis and for differentiating this neoplasm from other pleural pathologies, such as metastatic adenocarcinoma or lung carcinoma. There are three main histologic subtypes of mesothelioma: epithelioid, sarcomatoid, and biphasic, each with different morphological features and prognosis.[6]

Epithelioid mesothelioma, which is the most common subtype and has the best relative prognosis, is characterized by the presence of uniform cells with rounded or oval nuclei that form tubular or papillary structures. These cells are usually well differentiated, which can make it difficult to distinguish them from other epithelial tumors. Sarcomatoid mesothelioma, on the other hand, has a poorer prognosis and features spindle cells with a sarcomato-like growth pattern, which can sometimes lead to diagnostic errors. Biphasic mesothelioma combines features of both epithelioid and sarcomatoid types, and its prognosis usually depends on the predominance of one or the other [component.6]

Figure 1. Histology of diffuse epithelioid malignant mesothelioma of the pleura (hematoxylin and eosin staining). (A) Invasive myxoid papillary lesion. (B) Coarse confluent area of partially myxoid exophytic mesothelial growth. (C) Tip of a large exophytic polypoid lesion with inward mesothelial growth. (D) Large tubular structures in the pleura. (E) Greater magnification of the large tubular structure seen in the image above. (F) Tubular structures covered primarily by a single layer of mesothelium. [5]



Immunohistochemistry plays a key role in the diagnostic confirmation of mesothelioma, especially when morphological findings are inconclusive. The markers most commonly used to diagnose mesothelioma include calretinin, mesothelin, WT-1, and D2-40, which are positive in most cases of epithelioid mesothelioma. On the other hand, the identification of cytokeratins and vimentin can help confirm sarcomatoid cases. These markers, together with traditional morphological studies, make it possible to differentiate mesothelioma from other neoplasms that can affect the pleura, such as lung or metastatic adenocarcinoma. [6]

Overall, the combination of clinical evaluation, advanced imaging studies, and histologic analysis is essential for the accurate diagnosis of pleural mesothelioma. Early diagnosis remains a challenge, but it is essential to optimize therapeutic management and improve the prognosis in these patients.[14]

Treatment of malignant pleural mesothelioma remains challenging due to the aggressive nature of the disease and its usually delayed diagnosis. Treatment options include a combination of surgery, chemotherapy, and radiation therapy, although the choice

of treatment depends on the stage of the disease, histologic subtype, and the patient's overall condition. [15]

Surgery is considered in patients with localized disease and good functional status. There are different surgical approaches, the most common being pleurectomy/decortication, which involves resection of the affected pleura, and extrapleuropneumonectomy, a more extensive surgery that includes resection of the lung, pleura, diaphragm, and ipsilateral pericardium. Although extrapleuropneumonectomy offers a more radical approach, it is also associated with higher morbidity and mortality, so its indication should be carefully evaluated. Surgery, in any modality, is often combined with other adjuvant therapies to improve long-term outcomes.[15]

Chemotherapy remains the mainstay of treatment for most patients, especially those with advanced disease who are not candidates for surgery. The standard regimen includes a combination of pemetrexed and cisplatin, which has been shown to improve survival in these patients. In addition, other agents have been explored, such as bevacizumab, a monoclonal antibody that inhibits angiogenesis, which has shown some benefit in combination with traditional chemotherapy. However, response rates remain limited, which has driven the search for more effective therapies. [15]

Radiation therapy, although not curative in most cases, is used as a palliative treatment to control symptoms, such as chest pain or recurrent pleural effusion. In some cases, it is also used as postoperative adjuvant therapy to reduce the risk of local recurrence. In recent years, emerging therapies, such as immunotherapy, have gained ground in the treatment of mesothelioma. Drugs that inhibit immune checkpoints, such as PD-1 and CTLA-4 inhibitors, have shown promise in clinical trials, offering new hope for patients with advanced mesothelioma. However, access to these therapies is still limited and requires more research to define their role in standard treatment. Acts 15, 16

RESULTS AND DISCUSSION

The review of the 14 studies analyzed in the table below shows remarkable consistency in the identification of asbestos as the main etiological factor of malignant pleural mesothelioma. In all the studies reviewed, the strong relationship between exposure to this fibrous mineral and the development of mesothelioma is confirmed, with a latency period that can reach 50 years, which greatly complicates the early detection of the disease. Acts 1, 2

Table 1: Asbestos as the main etiological factor of malignant pleural mesothelioma.

I am a student	Title	Type of Study	Sample	Main Findings	Conclusions
1	Asbestos Exposure and Malignant Pleural Mesothelioma	Systematic review	17 studies, 1,104 patients	High correlation between asbestos exposure and mesothelioma, latency of 42 years, and 100% mortality.	Asbestos exposure is a determining factor in mesothelioma. Better preventive strategies are needed.
2	Pleural Mesothelioma: A Rapid Evolution of an Indolent Disease	Case report	A 58-year-old patient	Epithelioid mesothelioma with rapid progression and pleural solid masses.	Mesothelioma can progress rapidly with no known exposure.
3	Advances in blood and pleural biomarkers for mesothelioma	Narrative Review	Review of recent studies	Mesothelin and other biomarkers can help in diagnosis, although validation is lacking.	Identifying biomarkers can improve early diagnosis.
4	Occupational and Environmental Asbestos Exposure and Survival of Patients with Asbestos-Related Cancer	Follow-up study	546 patients with mesothelioma and 902 with lung cancer	Occupational exposure reduces survival.	Occupational exposure and proximity to asbestos sources reduce survival.
5	Molecular mechanisms in the progression of mesothelioma	Review of molecular mechanisms	Several studies focused on genetic and molecular markers	Mutations in key genes such as BAP1 affect prognosis.	Targeted therapies based on molecular markers can improve management.
6	The role of HMGB1 in the development of mesothelioma	Narrative Review	Experimental and clinical studies	HMGB1 promotes chronic inflammation that facilitates the progression of mesothelioma.	HMGB1 could be a therapeutic target.
7	Diffuse pleural mesothelioma: advances in diagnosis and treatment	Narrative Review	Studies on diagnostic techniques and emerging therapies	Importance of immunotherapy and multidisciplinary approaches.	Multidisciplinary and personalized approaches improve the

					prognosis .
8	Asbestos load in the lungs of mesothelioma patients	Estudio postmortem	95 deceased mesothelioma subjects	Identification of critical concentrations of asbestos fibers in lung tissue.	Assessment of asbestos burden in the lungs is key to causal attribution .
9	Malignant Pleural Mesothelioma: An Update	Narrative Review	Recent Articles on Pleural Mesothelioma	Advances in pathophysiology, diagnostic and treatment methods.	More studies are needed to validate new diagnostic techniques.
10	Histopathologic Features in Asbestos-Induced Mesothelioma	Histopathological study	Histological specimens from patients with mesothelioma	Key histopathological patterns in mesothelioma.	Histopathology is key to understanding the progression of mesothelioma

Source: Prepared by the authors.

The findings in relation to the types of asbestos (chrysotile, crocidolite, amosite) reinforce the existing consensus in the literature on its ability to generate chronic inflammatory damage, which leads to irreversible cellular changes. The toxicity of these minerals is manifested through the inhalation of their fibers, which, when deposited in the lungs and pleura, trigger a prolonged inflammatory process and oxidative damage that contributes to carcinogenesis.[Acts 7, 8]

From a clinical point of view, the results of the studies analysed confirm that pleural mesothelioma is an insidious disease, with non-specific symptoms in its initial stages, such as progressive dyspnea and chest pain, which are frequently associated with other respiratory pathologies. [Acts 13, 14]

This finding is consistent with what has been previously described in the literature, where the semiology of mesothelioma is difficult to distinguish clinically until the disease is in advanced stages. Physical examination reveals indirect signs, such as decreased breath sounds and dullness to percussion, due to pleural fluid accumulation, underscoring the need for a high index of suspicion in patients with an occupational history of asbestos exposure. [Acts 13, 14]

Regarding the pathophysiology, the studies reviewed emphasize the role of the chronic inflammatory process and oxidative damage as drivers of mesothelioma development. The failure of alveolar macrophages to remove asbestos fibers perpetuates continuous inflammation, releasing pro-inflammatory mediators and reactive oxygen species that damage cellular DNA. Studies on genetic markers highlight the importance of mutations such as those affecting the BAP1 gene, which have been observed in many cases of mesothelioma, reinforcing the idea that exposure to asbestos not only induces an inflammatory response, but also profound molecular alterations that predispose to cellular malignancy. [10, 11, 12]

Histopathological findings confirm the typical morphological characteristics of malignant pleural mesothelioma, differentiating into three subtypes: epithelioid, sarcomatoid and biphasic. The epithelioid subtype, which is the most common, is associated with a better prognosis compared to sarcomatoid, which shows greater aggressiveness and poorer response to treatment. In all studies, the importance of immunohistochemistry is highlighted as a fundamental resource for the differential diagnosis between mesothelioma and other pleural neoplasms, using specific markers such as calretinin, mesothelin and WT-1. [6]

In relation to diagnosis, the studies analysed reinforce the use of advanced imaging techniques, such as computed tomography (CT) and magnetic resonance imaging (MRI), which allow an accurate assessment of tumour extension. Pleural biopsy remains the gold standard for definitive diagnosis, and thoracentesis, combined with thoracic ultrasound, facilitates diagnosis in patients with pleural effusion. Immunohistochemical analysis is essential to confirm the diagnosis, since mesothelioma can mimic other pleural and pulmonary neoplasms.[Acts 13, 14]

The results of this review demonstrate the consistency of the data in relation to the etiology, clinical presentation, pathophysiology and diagnostic methods of malignant pleural mesothelioma. However, one of the main challenges remains the early detection of the disease. Despite the advances, the diagnosis of pleural mesothelioma is made in advanced stages in most cases, which considerably limits the therapeutic options and the patient's prognosis. [14]

In terms of treatment, studies show that current therapies, such as chemotherapy with pemetrexed and cisplatin, offer an improvement in survival, but the results remain modest. The introduction of immunotherapy, while promising, has not yet proven to be a definitive solution for most patients, and access is limited. This raises an urgent need to

develop new targeted therapies that build on mesothelioma-specific genetic and molecular alterations, such as mutations in BAP1 and other genes.[Acts 15, 16]

Advances in the field of biomarkers, both blood and pleural fluid, are promising, but have not yet translated into widespread clinical use. The studies reviewed suggest that mesothelin and other markers have potential to improve early diagnosis, but their sensitivity and specificity in some subtypes of mesothelioma remain limited. This is an area of research that should be prioritized to improve clinical outcomes and reduce mortality associated with this disease. [Acts 15, 16]

FINAL CONSIDERATIONS

The present work has confirmed that exposure to asbestos is the main determinant in the development of malignant pleural mesothelioma. The results obtained agree that asbestos fibers, once inhaled, trigger a cascade of inflammatory events and genetic mutations that culminate in the malignant transformation of mesothelial cells. This finding reinforces the need to continue applying asbestos control and removal policies to reduce the incidence of the disease in the coming decades.

On a clinical level, early diagnosis remains one of the main challenges, as the initial symptoms of mesothelioma are nonspecific and easily confused with other pleural diseases. Despite advances in imaging techniques and biomarker identification, patients continue to be diagnosed in advanced stages, severely limiting therapeutic options. It is essential to improve early detection methods to intervene in more favorable stages of the disease.

From a therapeutic perspective, current treatments, including chemotherapy with pemetrexed and cisplatin, have shown modest improvements in survival, but are not curative. Immunotherapy and new targeted therapies hold promise for the future, although they are still in the early stages of evaluation. This indicates that more effective therapeutic approaches, based on the molecular biology of mesothelioma, are needed to improve patient outcomes.

The importance of immunohistochemistry in the diagnosis of mesothelioma was highlighted, especially in the differentiation of other pleural tumors. The identification of histological subtypes (epithelioid, sarcomatoid and biphasic) is crucial not only for diagnosis, but also to guide treatment and establish prognosis, which highlights the relevance of these analyses in clinical practice.

Therefore, this study has reaffirmed the severity of malignant pleural mesothelioma as a direct consequence of asbestos exposure, and highlights the urgent need to advance

early detection, prevention, and the development of more effective therapies. Preventive strategies and surveillance of at-risk groups remain critical to reducing the global burden of this devastating disease.

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ACCOUNTANTS' PERCEPTION OF CORPORATE SOCIAL RESPONSIBILITY REPORTING

https://doi.org/10.56238/sevened2024.031-067

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ABSTRACT

This research sought to analyze the perception of accounting professionals about their contributions in the preparation and dissemination of Corporate Social Responsibility (CSR) practice reports by companies. The data were collected through a *survey* developed on *google forms* and distributed to accountants in the State of Mato Grosso via *emails* and *WhatsApp*. The data were analyzed from the results obtained by *google forms* and in the light of the theory of legitimacy. The evidence from the study is that 77% of respondents said they owned their own businesses and 59.1% reported not having registered any employees. For the majority of respondents, that is, 59.1%, companies need to develop their practices with the concept of corporate social responsibility in mind. Finally, more than 60% of respondents agree that the senior management of companies understands their role in participating in the preparation and dissemination of these reports.

Keywords: Corporate Social Responsibility. Accounting Perception. Disclosure of Reports.

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INTRODUCTION

In the development of business relationships, structures such as Ethics, Corporate Social Responsibility (CSR) and Sustainability are pillars that can effectively enable the interests of stakeholders related to the environment and the development of moral standards, while factors that permeate production and service relationships are at the focus of current academic discussions.

CSR practices have been widely known and published as Voluntary Social and Environmental Disclosure (SED). This information is presented through corporate reports or *websites*, as non-mandatory data, usually composed of CSR practices, and may include negative information about the impacts caused by the company (Bushman *et al.,* 2004; Schwartz & Carroll, 2008). By disclosing them, corporate entities tend to show their practices that, in theory, aim to compensate in some way for damages caused to society and, thus, find legitimacy for their actions.

Supposedly, CSR practices can bring significant benefits to other stakeholders in their activities. Dhaliwal *et al* (2011), when analyzing the benefits of these practices, show that companies that implement these practices do so in order to reduce their capital costs.

Thus, Dhaliwal *et al* (2011) concluded that corporations, when implementing CSR practices, not only aim at social results or the legitimization of their practices, but especially at reducing production costs. It should be noted that voluntary disclosure refers to information presented by companies beyond that legally required. In this sense, the *disclosure* of CSR actions, when executed with quality, can contribute to improving the company's corporate reputation (Baraibar-Diez & Sotorrío, 2018).

Considering information as the basis of the relationship between companies and the competitive environment, the actions of entrepreneurs need to be preceded by a set of information prepared and disseminated by managers (Fontana, Andrade & Macagnan, 2013). In this sense, the financial statements prepared by the professional accountant are an instrument of information and *disclosure* necessary to meet the needs of internal and external users in their demands. In view of this, the preparation and, subsequently, dissemination of reports that can expand the information capacity of these statements can contribute to improving the relationship between companies and the market (Prux Junior, 1998).

According to Gallon, Beuren and Hein (2008), due to the volatility and dynamism of the capital market around the world, the process of disclosure of information related to management to external users is a preponderant factor for the survival of companies. The quantity as well as the quality of the disclosure of accounting information presupposes that

it is an opportunity and uniformity of data for the entire market. Quality reports, in addition to providing credibility to managers in the capital market, harmonize equal rights among shareholders (Gallon, Beuren & Hein, 2008).

In view of this, CSR practices, when adopted and disclosed, can improve the perception of the company's image among internal and external stakeholders (Cho & Patten, 2007). Therefore, the way in which accounting professionals perceive themselves as promoters and responsible for the dissemination of these practices can contribute to legitimize them in the eyes of those interested in this information. In this sense, the problem that guided the present study was: what is the perception of accounting professionals about their contributions in the preparation and *disclosure* of reports on Corporate Social Responsibility (CSR) practices prepared by companies? The objective of this study was to analyze the perception of accounting professionals about their contributions in the preparation and *disclosure* of reports on Corporate Social Responsibility (CSR) practices presented by companies.

The individual or joint responsibility that falls on the accountant in the process of preparing these reports needs to be understood. On the other hand, it seems of fundamental importance that companies and their internal and external users perceive the role of the accountant as of fundamental importance in this process of preparation and *disclosure* of these reports.

However, studies related to CSR and accounting still seem to need greater impetus in academia (Irigaray, Vergara & Araújo, 2017; Junior & Galvão, 2021). Thus, a possible study gap is perceived, in the sense of discussing the importance of the role of accountants from their perception as an active participant in the preparation and dissemination of CSR reports in companies, specifically, in the State of Mato Grosso. Thus, the present study is justified and relevant within the context in question.

THEORETICAL FOUNDATION

In this section, the literature that supports the present study is presented, highlighting the discussions on the theory of legitimacy and Corporate Social Responsibility as well as the definition of professional accountant and his field of activity.

THEORY OF LEGITIMACY AND CORPORATE SOCIAL RESPONSIBILITY (CSR)

The theory of legitimacy, as discussed by Dias Filho (2012) and Sehn, Zanchet and Gomes (2018), originates from the theory of contracts and was incorporated into the accounting area to explain the adoption of certain disclosure mechanisms. This theory

seeks to understand how and why companies choose to disclose certain information, in order to legitimize their actions before stakeholders.

Legitimacy theory, as well as economic policy theory and *stakeholder* theory, is considered to be a systems-oriented theory (Eugenio, 2010). According to Eugenio (2010), the disclosure policy chosen by organizations is considered an important tool by which managers can influence the perception of the outside world about their company. According to Sehn, Zanchet and Gomes (2018), from the perspective of the theory of legitimacy, organizations will use different strategies in order to be seen as socially responsible and from this extract from the environment in which they operate, at the lowest possible cost, the resources necessary to achieve their objectives.

The disclosure of information, whether social or can be seen as a technique for companies to legitimize their activities, making known what the company does. Thus, according to Eugenio (2010), the theory of legitimacy and the theory of economic policy are consistent with the understanding of stakeholders in the relationship between the organization and society.

Studies on CSR practices have, over time, addressed their importance in the creation of value for companies, considering the possible levels of negative impacts produced by the production process of these organizations.

The so-called Corporate Social Responsibility practices have been the subject of studies, but there is no consensus on their definition. Marquis, Beunza, Ferraro and Thomason (2011) say that corporate social responsibility can be understood as control mechanisms that companies can adopt voluntarily to integrate social and environmental concerns into their business operations. For Dahlsrud (2008), corporate social responsibility can be understood as essential strategies adopted by companies to interact with their stakeholders.

For Anzilago, Flach and Lunkes (2020), corporate social responsibility can be implemented from the perspective of improving the image of organizations, but in a symbolic way. However, organizations through CSR practices seek legitimacy for their actions for the purposes of financial results. But, from the perspective of Anzilago, Flach and Lunkes (2020), it is possible that there is a reduced potential for significant corporate social responsibility in terms of financial return due to the greater legitimacy gap that can occur in these organizations.

In view of this, the disclosure of reports on CSR practices becomes essential for companies that, due to their production process, need social legitimacy. For Borges Junior and Silva (2024), there is a discussion about whether, in fact, the decision to disclose

information on socially responsible practices constitutes a genuine commitment by the company to these activities or if it is just a mechanism that aims to improve its image before stakeholders.

According to Michelon *et al.* (2015) the disclosure of CSR is not directly associated with improvements in the quality of information of companies. Therefore, this disclosure may not actually imply the commitment of companies to social and environmental problems. Thus, Michelon *et al.* (2015) say that the disclosure of CSR can only occur as a way to legitimize its business activities before its stakeholders.

It should be noted that Guthrie and Parker (1989), when referring to the theory of legitimacy, understand that the company's activities occur in obedience to a social contract. in the Guthrie and Parker (1989) perspective, this social contract implies determining socially desired standards that must be fulfilled so that corporate objectives are accepted by stakeholders.

THE PROFESSIONAL ACCOUNTANT AND THE FIELD OF ACTIVITY

Accounting as an area of study and technical-scientific application has over the years evolved its standards in order to meet the demands imposed by society within the scope of business organizations. According to Marion (2022), accounting is very old and has always existed to help people make decisions. At the same time, accounting is the instrument that provides the most useful information for decision-making inside and outside the company (Marion, 2022).

According to Decree Law No. 9,245 of May 27, 1946 as amended by Law No. 12,249/2010, professional accountants are those who have a bachelor's degree in accounting recognized by the Ministry of Education, passed the sufficiency exam and registered with the Regional Accounting Council (CRC). The Brazilian Accounting Standard (NBC) PG 01 of February 27, 2019, establishes that the professional accountant must exercise his profession with zeal, diligence, honesty and technical capacity. The aforementioned NBC also emphasizes that the accountant must comply with all the regulations issued by the CFC and the legislation in force, safeguarding the public interest, the interests of his clients or employers, without prejudice to professional dignity and independence.

For De Souza and Nikolay (2022), the accountant is responsible for controlling and meeting most of the obligations and requirements of government agencies, regulators, tax authorities, and accountability. Also according to De Souza and Nikolay (2022), by opting for integrity, the company commits itself to its employees and society to maintain only lawful

business, remaining faithful to this principle even in the face of very advantageous financial conditions. Therefore, *compliance* practices become an essential factor in achieving such objectives. Thus, it is up to the accountant (De Souza & Nikolay, 2022) to actively participate in the preparation and dissemination of reports and procedures that show stakeholders about the organization's practices.

METHODOLOGY

The methodological steps of this study were outlined based on the proposed objective. The study was classified as exploratory-descriptive, since, in relation to the perception of accountants about the preparation and *disclousure* of the CSR reports of the companies, it is perceived in the reviewed studies that there are few academic publications. On the other hand, several studies related to the *disclousure* of CSR practices were evidenced.

The collection of information was carried out through a structured questionnaire closed and addressed to accountants in the State of Mato Grosso. The sample is characterized as accessibility, in view of the possibility of access to professionals through their electronic addresses (e-mails) and messaging application, in this case, *whatsapp.*

The collection instrument, in this case, the questionnaire, was initially sent in the second half of 2023, however, it did not achieve the expected success. After restructuring the collection method, in addition to seeking to access the accountants through their electronic addresses, such as their e-mails, the messaging application was also used *whatsapp* of professionals. Thus, the collection extended until the first half of 2024.

After receiving the questionnaire, the analyses were performed based on the graphs and other information collected.

PRESENTATION AND ANALYSIS OF RESEARCH RESULTS

In this chapter, the profile of the respondents, the results of the survey, as well as the analysis of the data through the information generated by the collection instrument, in this case, google forms, will be presented.

PROFILE OF SURVEY RESPONDENTS

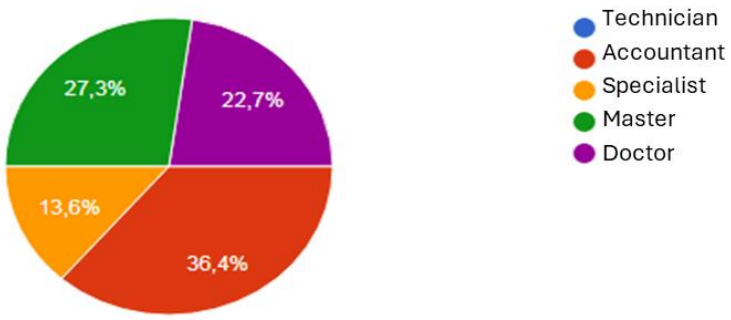
The results of the present study showed that in relation to the profile of the respondents, 63.6% are male and 36.4% female. The age group of accountants who answered the most in the survey was between 25 and 34 years of age, representing 40.9%

of the professionals. Professionals aged between 35 and 44 years represent 36.4%, between 55 and 64, 18.2% and over 65 years of age, 4.5%.

Regarding the time of experience of the professional accountant in the job market, the data showed that 54.5% of the respondents had already been working for more than 15 years, while 22.7% had been working for 3 to 5 years. Professional accountants who said they own their own business represent 77% of respondents. According to the data, 18.2% of the respondents have 2 to 3 partners in the company and 59.1% of the respondents said they do not have any collaborator (employee). Still with regard to the number of employees, the survey showed that only 13.6% of the respondents said they had more than 11 employees.

Graph 1 presented below shows how accountants are in relation to their professional category.

Graph 1 – Professional Category



Source: Survey data (2024)

Graph 1 illustrates the distribution of professional accountants in relation to their professional category, highlighting the predominance of accountants who own their own businesses. These data reflect a profile of experienced professionals, with a significant portion working for more than 15 years in the market. The analysis of the respondents' demographic and professional profile provides a solid basis for understanding perceptions and practices related to the preparation and dissemination of CSR reports, as explored in this study. These insights are key to driving future initiatives and policies aimed at strengthening corporate social responsibility in the accounting industry.

PRESENTATION AND ANALYSIS OF RESULTS

The data from this survey showed that 50% of the respondents said they knew what CSR practices are and 27.3% partially agreed to know these practices, that is, almost 70% of the accountants surveyed have information on the subject. The survey data are consistent considering that Junior and Galvão (2021) understand that the work of

accountants in the preparation and promotion of these reports is important because these professionals are directly involved with the corporate governance of organizations. Therefore, knowing these practices is intrinsic to the accountant's work within organizations.

Large companies use CSR to present themselves and thus market their businesses. The evidence is that 68.2% of the survey respondents totally agree that CSR practices can be an instrument to show the image of companies to society. This result seems consistent when it fits with the evidence of Junior and Galvão (2021) in showing that CSR practices are important since through them organizations can dialogue with their stakeholders. Therefore, it may be through the disclosure of their practices that companies seek to legitimize their results.

Alcamí, Alcâniz and Pérez (2019), when they point out that CSR practices are viewed by large companies as an opportunity to serve society and carry out their *marketing* (legitimation), thus stimulating positive reactions from stakeholders. In this context, by disclosing their CSR reports through informational transparency and quality, companies may be contributing to the construction of their corporate reputation (Baraibar-Diez & Sotorrío, 2018).

According to Lima (2021), it is in the image that the reputation of the professional and the organization is constituted, that, once tainted, recovery seems not to be an easy task. Also according to Lima (2021) and Srour (2005), the reputation of the organization and/or professional, once lost, can have a high capital cost to recover it. In this sense, being the company socially responsible and disclosing these actions can bring them benefits and reduce possible capital costs.

Regarding accountants' knowledge of CSR, graph 2 shows that accountants perceive the importance of these practices as a possibility in reducing capital costs.

Graph 2 – The fact that the company is socially responsible can bring it social benefits as well as reduce its cost of capital



Source: Survey data (2024)

It can be seen in graph 2 that 72.8% of the respondents agree in some way that if the company is socially responsible, this can contribute to reducing the costs in the production of goods or in the provision of services.

Pereira and Vilaschi (2006), Macedo and Corrar (2012) highlight the relationship that accounting has with corporate governance, considering that the accounting-financial information generated and presented by accounting professionals is associated with the performance of organizations. The studies by Schwartz and Carroll (2004; 2008) highlight three central concepts from this perspective, namely, value, balance and responsibility that can be used to better integrate CSR practices, that is, legitimization of their practices. Therefore, the *disclosure* of these social responsibility practices can work in the sense of informing stakeholders directly or indirectly how the entities are exercising their social role, and consequently, legitimizing their practices.

Dhaliwal, *et al* (2011) analyzed data from 213 North American companies in the period from 1993 to 2007 and according to the authors, if the disclosure of the organization's corporate social responsibility practices can contribute to reduce the cost of capital, then these companies would have incentives to disclose such information in their reports, especially those with high cost of capital. Dhaliwal *et al* (2011) in their study found empirical evidence that the organization's cost of capital, , is positively associated with the disclosure of social responsibility information in the following year.

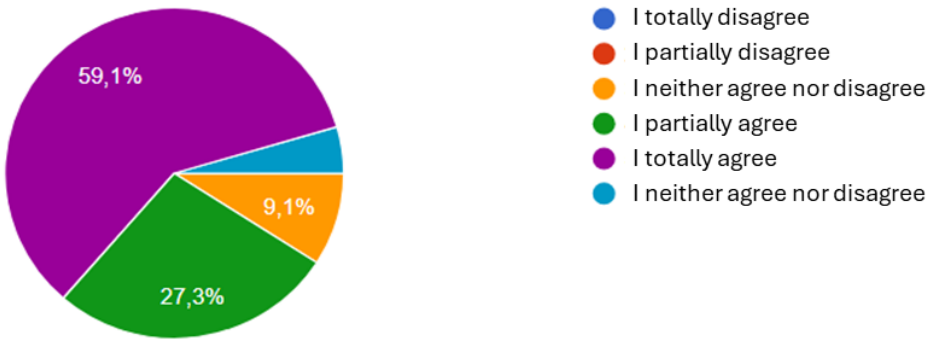
From this perspective, Junior (2019) says that the disclosure of corporate social responsibility activities can also have a positive effect on the cost of capital of organizations. In view of this, CSR practices, once developed by companies and disclosed, can play a fundamental role in reducing the cost of capital (Junior, 2019).

For the majority of respondents (54.5%), mandatory and non-mandatory reports, Income Statements (P&L), Cash Flow Statements (DFC), Social Balance Sheet (BS) and Value Added Statement (DVA) can be, among others, transparency instruments capable of evidencing the corporate governance practices of companies. It should be noted that the preparation and consequently the disclosure of these instruments are the responsibility of accountants together with organizations.

From this perspective, the study by Junior and Galvão (2021) sought to identify the role of the accounting professional in promoting CSR in Brazilian organizations. The results of the study showed that the accountant plays a fundamental role in the preparation of these reports, among the most cited being the Social Balance Sheet and Statement of Value Added.

The present research sought to analyze the perception of accountants in relation to the responsibility of the business class as well as its employees, in the process of awareness that the company must be managed using the concept of corporate social responsibility as well. Graph 3 presented immediately below shows the perceived result.

Graph 3 - The company must also be managed using the concept of corporate social responsibility



Source: Survey data (2024)

It can be seen from graph 3 that the majority (60%) of the respondents totally agree that the practices of companies need to be developed with the concept of corporate social responsibility in mind. In other words, the corporate management model based only on obtaining economic results in the perception of the respondents is not configured as the most appropriate today. However, it should be noted that 27.3% of respondents partially agree with this statement.

The study by Santos (2009) worked on the perception of Embraco's stakeholders, in the light of the dimensions of corporate social responsibility and the evidence was that, in the opinion of managers and employees, CSR practices when compared to other corporate governance practices such as ethical behavior itself, present differences. However, it is important to highlight that in the perception of most of those surveyed, the economic results of companies are linked to these practices.

Castillo-Muñoz *et al* (2017) and Saini and Singhania, (2019), link the corporate governance practices practiced by companies as economic benefits created in favor of their stakeholders. For the authors, over time new concerns have emerged, directly affecting the functioning of companies, such as demands from employees, socio-environmental regulatory bodies, quality improvements, defense of human rights, ethical behavior, among others.

By disclosing their reports on CSR practices, companies place themselves, directly or indirectly, under the scrutiny of society. In this sense, CSR reports are offering instruments that can provide criticism by society, but can also show maturity of

companies in dealing with the various segments that make up the society in which they operate.

In this context, 50% of the respondents to this survey fully agree that, in fact, when these reports are disclosed, society's behavior may be critical, however, these considerations tend to lead managers and employees to retrace the course of their practices.

This path can be traced, in theory, when there is institutional pressure exerted by the local community, by peers themselves, by the media and by the government on the need to implement CSR. From this perspective, the results brought interesting evidence. According to the survey data, 45.5% of respondents strongly agree that the pressures exerted by society can lead companies to rethink their actions and disclose them through these reports. On the other hand, another 45.5% partially or simply disagree with this statement. .

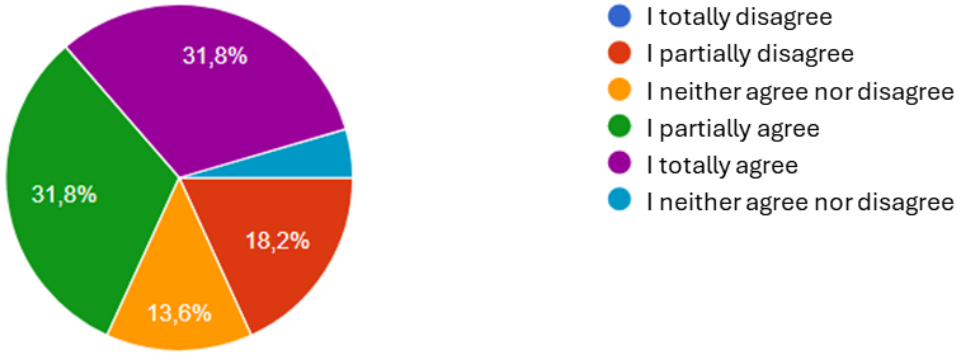
Junior (2019), highlights that companies that are concerned with disclosing sustainability reports are usually from sectors with activities that have a strong environmental or social impact and that are under pressure from society. However, there are discussions about the *disclosure* of these practices, especially when it comes to issues related to sustainability.

Michelon, Pilonato and Ricceri (2015) have empirically shown that the practices of disclosure of CSR reports do not imply increases in the overall quality of the firm's disclosure, so that the disclosure of these reports is much more of a symbolic action than a substantive one. From the authors' perspective, this practice could be adopted only to legitimize the actions of organizations. Therefore, from this perspective, the *disclosure* of these reports could only represent an additional cost for the company. From this context and in the light of the understanding of Michelon, Pilonato and Ricceri (2015) it is possible to analyze the perception of respondents who totally and partially disagreed.

For 68.2% of the respondents, the implementation of CSR in companies can improve their financial performance, so the knowledge of the accountant in this process is essential. For 59.1% of the respondents, they recognize that they are jointly and severally responsible for the information entered in these reports.

Thus, what is the perception of accountants about how the senior management of companies understands the role of this professional and how do they perceive their contribution in the preparation and dissemination of these reports? Graph 4, right after, shows the result of the accountants' perception of this question.

Graph 4 - The senior management of companies understands the role of the accountant and calls on him or her to contribute to the preparation and dissemination of CSR



Source: Survey data (2024)

There is no consensus on the question presented to the respondents by the researchers. However, according to graph 4, more than 60% of the respondents agree that the senior management of companies understands their role in the preparation and dissemination of these reports.

The study by Junior and Galvão (2021) identified that the accounting professional is related to the CSR practices of companies, because it is the accountant who has the skills to advise managers as well as those who have the power to make decisions about the importance of the performance of companies in relation to social and environmental actions. Thus, the data indicate that the professional accountant is responsible for the preparation of statements and reports on the financial and economic performance of companies, which reflect business actions. Therefore, the relationship between management and accounting professionals needs to be developed, a priori, in an intertwined way.

Finally, through the data collection instrument, it was stated that: accounting has improved its registration system, thus allowing companies to insert in the context of the Social Balance Sheet (SB) a very interesting list of information on the level of investments in the area of the environment. In view of this, the statement was in the sense that the accountant perceives his participation as a professional in the construction of these balance sheets as fundamental. The results showed that 86.4%, 59.1% totally agree and 27.3% partially agree that their work is of fundamental importance to prepare reports on CSR practices and, in this way, contribute to the economic and social development of companies.

It is worth mentioning that this entire process is directly related to Corporate Governance practices. In other words, they are companies accountable to stakeholders in all areas, especially in relation to how they are implementing *compliance* in their relationships. For Junior and Galvão (2021), these Corporate Governance practices

become principles and recommendations that are aligned with organizational interests, with the objective of preserving and improving the long-term economic value of organizations. Therefore, this can be directly related to the reputation of the good, the product, the organization. In this context, Srour (2005) says that reputation is an intangible asset, and is therefore the responsibility of all those involved in the process of producing and disclosing the results.

FINAL CONSIDERATIONS

This study aimed to analyze the perception of accounting professionals about their contributions in the preparation and *disclosure* of reports on Corporate Social Responsibility (CSR) practices prepared by companies. Data were collected through a *survey* directed to accountants in the State of Mato Grosso.

Among the results, it was observed that 50% of the accountant professionals who responded to the survey have master's (27.3%) and doctoral degrees (22.7%). Studies indicate that managers with a higher level of training tend to have a deeper understanding of accounting information, being considered highly relevant by companies (Melo & Magalhães, 2021). Thus, it can be concluded that CSR reports prepared with the input of more qualified accountants can more efficiently serve stakeholders.

The results also suggest that CSR reporting is important, as this information can benefit organizations by alleviating potential pressures from the local community. By disclosing actions with social and environmental impact, companies can legitimize their results before society. Accountants acknowledge this pressure, but agree that it can encourage managers to rethink their productive activities.

Finally, it is concluded that, for the accountants surveyed, their contributions in the preparation and *disclosure* of these reports are fundamental since part of this information inserted there is built specifically by them.

Despite the contributions of this research, it is important to highlight the limitation of the low number of respondents, considering the population of accountants registered with the Regional Accounting Council (CRC) of the State of Mato Grosso. For future studies, it is suggested to increase the sample and, if possible, include accountants registered with other CRCs in Brazil. Additionally, it is recommended to conduct longitudinal analyses to track changes in accountants' perceptions over time, as well as international comparisons to identify cultural and regulatory influences. Case studies in companies with exemplary CSR practices, investigations into the impact of technology on reporting, and the inclusion of the insights of other stakeholders can offer valuable insights. Exploring the influence of

academic training and investigating barriers faced by accountants are also promising areas for research. These approaches can expand understanding of accountants' role in corporate social responsibility and enhance information disclosure practices.

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ANALYSIS OF VACCINE ACCEPTANCE AMONG THE ELDERLY AT THE "VIVER BEM" COMMUNITY CENTER, IN THE CITY OF JI-PARANÁ/RO

https://doi.org/10.56238/sevened2024.031-068

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ABSTRACT

Introduction: In recent years, Brazil has advanced in the protection of the elderly population, especially after the implementation of the Statute of the Elderly in 2003, which ensures fundamental rights for people aged 60 years or older. This progress is evidenced by the increase in life expectancy, which in 2023 exceeded 76 years, reflecting improvements in living conditions and public health, including vaccination. Adherence to vaccination among the elderly still faces challenges such as misinformation and difficulties in accessing health services. The acceptance of vaccines at the "Viver Bem" Community Center in Ji-Paraná/RO is relevant, considering it an essential strategy for the prevention of severe diseases in this vulnerable population. Materials and Methods: The research involved 38 older adults, analyzing their vaccination cards and acceptance of vaccines such as influenza, hepatitis B, diphtheria, tetanus, pneumonia, and COVID-19. Demographic factors, reasons for acceptance or refusal of immunization, and prevalent chronic diseases were also investigated. Results: Most respondents were female (84.2%), and the most common chronic conditions were hypertension (61.3%) and diabetes (22.6%). Only 77.8% were vaccinated against influenza and 43.2% against hepatitis B, while adherence to the COVID-19 vaccine was 97.4%. Fear of side effects was reported by 50% of participants. Final Consideration: Educational campaigns are essential to increase vaccination adherence, since all interviewees showed interest in informative events about vaccination, reinforcing the importance of these initiatives.

Keywords: Vaccination coverage. Public health. Disease prevention. Health promotion.

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INTRODUCTION

In recent years, Brazil has demonstrated a growing commitment to the protection and well-being of its elderly population, especially after the implementation of the Statute of the Elderly in 2003. This document ensures fundamental rights to citizens aged 60 and over and reflects a significant change in the way Brazilian society sees and treats its elderly. In recent years, old age has come to be called better age, a way of overestimating the potentialities and possibilities that old age provides for some people, such as the opportunity to rest, travel and do things that generate pleasure, after retirement (Brasil, 2003).

As a result, Brazil has observed a notable increase in life expectancy, an achievement attributed to the general improvement in living conditions and the evolution of public health practices, including vaccination, which is one of the main strategies for the prevention of infectious diseases, especially among the elderly population, which constitutes a vulnerable group due to the aging of the immune system and the higher prevalence of comorbidities (Santos, et al., 2021). In 2023, life expectancy at birth in Brazil exceeded 76 years, reflecting not only advances in medicine and sanitary conditions, but also the positive impact of vaccines (Brasil, 2023).

In this context, this increase in longevity highlights the importance of effective health strategies, such as immunization, to ensure that the quality of life of older people continues to improve. Despite the importance of vaccination, there are still significant challenges in the adherence of the elderly to the recommended vaccination schedules. Factors such as misinformation, mistaken beliefs, difficulties in accessing health services, and lack of adequate guidance contribute to suboptimal vaccination coverage (Filho, et al., 2023). In addition, the characteristics of aging, such as immunosenescence, can influence the immune response to vaccines, making the administration of specific vaccines and the continuous education of health professionals even more crucial.

In view of these challenges, this project proposes an analysis of vaccination policies and practices aimed at the elderly population in Brazil, with the objective of identifying barriers and proposing strategies to improve vaccination adherence in this group. The promotion of adequate vaccination not only ensures the right to health and prevents diseases, but also contributes to the healthy longevity and well-being of the elderly population, aligning with the principles of equity and human rights in access to health (Silva, et al., 2022).

MATERIAL AND METHODS

This is an observational, descriptive and exploratory research, which was initiated from a comprehensive literature review, consulting several platforms, including academic databases Lilacs, Web of Science, PubMed, Scielo and others to support the study. The place chosen for the execution of the project action was the Living Well Community Center, located in the 2nd district of the city of Ji-Paraná - RO, located at Rua São Luiz, 348 - Nova Brasília, Ji-Paraná - RO, 76908-334. The target audience for carrying out the project were elderly people of both sexes attending the entity, in the same city.

The proposal was submitted to the Research Ethics Committee, in compliance with resolution 466 of December 12, 2012, receiving a favorable opinion for the execution of the research. After the opinion of the CEP, the field research was carried out at the Center for the Coexistence of the Elderly in the municipality of Ji-Paraná-RO.

During the execution of the project, there was the participation of approximately 70 elderly people. To apply the questionnaire, only the elderly who presented the vaccination card were interviewed, and the others participated in the recreational activities offered in the action.

It began with a brief presentation by medical students, discussing the importance of vaccination in an enlightening way, addressing the action of the vaccine in the body, the types of vaccines available within the scope of the Unified Health System (SUS), the updating of the vaccination card and the importance of collective immunization. Then a moment was opened for the reports and testimonies of the participants, as well as for the clarification of doubts, especially about the myths and truths about vaccination. Soon after, some recreational activities were carried out such as gymkhana, raffle of gifts, dance contest, and to finish it was offered a breakfast to everyone.

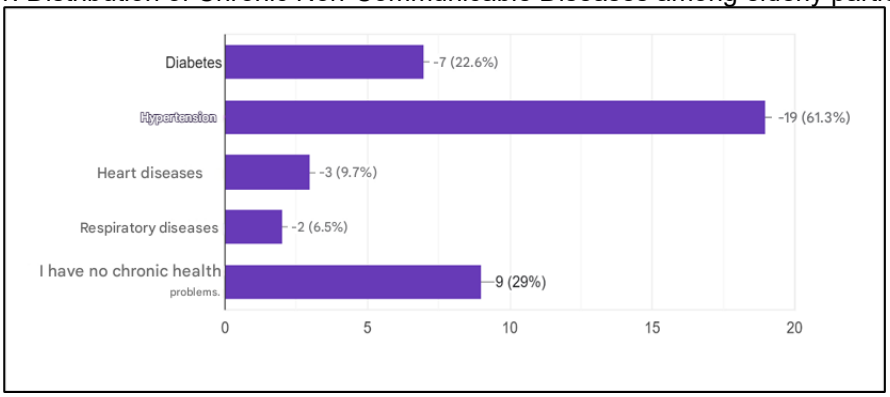
During breakfast, forms with closed questions about vaccination were applied, aiming to assess the level of acceptance and refusal of vaccines as a method of disease prevention among the elderly who frequent the place. Data were collected through a semi-structured form made available via Google Forms. The data obtained were compiled on a specific platform and evaluated, with the objective of being disseminated in scientific means to improve the quality of life of the elderly population of the Community Center.

RESULTS AND DISCUSSION

During the action carried out at the Living Well Community Center, approximately 70 elderly people participated in total, and 38 of both sexes were interviewed. There was a significant predominance of female participants (84.2%) compared to males (15.8%). These

results are similar to the studies by Azambuja (2021) and Santos (2020) conducted with elderly people in the community, which also found a higher percentage of women. This variation can be interpreted considering several factors, such as the fact that women, especially at advanced ages, are generally more present in community health and prevention activities, in addition to having a higher life expectancy than men (Rocha, et al. 2022; CSI, 2020). This difference may directly impact public health communication and engagement strategies, suggesting that actions aimed at the male public may be necessary to increase their participation and adherence to vaccination campaigns.

Figure 1: Distribution of Chronic Non-Communicable Diseases among elderly participants.

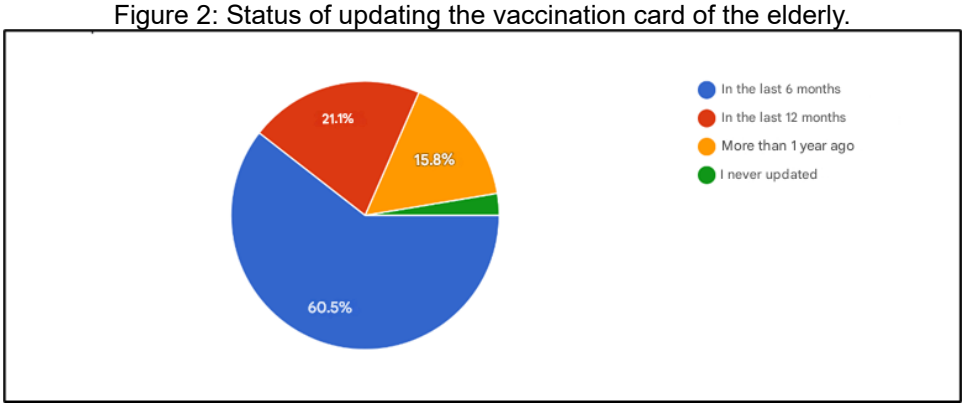


Source: Authors, 2024.

As for chronic health problems, figure 1 shows arterial hypertension as being more prevalent, affecting (61.3%) of the participants, while diabetes affecting (22.6%). This finding is in line with the Brazilian scenario, in which Ribeiro (2020) and Melo (2023) highlight systemic arterial hypertension (SAH) and diabetes as the most prevalent chronic disease among the elderly. In this context, it is noted that these diseases are often associated with a higher risk of complications in respiratory infections, such as influenza. On the other hand, (29%) of the elderly reported not having any chronic health problems. This result may be associated with the fact that most participants were female, as they tend to seek more preventive care such as vaccination, health care, and adopt healthier lifestyle habits compared to men (Azambuja, et al.2021).

Other diseases observed in the elderly, depression stood out in the largest number of participants (16.7%), which affects individuals of all age groups, although the incidence is higher among the elderly. This increase is characterized by several factors in the aging process, such as the loss of loved ones and the emergence of multiple diseases. These factors can significantly impact the mental health of this population, increasing vulnerability to the development of depressive conditions (Seguerri, 2023).

Figure 2: Status of updating the vaccination card of the elderly.



Source: Authors, 2024.

Regarding the updating of the vaccination card, it was observed that (60.5%) of the interviewees stated that they had updated their vaccination card in the last 6 months, demonstrating significant adherence to recent vaccine campaigns and ease of access to health services. On the other hand, (21.1%) of the elderly reported having updated in the last 12 months, data that corroborates the findings of Matos, et al. (2021) on the knowledge and vaccination adherence of the elderly to the specific vaccination schedule, in a study conducted in Cáceres/MT, in which most individuals kept their vaccines up to date. However, these results differ from the study by Ferreira et al. (2021), which identified that most elderly people had an incomplete vaccination card. Adherence to vaccination in this population is strongly associated with the guidance provided by health professionals, in addition to the ease of access to the service and attitudes and beliefs regarding this practice (Ferreira, 2021).

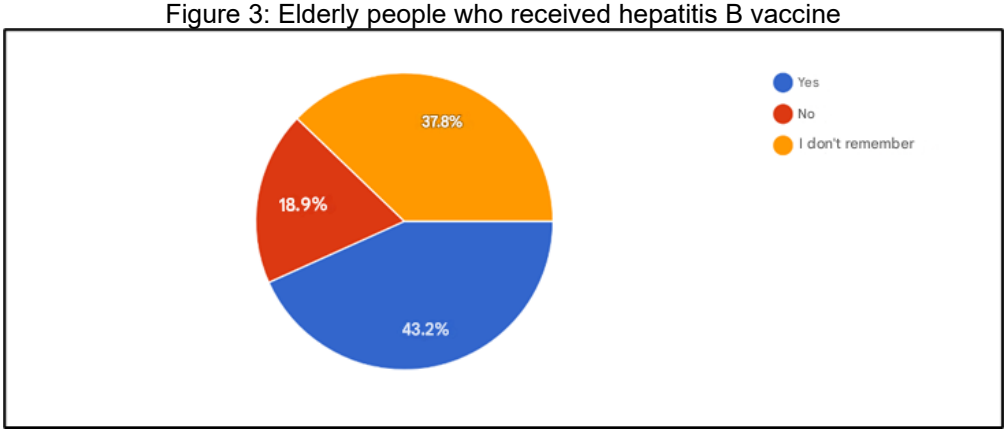
Still on the vaccination card, 89.2% of the participants know the importance of keeping the card up to date, while 10.8% are unaware of this fact. This shows a positive impact of public health campaigns, but there are still challenges in accessing information about vaccination, as pointed out by Duarte et al. (2018), who highlight barriers to access and misinformation as factors that affect vaccine adherence. Silva et al. (2021) reinforce that Primary Health Care plays an essential role in overcoming these barriers, through the training of professionals and the use of technologies to promote the vaccination schedule.

It was observed that 77.8% of the 38 participants were vaccinated against the flu in 2024, while 22.2% did not receive the vaccine. These data, especially among at-risk populations such as the elderly, are compared to three studies. Campos et al. (2023) reported an adherence of 70% among the elderly, identifying misinformation and fear of adverse effects as the main barriers, while Azambuja et al. (2021) found a rate of 65.3%, attributed to the difficulty of access in rural areas. However, according to Nobre et al. (2022) it was identified that even in universal health systems, vaccine hesitancy, influenced by fake

news and misinformation, affects between 15% and 30% of the population, which is consistent with the 22.2% refusal observed in the graph. The discussion points out that, although the adherence of 77.8% is positive, the non-adherence rate of 22.2% reflects ongoing challenges, such as misinformation. The comparison with previous studies suggests that the group analyzed had better access to and awareness about vaccination, but vaccine refusal is still an obstacle, especially in countries with universal health systems such as Brazil.

Figure 3 shows that 43.2% of the elderly reported having received the hepatitis B vaccine, a satisfactory coverage, but still below the ideal for this vulnerable age group. In addition, 18.9% were not vaccinated, which is concerning given the severity of hepatitis B, which can cause serious complications such as cirrhosis and liver cancer. Notably, 37.8% of the elderly do not remember if they have been vaccinated, suggesting a lack of awareness and adequate vaccination monitoring. The discussion points to the need for educational campaigns to increase vaccination adherence among the elderly and suggests the use of digital registration systems and vaccination efforts to improve coverage. The lack of remembrance of the elderly about their vaccination highlights the importance of continuous health monitoring (Ministry of Health, Brasília/DF, Manual of Epidemiological Surveillance of Adverse Events After Vaccination, 2nd Edition, [n.d.]).

Figure 3: Elderly people who received hepatitis B vaccine

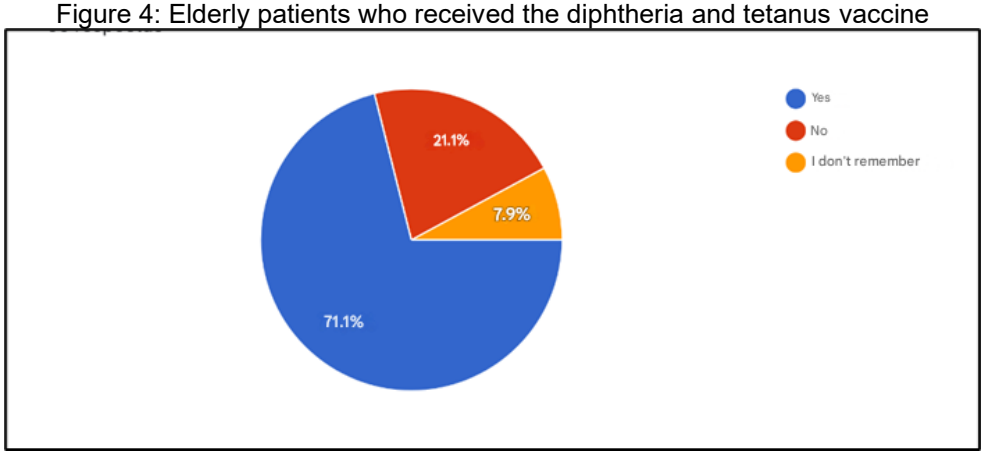


Source: Authors, 2024.

Regarding the diphtheria and tetanus vaccine, it was observed that 71.1% of the interviewees received the dT vaccine (diphtheria and tetanus), indicating good vaccination coverage among the elderly and the efficacy of vaccination campaigns (Figure 4). However, 21.1% have not been vaccinated and 7.9% do not remember, which suggests that part of the elderly population is still unprotected or uncertain about their vaccination status. These data may reflect failures in the follow-up of the vaccination card, lack of knowledge about the necessary boosters, or difficulties in accessing health services. According to Ferreira et

al. (2021), the absence of a vaccination card is associated with lower education, emphasizing the importance of considering the characteristics of the population when planning prevention actions.

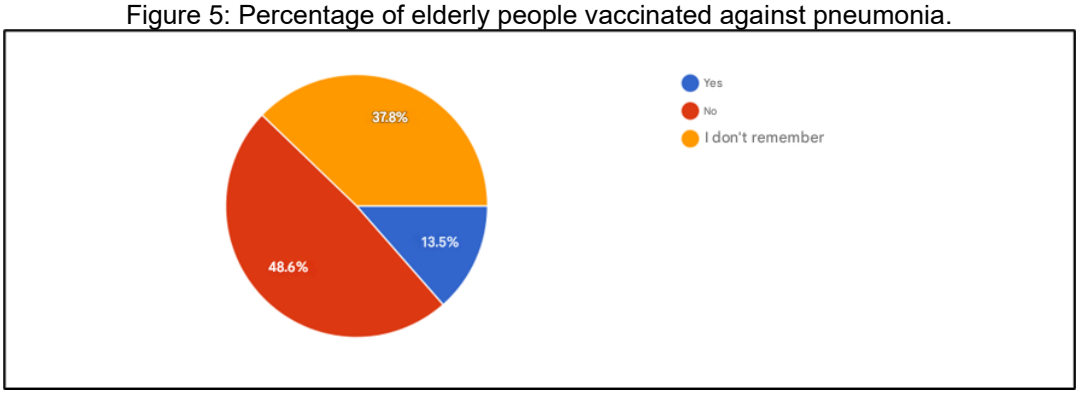
Figure 4: Elderly patients who received the diphtheria and tetanus vaccine



Source: Authors, 2024.

According to the data presented, they corroborate the need for educational campaigns and vaccination efforts to increase adherence to the dT vaccine, which requires reinforcement every 10 years. Digital vaccination monitoring systems and regular follow-up of the vaccination card are also recommended to improve coverage among the elderly, ensuring complete immunization and preventing serious complications.

Figure 5: Percentage of elderly people vaccinated against pneumonia.



Source: Authors, 2024.

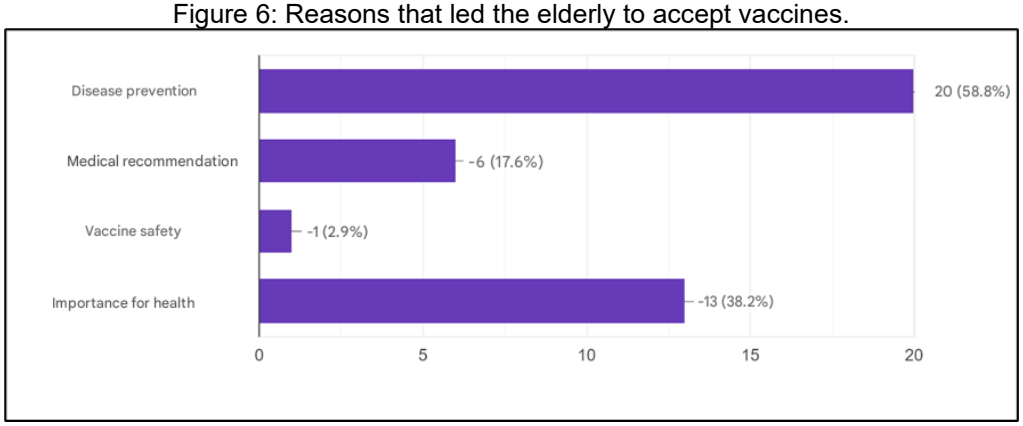
The data identified in figure 5 show that only 13.5% of the interviewees received the pneumonia vaccine, while 48.6% were not vaccinated and 37.8% did not remember. This indicates that most respondents are not adequately protected against this disease, which can cause serious complications, especially in the elderly or people with compromised immune systems. The discussion highlights that vaccination against pneumonia is essential to prevent serious infections, such as pneumococcal pneumonia, which can lead to

hospitalization and death, especially in individuals with comorbidities. Silva et al. (2020) suggest that low adherence can be explained by lack of information and access barriers. Improving communication about the benefits of vaccination is of utmost importance to increase vaccination coverage and protect the most vulnerable populations.

In the question of prevention against COVID-19, it was found that approximately 97.4% of respondents were immunized, while 2.6% did not receive the vaccine. Even with a small percentage of elderly people not immunized against COVID-19, these data indicate a high adherence to vaccination, contributing to the reduction of the risk of transmission and severe forms of the disease. Thus, it is noteworthy that mass vaccination was necessary to control the spread of the virus and reduce hospitalizations and deaths, as pointed out by Gonçalves et al. (2022). Despite the high adherence, the small percentage of unvaccinated people remain at higher risk of serious complications, so it is important to reinforce the need for continuous vaccination, including booster doses, to maintain immunity and prevent new outbreaks.

Figure 6 shows that disease prevention was the main reason for the acceptance of the vaccine, cited by 58.8% of the interviewees. This data reinforces the relevance of vaccines in protecting against infections, as highlighted by Fontana et al. (2021), who point to immunization as an essential public health strategy. In addition, 38.2% of the participants mentioned the importance for health, corroborating the perception of vaccines as fundamental for well-being, as discussed by Barata (2020). The medical recommendation, however, influenced only 17.6% of the interviewees, which may suggest a search for information from sources other than health professionals, as observed by Silva and Ribeiro (2022). Finally, only 2.9% cited the safety of the vaccine as a determining reason, reflecting the population's confidence in the safety of approved vaccines, as discussed by Soares et al. (2021).

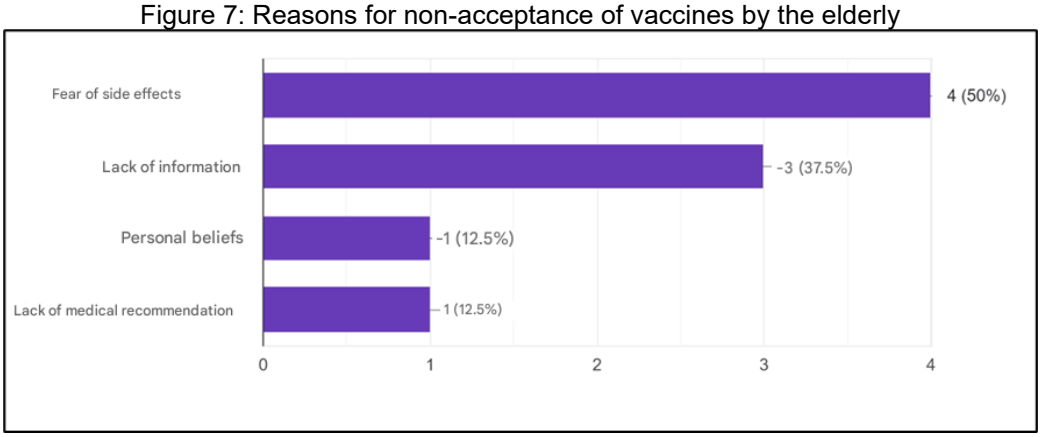
Figure 6: Reasons that led the elderly to accept vaccines.



Source: Authors, 2024.

On the other hand, the elderly who had not been immunized, pointed out, according to figure 7, the reasons why people did not accept vaccination, it is observed that the fear of side effects was the main factor, mentioned by 50% of the respondents. The lack of information was also significant, being reported by 37.5%. In addition, personal beliefs and lack of medical recommendation were cited by 12.5% of respondents. These data suggest that fear and misinformation are the biggest obstacles to vaccine uptake, as reported by Azambuja et al. (2021).

Figure 7: Reasons for non-acceptance of vaccines by the elderly

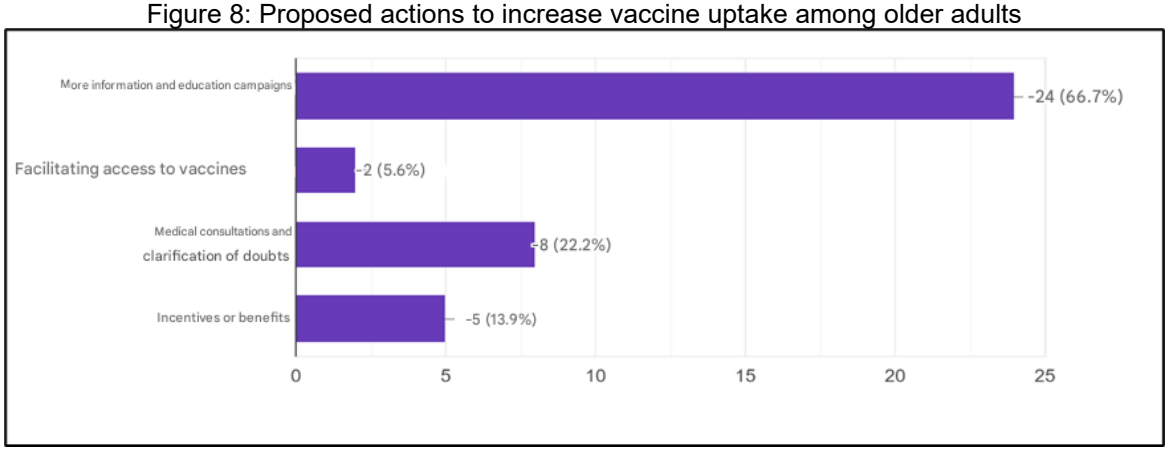


Source: Authors, 2024.

Approximately 20% of the participants, according to data obtained in the survey, stated that they had "accepted the vaccination", indicating a voluntary and conscious adherence. This result is consistent with studies that indicate that, in the absence of logistical or informational barriers, a significant part of the population accepts vaccination as individual and collective protection (Opel et al., 2013; MacDonald, 2015). On the other hand, 13.3% answered "did not inform" as a reason for not accepting the vaccine, which reveals resistance without additional justification.

Previous studies suggest that vaccine rejection may be linked to sociocultural factors, distrust in health institutions, and unfounded beliefs about the safety and efficacy of vaccines (Dubé et al., 2013; Larson et al., 2016). This emphasizes the need for more intensive educational campaigns, as suggested by Larson et al. (2014), who point out that vaccine hesitancy can be mitigated through more effective communication about the benefits of vaccines. As for other responses, (6.7%) ranged from ongoing acceptance to logistical issues such as forgetfulness (Bedford et al., 2018) or vaccine unavailability (Patel et al., 2020). Thus, it is critical for healthcare providers to develop more personalized engagement strategies to address these concerns and combat vaccine hesitancy (Gagneur, 2020).

Figure 8: Proposed actions to increase vaccine uptake among older adults



Source: Authors, 2024.

Thus, it is highlighted that 66.7% of the participants believe that "more information and education campaigns" are essential. This data is in agreement with Brazilian studies, such as that of Domingues et al. (2020), which emphasize the need for communication strategies that address misinformation and promote confidence in vaccines (Figure 8). Vaccine refusal in Brazil, especially among vulnerable groups, can be reduced by campaigns that use accessible and reliable media, as suggested by Silveira et al. (2021).

"Medical consultations and clarification of doubts", pointed out by 22.2% of respondents, are also fundamental, as identified by Luna et al. (2021). The role of the family doctor and Primary Care health professionals is important to provide personalized information, demystify fears and ensure that the elderly feel safe in relation to vaccination. Trust in the health team is a determining factor for vaccine acceptance in the Brazilian context.

On the other hand, only 5.6% of the participants mentioned the "facilitation of access to vaccines". Although this issue has been little highlighted in the graph, studies such as the one by Guimarães et al. (2022) show that accessibility, including the location of vaccination centers and the adequacy of schedules, are still significant barriers to vaccinating older adults in Brazil, especially in rural areas and less favored regions. However, 13.9% of respondents cited "incentives or benefits". Although this strategy has been less mentioned, Brazilian studies indicate that incentives, such as campaigns associated with social benefits, can increase vaccine adherence, especially among low-income populations (Santos et al., 2020).

Therefore, it is concluded that this analysis shows that educational campaigns are essential to increase vaccine acceptance among the elderly, complemented by medical consultations to clarify doubts and improve confidence. Accessibility and incentives also

play important roles, although less prominent. These factors suggest the need for integrated approaches to increase vaccine adherence.

There is a consensus that 100% of the elderly interviewed are willing to participate in educational events about vaccination, indicating a strong interest in being informed about immunization. This provision represents an opportunity to improve adherence to vaccines, especially considering the study carried out by Ferreira et al. (2021), which identified that in addition to low education and income, the fact that the elderly live alone are associated with an incomplete vaccination status among this population. In view of this, it is noted that educational events can help overcome informational barriers, since many elderly people recognize the importance of vaccination, even in the face of challenges. The survey also highlighted that the lack of a vaccination card is related to lower educational levels, emphasizing the need for health education (Ferreira et al., 2021). Therefore, the high willingness of older adults to participate in educational events, coupled with the need for strategies that consider socioeconomic barriers, suggests that these initiatives can significantly increase vaccine adherence, thus promoting better public health for this vulnerable population.

FINAL CONSIDERATIONS

The conclusions of this study highlight the relevance of understanding the characteristics and needs of the elderly in the context of vaccination. The predominance of women among the interviewees and the high prevalence of chronic diseases such as hypertension and diabetes indicate the need for specific communication and engagement strategies to promote adherence to vaccination in this age group.

While most participants kept their vaccination cards up to date and demonstrated high adherence to the COVID-19 vaccine, the data also reveal significant challenges, such as vaccine hesitancy driven by fear of side effects and lack of information. This reinforces the importance of educational campaigns that address these concerns and encourage the search for preventive care and provide clear evidence-based information, debunking the myths surrounding vaccination and reinforcing its importance for public health. In addition, the role of health professionals, especially in Primary Care, is crucial to increase confidence in vaccines, through consultations that offer clarification and adequate guidance.

In this way, the study reaffirms the need to facilitate access to vaccination and to create incentives that motivate adherence, especially among more vulnerable groups. By addressing these barriers, one can not only increase vaccination coverage but also promote healthy aging and a better quality of life in the elderly population.

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PHYSICIAN VULNERABILITY: THE PUBLIC DEFENDER'S OFFICE AS CUSTOS VULNERABILIS IN MEDICAL MALPRACTICE PROCEEDINGS

https://doi.org/10.56238/sevened2024.031-069

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ABSTRACT

Vulnerability is present when one of the poles of the relationship becomes weaker and prone to influence and damage. In a doctor-patient relationship, the first deduction that presents itself is the patient as the vulnerable party in the relationship; Although there is a place in this note, since, in most cases, this is the most recurrent scenario, it is necessary to visualize the hidden backstage on stage: the doctor in the figure of vulnerable after a mistake, based on circumstances beyond his control. This point will flourish within the process, with the active participation of the Public Defender's Office, as *Custos Vulnerabilis*, if it is not a defense per se, demonstrating that, regardless of being requested to represent the passive pole, its presence as a verifier of the guarantees that weigh the vulnerability will be due, concomitantly.

Keywords: Vulnerability. Doctor. Legitimacy. Public Defender's Office. *Custos Vulnerabilis*.

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INTRODUCTION

CUSTOS VULNERABILIS

Discussions about transgressions of the law in the practice of medicine have grown, allowing a greater understanding and extension of the problem that permeates public health care and the need to punish certain practices that constitute criminal offenses. This provides a more dynamic understanding of the relationship between Law and Medicine, since, *prima facie*, they do not have a deductive and direct connection.

In this way, a profession that was previously untouchable, dominated by the bourgeoisie and feared for nurturing the power to save lives through in-depth studies of the human body, began to be more verified, especially by social demands. In the meantime, these new perceptions have brought discussions that expose behaviors and practices in the practice of Medicine, which, despite having a lawful origin within the legal parameters of saving human life, result in illicit actions that put the life of a patient at risk, who, undeniably, is an individual protected by constitutional guarantees to the life and dignity of the human person.

Before starting the discussion itself, it is indisputable that the patient is the most vulnerable party in the relationship, and should be treated with complexity and attention. However, one discussion does not cancel out the other, so that the objective of the present work is to demonstrate the existence of medical vulnerability in the performance of a criminal offense and, as a result, the legitimacy of the Public Defender's Office to act in these processes as *Custos Vulnerabilis*, with the scope of verifying whether the guarantees of the doctor, a mere citizen, are being protected. Thus, in order to present this vulnerable aspect, it is necessary to treat the lato sensu Vulnerability together with the Vulnerability sought *stricto sensu*.

That said, the resource of qualitative, doctrinal and jurisprudential research was used, with access to the Google Scholar and Scielo platforms, through the keywords 'vulnerability', 'doctor', 'legitimacy', 'Defender's Office', 'custos vulnerabilis', as well as the use of data provided by the National Council of Justice to analyze the criminal types within the exercise of health care.

This article, therefore, fosters discussions on a topic little observed by society and the legal environment, so that this investigation is at the level of both social and scientific relevance. While social relevance opens space for the understanding of a vulnerability that is little presented to common sense and, therefore, little recognized, scientific relevance allows the construction of new paths for the recognition of the countless paths of vulnerability.

METHODOLOGY

LEGITIMACY OF THE PUBLIC DEFENDER'S OFFICE AND THE CUSTUS VULNERABILIS

The Public Defender's Office is a permanent institution, essential to the State's jurisdictional function, and it is responsible [...] for the promotion of human rights and the defense [...] of individual and collective rights, in a comprehensive and free manner, to those in need[4]." This is the main function of this body, but it is necessary to analyze in more depth and caution the expressions used to formalize the concept of Public Defender's Office.

Well, when the 'needy' are mentioned[5], the scenario that is presented in the first place, as the most usual, is that of individuals in conditions of economic insufficiency, who, by using their income to pay for the processes, would directly affect their subsistence. However, the complexity of this agency for helping the vulnerable is more comprehensive than a minimalist and economic criterion.

The extension of the meaning of vulnerable, in turn, is due to the germination of the Renovatory Waves of access to justice[6] (CAPPELLETTI, Mauro; GARTH, Bryan, 1998). In a brief step, the *first wave of renovation* takes care of the more deductive view, that is, of the insufficiency of economic resources, in which the State must act as a defender, with the objective of removing the economic obstacles of the individual; the *second wave of renovation* opens space for diffuse rights, bringing issues that do not only permeate the will of two parties, the emergence of the figure of Collective Justice; Continuously, the *third wave of renewal* procedurally streamlines litigation, in order to make it faster (CASAS MAIA , 2020).

Still in a tight synthesis, extracted from the doctoral thesis *The legal cycle of vulnerability and the institutional legitimacy of the public defender's office*: constitutional limiter or amplifier of comprehensive legal assistance?, authored by the researcher, professor and Public Defender Maurílio de Casas Maia, and in order to understand the dynamism of the Public Defender's Office, the *fourth wave of renewal* it requires care to

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[4] (LC 80/94). "Article 1 The Public Defender's Office is a permanent institution, essential to the jurisdictional function of the State, and it is incumbent upon it, as an expression and instrument of the democratic regime, fundamentally, to provide legal guidance, the promotion of human rights and the defense, at all levels, judicial and extrajudicial, of individual and collective rights, in a full and free manner, to the needy, thus considered in the form of item LXXIV of article 5 of the Federal Constitution."

[5] Rightly, the Public Defender's Offices began to adapt their regulations, starting to protect the interests of individuals, regardless of the financial criterion. Money is not everything. The legal assistance provided by the Public Defender's Office should not be limited to objective criteria, nor to the analysis of its beneficiaries or their assets. (AMORIM, ANA, 2021).

[6] For a greater understanding of the classic renovatory waves. See: CAPPELLETTI, Mauro; GARTH, Bryant G.; NORTHFLEET, Ellen Gracie. Access to justice. Porto Alegre: Fabris, 1988

associate the educational environment with legal knowledge, with the objective of making the social sensation of justice intrinsic; the *fifth wave of renewal*, in the wake of the decisions of the UN, especially from the Universal Declaration of Human Rights, opened the way for international litigation in favor of the unassisted, persecuted, stateless, among other minorities/majorities who saw their basic rights violated; and the *sixth wave of renewal*, markedly technological, facilitated access to justice by the "mosaic people", as the author quoted above clarifies.

Now, what should be extracted from the study of the renovatory waves is the analysis of social needs, verifying that there are other paths of vulnerability. Thus, the Public Defender's Office, as *custos vulnerabilis*[7], has the duty and legitimacy to be present in issues in which the vulnerable aspect assumes a latent role, as we can see in the assertions below:

> [...] access to collective justice was enhanced (second wave of renewal of access) and the special institutional responsibility of the Public Defender's Office with vulnerable categories, in the condition of constitutional needs, was finally perceived. Thus, the process of consolidating the constitutional mission of the Public Defender's Office as an emancipator and guardian of the vulnerable is reinforced (CASAS MAIA; In: LIMA MARQUES, 2020).

And of the Brazilian Supreme Court, with regard to the expansion of the Public Defender's Office's activities, in the condition of vulnerable costs, as we can see from the wording of Justice André Luiz de Almeida Mendonça, when accepting the action of Allegation of Non-Compliance with a Fundamental Precept, filed by Maurílio Casas Maia:

> ADPF 709 ED/ DF, 2023. "The condition of custos vulnerabilis allows the Public Defender's Office to intervene in the facts, in its own name, but in the interest of the rights of the needy, in order to strengthen the defense of collective and diffuse interests of groups, which, under other conditions, would not have a voice. It is an institute closely related to its institutional attributions of defense of human rights (art. 134, FC). In concentrated control actions, such intervention confers even greater openness to debate, allowing different perspectives to be brought that would not be available in other circumstances. Precedents: (STF, Rcl n. 54.011, Rel. Min. André Mendonça, j. 29.06.2022; STJ, EDcl no REsp 1.712.163, Rel. Min. Moura Ribeiro, j. 25.09.2019.)

Considering, therefore, that this body has a multifocal space of action, it is peremptory to affirm that the classic conception of the technical defense of an individual or group in need has been overcome, extending the presence of the Public Defender's Office

[7] The term Custos Vulnerabilis had as one of the main creators the Public Defender of the State of Amazonas, Professor at the Federal University of Amazonas – UFAM, Maurílio Casas Maia, in a Doctoral Thesis, defended in the Graduate Program in Constitutional Law, at the Center for Legal Sciences - CCJ, at the University of Fortaleza – UNIFOR (2020).

in the process as the "guardian of the vulnerable", just like the Public Prosecutor's Office in its role of *custos legis*.

In the meantime, the remedy to remove the vulnerable character in the procedural sphere, which, in turn, has become normalized, considering that one of the parties, or both, in their due circumstances, are vulnerable, is the Public Defender's Office. It is the core of access to justice and, consequently, of overcoming vulnerability.

RESULTS

VULNERABILITY IN THE LEGAL CONTEXT

A priori, vulnerability, coming from the Latin *vulnerabilis*, rested on the meaning of "injury, cut or open wound, without healing, bloody wounds with serious risks of infection" (JUNIOR, Eudes, 2010)[8]. In this way, vulnerability represents the fragility of human life within society, and can therefore fall on any individual. Obviously, these circumstances do not affect everyone equally, since, even to be in a vulnerable situation, inequalities are present.

In this vein, for example, the vulnerability of a hyposufficient individual will not be the same as that experienced by a woman in a context of domestic violence, just as it will not have the same characteristics as a refugee[9]. This context makes it peremptory to recognize that there are several types of vulnerabilities within a society and that, frequently, the paths that inequality makes are not visualized, thus preventing the knowledge of certain vulnerabilities that escape the common gaze, since it is a *factual situation, that is, it must be analyzed according to the specific* concrete case, "since it would be impossible for the established norm to exhaustively foresee all cases, listing them" (NÓBREGA, Alice, 2021).

In the same sense, the Amazonian defender is right to advocate for an expansion of the competence of the Public Defender's Office, because to circumscribe it to a reason of

[8] Vulnerable, a term of Latin origin, **vulnerabilis,** in its origin comes to mean the injury, cut or open wound, without healing, bloody wounds with serious risks of infection[7]. HOUAISS[8], in turn, defines it as follows: that he can be physically injured; subject to being attacked, defeated, harmed or offended. It always demonstrates someone's incapacity or fragility, motivated by special circumstances. Greek mythology reports that Thetis, mother of Achilles, anointed her son's body with ambrosia and held it on fire. He then plunged him into the river Styx with the intention of making him invulnerable. But he held him by a heel that was not touched by the water, and so he was left unprotected. He was killed by Paris, who hit him with a closed heel vulnerable. (JUNIOR, Eudes Quintino de Oliveira. The concept of vulnerability in criminal law, 2010).

[9] Thus, the following groups were considered vulnerable, regardless of income criterion: women victims of domestic or family violence; Elderly; people with disabilities or with global developmental disorders; children or adolescents; indigenous populations; quilombolas; riverside dwellers or members of traditional communities; over-indebted consumers or in a situation of consumption accident; people who are victims of discrimination on the basis of ethnicity, color, gender; origin; race; religion or sexual orientation; people who are victims of torture; sexual abuse; trafficking in persons or other forms of serious human rights violations; LGBTQIA+ population; persons deprived of liberty due to imprisonment or internment; migrants and refugees; homeless people; drug users; collectors of recyclable materials and workers in situations of slavery. (AMORIM, Ana, 2021).

economic vulnerability and/or asymmetry between the parties is to limit access to justice and the improvement of the democratic system:

> Based on the assumption of the doctrinal and jurisprudential adoption of the broad concept of "needy" and "insufficiency of resources" as sufficient for the *transindividual legitimacy* of the Public Defender's Office, it is understood that the expression "needy" should not be limited to the economic-financial criterion. (CASAS MAIA, 2020, p. 72)

In this sense, the scope of the concept and competence of the Public Defender's Office would reach those professionals who, despite being categorized as economically sufficient in the general sense of the work scale and remuneration, can be inserted in a synchronic and diachronic context of vulnerability, as is the case of doctors.

THE VULNERABILITY OF THE PHYSICIAN

Secularly, the doctor is a notorious figure and, for a long time, was considered a differentiated professional from the others, recognized for his distinct worldview, due to his power to save lives. In the context in which the doctor was seen with a fearsome power, to adduce that he could have some aspect of vulnerability would be innocuous and almost immediately refuted. Confrontation with this figure, therefore, was rare. However, nowadays, with the dynamization of social relations, greater media freedom and a broad knowledge by the 'average man', that is, with more democratic access to scientific readings on digital platforms, the doctor is in a position where his acts can be glorious or declining.

It is not a deductive vulnerability, in which the situation is presented and then it is stated that there is a vulnerable aspect in the doctor. It so happens that, in the reflections of Meirelles, Ana, et al. (2022), each reality is unique and personal, vitaminized by a 'coefficient of subjectivity', so that the perception of characteristics and circumstances is not always directly measurable. Thus, '*one should not conceive the idea of vulnerability as a label or a hermetic and closed condition, but as a complex reality, endowed with different dimensions*.'

Furthermore, with the constitutionalization of all acts in society, whose scope is to enforce the good of life and the dignity of the human person, any action attributed to an individual can have criminal consequences, if Criminal Law is present as an *ultima ratio*. Thus, not incorrectly, if the doctor commits an attempt on human life, even in circumstances beyond his control, he will be transgressing the law, adapting to some conduct typified in the Penal Code, and due accountability, if verified, must be presented.

It turns out that, given this scenario, the doctor becomes, in the process, a totally vulnerable individual. In this sense, it is not a question of insufficient resources, since it is

expected that, at this point, the minimalist view that vulnerability is triggered only by economic hyposufficiency has been overcome. Vulnerability here refers to the fact that it is hostage to public opinions and media influence, a Fourth Estate, which, through small manifestations, can influence the course of a medical malpractice process, preventing the defense from using the appropriate procedural mechanisms and even interfering in the security of the jurisdictional provision. Hence the alignment of the Amazonian defender with two columnists, in scientific matters about the performance of the Defender's Office, with regard to human rights, whether collective, individual, gender, class or any other definition.

> [...] it is up to the Public Defender's Office to ensure the promotion of the Human Rights *of each and every person, whether they are economically needy or not*, to the extent that the guiding criterion of institutional action is no longer exclusive to financial condition, *but rather the existence of a fundamental right worthy of state protection.* (RAGAZZI and SILVA: in: CASAS MAIA, 2020, p. 119)

Furthermore, it is necessary to address another garment imposed on physicians as a result of their actions: villainization. Now, within a process, especially in scenarios of medical error, the patient, the active pole, and the physician, the passive pole, are not in a situation of equal parameterization. Despite the support needed to face the procedural way of the cross, the only supporting figure of the health professional, within the process, is the lawyer himself. Often, the latter, not having enough time to seek a scientific understanding of the physician's conduct, is unable to orchestrate good arguments that can contribute to the search for full justice.

Furthermore, it is important to expose the main fragility that, it is dare to say, sustains the entire structure of vulnerability that permeates the physician. This professional is often inserted in an environment in which the emotional load is constantly put to the test, and must deal not only with the vulnerability of the patient he is attending, dealing with the delicate bridge between life and death, but also with the family members, who, in their liquid and certain right, demand dignified care.

In this context, physicians must face the unhealthy workplace and the scarcity of equipment, seeking to balance these conditions with humanized care, in an environment where tragedies are routine and resources are scarce or precarious. Regardless of all these challenges, the doctor must respond objectively, valuing science and running the risk of suffering a lawsuit.

Thus, in the reflections of Mascarello and Bertoglio (2019), the physician still faces occupational risks, that is, the risk of being contaminated by biological materials or infectious diseases. Even with the use of Personal Protective Equipment in patient management, these risks can be more complex and difficult to eliminate completely,

especially in urgent and emergency cases. Finally, the umbilical relationship between these risks and the vulnerability of the physician in the exercise of the profession is clear.

THE MOST RELEVANT TYPES OF CRIME ARISING FROM THE PROVISION OF HEALTH CARE

Criminal offenses in Brazil occur for the commission of a crime or misdemeanor. The focus will be given to crime, which consists of "*any conscious and voluntary action or omission, which, being previously defined by law, creates a legally prohibited and relevant risk to legal assets considered fundamental for peace and social life*". To this end, the Tripartite Theory is adopted, in which the concomitant existence of a Typical, Illicit and Culpable Fact is verified[10].

On another level, it is known that, for the commission of an intentional crime, whether by action or omission, there must be the figure of *animus*, so that it encompasses the object desired by the active subject of the action, making evident the intent of the first degree, as well as the means chosen and the knowledge of the secondary consequences of this act, characterizing, in turn, second-degree intent (ESTEFAM, 2024, p. 880). On the other hand, there are some situations in which the agent did not aim for a certain result, which, even so, will affect the commission of a crime; At this point, the crime is exposed in the culpable modality.

When dealing with fault in isolation, the following elements must be present: a) voluntary conduct; b) typicality; c) result (involuntary); d) causal link; e) breach of the duty of objective care[11], due to recklessness, negligence or malpractice; f) objective predictability of

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[10] "The tripartite or trichotomous current is the predominant one, not only in Brazil but also in foreign doctrine. Its adherents argue, among others, that there can be no crime in an action that does not deserve reproach. Culpability, therefore, must be an integral part of the concept. They also add that to consider it a prerequisite for punishment is to adjectivate it in a way that would serve any of the requirements of the crime; This is because, without a typical and anti-legal fact (as well as without culpability), there can be no imposition of penalty." (ESTEFAM, A.; LENZA, P.; GONÇALVES, V. E. R. Schematized® Criminal Law: 13. ed. São Paulo: Saraiva, 2024. E-book.)

[11] The duty of care consists of the imposition, provided for everyone, to act with caution on a daily basis, so as not to harm other people's property. This duty is determined objectively, that is, according to an average standard, based on what would be expected of a person of average prudence and discernment; hence the talk of "objective duty of care". The violation of this duty will be manifested through imprudence, negligence or malpractice. These modalities of guilt are, therefore, the ways of breaking the multi-cited element of the typical fact of culpable crimes.
The concrete determination of the breach of duty and, therefore, the finding of imprudence, negligence or malpractice require a hypothetical formulation, in which the agent's conduct is compared with that which would be expected of a person of average prudence and discernment, in the situation in which the individual found himself. Thus, for example, if someone drives a car on a public road at excessive speed and, in view of this, collides with another vehicle, injuring the driver, his conduct must be confronted with that of an average man, in the same situation in which he was. This comparison will reveal that the subject acted with recklessness, breaking the duty of objective care, because an averagely cautious person is expected to obey traffic rules at the wheel, something that the driver responsible for the accident did not do. (ESTEFAM, A.; LENZA, P.; GONÇALVES, V. E. R. Schematized® Criminal Law: 13. ed. São Paulo: Saraiva, 2024. E-book.)

the result; g) relationship of objective imputation. Usually, guilt manifests itself through recklessness, negligence or malpractice.

In the teachings of André Estefam (2024, p. 893), recklessness is a positive action, in which the agent acts "*without precaution, hasty, imponderable*"; Therefore, there is a willingness to act in this way, but the result is not expected. As for *negligence*, on the contrary, it is a negative, omissive action, in which "*the subject behaves without due caution*". Finally, malpractice occurs, as a rule, "in the exercise of the *profession, deriving from the practice of a certain activity, omissive or commissive*"; It is characterized by an individual who has no experience in a certain procedure, for example.

Thus, what can be concluded is that the doctor may suffer criminal liability for a conduct that, added to all the other elements, will be part of the analytical concept of crime. In this way, the presence of intent may be verified, in which the objective, from the beginning, was to characterize a fact considered unlawful, or guilty, in which the institutes of imprudence, negligence or malpractice will be present, scenarios that generally include medical conducts (MASCARELLO, Michel, 2019, p. 190).

THE MAIN OFFENSES COMMITTED BY PHYSICIANS IN THE EXERCISE OF THEIR PROFESSION

The practice of medicine involves the delicate bridge between life and death, so that one of the criminal responsibilities that can be imputed to a doctor is precisely homicide in its culpable modality, according to article 121, paragraph 3, of the Penal Code, with special attention to paragraph 4 of the same article, which deals with the non-observance of a technical rule of profession.

A doctor who submits a patient to an aesthetic procedure, for example, without the technical skills for such an intervention, is assuming the risk to the patient's health, becoming liable to punishment. This differs from the one who, even following the protocols described in the literature about a given disease, sees the patient die. To the former, the affairs of the law; to the latter, the understanding of the law. It is in this sense that we recall the studies below:

> One cannot confuse malpractice with the legal concept of professional error, synonymous with excusable diagnostic error (read: exempt from liability). Example: the doctor, when analyzing the patient, applied the technique that the medical books recommended. However, his diagnosis was wrong, because the person had contracted another disease, different from the one he imagined. The subject, in the face of the medications prescribed by the professional, has his process of deterioration of the organism accelerated and ends up dying. In this case, the doctor is not responsible for the result, not even as a fault. The fault was not his, because he acted according to the knowledge of his science, but of Medicine itself (so much

so that any other averagely prepared professional would have made the same mistake). (ESTEFAM, A.; LENZA, P.; GONÇALVES, V. E. R. 2024)

In view of another aspect, still on the culpable modality, there is bodily injury, which the Penal Code addresses in its article 129, paragraph 6. In this sense, there is no need to speak of classification when it occurs by intent, whether in the light, serious or very serious forms, but only when caused by recklessness, negligence or malpractice. It is important to note that this crime will only be configured when there is the presence of "*manifest malpractice, negligence or imprudence*". Therefore, the liability of the doctor is excluded if he acts in accordance with the rules of practice. (MASCARELLO, Michel, 2019, p. 193).

At this point, when addressing an intentional perspective, the crime of omission of help is verified, provided for in article 135 of the Penal Code, which is configured when, in the field of health, the professional refuses to attend to a certain individual, under the pretext of being out of his specialty. As an example, this occurs when the patient dies because the seriousness and urgency of the situation are not considered. Continuing, another crime that can be found is the illegal practice of medicine, under the terms of article 282 of the Penal Code, when any individual acts without authorization or the doctor himself exceeds the limit of his training.

Furthermore, there is also a violation of professional secrecy, although less frequently due to the adoption of ethical principles in medicine, provided for in article 154 of the Penal Code, which consists of *revealing, without just cause, in the exercise of a ministry, office or profession, information that may cause damage to others*. On another level, it is possible to cite the falsity of a medical certificate, along the lines of article 302 of the Penal Code.

CONCLUSION

IN DUBIO PRO JUSTITIA SOCIALIS

Since the creation of the Public Defender's Office, its main aspect has been the defense of the vulnerable; prima facie, those who did not have sufficient resources to bear the costs of a lawsuit without jeopardizing their own livelihood. With the evolution of social claims, the concept of vulnerability accepted by the Public Defender's Office was reflected, making it evident that it was not restricted only to the financial aspect.

In this sense, it was found to be pertinent to defend those who are vulnerable in aspects other than the economic. What has been observed over the years is that the Public Defender's Office has the capacity not only to carry out a technical defense itself, but also to act as a guardian of the vulnerable.

With regard to vulnerability, it cannot be treated as an exhaustive list, in which there are only a limited number of social figures pertinent to this concept, and therefore the subjective character of each concrete case must be analyzed. Thus, the study of vulnerability is continuous, requiring an intermittent analysis of the deficits inherent to each situation that arises.

Thus, medical vulnerability wanders under the influence of the media in the specific case, as well as in the work environment itself, which is involved in several risks that make the medical profession challenging and prone to emotional destabilization. This environment constitutes a fertile and vulnerable soil, marked by the fragilities arising from the social, emotional and unhealthy pressure of the workplace. And, if even in the face of these factors there are still doubts about the vulnerability of this professional, the criterion in dubio pro *justitia socialis*, already enshrined in the higher courts, applies:

> The more democratic a society, the greater and freer must be the degree of access to the Courts that is expected to be guaranteed by the Constitution and the law to the person, individually or collectively. *2.* In the Public Civil Action*, in case of doubt* about the legitimacy to act of an intermediary subject – the Public Prosecutor*'s Office, the Public Defender*'s Office and associations, for example –, especially if the dignity of the human person is at stake, *the judge must choose to recognize it* and, thus, open the doors to the judicial solution of disputes that, if different, they would never see their day in court. […]. (STJ, REsp 931.513/RS, Rel. p/ Judgment Min. HERMAN BENJAMIN, S1, j. 25/11/2009, DJe 27/9/2010. In: CASAS MAIA, 2020, p. 213).

And also in the abundant literature on the subject:

> Therefore, if it is understood that legal legitimacy (*ope legis*) is not sufficient to confirm the legitimacy of the body, that is, if the theory of ope *iudicis control* of institutional legitimacy is adopted and there is *doubt* about ministerial or defender legitimacy, it is also interesting to probe the *social relevance* of the *sub judice* legal good, when in doubt, institutional legitimacy must be confirmed, adopting the criterion *in dubio pro justitia socialis* applied to the analysis of institutional legitimacy: in doubt, in favor of *access to Justice* and the search for the effectiveness of Social Justice. Thus, in the debate on access to social justice, the principle *in dubio pro justitia socialis* will guarantee the *prohibition of retrogression* – in a similar sense, DIDIER JR. and ZANETI JR. – on the issue of the institutional legitimation of public agents when it comes to *institutional presentation* regarding the defense of primary and collective public-institutional interests in a broad sense. (CASAS MAIA, 2020, p. 214).

Therefore, such circumstances denote the clear fragility and vulnerability of the physician, leaving the Public Defender's Office more than justifiable in the figure of Custos Vulnerabilis. This does not prevent, in turn, this same body from acting as a technical defense in situations, for example, of default or even hyposufficiency, depending on the analysis of the magistrate in the face of the concrete situation.

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COVID-19: A STUDY OF THE STRATEGIES OF THE MULTIPROFESSIONAL TEAM FOR PSYCHOSOCIAL REHABILITATION IN A PSYCHOSOCIAL CARE CENTER

https://doi.org/10.56238/sevened2024.031-070

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ABSTRACT

This research investigated the adaptation strategies of the multiprofessional team of the Psychosocial Care Center (CAPS II) for psychosocial rehabilitation during the COVID-19 pandemic. Using a qualitative approach and the dialectical critical method, a literature review and semi-structured interviews were conducted. The data were analyzed using the methodology of Bardin (1977), processed in the IRAMUTEQ software, and categorized for interpretation. The results showed that the CAPS team implemented strategies focused on psychosocial rehabilitation, highlighting the importance of innovative and adaptable practices in critical moments and in the continuous routine. The research highlighted the need for robust public policies that support these practices with adequate resources, continuous training, and an institutional environment that promotes creativity and flexibility. Incorporating reinvention into the daily practices of the CAPS, supported by public policies, can avoid setbacks and promote advances in mental health care, benefiting professionals and users. The research underlines the importance of these strategies and the need to discuss mental health and public policies aimed at the citizenship of people with mental health problems.

Keywords: COVID-19. Mental Health Service. Multiprofessional Team. Adaptation Strategies.

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INTRODUCTION

When dealing with COVID-19, it is worth noting that it occurred from 2019 in China. In Brazil, this virus spread from 2020 onwards, resulting in the contamination and death of more than 700 thousand people (WHO, 2021). The services provided by the Psychosocial Care Center (CAPS) during the COVID-19 pandemic brought a series of challenges to everyone's mental health. The need to readjust mental health services to meet emerging needs was one of the main challenges. According to Figel et al. (2020, p. 2) the COVID-19 pandemic [...] culminated in the need to reorganize health care, including mental health, closely related to the impact on daily life and health.

It is worth noting that the Psychosocial Care Center is the specialized device for mental health care of severe and/or persistent cases. In this sense, this study aims to understand this reality in the city of Ponta Grossa/PR, observing the care strategies during the pandemic, as well as the demands of CAPS II.

Considering that the strategies are related to the methods developed to achieve a specific objective, in the context of CAPS II, these strategies are directed to meet the needs of their users with the objective of promoting psychosocial rehabilitation. Also according to the Municipal Health Foundation of Ponta Grossa/PR, CAPS II needed to change its care dynamics, since, before the pandemic, there were therapeutic groups, which due to the isolation measure, had to be interrupted, and the service started to be carried out through individual assistance via telephone, except in situations considered serious (Ponta Grossa, 2020).

Based on this assumption, one of the strategies used by the CAPS II multiprofessional team was to direct care within the territories of each user, enabling greater effectiveness in care.

Understanding the functions of the CAPS and the demands apprehended to them during the pandemic period, this research has the following general objectives: To investigate the adaptation strategies used by the multidisciplinary team at the Psychosocial Care Center II (CAPS II) due to the COVID-19 pandemic, for the psychosocial rehabilitation of mental health users.

In the context of health, the COVID-19 pandemic emerges, profoundly affecting the mental health of people around the world. Physical limitations, contact restrictions, and uncertainty about the future led to anxiety, depression, and other mental health problems. Some of the main factors contributing to the impact of COVID-19 on mental health include: changes in daily routine, loss of job or income, bereavement, loneliness, financial concerns, caregiver burden, among others (Floriano, 2021).

Data collection was carried out at CAPS II in Ponta Grossa/PR – which is a strategic point of care of the Psychosocial Care Network (RAPS). These are units that provide open and community health services, consisting of a multiprofessional team that works from an interdisciplinary perspective and provides care to people with suffering or mental disorders, in their territorial area, whether in crisis situations or in psychosocial rehabilitation processes. They are substitute services for the asylum model (Brasil, 2011).

Considering that the Psychosocial Care Centers are fundamental services in the process of the Brazilian Psychiatric Reform as strategic devices for the organization of the psychosocial care network in their territory. Users can arrive at the CAPS spontaneously or be referred by various public agencies. The treatment offered at the CAPS is based on the Singular Therapeutic Project (PTS), which consists of a personalized care plan, aiming to harmonize clinical care with initiatives of social inclusion and strengthening of relationships in the community (Guimarães, 2011).

In the period between March 17 and 20, 2020, the city of Ponta Grossa approved Municipal Decrees No. 17,077/2020 and 17,144/2020, which determined the suspension of activities involving agglomeration of people as part of a set of restrictive measures to contain a pandemic. This included the suspension of classes in schools and colleges, the closure of commercial establishments classified as "non-essential", gyms and shops. This period was important for the municipality to be able to structure its health network, acquire adequate protective equipment for health professionals, and implement a telephone monitoring service for COVID-19 cases (Ponta Grossa, 2020).

In this way, health professionals sought to offer care through video calls, also known as telemedicine, thus maintaining mental health services, both for pandemic-related crises and for other situations. The challenge in question is related to the lack of equality in internet access by the Brazilian population (Fiocruz, 2020). Thus, a complexity arises in the provision of care at a distance, which results in an increase in crises, as it is not possible to identify the most specific care needs to prevent them. In addition, it hinders the construction of the Singular Therapeutic Project (STP) and compromises the adequate evaluation of the effectiveness of the proposed care strategies. Care that was previously provided in an equitable and personalized way is now restricted to brief moments of a video call, limiting itself to what a person with mental health conditions shares, rather than including the closer observation and interaction that was previously practiced. This new format carries the risk of reinstitutionalization of care, in which actions can be reduced to the outpatient context, with a greater focus on hospitalization to deal with crises (Grandi, 2020).

Many mental health professionals have adopted telecare to continue providing therapeutic services in a monitored manner, ensuring continuity of care during social distancing. For Oliveira et al. (2021), it is important to consider the additional stress that the pandemic has caused for mental health professionals. They also need support in dealing with their own emotions while continuing to provide care to the community. Mental health staff played an essential role during the pandemic, providing emotional support, treatment, education, and resources to those who were facing challenges in their mental health due to that challenging period (Oliveira et al., 2021).

METHODOLOGY

To conduct this study according to the proposed objectives, it was chosen to adopt a qualitative, exploratory approach, using a semi-structured interview composed of ten open questions, complemented by the content analysis technique as methodological support.

As a data collection technique, a semi-structured interview was used, consisting of ten open questions, which contributed to answer the objectives of this research based on a script. In this way, the characteristic of this interview model makes it possible to discuss the research theme (Minayo, 2014). The interviews were conducted with the multidisciplinary team of CAPS II, located in the city of Ponta Grossa/PR, respecting the ethical aspects regarding voluntariness and the signing of the Informed Consent Form (ICF). For the delimitation of the research subjects, it is considered, based on Minayo (2014), the importance of determining the relevant group for the study and, at the same time, prioritizing the subjects

that hold the attributes that the researcher wants to know.

In this sense, the participants involved in the study were defined as municipal employees who are members of the multiprofessional team of the CAPS II unit, who have experienced the period before and during the COVID-19 pandemic, as active professionals. The total number of higher education employees who work at CAPS II in Ponta Grossa are 10 professionals from the following areas: four in psychology, two in physical education, two in occupational therapy, one in nursing and one in social work. The sample used for the research totaled six participants who work directly in the monitoring and construction of the Singular Therapeutic Project (PTS) of CAPS II users, leaving out of the research four professionals with higher education by the exclusion criteria, namely: three civil servants who started their activities at CAPS II after the period of the COVID-19 pandemic and one civil servant who had leave from CAPS activities granted by the institution at the time of the pandemic, because he is a 60-year-old person (risk group).

The professionals interviewed were from the following areas: three psychologists, two physical education professionals and one occupational therapist, the form was applied for data collection, and the interview was recorded with the participant's authorization.

In the qualitative approach, there is no concern with the number of participants, because the universe of the research is not the subjects themselves, but their representations and knowledge.

Thus, the number of study participants was not previously established, the interviews were conducted with six higher education professionals from CAPS II in Ponta Grossa, totaling 100% of the sample, between the months of October and November 2023.

Thus, the non-probabilistic sample is considered, which are described by the absence of a known probability of selection for each element of the population. As highlighted by Mattar (1996), these samples are often chosen based on specific criteria, such as convenience, the researcher's judgment, or the participants' accessibility. The non-probabilistic approach is especially useful in contexts where the application of probabilistic methods is challenging, allowing flexibility in the selection of participants. However, Mattar (1996) warns that the representativeness and generalizability of the results obtained from non-probabilistic samples may be limited, requiring a careful analysis and a contextualized interpretation of the findings.

The confidentiality of the participants' names was preserved, and they were identified with the word 'Interviewee', followed by the number indicating the order of the interview (Interviewee 1, Interviewee 2 and so on).

DATA ANALYSIS

The data analysis occurred in two distinct moments, namely: first, the construction of the word cloud and the analysis of similarity was carried out with the help of the Textual Analysis software IRAMUTEQ (R Interface for Multidimensional Analysis of Texts and Questionnaires) and in the second moment, content analysis was used according to Bardin (Souza, et al., 2018).

Given the extensive textual volume in some researches, combined with the complexity and subjectivity of traditional qualitative methods, such as content analysis, lexicographic analysis software emerges as auxiliary tools to ensure greater methodological rigor (Santos et al., 2017).

It is important to note that the textual or lexicographic analysis software on the market does not perform data analysis by itself. They serve as instruments for organizing and helping to categorize the data obtained (Taquette, 2016).

By proposing the use of software, the objective is to facilitate and make the data processing process more efficient, considering that the manual method of treatment can result in the loss of information. In this context, the IRAMUTEQ Software stands out as a facilitator in the treatment of data for qualitative research. Using programming language, IRAMUTEQ performs lexical analysis of textual bodies that the researcher wishes to analyze. According to Almico and Faro (2014, p. 727), Iramuteq is "a computerized method for text analysis, which seeks to apprehend the structure and organization of discourse, informing the relationships between the lexical worlds most frequently enunciated by the subject".

Text analysis is considered a type of data analysis, derived from transcribed verbal materials (Nascimento-Schulze; Camargo, 2000). Through textual analysis, it is possible to examine documents, interviews, published works and various other textual materials, allowing inferences from propositions. IRAMUTEQ reads textual corpus, which must be formatted according to the specificity of the software, and this formatting must be made explicit for a clearer understanding.

The "textual corpus" is understood as the set of texts that the researcher intends to analyze and is constructed by him. In the same way, the "text" is the result of the researcher's choice in relation to what he intends to analyze. Each document, fragment of text or interview, separated by a command line, constitutes a text. Thus, a set of texts forms a textual corpus. As for the "text segment", its dimension is determined by the software itself, usually not exceeding three lines, but can be adjusted by the researcher (Bueno, 2018).

It is important to emphasize that "the use of software is not a method of data analysis, but a tool to process it" (Kami et al., 2016, p. 2). This is emphasized by Bauer and Gaskel (2002), who state that no software is capable of analyzing data qualitatively, and it is incorrect to interpret it in this way. The responsibility falls on the researcher, who, with the help of the software, organizes and treats the data he intends to analyze.

As for IRAMUTEQ, it enables analyses of textual corpus, from basic lexicographic analyses, such as word frequency, to multivariate analyses, such as Descending Hierarchical Classification (DHC) and Similarity Analysis. In addition, it allows the graphic representation of the most expressive words in the textual corpus by means of the word cloud (Ramos; File; Amaral-Rosa, 2018).

The "word cloud," while simpler, is meaningful and visually appealing. Its representation is based on frequency calculation, where the most representative words are displayed in a larger font size, while the less representative ones have a smaller size. This

analysis seeks to understand the keywords of a textual corpus. Thus, it can be seen that the IRAMUTEQ Software offers a variety of resources for textual analysis, becoming particularly relevant when dealing with large volumes of data. Because it is free and easy to use, it is believed that the software has a lot to contribute to the area of research in teaching. However, it is essential to emphasize that IRAMUTEQ is used exclusively for data processing, and the interpretation of these is the responsibility of the researcher (Bueno, 2018).

Through "similarity analysis", it is possible to infer the connections between the data. By creating a word tree, this analysis establishes central nodes in which it is possible to relate other stemmed words and establish connections based on their semantic roots. Similarity Analysis provides a visualization of the connections between shapes through a tree-like illustration, based on graph theory (Santos et al., 2017).

The software identifies the connection between words and builds the similarity tree that represents the structure of the textual corpus, making it possible to discern the strength of connection between words from the thickness of the graph, and the words with the highest number of connection with other elements are those with greater centrality (Ribeiro, Servo, 2019).

With this, the textual corpus was constituted through the transcription of the interviews for processing in the IRAMUTEQ software and the data were categorized by associating it with content analysis, to treat the results obtained and perform the interpretation.

Thus, in the second moment, the Content Analysis Technique was carried out, which refers to a "set of communication analysis techniques, which uses systematic and objective procedures to describe the content of messages" (Bardin, 2011, p.42), focuses its intention on the inference of knowledge, and seeks to achieve a deep understanding of manifest meanings, relating semantic structures (signifiers) with sociological structures (meanings) (Minayo, 2014).

Content analysis is an interpretative method that deals with words, allowing the removal of inferences about the content of the communication of a text, related to its sociocultural context. This approach can be carried out quantitatively or qualitatively. While quantitative content analysis focuses on the frequencies of characteristics that are repeated throughout the text, the qualitative approach examines the presence or absence of a certain characteristic or set of characteristics in specific fragments of the text (Campos, 2004; Caregnato; Mutti, 2006).

Content analysis plays an important role in the extraction and interpretation of relevant information from the discourse of the professionals studied. This approach aims to identify and categorize the most prominent elements in the speeches, allowing an in-depth understanding of the topics covered. By categorizing the statements, it will be possible to discern trends, patterns and nuances in the professionals' discourse, revealing the main emphases, concerns or perspectives that emerge from the interview (Campos, 2004; Caregnato; Mutti, 2006).

Regarding content analysis, Minayo (2014) conceptualizes that it is a set of techniques that intend to understand and collect information about human behavior, enabling a varied application and having two functions: a) verification of hypotheses and/or questions and b) discovery of what is behind the manifested contents.

In this way, the three main phases of the content analysis method are pointed out, namely: a) pre-analysis, b) exploration of the material and c) treatment of results, inference and interpretation (Bardin, 1977).

The last phase of content analysis consists of the treatment and interpretation of the results, presenting relevant information and confrontation with the previously collected material, also indicating reflections for future analysis. Bardin (1977, p. 101) points out that "[...] the analyst, having at his disposal significant and faithful results, can then propose inferences and advance interpretations regarding the foreseen objectives – or that concern other unexpected discoveries".

The last phase of the organization comprises the treatment of the raw results and their interpretation. The objective of this stage is to highlight and condense the information obtained in the analysis, using statistical treatment to ensure that the data are considered valid and meaningful (Bardin, 2011; Urquiza; Marques, 2016).

Bardin's analysis is a complex approach that requires dedication and time on the part of the researcher to understand the method. However, if it is conducted correctly, following a transparent process, it can constitute a high-quality tool in the analysis of texts and in the construction of inferences and results in qualitative research (Bardin, 2011; Urquiza; Marques, 2016).

RESULTS

The results will be presented in two aspects: characterization of the participating professionals and lexical analysis - word cloud method and similarity analysis (Bueno, 2018).

Regarding the characterization of the participants, of the six professionals interviewed, 50% were female and 50% male. Regarding the professional category, three psychologists, one occupational therapist and two physical education professionals were interviewed. The time of operation in the municipality ranged from 3 to 10 years. Regarding complementary training, all professionals with higher education reported having attended one or more postgraduate courses in the following areas: collective health, management, mental health and education.

By the word cloud method, which groups words and organizes them graphically according to their frequency, the word "attendance" was the one with the highest frequency in the corpus - 64 times, followed by the word "user" that appeared in the text - 48 times (Figure 1).

Figure 1 Word Cloud



Source: Prepared by the author, based on the IRAMUTEQ software, 2023.

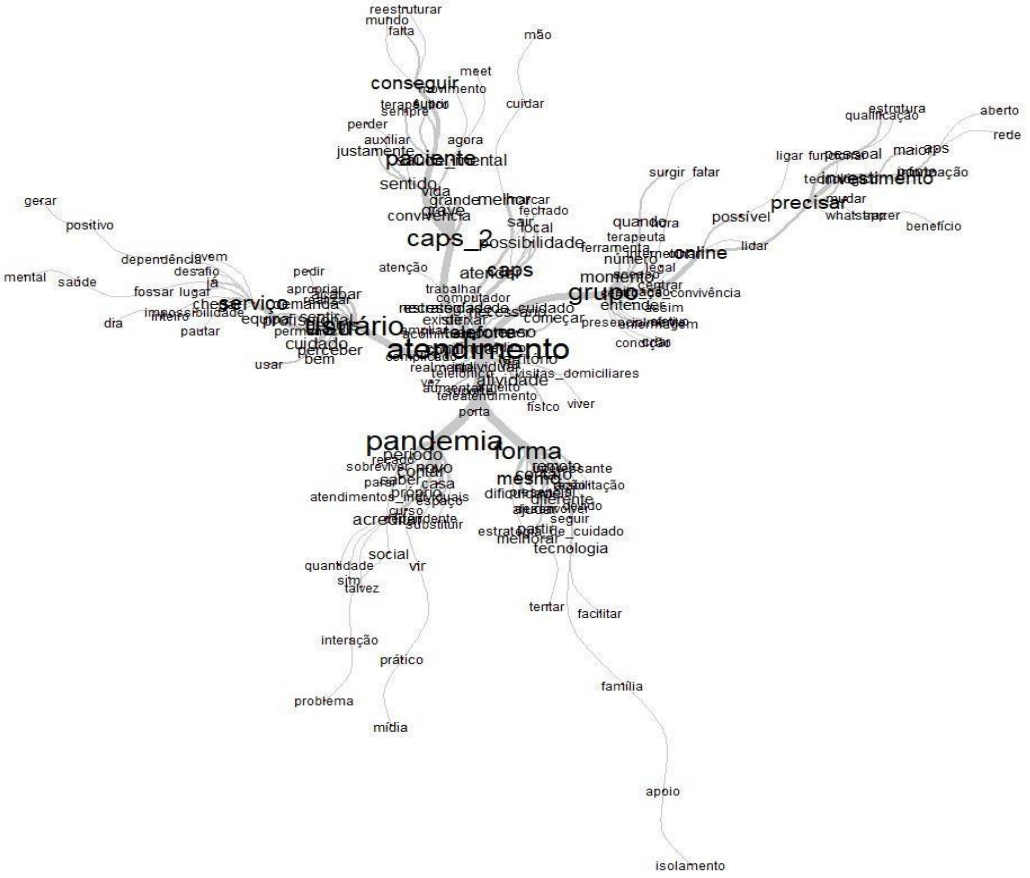
It is noted in the figure that the words are randomly positioned in such a way that the most frequent words appear larger than the others, thus demonstrating their prominence in the corpus of analysis of the research. For the purposes of this study, after the processing stages, the meanings of the words were interpreted through the professionals' speeches, so the word "care" had the meaning of care that is often synonymous with care strategy, corroborating Lopes et al. (2021).

Based on the Analysis of Similarity or Similarities (Figure 2), which makes it possible to locate co-occurrences between words, indicating their connections (Marchand &

Ratinaud, 2012), it is observed that the term "care" organizes different forms of its understanding, being strongly related to the words "pandemic", "CAPS 2", "group", "online", "investment", "user", "service".

In addition, elements related to the mental health treatment of the population assisted by CAPS II are highlighted, which, despite a lower co-occurrence, the terms "estratégia_de_adapatação", "structure", "care" stand out and give meaning to the terms mentioned above. It is noteworthy that 5394 words were part of this analysis.

Figure 2 Similarity Analysis



Source: Prepared by the author, based on the IRAMUTEQ software, 2023.

DISCUSSION

In this chapter, an in-depth analysis of the results obtained by both the word cloud and the similarity analysis was carried out, revealing significant insights into the essential themes that emerged in this study. The words that appeared with the most significance were: "care", "user", "pandemic", "group", "online", "CAPS_2", "service", "investment", "strategy" and "care" reveal the fundamental pillars of this discussion, shedding light on the complexities of the mental health care scenario. The convergence between the visual representation of the word cloud and the patterns identified by the similarity analysis promises to provide a more holistic and rich understanding of these interconnected topics,

outlining promising paths to improve care practices, especially considering the challenges posed by the pandemic and the increasing demands for adaptation.

This chapter shows the perspective of CAPS II health professionals who worked during the pandemic. The face-to-face interview took place on a day and time stipulated by the CAPS professionals in order not to hinder the flow and provision of service. After the presentations, they were asked if there was a need for adaptation strategies for mental health care at CAPS II after the pandemic, as shown in the following statements:

> [...] we need to rethink other estratégias_de_cuidado all this change certainly served to question ourselves as professionals in the sense of thinking about what needed to be improved, what needed to change (Interviewee 1).
>
> The CAPS_2 had to reinvent itself in the form of care, review some practices that we did before, have new estratégias_de_cuidado if the pandemic had anything positive, it was to review the practice of the CAPS_2 itself (Interviewee 2).
>
> [...] The most serious cases were attended individually here in the CAPS_2 itself. So we did a job of organizing new estratégias_de_cuidado in the service and the CAPS_2 did not close during the pandemic and then we replaced that personal contact that was weekly with telephone contacts (Interviewee 3).
>
> Some very specific cases we asked to come in person, more serious, more delicate cases, but it was a moment that required this atenção_individual, because there was no way to do group activities at that time. The pandemic was a moment that broke our foundations (Interviewee 4).
>
> [...] there was difficulty in being able to adapt to the needs of that moment, so the impossibility of meeting patients in person brought a lot of difficulty to a service that is based precisely on these meetings that took place mainly within the therapeutic groups (Interviewee 5).
>
> [...] the importance of the media, this also came to light and we tried to learn to deal with technology and do these practices from there [...] (Interviewee 6).

The COVID-19 pandemic demanded the reorganization of health services, highlighting the need to structure mental health care to ensure the continuity of treatment provided to users facing mental disorders. In addition, it is important to consider the stressful reality caused by the feelings generated during the period of social isolation, increasing the possibility of aggravation for those with pre-existing disorders and the emergence of new cases (Lopes et al., 2021).

The domain of care provided by mental health services, marked by subjectivity, is guided by elements such as coordination, planning and monitoring, involvement with the community, surveillance, and case management. In the face of the new pandemic context, the need arose to reorganize work processes and reconfigure the flow of information to the CAPS community (Barbosa et al., 2020).

As Barbosa et al. (2020) point out, this context triggered a series of reflections on the vitality of psychosocial care, considering it as a biological element intrinsic to all beings. The chaos that arose with the pandemic added to other preexisting factors that caused mental suffering, factors that already existed, but were often neglected, stigmatized and forgotten by society.

In Specialized Care, the outpatient services and the Psychosocial Care Centers (CAPS) remained mostly in operation, adopting measures to minimize the presence of people in the risk group. Efforts were made to avoid crowding in therapeutic activities, prioritizing individual care whenever possible and, preferably, carried out at a distance, using communication by electronic means (Fingel et al., 2020).

Through the statements extracted from the interviews, it is stated that there was a need for adaptation strategies due to the advent of the pandemic, according to Magrini, Homercher, Vieira, (2020) thinking about the reality experienced in a pandemic requires changes in work processes, generating many uncertainties and challenges for mental health workers. Like the CAPS, being a mental health service, it was necessary to adapt and look for ways to face the challenges to ensure the continuity of some care.

From the study carried out, it can be seen that the pandemic has changed not only the daily life but also changes in the way of care and functioning at CAPS II in Ponta Grossa/PR. The pandemic affects both professionals and users who need the CAPS service.

Thus, the presence of the words: "Care" and "User" highlight the emphasis on care and suggest the implementation of adaptation strategies. This could include looking for ways to address specific mental health-related challenges during the pandemic.

As evidenced by the statements of the CAPS professionals in their interviews, who indicated the need for adaptation strategies for mental health care, the next question to be discussed aims to investigate, based on the experience of these professionals, which adaptation strategies were implemented by the team to ensure the continuity of care, keeping the focus on the objective of the extra-hospital service, which is the psychosocial rehabilitation of the user. Demonstrated in the following statements:

> In our team, we called initially, weekly, then we started calling patients every two weeks to follow up. We continued to attend to new cases, with reception based on telephone contact and as the pandemic spread, we understood that it would be long-lasting, we started to do group consultations online (Interviewee 1).
> [...} the patients who had more difficulty being able to follow it is clear that a large portion, even due to the conditions of not having internet, of not having access, continued to receive care by telephone, but a portion of patients started to attend via online service in weekly meetings due to COVID. There were online groups made via MEET, but it needed more tools and investment in technology even though most users did not have access to the internet that ended up making it somewhat difficult.

> We did not have time nor did the government have time to resolve these issues (Interviewee 2).
> [...] But the main service provided during the pandemic that was not performed was service through technological means, such as the telephone and computer. Which did not exist before, precisely because of the possibility of the user coming to the CAPS_2 [...] I myself was reticent about online service and I saw how much it works, how much it makes it easier for people, so they are investments. But we don't have the structure [...] (Interviewee 3).
> Atendimentos_individuais by phone, so the phone was for messages, not today, today it is a tool, it is a practice that came to light in the pandemic and we continue to use it [...] remote service via telephone ended up expanding, leaving the sensitive team to do this service, the visitas_domiciliares and the estratégias_de_cuidado of thinking about the user appropriating the activities of their territory [...] (Interviewee 4).
> So we did a job of organizing new estratégias_de_cuidado in the service and the CAPS_2 did not close during the pandemic and then we replaced that personal contact that was weekly with telephone contacts (Interviewee 5).
> Telephone calls were the main point that changed and now we continue to provide calls by phone, sometimes guidance in an emergency situation, but teleservice did not do it before. Now we are sending messages from the CAPS_2 via WhatsApp, the technological contact we experienced in the pandemic, which was the great benefit that the pandemic brought us, showed us that we would need to have investment [...] it is evident the need to invest in technologies, such as electronic medical records, in the construction of online media that can transmit information, psychoeducation to users without demanding hours of work invested by the professional who may be performing another activity is to only multiply your speech within these media for different users, such as recording videos, for example (Interviewee 6).

The World Health Organization (WHO) has established the essential services that could maintain their operations during the COVID-19 pandemic. Among them are the Mental Health services, which, in the national reality, are integrated into the Psychosocial Care Network. One of these services is the CAPS, responsible for providing comprehensive and interdisciplinary care to people who face challenges in their mental health (Barbosa et al., 2020; Cruz et al., 2020).

In a study conducted by Fingel et al. (2020) in Paraná, a reorganization was observed in sanitary aspects and in the management of mental health care. Regarding the changes in the work processes throughout the Psychosocial Care Network, in order to avoid possible aggravations due to the suspension of group activities, the therapeutic interventions were conducted virtually.

During the COVID-19 pandemic, the mental health team had to face important challenges to adapt its services and continue to serve users effectively, as evidenced by the speech segments shown above. One of the most significant changes was the transition to remote care through video calls or phone calls (Celuppi et al., 2021).

This allowed mental health professionals to continue offering support to users without the need for face-to-face meetings, decreasing the risk of spreading the virus. The mental health team incorporated technologies and online platforms to facilitate communication and follow-up of users (Celuppi et al., 2021).

On this topic, it is highlighted that the main purpose of technology is to improve the efficiency of human activities in several areas. To achieve this goal, technology creates a variety of objects to meet the demands or improvements of existing objects, making them more resilient while improving production by reducing the time or cost involved. It can be affirmed, therefore, that technological work is intentional and rational, involving both theoretical and practical reasoning, systematic and specialized knowledge (Gonçalves; Machado, 2013).

Results can only be achieved through efficient planning and the use of tools. Technology is not only limited to the production of physical machines and tools, but also organizes and systematizes activities. This last aspect is related to studies that seek to transform the way health is produced in Brazil, highlighting the structuring and management of work processes in a variety of establishments that offer health services (Gonçalves; Machado, 2013).

A survey conducted in the United States in the first four months of the pandemic, conducted by Sorkin et al. (2020), revealed an increase in the use of digital tools in the area of mental health. Given this scenario, it is feasible to ponder on the benefits provided by technology in mental health care. During the period of strict isolation, the support of these tools allowed those who have access to seek help in acute moments of stress or crisis.

Additionally, when returning to a national perspective and considering the use of technology, many professionals faced challenges when trying to maintain continuity of care in a virtual way. This is due to the fact that several CAPS units do not have the necessary technological resources or face a lack of investment and maintenance of the equipment already available. This reality shows that, even with the advances resulting from the Psychiatric Reform in the country, investments in mental health do not seem to receive priority, despite the growing awareness of the psychic suffering present in a significant portion of society (Souza et al., 2020). Corroborating with some segments of speech that indicated the need for investment.

Certainly, the use of technology and virtual tools was highlighted as the main approach adopted by CAPS professionals, and is also supported by published studies that transcend the national reality (Lopes et al., 2021).

Despite the possibility of challenges, such as difficulties in accessing electronic devices, paranoia of some users in relation to technology, lack of access to the internet, and distrust of information transmitted virtually, the richness and relevance of this medium for the continuity of the therapeutic relationship cannot be denied (Lopes et al., 2021).

Figel (2020), in turn, points out that the application of technological resources presented positive and negative aspects. Advantages include the ability to maintain contact with users, even in the face of social distancing and isolation, ensuring that those in non-face-to-face care received follow-up on their needs.

However, some disadvantages are related to the access difficulties faced by users who do not have a satisfactory internet connection or phone. In addition, some users show low adherence to these modalities, often due to difficulties in using these devices or the lack of privacy in their homes, which prevents them from openly discussing confidential or personal issues. Cultural issues, such as living in rural areas and/or not giving importance to the use of technological devices, also contribute to the resistance of these users to use technology for health care (Figel, 2020).

These experiences are extremely important for the construction of effective strategies in mental health care, aiming to ensure access to a larger portion of the population. Reducing access barriers is essential not only during pandemic periods, as ensuring mental health care is a protective factor against various psychopathologies. In addition, it can act as a preventive measure against suicide, considering that some risk factors for suicide become more evident during the pandemic, such as the worsening of mental disorders, unemployment, financial difficulties, domestic violence, increased alcohol consumption, social isolation, and loneliness. This reality highlights the importance of planning prevention actions (Figel et al., 2020).

From these objectifications, it is verified that the care during the pandemic brought a new look from the team to mental health care, observing the need to adapt and the possibility of new approaches in mental health. The following is another adaptation strategy highlighted by the team when dealing with the challenges of the pandemic.

> Remote service via telephone ended up expanding, leaving the sensitive team to do this service, the visitas_domiciliares and estratégias_de_cuidado of thinking about the user appropriating the activities of his territory, the things that happen in his territory, and that he has long stopped using, and now because of the pandemic of not being able to travel but that he could do some things in the region where he lives, which is networking, because in a certain way it ended up centralizing care in the CAPS_2 (Interviewee 1).
> [...] the estratégia_de_cuidado in the territory I think has a different potential, going to the subject's house, feeling what is happening there is something that needs to continue and think of how to further optimize this estratégia_de_cuidado, this service technology [...] so this helped to think about how to develop saúde_mental care in the territory to think about a different way of acting in the CAPS_2 (Interviewee 2).
> [...] the service became more home-based for cases that were necessary where telephone contact or online group could not handle it (Interviewee 3).
> We couldn't stop everything, but we chose to do the services in the territory and it was an opportunity that we had to broaden this view of doing things there in the place where the subject was. Of course, taking care of the details, with protective equipment [...] so this helped to think about how to develop saúde_mental care in the territory, to think about a different way of acting in the CAPS_2 (Interviewee 4).

> Before the pandemic, basically, if you think about estratégia_de_cuidado, they were the same ones we use today. However, today we think much more about the patient in the sense that he has this autonomy because during the pandemic the patient was not left unattended and it was realized that even at home they were able to continue their lives because they are not dependent on the CAPS_2 (Interviewee 5).
> This changed our view with the pandemic, because before we had this idea that patients always needed the CAPS_2, but no, they can only give direction [...] being portas_abertas, [...]. With this, I believe that it was necessary to think about the psychosocial rehabilitation of the user. He felt comfortable here, we felt comfortable because he was close to our eyes [...]. But then, we were creating the estratégias_de_cuidado, managing with the users, but we didn't think so much about the issue of Reabilitação_psicossocial (Interviewee 6).

With the implementation of the Psychiatric Reform, the provision of mental health care began to follow the psychosocial paradigm, incorporating the subject and its various dimensions within its socio-community context as crucial elements. In addition, individuals in situations of mental suffering began to be approached differently with regard to health care (Sampaio & Junior, 2021).

Therefore, the current scenario of mental health care allows the exploration of new approaches when dealing with the subject who experiences a rupture with institutionalization. Through these innovative approaches, professionals have the opportunity to get involved in an impactful way, being affected and affecting, since mental health care encompasses the subjective integrality of the being. In this context, it is essential, especially in the face of challenges such as those experienced in the COVID-19 pandemic, to promote a more robust structuring in communication between health services, in addition to more substantial investments, both psychological and social, to ensure effective guarantees in the treatment of CAPS users (Barbosa et al., 2020).

The concept of territory in mental health represents a fundamental approach in the construction of more humanized and integrative practices. It transcends the idea of delimited physical space to incorporate the complexity of the interactions between the subject, his social relations and the environment around him. The notion of territory proposes a broader and contextualized understanding of mental health demands, recognizing that social, cultural, and environmental factors play an important role in mental health. Authors such as Paulo Amarante and Franco Basaglia highlight the importance of considering the territory as a dynamic and relational space, where psychosocial rehabilitation becomes possible by integrating the subject into his or her socio-community context. This perspective challenges the traditional institution-centered approach, promoting more inclusive, participatory practices capable of meeting the unique needs of users, thus contributing to a significant transformation in the field of mental health (Yasui, Luzio, Amarante, 2018).

Corroborating the analysis presented and aligning it with the understanding of the movement of the CAPS II team in the face of the COVID-19 pandemic, it is pertinent to resort to the conception of the meaning of life proposed by the Austrian physician Viktor Frankl. At a time when extraordinary challenges require innovative responses, the search for meaning becomes a vital compass. In his approach, he highlights that the meaning of life is found in conscious choices, in the attitude towards adversity and in the search for deeper purposes, even in extreme circumstances (Pereira, 2007).

The meaning of life is unique to each individual and can be discovered in any circumstance, regardless of external conditions. By identifying a deeper purpose, people are able to face challenges with greater resilience, achieving a fuller sense of satisfaction and fulfillment. For Frankl, this ability to consciously choose the response in the face of adversity confers dignity and purpose, even in the midst of suffering (Pereira, 2007).

The reinvention of strategies for the continuity of territorial care and the use of soft technologies for health production during crises represent an intense human investment, assuming the role of driving effective changes in favor of the subject. A preliminary analysis of the pandemic and its impacts on the socioeconomic and cultural spheres, especially on the trajectories of our users and their families, highlights the need to act in the territory, strengthening communication with other health services and public policies. Coexistence alleviates suffering, enables the singular and collective construction of different ways of living and reinforces the position of the CAPS as a reference of care and reception for users and family members.

CONCLUSION

Regarding the relationship between adaptation strategies due to the COVID-19 pandemic, used by the multidisciplinary team in the care of CAPS II users, the study participants expressed consensus regarding the evidence that the care at CAPS II in Ponta Grossa during the pandemic required new care strategies for welcoming, individual and group care. It also showed the need for investment and support in technological structure to improve user assistance.

Such strategies represent activities triggered by the people themselves, bringing meaning to the subject's life. The adaptation strategies applied by CAPS II in Ponta Grossa are care technologies that can be incorporated into the day-to-day work in mental health. At the Psychosocial Care Center (CAPS II), in particular, there are a variety of activities in progress. The nature of these activities is shaped by the skill, knowledge, and willingness of the professionals involved.

Restructuring and reinventing care are actions that confer social and humanitarian meaning to the user, even in crisis situations. It is essential to ensure the continuity of treatment and care, either through the use of technology or through the implementation of other strategies that strengthen the Psychosocial Care Network.

In summary, in view of the challenging scenario imposed by the COVID-19 pandemic, this study thoroughly explored the strategies adopted by the multiprofessional team in the context of the Psychosocial Care Center of Ponta Grossa (CAPS II) to promote psychosocial rehabilitation. The analysis of the practices revealed not only the resilience and adaptability of the team in the face of exceptional circumstances, but also the importance of the service in the continuity of mental health care. The strategies addressed, whether in the use of technologies for virtual care, in the active search through telephone contacts, or in the reorganization of work processes, show the dedication and responsiveness of the team in ensuring assistance to users at a time of intensification of psychosocial demands.

The ability of CAPS II professionals to reinvent themselves during the pandemic underscores the importance of innovative and adaptable practices not only in critical moments, such as a pandemic, but as an integral part of a continuous approach. The need for constant reinvention reflects the team's commitment to continuous improvement and the ability to respond to the emerging demands of the community's mental health. However, for this dynamic of reinvention to be sustainable in the long term and not be conditioned only to crisis situations, it is vital that it be supported by public policies.

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THE USE OF CELL PHONES IN THE CLASSROOM: A DIDACTIC RESOURCE OR DISTRACTION?

https://doi.org/10.56238/sevened2024.031-071

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ABSTRACT

Informatics has undoubtedly brought innovations and development to various areas of society, including in the educational sphere. As a result of this technological evolution, the cell phone has become an indispensable resource in people's lives in the various contexts of human life: work, entertainment, studies, etc. However, the existence of divergences of opinions and heated debate on how to use such resources in the school environment is highlighted. Thus, our research in general sought to verify the perception of students and teachers about the use of cell phones in the classroom. In specific terms, it sought to describe how the cell phone has been used in activities in the teaching-learning process. The research presents a qualitative approach and, as an instrument of data collection, the interview form with open and closed questions was used and the observation preceded by the experience in curricular practices and supervised internship in high school. What is revealed is that technology has provided a great contribution to society in general. However, thinking of the cell phone as a pedagogical resource is still a debate that needs to be better explored and aligned for its better use in educational institutions. Finally, the research shows that the teacher has a fundamental role to insert computer science in the school environment, giving a new look to the student's learning, creating bridges of connections between theories and practices.

Keywords: Education. Technology. Cell phone.

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INTRODUCTION

The society of the twenty-first century experiences the technological evolution glimpsed through the various technological resources within people's reach and use. In this we can see that information technology has undoubtedly brought innovations and development to various areas of society's daily life, including in the educational sphere.

The educational benefit that computer science provides to the student is much more visualized in relation to the skills that it enables to be developed. Computer use in the classroom, for example, provides children with the opportunity to learn skills such as typing and types of programs, word processing and spreadsheet applications, etc.

> Brazil took its first steps on the path of educational informatics in 1971, according to the book Projeto Educom, when, for the first time, the use of computers in the teaching of physics (USP in São Carlos) was discussed, in a seminar promoted in collaboration with the University of Dartmouth/USA. (NASCIMENTO, 2007, p. 12).

Thus, Informatics in Brazilian Education was born in the early 70's with educators from some Brazilian universities motivated by what was already happening in other European countries.

Brazil sought to further consolidate informatics in Brazilian education by creating the Special Secretariat of Informatics, SEI which, according to DECREE No. 84.067 Art. 1 (1979) its purpose was "to advise in the formulation of the National Information Technology Policy (PNI) and to coordinate its execution, as a superior body of guidance, planning, supervision and inspection, with a view to, especially, the scientific and technological development in the sector".

After the first steps to materialize informatics in Brazilian education, it is emphasized that there were several steps to reach the main target, which was the scientific and technological development in the sector. Thus, ministerial guidelines were created in 1982 to support the use of educational technologies and computer systems, as well as the National Seminars on Informatics in Education, agreements for the beginning of activities for the implementation of pilot centers, among others.

We can see that the evolution of information technology in Brazil occurred gradually, but today it is possible to observe the great advances of computer science in the various segments of Brazilian education, it is also emphasized that the school is inserted in the context of the influence of new technology, with this, there is a need to educate students for a world in which technological evolution and all discoveries define the limits of knowing and learning.

In this scenario, it is important for schools to work and use technologies in the school environment, as such a resource will enable the student to know about the technological world and help in the contextualization of various classes that better facilitate understanding and consequently teaching and learning in the classroom.

It is in this context that the use of cell phones in the classroom is discussed. It is true that the use of cell phones is present in the most varied contexts, whether business, academic or home. Since the cell phone is part of people's lives, it is no longer possible to escape this technological reality. However, the existence of divergences of opinions and heated debate on how to use such resources in the school environment is highlighted.

The use of cell phones in the classroom is controversial and often generates conflicts, as it is known that for a long time it has been unacceptable, both by teachers and by law. However, it is worth mentioning that access to communication and technology have grown a lot, so these transformations have provided profound changes from one generation to another, especially in relation to the use of cell phones.

In this context, this research was guided by the following guiding question: would the use of cell phones in the classroom be a didactic resource or distraction? This question seeks to instigate the perception of students and teachers about the use of cell phones in the classroom.

The issue is linked to the choice of the theme, which arose from the experience in Curricular Practices and during the Internship in High School, where it was realized that the use of the cell phone caused constant controversies and there was no methodology to use this technology as a pedagogical tool. Thus, in general terms, it sought through this research to verify the perception of students and teachers about the use of cell phones in the classroom. In specific terms, it sought to describe how the cell phone has been used in school activities in the teaching-learning process of students in the 3rd year of high school.

It is from this perspective that our work seeks to contribute to this contemporary debate involving the teaching-learning process with the help of technological resources, namely, the cell phone.

This work is organized preceded by an introduction containing the contextualization of the theme, problem, objective and justification, followed by the section that deals with the method or formalism that describes the methodological procedures that guided the realization of the research, then the analysis and discussion of the results is presented, finally the final considerations and references used in the work are presented.

METHOD OR FORMALISM

The research was carried out in the municipality of Benjamin Constant, State of Amazonas, at the Immaculate Conception State School. The research had 21 participants, among them, 19 students, 2 teachers.

The research follows a qualitative approach in which the interview form with open and closed questions and the observation preceded by the experience in curricular practices and supervised internship in high school were used as data collection instruments. Prodanov and Freitas (2013, p. 70), contribute that the use of this type of qualitative approach differs from the quantitative approach in that it does not use statistical data as the center of the process of analyzing a problem, and therefore does not have the priority of numbering or measuring units.

The research favored the deductive method, which according to Figueiredo (2008, p. 93), "starts from the general to the particular, that is, through a descending chain of reasoning based on theories or laws, to reach a conclusion". Therefore, the research started from the analysis of a reality that permeates society in general, followed by a particular reflection having as reality the school context of a classroom of a State school in the municipality of Benjamin Constant, being guided by the question-problem of knowing if the use of cell phones in the classroom is conceived as a didactic resource or distraction by students and teachers.

RESULTS AND DISCUSSIONS

This topic aims to present the results of this research that had as its main focus, the objective of verifying the perception of students and teachers about the use of cell phones in the classroom, as well as to describe how the cell phone has been used in school activities in the teaching-learning process of students in the 3rd year of high school. The research was carried out with two (2) professors and nineteen (19) students, totaling 21 participants in the research.

THE USE OF CELL PHONES IN THE CLASSROOM: A DIDACTIC RESOURCE OR A DISTRACTION?

Technology is a reality in people's lives, today in all sectors the use of technological resources is perceived, whether in shopping or teaching, in relationships or in business, in all spheres of society there is a technological presence. This fact has contributed to creating the virtual generation in which they continuously use the cell phone in all activities of their lives. And this insertion has caused changes in the various sectors, including education.

In the perception of some experts, technology has provided a great contribution to society in general. Considering the insertion of technology in the educational sphere, Behrens (2002, p. 74) states that "[...] The teacher needs to use information technology as an instrument of his pedagogical practice, aware that the logic of consumption cannot surpass the logic of the reproduction of knowledge. From this perspective, the computer and the network must be at the service of the school and learning".

The author sees information technology as an instrument of pedagogical practice that needs and should be at the service of the school as a contributing element of knowledge production, even because "teaching, in general, cannot avoid the technological advances that are imposed on everyday life" (PEREIRA, 2007, p. 13).

The table below shows the students' perception of the use of cell phones in the classroom, revealing how they use this tool in their school activities.

Table 1: Questionnaire applied to students

Questions	Student responses
1. Do you have a cell phone? ( ) Yes ( ) No	17 Yes 02 No
2. What functions do you use the most on your phone. Rate on a scale of 1 to 5 (where 1 represents the most used function and 5 the least used). ( ) Social Networks ( ) Text Messages ( ) Internet Browsing ( ) Photography ( ) Video/music	(10) Social Networks (5) Text Messages (3) Internet Browsing ( ) Photography (1) Video/Music
3-Have you ever used your cell phone to help you in any class activity?	18 Yes 1 No
4-Do you believe that the cell phone can be used as a possible tool to aid learning?	17 Yes 2 No
5-Is there a difference between traditional reading (printed) and digital reading?	16 No 3 Yes. If so, why:
6-Can cell phones be used in the classroom as a didactic resource to facilitate research on subjects in real time?	17 - Yes 2 - No

8-In **which subjects have you used the cell phone in the classroom to assist in carrying out the school activity with the teacher's permission?** **( ) in no discipline** **( ) in the disciplines of: _____It was used to:**	9- Spanish Discipline 2- Chemistry Discipline 2- Physics Discipline 1- History Discipline 1 - Mathematics Discipline 4 - Did not answer Of those who responded, all used it for research

Source: Field Research (2018)

The data presented in chart 1 indicate that most of the survey participants have a cell phone, a consequence of the influence of the technology era in which we live today. In which communication takes on new forms and styles, with more colors and greater speed.

In addition, it is observed that most use their cell phones to connect to social networks, another fact that is due to the way people relate to each other today. Social networks play an important role in people's lives, through them they connect with other people, no matter the distance.

The use of the cell phone is a striking characteristic of the new generations, it is with it that they spend the day, record their moments and stay connected with their virtual friendship cycle.

> Technology is gaining more and more space within the daily lives of children and adolescents and has also been gaining strength in the school field, given that young people seek modernity, carrying with them the much-used media devices and then acquiring knowledge through research on *smartphones, tablets* and cell phones (KNACKFUSS, 2017, p. 6).

The data also show that most students have already used the cell phone to carry out some activity in the classroom, and believe that it can be used as a tool to aid learning. From this point of view, the cell phone assumes another function as a pedagogical resource.

The frequent use of technology makes everything common and customary, as the data show that students see no difference between a printed and digital reading.

> The *smartphone* is inseparable in the daily life of the students of this new generation, because they want practically immediate answers, being a reality for most of them, when sending questions in forums, chat rooms and social networks. In the same way, it is integrated into their lives as they explore various applications to socialize, play and produce knowledge (SILVA, 2015, p. 44).

It is believed that the cell phone can be used as a pedagogical resource for real-time research, since the dynamics of the world require us to keep up with changes continuously.

The changes require new readaptations, the education system has undergone several transformations resulting from the use of new technologies in the classroom,

stimulating the creation of new forms of learning. In this context, the teacher needs to be aware of these new changes and apply them in the best possible way in the classroom.

According to the students interviewed, the Spanish discipline was where the cell phone was most used, being the most cited among the students, which shows the flexibility of the teacher in allowing the use of this technology in classrooms, as many teachers still cannot see this bias for the use of cell phones in the classroom.

It should be noted that the role of the teacher is fundamental to insert informatics in the school environment, because with regard to teaching, the teacher is one of the most important actors in the school atmosphere for student learning, therefore, teaching practices should be promoted, creating bridges of connections between theories and practices for the intellectual development of students in the various segments of knowledge.

However, many teachers have found limitations in the use of the available technological options, especially the use of cell phones in the classroom. Among the two teachers interviewed, both reported that they rarely use cell phones in their classes, but recognize that cell phones can be considered as a pedagogical tool. Let's look at the teachers' speech:

> The cell phone is a pedagogical resource if used for this purpose. However, many students use it only as a distraction and can harm teaching and learning if we do not have control over the situation (Teacher A).
>
> With technological evolution, the use of cell phones becomes a very effective tool for students and teachers, but unfortunately not all students use it with the intention of favoring their good education (Teacher B).

It is perceived that, although teachers recognize the cell phone as a pedagogical tool, they do not use it frequently, due to the inadequate posture of the students with regard to the handling of this technological resource.

> The use of cell phones was suspended at school due to their use for illicit purposes (Teacher A).
>
> Most students use these tools to post inappropriate photos and messages and even to sell drugs in schools (Teacher B).

Teaching, explains Oliveira (2010, p. 30), "is the act of facilitating student learning, which means that the teacher needs to carry out concrete actions resulting from planning that presupposes some theoretical principles". This also applies to guidance on the use of cell phones as a didactic tool to facilitate the teaching-learning process, since with access to the internet in the palm of their hand, students can learn and share knowledge. This is what Silva (2015, p.25) explains, as follows:

> Investigating the internet makes it possible to find *sites* that address common sense issues to scientific knowledge published in renowned journals. It is important, therefore, for the teacher to guide students on the importance of choosing credible websites, as well as the distinction between relevant and erroneous information (SILVA, 2015, p. 25).

Borges (2006, p.9) reminds us that "the difficulties for the integration of ICT in the school universe have their origin in several factors, and most of them are due to the absence of educational policies that organize and implement strategies for its implementation". This applies to the implementation of the use of cell phones in the classroom as a pedagogical tool. What is perceived is a serious difficulty for schools to adapt to this new reality of digital education, requiring school educational strategies and policies that enable the insertion of this resource in an educational way. This requires intense awareness-raising work with the entire school community.

The important thing is not to allow the harm to override the benefits that access to information technology enables to the educational process. But this management of technology in the school environment, especially regarding the use of cell phones, needs planning, organization and control combined with the pedagogical practices of teachers.

It is important to remember that educators, regardless of their area of knowledge, need to make use of the use and contribution of information technology to promote the school and citizenship education of students since "the teacher needs to be aware of the need to master certain theoretical knowledge in order to be able to make informed decisions with regard to lesson planning, the choice of activities to be carried out in the classroom and the evaluation process" (OLIVEIRA, 2010, p. 23).

Even in the face of the challenges that technology can cause due to its inappropriate use, experts still highlight its significant contribution to the educational process of students, let's see:

> Education experts say that technology contributes to motivating students and modifying their behavior in the learning process, helps in the formation of special students, as well as stimulates teachers and frees them from certain administrative tasks to better use their time. (BRASIL, PROINFO/DIRETRIZES, 1999, p. 10).

It is true that technology has brought many benefits to society, but we cannot neglect its side effects as a result of its inappropriate use. However, if it has the possibility of improving the teaching-learning process and consequently the quality of teaching, we encourage schools to advance in the use of their benefits while they must neutralize their possible harms. The big issue is in the culture of the individual. The formation of the citizen

also involves education in the proper use of what technology offers us and this applies to the use of cell phones.

FINAL CONSIDERATIONS

Today's society is marked by the constant use of technology in all areas, which has transformed the way people relate, negotiate and even study. From this point of view, education is also transformed by changing its ways of learning. And the use of cell phones is one of the technologies that has been inserted in the educational field as a tool in the dissemination of knowledge.

The survey showed that there is an opening for the use of cell phones in classrooms, but that it is still incipient, as many teachers still do not have this practice. Most students have already used their cell phones to do some class activity, this shows the potential to explore this technology in their learning.

However, thinking about the cell phone as a pedagogical resource is still a debate that needs to be better explored and aligned for its better use, since it requires sensitization, especially of students, about the proper use of this tool and, on the other hand, better preparation of school management and teachers on how to use such technological resources as a pedagogical didactic strategy for teaching and learning.

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THE INSERTION OF TECHNOLOGICAL RESOURCES IN THE TEACHING-LEARNING PROCESS OF STUDENTS IN THE EARLY YEARS OF A MUNICIPAL PUBLIC SCHOOL IN BENJAMIN CONSTANT, AM

https://doi.org/10.56238/sevened2024.031-072

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ABSTRACT

We live in a society with the marked presence of technological advances, in which new information and communication technologies are inserted in the daily lives of people in various sectors, including education, which in turn has sought to make use of technology to help in the teaching-learning process of students. This work presents a reflection on the insertion of technological tools in the educational context, specifically in the teaching of the early years, for this, it was dedicated to the objective of analyzing the insertion of technological resources in the teaching-learning process of students of the early years (I Cycle) of a municipal school, located in the municipality of Benjamin Constant, State of Amazonas. The research is exploratory in nature, in a qualitative approach and had as data collection techniques the interview and observation. The research showed that although the importance of the use of technological resources as a contributing element of quality education is recognized, limited access to these resources still prevents the more qualitative and potential use of this technological tool, as not all public schools provide such resources to assist teaching, and that this often ends up being one of the factors of technological and digital exclusion in the school context.

Keywords: Technology. Literacy teacher. Teaching and learning.

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INTRODUCTION

We live in a reality marked by technological advances, in which new information and communication technologies are inserted in the daily life of today's society in various sectors, including education, which in turn has the challenge of keeping up with the advances in technology and implementing them in the practices and pedagogical proposals in the teaching-learning process.

In this context, technologies acquire the role of a facilitating instrument of the education system, encouraging the interaction of the student with the digital world, the search for knowledge, research, and the right to technological information, as these effectively provide skills and competencies to students, improving their cognitive performance and expanding intellectual capacity.

From this perspective, ICTs - Information and Communication Technologies facilitate children's access to new knowledge. They seek to complement the teaching-learning process, expanding the individual's intellectual capacities, creating representations and articulations of thoughts, as well as a continuous evaluation of mastery and performance. And in this regard, the teacher assumes a special responsibility, since he works as an intermediary in the learning process through the mastery of technologies, as Almeida (2001, p.72) explains, as follows:

> The teacher who associates ICT with active learning methods develops the technical skill related to the mastery of technology and, above all, articulates this domain with pedagogical practice and with educational theories that help him to reflect on his own practice and to transform it, aiming to explore the pedagogical potentialities of ICT in relation to learning and the consequent constitution of knowledge networks.

In order for the student to be assisted by technology in the learning process, the teacher needs first of all to develop their technical technological skills, know how to relate the use of this tool with educational content and transform the use of this technology-education duet into pedagogical practice, as it is worth remembering that:

> It is necessary to educate for democratic, more progressive and participatory uses of technologies, which facilitate the evolution of individuals. When the child arrives at school, the fundamental learning processes are already developed in a significant way. There is also an urgent need for media education to understand, criticize and use them as widely as possible (MORAN (2000, p.50).

Here we can visualize the importance of the use of technologies, especially for students in the early years who are discovering themselves in society, being an opportunity to educate about the use of technologies, leading the student to understand and use it in a

responsible and educational way, promoting a better formation and preparation of the citizen for the society that is in constant technological evolution.

From this perspective, this work is justified by the relevance of discussing and reflecting on a current and very comprehensive theme, mainly because technological resources are already part of the daily life of the mass in general and are present in various sectors of society, with this, there is a concern about how children are being prepared to give it a current situation where technology is increasingly integrated into people's social lives. Thus, the main objective of this work is to analyze the insertion of technological resources in the teaching-learning process of students in the early years (I Cycle) of a municipal school. Specifically, it sought to: a) identify the conception of literacy educators in relation to the use of technology as a tool to assist in the teaching and learning of students in the early years (I Cycle); b) to verify the technological resources made available by the school and; c) describe the technological resources used by the teachers and their contribution to the teaching and learning of the students.

The research showed that although the importance of the use of technological resources as a contributing element of quality education is recognized, limited access to these resources still prevents the more qualitative and potential use of this technological tool, as not all public schools provide such resources to assist teaching, and that this often ends up being one of the factors of technological and digital exclusion in the school context.

This work follows the present structure: it is preceded by an introduction containing the contextualization of the theme, objectives, relevance, justification and objective; followed by the method and formalism section that describes the methodological procedures used in the research; In the section entitled Results and discussions, the data of the field research with theoretical support are presented and finally, the last section presents the final considerations about the research.

METHOD OR FORMALISM

The research was carried out in a public school in the municipality of Benjamin Constant, and was guided by a theoretical methodological conception focused on technologies in the educational context, specifically for literacy and literacy in the early years. This field of research was fundamental for an approximation of the school reality, especially the technological resources that the institution makes available to assist the learning process, thus resolving concerns as a researcher. In this sense, Marconi and Lakatos (2009) advocate that the field of research is:

> [...] That used with the objective of obtaining information and/or knowledge about a problem to which an answer is sought, or a hypothesis that one wants to prove, or even discovering new phenomena as they occur spontaneously, in the collection of data related to them and in the registration of variables that are presumed relevant to analyze them. (p.69)

In this context of observing, questioning and understanding educators and the school, the phenomenological approach method was adopted because it helps in the formulation of problems, in the construction of hypotheses and in the definition of concepts with a view to the theoretical foundation of research, that is, it leads us to understand what we propose to research, causing an interpretation of a given reality. Augusto Triviños (2008, p.43) states that "phenomenology is the study of essences and all problems, according to it, redefine essences: the essence of perception and the essence of consciousness". In this way, the phenomenological approach proposes a reflection on the investigated research object, leading it to interpretation and understanding.

The research was carried out in a qualitative nature because it sought to identify the use of technological tools used by educators as an aid in the teaching process and the quality provided due to its use. According to Triviños (2008, p.120), qualitative research "[...] on the one hand, it comprises research activities that can be called specific, on the other hand, it helps to have a clearer vision of what a researcher can achieve who aims to achieve an interpretation of reality".

It was necessary to make a bibliographic survey on the theme of the research before going to the field. The consultations were both through books and digital means. The sources provided adequate means for a better understanding of the theme in question, so that

as a researcher, guide and direct the research subjects to answer the questions posed in the research. Marconi and Lakatos (2009) list that:

> The phases of field research require, in the first place, the realization of a bibliographic research on the theme in question. It will serve as a first step to find out what state the problem is currently in, what work has already been done on the subject, and what are the prevailing opinions on the subject. Secondly, it will allow the establishment of an initial theoretical model of reference, in the same way that it helps in the determination of the variables and the elaboration of the general plan of the research (p.69)

The research is exploratory in nature, as it provides greater familiarity with the problem and an overview of a given fact, allowing the researcher to insert himself in the field of research. Marconi and Lakatos (2009) also explain about exploratory research stating that:

> These are empirical research investigations whose objective is the formulation of questions or problems, with a triple purpose: to develop hypotheses, to increase the researcher's familiarity with the environment, fact or phenomenon in order to carry out a research, [...] systematic procedures are generally employed either to obtain empirical observations or for data analysis (or both simultaneously). Both quantitative and qualitative descriptions of the object of study are often obtained, and the researcher must conceptualize the interrelations between the properties of the observed phenomenon, fact or environment. (p.71)

The technique used in the scope of the research was interview and observation. The number of participants in the research was six (6) teachers from the initial years (I Cycle) in which they contributed greatly to the research, the institution itself also provided information of great value for the conclusion of this research.

RESULTS AND DISCUSSIONS

This topic aims to present the results of this research, which had as its main focus, the objective of analyzing the conception of literacy educators in relation to the use of technology as a tool to assist in the teaching and learning of students in the early years (I Cycle).

A research was carried out with six educators from a public institution in the municipality of Benjamin Constant, in which the information obtained was through interviews and observation. In this way, the teachers were questioned about the **relevance of the insertion of technological resources as one of the tools for the literacy and literacy process.**

Chart 1 - Teachers' conception of the insertion of technological resources in the literacy and literacy process

	Answers
Professor A	Yes, technology is an important tool to teach students to read and write, you can innovate your methods, through technology the student makes more effort.
Professor B	Yes, this resource often helps, yes, the need is very great and the resources are few. Students do not have access to the computer, for example.
Professor C	Yes. Nowadays, these resources are of fundamental importance as a tool in the teaching-learning process of children.
Professor D	I believe it is of paramount importance so that students can be literate through technological means.
Professor E	Yes, because through some technological resources we can hold the attention of students. The children become more curious and it makes the class more dynamic.

Professor F	Yes, technologies greatly help the learning process of students, mainly because it is a way to implement and enrich classes, but unfortunately we cannot always count on this help.

According to the comparative table of answers, we can observe that all the teachers interviewed agree on the importance of inserting technologies in the teaching process and how relevant it is to complement their classes. This understanding, acceptance and recognition of how much technologies can contribute to the teaching and learning process of students is fundamental for technologies to have space in teachers' pedagogical practices, because as Stum and Gai (2016, p.20) argue:

> It is up to literacy teachers to understand the current situation and the real contributions of technologies to the teaching and learning process in children's literacy. Knowing how to organize, select and plan strategies during the study of various themes/contents are also necessary attributes for the new paradigms.

Although there is recognition of the importance of technological resources in the educational context, it is clear in the statements of teachers B and F that they are concerned with the difficulty of access to technological resources by both the teacher and the student in the school space. This is because the school has few technological resources to offer teachers and students, as can be seen in the teachers' response about **the existence of availability of technological resources in the school?**

Chart 2: Technological Resources made available at school

Research subjects	**Answers**
Professor A	Yes, data show, printer and speaker
Professor B	Yes, children's literature books, didactic games, television and date
	gig.
Professor C	Computer and television.
Professor D	It has a television, but it is not available for classrooms.
Professor E	Speaker, computer and data show
Professor F	Data show, printer to print activities and computer.

Currently, the school has only one (1) data show, two (2) desktop computers and two (2) printers, one in the teachers' room and one in the school office and one (1) speaker. The school does not have a notebook to assist classes in the classroom and no computer room and/or media room that allows access by students. As can be observed the insufficiency of

technological resources by the school has hindered the comprehensive use of technology in the school context, as can be observed through the teachers' statements about **which technological tools they used in the classroom as an aid to their classes?** We can follow the answers below:

Chart 3: technological tools used in the classroom by teachers

Research subjects	Answers
Professor A	Notebook, Data show, printer, speaker and cell phone
Professor B	My methodology is varied with didactic games, books, reading sheets, children's literature books, mobile alphabet, reading cards with illustrated figures.
Professor C	There are few, because in the school where I work we don't have these tools available. But data show, computer and television are always used.
Professor D	Computer and television
Professor E	Computer, speaker and data show
Professor F	Data show e notebook

The technological resources made available by the school are few, both in terms of variety and quantity, being insufficient to meet the demands of the entire school. This ends up limiting the insertion of technological resources to the pedagogical practices of teachers, who in turn do not use such resources so frequently and sometimes make use of personal technological resources. However, it is worth mentioning that it is not enough to have such resources if they are not properly applied. It is necessary to understand, first of all, that technology is comprehensive and in the school context it needs to meet the educational needs of today's society through differentiated teaching methodologies, contextualized with the syllabus and profile of the students. About this, Chaves (2004, p.2) explains that:

> [...] The use of technologies in teaching work requires conceptions and teaching methodologies different from the traditional ones, to meet contemporary educational needs. Therefore, it is necessary for teachers to develop a debate on the relevance of technologies in the teaching work and on the best way to use them, so that they are not seen and worked on as a merely technical resource (CHAVES, 2004, p. 2).

Thinking about the present day, methodical and traditionalist classes do not contemplate the demand and educational needs, since the changes resulting from globalization happen quickly and do not meet the momentary objectives. The teacher,

therefore, finds himself in a progressive context of updating and modifying the pedagogical work intertwined with the media and technologies.

Although with limitations in availability and access to technological resources in the school, the teachers seek to insert technologies in their pedagogical practices by recognizing their ability to assist in the intellectual development of their students, as observed in the teachers' statements.

Table 4: Contribution of technological resources to student learning

Research subjects	**Answers**
Professor A	In a pleasant, different and playful way.
Professor B	If the school had material for all classes it would be very good, but there are few technological resources to serve all classes in the school.
Professor C	With these resources we can show and transfer to students images and research on various subjects related to the content under study, making classes more dynamic and interesting.
Professor D	The technological resource is a means by which the student arouses more interest in learning to read, I say this because I show some activities on my cell phone to students who have difficulties in reading and I realize that they are improving.
Professor E	They contribute in an important way because children not knowing how to read and write make an effort and know how to handle these resources, a practical example is the cell phone that arouses curiosity is something different that always draws the attention of students.
Professor F	They contribute to making the class differentiated, dynamic, draws more attention from students and arouses interest, thus making students make more effort to learn mainly reading.

According to the perception of the teachers, the main contribution of technological resources is in their ability to arouse the interest of the student, being able to attract the attention and participation of the students more effectively, which directly contributes to better teaching and learning.

Although the relevance of technology in the educational sphere is recognized, the difficulties of its insertion and use cannot be neglected, which is reflected in several aspects, either by the lack of infrastructure and availability of technological resources in schools, or by the lack of technical skills on the part of teachers to handle such technologies, requiring training. A reality present in the research carried out, although the issue of the lack of

structure and technological resources in the school has stood out, through observations and informal conversations it was also observed the difficulty of some teachers in the use of the handling of educational technologies.

FINAL CONSIDERATIONS

We know that society today lives in the atmosphere of technology that has reached all areas of our lives. Technology is prospected to be a facilitator of human life, for which it needs to be made available and used appropriately and responsibly.

In the educational field, technological insertion has been increasingly stimulated and necessary given its potential to contribute to teaching and learning in a more contextualized, participatory, stimulating and attractive way for students.

This is because the teaching and learning method has undergone and still undergoes changes as means emerge to facilitate the teaching methodology. The work previously focused on memorization and decoding for cognitive development in the most diverse reading and writing skills, now aims to adhere to teaching innovative resources to facilitate learning performance.

The use of technological resources is of total relevance in any instance of education and is essential for a quality educational advancement, but unfortunately the reality is that not all schools provide such resources to assist teaching, and when they do provide in some cases technical skills on the part of teachers, requiring training.

It is necessary to take a more sensitive look at technological issues in the educational context so as not to view them only in the sphere of mechanical resources, but as methodological instruments to support pedagogical practices. The school must be a space to minimize the factors of technological and digital exclusion.

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QUALITY OF LIFE IN CLIMACTERIC WOMEN IN A MUNICIPALITY IN WESTERN BRAZILIAN AMAZONIA

https://doi.org/10.56238/sevened2024.031-073

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ABSTRACT

Objective: To evaluate the quality of life of climacteric women who are or are not using hormone replacement therapy. Method: A quantitative, descriptive, cross-sectional study was carried out with the application of a questionnaire to all women between 40 and 65 years of age registered in the Family Health Program of the Senador Adalberto Sena Family Health Unit in Cruzeiro do Sul (Acre) from August to October 2023. The research instrument used to evaluate was the Medical Outcomes Study 36-item Short Health Suvey (SF-36) and to evaluate climacteric symptoms, the Menopause Rating Scale (MRS) was used. Results: When evaluating the domains of the questionnaire on quality of life (SF-36), it was noticed that the variables pain, general health status, social aspects are the most cited with mean values above 50% and MSR above 90% in all domains, except heart discomfort with 85.2%. Conclusion: Facing the climacteric brings many anxieties, doubts and fear on the part of women. It was observed that almost all of the women in this study have symptoms related to the climacteric and are not being treated. Better attention, care and guidance are needed so that women have quality of life at this stage of life.

Keywords: Climacteric. Menopause. Women's Health.

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INTRODUCTION

During her life, women go through several processes that are marked by biological changes, which favor the manifestation of some diseases, clinical or endocrine, which can often leave women more vulnerable to various types of problems, whether psychological or metabolic. Among them, the climacteric stands out, which is characterized as the change from the reproductive to the non-reproductive phase (SOUZA et al., 2017).

The climacteric is a period in a woman's life that represents the transition from the reproductive to the non-reproductive phase. It begins when there is a decline in ovarian function and the announcement of menopause. Menopause is the permanent cessation of menstruation, that is, the last menstrual flow, proven through spontaneous amenorrhea for 12 consecutive months (ALBUQUERQUE et al., 2019).

The World Health Organization had vague definitions that used the words premenopause, perimenopause, menopausal transition, and climacteric as synonyms, thus causing a lack of clear and objective criteria to describe the stages of reproductive aging. And to understand the staging of reproductive aging, the Stages of Reproductive Aging Workshop (STRAW) was created in 2001, a system for staging reproductive aging and 10 years later STRAW +10 was made, which divides the staging into 7 stages and it is not necessary for all phases to occur and, if they do, they may not follow the sequence (AMBIKAIRAJAH, WALSH, CHERBUIM, 2022).

The climacteric, as it is a physiological process in a woman's life and is influenced by several factors involving the hypothalamic-pituitary-ovarian axis, where there is a decrease in ovarian functions and menstrual cycles become irregular until they cease completely at menopause, where the ovaries reach complete follicular exhaustion, and clinically speaking, the hormonal changes that occur at this stage, they are directly linked to women's health, with different intensities in each one and loss of quality of life at different levels for each of them (MINKIN, 2019; GUERRA et al., 2019).

The climacteric is a phase in which the woman experiences several changes in her body, and therefore the importance of the participation of the multiprofessional team in the care of women in this period, through the performance of actions with a holistic view, having their needs met efficiently (SILVA, et al., 2019).

In this cycle experienced by them, physical, psychic, mental, social and cultural changes also occur, and there is no family/marital support and attention from health professionals, these changes can trigger associated diseases (SILVA, et al., 2019).

Many women live the climacteric without complaints or need for medication. Other women have symptoms varying in diversity and intensity that can happen in the short,

medium or long term. The estrogen deficiency that sets in with the aging of women plays an important role in physiological changes and in the potential for developing pathological states (PERREIRA, 2016; FERREIRA, 2020).

Some studies have mapped the classic symptoms of the climacteric: hot flushes, irritability, decreased libido, insomnia, forgetfulness, vaginal dryness. The authors consider listening to women's complaints as an important tool for choosing interventions with the aim of improving women's quality of life in this period of life (RIBEIRO, et al., 2024; ALBUQUERQUE, 2019; BITTENCOURT, 2011).

The changes that women experience in the climacteric affect their physical, social, spiritual and emotional balance. These changes occur due to the gradual drop in hormones resulting from ovarian failure, leading most women to experience signs and symptoms that bring discomfort to a greater or lesser degree (FREITAS, 2004).

According to the Brazilian Institute of Geography and Statistics (IBGE), the Brazilian population is living longer. The life expectancy of women is around 78.8 years. With female aging, women are more likely to have diseases that are related to the degeneration of the body through aging, such as cancer and cardiorespiratory diseases, among others. In this scenario, women perceive the fragility of their own lives, suffer from physical, psychosocial and cultural changes, perceive the loss of youth, physical attraction, fertility, the decline of sexuality, feel fear and anxiety (IBGE, 2015).

It is important to inform the female population about the climacteric, since this period presents intense changes in women. Knowing what to expect from this period, she will be able to adapt to this new body (FREITAS, SILVA, SILVA 2008).

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In this cycle experienced by them, physical, psychic, mental, social and cultural changes also occur, and there is no family/marital support and attention from health professionals, these changes can trigger associated diseases (SILVA, et al., 2019).

One should go beyond the symptoms manifested by women, exploring other factors that can affect their well-being at this stage of life, such as diet, physical activity, mental health, sexuality, family and social relationships. Adopting, then, a comprehensive biopsychosocial approach, focused on improving the quality of life and needs of each woman, seen as active subjects in the achievement and maintenance of an adequate health status throughout her life (SILVA, PONTES, 2020).

In view of the above, this study aims to evaluate the quality of life of women who are going through the climacteric with or without the use of hormone replacement therapy (HRT).

METHOD

This is a quantitative, descriptive, cross-sectional study carried out in a Family Health Unit in the city of Cruzeiro do Sul, a Brazilian municipality located in the interior of the state of Acre. 133 women were analyzed and they were invited to undergo an appointment with the gynecologist, from August to October 2023 to carry out the interviews.

Women aged between 40 and 65 years who agreed to participate in the study after signing the informed consent form were included in the study. Those who did not follow up on the study and women who did not fully answer the questionnaires presented were excluded. 10 women who were not able to contact after 3 attempts and 1 who had a physical disability (sequelae stroke).

Three instruments were used to meet the objectives of the present research. To identify and characterize the user, an interview form was created with closed questions, which is an identification instrument with clinical, behavioral and sociodemographic data.

To assess quality of life, a validated instrument called *the Medical Outcomes Study* 36-item *Short Health Survey* (SF-36) was used, which aims to provide a profile of scores that is useful for understanding population differences in physical and mental health status, chronic diseases and other medical conditions, and serves to assess the effects of treatments on general health status, making it possible to compare the findings with others that use the SF-36 or to calculate the scores in future investigations (LAGUARDIA, et al., 2013).

It consists of twelve items derived from the SF-36 and evaluates eight different dimensions of quality of life, considering the individual's perception of their health in the last four weeks. Each item has a group of answers distributed on a graded Likert scale, and the final score also ranges from zero to 100. The data obtained are classified into two domains – physical and mental health. Thus, after the transformation of the calculation of the scores in each domain, subjects with a score greater than or equal to 51 are considered to have good physical/mental health, while those with a final score less than or equal to 50 are considered to have worse physical/mental health (SILVEIRA et al., 2013).

To assess climacteric symptoms, the Menopause Rating Scale (MRS) was used, being of quick application and direct and specific in terms of data validation, being of great value in the evaluation of the most prevalent symptoms for this phase of female life. "This

scale was initially standardized in Germany by Heinemann et al, having been translated into several languages, including Portuguese, and validated in Brazil in 2002" (ANDRADE, et al., 2019).

The data were organized and analyzed in Excel and presented through tables and figures for better assimilation and exposure. A descriptive statistic was performed, where the variables were illustrated in absolute (n) and relative (%) frequencies. The results were presented using tables and figures, prepared according to the tabular presentation standards of the Brazilian Institute of Geography and Statistics.

The present study was presented to the ethics committee because it is a study involving human beings. An opinion from the Research Ethics Committee (CEP) of the School of Sciences of Santa Casa de Misericórdia de Vitória (EMESCAM) was requested for consideration. This study was approved by the Institutional Ethics Committee under opinion number 5.784.540, CAAE 65026022.0.0000.5065.

RESULTS

In the first categorization are the sociodemographic characteristics, where of the 122 women included in the study, 39.3% are aged between 40 and 45 years, 73% declared themselves brown, with 29.5% with complete primary education, 78.7% married, 64.8% consider themselves Catholic, 66.4% of them work outside the home, 43.8% in general services, followed by 31.6% in education, at the moment 82% live with the first generation and with a family income of less than one minimum wage (56.6%) (Table 01).

Table 01 – Characterization of the groups according to sociodemographic characteristics

Variable	Frequency (n=122)	Percentage (%)
Age		
40-45 years	48	39,3
46-50 years	40	32,8
51-55 years	21	17,2
56-60 years	13	10,7
Self-declared color		
White	23	18,8
Brown	89	73
Black	10	8,2
Schooling		
No	15	12,3
Incomplete Elementary School	36	29,5
Complete Elementary School	39	32
Incomplete High School	03	2,5
Complete High School	12	9,8
Incomplete Higher Education	00	0
Complete Higher Education	17	13,9
Marital Status/Marital Status		
Single	00	0
Married woman	96	78,7
Widow	08	6,6

Legally separated	07	5,7
Consensual union	11	9
Religion		
No	01	0,8
Catholic	79	64,8
Evangelical	41	33,6
Testemunha of Jeová	01	0,8
Works outside the home		
Yes	41	33,6
No	81	66,4
Profession		
Health	07	17,6
Education	13	31,6
General Services	18	43,8
Other	02	4,7
Not informed	01	2,3
Arrangement and housing		
Alone	02	1,6
With 01 generation	100	82
With 02 generations	20	16,4
Family Renda		
Less than 1 minimum wage	69	56,6
From 1 to 2 minimum wages	33	27
Greater than 3 minimum wages	20	16,4

Source: Prepared by the authors (2023)

With regard to gynecological history, 83.6% of the women had their menarche between 10 and 15 years of age, 42.6% did not have menstrual cycles, 89.3% had an active sexual life, 54.1% had more than 3 pregnancies, 86.6% had normal deliveries and 26.7% had cesarean deliveries and 25.8% had an abortion. At the time of the interview, 13.1% were pregnant and of these, 86.9% did not plan their pregnancy (Table 02).

Table 02 – Distribution of gynecological antecedents

Variable	Frequency (n=122)	Percentage (%)
Age of menarche		
Before the age of 10	18	14,8
From 10 to 15 years old	102	83,6
After 15 years	0	0
Don't remember	2	1,6
Regular cycles		
Yes	22	18
No	48	39,4
No cycles	52	42,6
Sexual activity		
Yes	109	89,3
No	13	10,7
Number of pregnancies		
From 1 to 3 pregnancies	54	44,3
More than 3 pregnancies	66	54,1
No	02	1,6
Normal deliveries		
From 1 to 3	44	36,6
More than 3	60	50,0
None	16	13,4
Cesarean deliveries		

From 1 to 3	31	25,8
More than 3	1	0,9
None	88	73,3
Abortions		
From 1 to 3	31	25,8
More than 3	1	0,9
None	88	73,3
Is currently pregnant		
Yes	16	13,1
No	106	86,9
Pregnancy was planned (n=16)		
Yes	1	6,3
No	15	93,7

Source: Prepared by the authors (2023)

Of the women interviewed, only 49 are in menopause, with 16.4% entering between 40 and 45 years old and 23.8% entering between 46 and 50 years of age, 75.5% entered menopause less than 5 years ago, 73.4% it was natural, followed by 20.4% due to hysterectomy surgery, only 01 (0.8%) had oophorectomy. At the moment, 45.1% use some contraceptive method, but most have bilateral tubal ligation as a contraceptive method (43.6%), with contraceptive use of more than 10 years (83.6%). When asked about hormone replacement, only 04 (4.1%) performed it (Table 03).

Table 03 – Distribution of gynecological antecedents

Variable	Frequency (n=122)	Percentage (%)
Menopause time		
Less than 05 years old	37	75,5
From 05 to 10 years old	07	14,2
More than 10 years	05	10,3
Type of menopause		
Natural	36	73,4
Surgical	10	20,4
Radiotherapeutic	2	4,1
Chemotherapy	1	2,1
Fez histerectomia		
Yes	10	8,2
No	112	91,8
Fez ooforectomia		
Yes	01	
No	121	99,2
Uses contraception		
Yes	55	45,1
No	67	54,9
If so, which one?		
Oral contraceptive	22	40
Injectable contraception	01	1,8
SAYS	02	3,6
LTB	24	43,6
Condom	06	11,0
Time of use		
From 1 to 3 years	01	1,8
From 4 to 6 years old	05	9,1
From 10 to 10 years old	03	5,5
More than 10 years	46	83,6
Take hormone replacement		

Yes	4	4,1
No	118	95,9

Source: Prepared by the authors (2023)

They presented the first symptoms from 02 to 04 years ago (45.1%), with hot flashes (60.7%) being the main one, followed by menstrual irregularity (20.6%), 63 (51.6%) stated that they knew what to do to improve symptoms, where 42 (66.6%) mentioned the use of medicinal teas and 19 (30.2%) the use of hormonal therapy (Table 04).

Table 04 – Data on the climacteric

Variable	Frequency (n=122)	Percentage (%)
You know what climacteric is		
Yes	18	14,8
No	104	85,2
You know you can get pregnant in the climacteric		
Yes	18	14,8
No	104	85,2
You know what menopause is		
Yes	113	92,6
No	9	7,4
When you felt the first symptoms		
Less than 06 months	25	20,5
From 06 months to 01 year	17	13,9
From 02 to 04 years old	55	45,1
From 05 to 10 years old	13	10,7
More than 10 years	11	9,0
Don't remember	01	0,8
What is the first symptom		
Fogacho	74	60,7
Irritability	15	12,3
Insomnia	2	1,6
Decreased libido	2	1,6
Emotional Lability	2	1,6
Menstrual irregularity	25	20,6
He had no symptoms	1	0,8
You know why the symptoms happen		
Yes	63	51,6
No	59	48,4
You know what to do to improve symptoms		
Yes	63	51,6
No	59	48,4
If so, what?		
Hormone therapy	19	30,2
Teas	42	66,6
Physical activity	02	3,2

Source: Prepared by the authors (2023)

When evaluating the domains of the questionnaire on quality of life (SF-36), it was noticed that the variables pain, general health status, and social aspects are the most cited with mean values above 50% (Table 05).

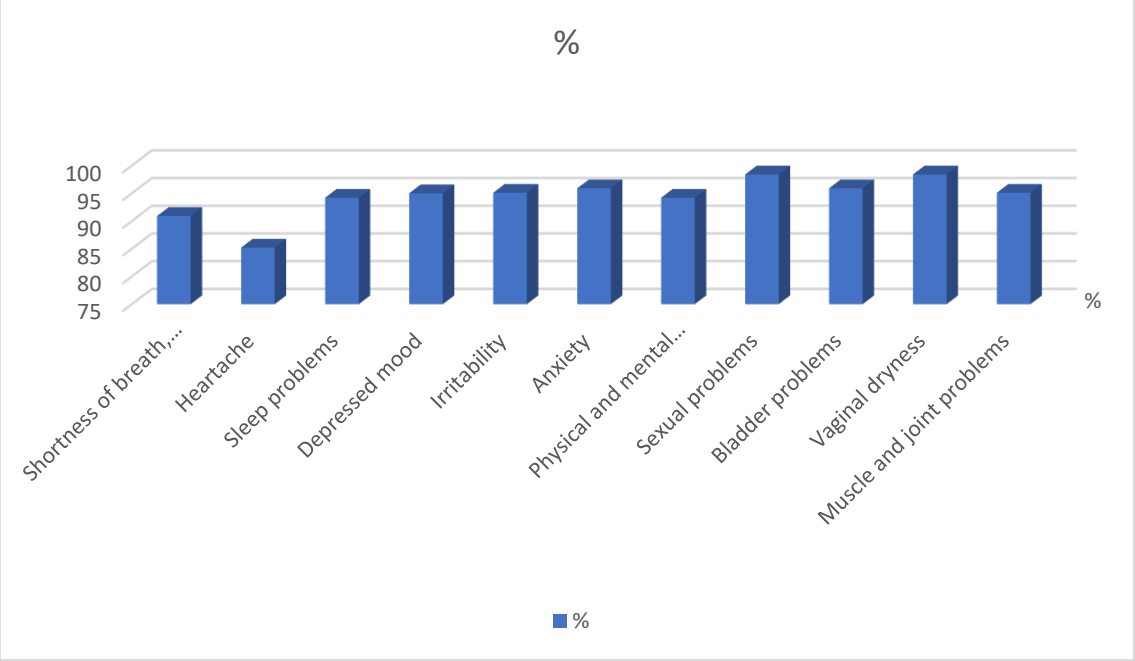
Table 05 – Description of the values of the domains evaluated by the SF-36 in a population of climacteric women

Variable	Average	Standard deviation	Minimal	Median	Maxim
Functional capacity	49,9	28,0	0	40,0	100,0
Physical aspects	40	46,3	0	0	100,0
Dor	54,4	24,9	0	51	94,0
General health status	56,07	12,6	20	57	92,0
Vitality	31,3	26,3	0	25	90,0
Social aspects	54,2	25,7	0	50	100,0
Emotional Aspects	31,9	46,4	0	0	100,0
Mental health	32,6	24,9	0	28	84,0

Source: Prepared by the authors (2023)

And when the symptoms were evaluated using the MSR Scale, all symptoms had values higher than 90%, except for heart discomfort (85.2%) (Graph 01).

Graph 01 - Frequency of climacteric symptoms, assessed by the MSR Scale.



Source: Prepared by the authors (2023)

DISCUSSION

In the present study, most of the women are aged between 40 and 45, brown, with a partner, of Catholic religion, with only complete high school, work outside the home and have a family income of less than one minimum wage.

In gynecological history, most women had their menarche between 10 and 15 years of age, more than 40% no longer had menstrual cycles, almost 90% had an active sexual life, more than half had more than 3 pregnancies, most of which were normal deliveries, and more than 25% had an abortion.

A similar result was found in the study by Santos et al (2021) carried out in the municipality of Três Lagoas - MG, which showed an average of 40-50 years, with a partner (56.9%, self-declared brown (54.6%), Catholic (52.5%), 61.3% did not have an occupation and with an income of up to two minimum wages for 70.7% of them. A similar result was found by Melo Filho and Lopes (2022) in the study carried out in the rural area of the municipality of Buriti dos Montes-PI.

In the study by Ribeiro et al. (2024), the mean age of women was 53 years, 73.7% are married, in terms of education, most had completed higher education (50.6%) and had a family income of more than four minimum wages (29.5%). This contrast in self-declared color may be associated with Brazil being a mixed country, and with greater predominance in the north and northeast regions, in relation to income, Brazil has an average real monthly income of 2,533 and the state of Acre has an income of 1,960 in 2021, which represents only 1.5 minimum wages per person (IBGE, 2021).

During the research period, only 49 women were already in menopause, which occurred at the age of 40 to 45 years, and another 20% had menopause due to some surgical procedure and only 4% were taking some type of hormone replacement. When it comes to symptoms that indicate the climacteric period, they include decreased libido, vaginal dryness, hot flashes, muscle and joint pain, urinary incontinence, sleep disorders, irritabilities, stress, headache, lack of memory and concentration, skin problems, and fatigue (MONTELEONE, et al., 2018; SANTOS, MOREIRA, SOUZA, 2023).

The climacteric is a physiological and normal phenomenon in the life of any and is divided into phases such as pre-menopause, perimenopause and post-menopause, and this includes the presence of various symptoms that can affect their health and quality of life and appear in women's lives when they play important roles in society, in the family and in the workplace (MONTELEONE, et al., 2018; SANTOS, MOREIRA, SOUZA, 2023).

However, many signs and symptoms presented in the climacteric are often not related by women to the period of decreased ovarian function, with the main symptoms reported by them in several studies being hot flashes (64.9%), tiredness (49.4%), (RIBEIRO et al., 2021), while Melo Filho and Lopes (2022) identified that only 35.6% of women had hot flashes, however, the main sign reported by them was still the main sign, followed by back or limb pain (32.8%) and vaginal dryness and 23.3%.

In addition to the symptoms mentioned, others of paramount importance are those of a psychological nature, such as difficulty concentrating, memory loss, mood swings, and sleep disorders, especially in the first year after menopause (Lima, et al., 2019). Bacelar and Pinto Jr (2019) state that throughout the climacteric there is a reduction in total sleep

time, which can also be altered due to emotional instability, and it is evident that women with moderate to severe dysmenorrhea have episodes of insomnia coinciding with the menstrual cycle, confirmed by the study by Zhou et al., (2021) in which 96.4% of the patients had a sleep disorder.

Another point is depressive symptoms, which are high even in women without a history of major depressive disorder, but more evident in those who have already had an episode before perimenopause and it is also not known whether these data are relevant in women who have undergone surgical menopause, being increased or decreased in these cases, however, current studies reveal that these women have an elevated risk of depression in women after hysterectomy with or without oophorectomy (MAKI, et al., 2018).

Regarding treatments to reduce symptoms, the study showed that most women reported the use of teas and only 3.3% women used hormones, where Ribeiro et al., (2024) shows the combination of food supplementation, herbal medicines, and hormone therapy, however, what has shown the greatest evidence is hormone therapy.

Pompei et al., (2022) evidenced in their study that hormone therapy is a first-line treatment for vasomotor symptoms when not contraindicated for estrogen and progesterone therapy, corroborating with the Menopause Society (2022), but the treatment will always take into account symptoms, preferences, risk factors, absolute contraindications, and cost availability, the latter being one of the factors that led to the non-treatment with hormones by the women in the current study.

In the same study by Pompei et al., (2022) observed that only a small part started hormone treatment, with a shorter hormonal duration for one year, being longer lasting for a higher socioeconomic class. However, with caveats, where Joann (2020) says that after 3 to 5 years, gradual reduction and treatment should be interrupted and if symptoms persist, doses should be reduced and periodic reassessment of risks and benefits should be reassessed.

According to the Menopause Society (2022) the risks of hormone therapy differ depending on the type, dose, duration of use, route of administration, timing of initiation, and whether a progestin is used. Treatment should be individualised using the best available evidence to maximise benefits and minimise risks, with periodic assessments.

For a long time, the concern with regard to climacteric women was restricted only to biological aspects, not considering everything else involved, hence the importance of care by a multidisciplinary team working in primary health care, including mental professionals (PEIXOTO, et al., 2022). Therefore, health professionals, especially in Primary Care, should

pay attention to the life cycle and dynamics of women who seek care, evaluating the possibilities of intervention and support for them (LEMOS, GUIMARÃES, SENNE, 2022).

When the domains were evaluated by the SF-36 and the MSR scale, several studies have shown that the best quality of life score was 61.6, with the physical domain having the best score with 63.3 and social relationships with the lowest score of 59.9 (Andrade et al., 2019); in the study by Miranda, Ferreira and Corrente (2014) they had a higher frequency of climacteric symptoms of mild to moderate intensity and social aspects had a score below 50.

In the domains evaluated by the SF-36 in the study by Lemos, Guimarães and Senne (2022), the physical, social, psychological and environmental aspects of women's lives are interconnected, have a positive and directly proportional association with each other, however they undergo changes with the aging process, especially after the onset of the climacteric, with a tendency to worsen the parameters in the subjective assessment. In the present study, these domains described by the authors did not present similar parameters, since the social aspects stand out with an average of 54.2 and, together with pain, with an average of 54.4, while the physical and psychological aspects are on average 40.0 and 31.9, although they still have positive aspects.

When referring to climacteric symptoms assessed by the MSR Scale, women had a percentile above 90% in almost all of them, except for heart discomfort with 85.2%, and the most cited were sexual problems and vaginal dryness with 98.4%, respectively. In the study by Andrade et al. (2018) it was shown that the women who participated in the research had an MRS score of 18, indicating severe symptoms during the climacteric, where urogenital symptoms were the most severe and psychological and somatovegetative symptoms the most moderate. On the other hand, the women's perception of QoL showed that the social relationships domain reflected the worst evaluation score, allowing the detection of the facet of the social relationships domain that presented the greatest fragility in terms of QoL, which is social support.

CONCLUSION

Most women are aged between 40 and 45, brown, with a partner, Catholic, with only a high school diploma, work outside the home and have a family income of less than one minimum wage. More than 90% did not use alcoholic beverages and were not smokers, and none used illicit drugs, but only 12% performed some type of physical activity.

With regard to gynecological history, most women had their menarche between 10 and 15 years of age, no longer had menstrual cycles, had an active sexual life, with more

than 3 pregnancies, most had normal deliveries and 25.8% had an abortion. During the research period, only 49 women were already in menopause, which occurred at the age of 40 to 45 years, and another 20% had menopause due to some surgical procedure.

The analysis of the quality of life indicators identified in the sample of climacteric women in the city of Cruzeiro do Sul shows that there are 122 women who are not under continuous follow-up by the FHS and do not receive regular clinical care. And this can lead to such a significant number of women who do not take some type of hormone replacement that it is considered an effective therapy both for vasomotor symptoms and to minimize risks, taking into account the individuality of each woman.

The symptoms, when presented very frequently and with intensity, can affect both the personal and professional lives of women, as they often leave them complaining, and misunderstood by family, friends, co-workers, bosses and especially by health professionals.

It was observed that almost all of the women in this study have symptoms related to the climacteric and are not under clinical follow-up or hormonal treatment. Better attention, care and guidance are needed so that women have quality of life at this stage of life.

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END-OF-LIFE CARE: A CRITICAL-REFLECTIVE REVIEW OF HOSPITAL PRACTICES

https://doi.org/10.56238/sevened2024.031-074

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ABSTRACT

The objective of this study was to reflect on the principles of autonomy and dignity of the person, relating them to health ethics in hospital practices. The individual has the

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opportunity to plan in advance the care of his health through advance directives of will. In the doctor-patient relationship, this principle is fundamental where it replaces the old authority of the physician with the consideration of the patient as an active participant in the treatment process, however some physicians face difficulties in discussing end-of-life issues due to factors such as personal discomfort, lack of time, insufficient training, limited resources, or the perception that patients may feel uncomfortable. In this sense, we present a theoretical and practical construction of these principles and their benefits in quality of life. Although in Brazil there is no law regulating advance directives, the Federal Council of Medicine published Resolution 1995/2012 in which it guides advance care planning to facilitate the work of the health team in the face of complex ethical dilemmas from the beginning to the end of life as the basis of shared care decisions.

Keywords: Autonomy. Dignity. Terminality. End of Life Care.

INTRODUCTION

DIGNITY OF THE PERSON AND ITS RELATIONSHIP WITH BIOETHICS AND BIOLAW

The word Bioethics, from the Greek *bios* (life) and *ethos* (related to ethics), involves the Biological Sciences, Health, Philosophy (Ethics) and Law (Biolaw). Its responsibility is to regulate conducts related to human and animal life and the environment (SOARES & PINEIRO, 2006). The principles of bioethics and biolaw, with a focus on the dignity of the person, are intrinsically linked to the autonomy of the patient's will. The latter must have his will and dignity assured in matters related to his own health. Biolaw seeks solutions to conflicts in this area and imposes limits on the performance of health professionals. It therefore establishes guidelines for making difficult decisions, ensuring that the patient's will is preserved and respected, in accordance with the rights of personality and human dignity.

The principle of the dignity of the person is guaranteed in article 1, item III of the Federal Constitution (BRASIL, 1988) and is inherent to man himself. The right of personality seeks to protect this principle of individual value, unique and essential to every person, ensuring the guarantee of a dignified life, being, therefore, the fundamental source of all rights (BRASIL, 1988). In the health area, information related to the patient belongs exclusively to him or her due to his or her right to intimacy, private life, honor and image, with the legal support of article 5 of the Federal Constitution (BRASIL, 1988).

Scientific and technological advances in biomedical sciences have made it possible to carry out unprecedented interventions, such as assisted reproduction, organ transplantation, genetic engineering, among others. Therefore, they made inevitable "ethical questions related to the limits of application of such biotechnologies" (CONTI & SOUZA, 2021, p.717).

The objective of this study was to reflect on the principles of autonomy and dignity of the person, relating them to ethics in health, personality rights and the benefits to patients in the scenario of terminal life and in medical conditions that reduce functional capacity, articulating theoretical, clinical and cohort studies to illustrate the connections between legislative support, course of medical treatments and quality of life.

Human dignity is related to the rights that all people have, simply because they are human. “... the recognition of the inherent dignity of all members of the human family and of their equal and inalienable rights is the foundation of freedom, justice and peace in the world..." (UNITED NATIONS [UN], 1948, p.1).

The Universal Declaration of Human Rights (UN, 1948) was drafted to ensure broad protection for people, as citizens with civil, political, social, economic and cultural rights. It has become the duty of the State to ensure the protection of the person as a subject

capable of making decisions and expressing himself freely. In its article 1, it highlights: "All human beings are born free and equal in dignity and rights. Endowed with reason and conscience, they must act towards one another in a spirit of fraternity".

THEORETICAL FRAMEWORK

HUMAN RIGHTS IN BIOETHICS: A UNIVERSAL DECLARATION

Bioethics, a term coined by the German theologian Fritz Jahr in 1927 (GOLDIM, 2009), developed in the second half of the twentieth century. and individual rights linked to the exercise of freedom and personal autonomy" (CONTI & SOUZA, 2021, p.717). The contestation of the power of institutions led to important changes, which also affected the medicine practiced at the time, characterized by paternalism and abuses in research with human beings (JONSEN, 1998 apud CONTI & SOUZA, 2021).

Another factor responsible for the development of bioethics was the impressive technical-scientific evolution, which enabled effective interventions in the health area, such as drugs and sophisticated diagnostic and surgical procedures. "This picture, in addition to transforming knowledge about life, highlighted the promises and dangers of the new biotechnical powers, since the human being, from a mere spectator, became the master of biological evolution" (CONTI & SOUZA, 2021, p.717).

The General Conference of the Universal Declaration on Bioethics and Human Rights consciously deliberates and recognizes the ethical issues arising from rapid advances in science and its technological applications. These issues must be examined with due respect for human dignity and in accordance with universally recognized human rights and fundamental freedoms (UNITED NATIONS, 2005).

THE PRINCIPLES THAT GOVERN BIOETHICS

The Universal Declaration of Bioethics and Human Rights is governed by principles that must be respected in the field of bioethics in its articles 3, 4, 5 and 6, which are: human dignity and human rights, benefit and harm, autonomy and individual responsibility and consent (UNITED NATIONS, 2005).

Human dignity is a central concept in human rights. The Universal Declaration of Human Rights, adopted in 1948 by the United Nations General Assembly, recognizes that dignity is inherent in everyone. Therefore, the protection of life, liberty and personal security is essential to guarantee it.

In addition, Article 4 highlights the importance of maximizing the benefits and minimizing the harms related to the application of scientific knowledge, medical practices,

and technologies. This means that when advancing in science and medicine, we must prioritize the well-being of patients, research subjects, and other individuals (UNITED NATIONS, 2005).

The four principles of bioethics

From the relationship of humanization of medical care, we can conceptualize each principle. First, the principle of autonomy is respect for the patient as an autonomous person. The patient has the freedom to want to be treated or not, to want to live with quality or to die with dignity (BRASIL; MINISTRY OF HEALTH; SECRETARIA DE ASSISTÊNCIA À SAÚDE, 2001). As long as all points related to their health are clarified, such as forms of treatment, diagnosis and procedures, considering all the possibilities of the best available treatment for the patient's health and well-being (KOVACS, 2009).

According to Naves and Sá, the principle of autonomy recognizes that people have the capacity to govern themselves. In the doctor-patient relationship, this principle is fundamental. It replaces the old authority of the physician with the consideration of the patient as an active participant in the treatment process. To ensure that the patient has all the necessary information, it is essential that the intervention process is transparent. Therefore, informed consent is required, allowing the patient to make well-informed decisions (NAVES & SÁ, 2018).

In view of the principle of non-maleficence, it is established that the doctor's action must be as harmful as possible to the patient's health, that is, the doctor must try to reduce as much as possible any effect of the treatment applied (MAXWELL et al., 2012). As for beneficence, the doctor has the ethical duty to cause as little harm as possible to the patient. Based on this context, we can highlight that the autonomy of the person over their own body overrides the principle of beneficence (PARSONS & CARVALHO, 2014)

The paradigm of medical paternalism, which had previously prevailed, has gradually been overtaken by patient autonomy. In contemporary and secularized society, the applications resulting from biomedical research generate dilemmas for the professional practice of physicians. Today, doctors allow patients to express their wishes, either spontaneously or through a document (PARSONS & CARVALHO, 2014).

Ethical medical intervention takes into account not only clinical aspects, but also personal values. This approach aims to ensure that the treatment is aligned with ethical principles and respects the dignity of each individual (SATO, 2023).

THE PRINCIPLES OF BIOLAW

Biolaw is based on three specific areas of Law: Constitutional, Civil and Criminal. The Constitutional Law and its fundamental rights to life, liberty, health and intimacy. The Civil has a direct relationship with personality rights. Article 13 of the Brazilian Civil Code establishes that, except when necessary for medical reasons, it is forbidden to perform any act that causes a permanent decrease in physical integrity or that goes against good customs, involving one's own body. Article 15, on the other hand, ensures that no one may be forced to undergo medical or surgical treatment that puts their life at risk (BRASIL; CIVIL CODE, 2002). These provisions aim to protect the autonomy and dignity of individuals in relation to decisions about their own bodies.

As we can see, the direct relationship with these branches of Law and Biolaw is notorious in the search for existing legal systems to assist in the solution of conflicts between science and people in general (PARISE, 2011). Thus, the principles of precaution, private autonomy, responsibility and dignity are considered for conflicting decisions.

The precautionary principle is related to preventing and avoiding acts that threaten to cause damage to the environment and human health, having a direct relationship with the principle of beneficence and non-maleficence (LAPA, 2002). For Francisco Amaral, private autonomy is the principle by which the agent has the possibility of performing a legal act, determining its content, form and effects (AMARAL, 2000). The principle of responsibility implies the obligation to indemnify the offended party with a sum of money, in order to sanction the offender and satisfy the victim (FARIAS et al., 2014).

Finally, the Federal Constitution of 1988 expressly brought the dignity of the person in its first article that establishes the foundations of the Brazilian State. This principle is central to the understanding of fundamental rights and aims to protect the integrity and well-being of individuals. Dignity is the foundation that unites the essential rights conferred on citizens. It serves as a constitutional reference to ensure the comfort and protection of people, preventing them from suffering injustice or inhumane treatment (CAVALIERI, 2010; FARIAS et al., 2014).

PERSONALITY RIGHTS

It is important to emphasize that there is no exhaustive list of personality rights, as these rights are under constant construction and are understood as general clauses for the protection of the person. The Civil Code establishes that, except in the cases provided for by law, personality rights are non-transferable and non-waivable. Thus, any violation of these rights can be sought in court, either by compensation or protection measures. The

protection of personality rights is fundamental to guarantee human dignity and individual freedom (DONEDA, 2003; MATTIA, 1977).

NARRATIVE AND CRITICAL REVISION

WHAT ARE THE BENEFITS OF THE APPLICABILITY OF THE PRINCIPLES OF BIOETHICS AND BIOLAW IN HOSPITAL PRACTICES?

The terminally ill patient is defined as one diagnosed with an expectation of death within a few months, with no possibility of fundamental recovery, and whose symptoms gradually worsen despite proactive treatment. The diagnosis of terminal illness is restricted to four types of diseases: cancer, acquired immunodeficiency syndrome (AIDS), chronic obstructive pulmonary disease (COPD) and chronic liver cirrhosis (CL), as established by the ordinance of the Ministry of Health and Welfare. The patient in a period of death, on the other hand, is one in a state of imminent death, in which there is no possibility of revitalization or recovery, and whose symptoms worsen rapidly (LEE et al., 2021).

End-of-life care and limiting conditions in pediatric patients involves more than one person, and those responsible are also part of the decision about the treatment of the child and adolescent, and conflicting wills may arise. The PPC [pediatric palliative care] protocol introduces those responsible together with the patient to the possibilities in the face of the available resources, being a method of listening, welcoming, technical positioning and questioning about the patient's desires, wants and needs, articulating what can be solved and what cannot. Articulations and informed decisions come from the diagnosis and recommendations of the multiprofessional team. The protocol demonstrated, in a retrospective study, effectiveness in promoting the well-being and quality of life of parents and patients by promoting information and assistance in decision making, however there were cases of non-questioning of end-of-life wishes, observing failures in the application of the PPC interfering in the autonomy of those involved and hypothetically submitting to costly treatments (PELÁEZ-CANTERO et al., 2023).

Research on paediatric palliative care has illustrated the importance of a well-structured protocol to ensure informed decisions and respect the autonomy of all involved. The aforementioned retrospective analysis offers evidence on the effectiveness of PPC, but also highlights the need for continuous improvements to avoid gaps in practices, modulated by bioethical and biolaw principles.

Considering adult and elderly patients, chronic diseases have been increasing in Brazil and worldwide. Focusing on Brazil, the authors present the need to discuss with the patient the care of the dying process, establishing the necessary care. However, there is no

legislative support because the legislation focuses on treatment and cure, preventing the health team from debating issues of the end-of-life process with the patient. Non-dialogue increases hospitalizations and invasive and unnecessary treatments, observing a clash between Evidence-Based Practices in End-of-Life-Care and Brazilian Medical Ethics. The authors identified that terminally ill patients were in inpatient units undergoing costly treatments, even though there are other guidelines in the literature, especially Palliative Care, noting a lack of knowledge of such measures in Brazilian practice (LIN et al., 2023)

Palliative Care in Adults and the Elderly evidences a conflict between evidence-based practices and local medical ethics, suggesting an urgent need for legislative and educational reforms. The correct identification of terminally ill patients together with knowledge of the guidelines can help to redefine palliative care in the Brazilian context.

There are benefits in quality of life when autonomy is achieved with the patient through information and dialogues about being submitted to treatments, but for the decision not to treat it is necessary to have support in the legislation. This study took place in Victorian, Australia, bringing an analysis of the perception of a patient who followed the change in legislation on informed decision and autonomy, prevailing the dignity of life and respect for personality. Victorian's experience serves as a relevant case study for other regions, demonstrating that legislative changes can lead to significant improvements in end-of-life care. This example can inspire reforms in other jurisdictions (GILBERT & BOAG, 2019).

A CRITICAL ANALYSIS OF DEATH AND DYING

It is essential to promote continuity in the provision of end-of-life care by a fixed, qualified and stable team of health professionals, as this facilitates a doctor-patient relationship of trust and allows more time to discuss topics other than clinical needs. More home care services and palliative care centres are needed, combined with effective communication to facilitate access to specialist care and the transition to end-of-life care (LUNA-MEZA et al., 2021).

Autonomy in the United States is considered one of the four ethical principles that guide critical medical decision-making (MACKLIN, 2003 apud KIM et al., 2021). Unfortunately, patients without advance directives may receive aggressive treatments that are not aligned with their care goals, which can exacerbate suffering. Some clinicians face difficulties in discussing end-of-life issues due to factors such as personal discomfort, lack of time, insufficient training, limited resources, or the perception that patients may feel

uncomfortable, frustrated, or stressed when addressing terminal care measures (BIONDO et al., 2019 apud KIM et al., 2021)

It is amazing how human beings often act as if they were immortal, ignoring the inevitability of death. The quest to prolong life at any cost is an intrinsic characteristic of our nature. However, this search does not always consider the impact it can have on others and sometimes even goes against the wishes expressed by sufferers. In most cases, death is the result of a long journey marked by chronic and debilitating diseases, such as late-stage cancer, dementia, and progressive failure of vital organs. "In all these cases, death is certain." (GAWANDE, 2015, p. 150).

The quote from author Atul Gawande makes us reflect on how we deal with death in our society. Even in the face of evidence of the benefits of talking about it, we often resist accepting it. It is essential to consider the quality of life and wishes of patients when facing serious illnesses, seeking a balance between prolonging life and ensuring dignity and comfort.

Palliative Care has been debated around the world for several decades, but we are still constantly evolving. In Brazil, we are just beginning a change in the way we think and accept our finitude (ARANTES, 2020, p. 62).

Resolution 1995/2012 of the Federal Council of Medicine (CFM) addresses the issue of the autonomy of the patient's will. This autonomy is intrinsically linked to the dignity of the person. It is sovereign and is based on principles such as equality, non-discrimination and the recognition that all people are subjects with rights. Health professionals have responsibilities towards patients, and in this context, new rights arise that must be considered. Among these rights, the exercise of individual freedom, self-determination, and autonomy stand out, allowing each individual to make decisions related to health care. These values are essential to preserve human dignity (RESOLUTION 1995/2012 of the FEDERAL COUNCIL OF MEDICINE, 2012).

Ana Michelle Soares, author of "While I breathe" – (2019, pg. 14), reports the importance of a clear conversation with your doctor about your real state of health. In her book, she tells her story (of her cancer diagnosis, her choices and what was most important: living her last days intensely and with quality of life) and her friend Renata (also diagnosed with metastatic cancer): where they take control of the treatment, make their own choices and in their routine explain what palliative care is: "Palliative care is not about dying, it's about how to live (until then).", when the end is near. In fact, they are about living fully until the last moment.

It is essential that the doctor explains to the patient what his real health status is and provides all possible information about the treatments, clarifying doubts related to medications and exams. Only through a clear, sincere and objective conversation will the patient have the freedom to make their own decisions.

To guarantee these principles in daily life, it is necessary to encourage families to talk about end-of-life care in order to instrumentalize the living will so that it has the quality of death (KIM & PARK, 2021). Other authors reinforce that advance planning of end-of-life care is one of the most important aspects of palliative care (PELÁEZ-CANTERO et al., 2023).

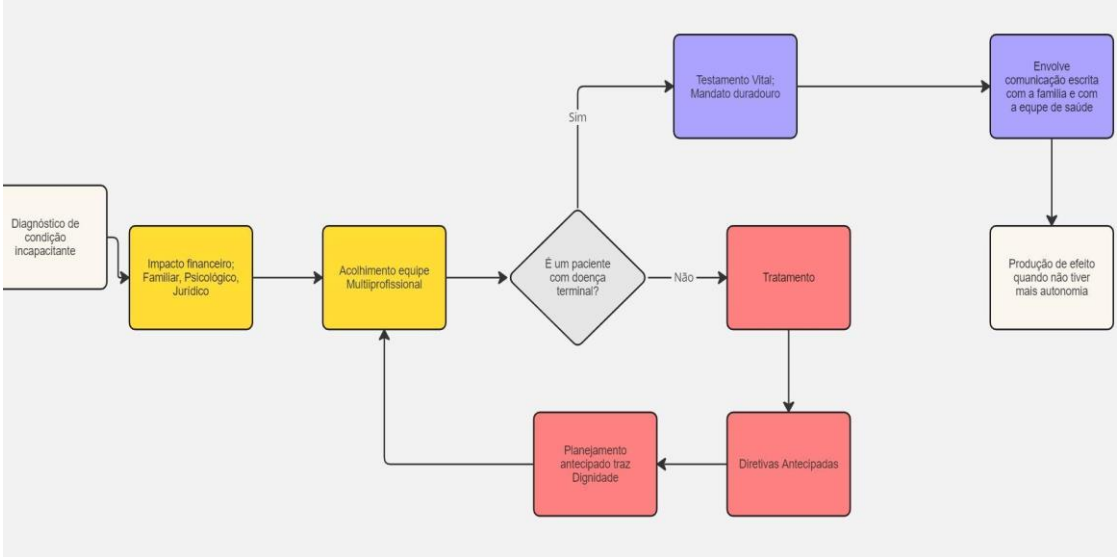
In the final stretch of life, often shrouded in uncertainty and fear, it requires a frank and sensitive dialogue between patients and health professionals. However, communication about desires and choices at this crucial moment comes up against several difficulties, compromising the patient's autonomy and the quality of their last days (KUUSISTO et al., 2022).

A PROPOSAL FOR A CARE PROTOCOL

Based on the legislative proposals and research cited in our study, which address vulnerability or its possibility in the life course, we developed a decision-making flowchart after the diagnosis of transient or chronic disabling disease, as well as considering the prognosis of terminality.

Figure 1 shows the existence of the disease condition, that is, performed by the medical team, which must activate the multidisciplinary team to support the financial, social, legal and psychological needs of the following guideline. It is important to highlight the need for the team to question whether it is a patient with a chronic or terminal disease so that palliative care can be performed, as well as to delegate decisions when the patient no longer has autonomy, with multiprofessional support in the delegation and with a written report. Finally, if the patient is conscious and with full civil capacity, it is recommended to carry out the Advance Directives of Will for the advance planning of care in relation to their health. In this sense, integration and communication between professionals and also with family members is required to improve everyone's quality of life.

Figure 1. Implementation of Humanization of Care for Patients with Transient or Chronic Disabling Diseases with Suspected/Confirmed Terminality



Source: prepared by the authors

CONCLUSION

The discussion is comprehensive and addresses the main challenges and needs in palliative care. The focus on education and the development of specific infrastructure is essential to improve the quality of life of patients. Promoting effective communication is crucial to ensure that patients can make informed and dignified decisions. Reflection on the patient's autonomy is urgent in time. The work of Atul Gawande, the personal experience of Ana Michelle Soares and the research presented show us that autonomy is seen as a fundamental ethical principle that must be respected to guarantee the dignity and quality of life of patients with terminal illnesses. Thus, health is distributed in an ethical and fair manner, alleviating the pain and suffering that the individual faces at that moment. Therefore, the principles of bioethics play a fundamental role in this whole context.

ACKNOWLEDGMENT

This study was funded by CAPES Grant 88887.824687/2023-00

CAPES Grant 88887.824682/2023-00

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CRIME AGAINST PROPERTY IN THE LIGHT OF THEORIES OF MOTIVATIONS FOR SOCIAL AND ECONOMIC CRIME

https://doi.org/10.56238/sevened2024.031-075

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ABSTRACT

The article presents reflections on the motivations of crime from a socioeconomic perspective, highlighting the need for an integrated and multidisciplinary approach. The objective is to discuss how the concentration of income and social and economic inequalities can influence criminal behavior, for this we take crimes against property as a reference. The study uses an empirical analysis based on the theories of social and economic character of crime. The discussions address how the unequal distribution of income and the problem of social economic mobility in Brazil can influence the increase in crimes against property, considering that economic and social inequality, combined with cultural pressures and the lack of clear social norms, creates an environment conducive to deviant behaviors. The discussions also indicate that economically marginalized individuals and deprived of legitimate opportunities are more likely to adopt criminal behaviors as a way to achieve imposed social objectives. The need for a more complex and multifocal understanding of the motivations of crime is defended, requiring connections with the various areas of knowledge and the integration of this debate with the elaboration of effective public policies that address the socioeconomic roots of crime.

Keywords: Theories of motivations. Social inequality and crime.

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INTRODUCTION

In the field of studies of the motivations of crime, several theories have offered important subsidies for the understanding of the phenomenon of criminal behavior. Studies and data analysis have revealed advances and deeper understandings about patterns of motivations that have led individuals to develop criminal behaviors, which have greatly helped in the formulation of strategic decisions in the prevention and fight against crime. Despite this considerable advance in academic studies and productions in this field of investigation, we still witness a theoretical distance between the various approaches to the motivations of crime, in the analysis of the information collected and in the theoretical formulations resulting from these analyses. A more holistic, intertwined and multidisciplinary approach could provide valuable reflections in this investigative path, and consequently favor the development of more effective and successful public policies, to the extent that, given the complexity and dynamism of crime, criminal actions will present new modalities and consequently new complexities and new challenges to the same extent, imposing the need for new reflections and actions in the fight against and prevention of crime.

In the search for a more comprehensive understanding, this article aims to raise discussions around the possibility of building theoretical connections between the approaches of the theories of the motivations of crime of a socioeconomic nature, seeking to develop a broader and more spectral look at the phenomenon of the motivations of crime, centered on the analysis of crime against property, and this type of crime in Brazil, according to the Yearbook of the Brazilian Forum on Public Security (2018-2022), grew by 430%, leveraged by the practice of crime against property, while robberies had a substantial decrease of 40%, which notably shows the evolution of a type of crime driven by current behavior patterns and technological means.

The choice for theories of the motivation of crime of a social and socioeconomic nature is due to several aspects, but mainly due to the fact that Brazil presents serious distortions in income distribution, which may be echoing in the manifestation of criminal behavior. Junior (2014) suggests that the harmful effect of economic growth can be enhanced in case of worsening social inequality, since this inequality represents an increase in the expected benefit of crime when the income of the richest portion grows and a lower opportunity cost for crime when the income of the poorest population decreases, The confrontation generated by an increase in inequality can also trigger the weakening of moral values that could distance the individual from the world of crime.

THEORIES OF MOTIVATION AND THE SOCIAL AND ECONOMIC CHARACTER OF CRIMINALITY

The debate on how the concentration of wealth and income production in a small class has generated social problems that are difficult to overcome by government programs, or by the autonomy of the market itself, is not recent, however, understanding how these factors can be drivers of criminal behavior is still a debate that needs to be deepened and when they are carried out they are usually associated only with the homicide rate.

Junior (2014) informs that inequality can aggravate the crime situation to the extent that income and benefits grow only for a small portion of the population, simultaneously reducing the opportunity cost for crime among the poorest, whose income can decrease due to inequality. In other words, when the rich get richer, the financial motivation for crime intensifies, and when the poor get poorer, the temptation to turn to crime as a means of survival increases.

Fajnzylbe & Araújo Jr (2001) indicate that other factors may influence the connection between income concentration and crime. For example, the frustration felt by low-income people when they observe the prosperity of others, can arouse feelings of injustice and marginalization, increasing the propensity for criminal behavior. In addition, economic inequality can erode informal mechanisms of social control, such as community cohesion and shared values, which typically serve to regulate the behavior of individuals. When the disparity between rich and poor is wide, these support networks and social norms can weaken, creating an environment where crime becomes more possible.

The distortions created by inequality, aligned with the social objectives imposed by the model of economic and social success, may be creating an environment that favors criminal behavior, mainly due to the lack of perspective of social mobility in terms of ascension, which the country presents, and that, on the other hand, the risk of losing economic power in the large portion of the population is much greater.

According to the WEF - **World Economic Forum,** through the Global Social Mobility Report (2020), Brazil is ranked 60th out of 82 economies in a social mobility ranking. The survey reveals the great difficulty that individuals belonging to the less favored classes in the country have in terms of their ability to ascend economically. The Report, in making a comparative analysis between countries surveyed, points out how the levels of social mobility, related to the time that a given individual can ascend socially between one country and another, present strong distortions, showing drastic situations for individuals located at the bottom of the social scale in less developed countries, as in the case of Brazil, reach those who are higher up the social pyramid.

The WEF Report (2020) shows that the number of generations needed for a low-income family to reach the average income varies significantly between countries, in France for example, it takes six generations to reach the average income, while in Denmark it takes only two generations, and three in Sweden, Finland and Norway. In South Africa and Brazil, this time dramatically rises to nine generations, that is, 180 years.

In terms of income distribution, this scenario becomes even more complex, Barbosa Et al (2020) indicates that, in the last three years of the Continuous PNAD series (2012-2018), the real income of the poorest half of the population decreased, with a sharper relative drop for those closer to the bottom of the distribution. In contrast, the richest half of the population experienced an increase in income, with those closest to the top seeing the greatest relative growth. These data indicate that, while a larger portion of the population experiences a process of increased impoverishment, a small portion continues to accumulate more wealth. Barbosa et al. (2020), continues his analysis by informing that, in an even smaller section of the poor population, the real income of the poorest 10% was lower in 2018 than in 2012, indicating a greater impoverishment of this portion of the population, already penalized by the lack of resources.

The studies pointed out by the authors also reinforce the consolidation of this trend of income concentration and lack of access to wealth and income by a large part of the population. According to Barbosa et al. (2020), in 2018, the economic recession experienced by a large part of the Brazilian population was already showing signs of recovery for the richest half of Brazilians, and the increase in the average per *capita* household income in 2018 was, in fact, the result of growth concentrated only by the increase in the income of the richest, while the poorest 10% continued to lose purchasing power, and the rest of the poorest half obtained minimum balances or remained in the process of loss in productivity and income. In the total balance of the period, a portion of those located among the richest 10%, the situation in the final year of the series is more favorable than in the initial year: this group now controls a larger fraction of income than it did previously – which, as we have seen, is true both from the relative and absolute points of view (BARBOSA et al., 2020. p. 21).

Resende and Andrade (2011) indicate that the variable income inequality influences crime indicators, especially for crimes against property. Their studies revealed significant information about income inequality as a major driver of infraction dynamics in more densely occupied urban regions. The authors' studies also reveal that there is an ambiguous role of this influence when it comes to crime against the person, becoming prominent only in cases of homicides. According to the authors, the explanation for this correlation of intentional

deaths is the consequences of property crimes. This may suggest that income inequalities may be a determining factor for crimes against property, but not so determinant for crimes against life or against the person.

The data from the references mentioned above show that, in the social and economic dynamics, there is an imbalance in the access to the production of wealth and income, mediated by the models of stable relations by the individual in the context in which they live. Thus suggesting a need for an articulated approach between theories of social interaction and theories of socioeconomic character.

In addition, the moral values that usually discourage the individual from engaging in criminal activities can be weakened in a context of growing social inequality. Caliman (2008), when debating Merton's theory of anomie, argues that marginalization is seen as a discomfort resulting from the inability of some individuals to find adequate means to achieve the ends accepted by society. The motivation for delinquent behavior is directly proportional to the difference between the individual's aspirations and the means available to achieve them; Those most affected by this discrepancy or pressure are the poorest. We can then indicate that, when there is a significant disparity between rich and poor, the social fabric is eroded, creating an environment conducive to conflict and the weakening of the sense of belonging to this fabric. According to Caliman (2008), deviation would be a characteristic phenomenon of the lower social classes, since they are the ones who often face the discomfort caused by the discrepancy between goals (aspirations) and the means to achieve them. This environment can decrease the effectiveness of moral values in preventing crime, leading to an increase in crime.

Mendonça et al. (2002), when approaching the studies of the motivations of crime, indicate that social interaction can be defined by the insertion of the individual within a certain utility, which includes attributes of other individuals and that exert influence on this utility. The authors use as an example the logic that the promotion of one individual indirectly affects the usefulness of another individual. Another way pointed out by the authors is the influence that other individuals, especially family members or close people, can exert on the behaviors of the subjects who live in this sphere of relationship.

Michael Gottfredson and Travis Hirschi (2009) argue that criminal acts can be attributed to the convergence of opportunities or circumstances that facilitate the commission of these crimes, a phenomenon that, they argue, is exacerbated by the absence of self-control, which refers to a person's ability to resist immediate impulses in favor of long-term goals, especially avoiding behaviors that could lead to crime, This self-control would be a personal characteristic that develops throughout childhood and

adolescence, influenced by the interaction between parents and children, individuals with low self-control tend to seek immediate gratification, have difficulty following social norms, and are more likely to engage in delinquent and criminal behaviors. This complex interplay of factors not only promotes transgression, but also underlines the importance of social and psychological context in understanding criminal behavior.

Mendonça et al. (2002) report that there is a central conception present in the studies, associated with the probability of an individual who engages in criminal behavior, which according to the authors, is influenced by variables related to social interaction. For example, it is frequent, in the approaches of the literature that deal with the subject, to assume that people from stable family environments have a reduced probability of involvement in criminal activities. In addition, factors such as marital status, religion, substance use, residential location, among others, are often used as indicators of social interaction in these studies. The underlying economic outlook suggests that individuals with certain characteristics would face a higher opportunity cost when engaging in certain behaviors that could make it difficult to access desired consumption goals.

For Silveira (2004), the central point addressed by research in the area of theories of social interaction lies in the finding that communities marked by a concentration of social challenges, such as poverty, cultural diversity and unemployment, tend to have a limited capacity to prevent and control crime. The presence of these characteristics makes such neighborhoods less attractive, leading residents to abandon them as soon as they have the means to do so. Silveira (2004) also indicates that the high housing mobility and the transitory nature of family life in these places prevent people from staying long enough to develop a solid sense of social cohesion and belonging to a community. In addition, the lack of residential stability contributes to the weakening of social ties, making it difficult to build a solid community identity.

This same idea is defended by Shaw and McKay (1969), who focused on the impacts of social disorganization on crime rates, suggesting that the approach centered on the individual treatment of delinquents may have a limited impact on reducing crime rates. Instead, the emphasis is on the pressing need to develop comprehensive programs that aim not only at punishment, but at transforming the living conditions of the subjects.

In the field of socioeconomic theories, we can mention, for example, theories that study how the relationship between production and consumption, combined with the models and lifestyles of the subjects, can influence the involvement in illicit activities. Among the theories that study criminal behavior from this study approach, we can mention the Economic Theory of Rational Choice proposed by Becker (1968), Anomie proposed by

Robert Merton (1938) and Lifestyle proposed by Hindelang, Gottfredson and Rofalo (1978), which highlight the importance of social dynamics in their various aspects such as; the interactions and insertions of individuals in the various social contexts, economic issues and models of behaviors and lifestyles, which concern how these individuals who are inserted in a certain social context interact and are influenced by these means, or how they are having access to wealth that is produced by this environment, and how this economic and social structure exerts an influence on the lives of these individuals, more precisely, how the combination of these elements can either encourage or deter criminal behavior.

The Theory of Anomie, proposed by Robert K. Merton (1938) points to the imbalances between socially established goals and the legitimate means available to achieve them. In a society that values the accumulation of wealth, the lack of legitimate means can lead to frustration and the use of illegal strategies to achieve success. This theory emphasizes the importance of socioeconomic conditions in predisposing to criminal behavior, especially in contexts where legitimate opportunities are scarce. Merton (1938), through the theory of social Anomie, describes that the causes of deviant and criminal behavior in society are linked to the model of how the cultural objectives imposed by a society, such as the achievement of economic success, social status and prosperity, create the obligation in the subjects, that, in almost all cases, these same individuals, they do not find equal access to legitimate means to achieve these goals, consequently leading to the possibility of developing deviant behaviors.

Thus, Merton (1938) defines anomie as a social condition that is characterized by a mismatch between the cultural goals defined by society and the means approved to achieve them. This may mean that the anomie proposed by Merton (1938), depending on the degree of equity in which a given society makes available to the subjects the methods to achieve these objectives, will exert pressure on the judgment of which truly legitimate methods are available to achieve them and in the absence of access to such methods, deviant behavior may occur.

For the Rational Choice Theory proposed by Becker (1968), crime results from a conscious analysis, where individuals evaluate the costs and benefits of their actions. As in the theory of Anomie, societal pressures to achieve material success, combined with the absence of clear norms, can favor rational decision-making that maximizes perceived gains, even by illegitimate means. Becker (1968) suggests that the decision to commit or not commit a crime is linked to the perception that the potential gains are greater than the risks. There is an evaluation of factors such as; the chance of being caught, the harshness of the penalties, and the financial benefits that the criminal act can provide.

From the perspective of rational choice theory, the behavior of the individual is understood as the result of a conscious analysis of the costs and benefits associated with what can be considered as criminal behavior. Becker (1968) proposes the reflection that participation in criminal activities occurs only when individuals perceive a positive advantage after this evaluation, in addition, we can associate this reflection with the fact that there may be a significant relationship between economic inequalities and the lack of clarity and cohesion of social norms, and this combination may distort behaviors due to social pressure to achieve personal success through the accumulation of material goods, as proposed by the theory of Anomie proposed by Merton (1938).

Mendonça et al. (2003) proposed that when the individual has a referential consumption pattern imposed by society's models, a component of dissatisfaction arises resulting from the non-satiety that this consumption, if not achieved, can manifest. This dissatisfaction, from the perspective of the economic and rational theory of crime, may suggest that, depending on the degree of satisfaction or in the absence of it, the individual may be led to break with patterns of behavior hitherto accepted as a reference. In the idea proposed by Merton (1938) that deals with social anomie, we can suggest that, as there is an increase in the levels of demand necessary to maintain the degree of satisfaction, the requirement of the degree of income necessary for the subject to stay out of crime also increases, Mendonça et al. (2003), points out that there is a proportional increase between the degree of dissatisfaction and the increase in income. Thus, the decision to commit a crime is not only motivated by economic deprivation, but also by the discrepancy between socially imposed consumption patterns and the consumption pattern of the individual who can potentially develop criminal behavior.

In an intersection with rational choice theory, the approaches to lifestyle characteristics proposed by Hindelang et al (1978) indicate that those who provide a higher expected return for the criminal face a higher probability of becoming victims, indicating that the criminal needs to perform an analysis of the probabilities of maximizing his profits in a possible choice of a victim. This is because, even in the face of the same risk of imprisonment, the aggressor perceives the opportunity to obtain greater gains by choosing victims who offer a more substantial return on the crime. In summary, the protection strategies adopted by potential victims play a crucial role in minimizing the risk of personal victimization.

From the point of view of the lifestyle theory proposed by Hindelang et al (1978), the propensity of the individual to become a potential victim could be explained from some characteristics that could increase the person's vulnerability, increasing the

probability of becoming the target of activities of this type of crime, such as: individual factors, which encompass personal characteristics such as age, sex, socioeconomic situation, level of education, marital status, possibilities of antisocial behavior, among others.

Aspects such as the lack of precaution in the use of social networks, participation in pages whose activities present a high degree of risk, in addition to the high exposure of the lifestyle that some individuals present, can further enhance the willingness to originate possible victims. Making an analysis of the crime against property from the perspective of the rational theory of crime, we could suggest that the agents who are committing the criminal act are making it from a logical decision, in which they meticulously examine the financial implications, power and meeting the specific demands of the group, before committing the crime. As argued by Becker (1968), the offenders in the case acted logically and rationally considering the pros and cons of their actions, evaluated the financial benefits, the potential to acquire control over the victim and the opportunity to satisfy a specific demand.

In the crime against property, the criminal, based on the logic of the theory of rational choice, can identify this practice as an effective means to obtain economic advantages, influence or satisfy specific requirements. From the point of view of social anomie, this behavior can be explained by the disconnection between cultural objectives, such as financial success, and the conventional means available to achieve them, resulting in the search for alternatives, such as involvement in criminal activities, in the case under discussion, in crimes against property. Merton (1938) suggests that refusal to accept institutionalized goals and means can result in rebellion about the rules that guarantee the balance of social behaviors. Thus, individuals seek to replace the established norms with others that are less institutional and legal, but more convenient to achieve the goals of the individual with a propensity for crime.

As previously analyzed, in terms of the analysis of factors that strongly influence criminal behavior, the approach made by the social anomie proposed by Merton (1938) suggests that social inequality, which is accentuated by the inequity in the distribution of economic resources and access to goods and services, can act as a catalyst for the emergence of deviant behaviors. This suggests that in situations where certain layers of society face significant obstacles to achieving financial success, in addition to being on the margins of social production and access to basic services for quality of life, the pursuit of materially valued goals can lead to alternative strategies, including criminal activities, as evidenced in economically marginalized communities

Thus, the interaction between the pressure to achieve high socio-financial goals Merton (1938), when combined with the absence of objective social norms, creates an environment conducive to anomie, where the clear definition of acceptable behavior is replaced by ambiguity, thus increasing the probability of social deviations. This complex dynamic underscores the importance of considering not only economic disparities in isolation, but also how these inequalities interact with social pressures and the lack of normative guidance. Analysis from this perspective can enable better understandings of how criminal behaviors are being shaped.

REFLECTIONS ON A PHENOMENON STILL UNDER DISCUSSION

A possible answer is that crime is a complex and multifactorial phenomenon, which involves biological, psychological, social, economic, cultural, political aspects, among others. Each individual has a life story, a personality, an education, a motivation, an opportunity and a choice that can influence their behavior. In addition, each society has a set of norms, values, laws, institutions, and systems that can favor or discourage the commission of crimes.

In this sense, there is no single cause of crime, but rather a combination of factors that can vary according to the context and type of crime. For example, some crimes may be more related to factors of impulsivity generated by the need to immediately achieve social goals, or by the simple lack of empathy. Still others may be more associated with social factors, such as poverty, inequality, exclusion, discrimination or violence.

From this perspective, Merton's Theory of Anomie (1938) highlights how the dissonance between cultural objectives and legitimate means can lead to criminal behavior, behavior resulting from the unfolding of a rational evaluation, in which the offender carefully weighs the risks involved and is convinced that the benefits outweigh the costs, covering aspects such as the probability of being captured, legal implications and emotional damage inflicted on the victim, an evaluation of costs and benefits made by the individual when deciding to commit the crime as proposed by Becker (1968), in the Theory of Rational Choice. Also facilitated by certain behaviors and habits that can expose people to a greater risk of involvement with crime, either as victims or perpetrators as proposed by Hindelang, Gottfredson and Rofalo (1978), in the proposed Lifestyle theory. This decision can also be influenced by the disintegration of social bonds, as suggested by Michael Gottfredson and Travis Hirschi (1969) in the theory of social control. Individuals with weak ties to family, school, or community feel less responsibility to follow social norms, increasing the propensity for criminal behavior.

Therefore, to understand and prevent crime, it is necessary to adopt a holistic and interdisciplinary perspective that considers the multiple dimensions that involve human beings and society. It is also necessary to recognize that there are no simple solutions, but rather strategies that require time, effort, and cooperation from all sectors and social actors.

Discussing these theories is particularly relevant due to the growing impact of economic inequalities and the rapid social transformations currently experienced. With globalization, urbanization, and technological innovations, new forms of crime emerge and social and economic pressures become more complex. Creating what Caliman (2008) understands to be a behavior resulting from deviance and marginality that presents a tangle of contradictions that classical criminology cannot clarify. One of these contradictions is the conflict between egalitarian intentions, which are laudable but utopian, and concrete reality, which is unequal and unjust. Thus, any effort to legitimize the rationality of the penal system becomes useless, as it does not address the understanding and resolution of the problems that give rise to crimes, deviation and marginality.

Understanding the motivations behind criminal behavior, based on these theories, can help in the development of more effective and fair public policies. In addition, addressing the socioeconomic roots of crime makes it possible to promote interventions that not only punish but also prevent crime, strengthening social cohesion and economic well-being.

These theories, by highlighting the relevance of socioeconomic factors, provide a comprehensive understanding of criminal behavior. They explain how individual cost-benefit assessments, dilution of social norms, and lifestyle impact all contribute to the decision to engage in illicit activities. Integrating these perspectives is essential for developing effective public policies that address both the social and economic causes of crime. Against a backdrop of growing inequalities and declining social norms, understanding these dynamics is crucial for formulating strategies that promote justice and social cohesion.

This analysis, when seen through the prism of social mobility and the search for social ascension, a typical situation of contemporary societies, raises the degree of assertiveness of this debate. The search for a better life and social ascension, which in themselves are already personal challenges, but which, in the midst of an excluding society and with high income distribution gaps, has greatly demanded efforts from individuals, especially those belonging to less favored social classes. Here it is important to underline that belonging to a class does not mean stereotyping the individual as a potential criminal, because crime is not exclusive to poor classes, but a "democratic" phenomenon that affects the various social strata, of course, with distinct characteristics of the role of the criminal in

each of them. For some, the fear of being frustrated in the face of the challenge, they are led to opt for less collective paths, falling into the involvement of criminal practices, including the practice against property. Criminal behavior, in this context, can emerge as a response to a system that seems to exclude those who fail to meet established standards.

By focusing on the analysis of the motivations of crime from the perspective of the various approaches to the motivations, we understand the complexity of the theme and the inexistence of the possibility of being fully understood by a single theoretical perspective. To consider the subsidies offered by the various theories for the understanding of criminal behavior, in a broader and more complex perspective.

Crime being this multifaceted phenomenon, which involves a variety of factors that may or may not connect, requires reflection from the same perspective. Socioeconomic factors, such as poverty and inequality, can significantly influence crime rates because they are directly linked to consumption models, in the midst of a society that is represented by the acquisition of goods as indicative of citizenship, but cannot be dissociated from psychological factors, such as low self-esteem and impulsivity, or from cultural factors, such as social norms and community values.

The understanding of these multiple faces of crime leads us to the need for a holistic understanding, because only in this perspective can we think about effective public policies. Focusing only on punitive measures or specific issues may incur in failures, as the approach requires a deeper reflection on criminal behavior. On the other hand, policies that adopt a multidisciplinary approach have the potential to combine preventive and punitive strategies in an integrated way. This means not only dealing with the socioeconomic factors that contribute to crime, but also understanding and addressing the various aspects that influence the individual's choices in committing crime.

Preventive and punitive measures, aligned with a deep understanding of the social and individual dynamics involved in crime, have the potential to be more effective in reducing crime and fostering safe and resilient communities.

It is also necessary to understand that social and economic transformations, driven by globalization and technological innovation, generate new forms of crime and new social and economic pressures. A multidisciplinary debate allows theories to adapt and respond to these changes, offering new analytical tools and innovative solutions to deal with emerging challenges. This is crucial to understand phenomena such as the increase in cybercrime and the evolution of criminal practices in a context of growing inequality.

The importance of a multidisciplinary debate between the various theories of crime motivations cannot be underestimated. Only through the integration of multiple theoretical

perspectives is it possible to achieve a more complete and deeper understanding of criminal behavior. This understanding, in turn, is fundamental for the development of more effective public policies, more comprehensive prevention and rehabilitation programs, and a more cohesive and just society. The complexity of the criminal phenomenon requires an approach that recognizes and values the contribution of different disciplines, promoting a continuous and collaborative dialogue between them.

FINAL CONSIDERATIONS

The purpose of this article is to make the correlation between the theories that deal with the motivations of crime focused on the field of social and economic interactions using crimes against property as a reference point, this debate emphasizes a possible bias which presents strong empirical evidence of how social and economic inequalities, Combined with cultural pressures and a lack of clear social norms, they can create an environment conducive to criminal behavior, which is mediated by the possibility of profit maximization on the part of the criminal.

These reflections enable the construction of ideas that defend the position that criminality cannot be explained by a single cause, and it is important to look at complex combinations of factors such as individual impulsiveness, issues of social conditions such as poverty, inequality and exclusion that can vary according to the context and type of crime, highlighting the dissonance between cultural objectives imposed by a society marked by inequalities and concentrations of income, in which the legitimate means to achieve such objectives will not always be within the reach of all subjects.

In this perspective, debating crime against property in the light of theories of the motivations of crime of a social and economic nature, can subsidize valuable and necessary reflections on the complexity that crime presents, offers a deep analysis of the motivations of crimes against property, because by enabling the connection between the social and economic fields, allow us to broaden the field of vision to aspects that underlie many studies on crime, since isolated approaches may fail to capture the true origin of the manifestations of criminal behavior in a given context, especially contexts that present relevant social and economic contradictions such as social inequalities, societies with high levels of income concentration and poverty.

In the theories discussed in this article, Merton's Theory of Anomie and Becker's Theory of Rational Choice, for example, serve as support for reflections on how social and economic pressures, especially in societies marked by inequalities, can stimulate the emergence of criminal behavior. Anomie, for example, puts into debate the mismatch

between socially sedimented cultural objectives and the legitimate means that are socially or legally validated to achieve them, suggesting that individuals whose experiences occur in contexts of inequalities, without the social and economic structure to achieve such imposed social objectives, can resort to crime as an alternative.

In the case of the theory of social interaction, which considers social networks and community ties as points that exert important influences on criminal behavior, we can understand that in contexts of intense inequality, social ties can weaken due to issues that can hinder closer social interactions such as long working hours, lack of infrastructure to ensure a good education and monitoring of school life, indisposition of time for solitary experiences are issues that can weaken social relations and erode community norms and informal social control, also increasing the propensity to crime.

Rational Choice Theory suggests the reflection that individuals, in a society whose income distribution is extremely unequal, will possibly have their chances of legitimate opportunities to achieve their social goals reduced, and with this, there may be the temptation of a possible inclination to illicit means to achieve such economic goals. This dynamic can be rationalized through the possible benefits perceived by crime after analyzing the cost-benefit that a criminal act can present, thus showing how inequality can aggravate crime in certain contexts.

Thus, it is possible to glimpse reflections that the presence of poverty and exclusion can be important factors for criminality, either by the weakening of social control mechanisms, or by the decrease in the effectiveness of moral values that are strengthened by social and family life, or by the lack of viability of many to achieve their social objectives through legitimate means. Understanding property crime offers a powerful lens for developing more effective interventions. This leads us to new possibilities of reflection, including that of rethinking a cultural change about the various aspects that involve crime and how society sees crime and punishment.

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ORAL HEALTH OF AGRIBUSINESS WORKERS: CHALLENGES OF THE 2030 AGENDA AND ESG CRITERIA, PROMOTING WELL-BEING AND INCLUSION TO INCREASE PRODUCTIVITY

https://doi.org/10.56238/sevened2024.031-076

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ABSTRACT

Contemporary dentistry aims to replace private care with the sanitary model. Agribusiness workers have difficulties accessing dental services. The dental care system has difficulties in acquiring, updating, referring and monitoring patients. Artificial intelligence is a computer system that performs tasks that require human knowledge and skills such as recognizing patterns and images, understanding written and spoken open language, perceiving relationships/nexuses, following decision algorithms, understanding concepts, reasoning through the integration of new experiences by self-improvement. This research aims to demonstrate the importance of a convolutional network of dental data analysis that enables the diagnosis of different pathologies that may be found in agribusiness workers and the respective referral to the oral health recovery and control services of this target population. With the bibliometric review carried out, it was realized that the construction and wide use of convolutional networks in the different dental specialties can contribute to the improvement of primary oral health care, in the private network and especially in the public network, thus benefiting agribusiness workers with an increase in quality of life, oral health indices and indicators, as well as in their productivity.

Keywords: Dentistry. Convolutional Networks. Agribusiness. Diagnosis.

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INTRODUCTION

Rural populations are communities whose ways of life and production are mainly related to land and water (BRASIL, 2013), being a space traditionally with little government action in the implementation of public policies related to the promotion of health and social assistance (SILVA, 2012). When compared to urban populations, they face a series of inequities, which impact their quality of life and must be analyzed in the light of their socioeconomic determinants and the orientation of the State in guaranteeing their rights (PESSOA, 2018). This context impacts their oral health indicators, intensifying more severe health problems that are expressed in the differences in availability and quality of health care offered (RÜCKERT, 2018). Access and accessibility to Primary Oral Health Care services are not ensured, based on the distances between rural communities, oral health services and support points (places that decentralize care, being a reference for other (distant) micro-areas assigned to a territory covered by oral health (CAVALCANTI, 2012). In Brazil, the guidelines of the National Oral Health Policy (PNSB/04) were launched, aiming at access, equidistal confrontation of the predominant epidemiological situation (including rural populations) and greater allocation of financial resources to structure a network of oral health services, with national capillarity, under the coordinating eye of PHC (CHAVES, 2018). However, studies on the performance of oral health teams show a legacy of the persistent biomedical model in professional care performance, little focused on community actions, with a lack of planning and low interaction with other primary health care workers (DOS SANTOS, 2016).

Oral diseases affect productivity (UN/SDG 2.a goal) in agribusiness, facilitate the emergence/evolution of secondary pathologies in those affected. Analyses between geographic space and oral health are gradually increasing (SILVA-JUNIOR et al., 2017), but little is known about the spatial distribution of oral pathologies using intelligent systems in this context. Currently, the oral health system aims to replace biomedical care with the sanitary model (UN objective/SDG 16.6) that coexists in a fragmented way. Dental services need to review their work logic, seeking to get closer to users, becoming humanized and problem-solving, as health surveillance (as a management component) provides methods/technologies/knowledge in view of the needs of a territory covered by oral health (UN/SDG objective 1.3). Studies on dental caries are carried out in urban areas, although invasive dental procedures against this disease frequently occur in patients from rural areas (BRANDÃO et al., 2020), taking into account that knowledge of oral health conditions in this context (UN/SDG goal 1.4) - almost 20% of the country's inhabitants - is still superficial (IBGE, 2016). Inequalities in oral health should lead to the introduction of actions (UN

goal/SDG 3.3) that reduce the health deficit of different social groups (MALDONADO, 2021) including in agribusiness workers (UN goal/SDG 3.4) where health promotion, disease prevention, and early intervention actions are low-cost and preserve quality of life (XIAUO et al., 2019) because reducing problems in the oral health of the community is a professional responsibility and, above all, of the State (UN/SDG objective 3.8).

The science of solving clinical problems through image analysis aims to extract information efficiently in the search for improvement in clinical diagnosis (SÁNCHEZ, 2021). Artificial intelligence is a technological advance that captivates researchers around the world. It does not replace the role of a human professional, but will be integrated into a rewarding and successful practice (KALAPPANAVAR, 2018) in the dental field, based on a computer system that performs tasks that require human knowledge and various skills such as recognizing patterns and images, understanding open written and spoken language, perceiving relationships/nexuses, following decision algorithms, understand concepts, reason through the integration of new experiences by self-improvement, solving problems and performing tasks (LOBO, 2018).

Interpreting images is a preliminary phase to the diagnosis and dental treatment plan. The combination of artificial intelligence and Dental Radiology improves diagnostic accuracy, professional routine, provides data, prioritizes exams according to severity (LIEW, 2018) generates descriptive reports, measures lesions saving clinical time, retrieves previous data or finds similar findings in other images, providing a list of possibilities (YAJI et al., 2018) establish parameters, including improving forensic identification (De TOBEL et al., 2017) as the success of an algorithmic system in relation to tooth detection/numbering approaches the level of experts (LEE et al., 2020). GEETHA et al. (2020) used an artificial neural system to check for caries on radiographs: the accuracy was 97.1%. Neural networks detect/classify dental restorations (ABDALLA-ASLAN, et al., 2020) with an accuracy of 93.6%. In recent years, advances in the area of technology have been developing the large area of health, specifically in the analysis of radiological images (SÍLIO, ET., AL 2023).

Thus, the objective of this research is to demonstrate the importance of developing a convolutional system of analysis of dental radiographic images, capable of identifying individuals and pathologies in individuals living/domiciled in rural areas/agribusiness workers, which speeds up the indication of exams, diagnosis, referral, pointing out the spatial/geographic distribution of these patients, in the support prior to decision making in public/private dental services (UN goal/SDG 16.17).

METHODOLOGY

The research was characterized/modeled as a descriptive research through a bibliometric survey in national and international databases (PUBMED, SCIELO, SCOPUS, BBO) in view of the proposed theme (use of convolutional networks in radiology and other dental specialties) through the use of key terms and previously established Boolean descriptors, namely: "DENTISTRY" *and/or* "CONVOLUTIONAL NETWORKS" *and/or* "AGRIBUSINESS" *and/or* ORAL DIAGNOSIS" respectively (but not necessarily in this order).

To carry out the literary survey, the following parameters were chosen, characterized as filters: 1) the exclusion of publications that did not provide full text; 2) simple abstracts; 3) publications that were outside the 8-year time window; 4) publications that were outside the proposed context, thus obtaining a "base" database of publications.

With the review, these publications were read and consequently the information/content that related/inserted or pointed to convolutional networks as "formative bases" of a forensic dental identification platform on the following aspects: 1) dental identification by differentiating permanent or deciduous dental elements of individuals, as shown in Figure 1:

Figure 1: FDI Scientific Notation for dental identification.

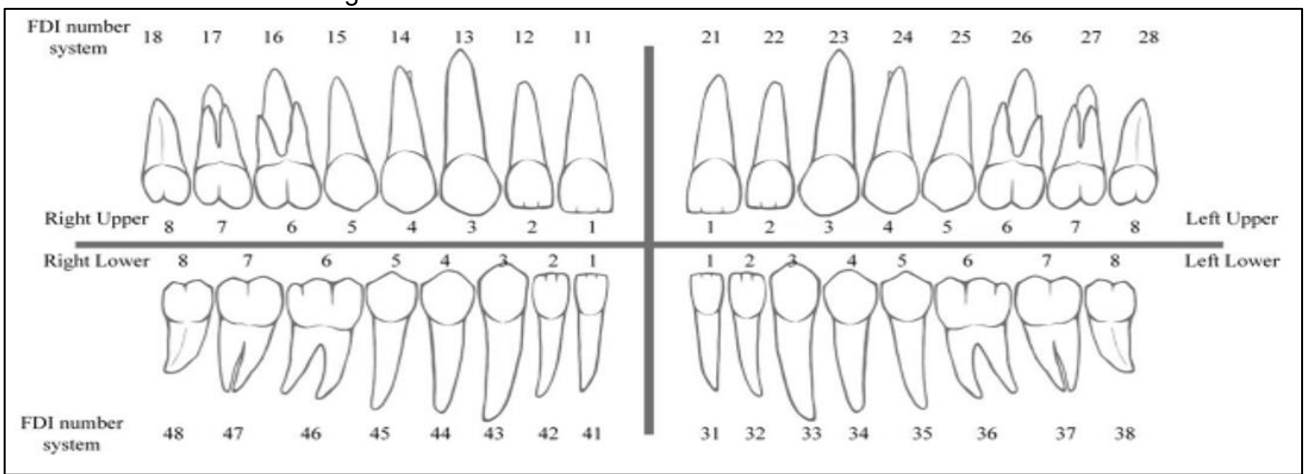


Figura 1:Sistema de numeração dos dentes FDI: 11–18=superior direito 1–8, 21–28=superior esquerdo 1–8, 31–38=inferior esquerdo1–8, 41–48=inferior direito 1–8; 1. Incisivo central, 2. Incisivo lateral, 3. Canino, 4. Primeiro pré-molar, 5. Segundo pré-molar, 6. Primeiro molar, 7. Segundo molar, 8. Terceiro molar.

Source: Adapted from Hu Chen, 2018.

Another aspect considered in the analysis of the publications was the concern with the use of artificial intelligence in the identification of the presence and identification of existing dental treatments, as shown in Figure 2:

Figure 2: Artificial Intelligence performance in the interpretation of intraoral images.

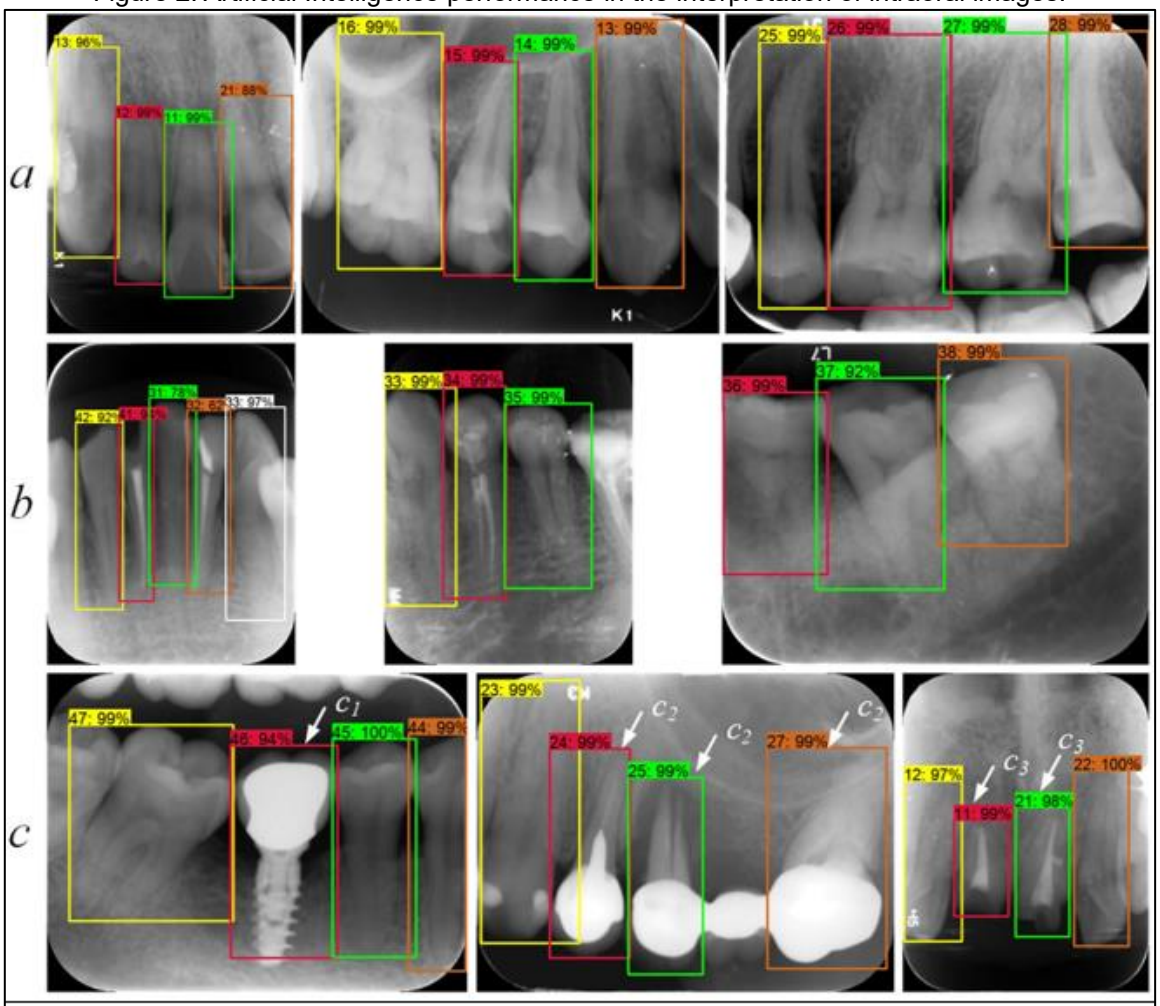


Figura 2 - Imagens de amostra anotadas corretamente por redes neurais no conjunto de dados de teste: (a) dentes superiores e (b) dentes inferiores, incluindo incisivos, caninos, pré-molares e molares; (c) alguns casos complicados, incluindo (c1) restauração de implante, (c2) coroa e ponte, (c3) dentes defeituosos.

Source: Adapted from Hu Chen, 2018.

Regarding the use of these convolutional networks in Dental Science, the focus of this research remained on their use in different dental specialties (regardless of whether this specialty is present and performed daily in the public and/or private dental care network) with filters of this collection of information/content in these publications: 1) the clinical analysis of new cases and those under treatment (in view of the addition of clinical information of these patients); 2) the identification and diagnosis of lesions in hard tissues (dental elements and respective bone bases – maxilla/mandible) such as dental caries, periodontal disease, oral cancer, presence and indication of endodontic treatment, orthodontics, use and need for prostheses, use and need for osseointegrated dental implants; 3) convolutional networks, which have an auxiliary character in decision-making regarding treatment possibilities; 4) the use of intra/extraoral radiographs (mainly panoramic radiographic shots) of dental patients in the training of these convolutional networks and the

use of these types of images so that they can assist in decision-making to help the dental surgeon.

RESULTS

Artificial intelligence has recently attracted significant public interest and is impacting many industries worldwide. Especially in health care, it promises to be truly transformative (RODRIGUES, et al., 2021) and the (clinical/routine) use of this type of information technology in the dental profession has increased substantially in recent years.

Employing technology, especially artificial intelligence technology, in the medical and dental field reduces costs, time, improves the quality of care, reduces human intervention and subjective errors to it, in addition to characterizing the era in which we currently live: "the Fourth Industrial Revolution" (KHANNA, 2016) because it is a fact that the combination of artificial intelligence with professionals in the radiological area (Radiologists) results in the formation of a form of hybrid intelligence, which promises to achieve even higher levels of diagnostic accuracy (LIEW, 2018).

The impact of artificial intelligence on the radiologist's routine should be gradual, providing data that the professional cannot extract from the images, prioritizing exams according to severity (PAIVA, 2017).

In certain areas of Radiology, artificial intelligence is capable of generating radiological reports with a preliminary description of the imaging findings and measurement of some lesions, and can even detect small changes in the images, saving time and helping in the recovery of previous patient data or finding similar findings in other images, providing a list of possibilities, improving the diagnosis and consequently the treatment plan offered to the clinical case in question.

That said, after the search in the databases, with the application of the key terms and established Boolean descriptors, a bibliometric review was carried out, in view of the assembly of a database/publications of interest and, after the extraction of the information/contents of these publications, a descriptive overview was obtained about the importance and practical functionality of a convolutional platform for the acquisition and classification of clinical data and photographic and radiographic images Intra/extraoral, emphasizing the importance that, allied to it, there must be a specialist system with a motor algorithm that allows inferring diagnoses suggestive of detection, capable of issuing opinions with decision support elements for referral to public/private dental services, facilitating the access of agribusiness workers to preventive/curative dental services. A total

of 43 national and international articles were found, and after applying the respective filters, 20 of them were excluded.

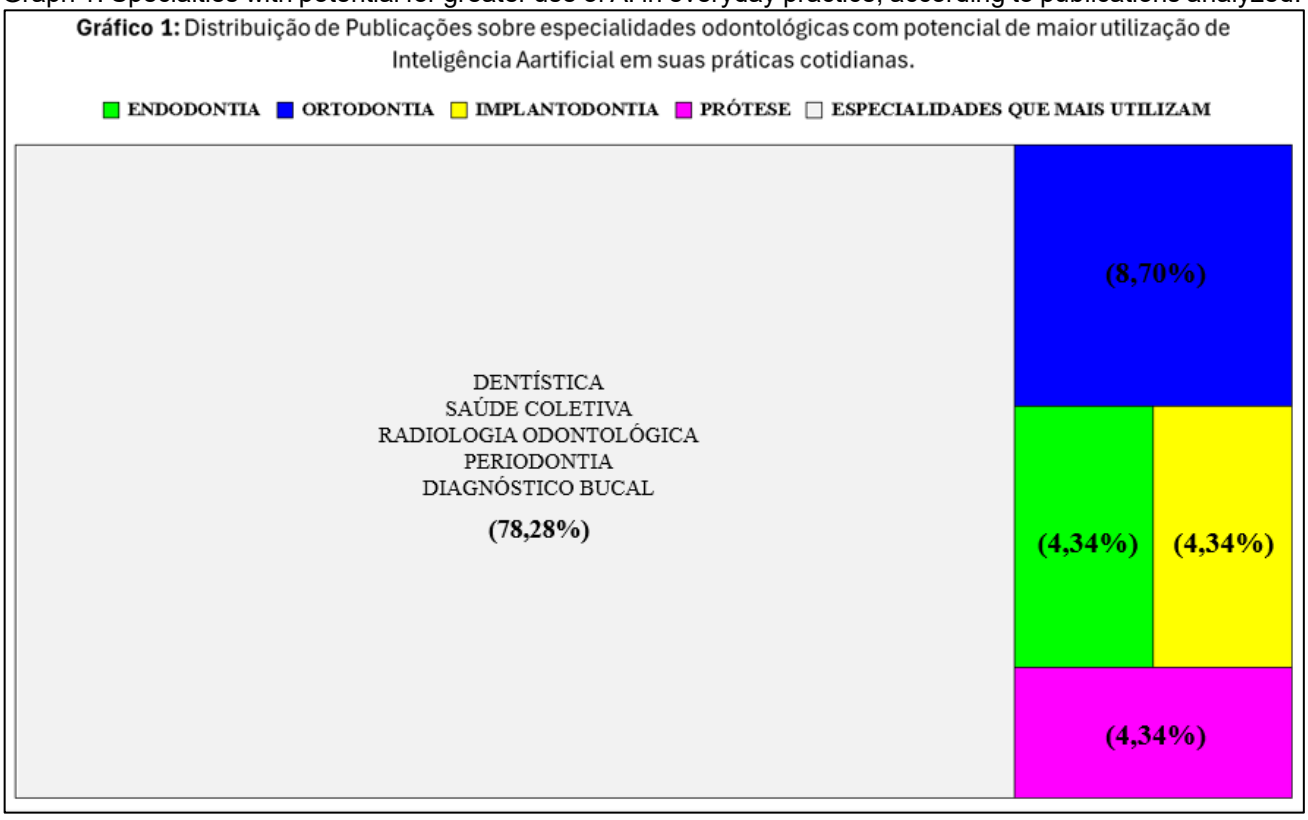
From the remaining publications (N=23) it was possible to prepare Table 1 (which represents the main specialties that use artificial intelligence in daily clinical practice) and Graph 1, which shows the specialties that make little use of this information technology (according to the bibliometric survey carried out), but which certainly has pointed out in its conclusions the positive potential for improvement in the quality of dental care provided.

Table 1: Distribution of publications on dental specialties that most use convolutional networks in daily clinical practice.

DENTAL SPECIALTIES	PUBLICATIONS (N)	PUBLICATIONS (%)
DENTISTRY	5	21,74%
COLLECTIVE HEALTH	3	13,05%
DENTAL RADIOLOGY	3	13,05%
PERIODONTICS	4	17,39%
ORAL DIAGNOSIS	3	13,05%
TOTAL	18	78,28%

Image Source: The authors.

Graph 1: Specialties with potential for greater use of AI in everyday practice, according to publications analyzed.



Source: The authors.

DISCUSSION

It is possible to say that through past data and through statistical algorithms, the machine will be able to learn how an association should be made. This process, according to Hurwitz and Kirsch (2019) occurs through training, which, also according to the authors,

is informed of previous data of entries, which can be historical data, purchases, geographic locations, characteristics of customers/patients, and how this data was classified. It should be noted that without any association rule being defined, the algorithm itself, through statistical tests, will learn and define the rules that define how the input data are related to its classifications (LIN et al., 2021; UTHOFF et al., 2018; WELIKALA et al., 2020). The authors emphasize the fact that due to this process (of learning by oneself) the relationship of the input data with the data of their classifications, *Machine Learning (ML)* began to be used in the health area.

Through this "reasoning" model, whenever a new patient emerges, the algorithm can be used to predict who this patient is, or whether or not a patient has a disease, if the model has already been trained to recognize these signs (through images already analyzed) or symptoms with the disease coming from pre-inserted clinical information and new insertions (Al-RAWI et al., 2022; AUBREVILLE et al., 2017; MAHMOOD et al., 2020; SONG et al., 2021; UTHOFF et al., 2018; WELIKALA et al., 2020; KAYA, 2022).

Figure 2: Artificial Intelligence performance in the interpretation of intraoral images.

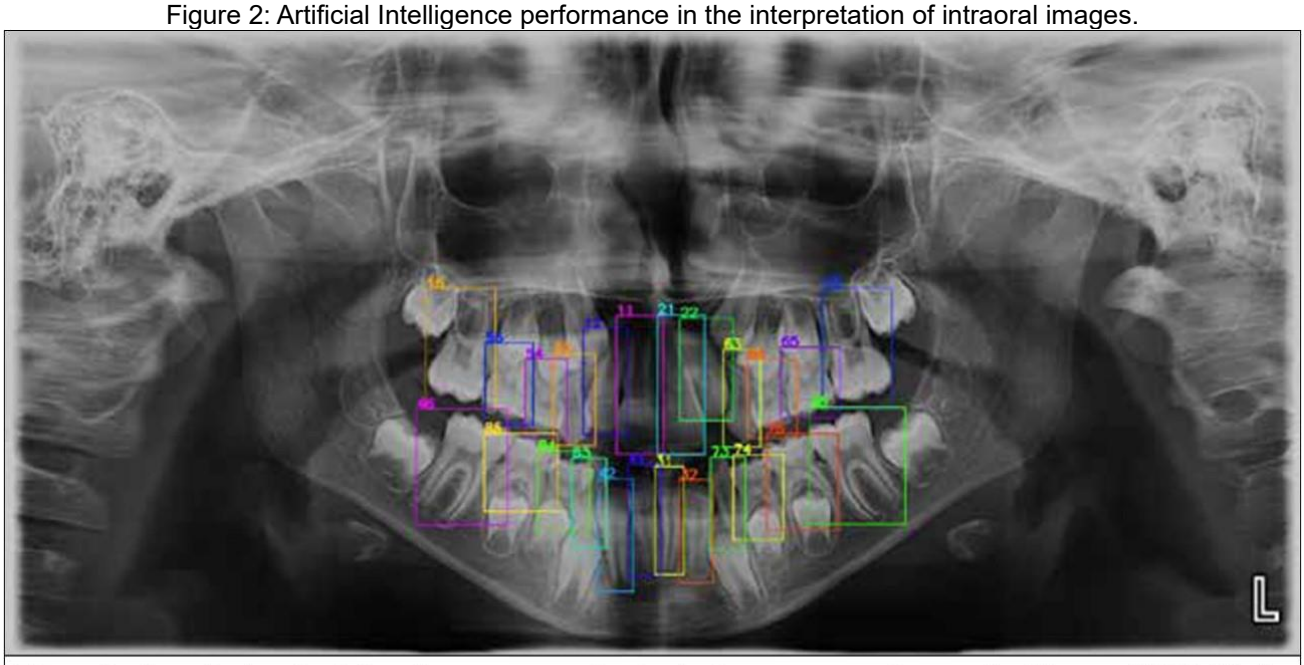


Figura 3 - Resultados da detecção e numeração de dentes permanentes e primários no YOLO V4. As saídas de numeração são escritas com base na notação científica FDI.

Fonte: Adapted from Kaya, 2022.

According to Erickson et al (2017), when using *Machine Learning (ML)* for image-based diagnosis, X-ray images or images of the region where the sign and symptom stand out are routinely used, both in new patients and in patients already undergoing previous treatments (such as training input data) as well as information on which of these patients had or did not have the disease to be analyzed. In this way, the algorithm extracts

information on color tones, textures, and formats from the contents of the images that can be converted into numbers to be used in training, generating the rules that will be used to predict images in future new patients.

Tooth decay is the most common dental disease and that is why its early stage disclosure is crucial. For the screening and diagnosis of tooth decay, dentists often use dental probes and, through observation of texture and discoloration, can determine whether the tooth is healthy or not. This method is very subjective and is based on the dentist's experience. In particular, proximal surfaces can be problematic on dental examination (BELTRÁN-AGUILAR, et al., 2005). Within this context, Devito et al. (2008) used an artificial neural network to classify proximal dental caries in order to predict whether an orthodontic treatment would require extraction. Moghimi et al. (2012) used artificial neural networks to predict the size of unerupted canines and premolars, within the context of human identification.

In this sense, within the context of the use of artificial intelligence in human identification, in the detection of pre-existing dental treatments and in the identification of new lesions in hard and soft tissues of the oral cavity, aiming at adequate referral of patients to primary, secondary and tertiary oral health services (when necessary), and according to the results of this work, it is noted: 1) that dental caries is a major concern, with 21.74% of the total articles analyzed in the sample due to the fact that it is the most prevalent oral disease, according to the dental literature analyzed; 2) according to the data collected, within the "Collective Health" specialty, the concern with caries diagnosis procedures (including analysis of intra and extra-oral radiographic shots) is present in 26.10% of the studies analyzed (13.05% of studies in the area of Collective Oral Health and 13.05% in Dental Radiology associated with Collective Health); 3) the specialty of Dental Radiology (and Imaging), although being by definition the most interested in the use of this promising information technology, is still timid, in comparison to other specialties, being alone the holder of 13.05% of the publications analyzed.

The detection of dental caries, for example, in intraoral radiological images, can undoubtedly be aided by neural networks, which makes the examination faster and more accurate, but the use of neural networks in conservative dentistry, even though it develops rapidly, is not yet widespread (SUWADEE, 2006). Regarding the main techniques used by the authors (in the analyzed publications), the following are: 1) the periapical intraoral radiographic technique; 2) the interproximal intraoral radiographic technique; 3) the panoramic extraoral radiographic technique, due to the gain in the examination area, using the same dose of radiation, among other intrinsic advantages. Geetha et al., (2020) used

an artificial neural network to determine whether or not there were cavities in the 105 X-ray images. They extracted sixteen feature vectors from the segmented image and these were the input nodes. There were two exit nodes that consisted of cavities or healthy teeth. The accuracy of caries detection was 97.1%, and the false positive rate was 2.8%. This study indicates that neural networks can be much more accurate in detecting tooth decay than traditional dental examination. CBCT (computed tomography) is used less frequently in the detection of dental caries (PRADOS-PRIVADO, 2020), being used more in cases of soft tissue lesions because algorithms can be used to locate the edges of anatomical and pathological structures, which can be very similar to each other due to image noise and low contrast (GRAVEL, 2004).

It is also important to highlight in this work the fact that periodontal problems can also be diagnosed through analyses from convolutional networks. According to 31.4% of the studies analyzed, their contents associate the discipline/specialty "Diagnosis in oral health" and "Periodontics". In other words, 31.4% of the studies point to the use of neural networks in the identification of dental support tissue problems as secondary (intrinsic) parameters to the specialty "Oral Diagnosis" based on the most prevalent periodontal diseases and their most suggestive images). By definition and conceptualization, preventive orthodontics is characterized by studies and diagnostic protocols/standards based on minimal clinical interventions in cases of disorders of the stomatognathic system. The use of convolutional networks in this context can be expressed in 8.70% of the studies analyzed. The specialties Endodontics, Implantology and Prosthesis accounted for 4.34% of the percentage of publications each.

CONCLUSION

Through this brief bibliometric review, it is clear that the construction and, above all, the wide use of convolutional networks in different dental specialties can undoubtedly contribute to the improvement of primary oral health care, in the private care network and, above all, in the public network. And yet: agribusiness workers (who do not access, or partially access, such services) would have a significant increase in quality of life, oral health indices and indicators, and especially in their productivity, as convolutional networks would speed up diagnoses of dental caries, periodontal disease, endodontic treatments, bone lesions, neoplasms, use/need for prostheses and implants, in addition to serving as a bridge of access/referral to primary care services (health care units). municipal health and/or private offices), secondary care (specialty centers) and complex oral health care (specialized hospitals).

ACKNOWLEDGMENT

The authors would like to thank the University Center of Adamantina/SP (FAI) for allowing the adjustment of the schedules of activities for participation in the graduate program, and also the Graduate Program in Agribusiness and Development (PGAD) of Unesp, Tupã/SP unit, for supporting the research.

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THE CHALLENGES FACED BY PRODUCERS IN THE PRODUCTION OF AMAZONIAN ROBUSTA COFFEE IN TANGARÁ DA SERRA - MT

https://doi.org/10.56238/sevened2024.031-077

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ABSTRACT

Coffee production is one of the main activities in the world, generating about 100 million jobs directly and indirectly. In 2022, 17.97 thousand bags of coffee production of the Amazonian robusta species were estimated in Brazil. With the considerable importance of coffee cultivation for the country, as well as for the municipality of Tangará da Serra - MT, it is relevant to identify the main challenges faced by Tangara's producers in the production of this type of coffee. In order to enable solutions to the problem exposed, the proposal was to characterize the producers of Amazonian robusta coffee in Tangará da Serra - MT, identify the difficulties that stand in the way of production and compare them to those recorded in 2019 with those faced in 2023. For the study, a qualitative methodological approach was used, which enables a given perception of reality, with an exploratory research strategy for greater familiarity with this theme little explored in the municipality. The careful description sought to identify the obstacles faced by local coffee producers, and nineteen semi-structured interviews were conducted with these workers for data collection. The results showed that they face various challenges in the production of Amazonian robusta coffee, since they worked individually, without ties to coffee associations or cooperatives, a factor that limits the representativeness of the crop, such as the lack of adequacy to the regime that manages water resources when the irrigation method is used for the crop and the succession to the coffee activity that is shown as an obstacle to be overcome, since it is the transfer of power to the next manager of the business. It is evident that this production

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in Tangaraense tends to grow since there are new entrants to the culture with crops in formation.

Keywords: Coffee growing. Robusta Amazônico. Challenges.

INTRODUCTION

World coffee production in the 2022/2023 periods reached a harvest of 168.2 million 60kg bags, assuming 178 million bags for the 2023/2024 coffee year, with Brazil being the main driver of production with 8.4% of the combined production in the Americas of 100.5 million bags (CAFÉ, 2024).

In Brazil, coffee production for the third survey of 2024 was estimated at 54,789.4 million 60kg bags, of which 39,585.2 thousand were of the Arabica species and 15,204.2 thousand bags of Amazonian robusta (*Coffea Canephora),* popular for the *conilon* variety. As for exports, it increased by 40.1%, surpassing the record of 43.9 million bags (CONAB, 2024).

The Arabica coffee cultivation regions are predominant in the states, Bahia, Goiás, Minas Gerais, Espírito Santo, Rio de Janeiro, São Paulo and Paraná, totaling production of 40,749.2 thousand bags of the species in the January 2024 harvest, along with the other small producing regions. The cultivation of the Amazonian robusta species is present in the states of Rondônia, Bahia in the Atlantic region, Mato Grosso, Minas Gerais in the Zona da Mata and North, Amazonas and Espírito Santo, obtaining a production of 17,333.0 thousand bags processed in the same period (CONAB, 2024).

Specifically in the State of Mato Grosso, coffee production occurred in the North and Northwest regions of the State, covering an estimated 12,591 thousand hectares of coffee cultivation in 2018. Since in the periods from 2008 to 2011 the species produced in the state was *Coffea* arabica, in 2018 the species corresponded to only 0.9% of the total estimated in the harvest, possibly declining due to reflections of old bearer plants with low productivity, inadequate management, variable price paid to the producer, water deficits, among others. However, currently the predominant variety is the Amazonian robusta species (SEAF, 2019, p. 39-40).

The variety of Amazonian robusta coffee in Mato Grosso covers small and medium-sized producers, family farmers in the regions of Colniza, Juína, Cotriguaçu, Aripuanã, Nova Bandeirantes, Rondolândia, Alta Floresta, Nova Monte Verde, Tangará da Serra and Carlinda, considering only the municipalities participating in the Pró Café Mato Grosso project. The adhesion of producers to the cultivation of this new species is due to the climatic factors of the region, considered favorable or suitable for the variety (SEAF, 2019 p. 41-42).

In Tangará da Serra, the production of Amazonian robusta coffee occurs by settled families and rural producers, being an area with intense aggregation of new lands by rural

settlement policy (SEAF, 2019). It occurs timidly, as its production has been declining over the years, due to the numerous difficulties faced by producers (ENCAFÉ, 2019).

For the specification of the research theme and knowledge about it, the study is delimited from the theme of the numerous difficulties faced by producers of Amazonian Robusta coffee within the gate, thus enabling the deepening of the knowledge of such a situation in the region of Tangará da Serra, evaluating its peculiarities objectively.

In relation to Brazil, the biggest challenge for the coffee sector is the economic sustainability of the production chain, since producers tend to dilute their production gains with the production chain and its increasingly demanding consumers. Factors that imply the search for certifications that aim at quality standards in production processes, thus adding value to the product. Another limiting factor for coffee cultivation is the issues associated with taxation, tariff and non-tariff barriers and logistics (Miarelli, 2006).

In the regions of Viçosa, Triângulo, Lavras, Governador Valadares and Montes Claros Minas Gerais, the main difficulties faced in the coffee crop by producers are the shortage of qualified and committed labor, the total management of the business including the storage of beans, the lack of security in the field, energy supply carried out by the concessionaire intermittent and poor quality, the high costs of agricultural inputs and implements, the lack of knowledge of the market, the lack of articulation for the sale of grains directly or exported, and the disunity of the regional group of producers, factors that accentuate a weakening of cooperatives such as the demotivation of the producer (Novaes, 2021).

In the State of Rondônia, the main challenges faced by coffee producers are the impasses involved in access to credit, the lack of professionalized technical assistance for the field, a flawed political regime in relation to the coffee sector, the high costs with inputs and labor, factors that reflect on the price practiced, compromising the producer's income (Rosa Neto, 2005).

The main challenges faced by coffee producers in the State of Mato Grosso are the failures in the transfer of concise information by institutional organizations to the segments that make up the link of the coffee production chain, the production systems applied, the difficulties of access to the market by producers and the relationship with the members of the production chain. These factors hinder the good performance of the coffee crop, causing difficulties in forming strategies that contributed to the promotion of coffee production in the State, consequently reducing the area planted with the crop (SEAF, 2019).

The study carried out by EMPAER, Production System 7 (2005), highlights that the main difficulties of Mato Grosso producers in the production of coffee in the regions of

Paranaíta, Colniza, Juína, Alta Floresta, Nova Monte Verde, Nova Bandeirante and other smaller areas of the Alta Floresta region, are originated by the length of the poles, which compromises the commercialization of beans due to the high production costs, another factor is the fragile relationship between producers and the inferior quality of the coffee produced, factors that devalue the prices charged by producers (Vieira *et al*., 2005).

In Tangará da Serra - MT the difficulties faced by producers are the taxes for family farming, the challenges of commercialization, the lack of minimum structure on the properties, the lack of knowledge of the new plant that bears Amazonian robusta coffee, and the lack of information on the main costs to invest in the crop. It is also known that coffee consumption in the municipality of Tangará da Serra is not locally produced, there is a slowness on the part of regulatory agencies regarding the guidance for obtaining the Provisional Operating Authorization (APF), difficulty in accessing credits and low articulation of common interests in groups by family farmers (ENCAFÉ, 2019).

The theme addressed in the research comprises the production of coffee of the Amazonian Robusta species in the municipality of Tangará da Serra - MT. The study sought to identify the challenges faced by producers in the production process, comparing them to the challenges listed by producers in the I ENCAFÉ report (2019).

The research approach is expressive for the coffee culture as well as for the University of the State of Mato Grosso, which aims to partner with the local community where it is inserted, considering the peculiarities of each demand, in order to have its professional resources to assist in the search for solutions to the problems faced by the small coffee farmer. Therefore, the general objective of this research was to diagnose the main challenges faced by Amazonian robusta coffee producers in Tangará da Serra – MT. As specific objectives, the characterization of Amazonian robusta coffee producers, identification of production challenges and comparison of the problems listed in 2019 with the challenges posed in 2023 were selected.

COFFEE PRODUCTION CHAIN

The production chain is a composite of interconnected operations that are established before the gate, during and after the gate and contributes to the production on the farm, integrated by the transportation of agricultural provisions, suppliers of inputs and labor, storage, processing, distribution of cultivated products and the final consumer (Prado *et al*., 2021).

However, when observing the macro-segment of the production chain, it can be divided according to the type of product and objective of the analysis, obeying three

segments: (I) Commercialization, which corresponds to the companies in contact with the customer in the production chain, such as the domestic market and companies responsible for distribution logistics, (II) Industrialization, which involves those responsible for transforming the raw material into the final product, which can be a family unit or agroindustry, and (III) Production of raw material that needs suppliers of raw material for the agricultural production process (Batalha, 2021).

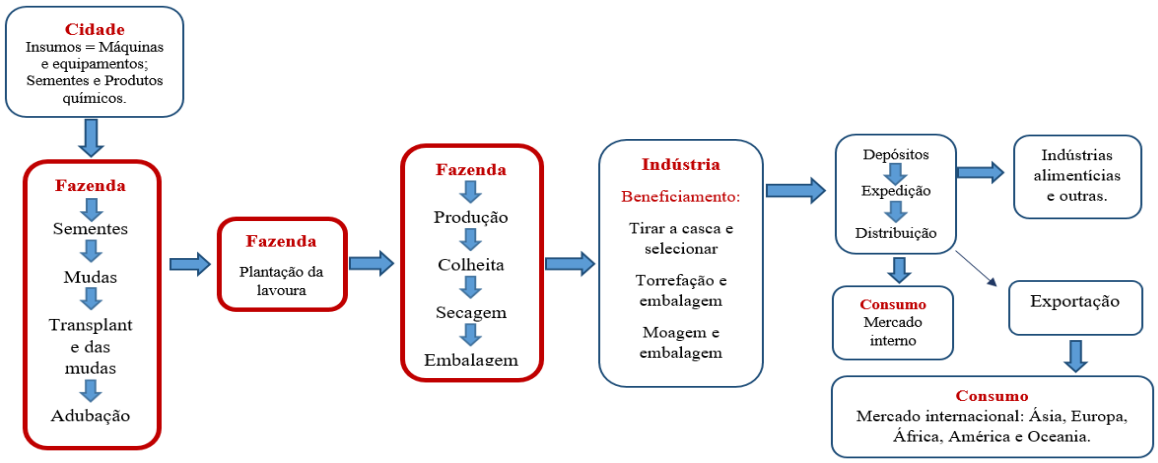
For a better understanding of a production chain, Figure 1 shows the representation of the coffee production chain so that the processes in the rural environment, which is the scope of the study, can be observed in detail.

According to Neto and Menck (2014, p. 149) "the coffee production chain is responsible for the generation of more than eight million jobs in the country, providing income, access to health and education for workers and their families".

Economic activities integrated with the market, technology, and capital are operations linked to each other as a set of commercial and financial relationships that establish a flow of exchange between suppliers and customers, valuing the means of production and ensuring the articulation of operations (Batalha, 2021).

Understanding the coffee production chain is relevant because it is one of the main food and beverage segments in the world, responsible for generating about 100 million jobs directly and indirectly (Trauer *et al.*, 2017).

Figure 1 - Coffee production chain.



Source: Adapted from Santos *et al.*, (2020, p. 12).

The coffee production chain involves a series of interconnected operations ranging from the production of raw material to the final commercialization, contributing significantly to the economy and rural development.

In Brazil, the production chain generates about eight million jobs, with almost 1,900 municipalities producing coffee growing, employing an estimated 287 thousand people responsible for the economic development of the municipalities (Souza, 2018).

COFFEE PRODUCTION IN THE STATE OF MATO GROSSO

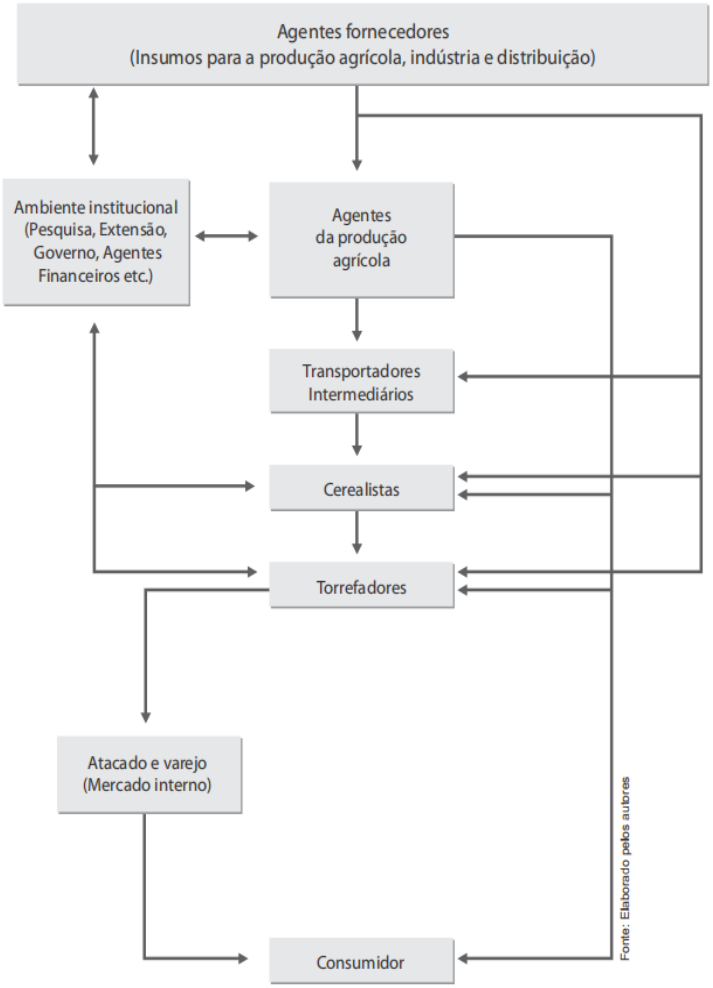
In 2016/2017, coffee production in the State of Mato Grosso, due to climatic problems such as water *deficit* that affected the producing regions, comprised a planted area of 15.8 and 11.2 thousand hectares, harvesting 84.5 thousand bags of coffee processed in 2017 (SEAF, 2019).

In 2023, the production of Amazonian robusta coffee in Mato Grosso was 260.3 thousand bags processed, highlighting the adoption of more sustainable management practices, more prolific clonals and the efficient use of resources. In January 2024, the harvest was estimated at 263.7 thousand bags of processed coffee. This fact is due to the adhesion of new areas that will go into production, to the supply of seedlings, fertilizers and irrigation kits promoted by the State and municipalities (CONAB, 2024).

The production of coffee culture brings together several structured sectors performing in a systemic way different functions for the same purpose. They are the agents that supply agricultural inputs, directly linked to the coffee producer, the industry that transforms the beans, with an intrinsic relationship with roasters and cerealists, and the distributors with a direct and indirect relationship with the trade up to the final consumer. All production and transformation agents are intrinsically linked to institutional environments, whether inspection, financial, research and extension.

The activities that make up the coffee production chain in Mato Grosso are represented in Figure 2, and comprise the agents from coffee agriculture, from the field to the final consumer.

Figure 2 - Coffee agro-industrial chain in Mato Grosso.



Source: SEAF (2019, p. 84).

The importance of the coffee production chain is highlighted, from the main agents involved in the supply of inputs to final consumption. The supplying agents, responsible for supplying agricultural production and industry, interact with agricultural production agents, who depend on the institutional environment for support in research, extension, and government policies. After production, the coffee passes through intermediate and cereal conveyors, until it reaches the roasters, who prepare the product for the market. Then, the coffee is directed to wholesale and retail, where it finally reaches the consumer. This integrated structure is essential to ensure efficiency and quality throughout the chain, promoting the development of the coffee sector in the state.

The coffee production chain in Mato Grosso plays an important role for the regional economy, promoting rural development and job creation in various stages of its production. The constant growth of production, combined with the search for innovations in management and the adoption of new technologies, highlights the potential of Mato Grosso in the national coffee scenario. With a well-defined organizational structure, the sector is increasingly strengthened, contributing to the appreciation of Amazonian robusta coffee and

consolidating the state as a relevant producer and exporter. The integration of the agents in the chain, from the production of inputs to the final commercialization, reflects the commitment to quality and sustainability, factors that are essential to maintain competitiveness in the coffee market.

LIMITATIONS IN COFFEE PRODUCTION

Agriculture is a practice that depends on climatic factors to thrive, such as temperature, the amount of rain that falls in the cultivated region, soil moisture, and solar radiation. Climate imbalance is the main limiting factor for coffee production, as it can compromise the development of the coffee-bearing plant, due to its low hydraulic conductivity (Pinho, 2021).

Natural *water deficit* compromises the absorption of nutrients and water by the carrier plant even when under irrigated conditions, limiting the absorption of CO2 for photosynthesis, used to build new cells and tissues, compromising the growth and productivity of the coffee carrier plant (Pinho, 2021).

As for the limitations with the scarcity of water in the dry season, the producer resorts to the irrigation method since without water it is not possible to plant. The method depends on the supply of water from rivers or reservoirs, however it is necessary to train new adherents to the irrigation method as well as producers who already have it, so that the use of water is adequate (Coelho *et al*., 2017).

The high prices and fees with energy when using the irrigation method increases crop productivity, being another limiting factor for the coffee crop, and can represent about 70% of the variable costs, a factor that compromises the net profit of the annual production, considering that the investment with the irrigation and operation method is high (Silva, 2020).

High air temperatures together with water *deficit* aggravate damage to coffee crops, progressively reducing plant growth, compromising coffee fruit production (Rodrigues *et al*., 2016).

For Matiello (2016), another limiting factor in coffee production is the diseases that affect the plant that carries the coffee, especially rust, which attacks the Amazonian robusta species more aggressively because it is a more crowded planting system, induced to higher yields by irrigation and clonal seedlings. Rust attack occurs more aggressively when there is a water deficit, lack of nutrients for the plant, high temperatures and low air humidity. The disease causes defoliation of the plant and limitation in the production of the next harvest.

Of the diseases that can affect coffee production, Fusarium wilt is also highlighted, which acts especially on the Amazonian robusta coffee species, its appearance in crops is worrisome given its aggressiveness in causing the death of the plant, thus causing losses to the producer (Morais *et al*., 2019).

The limitations imposed on coffee cultivation by climate change can be circumvented with the implementation of agronomic practices such as the use of shading by tree species, soil cover and erosion containment. These techniques make it possible to maintain soil and plant water levels. Another viable alternative is the selection of genotypes that are more resistant to current environmental conditions (Rodrigues *et al*., 2016).

Due to the specific characteristics of the area that the coffee crop needs for planting, the type of soil of the producing property, slope and depth, can become a limiting factor for the coffee crop when the construction of the producing space according to the techniques oriented to the culture and location of the property is not considered (Vieira *et al*., 2005).

Another limiting factor for coffee cultivation is the lack of labor to work in the field, such as the decline of family successors on the properties, factors caused by economic growth and the change of trends towards non-agricultural activities in society and increased production for own consumption. New trends for agricultural activities are the increase in training and qualification with digitalization, average level of education, salary increase of employees, among others. Small producers are often unable to keep up with so many changes, being harmed by the lack of labor in their activities (Balsadi, 2022).

The taxes that fall on family farming, the challenges of commercialization, the lack of minimum structure on the properties, the lack of knowledge of the new plant that carries Amazonian robusta coffee and the lack of information on the main costs to invest in the crop are important challenges that, if solved, change the conditions of coffee production. It is also known that coffee consumption in the municipality of Tangará da Serra is not locally produced, there is a slowness on the part of regulatory agencies regarding the guidance for obtaining the Provisional Operating Authorization (APF), difficulty in accessing credits and low articulation of common interests in groups by family farming producers contribute considerably to the detriment of this cultivation (ENCAFÉ, 2019).

Regarding production planning, a rural property lives in the context of other rural properties, companies that supply inputs, energy and services and their customers, with the producer often being the manager of the business. For the survival of the business, the producer must consider all the changes in this context, however crises due to lack of planning are caused, and, therefore, the possibilities for irrigation, the adaptation of the

chosen carrier plant to the region, its resistance to diseases, market possibility, among other aspects, must be analyzed (Sette, 2008).

Preparing to start a coffee activity consists of making decisions in a programmed way that includes: what to do, why to do it, when it should be done, how much it will cost, how it should be done and where to do it, also considering to whom the production will be sold and identifying the possible threats and opportunities of this environment, as well as the strengths and weaknesses of the property that involves the quality of the land, its infrastructure, viable suppliers of inputs and services, availability of labor for the field and the feasibility of introducing another complementary crop on the property, being ideal to adopt an action plan to define which crop will be planted, thus making the quality of the plant and availability of the seedlings chosen in the market more assertive. Success for the crop also depends on technical and managerial assistance in the planning, implementation and maintenance of the crop (Mesquita *et al*., 2016).

METHODOLOGY

For the perception of a given reality of rural producers in Tangará da Serra - MT in the production of Amazonian robusta coffee, the problem is characterized as qualitative, and "qualitative research includes a set of interpretative techniques that seek to describe, decode, translate and, in another way, apprehend the meaning, and not the frequency, of certain phenomena that occur more or less naturally in society", which "aims to achieve a deep understanding of a situation, [...]" (Cooper, 2016 p. 146).

To learn about the theme little explored in the local context, the exploratory research strategy is approached, providing the opportunity to collect data from Tangara's coffee growers through field research. "Exploratory data analysis is a perspective of data analysis and also a set of techniques" (Cooper, 2016, p. 408).

With the objective classified as descriptive, detailed descriptions of the challenges faced by coffee producers were made, knowing the reality and the reasons that impact the cultivation of this crop, since the descriptive structure in studies on organizations applies "[...] organizational structure, personnel policies, production system, marketing processes, relationships with other organizations, etc.", (Gil, 2021 p. 163).

In relation to the researched group, it comprises all coffee producers in Tangara, with a total of twenty-two producers, but with a response from nineteen interviewees, due to their accessibility. Thus, it is classified as census research or population survey, which implies identifying the social structure of the group, discovering the system experienced, based on

the survey of socioeconomic and technological data, which can be of a geographical, demographic, economic, sanitary, housing, road, and educational nature (Gil, 2022).

To identify the group of coffee producers, the information was collected from the technical manager of EMPAER, who provides assistance to local properties.

Regarding data collection, a semi-structured interview script was used that "allows a more direct comparison between the answers; the variability of questions is eliminated and, therefore, the variability of answers is assumed to be real" (Cooper, 2016, p. 155), as detailed in the script.

According to Cooper (2016, p. 154), "the interview is the basic technique of data collection in qualitative methodologies, which varies based on the number of people involved, the level of structure, the proximity of the interviewer to the participant and the number of interviews conducted during the research".

The interviews were carried out through the researcher's displacements with partners to the rural properties for meetings with the researched between 03/28/2023 and 04/19/2023 as the observation technique in a complementary way to the information collected. For Cooper (2016, p. 173), "observation qualifies as scientific investigation when it is conducted specifically to answer a research question, systematically planned and executed, uses appropriate controls, and provides reliable and valid information about what occurred".

For data analysis, the content analysis technique was applied, a qualitative analysis instrument to evaluate the results of the interviews, giving specific treatment to the answers coming from the producers, seeking understanding for the results of the interviews, the causes of the challenges in production, the antecedents, effects and consequences for the coffee crop as well as for the producer. In short, this technique allowed the elucidation of the narrative structure of texts; the contextualization and interpretation of the meaning of images and sounds of the reality of coffee producers.

RESULTS AND DISCUSSION

CHARACTERIZATION OF AMAZONIAN ROBUSTA COFFEE PRODUCERS

Tangara's coffee production is found in ten regions of the municipality named as: Alto da Boa Vista (Vale do Sol I Community), Nakamura Condominium, Agrovila II (Antônio Conselheiro Settlement), Bezerro Vermelho (Vale do Sol II), São José, São Joaquim Community, Nossa Senhora Aparecida, Gleba Aurora, Linha 12 and Belo Horizonte Community.

In the Alto da Boa Vista region (Vale do Sol I), production is subdivided into four distinct properties. In the Nakamura Condominium region, production is carried out on a property. The region of Agrovila II (Antônio Conselheiro Settlement) is the coffee production carried out in a family group. In the region of Bezerro Vermelho (Vale do Sol II), there is the largest number of coffee-producing properties in the same region, five of which are different.

In São José, coffee production is carried out on two properties. The region of the São Joaquim Community comprises coffee production on one property. In the region of Nossa Senhora Aparecida, it also consists of only one coffee-producing property. The Gleba Aurora region, on the other hand, obtains coffee production on two properties. In the region of Line 12, coffee production is carried out on a property. As the Belo Horizonte Community, similar to the region of line 12, there is also only one producer.

Regarding the similarities of the group analyzed and considering the set of regions of the municipality presented, the coffee producers have an average age of 57 years, with a predominantly male sample, the population is relatively old compared to the estimated life of the Brazilian. According to the Brazilian Institute of Geography and Statistics - IBGE (2020), the current life expectancy in Brazil is 73.1 years for men.

This factor is relevant due to the unwillingness of most of the heirs to continue working in the field, a condition highlighted when reporting the current residence of the children mostly in the urban perimeter, however there are two producers with possible successors for the activity who can be prepared for succession in the next 10 years. The marital status is predominantly married and parents of an average of 2 children each individual, being a group of high school education.

The population analyzed has a migratory profile when the Brazilian regional origin of the parents is scored, namely, Northeast (Bahia and Pernambuco), Midwest (Cuiabá, Goiânia and Cáceres), Southeast (Espírito Santo, São Paulo and Minas Gerais) and South (Paraná). The diversity of inherited cultures reflects the family tradition in the coffee culture, with an average of two generations producing coffee or cultivating the coffee culture.

This family tradition in the coffee culture in Tangará da Serra was interrupted and resumed by the producers mostly 2.5 years ago on average, with the exception of four of the pioneers in the local culture who keep producing 31 years on average, that is, currently there has been the replanting of new clonal seedlings more adapted to the climate on the properties and even the formation of new coffee plantations in the region due to political incentive through donations of Seedlings.

The coffee activity is managed on average by two people on each property and is currently not considered the main source of income for coffee producers in Tangará da Serra - MT.

IDENTIFICATION OF PRODUCTION CHALLENGES

Regarding the similarities in coffee production and performance of the group analyzed, the sample mostly does not have links with democratic organizations such as associations or cooperatives, when there is a link the organization is not related to coffee production, but to other crops carried out on the properties such as by link to the location of the property, This factor demonstrates that coffee producers work individually.

This position limits the representativeness of the coffee culture obtained through cooperatives or associations, which promotes the development of the activity, protecting the linked members. The cultural diversity of the producers, presented by the origin of their progenitors, can be considered as a challenge for the performance of the sample in the coffee activity by democratic organization.

Regarding the difficulties in the production process, the irrigation method and the shortage of labor for the field are the challenges most pointed out by Tangara's coffee producers. The irrigation method requires efficient equipment for the controlled supply of water as the concentration of water necessary for good flow. Access to water in volume by properties is a limitation, since for irrigated practice it is necessary to invest in an artesian well or access to authorization to withdraw water from rivers or streams, both subject to environmental and regulatory factors.

However, all properties use the irrigation method in the dry season to ensure the health of the coffee bearing plant and its productivity. Of the properties that use the irrigation method, only four have the necessary authorization to control the use of water. The recurrent fact may be caused by the administrative bureaucratization imposed by the regulatory bodies.

Coffee cultivation in fourteen of the properties analyzed is carried out in a non-ecological way. The use of pesticides in coffee plantations is justified to control possible diseases, pests and weeds as well as to promote the increase in the productive capacity of the plant.

With regard to local coffee production, after processing 99% of the beans are sold. Of the local production, 80% is directed to one or two local producers capable of carrying out the agro-industrialization stages from processing to bottling the coffee, when the production of the other producers is purchased after the beans have dried. The sale of grains to

another producer and not directly to the customer via local fairs can be considered due to the unfeasibility of transportation costs and stages of agro-industrialization.

Regarding rural technical assistance, two of the properties declared that they did not receive the service. On the other hand, all the others receive rural technical assistance from the public company EMPAER, a service declared to be sufficient by more than half of those assisted. The exchange of experience between producers about coffee growing is perceived in 55% of those surveyed, a relevant factor for the improvement of the practices carried out in the crop.

Regarding the family's future perspectives for working in agriculture, the average from the information exposed in the interviews confirms that continuing the coffee activities is the proposal of the heirs, a reality that drives the coffee culture in the municipality of Tangará da Serra - MT as the awakening of future generations to the local coffee production.

In relation to the challenges listed above, irrigation in production has several segments to form an irrigation system, such as motor, pump, pipes, connections and emitters, objects that are usually costly for the producer, however it is possible to adapt the emitters thus making the irrigation system accessible with the same success as conventional systems, when water is used with due care (Coelho *et al.*, 2017).

According to Coelho *et al.* (2017), to establish an irrigation system, technical guidance is needed that designs the irrigation system according to the size of the property area, distance from the planted area to the river or dam, and the measurement between the level of available water and the plantation. Technical guidance is exercised by municipal, state, and federal government agencies, the private sector and irrigation material stores, however in the municipality of Tangará da Serra - MT there is a shortage of technical assistance for irrigation, as referred to by local coffee producers.

The attack of diseases in the coffee crop causes damage to the plant and decline in production, and there may be a need to replant the crop, so it is essential to develop epidemiological studies of the ducks in the system in question to propose management strategies that avoid such damage. The management of coffee diseases can be made possible by the use of more resistant clonal varieties (Morais *et al.*, 2019).

Regarding the management of the coffee crop and its characteristics, it is essential to observe the area for planting, considering the decline of the soil, its drainage, depth, natural fertility of the soil, among other preparations for the implementation of the crop (Vieira *et al.*, 2005).

For the Amazonian robusta coffee species, pruning the coffee-bearing plant is an essential practice, with the objective of renewing the plant structure, regulating the harvest, reducing the size of the plant, eliminating excess buds or stems, eliminating unproductive branches, phytosanitary control, better performance in the harvest, possibility of mechanized harvesting, good management practice and better branch/leaf ratio to increase productivity and production quality (Vieira *et al.*, 2005).

Regarding the public incentive for coffee cultivation, the property must be in accordance with the standards established by the responsible culture incentive program, such as conservation and phytosanitary practices, proof of technical guidelines established for the crop, proof of tax regularity, acceptance of the minimum price for the commercialization of the grain listed by the public agency, among others, however, the program to encourage coffee cultivation in the State of Mato Grosso was made unfeasible by the State Legislative Assembly (Mato Grosso, 2000).

Regarding the lack of labor for the countryside, there was a significant decrease of 1.4 million persons with the workforce between the years 1996 and 2017. The activity has undergone modifications over the years due to the automation and mechanization of management, such as the reduction in the participation of young people and the reduction in the role of family members in the activity (Balsadi, 2022).

With regard to the high prices and energy rates with the use of irrigation in the dry season, the expenses can represent 70% of the variable costs of agriculture according to the performance of the motor pump and operation in the peak period from 6 pm to 9 pm, when the taxation is higher. However, it is possible to relocate the task to off-peak hours and take advantage of discounts and taxes levied on rural irrigation granted by the energy concessionaire (Silva, 2020).

COMPARISON OF THE CHALLENGES LISTED IN 2019 WITH THE CHALLENGES LISTED IN 2023

For the knowledge of the productive cycle of the coffee culture in the municipality of Tangará da Serra - MT, as well as the current production model, production planning, cost records, legal requirements, product quality, all production management and commercialization of coffee in the region, an activity linked to the extension project "Coffee with Research" was carried out at UNEMAT where the students of the administration course of the 2nd module class together with the professors promoted the I ENCAFE event in 2019. This activity generated a public report to promote coffee cultivation, filed with the local

Secretariat of Agriculture, Livestock and Supply (SEAPA) and the State Secretariat of Family Agriculture (SEAF).

During the event, coffee producers listed various challenges faced in the coffee production process.

Chart 1 shows the comparison of the challenges in coffee production listed in 2019 as well as the challenges listed in 2023.

Chart 1 - Comparison of the challenges of coffee production in Tangará da Serra – MT between the year 2019 and 2023

Challenges in coffee production in Tangará da Serra - MT related by producers	**Related challenges 2019**	**Related Challenges 2023**
1- The coffee consumed in the municipality is not locally produced, 60% of the beans are purchased in Minas Gerais and 20% in the regions of Juína and Cotriguaçu, operating below the productive capacity	**X**	
2- Slowness on the part of regulatory bodies, regarding the guidance for obtaining the Provisional Operating Authorization (APF), making access to credit difficult	**X**	
3- Low articulation of common interests in groups by family farmers	**X**	
4- Fiscal and tax issues, family farming is still taxed	**X**	
5- Challenges in marketing, most family farming producers in the region do not have the structure to process coffee, so they outsource the process	**X**	
6- Lack of minimum structure on the properties, lack of water for irrigation	**X**	**X**
7- Lack of knowledge of the new "Amazonian robusta" plant	**X**	**X**
8- Lack of information on the main costs to invest in this crop	**X**	
9- Challenges in correcting the land for planting		**X**
10- Insect and pest attack		**X**
11- Lack of public support with machinery		**X**
12- Lack of manpower for the field		**X**
13- Lack of technical assistance for irrigation		**X**
14- Lack of scientific field research on soil such as soil moisture, among others		**X**
15- Inconstant technical visit		**X**
16- High prices and energy bill rates with the use of irrigation		**X**

Source: Survey data (2023).

It is demonstrated that the difficulties with the irrigation method remain in the coffee production in the municipality, such as the lack of knowledge with the new species of Amazonian robusta coffee cultivated. The factors are determinant for production, since the plant is dependent on moisture throughout the life cycle, as planting and management require specific techniques for the clonal Amazonian robust species suitable for the climate of Tangará da Serra - MT.

It is understood that some challenges listed in 2019 are not repeated in 2023, as items 6 and 7 still remain a challenge for coffee producers. In the 2023 survey, new challenges in coffee production arise, with topics 9 to 16 listed in the comparative table below. It is assumed that challenges 1 to 5 and 8 of 2019 not related in 2023, have been solved for producers.

As for the limitations imposed on coffee cultivation at the national level and its regions, it is possible to identify, in Chart 2, the challenges of production in the coffee sector together. What they have in common are the challenges with high costs of agricultural inputs and implements demonstrated in the southeast and north regions of the country, such as the disunity of the group of regional coffee producers evidenced in the southeast and midwest regions of the country.

Chart 2 - Challenges in coffee production at the national, regional and municipal levels.

Challenges in coffee production	Brazil	Southeast Region	North Region	Midwest Region	Tangará a Serra-MT
1- The shortage of skilled and committed labor,		X			
2- The total management of the business including the storage of grains,		X			
3- The lack of security in the countryside,		X			
4- The supply of energy carried out by the intermittent and poor quality utility,		X			
5- The high costs of agricultural inputs and implements,		**X**	**X**		
6- The lack of knowledge of the market,		X			
7- The lack of articulation for the sale of grains directly or exported,		X			
8- The disunity of the regional producers' group,		**X**		**X**	**X**
9- The impasses involved in access to credit,			X		
10- The lack of professionalized technical assistance for the field,			X		
11- Political regime flawed in relation to the coffee sector,			X		
12- High labour costs,			X		
13- The failures in the transfer of concise information by institutional organizations to the segments that make up the link of the coffee production chain,				X	
14- The production systems applied,				X	
15- difficulties in accessing the market for producers,				X	
16- The relationship with the members of the production chain,				X	
17- The length of the poles that compromises the commercialization of grains due to the high production costs				X	
18- The inferior quality of the coffee produced				X	
19- Taxation of family farming					X

20- The challenges of commercialization					X
21- The lack of minimum structure on the properties, such as the lack of water for irrigation					X
22- The lack of knowledge of the new "Amazonian robusta" coffee-bearing plant					X
23- The lack of information on the main costs of investing in culture					X
24- The slowness on the part of regulatory bodies regarding the guidance for obtaining the Provisional Operating Authorization (APF)					X
25- Coffee consumption in the municipality is not locally produced					X
26- The low articulation of common interests in groups by family farmers					X
27- Challenges in correcting land for planting					X
28- Insect and pest attack					X
29- Lack of public support with machinery					X
30- Lack of scientific field research on soil such as soil moisture, among others					X
31- Inconstant technical visit					X
32- High prices and energy bill rates with the use of irrigation					X
33- The economic sustainability of the production chain	X				
34- The issues associated with taxation, tariff and non-tariff barriers and logistics.	X				

Source: Literature and field research (2023)

Caption		
Regions	**Sample**	**Author who lists the challenges**
Brazil	Brazil	MIARELLI, 2006
Southeast	Minas Gerais	NOVAIS, 2021
North	Rondônia	ROSA NETO, 2005
Central-West	Mato Grosso	SEAF-MT/ EMPAER-MT/ EMBRAPA Rondônia, 2019 and Production System 7, 2005.
Central-West	Mato Grosso - Tangará da Serra	ENCAFÉ, 2019.

Source: Survey data (2023).

Regarding the disunity of the group of regional coffee producers, it is a limiting factor for the punctual coffee culture, since the coffee activity carried out linked to an association or cooperative establishes strength for producers in facing various production challenges, such as fostering the representativeness of the coffee culture practiced by small producers.

FINAL CONSIDERATIONS

The coffee activity is a crop that marks the economy of the municipality of Tangará da Serra - MT since its implementation by the Land Company, which provided the migration of several families to the municipality in order to produce coffee, rice, corn and beans, and coffee production is now a smaller-scale activity. With this, the research problem was to

highlight the main challenges faced by Amazonian robusta coffee producers in Tangará da Serra - MT in 2023.

As a conclusion, it can be mentioned that the local coffee culture faces various challenges in the production of Amazonian robusta coffee, which are factors that impact the activity, with producers who act individually, limiting the representativeness of the tangaraense culture that would be made possible by coffee associations or cooperatives, a link that would mitigate the challenges faced in the activity.

For the expansion of the coffee plantation, the use of the irrigation method is fundamental, since without practice it is not possible to exploit the maximum capacity of the coffee bearing plant in its productivity. However, it is essential to adapt the use of water by producers to ensure their right to use the water resource in a managed way, thus minimizing possible conflicts between users, giving the producer the opportunity to expand the coffee culture in the region.

Succession to the coffee activity is a challenge since it is the moment of passing control of the activities to the next generation or to the next management, however it is a necessary decision for the continuity of the culture. For the transfer of power, it is necessary to plan and prepare the successor, introducing him in daily coffee activities, such as entrusting responsibilities, establishing a link with suppliers of inputs and customers of the bean, among many other factors.

Considering the objectives of the research to characterize the producers of Amazonian robusta coffee, it is proven that they are middle-aged producers, predominantly married and with an average of 2 children and with an average of high school education.

Regarding identifying the challenges of Tangara's coffee production, it is proven that the irrigation method and the lack of labor for the field are specific challenges for the activity, factors that impact the crop directly.

Regarding the difficulties of coffee production, comparing the challenges listed in 2019 with those listed in 2023, new challenges were identified in 2023, such as challenges listed in 2019 that still remain unresolved.

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ELABORATION, NUTRITIONAL AND SENSORY ANALYSIS OF PEANUT BUTTER FLAVORED WITH MOZZARELLA CHEESE

https://doi.org/10.56238/sevened2024.031-078

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ABSTRACT

Peanuts are one of the foods that are linked to the northeastern culture of Brazil. The consumption of this legume varies from the seed in natura, roasted and salted, to sweet (such as the traditional northeastern paçoca), in addition to derived products that have peanuts in their formulation. However, there is still the possibility of adding value and innovation using peanuts, since food industries are always looking for innovative products that are healthier. According to this, peanut butter is an excellent alternative, as it is a peanut-based product well accepted by a large part of the population, and is consumed by all social classes and age groups, in addition to being a very rich food in nutritional terms. Peanut butter can also be supplemented with other foods, in order to increase its nutritional and sensory values. Aiming at this aspect, the use of cheese as an alternative to supplement peanut butter is a viable option, since it is a food much appreciated by the Brazilian population due to its sensory and nutritional characteristics. In this sense, the present work aims to make peanut butter with cheese using the following ingredients: peanuts, mozzarella cheese, vegetable oil and salt. The nutritional composition and sensory evaluation of peanut butter enriched with mozzarella cheese were analyzed in order to ascertain the public's acceptance and purchase intention. In the present study, five peanut butter formulations were elaborated, ranging from 0, 10, 15, 20 and 25% mozzarella cheese, respectively. It was observed that the greater the amount of mozzarella cheese added to peanut butter, the less energetic the product is made. According to the results obtained, it is possible to conclude that the peanut butters enriched with mozzarella cheese did not reach the minimum result in relation to all the parameters analyzed (appearance, color, texture, flavor and global acceptance) with the average 7 (seven) being the minimum expected result. It is noteworthy that sample E with 35% mozzarella cheese was the one that came closest to the minimum sensory requirements, while for the intention to purchase sample C with 25% mozzarella cheese. That said, it is noticeable the need for a better adaptation in the formulation or addition of extra components that increase the sensory

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qualities of the product, it is also notorious that the product developed is unusual to the Brazilian palate, thus causing a high deviation in relation to sensory requirements.

Keywords: Peanut. Mozzarella cheese. Peanut butter. Nutritional analysis. Sensory analysis.

INTRODUCTION

Peanuts (*Arachis hypogaea* L.) are a legume native to South America that has gained prominence on the world stage, integrating multiple productive sectors (BERTIOLI et al., 2011). It has a high social and economic value, with global production of more than 47 million tons, it is the fourth most produced oilseed in the world (USDA, 2021). In Brazil, production is abundant, with a total of 536.5 thousand tons produced in the 20/21 harvest, 94% of which came from the state of São Paulo. Other producing states are Rio Grande do Sul, Mato Grosso do Sul, and Paraná (CONAB, 2021; DEPIERI 2019).

Peanuts are used as an ingredient in the production of various foods. The main forms of consumption are roasted whole grains, mainly as a snack and products made from crushed peanuts, such as peanut butter or peanut butter. The use of peanuts as pastes and fillings has increased in recent years, especially in bakery and dessert products (WILSON, 2015). However, the growing search for health is helping to form new habits among consumers interested in finding healthier, more nutritious, and natural varieties on the market (DUARTE et. al., 2021).

Peanut butter is a product made from crushed peanuts that has been gaining popularity among athletes and exercisers due to its beneficial properties, such as fatty acid profile and protein content. In addition, it contains vitamins, minerals, and bioactive compounds, such as resveratrol, which help reduce the risk of cardiovascular disease (LUU et al., 2015; MAGUIRE et al., 2004; MACIEL, 2018). Due to its benefits, peanut butter has great growth potential in the food market.

Mozzarella Cheese, Muzzarella Cheese or Mozzarella Cheese is the cheese obtained by stretching an acidified mass, it is an intermediate product resulting from the coagulation of milk through rennet or the action of enzymes with coagulating capabilities, and may or may not be added by the action of specific lactic acid bacteria (BRASIL, 2012). It must come from ingredients such as milk and/or reconstituted milk, standardized or not, referring to the content of fat, rennet and/or enzymes with appropriate coagulant capacities and sodium chloride. Optional ingredients such as caseinates, citric acids, lactic, acetic or tartaric acids, as well as spices, condiments and/or food substances may also be composed (BURITI et al., 2008).

That said, the growing increase in consumer demand and expectation for innovative and healthy products has stimulated the development of new food products, which drives companies in the field to invest in this sector, in order to keep up with this trend and remain stable in the market.

In view of the above, the present work aims to prepare peanut butter flavored with mozzarella cheese, in order to unite their beneficial properties in a single product. According to this, support and contribute to the food agroindustry, aiming to increase the variety of peanut-based products. In order to contribute to the growing expectation of consumers in healthy and innovative products and also aiming at good acceptance by them, the development of peanut butter flavored with mozzarella cheese is necessary, since both base products (peanuts and mozzarella cheese) are well accepted by the population and both have nutritional and sensory qualities recognized worldwide. In addition to being consumed by people from different social classes and age groups, such a product can also have a significant contribution to specific audiences such as physical exercisers and people who aim to gain weight, since the product that will be developed is rich in proteins and lipids. As a means of uniting the different nutritional qualities of both raw materials and in accordance with what was mentioned above, this project aims to make peanut butter with mozzarella cheese. The main ingredients in the formulation of peanut butter with mozzarella cheese are: roasted peanuts without shell and without salt, mozzarella cheese, soybean oil and salt. It should also be noted that the product developed is unprecedented in Brazil.

MATERIAL AND METHODS

The experiment was carried out at the Bakery Laboratory of the Federal Institute of Education, Science and Technology of Maranhão – São Luís/Maracanã Campus.

MATERIALS

The peanuts were purchased at a natural products store located in the municipality of Paço do Lumiar, while the mozzarella cheese, soybean oil and salt were purchased at a supermarket in the municipality of São Luís.

PREPARATION OF PEANUT BUTTER

The peanut base paste (PBA) was obtained according to the methodology carried out by Lima et al. (2009), using fresh peanuts. For the preparation of the PBA, the following steps are followed: selection of raw material, roasting, grinding and addition of inputs. During the selection of the raw material, it is necessary to have a good quality of the peanut so that it does not contain fungi, remains of shells and foreign materials. The peanut roasting follows the following conditions: 135°C for 1 to 2 minutes dry. After roasting, it is necessary to remove the peanut skin. Proceeding to grinding, it breaks the peanut grains and consequently their cells, causing part of the oil contained in the peanut to be released,

favoring the formation of the paste. After 4 to 5 minutes of processing, a homogeneous paste was obtained. It is worth noting that the temperature during grain processing should not exceed 60°C. In the incorporation of inputs, components were added that aim to stabilize and sensorially add the base paste (salt, vegetable oil and mozzarella cheese).

METHODS

Five formulations of peanut butter with mozzarella cheese were developed in different concentrations, one of them being standard, that is, absent of mozzarella cheese, while the others with concentrations of 20, 25, 30 and 35% of mozzarella cheese.

Initially, all the ingredients were weighed on an analytical balance and after the preparation of the PBA, the mozzarella cheese was macerated in order to facilitate its homogenization with the PBA and then, the mixture of the ingredients was done manually until a homogeneous and smooth paste was obtained.

FORMULATIONS OF PEANUT BUTTERS

The formulations of the peanut butter samples were presented in Table 1.

Table 1 – Formulations of the peanut butter samples

Ingredients	Sample A (0%)	Amostra B (20%)	Amostra C (25%)	Amostra D (30%)	Amostra E (35%)
Peanut (g)	86.24g	73.72g	70.89g	68.72g	66.24g
Cheese (g)	0.00g	14.60g	17.75g	20.40g	23.10g
Oil (g)	12.90g	10.60g	10.65g	10.20g	9,90g
Salt (g)	0,86g	0,73g	0,71g	0,68g	0,66g

Source: Prepared by the author (2023)

NUTRITIONAL ANALYSIS

To carry out the nutritional composition analysis, the determinations established by the National Health Surveillance Agency – ANVISA were followed, through the Resolution of the Collegiate Board – RDC No. 429 of October 8, 2020, which provides for the nutritional labeling of packaged foods and the Normative Instruction – IN No. 75 of October 8, 2020 (ANVISA, 2020), which establishes the technical requirements for declaring nutritional labeling on packaged foods and the Brazilian Food Composition Table – TACO 4th Edition

(BRASIL, 2020) was also used.

MICROBIOLOGICAL ANALYSIS

Due to the susceptibility of peanuts to contamination by microorganisms, microbiological analysis is necessary (SPINELLI et. al., 2018). The multi-tube technique for the determination of thermotolerant coliforms was carried out in the microbiology laboratory of the Federal Institute of Education, Science and Technology of Maranhão, Maracanã Campus (SPINELLI et. al., 2018; ARAÚJO et al., 2019).

SENSORY ANALYSIS

The sensory analysis was carried out based on the methodology recommended by Lopes (2012), using a nine-point Hedonic Scale, being 9 = very much liked, 8 = very much liked, 7 = moderately liked, 6 = slightly liked, 5 = indifferent, 4 = slightly disliked, 3 = moderately disliked, 2 = very disliked and 1 = extremely disliked. The following characteristics were evaluated: appearance, color, texture, flavor and global acceptance.

To evaluate the purchase intention, a Purchase Intention Form was used by a 5-point attitude scale, as follows: 1 = I would certainly buy this sample, 2 = I would probably buy this sample, 3 = I have doubts about whether I would buy this sample, 4 = I probably would not buy this sample and 5 = I certainly would not buy this sample.

The sensory evaluation was carried out at the Federal Institute of Maranhão IFMA – São Luís/Maracanã Campus, on October 16, 2023, with the cooperation of 56 untrained evaluators, male and female servers and students, where all signed the Informed Consent Form (ICF). Everyone made the evaluation individually and was properly instructed to observe the characteristics of the product and mark the answer sheets.

STATISTICAL ANALYSIS

The data were evaluated using the *Excel* version 2019 program (*Microsoft Corporation*).

RESULTS AND DISCUSSION

NUTRITIONAL COMPOSITION OF PEANUT PASTES

Using the nutritional values that make up each ingredient, and having as reference the Brazilian Table of Food Composition – TACO, table 2 was elaborated. Table 2 shows the nutritional composition of peanut butters flavored with mozzarella cheese in the respective proportions of 0, 20, 25, 30 and 35% mozzarella cheese.

Table 2 – Nutritional composition of peanut butters

Nutritional components	Sample A (0%)	Amostra B (20%)	Amostra C (25%)	Amostra D (30%)	Amostra E (35%)
Energy value (kcal)	667,9	615,4	607,66	598,48	588,81
Protein (g)	19,40	20,53	20,74	20,96	21,14
Carbohydrate (g)	16,13	14,38	13,86	13,55	13,18
Fibers (g)	6,73	5,75	5,53	5,36	5,17
Total Fats (g)	58,42	52,86	52,14	51,16	50,17
Saturated fats (g)	10,32	10,41	10,8	10,86	10,93
Gorduras trans (g)	0	0	0	0	0
Sodium (mg)	860	779,50	792,89	775,27	767,89

Source: Prepared by the author (2023)

Analyzing the nutritional values of the five samples of peanut butters, it can be observed that the nutrient content changed according to the formulation used, however all formulations were presented as a source of protein, in addition to having reduced carbohydrate, total fat and sodium content. It was also observed that the greater the amount of mozzarella cheese added, the less energetic the peanut butter is. This is due to the fact that standard peanut butter contains more lipids than peanut butter plus mozzarella cheese.

MICROBIOLOGICAL ANALYSIS

Table 3 shows the values of the microbiological analyses.

Peanut butter	Coliforms totais	Thermotolerant coliforms	*Salmonella spp.*
Sample A	< 3,0	< 3,0	absent
Sample B	< 3,0	< 3,0	absent
Sample C	< 3,0	< 3,0	absent
Sample D	< 3,0	< 3,0	absent
Sample E	< 3,0	< 3,0	absent

Source: Prepared by the author (2023)

According to table 3, the absence of *Salmonella spp* and the low value in relation to the concentration of total and thermotolerant coliforms were found in all samples, thus ensuring the microbiological quality of the peanut pastes flavored with mozzarella cheese by having the results in accordance with normative instruction No. 60 of December 23, 2019 (ANVISA, 2019).

ANALISE SENSORIAL

Table 4 shows the statistical values of the sensory analysis.

Table 4 - Results of the sensory analysis

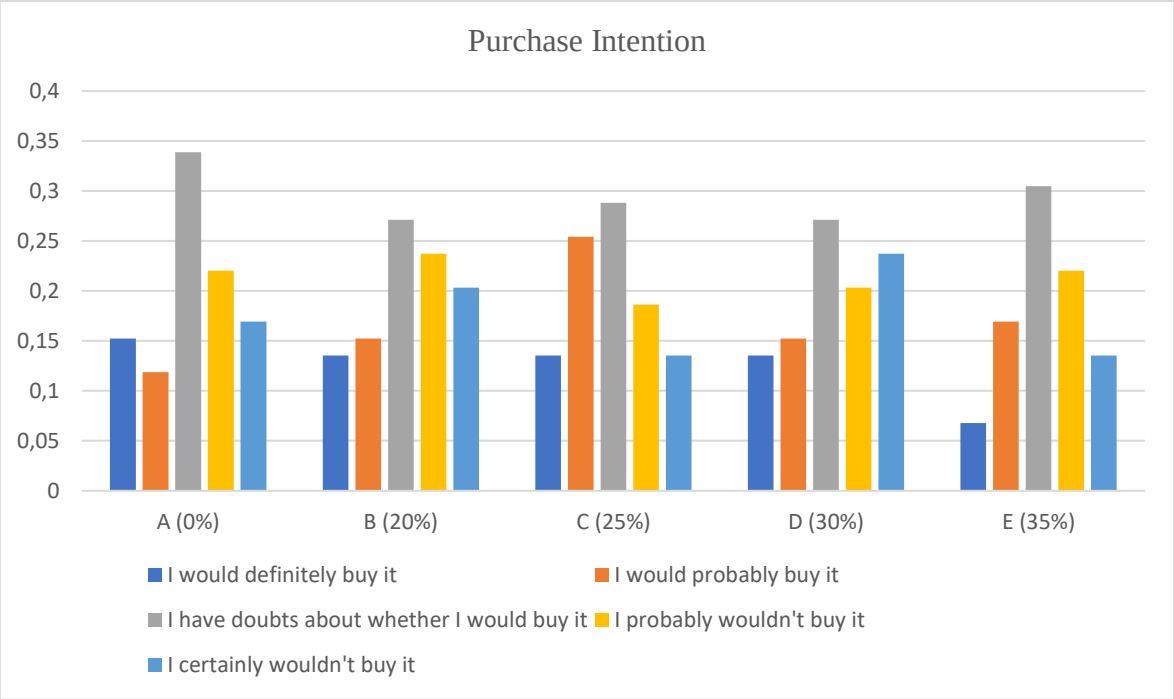
	Sample A (0%)	Amostra B (20%)	Amostra C (25%)	Amostra D (30%)	Amostra E (35%)
Appearance	5,86 ± 1,98	6,32 ± 1,96	6,49 ± 1,75	6,49 ± 1,73	6,78 ± 1,61
Colour	6,06 ± 1,86	6,35 ± 2,01	6,60 ± 1,76	6,45 ± 1,75	6,86 ± 1,59
Texture	5,98 ± 1,85	5,96 ± 2,23	6,06 ± 2,04	6,13 ± 2,02	6,44 ± 1,81
Taste	5,44 ± 2,27	5,24 ± 2,17	5,40 ± 1,96	5,47 ± 2,21	5,42 ± 2,04
Global acceptability	5,45 ± 2,08	5,48 ± 2,14	5,78 ± 2,02	5,53 ± 2,09	5,51 ± 2,14

Source: Prepared by the author (2023)

According to the data obtained and analyzing the appearance item, sample E with 35% mozzarella cheese obtained the highest score of acceptance by consumers 6.78, while sample A that has 0% mozzarella cheese obtained the lowest score 5.86. Regarding color, sample E also obtained the highest acceptance 6.86 and sample A the lowest acceptance 6.06. As the amount of mozzarella cheese in peanut spreads increases, the appearance and color of the products made become more attractive. It was observed that the greater the amount of mozzarella cheese in the peanut pastes, the more spreadability, uniformity and there is also no oil formation on the surface of the product. . In the texture attribute, sample E had the highest acceptance score: 6.44, while sample B, containing 20% mozzarella cheese, had the lowest acceptance rate. This may be due to the fact that the greater the amount of mozzarella cheese present in the peanut butter, the better the structure, consistency, firmness and adhesiveness in said prepared product. In the flavor attribute, sample D with 30% mozzarella cheese had the highest score of acceptance by the tasters 5.57 and sample B the least acceptance 5.24. In the global acceptance, sample C with 25% mozzarella cheese obtained the best acceptance 5.78 and sample A obtained the lowest acceptance.

Purchase intention is an important criterion for the development of a new product (SOUZA, 2022), and the results are shown in graph 1.

Graph 1 - Purchase intention



Based on the results for the purchase intention test, peanut butters flavored with mozzarella cheese in the proportions of 20, 25 and 30% were the ones that presented the highest score in purchase intention. After adding the criteria "would certainly buy" and "probably buy", samples B, C and D had respectively 28.79%, 38.97% and 28.79%. Samples A and E had lower scores, with sample E having the lowest percentage 23.71%, followed by sample A with 27.11%. Using acceptability parameters It is then noted that none of the samples present satisfactory results and are not well accepted by the tasters.

CONCLUSION

According to the results obtained, it was possible to conclude that the peanut butters enriched with mozzarella cheese did not reach the satisfactory result in relation to the sensory parameters analyzed (appearance, color, texture, flavor and global acceptance) with the average 7 (seven) being the expected result. It was highlighted that sample E with 35% mozzarella cheese was the one that came closest to the minimum sensory requirements, while for the purchase intention it was sample C with 25% mozzarella cheese. That said, it was noticeable the need for a better adaptation in the formulation or addition of extra components that increase the sensory qualities of the product, it was also notorious that the product developed is unusual to the Brazilian palate, thus causing a high deviation in relation to sensory requirements.

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SEVEN publicações acadêmicas

CHAPTER 79

COVID-19 AND THE MENTAL HEALTH OF ELDERLY PEOPLE PARTICIPATING IN COMMUNITY CENTERS

https://doi.org/10.56238/sevened2024.031-079

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ABSTRACT

The present study focuses on the importance of the participation of elderly people in Community Centers for mental health. In an attempt to understand the subject to be researched, as well as the themes interconnected to this process, including the discussion of concepts necessary for a better understanding of the object, it was necessary to read specific readings in the area of gerontology, mental health, pertinent legislation and COVID-19, in addition to topics such as coexistence groups; the recent change that occurred in terms of basic social protection, which was the reorganization of social assistance services; Service of Coexistence and Strengthening of Bonds; among others. This research aims to investigate the perceptions of the impact of COVID-19 on the mental health of older people participating in the Community Centers. With a qualitative approach, based on the dialectical critical method, the research included an exploratory literature review and semi-structured interviews with users of eight Community Centers for the elderly, located in the city of Ponta Grossa/PR, totaling sixteen people interviewed of both sexes. To support the organization of information, the IRAMUTEC software was used, in the sense of constituting the textual corpus, building the word cloud and the similarity tree. The analysis of the results followed the procedures of the content analysis proposed by Bardin (1977) and then the categorization of the data was carried out contemplating three chronological phases: 1) pre-analysis; 2) exploitation of the material; 3) treatment of results, inference and interpretation. Through data analysis, it was possible to capture, with the results in the form of answers, how elderly people participating in the Community Centers had their mental health affected by the consequences left by the COVID-19 pandemic. The interviews were duly allowed by the elderly people, who were also previously informed about the objectives and procedures of the research. It was concluded that the Community Centers for the elderly is an extremely important place, which can provide human emancipation, prevent isolation and social exclusion and is also an environment in which participants can interact with each other, share life experiences, in addition to achieving active and healthy aging.

Keywords: Community Center. Aging. Elderly Person. Mental health.

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INTRODUCTION

COVID-19 AND THE MENTAL HEALTH OF OLDER PEOPLE PARTICIPATING IN COMMUNITY CENTERS

On March 11, 2020, the World Health Organization (WHO) declared the COVID-19 pandemic. Indicators pointed to the elderly population as the most vulnerable to the disease, due to comorbidities, pre-existing chronic diseases, and senescence that weakens the functioning of the body, lowering its immunity (Bravalhieri et al. 2002, p.9), as they are more vulnerable to diseases.

According to the Statute of the Elderly Person (Law 14.423, of July 22, 2022), every person aged 60 or over is legally considered an elderly person. For the WHO (2020), the elderly were considered the group at highest risk of contamination by COVID-19, imposing isolation, as a safety and prevention measure, the first to enter the social isolation protocol.

In addition, an elderly population, which actively seeks to perform physical activities, participate in life in society such as: in the Community Centers, Open Universities of the Third Age, interact with other people, seeking good coexistence and socialization, is certainly contributing to their physical and social well-being and thus contributing to their balanced mental health.

People over 60 years of age are increasingly working longer in their professions, collaborating in the care of the home and family, and we observed that after the pandemic, as a support for the care of grandchildren, participating in social life, and often as a supporter, ensuring the livelihood of the whole family, being the only source of income left in this period. The aging process contemplates the chronological factor of human development, which everyone is subject to experience, showing that the way it happens is very discriminative and personal, as it varies from individual to social context, being influenced by issues of culture and gender (IRIGARAY et al., 2008. p. 33).

The elderly person who seeks activities in the community centers is the one who arrives at the SUAS with varied demands, but who is active and there finds a space where support is offered to improve the quality of life through physical and leisure activities, with the objective of increasing well-being and quality of life through physical activities, conversation circles, exchange of experiences, which are activities carried out at CECON, through the Services of Coexistence and Strengthening of Bonds (SCFV).

Its purpose is to intervene socially in the demands of the elderly, planning and creating challenging situations, which stimulate them in the construction and reconstruction of their individual, collective and family histories and experiences. The service aims to strengthen family and community relationships, in addition to promoting the practice of

physical, leisure, playful, cultural activities, valuing the sense of collective life, thus strengthening the mental health of those who attend community centers.

In this scenario, the loss of family income during the pandemic could aggravate social and health inequalities, affecting the lives of older people, which can also be affected by physical and social isolation, fear of contracting the disease, fear of death, loss of friends and close ones, generating a high degree of psychological suffering and, focusing on the emergence of anxiety and depression.

In view of this, this research arose from the concern about the consequences of the COVID-19 pandemic on the mental health of elderly people participating in Community Centers (CECON), due to the safety measures imposed in Brazil, with the sanitary hygiene protocol and the decree of social isolation during this pandemic period. Understanding that, in the case of social isolation for the elderly, this "[...] it is considered a public health problem, as it increases the risks of cardiovascular, autoimmune, and neurocognitive diseases, and can lead to disorders such as depression and anxiety", compromising mental health (BRAVALHIERI et al. 2021, p.16).

We corroborate Bravalhieri et al (2021, p.18), where they point out that the pandemic has had consequences in the lives of older people in all aspects, especially in the emotional aspect, directing the need for research that deepens the perceptions that the impact of the pandemic has left on the mental health of these people. In this context, the present study has the following research question: What is the perception of the impact of COVID-19 on the mental health of elderly people participating in community groups located in the municipality of Ponta Grossa/PR?

From this question, we observe the factors that corroborate the advancement of the longevity of the elderly person, which can also be impacted on mental health. Thus, the hypothesis of this research is: Participation in CECON is important for the maintenance of the mental health of the elderly who are part of these groups, and the perceptions of the impact of COVID-19 in this context.

The present research has the following general objectives:

To investigate the perceptions of the impact of COVID-19 on the mental health of elderly people participating in the Community Centers in the municipality of Ponta Grossa/PR; and as specific objectives:

- Understand participation in activities at the Community Center for the mental health of the elderly;
- To identify perceptions of the impact of COVID-19 on the mental health of older people participating in CECON;

- To analyze the contribution of CECON to the mental health of the participating elderly people.

The proposal of this research emerges from the intention of starting the discussion about participation in activities in Community Centers for the mental health of the elderly. This research is justified by facing an emerging problem in the pandemic period, which is a growing demand for the care network, when it comes to the mental health of the elderly. This public is seriously affected in periods of social isolation.

According to a UFRN survey, carried out on 02/16/2022, social coexistence improves people's mental health. Family and community life is a right expressly provided for in the Statute of the Elderly (art. 3), and must be guaranteed by the family, community, society and the Government with absolute priority. The level of satisfaction of older people in living with other people can increase in intensity throughout life, improving quality of life. In groups, the opportunity arises to establish new friendships, expand knowledge and remove loneliness.

METHODOLOGY

COVID-19 AND THE MENTAL HEALTH OF OLDER PEOPLE PARTICIPATING IN COMMUNITY CENTERS

It is a bibliographic, documentary and field research of a qualitative nature, using the authors and legislation that deals with this theme, according to MINAYO (2008, p.16), who highlights that in qualitative research, the important thing is objectification, because during scientific investigation it is necessary to recognize the complexity of the object of study. The author points out that qualitative approaches are more appropriate for scientific investigations of groups, delimited and focused segments, of social histories from the point of view of social actors, of relationships and for the analysis of discourses and documents.

Thus, our choice was exploratory qualitative research, which is dedicated to the construction of knowledge on a topic that is still unknown, allowing the production of hypotheses for reading that reality, as the theme (perceptions of the impact of COVID 19 on the mental health of the elderly) is little addressed from the perspective of researchers and professionals themselves.

The analyses will follow the procedures of the content analysis. For BARDIN (1977, p. 31), content analysis can be understood as, "[...] a set of techniques for analyzing communications". We used as an instrument of data collection, the semi-structured interview, with 5 (five) open and closed questions, in addition to information about the profile of the users participating in the CECON.

In this sense, 5 open questions were elaborated, to give the interviewee the opportunity to speak in greater detail about the subject and make it possible to discuss the research theme (MINAYO, 2014, p. 14); as well as objective questions in the sense of characterizing and outlining a profile of who we are researching. The interviews were conducted with elderly people participating in the CECON, located in the city of Ponta Grossa/PR, respecting the ethical aspects regarding voluntariness and the signing of the Informed Consent Form.

The universe of the research is represented by the 8 (eight) CECON that serve elderly people, totaling approximately 250 (two hundred and fifty) users. It was decided to list 2 (two) people per CECON, of both sexes, if any, using as inclusion criteria, the elderly person who participates for the longest time in the equipment; who has cognitive understanding to answer questions; even so, if the tie remains, we use the age criterion, thus, the oldest person attending CECON, comprising the research. As an exclusion criterion, people who started their participation in the groups from 2023 onwards.

Considering the treatment of the empirical information collected in the interview, initially with the transcription and fidelity of all the subjects' statements; then the textual body was carefully and exhaustively organized; and then begin the analysis of the data obtained, which took place in two different moments. In the first moment, the construction of the word cloud and the analysis of similarity were carried out with the help of the Textual Analysis software IRAMUTEQ (R Interface for Multidimensional Analysis of Texts and Questionnaires) and in the second moment the content analysis was used according to Bardin.

In this context, we highlight the IRAMUTEQ Software as a facilitator in the treatment of data for qualitative research. Using programming language, IRAMUTEQ performs lexical analysis of textual bodies that the researcher wishes to analyze. According to Almico and Faro (2014, p. 727), IRAMUTEQ is "a computerized method for text analysis, which seeks to apprehend the structure and organization of discourse, informing the relationships between the lexical worlds most frequently enunciated by the subject", In addition, it allows the graphic representation of the most expressive words in the textual corpus through the word cloud (RAMOS; FILE; AMARAL-ROSA, 2018, p.21). The "word cloud," while simpler, is meaningful and visually appealing.

However, it is essential to emphasize that IRAMUTEQ is used exclusively for data processing, and the interpretation of these is the responsibility of the researcher (BUENO, 2018, p.08). Through "similarity analysis", it is possible to infer the connections between the

data. By creating a word tree, this analysis establishes central nodes in which it is possible to relate other stemmed words and establish connections based on their semantic roots.

Similarity Analysis provides a visualization of the connections between shapes through a tree-shaped illustration, based on graph theory (SANTOS et al., 2017, p.3). After the pre-analysis, the exploration of the material was carried out, which is nothing more than the "[...] systematic administration of the decisions taken [...] consists essentially of operations of codification, discount or enumeration, according to previously formulated rules" (BARDIN, 1977, p. 95). The last phase consists of the treatment of the results, condensing and presenting relevant information, inferences and confrontation of the results with the previously collected material, also indicating reflections for future analyses. The present research was approved by the UEPG CEP and all ethical aspects were respected. It is intended to bring the research carried out in the 8 CECON (Living Centers for the elderly), in the city of Ponta Grossa-PR, in order to demonstrate the perceptions of the impact that the COVID-19 pandemic has brought to the mental health of the elderly who attend the CECON. The survey was conducted in December 2023.

RESULTS

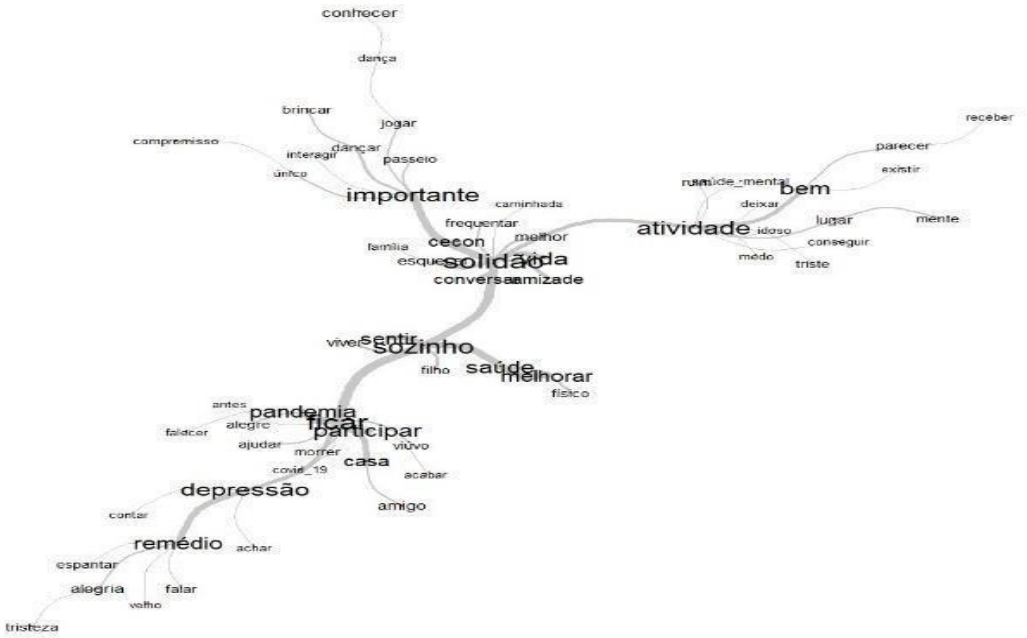
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Similarity Analysis

From the Analysis of Similarity or Similarities, which makes it possible to locate existing competitions between words, indicating their connections (RATINAUD; MARCHAND, 2012, p.22), it is observed that the terms: "loneliness", "important", "activity", "alone"; "health", "pandemic"; "depression" and "medicine" organize different forms of its understanding, being strongly related to the words: "alone"; "CECON"; "important"; "activity"; "improve"; "participate"; "house"; "friend"; "joy" and "sadness".

In addition, the analysis shows elements related to the well-being that the CECON provide for the mental health of the elderly people who attend there, despite a lower frequency, the terms "know"; "walk", "dance"; "mental health"; "well"; "conversation"; "friendship"; stand out and give meaning to the aforementioned terms. It should be noted that more than 18,394 words were part of this analysis.

Similarity Analysis



Source: Prepared by the author, based on the IRAMUTEQ software, 2023

With the intention of carrying out an in-depth analysis of the results obtained by both the word cloud and the similarity analysis, revealing significant insights into the essential themes that emerged in this study. The words that appeared with the greatest significance were: "loneliness", "CECON", "activity", "pandemic"; "alone"; "mental health", "depression" and "medicine" reveal the fundamental pillars of this discussion, shedding light on the complexities of the scenario of perceiving the importance of coexistence for the mental health of the elderly in CECON.

The convergence between the visual representation of the word cloud and the patterns identified by the similarity analysis promises to provide a more holistic and rich understanding of these interconnected topics, outlining promising paths to improve care practices, especially considering the challenges posed by the pandemic and the increasing demands for adaptation.

We bring to the show, the perspectives of the elderly people participating in the CECON, with regard to mental health in these living spaces. The face-to-face interview took place on a day and time stipulated by the CECON professionals, in order not to jeopardize the activities already planned.

After the presentations, they were asked: why did you look for CECON? it is evident that the terms alone, loneliness and depression are predominant in the statements of the vast majority of people, showing that of the 16 elderly people interviewed, 75% of the people are clear about this feeling, and consciously seek alternatives by participating in the meetings at the CECON, to overcome the situation in which they find themselves; and 25%

of the people, perhaps because they did not understand the purpose of the questions, rambled in the answer, as shown in the last 4 statements demonstrated here.

Social isolation contributed a lot to the elderly feeling alone, but it was a necessary measure. Our concern is for the elderly to remain in this condition, and not to resume their activities before the pandemic, passively accepting, and refraining from seeking alternatives to resume activities in living spaces.

- *I looked for it because even though I had a husband, I felt alone. [...]I tried to interact with people, meet other people, learn new things, participate in activities, outings, parties, celebrations [,,,] (interviewee1)*
- *[...] I found myself alone at home, I have 2 children who don't live here, I was left without having and knowing what to do with my life, then they recommended me to come here to participate [...] (Interviewee 2)*
- *[...] I'm alone, I had 8 children, but I don't have contact with any. [...] Then I came here, I really like coming here, I participate in everything here is very good, it "clears" my head, I feel better when I'm here [...] (Interviewee 3)*
- *[...] I've been participating for a long time, well before the pandemic [...] I looked for it, because I was depressed and at the health center they indicated it to me here [...] (interviewee 4)*

Evidence from recent epidemics shows that social isolation and quarantine measures are associated with increased depression and anxiety in the general population (WONG et al, 2020, p.6). Studies carried out in the context of the COVID-19 pandemic corroborate the results found previously, showing an increase in the prevalence of mental disorders in the population, especially in the elderly (Pecoits et.al. 2020, p.13).

Furthermore, the authors reinforce that [...] social isolation and loneliness are serious risks to public health, and although they are underestimated, they already affected a significant portion of older people even before the pandemic, especially those living alone (PECOITS et.al. 2020, p.13). With the effects of COVID-19, the number of elderly people who are socially isolated has increased even more, since, before the pandemic, many of them who lived in the community actively participated in social activities, which were suspended by the restriction measures.

Although 25% of people did not respond punctually to what was questioned, the importance and benefits that CECONs contribute to mental health in their lives are clearly observed.

- *I've been going here for 42 years. There is no bad time here, and it is very important to have this space to improve our physical and mental health.*

(interviewee 12)

- *I've been going to it for more than 30 years since I retired, [...] I looked for a place where I could fill my time and my head with good things. (interviewee 13)*
- *[...] To distract, it is a pleasure to be together with people. (interviewee 16)*

We can observe in the statements of the interviewees that loneliness and depression are categories that appear in most of the statements, which is the reason for the search to participate in the CECON. Talking about loneliness is not easy, studies in the area of mental health have sought definitions for loneliness. Among these concepts discussed can be defined as the state of feeling lonely, thus resulting in isolation.

Loneliness is a feeling that is usually painful and distressing, which leads to a malaise in which the person feels alone, even if surrounded by people, because he thinks that he lacks support, especially of an affective nature. Loneliness is a complex creation and can easily be confused with isolation, difficulty in communication, abandonment, among others.

Its meaning is so broad and complex that in the study of this theme two problems arise: that of establishing a concrete definition and that of objectively evaluating the extent of loneliness Feelings of loneliness can arise in any age group, but they are particularly important not only because of their prevalence, but also because of their consequences. in the elderly, considering that loneliness can be emotional, when the absence of a close emotional attachment, while social loneliness can mean the absence of a social support network for the individual and fragile family and community bonds.

According to GOMES (2001, p.21), in psychological terms, a better concept of loneliness should consider at least the following aspects: lack of meaning and purpose in life; emotional reaction; unwanted and unpleasant feeling; feeling of isolation and separation and deficiency in relationships.

NETO (2000, p. 6) loneliness is a disturbing side of attraction. He also states that it is a painful experience that one has when social relationships are not adequate. Loneliness is a feeling that is usually painful and distressing, which leads to a malaise in which the person feels alone, even if surrounded by people, because he thinks that he lacks support, especially of an affective nature. MCNNIS; WHITE (2001, p 9) report that the elderly are especially vulnerable to feelings and states of loneliness, due to their decline in their physical health, which forces them to social isolation.

In addition to these, the loss of close family members and the proximity of death also contribute to this vulnerability. Feelings of loneliness can arise in any age group, but they are particularly important not only because of their prevalence, but also because of their

consequences, in adolescents and the elderly, according to scientific data. Studies carried out with elderly people highlight that sadness is the factor that most contributes to loneliness. Other direct factors that contribute to loneliness in old age and we should be aware of are: Widowhood; The departure of children from home (which characterizes the phenomenon of the empty nest); mourning; Depression that can impact the morbidity, mortality and quality of life of older people; The absence of loved ones, which in gerontology is called social abandonment and broken family and community affective bonds; Feeling of inner emptiness; Social isolation due to COVID-19.

Ageism present in the labor market; Unplanned retirement process; Socioeconomic problems. It is difficult to research and reach conclusions about loneliness, a phenomenon that expresses itself as a feeling, which only materializes and reveals itself through the expressions of the body, gestures, speech and variable and multiple silences as people and their ages are. For this reason, it is up to society, in its various instances, to try to get to know the elderly and preserve their dignity, and to the State to protect them and guarantee their legal rights. The family and the social support network of the elderly person also play an extremely important role in combating loneliness, since their presence makes the elderly individual feel more belonging to that cycle and more welcomed. Within these cases, the frequency of the feeling of loneliness is lower.

In people over 60 years old, the risks of developing depression increase because there are many factors that favor a depressive condition. It is at this stage that people go through the most significant social changes: loss of friends, relatives and spouses, retirement – which triggers a feeling of worthlessness, diseases that begin to emerge, loss of autonomy and mobility, sudden change in one's own self-image. Other more complex factors also tend to emerge after the age of 60.

In addition to loneliness, loss of vitality and autonomy, the doubts and anxieties of youth appear to "charge". Who would I like to marry? Did I choose my profession well? Should I have gone another way? Should it have been a better father or mother? Questions that can generate a negative feeling in many elderly people, who may not be prepared to deal with this passage of time in a new configuration of life.

In general, depression affects the elderly in two specific ways: those who have already had a depressive condition at some point in their lives, treated or not, and enter old age with depression; and those who develop the disease only at this stage, precisely because of the factors related to aging and already mentioned. In the second case, the catalyst is usually the loss of their social role, making the elderly feel less integrated into the environment, less useful to the family and to society itself.

In this sense, we share PREVIATO (2019, p.2), when he highlights that the activities at CECON, with [...] the elderly living group is characterized by leisure activities, such as games, dances, manual activities and outings, which produce satisfaction in the participants, as they allow the exchange of affections, socialization and construction of bonds, in addition to enabling autonomy in choosing what they want to live, which allows the elderly to play a leading role [...]. They also point to the power of these spaces as an educational and training device, bringing new perspectives of inclusion and access to new work activities, for example, participation in handicraft, gastronomic, and cultural fairs. (PREVIATO, et. al, 2019, p.3).

Following the interview, the elderly people were asked about the importance of their participation in these activities for their mental health, we have the following:

- *It is very important. "Empty mind, devil's workshop". Here we do manual activities, circle dances, we move, laugh, make small talk, learn a lot, meet people who come here to talk to us, like you [...] (Interviewee 1)*
- *[...]It's good to know that there are people who look and care about us. We feel valued, we return home again, renewed, with a clean and light head! [...] (interviewee 2) • [...] It was very good, they helped me to start my life over. Slowly, but I made friends and I come here, I participate in meetings, activities, and I miss it when I stay at home. [...]I think that, if I didn't come here, I would have already given myself in life, loneliness is not easy! (Interviewee 3)*
- *[...] It's very important, without going to the CAPS, I need to interact, talk, do something to occupy my head. [...]And for the head, it relieves our mind to participate here. (interviewee 4)*

It has been proven that the SCFV carried out in the CECON is of great importance for this elderly population, especially in the sense of having a physical space of reference, where the feeling of belonging is evident in the subjects' statements. The idea of thinking of alternatives to propose activities to the elderly has been around for a long time, but the reorganization of services, unifying them throughout the territory proposed in the social assistance typification is more recent. This service is extremely necessary, observing the satisfaction in the participation of the elderly people, according to their statements in the research.

The Coexistence Center for the Elderly is a place that, in addition to providing human emancipation, preventing isolation and social exclusion, is an environment in which the elderly can interact with each other, share their experiences, in addition to obtaining an active and healthy aging, thus improving their mental health. According to VERAS (2005,

p.10), the Community Center can provide the elderly with a reason to go out regularly and an opportunity for social contact, becoming a place for leisure activities and vocational and cultural education, which both serve to value the elderly as citizens and to demystify prejudices and stereotypes that surround old age and, thus, to build new possibilities to rework life.

Following the interview, were the interviewees asked what are their perceptions of the impact of COVID-19 on mental health in their participation in CECON activities?

- *[...] The pandemic was a very difficult period, [...] when it passed and we were able to resume life, as soon as it opened here I came back, [...] here is the best medicine for depression, even with restrictions at the beginning, we carried out some activities that relieved all that sadness, and today, I know that here for me is the best place, I try to participate in all the activities that are here, And with that it helps to clear my head of sad thoughts, and I don't let the boat fall. (Interviewee 1)*
- *[...] The pandemic was very sad, I was alone, without a wife, without being able to go out even to buy food. We get lost, we don't know how to start over. [...] After I came here, it seems that things were getting straight, [...] it seems that it clears our heads, they referred me to the health center, I consulted and I use medication for depression. (Interviewee 2)*
- *[...] The pandemic confined the elderly to their homes. Our head turned inside out, with no activity and no remedy. Loneliness is very bad. CECON fills a space in our life and the head works better. (Interviewee 3)*
- *[...] The resumption of activities was slow, we were still very afraid. But for sure, the pandemic showed a problem that we old people feel a lot, being alone, no one sees the elderly person, nor the family. (interviewee 4)*
- *[...] Those who were not sick in the head, with the pandemic stayed. [...] after I came to CECON and realized that it all seems very strange, it seems that I had to learn to live, and here we received all the support and welcome we need. (Interviewee 5)*

It was unanimous in the statements, that is, 100% of the interviewees, that the COVID-19 pandemic substantially compromised the mental health of the elderly people attending CECON. In the reports, it is observed the difficulty in which social isolation, fear of death, lack of coexistence with family and other people modified the psychology of these people.

On the other hand, it shows the importance of these spaces in people's lives, in the sense of providing a successful aging and a set of proposals that contemplate integrality in the care of the elderly, striving for the thoughtful search for autonomy and independence in this phase of life through the fulfillment of their basic needs, going through the instrumentalization for political participation and the deconstruction of stereotypes that hinder the exercise of their fundamental rights.

Among the psychological effects that social distancing can trigger in this age group are insomnia, fear of being contaminated, anxiety, worries about their loved ones, and frustration for not knowing when the situation will be controlled. It is noteworthy that insufficient information and financial difficulty can contribute to the increase in these psychological effects (CANDORE, et al. 2019, p.4).

Aspects such as increased loneliness and reduced social interactions are risk factors for several mental disorders, such as geriatric depression (FIORILLO, 2020, p.7). According to PEREIRA (2020, p.3), other consequences of psychological states are panic attacks, post-traumatic stress disorder, psychotic symptoms, and suicide. On the other hand, for COSTA (2016, p. 9), psychological well-being can be enhanced, from the moment that elderly people are stimulated, even if in their homes, to perform some physical activities, memory activities, as well as to get closer to virtual reality, as a process of continuing education, through the use of storytteling.

Therefore, it is important to identify the biopsychosocial conditions of each elderly person, in addition to highlighting their vulnerabilities, in order to promote strategies that can contribute to active senescence. Among the strategies, COSTA (2016, p. 9) refers to the use of exergames as a modality of physical activity, which proved to be an important therapeutic alternative in the context of the COVID-19 pandemic.

We request an evaluation of CECON's activities, for your mental health, we have the following:

- *[...]As I said, here is the remedy to ward off depression! The air here is different, the energy of this place infects the heart and our mind. (Interviewee 1)*
- *[...] As I said, here is the remedy to ward off depression! (Interviewee 2)*
- *[...] Here is a remedy to ward off depression! Thank God, there is a place like this. [...] I'm glad there's this place here for us seniors. (Interviewee 3)*
- *[...]I recommend it to everyone who asks. I can't stay here anymore. (interviewee 4)*
- *[...] Activities are very important for our mental health, we can sleep better [...]. (Interviewee 5)*

- *[...]I'm glad there's this place here for us seniors. You create a commitment with colleagues, with activities, this occupies the mind. For me, CECON is living well! (interviewee 6)*
- *[...]My mental health has improved a lot. [...] It helps fill my life. (interviewee 7)*
- *[...] Coming here every week makes life lighter, it's good for mental health. (interviewee 8)*
- *[...] It's very important, coming here to spend the day, relaxes the mind. (interviewee 9)*
- *[...] My mental health improved a lot, coming to have fun is the best medicine for depression. (interviewee 10)*
- *[...]Here is the only place we have with many activities. [...] I miss it so much when I can't come here. It's bad for my mental health, I can't even sleep. (interviewee 11)*
- *[...] It helped me understand grief, it brought me the will to live. (interviewee 12)*
- *[...] Here is the remedy for depression for loneliness, it becomes a family when ours doesn't show up! (interviewee 13)*
- *[...] Very good, the elderly deserve to have a place of leisure, to forget sadness. Have something to do. (interviewee 14)*

If, on the one hand, we celebrate the achievement of longevity, on the other hand, it is necessary to pay attention to the guarantee of the necessary conditions for the elderly person to live with dignity, because the old of today reveals the future human condition for the men of the present, who will be the old of tomorrow, of the future. Thus, it is not enough just to achieve more years of life, it is necessary to live them with quality. The propositions about the care policy, when referring to the elderly, are very good, however, for various economic, political and bureaucratic reasons, its total implementation has not yet been achieved. Still, it is a gain in the lives of these people, with the little they have, they are infinitely grateful.

At the end of the interview, we asked the interviewees for "a suggestion to improve the services offered to the elderly population in the municipality", we had the following:

- *[...]There's nothing to complain about, everything they do here is very good, especially to occupy our heads. Maybe a psychologist's visit, once a month to have a conversation, listen to some people who are a little depressed, or who are in difficulty, would be great! Also take more tours, trips, which before the city*

hall provided more, now we can almost never go out. (Interviewee 1)

- *[...]Everything they do here is very good, especially to occupy our heads. To take tours, we go to CECON Nova Russia on Wednesdays, it is very good to interact with other people, we make more friends, with other men, before the city hall provided more, now we can almost never go out. (Interviewee 2)*
- *[...]Do more sightseeing in the city. (Interviewee 3)*
- *[...]It would be very important to have activity every day to occupy the routine of the elderly and improve our mental health every day. Also 1 doctor once a month to make an evaluation of us and 1 psychologist to talk to. (interviewee 4)*
- *[...]I didn't have any of that here, I can't complain or ask for anything else, everything here is very good for my mental health, it did me a lot of good to participate here in CECON. (Interviewee 5)*
- *[...]I suggest that you return to activities as before the pandemic. As it was at the time of FAPI, it was even better. (interviewee 6)*
- *[...]Taking more tours, trips is very enjoyable, even if you need to charge a little, we save some time, so we can go for a walk. (interviewee 7)*

In general, the elderly are very satisfied with the participation of the activities in the CECON, improve?

We are sure yes! If, on the one hand, we celebrate the achievement of longevity, on the other hand, it is necessary to pay attention to the guarantee of the necessary conditions for the elderly to live with dignity. The State has the duty to guarantee what is provided for in the typification of social assistance services in the improvement of services in CECON.

DISCUSSION

The research demonstrated important data regarding the characterization of the elderly people participating in the CECON. In all, there were 16 elderly people of both sexes, who became users of the 8 CECONs. Age ranged from 60 years to 89 years (mean age = 65.37). The majority of the group interviewed, that is, 75%, is between 60 and 79 years old (12 people) and 25% of the interviewees, between 80 and 89 years old (4 people).

Of these, 75% answered that they are retired in a total of 12 people; 17.5% answered that 3 people receive a pension (widow) and 7.5% receive BPC (continuous pension benefit) 1 person. The majority or 75% of users are aged 60 to 79 years (12 people) and 25% of these are aged 80 to 89 years (4 people). Regarding gender, mostly

female in the CECON, about approximately 10% of the 240 goals passed on to the 8 CECONs surveyed are from the male public.

Regarding marital status, 60% or 9 elderly people are widows, 2 single, 2 married and 3 separated. Other information could also be observed: the majority, that is, 87.5%, live alone, have children and grandchildren, but do not collaborate with their care; use daily medications for: hypertension, diabetes, cholesterol, anxiety, depression and insomnia. In the research we tried to contemplate both sexes: 50% male and 50% female.

Other studies also point to the predominance of women's participation in groups of people (BORGES; BRETAS; AZEVEDO; BARBOSA, 2008; CASCAES; FALCHETTI;

GALATO, 2008; COUTO et al. 2018; LEITE et al. 2002; VIEIRA, 2013), including in specific groups of physical exercise (ANDRADE et al., 2014; BENEDETTI, MAZO; BORGES, 2012; HORTENCIO; SILVA; ZONTA; MELO; FRANCE, 2018; SILVA; CARVALHO, LIMA; RODRIGUES, 2011).

Vieira (2013, p.4) points out that the greater representation of the female sex may be related to the fact that women tend to adhere more easily to social, self-care and health projects. In the research by Andrade et al. (2014, p.3), whose objective was to investigate the perception of the elderly about living groups, the predominance of women was explained by male resistance to participating in the groups, the married women investigated answered that their partners did not participate because they maintained prejudices about being part of groups of elderly people. We present the results, according to Bueno (2018, p.2), with the analysis of the IRAMUTEC software, in two modalities: lexical analysis – word cloud and similarity analysis.

SOFTWARE IRAMUTEQ

The use of a computer program had the advantage of coding, organizing and separating information, which allowed the quick location of the entire text segment used in qualitative writing. Using the word cloud method, which groups the words and organizes them graphically according to their frequency, some words such as: "gente e ficar" (people and stay) often appeared in the statements, associated with other words to give meaning to the speech – "we like to...; get well, get bad...", are not relevant to our analysis.

However, the word "loneliness" appeared 76 times, it was the one with the highest frequency, followed by the word "important and activity", which appeared 65 times; the words "depression, loneliness, life, alone"; The words "pandemic, medicine, health, mental, participate" appeared 63 times in the frequency of the corpus; the words "CECON, improve,

head and talk", appeared 62 times. All the words can be observed more frequently in the statements of the elderly people who participated in the research.

It should be noted that the use of IRAMUTEQ is not a method of data analysis, but a tool to process them. Therefore, it does not conclude this analysis, since interpretation is essential and the responsibility of the researcher. Therefore, this material should be understood as a qualitative software for data analysis - lexicons - to assist and complement content analysis.

Word Cloud



Source: Prepared by the author, based on the IRAMUTEQ software, 2023.

The words are randomly positioned, in such a way that the most frequent ones appear larger than the others, thus demonstrating their prominence in the corpus of analysis of the research. For the purposes of this study, after the processing stages, the meanings of the words were interpreted through the speeches of the users who responded to the interview, thus the word "loneliness", a feeling reported by most elderly people, aggravated by the decree of social isolation, imported by the pandemic. It is evident in people's speeches the importance of attending CECON to get out of loneliness and improve their mental health.

CONCLUSION

COVID-19 AND THE MENTAL HEALTH OF OLDER PEOPLE PARTICIPATING IN COMMUNITY CENTERS

The present research aimed to investigate the perceptions of the impact of COVID-19 on the mental health of elderly people participating in the Community Centers in the municipality of Ponta Grossa/PR. The study showed the situation of social vulnerability experienced by the elderly in Brazil during and after the pandemic period, clearly observed

by the subjects' statements, how much this episode added to the safety and social isolation measures interfered with the mental health of these people.

We understand that society must prepare itself to meet the needs of the elderly, as the increase in life expectancy and, consequently, in the number of individuals at an advanced age has not been accompanied by the creation of effective public policies with a view to providing a living condition, especially with a focus on mental health for this population segment. We also found that the pandemic negatively affected the family routine and leisure activities of all people, especially the elderly. It is necessary to adopt actions and strategies aimed at minimizing and/or reversing the negative effects linked to socioeconomic and psychological factors of these elderly people.

In this sense, CECON has a fundamental role in the lives of these people, providing in addition to leisure, several other activities with the intention of strengthening ties with the community and socialization; the expansion of the support network through the bonds of friendships, which consequently can improve health mental.de improve their mental health. The improvement in psycho-emotional health is constantly reported by users during the meetings held as a routine at the community center, so we can observe how important this type of mental health care is.

In order to improve the psycho-emotional status of users, we can contribute to a better insertion of these in the community and the implementation of this type of space that can help to demystify prejudices regarding mental impairment, in addition to preventing the occurrence of new crises.

It is also worth mentioning that this research revealed that social isolation and other safety measures imposed by the COVID-19 pandemic substantially affected the mental health of these people, interfering with their routines today. As observed in the statements, many of them have depressive, sleep, and anxiety disorders, reporting that after the pandemic the problems appeared.

We have a real framework of legislation for the protection and defense of the rights of the elderly, but there is still a need to legitimize the implementation of many of the existing laws, so that this growing population worldwide has the right established in CF/88, which is the right to age with dignity. In this vein, we include the Community Centers, which are the spaces provided for in the classification of the SUAS, where these elderly people are encouraged to participate in the groups, thus minimizing possible feelings of loneliness, and exercising the right provided for in the legislation, which is that of social coexistence.

Considering that the Community Centers provide an indisputable improvement in the mental health of these people, we verify the insufficiency of these spaces, not being able to

meet the demand, in this sense, through public policies, it urgently needs to create discussion agendas and look after the elderly population that is without care alternatives, contrary to what is provided for in the legislation.

We recommend everyone to take care of their aging process, stay active to meet new people, strengthening their bonds and trying to use communication resources to keep in touch with their loved ones, because by fighting loneliness, you will be taking care of your health for greater longevity and better quality of life. Also pay attention to the tips that were mentioned for resilience strategies. We wish a longevity full of meaning for everyone.

Having completed this path, which resulted in the dissertation presented here, we hope that the reading of this study will be pleasurable, but also productive of discomfort and discomfort, and that these discomforts will be transformed into institutional, political and social actions, and displacements that stimulate conversation and contribute to a critical understanding of the mental health of the elderly people participating in the CECON of Ponta Grossa-PR, as well as present possible ways to identify and cope with the factors associated with common mental disorders at this stage of life.

In the face of a society that is constantly aging, it is of paramount importance to expand studies and references that give visibility to the issue of aging from the perspective of discussing ways to sensitize the government, society and the family about the responsibility they have to guarantee the right to life with dignity and well-being.

The present study was based on Investigating the perceptions of the impact of COVID-19 on the mental health of elderly people participating in Community Centers in the municipality of Ponta Grossa/PR. As a result of the study developed with the elderly, it is of unquestionable importance and constitutes a relevant alternative for socialization and/or resocialization, improvement of quality of life and redefinition of their place in society, Consequently, improving their mental health, however, a more effective discussion is needed about it, in the sense of expanding services, thus being able to encompass all the elderly demand existing in the municipality.

When referring to the perceptions of the impact of COVID-19 on the mental health of these elderly people, it is clearly demonstrated how it affected their daily routine, their mobility, also demonstrating the insecurity that the whole process generated, making it difficult to resume life, visibly affecting the mental health of these elderly people.

On the other hand, we proved the importance of participating in CECON in improving the quality of life, consequently improving the mental health of these people. With regard to social interaction, living groups are of great relevance, since they can provide the elderly

with quality of life, avoiding isolation and promoting socialization among the elderly, and should also develop activities involving the family and society.

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TEACHER TRAINING IN THE DECOLONIAL PERSPECTIVE: CURRICULAR PROPOSALS FOR PEDAGOGY AT ABYA YALA

https://doi.org/10.56238/sevened2024.031-080

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ABSTRACT

Teacher training is a complex and challenging topic. Decolonial curricula become the object of research, as a form of epistemological and cultural resistance, in colonized societies that reproduce principles and values that are foreign to community life and the culture of native peoples. With the objective of presenting, describing and reflecting on experiences of teacher training curricula in Pedagogy courses, the text organizes and systematizes, based on documents and data available on electronic sites, curricular proposals produced at Abya Yala. We conclude that there are possibilities to build decolonial curricula for teacher training.

Keywords: Pedagogy. Teacher training. Pedagogical proposal. Curriculum. Decoloniality.

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INTRODUCTION

Teacher training is the object of investigation and dispute. Monocultural curricula seek to maintain hegemony over different realities and historical-cultural contexts. The curriculum is the result of choices, selections in which Eurocentric epistemology and worldview predominate, founded on Cartesian science linked to economic thinking that is structured on racial/ethnic superiority. There are, however, curricula that contemplate the cultural diversity, spaces and times of each ethnic group that lives in the context of Abya Yala, known as Latin America. These proposals for teacher training are the result of collective constructions that guarantee the continuity of life within social and cultural structures that are based on other epistemologies and worldviews. The curriculum, in this context, is understood as the central nucleus of the educational project and contemplates the interests, desires and social representations. In this sense, in decoloniality, there is no curriculum, but curricula that seek to represent understandings of being in the world as living beings.

Our research aimed to investigate instituting experiences of Pedagogy curricula in Higher Education Institutions from a decolonial perspective in the context of Abya Yala. (Fuchs, 2019). Our purpose was to develop subsidies and southern references for the construction of decolonial curricula for the training of pedagogues.

As for the methodology, we emphasize that in the decolonial perspective, the methodology does not precede, but is processed in the act of the experience itself. Thus, the instituting experiences of curricula of the Ixil University (Guatemala), the University of Antioquia (Colombia) and, in the Brazilian context, the Federal University of Recôncavo Baiano and the Bento Gonçalves Campus of the Federal Institute of Rio Grande do Sul – IFRS were investigated. The collection and production of data was carried out through information on websites and bibliographies, as well as in the author's experience in the Structuring Teaching Nucleus of the IFRS Pedagogy course. The participant research and the bibliographic research served as a methodological basis. Works by decolonial authors underpinned the research.

The data analysis indicated the following results: a) a decolonial training curriculum is based on the foundations and epistemological principles others produced through participatory research rooted in Mother Earth; b) this curriculum is composed of a flexible and intercultural dynamic, seeking the emancipation of the subjects through possible inter(trans)disciplinarity, with problematizing teaching action shared with the community and the use of dialogical and horizontal methodologies. In this way, an "other", decolonial

formation is sought, rooted in the experiences of peoples and cultures that (con)live in interculturality and pluriversality.

From the question "are there decolonial teacher training curricula?" we reflect on teacher training curricula in Pedagogy courses in the context of Abya Yala. The bibliographic, descriptive and qualitative research gathered documents and information available on the websites of educational institutions in three countries, Guatemala, Colombia and Brazil. The institutions were defined after investigation in different courses that are closer to decolonial thinking, even though this perspective is not explicit in the researched documents.

This text aims to reflect on experiences of teacher training in Pedagogy courses from a decolonial perspective.

DECOLONIAL THINKING AND THE CURRICULUM

Teacher training is one of the central aspects in a perspective of social transformation based on and based on education. What education? The one that has been marked by colonial thinking that detaches the knowledge studied from reality? Or the one that incorporates the cultural elements and knowledge of the original peoples? What knowledge is made available in schools in order to build identities that relate history, territory, and the way of working and living? Is there only one way of being in the world? In response to these questions, we point to decoloniality.

Decolonial thought emerged in the context of Abya Yala, in the 1990s, with the participation of social leaders, researchers, who understood that decoloniality is not only a political manifestation, but a deeper and more comprehensive subversion, which manifests itself in "[...] all power relations implied in culture, knowledge, education, mentalities and socioeconomic organization." (Mota Neto, 2015, p. 16).

According to Fuchs (2019, p. 56), decoloniality "[...] presents itself as a movement that has peculiarities and specificities characteristic of each locality and community that carries its histories, cultures, sacred spaces, worldviews, forms of power and organization of work and life".

Teacher training in a decolonial perspective develops research and produces "[...] knowledge in and with those involved in the investigative process in order to make them capable of understanding and transforming educational practices that simultaneously involve education, scientific research and political action." (Fuchs, 2019, p. 30). From this perspective, such research is based on ancestral epistemology and on the "[...]

organizations of work and community life based on a holistic horizontality" (Fuchs, 2019, p. 56).

Teacher training in the decolonial perspective presupposes knowledge – developed by unfinished human beings – that produces movements and meanings of life in the relationship between people and the world (Freire, 1997). But, training with what curriculum?

The curriculum of training for teaching, from the decolonial perspective, comprises

> a dialectical, pluriversal and multicultural movement that involves the relationship with spaces, leaders and elders, bearers of knowledge that is not captured by the colonial formation of books, encyclopedias and classes developed in buildings and closed rooms in which daylight only penetrates through small windows that provide a reduced look at reality." (Fuchs, 2019, p. 109).

A decolonial curriculum must incorporate culture, work, ethos, and the relationships between knowledge, providing opportunities for horizontal dialogues between the different historical subjects who build the worlds according to their ways of being and being. Decolonial teacher training understands the human being as an unfinished, inconclusive subject, who develops knowledge and movements that produce meaning in life in the relationship with other human beings and their territory.

Among the instituting experiences of teacher training, we opted for four curricular experiences that point to a decolonial movement, considering that we do not live in another world, but in this one marked by colonizing capitalism that reduces the environment, nature and the human being to mere resources that generate capital for a few.

The institute curricular experiences analyzed located in the Amerindian territory are the University of Ixil, in Guatemala, the University of Antioquia, Colombia, the University of Recôncavo Baiano and the Federal Institute of Education, Science and Technology of Rio Grande do Sul, Bento Gonçalves Campus. In these institutions, we seek to mine curricular elements that are close to a decolonial movement that is characterized by a rescue of ancestral epistemology and the organizations of work and community life supported by a horizontal holistic relationship". (Fuchs, 2019).

Decoloniality seeks

> [...] a self-organization of communities and the struggle for the maintenance of environmental structures that allow life in its entirety. An education is not sought to separate, rupture, fragment the human being from the environment in which he is inserted, aiming at the interdependence of different forms of life. (Fuchs, 2019, p. 56).

This movement is opposed to the curriculum whose organization was designed from Europe, which "[...] considers itself the civilizing, superior, developed center. The others are considered primitive, underdeveloped, the periphery." (Fuchs, 2019, p. 60).

The curriculum, according to Elizabeth Macedo (2006, p. 290), "[...] it is a hybrid formed by oblique plots of power [that] both strengthen certain groups and strengthen resistance. In both movements, which are part of it, they allow the difference to appear in the negotiation with the structures of violence and violation that (they) have produced." The curriculum results from a negotiated construction between different social groups.

The decolonial curriculum will be a movement of epistemological and cultural resistance in opposition to the colonial ideology based on reason that is articulated with the relations of power, knowledge and being white, macho, European, Christian that exploits, destroys and kills nature and life in its different forms.

METHODOLOGICAL ADHERENCE TO DECOLONIAL THEORY

Decoloniality has based its struggles on theoretical-methodological assumptions that seek to overcome the way of being in the colonial world. In terms of teacher training, are there experiences that point to a decolonial education? At this moment, we seek to point out instituting experiences of teacher training in the context of Abya Yala, based on curriculum documents and reports made available on websites.

Decoloniality should not be understood as a single movement, which emerged in the 90s of the twentieth century, but rather as a

> a movement that has peculiarities and specificities characteristic of each locality and community that carries its histories, cultures, sacred spaces, cosmovisions, forms of power and organization of work and life. There is no form of decoloniality, but all decolonial movements seek to reintegrate the environment with life in its various forms of manifestation and expression linked to the land. (Fuchs, 2019, p. 56).

As it is a movement that seeks to reintegrate the environment of life with the earth, teacher training must reinvent its curriculum and methodologies in order to reconnect the human being with history, culture and the forms of organization of society based on work and economy.

In the research in question, we sought to "[...] a methodology with a decolonial perspective [that] is based on the history of subalternized peoples and cultures through power relations established under epistemological and scientific principles strongly identified with European modernity." (Fuchs, 2019, p. 29). In this perspective, we used research and literature review and autobiographical narrative with qualitative analysis,

based on authors inserted in or linked to Abya Yala and documents and reports collected from electronic sites.

According to Mota Neto (2015, p. 6), the decolonial methodology expresses a subversion of "[...] all power relations implied in culture, knowledge, education, mentalities and socioeconomic organization". Thus, from this perspective, the methodology seeks to overcome the dichotomy between academic and popular knowledge, as it introduces other ways of relating knowledge, powers and beings, outside the Cartesian and colonial paradigm. In this sense, the research sought to reflect on epistemological, methodological and gnosiological aspects that point to the production of knowledge that leads to teacher training, especially pedagogues.

Next, we briefly present four experiences of teacher training in Pedagogy courses at universities in Abya Yala.

INSTITUTING EXPERIENCES OF DECOLONIAL FORMATIVE CURRICULA

As previously mentioned, the experiences of teacher training curricula in the decolonial perspective investigated are those of the Ixil University (Guatemala), the University of Antioquia (Colombia), the Federal University of Recôncavo Baiano and the Federal Institute of Rio Grande do Sul (IFRS) Bento Gonçalves Campus.

UNIVERSITY OF IXIL

The University of Ixil, in Guatemala, founded in 2011 by indigenous peoples and community leaders in the Maya Ixil territory, is characterized as a non-state formation, not recognized by the State. (UIxil, [2014]). The curriculum, defined through the participation of elders and the indigenous community, aims to train professionals who work in reality, considering the collective knowledge and experiences related to the land (Fuchs, 2019).

A Universidade seeks to train young people who have "[...] peasant pride and demonstrate to their parents that they can responsibly take charge of their land heritage, they collaborate mutually in their agricultural initiatives through the 'Xula'." (Sabas, 2016, n.p.). A "Xula" é "[...] An ancestral tradition in which the members of the community trocam trabalho agrícola entre sí. A "Xula" tem lugar sempre que um projeto é empreendido [...] Uma iniciativa pessoal é abraçada como uma responsabilidade coletiva" (Sabas, 2016, n.p.). The training curriculum includes three topics, namely: "Natural resource management (community management of the common goods of the population), food – agriculture as the material basis of the Mayan civilization, and young people with knowledge of Mayan Ixil law and national and international laws." (Sabas, 2016, n.p.).

This training aims to include men and women who do not have access to higher education due to economic conditions and the absence of public education, as well as to meet the principles and foundations of the Ixil worldview that are not studied in university curricula (Fuchs, 2019).

UNIVERSITY OF ANTIOCH

The course of "Pedagogy of Mother Earth", from the University of Antioquia, Medelín, Colombia, was approved in 2011, with the participation of ancestral leaders and contemplates the ways of being in the world that are founded in relations with Mãe-Terra. O visa course to form "[...] teachers leaders of the peoples and at the same time, teacher leaders with pedagogy and a good heart." (UdeA, 2018, n.p.).

The training curriculum is based on a methodology based on critical analysis and creative, participatory and intercultural resolution of difficulties. It proposes a broad dialogue, with intelligence and a sincere heart, within communities, neighbors, family, until it reaches the articulation of a worldwide movement in defense of the earth as a mother and allows new generations to bring new generations closer to other ways of seeing the world. In this way, decolonizing thought to find the roots, one's own face and in one's own marks and starting from the deep knowledge of the memory of ancestors to talk and feel the heartbeat and at the same time continue walking with good dreams for all the children of mother earth (UdeA, 2018).

Os profissionais formados devem ter uma "[...] a comprehensive, intercultural and community vision that participates in the construction of public policies and local development strategies for indigenous communities and society in general, always in defense of Mother Earth" (UdeA, 2018, n.p.).

FEDERAL UNIVERSITY OF RECÔNCAVO BAIANO

The Pedagogy course at the Federal University of Recôncavo Baiano presents a curriculum focused on local cultural characteristics and seeks to develop "methodological and curricular actions and articulations that do not fit into scientific and academic standards and paradigms in a traditional and conventional way" (Fuchs, 2019, p. 32).

The context, in terms of training, requires a curricular proposal that dialogues with the reality and local and regional needs. To this end, the curriculum considers

> pedagogical work as a meaning of training; the emphasis on a solid theoretical training; research as a form of knowledge and intervention in social reality; shared and collective work through shared teaching; interdisciplinary work; the theory-practice articulation and curricular flexibility (UFRB, 2008, p. 4).

The curriculum is composed of two axes, namely, 1) Research, New Technologies and 2) Pedagogical Praxis. This is because "[...] teacher training in contemporary times has demanded a differential that permeates the involvement of research as the axis of the teaching and learning process in the constitution of the curricular matrices of the Teaching Degree courses" (UFRB, 2008, p. 2).

These two axes transversalize the curriculum and provide opportunities for the experience of research and teaching action, seeking to connect the "world of the subjects, their desires, limits and potentialities" (UFRB, 2008, p. 7). The research seeks to overcome colonial relations and structures that materialize through knowledge produced by men, Europeans, whites, heterosexuals, Christians and that brings, as a consequence, "a decontextualized, superficial education, which tries to find hooks to connect and establish a monologue about the past, the present and the future" (Fuchs, 2019, p. 130).

FEDERAL INSTITUTE OF RIO GRANDE DO SUL

The Pedagogy course at the Bento Gonçalves Campus of IFRS, in turn, starts from the understanding of the human being as a "[...] unfinished, socio-historical subject, guided by labor relations, in permanent construction, immersed in the diversity and complexity of society and cultures". (IFRS, 2018, p. 22).

The curriculum is based on an ethically committed and inclusive education that respects differences, defends interculturality, guarantees public, free and quality education for all and integration with the school community (IFRS, 2018).

Interculturality, according to Silva (2006, p. 145), "[...] potentially reveals itself as an intervention project to be built intentionally". It is a strategy, an action and a permanent process of tension between political, social, ethical and epistemic projects and the power devices that maintain "[...] inequality, inferiorization, racialization and discrimination". (Walsh, 2012, p. 66).

The curriculum of this course presents some challenging curricular components for teacher training in a decolonial perspective, such as: Education and Ethnic-Racial Relations, Education, Gender and Sexuality, Integrative Project: Integral Education, Health and Body, Guided Reading and Seminar.

The interdisciplinary activity is included in the syllabus of each curricular component. Interdisciplinarity, according to Fazenda (2013, p. 21), becomes an act of "[...] boldness of searching, of research: it is the transformation of insecurity into an exercise of thinking, into building".

Teacher education requires a collective and intentional effort to build curricula and methodologies with other epistemological bases in which lives are interconnected and interdependent.

Having presented the experiences, we ask: what can we infer from these four decolonial theoretical-methodological proposals?

ANALYSIS AND DISCUSSION OF THE RESULTS

Castro-Gómez (2007), when analyzing the role of the university, points to two main functions, namely: the epistemological and the vigilant of the legitimacy of knowledge. In the first function, it is up to the university to demarcate the difference between legitimate knowledge and other knowledge. In the second, to monitor and guarantee the limits between useful (doxa) and useless (episteme) knowledge. This useful knowledge is related to "[...] industry, [the] mechanical, automated, robotized work, which makes the human being an appendage of the machine." (Fuchs, 2019, 156). In the studies carried out, we point to ruptures in this colonial conception of university.

The Ixil University, located in the Maya Ixil indigenous territory, is an institution not recognized by the Guatemalan State, as it does not adapt to the colonial requirements and standards of training. The institution does not train pedagogues, but offers courses "[...] focused on the insertion and transformation of reality based on original knowledge and community leaders". (Fuchs, 2019, p. 84).

The training curriculum is based on

> in the wisdom of the elders, religious leaders, community leaders, in the economy, in religiosity, in social organization, in the participation of the community in the process of initial formation until the final one, when an academic work is presented with a proposal for a solution to a social problem in the presence of leaders and other members of the community. (Fuchs, 2019, p. 85).

The University of Antioquia, in the Pedagogical Project of the course of "Pedagogy of Mother Earth", in addition to the participation of representatives of the indigenous communities, emphasizes the research, the intervention in reality and the objective of forming "[...] teachers leaders of the peoples and at the same time, teacher leaders with pedagogy and a good heart." (UdeA, 2018, [p.s.n.]). This course understands that human beings and all forms of life are part of the creation of "Mother Earth", "[...] the planets, the stars, the animals, the trees, the rivers, the air, the rain, because she is the protective mother of all that is dreamed and all that is created, we live in her and for her." (UdeA, 2018, [p.s.n.]). The course has the objective of training professionals with "[...] a comprehensive, intercultural and community vision that participates in the construction of

public policies and local development strategies of indigenous communities and society in general, always in defense of Mother Earth." (UdeA, 2018, [p.s.n.]).

The University of Recôncavo Baiano has campuses in different areas of the Bahian territory. The Pedagogy course analyzed is located at the Amargosa Campus, 140 km from Salvador. This course presents research and pedagogical praxis as founding principles of education, articulating itself in thematic axes that

> will transversalize the entire curriculum, enabling the graduate of this course to experience the practice of research and teaching action in its various modalities (teaching and learning in early childhood education, initial grades of elementary school, teaching and learning of pedagogical subjects, education management, performance in social movements). (UFRB, 2008, p. 2).

Through this articulation, trained professionals will be able to question their reality and – dissatisfied with it, linked to research and teaching – collectively produce and systematize knowledge through the experience of the processes of action-reflection-action, providing opportunities for the transformation of reality. (UFRB, 2008).

The Pedagogy course at IFRS, Bento Gonçalves Campus, in its Pedagogical Project, presents a proposal for interdisciplinary training, involving the different curricular components of each class in each semester. It also presents in its curriculum, themes such as gender, sexuality, ethnic-racial relations, guided readings and seminars that provide opportunities for studies and reflections that seek to overcome the colonial thought marked by being white, European, sexist that "[...] that produces a world that exploits, destroys and kills nature and the human being that is not equal to that one." (Fuchs, 2019, p. 19).

The analysis of the curricular proposals of the Pedagogy Course of the four higher education institutions at Abya Yala provided the opportunity to elaborate a decolonial framework in order to systematize some elements that lead to a Pedagogy curriculum, seeking to overcome the colonial paradigm of education. Fuchs (2019, p. 183) states:

> The decolonial teacher training curriculum involves community organization, participant research, interculturality, trans/inter/disciplinarity, teaching, and horizontal dialogic methodology. This curriculum is open to new creations. It is not closed and not entirely predictable. There is no beginning or an end in this curriculum, but a wheel, an intertwined and interconnected thread that moves specific training in the area of pedagogy.

In this sense, a teacher training project in the decolonial perspective implies finding possible paths and gaps in the instituted curriculum, making it instituting, with the insertion of inter/trans/disciplinary curricular components. Thus, our reflection includes "[...] the teacher training process, the articulations between the curricular components and the

educational practices and their respective methodologies with a view to another training of pedagogues." (Fuchs, 2019, p. 181).

From the above, we can affirm that the curricular proposals for teacher training analyzed seek to implement a training path that values knowledge and practices based on local historical knowledge. Despite the limitations and challenges faced, the institutions seek to "[...] to provoke epistemological and methodological ruptures that point to the South and its multicultural and intercultural diversities and pluriversities." (Fuchs, 2019, p. 159-160).

CONSIDERATIONS IN PERSPECTIVE

We have reached the end. An inconclusive ending, because we continue to think; Because unfinished is the process of transforming reality and because incompleteness seems to be the trademark in the DNA of humans. We continue to look to the future – with a perspective!

From the analyses we can perceive movements that seek to follow other paths for teacher training, decolonial, utopian, fed by hope and faith in the capacity of human beings to produce living conditions and solidary forms of education and economy. There is knowledge that leads to a society of autonomous subjects, free and at the same time interdependent and interconnected with cultural diversity.

Teacher training based on the decolonial movement becomes feasible and overcomes the Eurocentric curricular monoculture that links the capitalist economic model that seeks to impose an organization of society constituted from the race/ethnicity conception.

The analysis of the proposals points out the following main results: a) the construction of decolonial pedagogical projects requires a critical, intercultural and participatory attitude; b) proposals for decolonial teacher training imply community organization, participant research, interculturality, trans/inter/disciplinarity, teaching and horizontal dialogic methodology; and c) decolonial pedagogical proposals prepare subjects to understand, intervene, transform and change the reality in which they live.

In fact, we conclude that: a) a decolonial teacher training curriculum starts from the foundations and other epistemological principles produced through participatory research rooted in Mother Earth; b) the decolonial curriculum seeks the emancipation of the subjects, through a different education based on the experiences of peoples and cultures that coexist in interculturality and pluriversality; c) decolonial pedagogical proposals provide opportunities for the formation of critical citizens and activists in search of a world of good,

dignified and fair life for all; and d) there are possibilities to build teacher training curricula that are interrelated and interconnected with the socio-historical reality within the cultural diversity that characterizes Abya Yala.

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IDEOPOLITICAL PROJECTS IN DISPUTES AND THE REPERCUSSIONS ON SOCIAL POLICIES: THE ADVANCE OF THE NEW RIGHT AND THE SUBTRACTION OF SOCIAL RIGHTS

https://doi.org/10.56238/sevened2024.031-081

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ABSTRACT

The social democratic project of the labor parties resulted in reforms in social policies. From 1980 onwards, with the global capitalist crisis in the 1970s, the so-called New Right ascended, which subtracted labor and social rights and gave rise to a part of this so-called New Right to become extreme in conservatism and ultra-neoliberalism. The objective of this article is to analyze the repercussions on social policies of the different ideo-political government projects, pointing out the challenges of rowing against the neoliberal tide for governments of class conciliation in Brazil. It is an analytical and qualitative research, based on literature intentionally chosen to meet the proposed objectives. The method of exposition begins with the first session that conceptually addresses the denomination of the emerging New Right until its sharpening in extreme right-wing groups of a religious, military and neoconservative nature. In the second, it analyzes the New Right in Brazil and after 2016 its far-right expressions with the government of Jair Bolsonaro and the counter-reforms implemented. In the last session, we problematized the possibilities of the return of neo-developmentalism and a government of class conciliation, its challenges and possibilities.

Keywords: Neoliberalism. Extreme Right. Social Policies.

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INTRODUCTION

Since the end of the nineteenth century, the new stage of imperialist monopoly capitalism has surpassed the previous model of free markets. The demands of monopoly capital and workers organized in unions and political parties gave rise to the so-called social state, initiating a cycle of reformist public policies, of inclusion based on citizenship and social rights that remained unchanged until the early 1970s. However, with the global crisis of capitalism in the second half of the 1970s and the exits from the crisis led by the bourgeoisie and the State, the so-called New Right was born, a kaleidoscope of proposals that has in common the defense of neoliberalism and neoconservatism (Pereira, 2016). Therefore, contrary to the labor parties and their coalitions, they assume the defense of individual and economic freedom, free markets, with less participation of the State in the provision of policies and services, reduction of social and labor rights that increased public spending and hypertrophied the State.

Thus, the collective search (bourgeoisie and its organic intellectuals, such as the IMF, World Bank, European Union, among others) for an answer to the economic, political and social crisis of the bourgeois order and the supposed crisis of the social state, provided the necessary subsidies for the construction of a variety of ideologies contrary to the social state anchored in the universality and equity of social policies. Despite their oppositions and theoretical variations, they united around a common ideal: criticism of the interventionist model of the State put into practice in European democratic regimes and which spread to all continents with greater or lesser strength and funding, uncontested defense of neoliberalism and neoconservatism in social values. The specificity that guarantees the differences of this right in relation to the previous ones is that the values and political positions are not anchored in the old aristocratic pre-capitalist social order and that they differed from the liberals, called modern and progressive.

The New Right has expanded neoliberalism in the West and after three decades of neoliberal policies in the US, the European Union, Latin America, among others, the discourses have become radicalized and emerge as part of this New Right, the extreme right, which has been spreading throughout the West, based on the neoconservatism of traditional customs and values and ultra-neoliberalism [i]authoritarian, anti-democratic, neo-fascist. How is this trend expressed in Brazil? What are the repercussions on social policies and social and labor rights? These are some of the problematizations that guided the bibliographic research and that led us to the qualitative approach of intentional choice of references to give answers to the problematizations raised.

The exposition of the theoretical foundation and the results are divided into three sections: the first, the subsumption of the neoliberal, the political direction that expanded it, the so-called New Right that, after four decades, opened possibilities for the extreme right to rise to power and spread its worldview. In the second, the advance of the extreme right in Brazil is discussed, via counter-reform in social rights, bringing to the debate how the extreme right in Brazil was personified in the government of Jair Bolsonaro and contributes to the counter-reform process that triggered the dismantling of social policies and the subtraction of social rights. In the last session, the challenges and possibilities of the resumption of neodevelopmentalism in Brazil with Lula's third government are discussed, in the face of a country in ruins left by Bolsonaro and the advance of neoliberalism as a superstructure.

THE EMERGENCE OF THE NEW RIGHT, EXTREME RIGHT AND THE RECONSTRUCTION OF THE REGULATORY AND PROTECTIVE STATE OF THE MARKET

At the outset, it is important to highlight that the history of the capitalist mode of production can be told by a succession of crises inherent to this mode of production which, unlike other moments of humanity, do not constitute crises of scarcity, but crises of overaccumulation, when capital exists in excess and thus cannot realize your profit expectations. (Brandt; Cislaghi 2020).

The response of the ruling class to the crisis of capitalism is differentiated by the choices of the best strategies for new investments and expanded reproduction of capital. The crisis of 1930 gave rise to the Fordist/Keynesian model of the interventionist welfare state to guarantee the expansion of capitalism in the stage of the export of capital, goods and transnational corporations. This stage or model of monopolistic and imperialist accumulation gave rise to the social state, pressured by the struggles of the workers and the expansionist project of capital, therefore, the reformist era, progressive within the capitalist order to guarantee its legitimacy

The crisis of the 1970s, also a crisis of overaccumulation, when the demands for hypertrophied insertion of the State had already been exhausted, since new forms of accumulation were needed, both financially and in the area of services. In this context, a hypertrophied State, now called bureaucratic, excessive spending, generator of paid leisure, lack of love for work and individual and family lack of responsibility for their life trajectory and coverage of social risks, was no longer of interest. Neoliberalism has a timid but powerful beginning in England, the USA and Chile. It is driven by the dictates of the

Washington Consensus for Latin America and Eastern Europe. But, after the financial crisis of 2008, it became the "new reason for the world" (Dardot; Laval, 2016), called by Marxists the superstructure (legal, political, ideological and cultural) of the flexible, globalized and financialized accumulation model.

However, according to Lacerda (2019), the neoliberal turn to recover from the crisis of capital accumulation began to require a new hegemonic project that was the paradoxical alliance between neoliberalism and neoconservatism. The neoliberal rationality aimed at satisfying the expanded needs of the market, commodification, individualism, which collides with the rationality of collectivity, the decommodification and de-familiation of the previous stage, that is, social and labor rights.

The New Right and the conjunction between neoliberalism and neoconservatism, according to Pereira, (2016), although the union seems paradoxical. And this paradox is explained by Brown (2023) when he states that neoliberalism and conservatism are convergent political ideas in several ways, as both are anti-democratic, are based on the order generated by markets, defend a lean, smaller State without interference in the natural order of free markets; they act against political freedom and equality among citizens, because they consider natural inequalities necessary, and there should be individual freedoms and merely formal equality; Traditional values must prevail such as private property, traditional family and good customs. For the aforementioned author, neoliberalism transforms collective problems into individual problems with market solutions and defends the statism of the company model, in which democratic norms are replaced by criteria of efficiency and profit. Neoconservatism, on the other hand, prepares the ground for the authoritarian characteristics of neoliberal governance because the political-religious discourse allows for the mobilization of a submissive citizenry.

New Right also characterizes the parties that emerge in Eastern Europe, following the experiences of socialism and the defense of markets, traditional values, trade openness, and financial deregulation. Thus, it differs from the aristocratic and pro-Ancien Régime conservatives, the Bonapartists, fascists, Nazis, another right-wing tendency, but anchored in nationalism, in racism. The current New Right is neoliberal and neoconservative.

According to Brown (2023), neoconservatism is partly a response to the erosion of morality in state-planned capitalism, the inclusion of minorities through policies of quotas, equity, and universality, which mean the expansion of collectivist values of socialism and communism. Neoconservatism is about filling the void left by the social state, now with rigid moral values, not of the previous order, but of the new bourgeois order, which emanates

from free markets, natural hierarchies, opposed to communism, income distribution and social democracy.

Harvey (2005) calls this current stage of financial capitalism the model of accumulation by dispossession, which expropriates common lands or common goods, such as social policies that are precarious or privatized; state assets; of nature, indigenous lands, water, energy, communications, everything that was previously state-owned. The expectation is that all forms of collective solidarity will be dissolved in favor of individualism, the market, and private property. The resumption of personal and family responsibility is used to justify cuts in public spending, focusing on the extremely poor in state intervention, privatizations and the reduction of social and labor rights.

In the same sense, Lacerda (2019, p.52) understands that the "anti-statist ideology, founded on white supremacy, the defense of the patriarchal family, and Protestant fundamentalism" supports the dismantling of welfare policies that are of interest to a large part of the population. In the words of Lacerda (2019, p.58),

> [...] neoconservatism is a political movement that has forged a privatist ideology (it defends the predominance of the private power of the family and corporations), anti-liberal (in favor of public interference in aspects of personal life), neoliberal (against state intervention to reduce inequalities), conservative (articulates itself in relation to the welfare state, the feminist and LGBT movement) and right-wing (opposes demand movements that seek greater equality of rights).

What can be understood from the author is that neoconservatism is a set of preferences, a way of thinking, a mentality linked to militarism, free market absolutism, Christian values, hatred of gender, class, race. In this key of thought, Brown (2023, p. 16) states that "neoliberal rationality prepared the ground to mobilize and legitimize fiercely anti-democratic forces in the second decade of the twenty-first century". And so the author describes,

> [...] the composition of the [...] far-right (white authoritarian nationalist political formations) is due to the instrumentalized anger of economically abandoned and racially resentful individuals, but also delineated by more than three decades of neoliberal assaults on democracy, equality, and society (Brown, 2023, p.17).

Thus, after four decades of anti-democratic neoliberal policies, it created favorable ground for sectors of the New Right to become even more radicalized, with the emergence of the extreme right. The adherents of the extreme right, defenders of individual freedoms, are frontally opposed to social policies of a universalizing nature, because they generate laziness, lack of love for work, family and individual responsibility, that is, social democracy, but they are also authoritarian and anti-democratic, because, for them, democracy must be

strictly liberal, vote and be voted for, giving a blank card to the rulers. The traditional values arising from the bourgeois order must emanate from this order and do not need the interference of the State, except for their guarantee.

However, the extreme right is not against the interference of the State, however, it must have the function of restoring moral and traditional authority, as well as safeguarding the market from its free action and helping it when it needs it. It is also in favor of public social protection, via minimum income cash transfer, with conditionalities for the strictly poor, leaving the others to satisfy their needs in the market.

According to Pereira (2020), in the face of social demands, the government on the extreme right acts on 3 fronts:

> [...] The first co-opts and mischaracterizes social movements in their anti-capitalist struggles, transforming them into a representative identity struggle. The second refers to a double meaning, on the one hand it exalts the individual and his freedom and on the other hand, it weakens the real possibilities of mechanisms of popular and democratic participation; or any other form of social participation modality; and third is that, through a rational discourse and arguments, the opposition to social protection is committed to meeting social needs, as they confuse human needs with individual demands, since they believe that the State cannot offer solutions to individual demands. (Pereira, 2020, p131).

For the extreme right, the interventionist State is inefficient, unable to reduce poverty and the deviant behaviors that result from it, since not all social problems should be faced, since some are considered natural and spontaneous, at the same time everything that is not essential for the proper functioning of capitalism is considered individual failure and the entire responsibility of individuals, incompetent, maladjusted, to whom the State should not commit itself and whose solutions should be sought in their families, communities and markets.

In Brazil, the New Right emerged with the governments of Color de Melo, Itamar Franco and FHC and aimed to insert the country in the era of globalization, flexible accumulation and expand the neoliberal ideology and its counter-reforms. It was interrupted for thirteen years by the PT governments, called neodevelopmentalism, a Brazilian version of social democracy of class conciliation. This conciliation, however, since 2013, was no longer of interest to part of the national bourgeoisie, which orchestrated the coup with the support of the PMDB, a center-right party, which took over executive power in 2016.

In the US, the extreme right ascends with the Trump administration, with an anti-immigration policy, which mobilized conservatives. In the European Union, right-wing, conservative parliaments and prime ministers predominate in some countries. Even in social democratic countries, there are supporters of far-right parties for their anti-

immigration discourses, active labor policies, reduction of public spending, among others, even if they do not have ascension to the executive.

In the Brazilian context, the example of the extreme right that lit up the executive from 2019 to 2022 was the government of Jair Bolsonaro and even today it has the largest benches in the Senate or in the Chamber of Deputies, with defense of conservatism in values and exacerbated or classical neoliberalism.

THE ADVANCE OF THE EXTREME RIGHT IN BRAZIL AND THE NEOLIBERAL COUNTER-REFORMS OF SOCIAL POLICIES

The effects of the 2008 crisis began to be felt in Brazil in 2014 and the re-election of Dilma Rousseff, with a small margin of difference in the vote, ended in the parliamentary, legal and media coup articulated by representatives of the bourgeoisie former allies, including Michael Temer, her vice president, who took over the government and remained until the 2018 elections. despite the records of unpopularity.

The coup government of Temer, in a logic of return to neoliberalism, now under the sign of ultra-neoliberalism, which expresses the radicality of fiscal adjustment, manages to approve the Constitutional Amendment, n.95/2016 that established the ceiling of primary spending, which froze for 20 years any real increase in resources for public policies in the Union budget, representing a qualitative advance in the permanent fiscal adjustment that has marked the neoliberal economic model in Brazil since the end of the dictatorship (Behring, 2008). In addition, it approved the Labor Reform that subtracted rights conquered by the working class, paving the way for the acceptance of an ultra-neoliberal discourse anchored in traditional values.

Thus, from 2016 to 2022, we were under a coup d'état of a new type (Demier, 2017), no longer military, by the armed forces imposing a new State, but in its modern version, in the name of the law and which has at its core the deepening of fiscal adjustment, called the New Fiscal Regime. This classic perspective of neoliberalism returns in an aggressive, anti-democratic and authoritarian way driven by hate speech against those who are different and opposed.

The rise of Bolsonaro, from the far-right liberal party, is due to two important political factors, according to Cogiolla (2020): the first was the impeachment and imprisonment of former President Lula, with the firing of *fake news* against the PT and PC do B slate; and the second was the failure of the Temer government and the right-wing parties to impose a governmental change in their favor, which expressed the advance of the armed forces or a military representative and the recovery of their political power. Jair Bolsonaro's victory for

the presidency of Brazil had the effect of an international bombshell, put the country in political commotion, and the consequences of the extreme right in power began to be discussed all over the world.

In the first months of Bolsonaro's government, he dismantled the mechanisms of democratic participation of civil society in the deliberative bodies, through the extinction of several councils and other collegiate bodies, many of these councils and collegiate bodies have essential attributions for the execution of important public policies. This implies constitutional non-compliance, since the councils are deliberative collegiate bodies provided for in the Magna Carta, and are instances of democratic control, which ensure the citizen's participation in democracy. (Pereira, 2020). Showing the anti-democratic, or restrictive, face of democracy of that government.

The greatest achievements of this government in the ultra-neoliberal and neoconservative logic were the conduct of economic policy according to neoliberal principles; the counter-reform of Social Security, which subtracted social rights by extending the contribution time and retirement age. It represented the attempt to approve a model of capitalization and reduction of welfare benefits in this policy that fortunately were not approved.

Added to the context of counter-reforms such as the cuts in the Social Assistance Policy, came the Covid 19 pandemic, with serious health and economic effects, but the option for the economic had consequences in the concentration and centralization of capital and thousands of lives reaped. The worsening of social inequalities becomes visible in the mortality, aggravation and illness in the pandemic, as social distancing and sanitary measures to reduce contagion could not be followed by the poorest, due to precarious conditions of water supply and sewage, housing conditions, precariousness of bonds and working conditions and expansion of unemployment, increase in the price of food. According to data from Oxfam (2020), the pandemic has meant an increase in inequalities between social classes and a deep concentration and centralization of capital, to the detriment of small businesses.

It should be noted that, even with the inflection of the Covid-19 pandemic, with greater incidence in the first two years (2020 and 2021), there was no retreat in the ultra-neoliberal agenda, which combined with the health crisis, with catastrophic results, assuming the profile of mass genocide and which affected, above all, the working class in its most impoverished sectors, based on a discourse that submitted the defense of life to the economy.

Despite this, some protection measures were adopted, albeit belatedly, after a movement of struggles and demands, such as the purchase of vaccination and the creation of an assistance benefit for the poorest, called Emergency Aid (AE), with the purpose of guaranteeing a minimum income to the most affected Brazilians during the pandemic of the new coronavirus, the AE was aimed at informal workers over 18 years of age, whether or not they contributed to the INSS, who did not receive any other benefit from the Federal Government (with the exception of the PBF).

According to Junior, Miguel and Filgueira (2023), the balance of the four tragic years of the Bolsonaro government, which can be summarized by the following facts: attacks on the institutions and foundations of the Democratic Rule of Law; rising unemployment, falling income and increasing poverty and hunger; deterioration of international relations and the transformation of the country into a pariah; denialism in the management of the pandemic, which led to almost 700 thousand deaths from Covid-19; fires and record deforestation of the Amazon rainforest and attacks on indigenous peoples; successive cuts in the budget of universities, threats to teacher autonomy and intervention in various institutions; dissemination of a culture of hatred and violence in schools; criminalization, censorship and lack of investment in culture, social sciences, among others. (Rocha, 2021).

The extreme right represents in the Brazilian context, according to Pereira (2020), as an alternative to the crisis of capital that peaked in 2008 and is perpetuated, its basis of action is the fight against systemic corruption, the implementation of a new policy that is not based on agreements, among others. However, led by "good men" and "family" accompanied by beautiful demure and housewife women, with a fallacious but charming discourse that associates the military, businessmen, and the market with honesty, a firm hand, discipline, and correctness" (Pereira, 2020, p.119), they devastated the country and its economy by setting prices at the world market price, dominated by big financialized capital.

In this way, the far right takes hold of a strong material base and sustained "by fire and sword by socially predatory and politically demobilizing political practices, guided by the competitive logic of the market that submits everything, including the power of the State" (Pereira, 2020, p 121) as a result of such practices, the growth of unemployment, the prevalence of precarious and unprotected work and the high growth of social inequality.

It is for this reason that the rule of law, which this party claims to respect and strengthen, but in a minimal State dimension, "has never been minimalist", on the contrary, it is "intrusive, it intends to curb nonconformity and collective action, resulting in the

criminalization of social movements or any collective action that threatens the status quo of the neoliberal State. (Pereira, 2020)

The balance sheet of these center-right and far-right governments, however, demonstrates that their real effects fell far short of the expectations of their social bases. On the contrary, the maintenance of economic policies to sustain ultra-neoliberalism only guaranteed small economic advances, which further concentrated income and increased social inequalities. The new policy was actually fake news, as it always used the agreements with the center under the aegis of corruption.

III LULA'S GOVERNMENT: IS IT POSSIBLE TO RETURN TO NEO-DEVELOPMENTALISM AND CLASS CONCILIATION?

According to Santos (2024) in relation to the Lula government, the expectation is that this third term of Lula will be oriented towards the reconstruction of many of the management capacities of the public machine, which were weakened in the previous term. So, the evaluation of this first year of Lula's third term must consider some obstacles and challenges generated by:

1) the legacy of the previous period (economic austerity policies, the Covid-19 pandemic, and the outbreak of the Ukraine War); 2) the electoral expansion of the extreme right around the world in recent years; 3) the limits of building coalition governments, which had their greatest crisis in 2016 (Santos, 2024, p.38)

By coalition governments we understand, the Brazilian system of government, which emerged from the 1988 Constitution, came to be called Coalition Presidentialism – an expression of the political scientist Sérgio Henrique Abranches (1988) – precisely because of the way the president needs to behave before the National Congress, that is, it affects several choices of the president, such as the appointment of his team of ministers, for instance. It is a political-institutional arrangement that is due to the act of closing agreements and making alliances between political parties and political forces in pursuit of a specific objective.

It is the way in which the Executive Branch in Brazil conducts public administration, distributing administrative posts in search of political support and the formation of a parliamentary majority. In this sense, we can understand that, for a government to be able to put its government agenda into practice, it is necessary to create a base of support, of support, in the Legislative Branch. Through Coalition Presidentialism, it is possible to see the union of several parties in favor of a government agenda that can benefit the population as a whole.

However, Branches (1988) refers to the negative points of Coalition Presidentialism, which is that this system has a much more strategic role for parties and representatives than for the population itself. The formation of a coalition occurs so that a certain candidate or party wins the presidential elections and that others win positions in this government. The population, in this case, is not in the foreground, there is still the constant imminence of crises: if the Executive has a President who is not very skilled in the art of negotiating, it may have its governability reduced. Although the Executive has the power to set the agenda and has the constitutional competence to legislate, the Legislative has in its hands the power to vote on projects of interest to the government, and may hinder the execution of public policies by not voting on their projects. Therefore, Coalition Presidentialism can generate instability in the country's political order.

That is why, when the Lula government began, we once again witnessed: the left elected the president of the Republic, but it is unable to put into practice the fundamental aspects of its political program, in particular its economic agenda, clearly explained by Lula throughout the electoral process. This finding is nothing new in relation to previous governments, including those of Lula himself, who operated through a singular "coalition presidentialism", in which the Executive guarantees support and approval for its projects by distributing funds, ministries, and positions of influence in federal state agencies to parliamentarians (Miguel, 2022). Thus, at the beginning, the conjuncture then presented contradictory circumstances that were quite different from those existing in previous PT governments.

Also according to Miguel's (2022) analysis, the author identifies elements that hinder the constitution of a "progressive" government (more to the left) – the deconstruction-rigging of fundamental state bodies by the Bolsonaro government, the disorganization of public finances, the ever-present pressure from the "market" to carry out a permanent fiscal adjustment, the aggressive action of Bolsonarism to permanently block any government initiative, and the government itself underrepresentation of the left, already mentioned, in the National Congress.

The extreme right, in its (neo)fascist and ultra-neoliberal strands, was already showing signs that it would bring challenges to the government. This is one of the characteristics of the "crisis of democracy", as identified even by the most conservative Political Science: the absence of moderation of an opposition that is willing to overthrow the government at any price, the contempt for the tacit rules of political dispute, the effort to keep tension always at a very high level, in order to produce failure in state management (Miguel, 2022).

It is a singular situation, a different game from the one played in Lula's two previous terms: to contain the government, to empty its transformative impetus, to force it to compromise with the status quo, the attempt to destroy it, to prevent it from actually exercising the task for which it was elected, that is, to govern in progressive ways, to return to neo-developmentalism, that is, economic growth with a social policy of social inclusion.

Even before the new government took office, dissatisfied with the transition PEC, which proposed the permanent withdrawal (or during the four years of the Lula government) of the resources of the new Bolsa Família from the "spending cap", they actively acted to dehydrate it, managing to reduce its scope to only one year. The objective of this PEC, indispensable for the exercise of minimum governability, was to make room in the budget for other priority social expenditures and public investments.

At the beginning of the government, the discursive tactic was that the Lula government should be a government of the broad front that elected him. But, in fact, they accepted an eventual broad front government, but subordinated it to the neoliberal playbook. Thus, they rhetorically recognize the inequality, poverty and hunger that exist in the country, but they are not willing to confront them, because for them (national bourgeoisies associated with foreign financial capital and their organic intellectuals) the budget has to continue to be subordinated to financial capital, prioritizing the payment of interest on the public debt. In short, permanent fiscal adjustment should be the priority of the "broad front government" (Santos, 2024).

It should be considered that Lula owes his victory, mainly, to the poorest population in the country (who earn up to two minimum wages), and that he expressed himself in other social segments (women, blacks and LGBT) and regionally (Northeast) massacred, disqualified and stigmatized by the previous government. Its campaign was directed, fundamentally, to respond to the needs and demands of these segments: the fight against hunger (with emphasis on a new, much more robust Bolsa Família); the real increase in the minimum wage; the recovery of funding for school meals and popular pharmacy; the resumption of housing policy aimed at low-income families; the return of public investments and the defense of policies to protect the rights of "minorities".

Even in the face of the challenges faced at this juncture, we can consider and point out some significant advances in the economic aspect we have: increase and appreciation of the minimum wage above inflation, classified by Lula as "untouchable", the policy of valuing the minimum wage has positive effects not only on the lives of workers and retirees but also on all categories; inflation under control; record increase in the average income of

workers; lowest unemployment rate in 10 years; record number of employees; stability in fuel and food prices, among others.

In relation to social policies, it has already promoted the rescue of 24 million Brazilians from food insecurity through the increase of social programs, including the Acquisition of Food from Family Agriculture (PAA); the record number of beneficiary families in the Bolsa Familia which, after the previous government's attempts to dismantle it, has returned to being a fundamental pillar of the federal government's social protection network. With the inclusion of more than 200 thousand families, the program had a record reach in June 2024, of 21 million families, with a budget of R$ 14.23 billion and an average value of R$ 683.75 per family from the 12% increase. In health, it expanded the More Doctors Program, which in 2023, reached more than 25,400 professionals, an increase of 105% compared to 2022. The goal for 2024 is 28 thousand active doctors. 86 million people are benefited by the program and 744 new municipalities are now served.

In education policy, the current government implements full-time school and readjustment of school meals - one of the greatest cruelties of the Temer and Bolsonaro governments was the freezing of the value of school meals, which was promptly revised by Lula at the beginning of 2023, with a 39% increase in the amount transferred by the federal government, which went from 36 to 50 cents per day for each student enrolled in basic education in the public network, in addition to indigenous and quilombolas, children in preschool and daycare centers and students in full-time schools. The program aims to increase full-time vacancies, offering working hours equal to or greater than seven hours a day or 35 hours a week, with investments that should reach R$ 4 billion by the end of 2024, and R$ 12 billion by 2026, with the forecast of 3.2 million new vacancies. According to the MEC, 100% of the states and 84.3% of the Brazilian municipalities have already joined

Regarding the tax burden, we are looking for new sources that do not burden the poorest, such as taxes on exported products. Exemption from income tax for those who earn up to R$ 2,824.00. The government guaranteed the exemption from Income Tax for those who receive up to two minimum wages per month from 2025, benefiting 15 million Brazilians. Until the end of his term, Lula guaranteed that he will exempt from the tax those who earn up to R$ 5 thousand per month.

In terms of economic development, it did not re-edit the acceleration of growth, the driving force of the previous neo-development, but it has already ensured the country's return to the ranking of the 10 largest economies in the world. Brazil was the seventh largest economy in the world between 2010 and 2014, during the PT governments. After the 2016 coup, it lost positions until it plummeted to 11th in 2022. With less than two years

in office, Lula has put Brazil back in 8th position in the ranking of the largest economies in the world, by the International Monetary Fund (IMF). The 0.8% GDP growth in the first quarter of 2024 resulted in a cumulative increase of 2.5% in the four quarters ended in March, which led Brazil to rise in position, overtaking Italy. This economic growth is the basis of the policy of class conciliation, which enables the acceptance of social policies by the dominants, but imposes the direction of the focus apart from universal policies, no longer desired by the bourgeoisie.

It should be noted that Lula won the election with the vote of the poorest, the Northeasterners, assuming the commitment to make a government that again focused on inclusive social policies for those who suffer the most from social inequalities. If the government fails in this basic commitment, it is not only Lula's political career that will come to a melancholic end or the PT that will suffer. A possible failure of the Lula government, as observed in the years following the legal-parliamentary-media coup of 2016 (Jinkings, 2016; Pinheiro-Machado; Freixo, 2019), will be the necessary fuel for the growth of the extreme right, which may have a great chance of returning to power, with or without Bolsonaro. It will reaffirm, for vast layers of the population, that democracy does not work, it makes the State and government impractical, leaving only to cede powers to the rulers who, in the name of effectiveness and efficiency, govern without relation to the people who elect them.

CONCLUSION

Although the capitalist state is always an "executive committee of the bourgeoisie", a "political structure of capital" of dominant interests, it is permeated by the class struggle, by the correlations of forces, by antagonistic interests. Thus, depending on the ideo-political project defended by the political parties of the rulers, it will imply in a different way public policies, especially those of a social nature, either opening a time of reforms or on the contrary a time of counter-reforms, because, instead of inclusion, they restrict access, make social policies precarious and privatize.

The reformist era is an exception in the current capitalist context, it depends on the conjunctures and political forces in each country. Since the crisis of financial capitalism in 2008, neoliberalism has been the only alternative to be followed, opening up possibilities for the resumption of ultra-neoliberalism, even more fierce in the logic of fiscal adjustment, of reduction of public spending, based on neoconservative discourses that spread hatred of those who are different and opposed.

In the context of the predominance of counter-reforms put into practice by the advance of the extreme right, the restrictive logic and the subtraction of rights is the norm to

be followed and accepted, legitimized. In the government of exception to this logic, it suffers from the deconstruction of previous governments and the national and international pressures to maintain fiscal adjustment, grow and develop the country at the margin of what is expected. The criticism of the government spending on ministerial structures and social programs. Thus, the challenges for the resumption of neo-developmentalism are enhanced.

What is in dispute today is the public fund, in which financial capitalism seeks a greater share, imposing restrictions on other expenditures, such as social spending. The restrictive logic of fiscal adjustment wants to equalize all governments regardless of their ideo-political affiliations, leaving with no way out those who are against interpreting social rights as spending and not investment. Therefore, with the fiscal adjustment, it is the social rights that the extreme right makes a point of neglecting and precarious through the offer of scarce resources that can barely cover selective social policies focused on the most impoverished. Achieving its ends of undermining state and universalizing public social protection.

The New Right, made up of neoliberal and neoconservative strands, put into practice neoliberal policies that undermined democracy and social democracy. Labor parties are at a dead end, but still making a difference by adopting more inclusive social programs, reducing the effect of the dismantling of the public structure of social rights, in Brazil, in the Federal Constitution of 1988. How long will they be able to resist? To have popular support and that of part of the national bourgeoisie?

In the model of accumulation by dispossession, monetization, financialization, privatization, targeting, familism[3], rephilanthropization[4], speak louder than public social protection. Everything that was solid melted into thin air, to give way to financial and neoliberal capitalism. We will always resist and fight!

[3] It is the process of making families responsible for social policies, in which families are called upon as one of the main instances for the provision of social welfare. Mioto (2018).
[4] It aims to replace the logic of citizenship, based on the non-recognition of historically conquered social rights, as it is based on a humanitarian discourse of solidarity and philanthropy, leveraged by a morality of helping the needy. (Yazbek, 2001)

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[i] This is considered the 3rd phase of neoliberalism, and is called ultraneoliberalism, which is based on the trinomial: 1. Violent deepening of the exploitation of labor, that is, of precariousness and "capture" of the worker's subjectivity; 2. Expansion of the appropriation of public funds by financial capital; 3. Privatization and expropriation of common and state assets that still exist (LIMA SOBRINHO, 2022, p. 122).

DIGITAL INFORMATION AND COMMUNICATION TECHNOLOGIES COMBINED WITH AN INVESTIGATIVE APPROACH TO HEALTH EDUCATION

https://doi.org/10.56238/sevened2024.031-082

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ABSTRACT
Contemporary society has experienced a new way of relating to others and the environment. The speed of information propagation has provided different perspectives for education. Both the way of learning and teaching have been impacted by the digital age. Therefore, the restructuring of pedagogical practice has become a necessity. The use of digital technologies as teaching strategies can provide the development of a student with the ability to solve problems and reflective and critical capacity (VIDAL; MIGUEL, 2020).

Keywords: Digital Information and Communication Technologies (DICT). Artificial Intelligence (AI). Personalized education. Pedagogical innovation.

INTRODUCTION

Contemporary society has experienced a new way of relating to others and the environment. The speed of information propagation has provided different perspectives for education. Both the way of learning and teaching have been impacted by the digital age. Therefore, the restructuring of pedagogical practice has become a necessity. The use of digital technologies as teaching strategies can provide the development of a student with the ability to solve problems and reflective and critical capacity (VIDAL; MIGUEL, 2020).

The teaching of Science in Brazil has also undergone a significant evolutionary process since its inclusion in school curricula through the Law of Guidelines and Bases, in 1961 (Law No. 4,024), until the creation of the new Law of Guidelines and Bases of National Education (LDB), in 1996 (Law No. 9394) and subsequent educational policies such as the National Common Curriculum Base (BNCC), in 2018. Science teaching has gone from a traditional content-based panorama to a teaching based on the relationship between science, society, technology and the environment (SILVA-BATISTA; MORAIS, 2019).

Within this new perspective and according to the LDB (Law No. 9394), it is up to the school and the teacher to implement an education supported by new pedagogical practices that make teaching more attractive and contextualized. In addition, the Federal Constitution proclaims that teaching strategies must meet subjects with different educational needs (BRASIL, 1988).

DIGITAL INFORMATION AND COMMUNICATION TECHNOLOGIES (TDIC)

According to Kesnki (2012), Digital Information and Communication Technologies (DICT) promote student involvement, communication, motivate and facilitate learning. Both the BNCC and the National Curriculum Parameters (PCN), guiding documents for Brazilian education, advocate the use of DICT as motivating elements in the formation of an autonomous student in the search for knowledge (SILVA *et al*., 2021).

DICT have become part of students' daily lives and, according to the BNCC, their use in the school context can help teachers stimulate interest and protagonism. The incorporation of digital technologies in pedagogical practices can stimulate participation and creativity, promote autonomy and digital literacy. In addition, DICT fosters dialogue between different areas of knowledge, providing training for life (BRASIL, 2018).

In view of the technological insertion in the daily lives of students, the need for innovation and diversification of teaching and learning methods has become imminent (ZÔMPERO *et al*., 2019). Social changes and new educational demands required a teacher

who transcended the limits of the traditional classroom. Zômpero et al. (2019) point out that the teacher who manages to overcome the barriers imposed on teaching and learning leads the student to learn how to learn. With this new perspective, it was necessary to look for ways to encourage a questioning student with the ability to solve problems (ZÔMPERO *et al*., 2019).

On the other hand, the use of Digital Information and Communication Technologies (DICT), combined with Artificial Intelligence (AI), has also proven to be a powerful tool in the educational context, allowing the teacher to enhance the teaching-learning process and make classes more dynamic and personalized. It is worth knowing that Artificial Intelligences (AIs) can be considered a subcategory of Digital Information and Communication Technologies (DICT), but with a specific and distinct focus within this universe. While DICT encompasses a broad set of digital technologies used to process, store, and communicate information (such as the internet, educational software, social networks, and digital devices), AI refers to systems that simulate human intelligence, performing tasks such as data analysis, learning, and decision-making based on advanced algorithms (CARVALHO, 2021). In other words, AI is a tool within DICT, but it has unique characteristics that expand the possibilities of personalization and automation in education.

The integration of Digital Information and Communication Technologies (DICT) with Artificial Intelligence (AI) in education can occur through various tools and strategies that enhance teaching and learning. One form of integration is the use of adaptive learning platforms, which use AI algorithms to personalize content according to each student's performance and needs. These platforms analyze data on students' interaction with the system, adjusting the level of difficulty of the activities and suggesting complementary materials, promoting more individualized learning (CAMPOS, 2018).

The implementation of AI in the classroom can transform pedagogical practice by facilitating the analysis of data on student performance, enabling more accurate monitoring and targeted pedagogical interventions (MORAN, 2015). In this way, the teacher starts to play a more efficient mediating role, using technology to identify difficulties and adjust the content according to the needs of each student (GATTI, 2019).

For students, the impact of using DICT associated with AI is significant, providing a more interactive and personalized learning environment. In addition to increasing engagement, this combination of technologies enables students to develop skills such as critical thinking and problem-solving. (RUSSEL & NORVIG, 2018).

Thus, the combination of Digital Information and Communication Technologies (DICT) with Artificial Intelligence (AI) represents a substantial advance in education,

providing a more interactive and adaptive learning experience. By offering personalized content and immediate feedback, AI DICT promotes greater student engagement, allowing each student to learn at their own pace and focusing on the areas in which they most need development. By receiving recommendations and additional resources in an automated way, students have the opportunity to explore complementary content and reinforce areas of interest or difficulty (VICARI, 2018). Thus, DICT associated with AI not only helps to improve academic performance, but also prepares students to face challenges in an increasingly dynamic educational scenario, where this integration becomes essential to form individuals able to deal with an uncertain and technologically advanced future.

Even pointing out benefits, on the other hand, the implementation of AI in education, aiming to promote meaningful learning, presents significant challenges that need to be addressed carefully and strategically. One of the main challenges is the resistance to change and the adaptation of teachers to new technologies (SANTOS & LIMA, 2022). Many teachers may feel overwhelmed by the need to integrate AI tools into their pedagogical practices, especially if they have no prior experience with such technologies. To overcome this challenge, it is crucial to offer continuous training and adequate supports, which not only introduce the technological tools, but also explain how to integrate them effectively with existing teaching methodologies. Training should be practical and results-oriented, allowing teachers to develop confidence and skills in using AI to create more personalized and engaging learning experiences (OLIVEIRA & SANTOS, 2021).

Another key challenge is the need to ensure that AI technologies are used ethically and equitably. This includes protecting student data privacy and ensuring that AI tools do not reinforce existing biases or inequalities (SILVA & OLIVEIRA, 2021). To address these challenges, it is necessary to establish clear guidelines and data protection policies, as well as promote transparency in the use of technologies.

In view of the above, it is essential to involve teachers in the selection and customization of AI tools, ensuring that they are adapted to the specific needs of students and the educational context. In this way, the integration of AI in education can be carried out in a way that maximizes the benefits for all students, promoting meaningful and inclusive learning, seeking an increasingly interactive and transformative school environment.

HEALTH EDUCATION

Health Education is a pedagogical process that requires the construction of knowledge and skills that promote autonomy and critical awareness for the realization of healthier choices, individual and collective, taking into account the context of the subjects

(LEITE, 2014). Therefore, the theme aims to lead subjects to autonomy, self-knowledge, and self-regulation over their organism through the acquisition of knowledge. This allows discernment in decision-making that corroborates health promotion (BRASIL, 2006).

In this context, Ponte and Maldarine (2019) emphasize that understanding the integrated functioning of the human body can promote the internalization of healthy attitudes and habits. This knowledge awakens in learners more conscious choices related to lifestyle. According to the BNCC, it is:

> It is essential that students are able to take the lead in choosing positions that represent self-care for their bodies and respect for the bodies of others, from the perspective of comprehensive care for physical, mental, sexual and reproductive health (BRASIL, 2017, p. 325).

Thus, schools must implement transversal pedagogical actions that integrate knowledge (BRASIL, 2017). In addition, Cardoso et al. (2008) suggest that teaching practices should prioritize the context and involvement of the school community.

Santana and Mota (2022) highlight the need to provide opportunities for Biology teaching that meets social demands and dialogues with the reality of the subjects, making them active in issues involving health and the environment. Thus, the use of contextualized and interdisciplinary pedagogical strategies that offer an integration of knowledge and foster dialogue between knowledges is increasingly justified (BRASIL, 2010).

Interdisciplinarity is necessary as it overcomes the fragmentation of knowledge of school contents. Nascimento et al. (2020) highlight interdisciplinarity as an integrating tool for knowledge and emphasize that the process needs to be mastered by the teacher. According to Ruas and Araújo (2017), in interdisciplinarity there is a transposition of disciplinary limits, promoting integration of knowledge. The relationship between disciplines, the dialogue between parties, and the contextualization of teaching are pointed out by Nascimento et al. (2020) as characteristics that promote interdisciplinarity. From this perspective, integrative, problematizing, questioning and contextualized didactic strategies can contribute to student learning.

The premise of a democratic and good quality education guaranteed by national legislation requires, according to Libâneo (2013), the appropriation of a set of strategies, resources and spaces. Jacobucci (2008) already discussed the use of non-formal spaces of education as "allies of the school" in the dissemination of scientific knowledge.

TEACHING BY INVESTIGATION AND DIDACTIC SEQUENCE

For Sasseron (2015), teaching by inquiry values student-centered activities, enabling the development of autonomy, the ability to make decisions, evaluate and solve problems. In this way, the teaching of Biology by investigation can appropriate strategies that allow learners to relate scientific knowledge to everyday situations (SANTANA; MOTA, 2022).

Sasseron (2015) points out that teaching by inquiry unites science and school and that inserting students in problem situations, which involve scientific concepts, can stimulate them to create solutions to everyday challenges. Pedaste et al. (2015) propose that teaching by inquiry comprises interconnected phases, translating into the investigative cycle, with guidance, conceptualization, investigation, conclusion and argumentation.

The interaction of the phases of the investigative cycle provides conditions for the use of student-centered teaching methodologies, so that he is the main responsible for the construction of his knowledge and the teacher is an adjunct to the process. This interconnection of the phases allows the teacher to develop pedagogical strategies, such as Investigative Didactic Sequences (SDI), which encourage students to solve problems. SDI offers means to bring students closer to scientific knowledge (SCARPA; CAMPOS, 2018).

According to Carvalho (2018), an investigative teaching sequence consists of pedagogical activities that provide means to propagate scientific knowledge on a given topic. The activities are built around a problem-situation and Carvalho (2013) emphasizes that the phenomenon to be investigated must be inserted in the student's daily life. Lima (2019), in turn, emphasizes that investigative activities should be increasingly articulated, involving the solution of the problem, in order to provide the development of skills and meaningful learning.

MEANINGFUL LEARNING

Meaningful Learning (SA) occurs, according to Ausubel et al. (1980), when new information and concepts are related and incorporated into pre-existing structures, the subsumers. Thus, SS occurs when the student relates the content studied to previous knowledge (AGRA *et al*., 2019).

According to Agra et al. (2019), learning will be mechanical if new knowledge does not interact with subsumers. Moreira (2012) reiterates that there may not be adequate prior knowledge and, therefore, the teacher has a crucial role in attributing meaning to the new content. According to the BNCC (BRASIL, 2018), for there to be meaningful learning, the information provided must make sense in the learner's experience.

Brum and Schuhmacher (2015) highlight problem solving, sequential didactic activities and Concept Maps (MC) as tools to assess meaningful learning. According to Moreira (2012), CM can be used to represent the relationships between concepts in a given theme, starting from broader concepts to more specific ones.

In attention to the different social demands that reaffirm the need for an increasingly democratic education, accessible to all and that uses varied resources to promote a connection between the student and knowledge, we seek contextualized pedagogical strategies, supported by digital technologies, teaching by investigation and in a non-formal space of education that can motivate and to awaken the student's protagonism in the search for scientific knowledge, in contemporary themes of relevance in the field of health education.

NON-FORMAL EDUCATION SPACE

Non-formal education spaces gained prominence as an educational tool in the 70s, when teachers realized how much these spaces could add to pedagogical practice. Areas such as ecological parks, museums, zoos, science centers, botanical gardens, among others, were designated as non-formal spaces for education and considered to promote scientific knowledge (CAZELLI, 2005; ROCK; TÉRAN, 2010).

Vieira (2005) and Souza (2021) clarify that non-formal education is carried out in a systematized way and with the intention of achieving objectives outside the environment of the educational institution. Rocha and Terán (2010), on the other hand, conceive the process as systematized or not, with established objectives, but with a certain malleability in relation to factors such as time and learned contents. Back et al. (2017) understand

> the formal spaces as schools, the school context itself; informal spaces for spontaneous socializing, with friends, theaters, readings without the purpose of teaching, and the non-formal space includes walks, visits that have the intention of teaching, with activities developed in a targeted way, but outside the classroom (BACK *et al.*, 2017, p. 2).

According to Jacobucci (2008, p. 56), a non-formal space of education "is any space other than the school where educational action can take place". For Silva and Santos (2021, p. 5), non-formal education spaces are "all those spaces that can also be used for teaching and learning, but without following the systematization that occurs with the teaching promoted by formal spaces". Silva and Santos (2021) also point out that non-formal spaces can contribute to teachers' pedagogical strategies, bringing an interdisciplinary and contextualized perspective.

According to Guerra (2011), one learns what is necessary in daily life, what provides pleasure and the environment is a generator of stimuli that favors brain connections for this process. In this sense, exciting and motivating pedagogical strategies, such as the use of non-formal spaces, can contribute to student learning. Hennemann (2015) highlights that motivation can underpin learning and the emotions aroused lead to the development of motivation.

In this motivating context, non-formal education spaces emerge, as well as other strategies that enhance teaching and learning, such as Digital Information and Communication Technologies (DICT), which, according to the BNCC, arouse interest and promote student engagement (BRASIL, 2017).

In the next paragraphs of this chapter we will present a study proposal where the application of an investigative didactic sequence elaborated from the perspective of Meaningful Learning and the use of DICT on the theme "The influence of physical exercise on the human body" was analyzed. The research provided students with an autonomous construction of knowledge and understandings about important concepts of science in the field of health education and provided conditions for meaningful learning.

METHODOLOGICAL PATH

The qualitative study consisted of the analysis and interpretation of data produced and collected during the elaboration and application of an investigative didactic sequence (SDI), with the participation of 30 students, from the 3rd year of High School, from a public school in Belo Horizonte. To deepen the understanding of the effects and efficacy of the didactic sequence, the study comprised the following steps: (1) elaboration and descriptive analysis of the application of SDI; (2) analysis of the students' conception; and (3) analysis of the students' perception of the application of the SDI (Chart 1).

Chart 1 – Presentation of the stages developed in the research

STAGE	INSTRUMENTS	PARTICIPANTS
1) Elaboration and descriptive analysis of the application of SDI	Bibliographic research, elaboration of activities with an investigative approach, implementation of free tools for the use of Digital Communication and Information Technologies in SDI, research of tools based on Meaningful Learning to be implemented in SDI and incorporation of non-formal education space.	Not applicable
	Survey on the possession and use of DICT by students through a questionnaire	30
	Diagnosis of students' previous knowledge through questionnaire and word cloud	30
	Didactic activities developed throughout SDI	30
2) Analysis of the students' conception	Application of semi-structured questionnaires and didactic activities developed throughout the SDI.	30
3) Analysis of students' perception of the application of SDI	Application of semi-structured questionnaires	30

Source: The authors (2022).

ELABORATION AND DESCRIPTIVE ANALYSIS OF THE APPLICATION OF THE SDI

In order for the SDI to be properly elaborated, it was necessary to investigate the use and possession of digital technologies by students. The survey was carried out through a questionnaire. Such investigation provided the verification of the feasibility of carrying out SDI's activities, which used digital technologies. The questionnaire used in the survey of digital technologies was made through the *Google Forms* tool and answered by the students in the school's computer lab. "Do you have a smartphone or tablet?" and "Do you have quality internet access?" were questions listed.

The research participants made a diagnosis of previous knowledge about the topics addressed in the study. For Ausubel (2000), relating previous knowledge to new information can promote Meaningful Learning (SA). The investigation about previous knowledge was carried out by means of a semi-structured questionnaire and/or word cloud. The questionnaire was made through *Google Forms* and the word cloud through *the Mentimeter.com* application.

The activities of the didactic sequence were built in a systematic way, according to the phases proposed by the investigative cycle of Pedaste et al. (2015), namely: guidance, conceptualization, investigation and conclusion, with the discussion going through them. A visit to a non-formal education space was incorporated into SDI's activities, with the aim of motivating students in the construction of knowledge. The students visited the Center for Education and Communication in Life Sciences (NEDUCOM), at the Institute of Biological Sciences (ICB) of the Federal University of Minas Gerais (UFMG). This space

encompasses several extension projects related to Health Education and fosters scientific dissemination practices at the university-community interface.

The data produced during the study were collected from the observation of the teacher-researcher, records produced by the students participating in the research in didactic activities developed throughout the SDI, images and semi-structured questionnaires.

ANALYSIS OF THE STUDENTS' CONCEPTION AND ANALYSIS OF THE STUDENTS' PERCEPTION OF THE APPLICATION OF THE IDS

The understanding of the participating students about concepts related to the theme worked on and their perceptions about the activities developed during the SDI, including perceptions about the visit to NEDUCOM, were collected by questionnaires (Chart 2). Within the scope of the students' conceptions, the didactic activities developed throughout the SDI, such as concept maps, videos, booklets, were also considered.

Chart 2 – Guiding questions of the semi-structured questionnaires

QUESTIONS
What do you mean by "integrated functioning of the human body"?
Can you identify the structures of the locomotor system and their respective functionalities?
Do you identify the components of the cardiovascular system and their respective functionalities?
Can you identify the changes caused by physical exercise in the systems of the human body?
Do you understand the difference between physical exercise and physical activity?
Do you understand the relationship between physical exercise and health?
Did you enjoy participating in the activities of the didactic sequence? Why?
Can you see if the activities contributed to your learning?
What was the importance of the activity carried out for you?
What did you like the most during the completion of the didactic sequence?
After having participated in this investigative activity, contribute by leaving your criticisms and suggestions to make the process more interesting, fruitful and enriching.
Can you identify the structures of the locomotor system and their respective functionalities?
Do you identify the components of the cardiovascular system and their respective functionalities?
Can you identify the changes caused by physical exercise in the systems of the human body?
Do you understand the difference between physical exercise and physical activity?
Do you understand the relationship between physical exercise and health?
Did you like the mediated visit? Point out at least one reason.
Can you see if the visit contributed to your learning? In what way?
What was the importance of the activity developed during the visit for you?
What did you like the most during the visit? Why?
Did the visit to the non-formal educational space contribute significantly to your learning about the human body and health?
About the topic studied during the visit, what did you learn most relevant?

Source: The authors (2022).

RESULTS AND DISCUSSION

The didactic sequence had as its main focus the insertion of students in an investigative learning process on the theme "The influence of physical exercise on the human body". The idea of the approach came from situations experienced with the group of

students in the classroom. Taking advantage of the context, joint activities of Biology and Physical Education were developed to arouse the curiosity of students in relation to the effects of physical exercise on organic systems and health promotion. The SDI was organized in 8 moments, distributed in 7 classes (Chart 3).

Chart 3 – Organization of the SDI in moments of application

MOMENTS	OBJECTIVES	DURATION	DEVELOPMENT
First	To ascertain the profile in relation to the possession and use of DICT and contextualize the theme	1 lesson (50m)	Survey on the possession and use of DICT and conversation circle.
2nd	Diagnosing prior knowledge	1 lesson (50m)	Word cloud, diagnostic questionnaire and discussion.
Third		1 lesson (50m)	Presentation of the guiding question (*Why do we breathe for breath after physical exercise*?), raising hypotheses and discussion.
4th	Explore, analyze, discuss, and interpret data	2 lessons (1h 40 min)	Interdisciplinary practical class, data exploration, discussion and orientation to consult the scientific literature to confirm or refute hypotheses.
5th	Stimulate scientific and critical argumentation	1 lesson (50 min.)	Discussion and argumentation about hypotheses with scientific basis.
6th	Motivate the student in the construction of scientific knowledge	Extra-class activity	Guided tour of the non-formal education space (NEDUCOM/UFMG).
7th	Promote understanding of the changes caused by physical exercise in the human body	Extra-class activity	Preparation of digital resources (video, MC and educational booklet).
8th	Verify and evaluate the knowledge stimulated	1 lesson (50 min.)	Presentation of the final product and final questionnaire.

Source: The authors (2022).

1st moment: The scientific research project was presented to the students and a survey was carried out on the possession and use of DICT, through the *Google Forms* tool. The students participated in a conversation circle to contextualize the topic addressed. In the survey of possession and use of digital information and communication technologies,

97.8% of the students reported having a smartphone or tablet and 70.8% had a computer at home. Regarding the difficulty of using DICT, 61.8% said they had no difficulty, 34.8% had little difficulty and 3.4% had difficulty. The information collected suggested feasibility in the application of SDI activities.

During the conversation circle, the teacher-researcher showed images of people adept at the practice of regular physical exercises and asked the students to observe and physically describe such people. During the discussion, the students highlighted the well-defined muscles of the individuals and discussed the importance of physical exercises in the prevention of diseases such as diabetes and hypertension. According to Luan et al. (2019), regular physical exercise is a potent non-pharmacological device in the prevention and treatment of diseases and the World Health Organization (2014) also attributes to this practice the prevention of diseases such as high blood pressure, diabetes, strokes, depression, among others.

2nd moment: The students participated in the construction of a word cloud, in which they were challenged to express in three words what "Physical Exercise" represents to them. The teacher presented the results and mediated the analysis and discussion carried out by the class. Pagliarini and Sepel (2022) recommend that the implementation of tools that collect prior information allows the teacher to qualify pedagogical actions.

As a result of the word cloud performed by the students, health, gym, effort, food, well-being and weight training were terms that appeared more frequently and that, corroborated with the discussion among peers, suggest that most students related physical exercise to health promotion. However, it is interesting to note that the students also associated physical exercise with other concepts such as self-esteem, determination, willingness, responsibility and learning, that is, they demonstrated a relationship between exercise and mental well-being. Freitas (2019) highlights that physical exercise is an important tool with undeniable biological and psychological benefits that prevents the onset of various diseases and reduces stress.

The students answered a questionnaire, made on *Google Forms*, to assess their conceptions about the human body, physical exercise and health. The results in relation to the questions investigated show that more than 60% (19) of the students fully agreed with the statement "The systems of the human body work in an integrated manner". However, they demonstrated that they did not have previous knowledge for this, as they stated that they did not identify the structures and respective functions of these systems. According to Moreira (2012), there may not be adequate prior knowledge, and in this case, the role of the

teacher is fundamental to attribute meaning to the information to be incorporated into the cognitive structure.

The results also show that approximately 50% (15) of the students understand the difference between physical exercise and physical activity and about 80% (24) consider that they understand the role of physical exercise in the prevention of diseases. It is important to emphasize that this stage of the research, diagnosis of previous knowledge, provides information to direct pedagogical actions and achieve an SSA (AUSUBEL, 2000). In addition, it was possible to perceive, through peer discussion, a curiosity of the students in relation to the performance of physical exercise in the functioning of the human body. From this, it is understood the importance of the teacher planning pedagogical actions that make sense to the student (BRASIL, 2018).

3rd moment: The guiding question was presented to the students who, in groups, wrote down their initial hypotheses (Chart 4) about "Why do we breathe after a physical exercise?" and brought it for general discussion with the class.

Chart 4 – Hypotheses presented by the students

GROUPS	CHANCE
1	"*We get out of breath after physical exercise, because the body needs more oxygen; heartbeat is accelerated; adrenaline increases; There is a lack of air and the respiratory system becomes unbalanced. So all these factors contribute to panting after physical exercise.* "
2	"*We get out of breath because to carry out our functions we need oxygen, which varies according to our activities. In a more accentuated exercise or physical activity, we need a greater amount of air, if we are not prepared (in good health), breathing is altered and we are panting.* "
3	*"We were gasping for breath because of the increase in respiratory and heart rate, because we are sedentary and because of the action of adrenaline.* "
4	"*We gasp because as the exercise is performed the muscle fibers require more oxygen from the blood, causing the lung to work at an accelerated pace, along with the heart that needs to pump blood faster. For this reason, we get out of breath after physical exercise.* "
5	"*This is due to the increased speed at which the heart pumps blood because of exercise. The cardiovascular system has to operate faster, so it interferes with the respiratory system.* "
6	"*Because when we exercise, the blood circulates faster through the body, due to the stimuli (nervous system) caused by the muscles.* "

Source: The authors (2022).

The groups associated the difficulty in breathing, after physical exercise, with changes in the cardiovascular and respiratory system and some mentioned the action of neurotransmitters such as adrenaline, but none of them clearly addressed the events that lead to this shortness of breath, in an integrated sequence.

Vanzela et al. (2013) point out that the organic functions of the human body are traditionally addressed by Biology in a compartmentalized way. This approach makes it difficult to understand this content and translates into the need for pedagogical strategies that integrate this knowledge.

4th moment: the students participated in an interdisciplinary practical class with the Biology and Physical Education teachers. Divided into groups, the students chose two representatives, one female and one male, to measure vital signs, heart rate (HR) and blood pressure (BP). The measurement was carried out by the Physical Education teacher, who, in addition to being a physical educator, is a physiotherapist, and had the help of an automatic arm sphygmomanometer.

Data collection took place in three moments: before the exercise (rest), immediately after and ten minutes after the end of the physical exercise. The students recorded the collected data and discussed the results in their respective groups. The students observed the following questions: "Was there a change in HR and/or BP after physical exercise? If so, why did it occur? ", "Was there any difference in the data obtained in relation to the collection times? If so, why? ", "Was there any difference in the data regarding gender? If so, why? ". The groups analyzed the results, proposed and recorded their hypotheses (Chart 5). Then, they presented and discussed their findings and hypotheses with the class.

Table 5 – Initial hypotheses about changes in BP and HR

GROUPS	CHANCE
1	*"There was an increase in HR and BP due to the increase in the levels of adrenaline stimulated by the nervous system. It may also be due to the pumping of blood during exercise. ”*
2	*"There was an increase in HR and BP after exercise due to the release of adrenaline and respiratory control. "*
3	*"Females increase HR more because of hormones and the colleague who had lower BP and HR than at rest may be due to regular physical exercise. "*
4	*"There was an increase in HR and BP due to the need for oxygen generated by the muscles and thus the blood has to be pumped faster. The difference in relation to sex is because a woman's heart is smaller, having to pump blood faster. ”*
5	*"There was an increase in HR and BP, because when physical activity is practiced, the body needs more oxygen and so the heart makes more effort to pump the necessary blood. Regarding gender, there was variation due to weight, height, and whether or not they do regular physical activity. ”*
6	*"There was an increase in BP and HR because of the increase in respiratory rate and blood flow, increasing muscle contractions, due to the effort. There was a difference between the sexes, due to the physical issues of men and women. ”*

Source: The authors (2022).

The teacher-researcher advised that, for the next class, students should consult the scientific literature to confirm or refute hypotheses both in relation to the guiding question and the measurement of vital signs. Students should argue about their records, corroborated by the scientific literature. To guide the students' consultation, support materials were posted on the *Google Classroom* and *WhatsApp* platforms, already known and used by them.

This stage of the SDI showed great engagement and motivation of the students when carrying out practical activities that encouraged them to collect, explore, analyze data and formulate hypotheses to solve the proposed problems. Carvalho (2013) points out that activities should be built around problem situations inserted in the students' daily lives and Lima (2019) emphasizes that they should be planned in a growing dynamic, in order to develop skills and promote SS. In addition, the students showed enthusiasm by carrying out the activities in a physical space different from the traditional classroom. According to Guerra (2011), the environment generates stimuli that can favor learning. In addition, the emotions aroused by these stimuli develop motivation (HENNEMANN, 2015).

5th moment: After consulting the scientific literature to confirm or refute hypotheses, both in relation to the guiding question and the measurement of vital signs, the students presented their findings and arguments (Charts 6 and 7).

Chart 6 - Arguments presented to explain the guiding question

GROUPS	ARGUMENTS
1	*"We get out of breath after physical exercise, because the more muscle fibers strive to perform a task, the more they consume oxygen brought by the bloodstream. This forces the lungs to work at a fast pace, since they are responsible for oxygenation. The heart also speeds up, as it needs to pump blood more vigorously. And that's why, during exercise, the heart rate and respiratory rate increase. "*
2	*"We get out of breath after a physical exercise because when you start a physical exercise the muscles start to work harder than normal and for that they need energy in the form of ATP. For ATP to be produced, there needs to be oxygen. This oxygen is carried by the blood that is pumped by the heart. Hence the change in respiratory rate and heart rate. "*
3	*"Physical exercise stimulates the brain and activates the frontal cortex. There is release of neurotransmitters and increased respiratory rate, increased heart rate, and increased volume of blood pumped by the heart per minute. That's why we get out of breath after physical exercise. "*
4	*"Physical exercise leads the nervous system to inject adrenaline into the bloodstream, consequently increasing the heart rate, pumping more blood to the body. One of the direct consequences of this event is the increase in lung activity, generating the sensation of panting. "*
5	*"The breathing pattern depends on variables related to respiratory volume and timing, and its control is influenced by cortical and peripheral mechanisms, as well as respiratory and limb muscles. During and after physical exercise, there is an increase in muscle bioenergy functions, increasing physiological reactions responsible for gas exchange, such as respiratory and cardiac rates, enabling greater oxygen supply to tissues and increasing the removal of carbon dioxide. "*
6	*"The changes in the breathing pattern at the end of the exhaustive exercise are due to changes in the muscles of the lower limbs (lower limbs) compared to changes in the respiratory muscles. Therefore, changes in the breathing pattern during and after exercise can be generated by fatigue of the muscles of the rib cage, more than that of the diaphragm, or by fatigue of the muscles of the lower limbs, leading to wheezing. "*

Source: The authors (2022).

Chart 7 – Some of the arguments used by the students to explain the variation in BP and HR after physical exercise

GROUPS	ARGUMENTS
2	*"The increase in heart rate and blood pressure is due to the action of the sympathetic autonomic nervous system that has the ability to increase cardiac activity, thus increasing the heart's ability to pump blood. On the other hand, there is the action of the parasympathetic autonomic nervous system to stop this action, slowing down the heart rate during recovery from exercise. In addition, the size of women's hearts, smaller than men's, influences the volume of blood pumped and consequently a greater oscillation of heart rate. "*
3	*"There was a difference between the sexes, as women have a smaller body surface area and a smaller heart than men. The heart in women has a smaller stroke volume (volume of blood ejected from the heart with each beat) the geometry of the left ventricle in women is different. In physical stress, women respond differently, there is a lower increase in peripheral vascular resistance and less impact on BP. On the other hand, there is a greater elevation in heart rate, but all of this can vary depending on body mass, glycemic index, and other factors. "*
5	*"One of the main adjustments observed after the practice of physical exercise is the response of systolic blood pressure to diastolic blood pressure, which tends to reduce below the levels found in pre-exertion. This effect is called post-exercise hypotension. This may, for example, explain why some colleagues had a reduction in BP ten minutes after the end of the exercise. Aerobic exercise has a hypotensive effect and its magnitude depends on the intensity, duration, muscle mass involved and gender of the practitioners. The nervous system, during physical exercise, increases the release of neurotransmitters such as serotonin, noradrenaline and dopamine. It stimulates the release of neurotrophins, stimulates neuroplasticity that causes a decrease in the feeling of stress and anxiety, which causes post-exercise hypotension. "*

Source: The authors (2022).

The groups argued about the initial guiding question, bringing integrated information about the activation of the nervous system by physical exercise, the release of neurotransmitters and the associated systemic responses. Azevêdo et al. (2019) corroborate that physical exercise stimulates cortical and subcortical areas of the central nervous system, decreasing parasympathetic action and increasing sympathetic activity. Stimulation of the sympathetic nervous system leads to the release of neurotransmitters that lead to increased heart and respiratory rate.

During the interdisciplinary practical class (Physical Education and Biology), the groups noticed that there were changes in the data recorded (HR and BP) after physical exercise, when compared to the resting situation. All individuals measured had an increase

in HR and BP immediately after exercise, but they noticed that some colleagues showed a decrease in HR and BP values 10 minutes after the end of the physical exercise, when compared to the resting data.

The muscle work performed during physical exercise leads to a greater energy demand and causes changes in the body's homeostasis. To meet this demand, the body makes use of immediate adjustment mechanisms that promote an increase in HR and BP (BRUM *et al.*, 2004). According to Laterza et al. (2007), there may be a reduction in blood pressure levels, after physical exercise, lasting for several hours and trained individuals have efficient autonomic and hemodynamic adaptations.

Some students highlighted that female colleagues had a greater elevation in heart rate when compared to male colleagues. Some studies mention differences in autonomic control, hormonal issues, body mass, among others that corroborate these results (SAMORA *et al.*, 2020).

6th moment: The students visited the NEDUCOM/UFMG laboratory, where they participated in the approach carried out by the "Interact Project" with the theme "Physical exercise". The students had the opportunity to visit laboratories of the Department of Morphology of the Institute of Biological Sciences (ICB/UFMG) and participate in a practical class on the systems of the human body, with real anatomical parts. During the visit, and especially on the way back to school, the students mentioned how interesting it was to participate in the activities at NEDUCOM. The integration of a non-formal education space in the SDI aimed to motivate students in the construction of scientific knowledge in a contextualized and playful way. Guerra (2011) highlights that the environment can stimulate learning and emotions lead to the formation of memories. So, exciting experiences, such as those offered in these spaces, can contribute to the student's teaching and learning process.

Therefore, the importance of the visit to the NEDUCOM/UFMG laboratory to awaken the students' motivation to learn was notorious. They were curious and involved throughout the approach. In addition, the visit gave rise to a sense of belonging to the University, a desire to be part of that academic context. Consequently, all this transposition of the limits of the traditional classroom can lead the student to learn how to learn (ZÔMPERO *et al.*, 2019). Therefore, the demand for pedagogical practices that meet a changing society goes beyond the walls of the classroom, seeking contextualized spaces that promote exchanges of experiences with students.

7th moment: As SDI products, the groups made a digital concept map, a digital booklet and a video, in which they revisited the guiding question, addressing the action of

physical exercise on the systems of the human body. The choice of technological tools was made by the students themselves. In this way, each group researched and used the applications of their interest. The use of ICTs was also thought of as a motivating and student engagement strategy, since these technologies are part of students' daily lives and, as recommended by the BNCC, can help teachers in the search for student protagonism (Brasil, 2018). Thus, the students produced well-prepared materials, in a creative way, using different applications and based on the scientific knowledge they sought, in a totally autonomous way, during the stages of SDI.

8th moment: The groups organized a digital exhibition and presented the materials produced to the pairs and, later, the presentation was extended to the school community, through the school's social networks and those used by teachers in other projects that promote knowledge. According to Sasseron (2013), the dissemination of ideas is part of science and new perspectives can be added to the previous view. Knowledge is constantly changing, and peer-to-peer exchanges can enhance ideas. At the end of the 8th moment, the students answered the questionnaire to assess their conceptions about the human body, physical exercise and health.

The results of the analysis of the questionnaires, applied to diagnose previous knowledge and to verify the final conceptions, showed that there was an increase in the number of students who considered to have knowledge about the concepts addressed in the proposed statements. Regarding the statement "The systems of the human body work in an integrated manner", more than 85% (26) of the students considered that they understood this integration and, according to the results shown in chart 4, there was a significant increase in the number of students who considered identifying structures and functions of the systems involved. This suggests that the SDI participants added information about the topic studied to the repertoire they previously had. For Moreira (2012), new information can be incorporated into that already existing in the cognitive structure. When this new information is able to establish relationships with previous knowledge, it is cognitively added to the learner's repertoire. Ausubel (1980) highlighted that SSA occurs when there is substantial interaction between existing information and new information.

At the end of the SDI activities, the students answered a questionnaire, made on *Google Forms*, to evaluate their perceptions or experiences regarding the activities developed and applied in the didactic sequence and regarding the visit to the NEDUCOM/UFMG laboratory. The questionnaire to assess the students' perception of SDI included questions such as "Did you enjoy participating in the activities of the investigative didactic sequence? Why? ". The percentage of students who answered affirmatively was

93.3% (28). The reasons listed by them were the acquisition of knowledge about the human body (19 students), a different form of learning (8 students) and the acquisition of scientific knowledge (1 student). Only two students reported not having liked it, as they found the activities too laborious and difficult.

It was possible to perceive, through the students' reports (Chart 8), important aspects proposed by the SDI developed, such as, for example, the integrated understanding of the concepts addressed by the theme, the curiosity aroused by the investigative context, the interest in using DICT in activities and in seeking scientific information to explain phenomena experienced in everyday life.

Chart 8 – Students' reports about what they liked most during SDI

STUDENT	REPORT
1	*"Learning in a relaxed way, since we are always very used to the teacher explaining the theory, but we never have the practice. "*
2	*"The proposed work, the explanatory video, concept map and etc... Especially the visit to the ICB. "*
3	*"Making the digital concept map, because it was the activity I learned the most. "*
4	*"When it clicked and I realized I was really learning."*
5	*"Of how one thing connects to another in our body, which works all together, and with each question aroused more curiosity. "*

Source: The authors (2022).

Thus, the reports suggest an increase in the students' motivation to learn. According to Guimarães and Boruchovitch (2004), motivation promotes the involvement of students in activities that challenge them, provides the development of strategies for solving problems, generates enthusiasm and acquisition of skills. Consequently, the investigative approach, placing students at the center of the learning process, encouraging them to discover concepts related to their daily lives, promoted more meaningful learning.

The questionnaire to analyze the students' perception of the visit to the NEDUCOM/UFMG laboratory included questions such as "Did you like the visit to the NEDUCOM/UFMG laboratory?". All 30 participants (100%) said they enjoyed the visit. The students also listed reasons why they liked it. Of the 30 respondents, 19 pointed out the acquisition of knowledge, 7 pointed out the contact with the anatomical specimens, 2 highlighted the welcome of the NEDUCOM team, 1 of the students said that he liked it because it was the university he wanted to study and another highlighted that the topic addressed was the one he liked the most.

When we evaluated the students' perception of the visit, we realized that they were impacted by the differentiated pedagogical activities, with the contact with the anatomical

specimens and with the scientific knowledge provided by the academic environment. Through the reports, we found a feeling of belonging of these students in relation to the university. The visit to NEDUCOM/UFMG was pointed out by the students as an enriching moment and a lot of learning. The pedagogical activities, carried out by the NEDUCOM team, aroused interest, curiosity, attention and motivation of the students. Hennemann (2015) highlights this motivation as a foundation for learning.

Several authors reiterate that teaching can take place outside the classroom environment and that making classes more interesting and attractive contributes to the acquisition of knowledge and the formation of a student with the capacity for scientific and critical argumentation (Rocha and Fachín-Téran, 2010; Jacobucci *et al.*, 2009; Marandino, 2009; Praxedes, 2009). For Santos (2018), non-formal spaces of education are important means of scientific dissemination because they arouse curiosity and interest.

FINAL CONSIDERATIONS

The study developed allowed us to conclude that the insertion of students in contextualized, motivating pedagogical practices that make sense to the learner can arouse interest in science. The incorporation of the visit to the University's NEDUCOM space to SDI's activities contributed to motivating students and fostering the construction of scientific literacy. The interaction between basic education and higher education created perspectives for the teaching and learning process.

The use of DICT during the SDI activities provided a contextualized approach to the themes worked and the involvement of students in the stages of the construction of scientific knowledge. Involving students in everyday themes provided an integrated knowledge of their own bodies and elucidated the importance of organism-environment interaction for health promotion.

The practices based on the investigative cycle aroused curiosity in the students to solve problem-situations inserted in their daily lives. The contemplation of the investigation, discussion and sharing of ideas in the activities developed brought fluidity to the construction of knowledge.

Therefore, this entire process elaborated from methodologies focused on the needs of the learner and that takes into account their cognitive baggage may have contributed to significant learning.

ACKNOWLEDGMENT

To the professors and students participating in the research and to the Coordination for the Improvement of Higher Education Personnel (CAPES) for the financial support.

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INITIAL AND CONTINUING EDUCATION OF BASIC EDUCATION TEACHERS: A REFLECTION ON EDUCATIONAL INEQUALITIES

https://doi.org/10.56238/sevened2024.031-083

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ABSTRACT

The present work presents a qualitative research, entitled "Initial and continuing training of Basic Education teachers: a reflection on educational inequalities in Brazil". The objective was to identify the level of training of Basic Education teachers in Brazil. And the following problem was investigated: is initial and continuing education accessible to all Basic Education teachers in full exercise in Brazil? As for the methodology, the study used documentary research, through the search for documents referring to the Census of Basic Education in Brazil on the website of the Ministry of Education -MEC and the National Institute of Educational Studies and Research Anísio Teixeira-INEP, released in the years 2020 and 2023. And 02 documents containing the technical summary of the Basic Education Census, related to the years 2020 and 2023, were found. After analysis, comparing the 2020 Census with that of 2023, the results showed that there was a small growth in the level of teacher training in Brazil, although it is not clear by what means these trainings were acquired, whether by public or private institution, so educational inequalities and exclusion regarding the initial and continuing training of basic education teachers in Brazil become almost imperceptible.

Keywords: Initial and continuing education of teachers. Basic Education. Educational inequality. Brazil.

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INTRODUCTION

Teacher training is a continuous process in the trajectory of the educator, but he does not always have the financial resources to acquire training at higher levels, because social inequalities in Brazil are high in several areas and these also reach the educational field, as it is common to see people who work during the day and at night study in private institutions, paying for a course, seeking training that is initial or continued and this reality covers many future and current teachers of Basic Education in Brazil.

It is observed that there are laws in which they guarantee free initial and continuing education. But are these being offered with sufficient quality and quantity for all those who need it and do not have the financial resources to pay? In this question, the problem of the research to be investigated arises: is initial and continuing education accessible to all teachers of Basic Education in full exercise in Brazil?

In this perspective of elucidating such questions and identifying the level of training of Basic Education teachers in Brazil, it was first necessary to know concepts about educational inequalities and also the trajectory of the Curricular Guidelines for the initial and continuing training of teachers. But after all, what is this educational inequality? What do the scholars of the scare say? Garcia and Hillesheim (2017), have the following view:

> In turn, educational inequalities, as they constitute an expression of social inequalities, are also considered an important parameter for the organization of educational policy. In general, they are referenced based on the dimensioning of the number of illiterate people (absolute and functional); school dropout; repetition rates; years of study; of the quality of teaching, considering school structures and the training of education professionals. (GARCIA AND HILLESHEIM 2017, p. 134).

In this context, it is observed that social inequality is one of the generating matrices of educational inequality and when it is reflected in teacher training, it compromises the quality of education and the critical thinking of the teacher who does not have access to proper training. And so, according to Demo, (2001, p. 320), the system does not fear the poor who are hungry. It fears the poor who know how to think.

Considering education a necessary good for human beings, it is important to know more about the subject and begins by verifying who has the right to education according to the Federal Constitution of 1988. And the aforementioned document determines:

> Article 205. Education, a right of all and a duty of the State and of the family, will be promoted and encouraged with the collaboration of society, aiming at the full development of the person, his preparation for the exercise of citizenship and his qualification for work. (Brazil, 1988).

As for the legal scope of education according to Law No. 9,394, of December 20, 1996, which establishes the Guidelines and Bases of National Education, in its article 1, it states:

> Education encompasses the formative processes that take place in family life, in human coexistence, at work, in teaching and research institutions, in social movements and civil society organizations, and in cultural manifestations. (BRAZIL, 1996).

In this context, it is observed that the concept of education is very broad and encompasses several formative processes that are developed preferably at school. According to Charlot (2006), education is a triple process of humanization, socialization and entry into a culture, singularization-subjectivation [...]. Thus, when reflecting on the concepts of the educational process, it is found that in order to educate it is first necessary to educate oneself. And for this it is necessary to train educators, that is, teachers with competences for such a process of development of the subject. This dialogue is in line with the words mentioned by Freire (1991), when he stated:

> No one starts being an educator on a certain Tuesday at four in the afternoon. No one is born an educator or marked to be an educator. We become educators, we are formed, as educators, permanently, in practice and in reflection on practice. (FREIRE, 1991, p. 58).

In view of this, when analyzing the scenario of teacher training, it is verified that some laws have been approved that direct the Initial and Continuing Teacher Training in Brazil, of which the following stand out: Resolution CNE/CP No. 1, of February 18, 2002 (Brazil, 2002), Resolution CNE/CP No. 2, of July 1, 2015 (Brazil, 2015), CNE/CP Resolution No. 2, of December 20, 2019 (Brazil, 2019), CNE/CP Resolution No. 1, of October 27, 2020 (Brazil, 2020) and, recently, CNE/CP Resolution No. 4, of May 29, 2024 (Brazil, 2024).

In view of the Laws that determine the obligation of the public power to provide quality training for teachers, in order to know the level of teacher training, the following problem was investigated: is initial and continuing education accessible to all teachers of Basic Education in full exercise in Brazil? To this end, the study is organized as follows: first chapter presents the introduction, the second chapter contemplates the methodology, third chapter demonstrates the results, fourth chapter the discussions. And finally, the final conclusions of the work are reached, where a brief comment is made analyzing the findings of the research.

METHODOLOGY

The study used documentary research, through the search for documents related to the Census of Basic Education in Brazil on the website of the Ministry of Education of Education-MEC and the National Institute of Educational Studies and Research Anísio Teixeira-INEP, released in the years 2020 and 2023. And 02 documents were found containing the technical summary of the Basic Education Census, referring to the years 2020 and 2023. And in these we researched the level of training of Basic Education teachers in Brazil, and these data are described in the results.

RESULTS

In this chapter, the results of the research are presented, demonstrating the data found in 02 documents containing the technical summary of the Census of basic education in Brazil, referring to the years 2020 and 2023, on initial and continuing teacher training, aiming to demonstrate the level of training of Basic Education teachers in Brazil. Thus, we begin by presenting data on the number of teachers according to the level of training in figures 1 and 2.

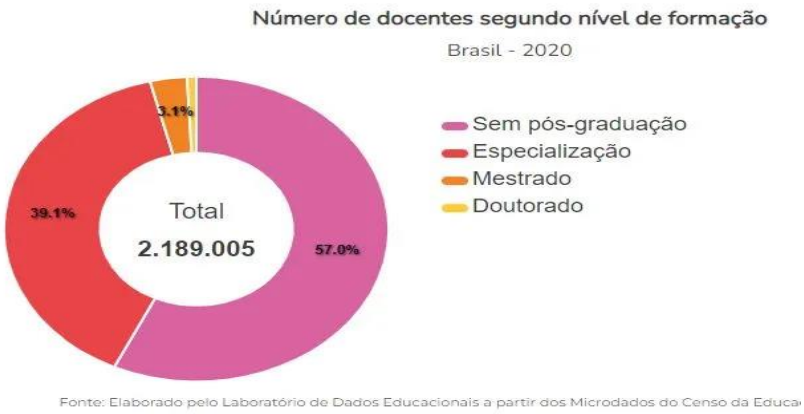
Figure 1.



Source: Prepared by the Educational Data Laboratory of the Teacher Training Mapping Platform - MAPFOR - Federal University of Paraná (UFPR), based on Microdata from the Basic Education Census / INEP (Brazil, 2020).

When analyzing the data found in the Basic Education Census for the year 2020, the results of the research are shown in graph 1, regarding the number of teachers according to the level of training in a total of 2,189,005 teachers, with no minimum training 5.0%, High School in the normal modality 8.4%, Higher education with a degree or pedagogical complementation 41.0%, Postgraduate 43.%.

Figure 2.



Source: Prepared by the Educational Data Laboratory of the Teacher Training Mapping Platform - MAPFOR - Federal University of Paraná (UFPR), based on Microdata from the Basic Education Census / INEP (Brazil, 2020).

In the second graph figure 2, there is no Lato Sensu Graduate 57.0, with Specialization 39.1%, and with Stricto Senso-Graduate Degree-Master's or Doctorate only 3.1%.

The results of the Basic Education Census regarding the level of teacher training in Brazil, year 2023, are shown in table 1.

Table 1. Basic Education Census-(Brazil-2023). School Levels of Basic Education and levels of teacher training.

School Levels of Basic Education	Only high school level or inferior	High school only normal/ma-gistery.	Complete Higher Educatio n	Lato sensu post-graduation, with specialization	Postgraduat e- Stricto Senso-Master's or Doctorate	Total number of professors working
Early Childhood Education	8,4%	11%	80,7%	Not informed	Not informed	685 thousand teachers
Early Years of Elementary School	4,9%	7,8%	87,3%	Not informed	Not informed	769,366 teachers
Final years of elementary school	Not informed	Not informed	92,0%	Not informed	Not informed	774,395 teachers
Middle school	4,0%	Not informed	96,0%	Not informed	Not informed	538.781 teachers

Source: Prepared by the author, according to the technical summary of the Census (Brazil-2023).

According to the technical summary of the Basic Education Census (Brazil, 2023), it is stated that: Early Childhood Education had a growth in the percentage of graduated teachers with a degree working in early childhood education, from 73.3% in 2019 to 79.5% in 2023. In elementary education – Final years, the percentage of teachers with higher education in licensure increased by 3.7% between 2019 and 2023. As for secondary

education, considering the general indicators by Federation Unit, the five highest percentages are observed in states of the five major regions of the country: Federal District (86.3%), Amapá (84.8%), Espírito Santo (84.1%), Paraná (83.3%) and Rio Grande do Norte (79.9%). (Brazil, 2023).

In an overview, the percentage of professors with graduate degrees rose from 41.3% in 2019 to 47.7% in 2023. And the percentage of teachers with continuing education also increased, from 38.3% in 2019 to 41.3% in 2023 (Brasil, 2023).

DISCUSSION

In view of the above, we are faced with a worrying reality and making a brief reflection it is possible to observe a certain degree of educational inequality with regard to teacher training in Brazil. And the results obtained answer the problem of the research that refers to the question: is initial and continuing education accessible to all teachers of Basic Education in full exercise in Brazil? No, because according to the data from the technical summaries of the Censuses of the years surveyed, there are still teachers without minimum training.

Thus, it is noticeable that initial and continuing education, especially at the Lato Sensu and Stricto Sensu levels, are not accessible to all Basic Education teachers working in Brazil. Because the results of the 2020 Census reveal that 57. % of the professors did not have a Lato Sensu Graduate Program and only 3.1% had a Stricto Sensu Degree, that is, they were Masters or Doctors. In 2019, the data regarding the number of teachers with continuing education at Lato Sensu level was 41.3% and rose to 47.7% in 2023. (Brazil, 2023). However, the number of teachers with continuing education at the Stricto Sensu level in 2023 was not located.

CONCLUSION

In view of this, it is noticeable that it is necessary to promote initial and continuing training for teachers of Basic Education in Brazil, because without qualification there is no way for the education professional to prepare himself to perform multiple tasks simultaneously in practical pedagogical contexts and although free training is a right guaranteed to the teacher by force of law, these are sometimes denied to them, so seeking to train themselves to face the various daily challenges, some teachers in Brazil invest their own financial resources in Continuing Education courses, promoted by private institutions, especially training at the Stricto Sensu level. Therefore, even supported by the laws, some teachers do not have as much access to initial and continuing education as they should.

Therefore, in order to mitigate these neglects of teachers, it is necessary that public policies for teacher training, both initial and continued, be fully complied with, with respect for society as a whole, aiming at the quality of education in Brazil. Therefore, to follow the evolution of this process, it is necessary in the future to carry out a new study to verify if there have been changes in the educational scenario.

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PROTECTION AND CIVIL DEFENSE: RAINS IN 2013 IN THE MUNICIPALITY OF JAPERI – RJ

https://doi.org/10.56238/sevened2024.031-084

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ABSTRACT

This article seeks to show, through a case study of an event that occurred in 2013, in the municipality of Japeri in the State of Rio de Janeiro, in order to point out successes and mistakes made, both by the population and by the Public Power so that it can improve the structures of Civil Defense at the national, state and municipal levels, with relevance with regard to investments in human and material resources and in the organization of methodologies for diagnosis and mapping of risk areas. All these changes in the environment impact in different ways on the living conditions of different social groups that inhabit the municipalities, whether in their urban or rural areas. The objective of this study was to analyze the vulnerabilities that occurred in the municipality of Japeri, during the rains of December and January 2013, a period when there were greater rainfall changes, in the interventions of emergency and disaster actions, in the scenarios of the accident. The methodology applied was based on a case study that concluded at the end of the study that it is necessary to raise awareness among the population involved, also, by establishing a partnership between the environmental sector and the municipal Civil Defense for the implementation of future actions.

Keywords: Civil Protection and Defense. Civil Defense Actions. Public Policies of Urbanization.

INTRODUCTION

PROBLEMATIZATION

What is the role of the population and the Government when hydrological disasters occur based on what happened in Japeri in 2013?

OBJECTIVE

To analyze the vulnerabilities that occurred in the municipality of Japeri, during the rains of December and January of 2013, a period when there were greater rainfall changes, in the interventions of emergency and disaster actions, in the scenarios of the accident.

RELEVANCE

In recent decades, extreme events have caused constant impacts in several Brazilian municipalities.

Extreme events can occur in the form of heat waves, periods of drought, floods, landslides, etc. Certainly, droughts, floods and landslides are the most frequent natural disasters in the country. (Loureiro et, al, 2014)

Currently, in Brazil, it is the responsibility of the Ministry of Cities to deal with urban development policy and sectoral policies for housing, environmental sanitation, urban transport and traffic. But the housing panorama is still marked by precarious settlements devoid of urban equipment and mainly composed of buildings of low construction standard and empirical construction. In 2001, according to the Brazilian Institute of Geography and Statistics (IBGE), the country had 19,631 registered favelas, in a total of more than 1.6 million households. Of these, 70.1% were located in the 32 largest municipalities in the country with more than 500 thousand inhabitants. (Souza, et, al, 2009)

The Hyogo Framework, and the 1st National Conference on Civil Defense and Humanitarian Assistance (CNDC, 2010), took place in March 2010 in Brasilia, and brought new proposals for public policy on Civil Defense where they were formulated and approved, in order to contribute to the reformulation of the Civil Defense planning process in Brazil. Both established strategies and priorities in facing issues such as poverty, vulnerabilities in their multiple dimensions, in addition to the importance of preparing diagnoses and risk maps.

The theme of disaster risk has been institutionalized for many years, but the implementation of the Civil Defense System in most municipalities is far behind. In the ministries, there are different programs related to the theme of climate change and natural disasters, however, there were many adversities to integrate them transversally to the

issues of poverty, environmental degradation, health, housing, education, among others. Transversality in the assessment of risks and vulnerabilities in the management process was a basic condition for jointly facing the problems and factors that determine, to this day, the occurrence of disasters

LITERATURE REVIEW

In times of war, communities affected by combat actions needed to mobilize quickly to reestablish the basic needs of the community, in the areas of health, food, transportation, shelter, security, etc., providing them with minimum conditions for their subsistence. (Neto, 2007).

In the history of humanity, there have been major disasters associated with earthquakes, volcanism, hurricanes and tsunamis, which have killed thousands of people around the world. However, international records show that, from the second half of the twentieth century, there was a significant increase in the frequency and intensity of natural disasters. (Maffra et, al, 2007)

The negative results caused by natural disasters can reach proportions beyond the response capacity of the affected public agencies, proportions that reach threats to life, the environment and economic and financial development. (CNM, 2016)

The issue of disaster risk has been institutionalized for many years, according to item XVIII of Article 21 of the Federal Constitution of 1988 establishes that it is up to the Union to "*plan and promote permanent defense against public calamities, especially droughts and floods*". (Brazil, 1988)

In Brazil, in 2012, the National Policy for Civil Protection and Defense (PNPDEC) (Law No. 12,608) was instituted, which establishes government attributions at the federal, state, and municipal levels to face these events and minimize the risks and impacts of disasters, considering legal and administrative aspects. This Law was revised, in part, by Federal Law 14,750 of December 12, 2023. (Brazil, 2023).

The PNPDEC, in its article 8, established the following competencies for the municipalities, among others:

> III - incorporating civil protection and defense actions into municipal planning;
> IV - to identify and map the areas at risk of disasters;
> V – to promote the inspection of disaster risk areas and to prohibit new occupations in these areas;
> IX - to keep the population informed about areas of risk and the occurrence of extreme events, as well as about prevention and warning protocols and emergency actions in disaster circumstances (Brasil, 2012).

Thus, to ensure the civil protection of the population, it is necessary to identify vulnerabilities and social groups exposed to risks. It is also essential to understand which processes are involved in the constitution of vulnerabilities to disasters and which involve, in turn, an intersectoral and transdisciplinary management of risks (Júnior, 2016)

When dealing with the issue of reducing vulnerability to hydrometeorological events, such as rainfall, it is necessary to take into account the imbrications of political-institutional practices. (Valencio, 2010).

The challenge in this process for disaster risk reduction and in facing these situations lies in the recognition of the intersectoral nature of these actions and the need for them to be transversalized among the different public spheres: municipal, state and federal, private entities and civil society. (MIN, 2010)

At the intersection of these elements, we identify strategies that both make it impossible to establish a higher level of territorial security for impoverished social groups and reiterate the social disqualification of this group when affected by rainwater and mud that carry their material goods and their lives. (Valencio, 2010).

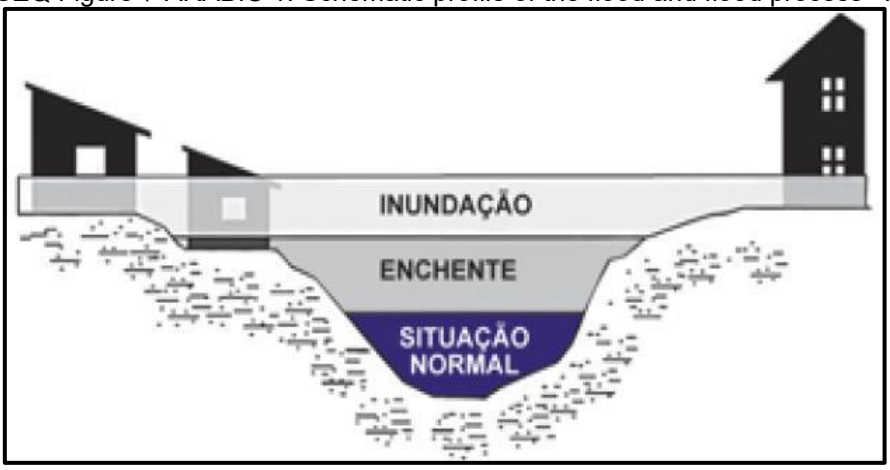
For the actions to be successful, the Civil Defense needs to establish partnerships and build networks so that other sectors can take ownership and share in the programs to be developed. The involvement of communities and institutions will then make it possible to expand autonomy and ensure self-management for decision-making on the situations that affect them. Gradually, it becomes possible to build legal and juridical recognition in a formal process of decision-making and resource management. (MIN, 2010)

CHARACTERIZATION OF FLOODS, FLOODS AND FLASH FLOODS IN URBAN AREAS

Floods and floods are natural events classified and codified in Brazil (2022), which occur periodically in watercourses, often triggered by heavy and rapid rains or long-lasting rains. In addition to flooding and flooding, there are also the concepts of flooding and flooding, usually used in urban areas. (Tominaga et, al, 2012)

Figure 1 shows the difference between the normal situation of the volume of water in the channel of a watercourse and the events of flooding and flooding.

Figure: SEQ Figure * ARABIC 1: Schematic profile of the flood and flood process - Adapted



(Source: Brazil, 2007)

According to the Brazilian Classification and Codification of Disasters (Cobrade):

A. **Flooding:** Submersion of areas outside the normal limits of a watercourse in areas that are not normally submerged. The overflow occurs gradually, usually caused by prolonged rainfall in lowland areas.
B. **Flooding:** Extrapolation of the drainage capacity of urban drainage systems and consequent accumulation of water in streets, sidewalks or other urban infrastructures, as a result of heavy rainfall.
C. **Runoff:** Surface runoff of high speed and energy, caused by intense and concentrated rainfall, usually in small basins of rugged relief. Characterized by the sudden increase in the flows of a certain drainage and sudden overflow of the river channel. It has great destructive power

It is now known that floods are related to the amount and intensity of atmospheric precipitation. The magnitude and frequency of floods occur as a function of the intensity and distribution of precipitation, the rate of water infiltration into the soil, the degree of soil saturation, and the morphometric and morphological characteristics of the drainage basin. (Tominaga et, al, 2012)

Due to the high degree of degradation of urban rivers, resulting from the release of sewage and garbage, the contamination of rainwater by washing surfaces and the plumbing itself, there is a detachment between the natural environment (river) and the city. Watercourses are now recognized as sewage channels (and no longer as rivers) and, consequently, any covering intervention is no longer recognized as impactful (negative impact). (Souza, 2013)

THE CONSEQUENCES OF FLOODS IN URBAN AREAS

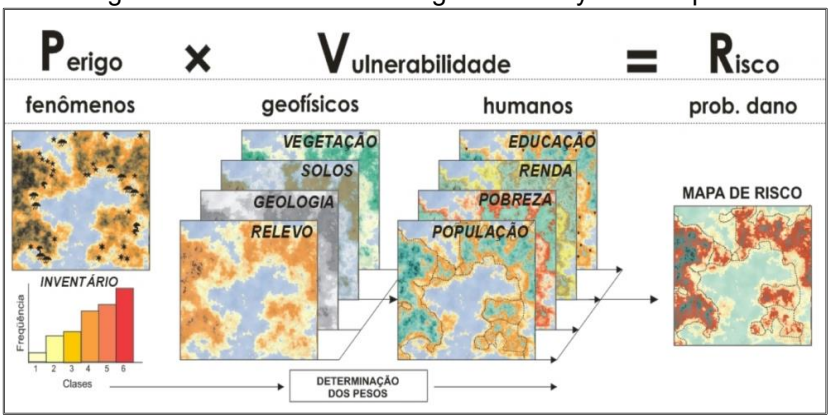
According to Law 14,750, of December 12, 2023 - "the result of adverse events, of natural origin or induced by human action, on ecosystems or vulnerable populations that causes significant human, material or environmental damage and consequent economic and social losses" (Brasil, 2023).

Social and environmental risks can be reduced and avoided through efficient management of land and environmental resources. Therefore, it is important to plan and execute measures to prevent or minimize disasters in conjunction with other issues and sectors, governmental or non-governmental segments, and society. The negligence on the part of the municipal management, in relation to the risk areas and the vulnerable population, brings losses that go beyond the local scope. (Coutinho et, al, 2015)

The risk defined and expressed by Freire (2014) is the probability of harmful consequences or expected losses (deaths, injuries, property, livelihoods, interruption of economic activity or environment, natural or anthropogenic hazards, and conditions of vulnerability, as in Figure 2).

Risk = hazards x vulnerability

Figure 2: Parameters involving a risk analysis - Adapted



(Source: natural disasters and geotechnologies: basic concepts INPE, 2008)

It can be said that, in addition to the natural conditions, the various anthropic interventions carried out in the physical environment have been decisive in the occurrence of disasters, floods and floods, especially urban expansion occurs with a set of actions that modify the original conditions of the hydrological cycle of a region: deforestation, exposure of land to erosion and consequent silting of watercourses. (Brazil, 2007)

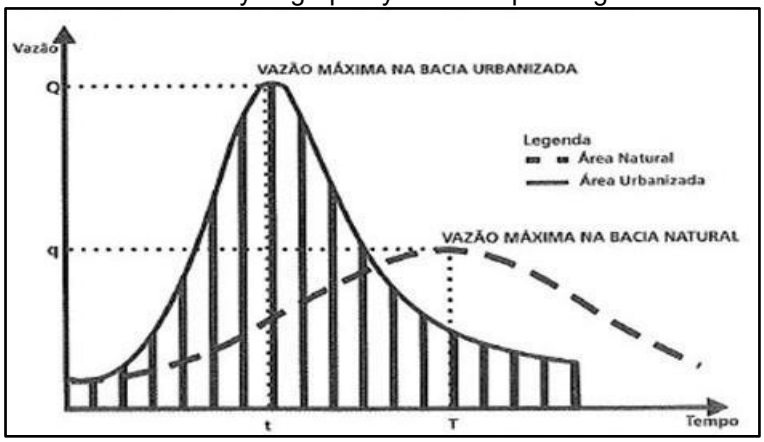
Deforestation and the disorderly occupation of slopes have caused a series of harmful effects, triggering several processes of disaster risks. Its effects combined with the problems of precarious housing, limited access and/or lack of basic infrastructure, and the

lack of knowledge of how to build on slopes have greatly contributed to the production of an environment of high vulnerability and risk. Disaster is not a one-off problem that is limited to the occurrence of rainfall, but the result of the interaction between a natural phenomenon and anthropic action on the environment. (Dutra, 2011)

Urbanization causes soil waterproofing, reducing infiltration, underground runoff and the concentration time of the basin. As a result, in a few minutes after a rain, the first signs of flooding appear. If there is no urban planning, it will be inevitable that numerous problems will arise for the population, as a result of the impacts of urbanization on the environment. (Bezerra et, al, 2016)

From the hydrological point of view, Figure 3 clearly shows the change caused in the maximum flow of a basin, a function of impermeabilization of the land as a result of urbanization. (Brazil, 2017)

Figure 3: Modification in the hydrograph by the waterproofing of the basin - Adapted



Source: Brazil, 2007

PREVENTIVE MEASURES IN RISK AREAS

The municipalities were delegated the tasks of identifying and mapping disaster risk areas; promote the inspection of disaster risk areas and prohibit new occupations in these areas; inspect buildings and risk areas and promote, when appropriate, preventive intervention and the evacuation of the population from high-risk areas or vulnerable buildings; keep the population informed about risk areas and the occurrence of extreme events, as well as about prevention and warning protocols and emergency actions in disaster circumstances. (Brazil, 2012).

The master plan is the basic instrument of the municipal policy of development and urban expansion, with the objective of ordering the development of the social functions of the city or municipality and ensuring the well-being of its inhabitants. The way space is used in cities can have severe impacts, and it is necessary to guide urban expansion, invest in

basic infrastructure, promote the conservation of open spaces and the protection of natural resources, as well as equity in the use of public space. (Coutinho et, al, 2015)

The master plan must include, among other information, the survey of risk areas based on a geotechnical map, urban drainage measures and guidelines for the land regularization of settlements. (Ganem, 2012)

The Urban Drainage Master Plan must provide for the mechanisms for managing urban infrastructure, related to the flow of rainwater, rivers and streams in urban areas. The proper planning of these mechanisms combined with the use and occupation of the appropriate land will contribute to improving sanitation conditions, environmental and urban quality, and reducing economic losses. (Bezerra, et, al, 2016)

Environmental education is another very important instrument. The population must be aware that the inadequate disposal of garbage and debris causes problems in the drainage system and in the flow of rivers, causing flooding, flooding and flooding. (Tominaga et, al, 2012)

Considering the severity of the events and their consequences and more frequent global trends, it is vital for the planning of prevention and response actions to structure information and surveillance systems on natural disasters, which contain the integrated action of sectors such as Health, Environment and Civil Defense, in addition to the participation of civil society and local communities that suffer more directly from the effects of disasters. (Sobral et, al, 2010)

MATERIALS AND METHODS

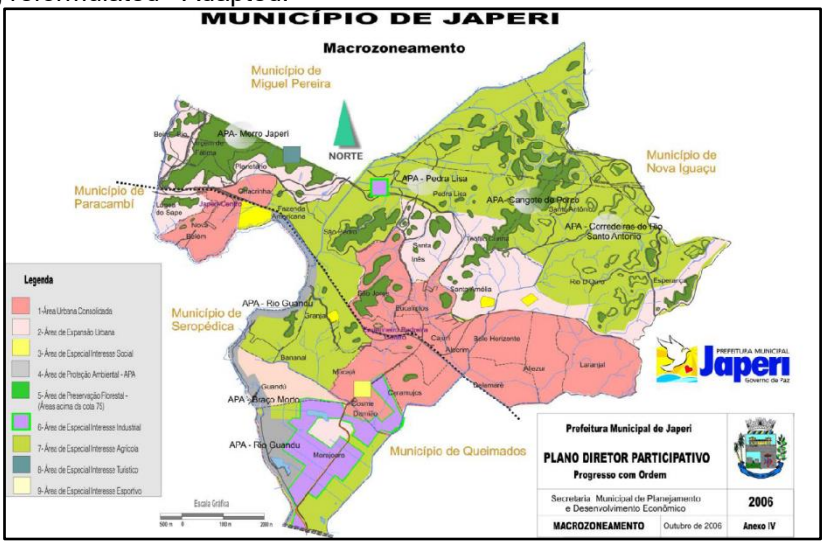
CHARACTERIZATION OF THE STUDY AREA

Japeri is a municipality in the Metropolitan Region of Rio de Janeiro that makes up the municipalities of the Baixada Fluminense of the State, located at the geographic coordinates 22º38'35" south latitude and 43º39'12" west longitude, at 30 meters of altitude it occupies an area of 82,954km², as in Figure 4. The population verified in the 2013 count was 98,393 inhabitants, IBGE estimate, limited by the municipalities of Paracambi, Seropédica, Queimados, Miguel Pereira and Nova Iguaçu. Bathed by the rivers Guandu, Santana, Rio dos Poços, Rio d'Ouro, Santo Antônio, Ribeirão das Lages and São Pedro, it is cut by the RJ-125, and called "Estrada Miguel Pereira" and RJ 093 called "Estrada Ary Schiavo". (Plancon, 2015)

The rainfall of the municipality on December 6, 2013 reached 90 mm according to the rainfall devices installed by the National Center for Monitoring and Alerts of Natural Disasters (Cemaden) and according to data from INEA/SEA/State Government, in the

points of flooding and flooding pointed out by the Municipal Contingency Plan prepared and reviewed every year by SEMPDEC. Historical data reported by SEMPDEC pointed to rainfall indices that far exceeded the drainage capacity of water bodies and the urban drainage system, so the vast majority of the affected population was related to urban areas and urban expansion, according to the Municipal Macrozoning, positioned in riverbank areas and adjacent areas. (SEMPDEC, 2013)

Figure 4: Political Division of the Municipality of Japeri - Participatory Master Plan, 2006. The Municipality's Master Plan is being reformulated - Adapted.



Source: SEMPDEC Collection

STUDY TOOLS

For the elaboration of this work, research was carried out with municipal public agencies on historical data, literature review, based on bibliographic references researched in books, websites, articles, theses, laws and reliable documents pertinent to the theme of the subject, from which the data were collected for analysis.

After the data surveys , it was found that there are points of flooding and flooding in the municipality, especially in the neighborhoods called critical points considered by SEMPDEC, Figures 5 and 6, that by determination of Law 12.608 - National Policy for Civil Protection and Defense, Contingency Plans must be prepared according to the threats, respectively classified and codified in Cobrade.

The rainfall that occurred in the municipality in 2013, caused the municipal decree of an Emergency Situation, according to Brasil (2022), with the State and Federal public agencies according to the Disaster Information Form (FIDE) - 2013, in the Alecrim neighborhood located in the district of Engenheiro Pedreira - Japeri - RJ, had the highest rate of flooding and flooding between the months of November and April causing inconvenience to the citizens of the region, has been affected according to the historical

reports of SEMPDEC since 2009 due to the water bodies: Teófilo Cunha Channel with an extension of 3 km, it is a tributary of the rivers: Santo Antônio River, D'Ouro River, Poços River, contributors to the Guandu River Sub-basin, an important source area of the Metropolitan Region of Rio de Janeiro, belonging to the Sepetiba Hydrographic Basin. (SEMPDEC, 2013)

However, the importance of the need to carry out preventive works to reduce and/or minimize losses and damages caused by erosive processes, landslides, floods, floods, droughts and other disasters is emphasized. And also, to analyze the vulnerability of the population, identifying the groups most affected by these risks (effects of threats on exposed social groups).

The knowledge of the territorial reality through the mapping of risk areas is strategic information, of paramount importance for the formulation of public policies, the management and planning of the territory and for the improvement of the quality of life of the population. (Júnior, 2012)

On the other hand, it is also emphasized the need to carry out detailed studies, integrated planning with intense participation of the community in the planning and execution of flood forecasting, prevention and control measures, as well-managed watersheds preserve wild flora and fauna, ensure biodiversity, facilitate pest control and reduce floods and droughts or droughts. (Saueressig, 2012)

Figure 5: Flood flooding area in the area demarcated by SEMPDEC after the 2013 rains, adapted by Engineer Bruna T. Carvalho – 2017.



Caption:
- Theophilus Canal Cunha – Area of 1
Rio D'Ouro – Area of 2
Santo Antônio River – Area of 3
Risk Region 4 – Floods and flooding
Risk Region 2 – Floods and floods

CASE STUDY

Figure 6: Irregular constructions on the banks of the Teófilo Cunha Canal in the Municipality of Japeri – RJ, in 2013.



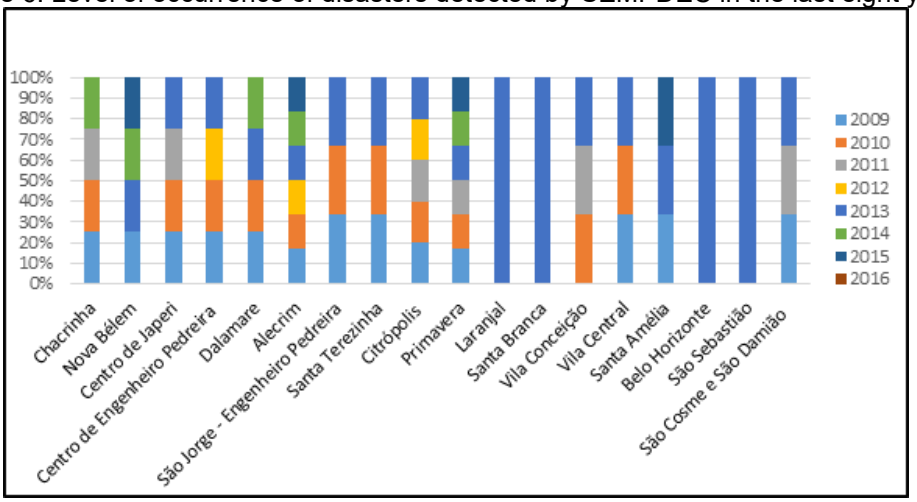
Photos: SEMPDEC Collection

The case study in this research was developed in the municipality of Japeri in the State of Rio de Janeiro, in order to combine qualitative or quantitative evidence and seeking to address propositions for understanding steps such as examination of evidence, categorization, classification in tables or charts, testing and recombination of evidence, according to Yin (2015), to understand how the event of heavy rains in Japeri in 2013 took place and its consequences.

According to the graph prepared by the authors, in Figure 6, it is verified that the Alecrim neighborhood has the highest rates of occurrences of flooding, flooding and flooding in the last eight years, this demonstrates that the public authorities have not intervened in the improvements of municipal infrastructure for disaster prevention.

Neighborhoods with occurrence of flooding and flooding

Figure 6: Level of occurrence of disasters detected by SEMPDEC in the last eight years



Source: graph prepared by the authors themselves es- 2024

The amount of garbage accumulated on the banks or disposed of incorrectly by the population ends up being dragged by the rains into the Teófilo Cunha Canal, as shown in Figure 7, hindering the natural flow, causing clogging of the stretches, under car crossing bridges, because it has an insufficient section. Between downstream and upstream there is

a part that is channeled where it suffers the bottleneck of the channel as a result of the decrease in flow.

Figure 1: Photo 1 - Overflow of the Teófilo Cunha Canal - Flood - 2009, Photo 2 - The removal of solid waste on the access bridge - 2009, Photo 3 and 4 - Comparison of the emergency situation at the time of the disaster and the current situation of the canal - 2017, Photo 5 and 6 - Flooding of the canal on Himalaya street - 2013 and current situation of the canal - 2017 of the municipality of Japeri - Engenheiro Pedreira - RJ.



Source: Photos from the SEMPDEC collection.

Siltation by sediments altered the flow capacity and increased the rate of soil erosion in the watershed, which increased the risk of water overflows. The disorderly occupation of the banks of the canal bed promoted disorganization in the use of geographic space, as a result of the devastation of riparian forests.

The drainage and sewage system was deficient, the municipality in turn did not have the proper care with maintenance and conservation, the Alecrim neighborhood was characterized by a rapid and population growth, without basic sanitation with a low-income community, the paving of streets and sidewalks caused soil waterproofing, increasing, the speed of drainage, The rainfall retention time decreased, after the rains the disinfestation system was carried out on an emergency basis for the control of infectious diseases, with the aim of mitigating a possible secondary disaster.

FINAL CONSIDERATIONS

From the data obtained by the case study, it was found that there was, already in 2013, the need for greater public and private investments for the education of the population at the time of disposal of their garbage, which based on the new norm of the Ministry of the Environment – Integrated Management of Solid Waste, urban infrastructure works throughout the Teófilo Canal Cunha, the main water receptacle of Japeri, it is verified,

in order to minimize disasters, the drainage of the canal in the most critical periods of the year, the construction of a rainwater and sewage network of the local system, in collaboration with the Environmental Sanitation Plan in which it portrayed the non-existence of the municipal drainage system.

The city of Japeri should control the disorderly occupation of the land, especially in areas established by the macrozoning plan where it establishes areas that must be occupied, so the city hall can better manage the form of occupation of its land avoiding settlements in risk areas; where the settlements pointed out by SEMPDEC, together with the Municipal Participatory Master Plan as risk areas, should be assisted with the creation of mechanisms to raise awareness among the population so that there is no further expansion of these areas and it is also necessary to remove the constructions that are eminently in danger of collapsing, directing, since that time, the population of risk areas to housing programs of social interest,

In addition to promoting the diversity of uses and contributing to the generation of new areas of employment and income, which would protect threatened families from the risk area in which they lived. Aiming, in the nature of protection and civil defense, the prevention and mitigation of risk in the most vulnerable areas, to the occurrence of disasters, which, like the one that occurred in 2013, cause loss of material goods and lives.

The Civil Defense today already has the Alert and Alarm system through *software,* in which messages are sent to the population through SMS, warning of a possible emergency situation , with technological advances in the area of civil defense, we have already installed four automatic rain gauges and a hydrological station installed in risk areas, with the objective of expanding the monitoring network and improving the forecast of natural disasters and reduce socioeconomic and environmental damage to its population.

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STRUCTURING OF DETENTION AND RETENTION RESERVOIRS AS A PROTECTION AND CIVIL DEFENSE ACTION AGAINST FLOODS

https://doi.org/10.56238/sevened2024.031-085

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ABSTRACT

This article seeks to point out alternative solutions to municipal governments to deal, within their urban zoning, through the structuring of detention and retention reservoirs as a civil protection and defense action, recommended by the National Policy for Civil Protection and Defense (PNPDEC), in the face of floods, seen as disasters that affect many victims and cause great losses. The authors, through a bibliographic and documentary research, approach the theme in a qualitative way, using the view of authors specialized in the triangulated areas, thus justifying the proposed idea, trying to solve the problem presented, where it was concluded that in fact alternative structural engineering measures, related to reservoirs can, when of interest to the Government, avoid and minimize the effects of disasters that occur, through the installation of these in cities.

Keywords: Civil Protection and Defense. Flooding. Detention and retention reservoirs.

INTRODUCTION

PROBLEMATIZATION

How can structural measures be used to avoid or minimize the effects of disasters such as floods in cities?

OBJECTIVE

Present structural engineering alternatives in order to avoid and minimize the harmful effects of flooding in cities, when in the period of normal disasters.

JUSTIFICATION

Floods are adverse events that, according to the Brazilian Classification and Codification of Disasters (COBRADE), Brazil (2022), usually occur in densely populated urban watersheds, where urban land occupation has occurred without proper control and the soil has been highly impermeable.

In Brazil, in 2012, the National Policy for Civil Protection and Defense (PNPDEC) was introduced, which made several agencies responsible for carrying out prevention, mitigation, preparation, response and recovery actions, seeking to avoid the occurrence of disasters or reduce their effects, so that the municipalities, through their governments, since then, began to have to carry out several interventions for this purpose (Brasil, 2012).

The removal of the vegetation cover from the soil and its waterproofing interfere with the natural hydrological cycle, with the water that no longer undergoes evapotranspiration, which with the reduction of the infiltration of these waters into the soil, reducing the recharge of the water table, increase the surface runoff and reduce the concentration time of the basin, overloading the drainage systems such as gutters, culverts, plumbing and galleries.

In recent decades, most developing countries, including Brazil, have experienced urban sprawl with poor drainage infrastructure, with flooding problems arising mainly from the rapid expansion of the urban population, the low level of awareness of the problem, the lack of long-term plans, the poor use of non-structural measures, and the inadequate maintenance of flood control systems (Canholi, 2014)

Figure 1 shows an example of flooding in Praça da Bandeira, Rio de Janeiro.

Figure 1: Flooding in Praça da Bandeira.



Source: Daniela Caruncha/06-04-2010 - Jornal EXTRA - Online

These events cause great damage to society, present themselves as disasters, and are observed more and more frequently in several Brazilian cities (Brasil, 2022). The urban drainage model by rivers and canals, which are only intended to transport the flows and transfer the floods downstream, no longer account for the volume of surface runoff caused by the rains and the expansion of this system in some situations becomes unfeasible or very costly, due to the need to interrupt traffic and expropriate properties. (PDMAP, 2014)

These problems could be minimized or avoided with non-structural measures, those that do not require works, by introducing standards, regulations and programs that control the occupation of the land, delimiting its use and planning its occupation. Non-structural measures can be effective at lower costs and with a long term of action. (Canholi, 2014)

With the flooding framework in place, only interventions with structural measures remain, which are engineering works classified as intensive and extensive measures.

It is also understood that in cases of disasters, conceptualized as such in Brazil (2023), non-structural and structural measures are tools that should be installed during the period of normality, preceding adverse events, which should be carried out as prevention, mitigation, or even preparation actions, as the agents who will intervene in the event of a flood, They will need to be prepared and knowledgeable about these structures. Also, they can be installed as a recovery action, after the event occurred, after the so-called period of abnormality, where responses are executed, seeking to provide aid to victims and reduce damage and losses caused by the hydrological event. (Brazil, 2012).

For Macedo (2004), intensive structural measures are those that act directly on watercourses, through the construction of structures such as dikes, retaining walls, accumulation and retardation reservoirs, diversion channels and engineering works that modify the morphology of the watercourse and aim to change the natural configuration of

the watercourse flow, or by the acceleration, retardation and diversion of the flow, thus mitigating the effects of a flood in certain areas.

According to Tucci (1993), extensive are the measures that act in the basin, modifying the relationships between precipitation and flow, so that through direct physical measurements in the basin it can reduce the runoff coefficient and reduce the effects of erosion and, as a consequence, reduce the risk of flooding.

Extensive measures include: control of vegetation cover, widespread storage in the basin, devices that increase infiltration and percolation capacity: permeable pavements, infiltration ditches, percolation basins and soil erosion control. (Souza, 2013)

Detention or retention reservoirs are an alternative increasingly used in solving urban flooding problems, as they are highly efficient as long as they are correctly sized and executed. These reservoirs can store a large volume of water and promote its disposal after the critical peak rainfall period. (PROSAB, 2009)

METHODOLOGY

This article was developed through a literature review of books, theses, articles and magazines about the problem of urban drainage, focusing on detention reservoirs, a solution increasingly used in the control of flows in urban watersheds. Where, through a bibliographic and documentary research, data were sought that would justify the theme addressed in order to correlate areas such as engineering, civil protection and defense and other related areas (Lakatos and Marconi, 2017).

The study of urban drainage is widely addressed in scientific works, with several works presented, in this way, basic concepts such as hydrological cycle, hydrographic basin, concentration time, rational method, maximum precipitation, are recurrent in the literature, in this article will be addressed aspects of this subject, aiming to avoid the occurrence of the disastrous event such as flooding or the minimization of damage and losses to people living in cities.

DEVELOPMENT

THE EFFECT OF URBANIZATION

Urban growth in the vast majority of Brazilian cities occurred with a total lack of planning and control by the responsible agencies, this occupation brought several problems to the population that lives in these areas, due to the impacts of urbanization on the environment.

Canholi (2000) states that "the problem of flooding was particularly aggravated in emerging countries, due to the speed of the population densification process and the precariousness of the infrastructure, combined with the lack of planning and the lack of resources". The main effects of urbanization are: the increase in the maximum flow, the anticipation of the peak and the increase in the volume of surface runoff.

Tucci (2009) states that "the consequences of urbanization that most directly interfere with urban drainage are the alterations of direct surface runoff".

Floods and urban floods affect several Brazilian cities and have become chronic problems, the impermeabilization of the soil, the occupation of floodplain areas and the hygienist solution adopted of only transposing the waters far away through canals and rivers, trying to avoid waterborne diseases, have only transferred the problem from one place to another, causing floods downstream.

Table 1 presents a survey of Brazilian municipalities with urban areas that suffered floods, it was carried out by the Brazilian Institute of Geography and Statistics (IBGE) in 2008, this survey already pointed out, at that time, that of the 5564 Brazilian municipalities, 2274 suffered floods in urban areas, this represented more than 40% of the municipalities, the southeast region presented the worst scenario, More than 50% of municipalities have suffered flooding in urban areas.

Table 1: Municipalities, total and with floods and/or flooding in the urban area, in the last five years, by areas in which floods and/or flooding occurred, according to Major Regions and Federation Units – 2008.

Grandes Regiões e Unidades da Federação	Municípios					
	Total	Com inundações e/ou alagamentos ocorridos na área urbana, nos últimos cinco anos				
		Total	Áreas em que ocorreram inundações e/ou alagamentos			
			Áreas urbanas ocupadas, inundáveis naturalmente pelos cursos d'água	Áreas de baixios naturalmente inundáveis, ocupadas irregularmente e/ou inadequadamente	Não usualmente inundáveis	Outras
Brasil	**5 564**	**2 274**	**1 381**	**1 093**	**698**	**156**
Norte	**449**	**150**	**95**	**83**	**28**	**11**
Rondônia	52	20	13	8	6	2
Acre	22	14	9	7	4	–
Amazonas	62	24	18	14	2	–
Roraima	15	5	2	2	2	–
Pará	143	66	43	43	10	5
Amapá	16	3	1	3	–	–
Tocantins	139	18	9	6	4	4
Nordeste	**1 793**	**644**	**375**	**319**	**201**	**41**
Maranhão	217	63	36	36	19	7
Piauí	223	61	30	24	37	–
Ceará	184	78	50	40	20	4
Rio Grande do Norte	167	55	35	27	11	–
Paraíba	223	75	43	39	24	2
Pernambuco	185	91	58	50	27	6
Alagoas	102	40	24	11	17	3
Sergipe	75	35	17	18	9	5
Bahia	417	146	82	74	37	14
Sudeste	**1 668**	**851**	**563**	**393**	**229**	**57**
Minas Gerais	853	409	277	159	117	14
Espírito Santo	78	67	48	47	15	7
Rio de Janeiro	92	78	64	53	19	5
São Paulo	645	297	174	134	78	31
Sul	**1 188**	**568**	**287**	**237**	**195**	**42**
Paraná	399	137	68	61	50	15
Santa Catarina	293	172	105	92	71	8
Rio Grande do Sul	496	199	114	84	74	19
Centro-Oeste	**466**	**121**	**61**	**61**	**45**	**5**
Mato Grosso do Sul	78	34	15	15	19	1
Mato Grosso	141	34	19	18	12	2
Goiás	246	52	26	27	14	2
Distrito Federal	1	1	1	1	–	–

Source: Adapted from IBGE, National Survey of Basic Sanitation, Coordination of Population and Social Indicators, National Survey of Basic Sanitation 2008.
Note: The municipality may suffer flooding and/or flooding in more than one area.

ALTERNATIVE URBAN DRAINAGE TECHNIQUES

The increase in the occupation of the urban area occurred without the proper infrastructure investments and after the installed problem, all that remains is to seek alternatives to control this runoff, implementing alternative urban drainage techniques.

A technique widely used in developed countries is the infiltration of rainwater, which promotes the recharge of groundwater, being a solution with a greater environmental attachment, this technique uses infiltration trenches, infiltration wells, permeable pavements and coatings, ditches and infiltration ditches. (SUDERHSA, 2002)

In developing countries, measures are usually adopted to retain these waters for release after the peak of rainfall events, this technique is criticized when measures to reuse these waters are not jointly employed, which can be used for non-potable purposes, this technique uses retention reservoirs. (PDMAP, 2014)

HOLDING RESERVOIRS

The concept of slowing down runoffs is antagonistic to the hygienist concept, which accelerated runoff through pipes. Delaying flow through retention reservoirs is a technique used to readjust or increase the efficiency of drainage systems, by increasing the concentration time and reducing maximum flows. (Ramos, 2015)

This solution can be used at the microdrainage level, that is, in lots, shopping malls, soccer stadiums, etc., or at the macrodrainage level, in rivers and streams. Retention reservoirs can be open air or underground, they can be operated by gravity or by hydraulic pumps. (PDMAP, 2014)

OPEN-PIT RESERVOIRS

They require an extensive area for their implementation, they must have green and leisure areas as aggregates, valuing the presence of water urbanistically, taking care to maintain continuous maintenance, so as not to cause the proliferation of disease vectors and aquatic vegetation. Figure 2 presents an example of an open-pit reservoir. (City Hall of Rio de Janeiro, 2016)

Figure 2: Detention Reservoir at Júlio Andreatta Square (Water Squares), Porto Alegre – RS - Adapted



Source: Porto Alegre City Hall – PMPA, Department of Rainwater Sewers – DEP (2011).

UNDERGROUND RESERVOIR

They do not require large areas for their implementation, as their storage capacity is not limited to the dimensions of the land, and can be compensated by the depth, they are usually a solution for densely populated urban areas, after their construction the area over the reservoir can be used for public leisure such as squares and recreation areas. Improper disposal and failures in the collection of solid waste cause the accumulation of this waste in the reservoir, requiring its cleaning after heavy rainfall events. (Nakazone, 2005)

Figure 3 presents an example of an underground reservoir under construction and Figure 4 presents this same reservoir ready.

Figure 3: Praça da Bandeira Detention Reservoir (under construction), Rio de Janeiro – RJ – Adapted.



Fonte: g1.globo.com, 2013.

Figure 4: Praça da Bandeira Detention Reservoir - Ready, 2015, Rio de Janeiro - RJ - Adapted.



Source: Wikipedia.

CONCLUSION

Therefore, from the above, it was found that detention or retention reservoirs can, in fact, be an alternative to be used by municipal governments within the urban planning of cities to avoid floods, as well as a solution when these become disasters recommended by the National Policy for Civil Protection and Defense (PNPDEC), where agents should act in the response to rescues and in the reduction of damage and losses. Therefore, the structuring of these reservoirs can also be seen as prevention and mitigation actions, within the same PNPDEC, as addressed in this scientific work.

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ANXIETY, DEPRESSION AND STRESS IN FIRST-YEAR MEDICAL STUDENTS AT TIRADENTES UNIVERSITY: A FIELD REVIEW

https://doi.org/10.56238/sevened2024.031-086

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ABSTRACT

The transition to university life in challenging courses, such as Medicine, is a period that brings high levels of stress and an increasing prevalence of mental disorders, including anxiety and depression. These factors directly affect the well-being of students and, consequently, their ability to care for patients. A study of first-year medical students found that a significant portion faces moderate to high stress, with 53.6 percent showing signs of anxiety and 22.7 percent indicating depression. The research highlights the relationship between stress, anxiety, and depression, showing that a lower quality of life is associated with elevated levels of stress. These data highlight the importance of implementing mental health support strategies in educational institutions. Integrating programs and interventions that help students manage their emotional demands is essential, as this not only improves students' well-being, but also enhances the quality of care they will be able to provide in the future. Therefore, it is critical that universities prioritize mental health as an integral part of medical education.

Keywords: Anxiety. Depression. Psychological Stress. Quality of Life. Medical students.

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INTRODUCTION

The transition to university life, especially in demanding courses such as Medicine, can be marked by a combination of euphoria and stress. New responsibilities and intense workload often result in chronic stress, negatively affecting cognitive functions and students' overall health (March-Amengual JM *et al*, 2022).

These students face intense academic pressure, with high demands and workload that contribute to high levels of stress. These factors not only affect the well-being of students, but also have serious implications for their ability to provide quality care to patients. First-year medical students must acquire effective stress management techniques to avoid the potential negative consequences of these stressors, as well as develop the ability to identify and manage stressors (Panja S *et al*, 2023).

Generalized anxiety disorder has as essential characteristics anxiety and excessive worry about various events or activities. The intensity of these feelings is disproportionate to the actual probability or impact of the anticipated event. Major depression disorder, on the other hand, is characterized by a depressed mood, decreased interests or old pleasures, weight loss or gain, among others, and these characteristics are usually present every day, most of the day for at least 2 weeks (5th edition of the DSM-V, 2013).

Depression is widely recognized as one of the most prevalent mental health issues among college students. Among these, medical students have particularly high rates of this condition compared to the general population and students from other areas. Studies conducted in Brazil indicate that between 20% and 50% of medical students face mental disorders, with the prevalence of anxiety symptoms also being remarkably high (Shao R *et al*, 2020).

This situation is partly explained by the various personal and organizational stressors faced during medical training. Academic environments are often characterized by high levels of demand and stress, often to the detriment of students' mental health, with a predominant focus on theoretical outcomes. Academic literature, including studies conducted during and after the COVID-19 pandemic, has revealed that medical students are particularly vulnerable to mental health problems, experiencing elevated rates of depression, anxiety, and burnout (Lee CM *et al*, 2021).

The challenges faced by medical students are multifaceted and contribute to the high prevalence of psychological disorders. Among these challenges are intense academic rigor, financial debt, sleep deprivation, lack of control over their circumstances, constant exposure to illness and death, and inadequate treatment during training. These factors become most evident at key moments in academic training, such as the first year in medical school, the

transition from the preclinical curriculum to the internship, and the final periods before the start of residency. These transformations and the obstacles faced elucidate the increase in mental difficulties in this population. (March-Amengual JM *et al*, 2022).

The reluctance to seek help for mental health problems is an additional concern, exacerbated by factors such as the desire to maintain an image of invincibility and the fear of jeopardizing one's career. However, evidence indicates that psychological support can significantly reduce distress and improve the quality of patient care (Nair M *et al*, 2023). Taking into account the damage that anxiety, depression and stress disorders can cause in the academic and professional lives of these students, it is imperative that educational institutions review their curricula to integrate mental health support, better preparing future physicians for the emotional and academic challenges of their profession (Lee CM *et al*, 2021).

In this context, the present study is necessary to evidence the influence of quality of life and stress on medical students in relation to mental disorders of anxiety and depression. The final objective is to clarify the prevalence of these disorders among first-year medical students at Tiradentes University, in addition to correlating these data with the impact of stress and quality of life on each student's routine. This research may contribute theoretically to the literature on mental health in medical education and, in practice, to the implementation of interventions that promote the well-being of students.

METHODOLOGY

This is a cross-sectional study, carried out at the Tiradentes University through an online questionnaire directed to first-year medical students. Of the 140 students enrolled at the Tiradentes University in the first year of the medical course, 97 students were part of this study, whose inclusion criteria were: being enrolled in the first year of medicine at the Tiradentes University. Students who were not properly enrolled or who were not part of the first year of medicine were excluded.

Exploratory data analysis was performed by calculating simple and percentage frequencies for sociodemographic variables and PSS10 and HAD classifications, and median, interquartile range, minimum and maximum for Whoqol scores. The inferential analysis used the Chi-square or Fisher's exact tests (Siegel & Castellan Jr, 2006) when crossing the HAD-A, HAD-D and PSS10 with other qualitative variables, where the results were presented in terms of a cross-reference table, and percentages calculated as a function of the lines. The Mann-Whitney (Mann & Whitney, 1947) and Kruskal-Wallis (Kruskal & Wallis, 1952) tests were used when the Whoqol scales were crossed with other

qualitative variables, where the results were presented in terms of median and interquartile range. The Shapiro-Wilks test (Shapiro & Wilk, 1965) was used to verify adherence to the Normal distribution.

The data were organized in Microsoft Excel, and all statistical analyses were performed in the R software, version 4.4.1 (The R Core Team, 2024). The level of significance adopted was 5%.

RESULTS AND DISCUSSION

The study analyzed 97 first-year medical students at UNIT, 73.2% of whom were women and 26.8% were men. Most students (45.4%) were between 17 and 19 years old, and 61.8% lived with their parents. In relation to income, 62.9% had an income of 10 minimum wages or more, and 68.1% had no financing or scholarship. Regarding the use of medications, 43.3% of the students used medications, with 29.9% for anxiety, 17.5% for depression, and 9.3% for stress. On the stress perception scale, 58.7% had a moderate level of stress. In addition, 53.6% of the students had some level of anxiety, and 22.7% showed signs of depression (Table 1). Quality of life was assessed in the four aspects of the WHOQOL-BREF, with medians of 67.9 in the physical aspect, 62.5 in the psychological aspect, 75.0 in the social relationships and 75.0 in the environment, indicating a good support network, but a possible need to focus on mental health (Table 2).

Table 1: Socioeconomic characteristics of the students

Variable/Category	Frequency	Percentage
Age group		
17 to 19 years old	44	45,4
20 to 24 years old	40	41,2
25 years or older	13	13,4
What is your sex (gender)?		
Female	71	73,2
Male	26	26,8
You currently reside		
Relatives' house	7	7,2
Parents' house	60	61,8
I share a house / apt with one or more colleagues	6	6,2
Alone	24	24,7
What is the family income?		
Between 1 and 2 minimum wages	2	2,1
Between 2 and 4 minimum wages	6	6,2
Between 4 and 6 minimum wages	7	7,2
Between 6 and 10 minimum wages	21	21,6
Between 10 and 20 minimum wages	32	32,9

More than 20 minimum wage	29	29,9
Funding/scholarship		
No	66	68,1
Yes	31	31,9
Health medicine		
No	55	56,7
Yes	42	43,3
Medication for depression		
No	80	82,5
Yes	17	17,5
Medication for anxiety		
No	68	70,1
Yes	29	29,9
Stress medication		
No	88	90,7
Yes	9	9,3
PSS-10 Rating		
Baixo	11	11,3
Moderate	57	58,7
High	29	29,9
HAD-A Classification		
Absence	45	46,4
Lightweight	16	16,5
Moderate	31	31,9
Grave	5	5,2
HAD-D Classification		
Absence	75	77,3
Lightweight	8	8,3
Moderate	14	14,4

Source: prepared by the authors. Table 2: whoqol-bref domains

Variable	Median	IIQ	Minimal	Maximum
Dom 1 - physical health	67,9	21,4	32,1	92,9
Dom 2 - psychological	62,5	20,8	25,0	91,7
Dom 3 - social relationships	75,0	25,0	16,7	100,0
Dom 4 - environment	75,0	18,8	31,3	93,8

Source: prepared by the authors.

In 2022, Dr. Jing mai, a first-year resident physician, took her own life after battling feelings of anxiety, insomnia, inadequacy, and stress. His tragic death sparked a clamor for reforms in medical curricula to address barriers to mental health and promote well-being, starting with the level of education of students (NairM *et al*, 2023). According to the results obtained in the present study, we have that the worst quality of life is in stressed people, impacting physical and psychological health (Table 3).

Table 3: Relationship between the variables and domains of the quality of life scale

Variables/category	Physical health	P	Psycho-cologica i	P	Social re-lationshi-Pis	P-va-lor	Environm ent	P
Age group								
	71,4 ±		70,8 ±		75,0 ±		79,7 ±	
17 to 19 years old	14,3	0,105	17,7	0,045	25,0	0,021	15,6	0,001
	64,3 ±		56,2 ±		66,7 ±		68,8 ±	
20 to 24 years old	22,3		25,0		25,0		20,3	
	64,3 ±		62,5 ±		66,7 ±		71,9 ±	
25 years or older	14,3		20,8		16,7		15,6	
Current residence								
Family	60,7 ±		70,8 ±		66,7 ±		65,6 ±	
Colleagues	14,3	0,128	25,0	0,484	25,0	0,253	21,9	0,005
Parents' house	71,4 ± 17,9		66,7 ± 20,8		75,0 ± 18,7		78,1 ± 16,4	
Alone	64,3 ± 21,4		56,2 ± 25,0		66,7 ± 25,0		71,9 ± 13,3	
What is the family income?								
Entre 1-10 S.M.	67,9 ± 19,7	0,64	58,3 ± 18,7	0,387	75,0 ± 16,7	0,342	71,9 ± 25,8	<0,001
Entre 10-20 S.M.	67,9 ± 21,5		68,8 ± 27,0		66,7 ± 18,8		71,9 ± 19,5	
But from 20 S.M.	67,9 ± 21,4		66,7 ± 20,8		75,0 ± 25,0	84,4 ± 9,4		
Medication for anxiety								
No	75,0 ± 18,8	0,001	68,8 ± 25,0	0,026	75,0 ± 20,8	0,396	78,1 ± 14,1	0,07
Yes	64,3 ± 17,9		58,3 ± 20,9		75,0 ± 16,7		68,8 ± 15,6	
Medication for depression								
No	71,4 ± 17,9	<0,001	66,7 ± 20,8	0,014	75,0 ± 16,6	0,418	75,0 ± 19,6	0,675
Yes	57,1 ± 17,9		58,3 ± 29,2		75,0 ± 41,6		78,1 ± 15,6	
Class PSS10								
Down	82,1 ± 23,2	<0,001	79,2 ± 14,6	<0,001	75,0 ± 25,0	0,139	84,4 ± 14,1	0,004
Moderate	71,4 ± 14,3		66,7 ± 20,8		75,0 ± 25,0		78,1 ± 12,5	
High	57,1 ± 17,9		45,8 ± 20,8		66,7 ± 25,0		68,8 ± 18,7	
Class HAD-A								
Absence	75,0 ± 14,2	<0,001	70,8 ± 12,5	<0,001	75,0 ± 25,0	0,013	78,1 ± 15,6	0,004
Lightweight	69,6 ± 15,2		58,3 ± 16,6		75,0 ± 25,0		78,1 ± 12,5	
Moderate/severe	57,1 ± 17,9		47,9 ± 20,8		66,7 ± 25,0		68,8 ± 25,8	
Class HAD-D								
Absence	71,4 ± 17,9	<0,001	66,7 ± 20,8	<0,001	75,0 ± 16,6	0,002	78,1 ± 14,1	0,021

Lightweight	64,3 ± 12,5		56,2 ± 18,8		66,7 ± 18,7		70,3 ± 17,2	
Moderate/severe	48,2 ± 11,6		39,6 ± 11,4		50,0 ± 22,9		62,5 ± 25,0	

Source: Prepared by the authors.

The transition to university, often accompanied by changes in routine and even city, can generate a sense of euphoria, but it is also marked by fears and anxieties related to a new and challenging context. Stress, a physiological response to the pressure of unexpected events that outweigh personal coping strategies, is prevalent in this period. Chronic stress is known not only to impair cognitive functions such as memory and perception, but also affects features of the immune, cardiovascular, gastrointestinal, and endocrine systems (leombruni *et al*, 2022). During our study, we had as results the prevalence of stress in medical students of all ages, in addition to a prevalence of high stress in female students (36.6%), while moderate stress is more present in male students (26.9%) (Table 4). As a result, it can be seen that these students are being increasingly harmed psychologically and cognitively due to the presence of stress in their daily lives.

Table 4: Relationship between the variables and the domains of the pss scale10

		PSS10		
Variable/Category	**Baixo (%)**	**Moderate (%)**	**High (%)**	**P-value**
Sex/gender				
Female	8 (11,3)	37 (52,1)	26 (36,6)	0,042
Male	3 (11,5)	20 (76,9)	3 (11,5)	
You currently reside				
Family/colleagues	4 (30,8)	3 (23,1)	6 (46,2)	0,034
Parents' house	5 (8,3)	40 (66,7)	15 (25,0)	
Alone	2 (8,3)	14 (58,3)	8 (33,3)	
Class HAD-A				
Absence	10 (22,2)	30 (66,7)	5 (11,1)	<0,001
Lightweight	0 (0,0)	12 (75,0)	4 (25,0)	
Moderate/severe	1 (2,8)	15 (41,7)	20 (55,6)	
Class HAD-D				
Absence	11 (14,7)	47 (62,7)	17 (22,7)	0,051
Lightweight	0 (0,0)	4 (50,0)	4 (50,0)	
Moderate	0 (0,0)	6 (42,9)	8 (57,1)	

Source: prepared by the authors.

As already noted, this period is a challenging experience both personally and academically. Often, students already face an intense workload and significant stress since the entrance exam. The daily and life changes associated with entering college can intensify stress, impacting physical and emotional well-being and, consequently, academic success. High stress can lead to symptoms associated with behavioral changes, constant worries, self-destructive thoughts, and social withdrawal (Bernardelli, LV *et al*, 2022). Taking into account this phase of change, the data indicate that there is a significant difference between

stress levels depending on the living environment: students who live with family members or classmates have high stress (46.2%), while those who live with their parents or alone have moderate stress (66.7%) (Table 4).

Stress can be divided into distress (negative stress) and eustress (positive stress), both of which are physiologically experienced in a similar way. However, current understanding suggests that stress does not reside only in the event itself, but in the physiological response to it. The perception of threat and the insufficiency of coping resources determine the effects of stress (oura *et al*, 2020).

This is the result of an extensive workload, rigorous evaluative tests and the need to meet high performance standards. In addition, the pressure to excel academically, absorb large volumes of complex information, and deal with the future responsibility of treating lives can increase this level of stress (Panja *et al*, 2023).

This feeling impacts the lives of countless people around the world, and is associated with the psychopathology of various health conditions and the difficulty of adapting to demanding social environments. Stressful experiences, combined with psychological factors, influence the clinical manifestations and evolution of various diseases. In 1948, the researcher Selye acutely reported that stress generated a response, known as the alarm occurrence stage. This response can be adaptive, leading to the stage of resistance, which allows the problem to be solved, or it can culminate in a stage of exhaustion, resulting in physiological, psychological, and psychosocial consequences that can be chronic and irreversible (Avila-Carrasco, L *et al*).

Within our research, a clear correlation was observed between stress and anxiety. The results indicate, satisfactorily, that the higher the stress levels, the greater the anxiety reported by the patients. In addition, the comparative analysis between depression and stress showed results very close to what is considered significant (0.051), reinforcing a probable relationship between these two variables (Table 4).

Research on the emotional distress associated with prolonged exposure to stressors reveals that medical students have significantly higher levels of depression compared with the general population. Depression is marked by a combination of genetic and environmental factors that culminate in deep feelings of discouragement and excessive sadness. While there is an established relationship between depression and perceived stress, the exact mechanisms of this connection are not yet completely understood (liu z *et al*, 2021).

Several studies confirm that medical students have higher levels of depression and mental problems than the average population, and this condition can persist after

graduation, impacting the professional lives of doctors. These psychological problems often arise during training, since these students have better psychological status when entering college than when completing the course. This suggests the need for ongoing mental health support from the beginning of medical education to better prepare future professionals for an emotionally demanding career (ranasinghe pd *et al*, 2022).

The results showed that, when comparing the age group with the physical health of the students, there was no significant difference. However, when looking at the psychological domain, younger students (17-19 years) had better quality of life, while young adults (20-24 years) had the worst quality of life. This reveals a decline in psychological well-being as students advance in age during their academic training. In addition, younger people also reported a significantly higher quality of life with regard to social relationships and the environment, when compared to young adults. These findings suggest that the transition to adulthood may be a period of greater vulnerability in terms of emotional and social well-being, reinforcing the need for interventions aimed at the psychological and environmental support of these groups (Table 5).

Table 5: Relationship between the variables and domains of the HAD-D scale

	HAD-D			
Variable/Category	**Baixo (%)**	**Moderate (%)**	**High (%)**	**P-value**
Medication for depression				
No	68 (85,0)	7 (8,8)	5 (6,2)	<0,001
Yes	7 (41,2)	1 (5,9)	9 (52,9)	
Class PSS10				
Absence	11 (100,0)	0 (0,0)	0 (0,0)	0,051
Lightweight	47 (82,5)	4 (7,0)	6 (10,5)	
Moderate/severe	17 (58,6)	4 (13,8)	8 (27,6)	
Class HAD-A				
Absence	42 (93,3)	2 (4,4)	1 (2,2)	<0,001
Lightweight	13 (81,2)	2 (12,5)	1 (6,2)	
Moderate/severe	20 (55,6)	4 (11,1)	12 (33,3)	

Source: prepared by the authors.

Medical academic training is undoubtedly stressful and contributes to the emergence of depression and anxiety. These diseases, which are usually generated by various external and internal factors, play a significant role in academic performance, since they generate symptoms that can lead to school dropout, substance abuse, and suicidal ideation. In the long term, these problems can affect the safety and effectiveness of the care provided (mhata nt *et al*, 2020).

This research corroborates that the higher the level of depression, the greater the anxiety, creating a harmful cycle for the mental health of students. In addition, it was observed that, as depression increases, stress levels also tend to increase almost

proportionally, as demonstrated in the PSS results10, revealing a significant correlation between these conditions (Table 5).

A qualitative-quantitative research conducted at a medical school between August 2016 and March 2017 revealed that academic pressure was the main concern of students. The large amount of information and the high standards required have been identified as the main causes of mental distress, and in addition, the lack of time to sleep and engage in extracurricular activities has contributed to these feelings. Another study showed that approximately 42% of Jefferson Medical College students reported significant financial difficulties in the last year, considering them stressful events, which can also exacerbate symptoms and changes in hu- mor (Shao R *et al*, 2020).

Among the students who use antidepressant medications, it was found that 52.9% had high levels of depression, suggesting that medication alone may not be sufficient to guarantee a satisfactory quality of life in these cases (Table 5).

Factors associated with depression in medical students include financial stressors, changes in family relationships, and academic concerns about graduate life. A previous study highlighted some more specific risk factors for each year in which students were in the 1st year the "volume of work" and "absence of feedback", while the 3rd year students reported "fears about future ability" and "pedagogical inadequacy" as the main stressor (Mirza AA *et al*, 2021).

Despite having higher rates of this disorder, these students often do not seek appropriate treatment due to time constraints, fear of confidentiality, stigma, cost of attendance, and academic implications (mhata nt *et al*, 2023). Finally, the results show that the worst quality of life is found among those with moderate or severe depression, affecting both psychological health and social relationships and the environment in which they live, highlighting the importance of appropriate treatment (Table 5).

These correlations reinforce the urgent need for interventions that promote the integral well-being of medical students, ensuring that they can effectively deal with the challenges of their training and career.

Anxiety is a widely recognized problem in the state population, gaining particular relevance in the context of medical students. The presence of this condition not only compromises academic performance and increases dropout rates, but also profoundly affects the professional development of these future physicians. The existing literature points out that anxiety can have significant negative repercussions, not only for the students themselves, but also for the patients they treat. Like depression, generalized anxiety disorder is often not detected and treated early (Quek TT *et al*, 2019).

Our studies indicate that the higher the level of depression, the greater the anxiety, creating a feedback relationship that intensifies emotional suffering (Table 6).

Table 6: Relationship between the variables and domains of the HAD-A scale in %

	HAD-A			
Variable/Category	**Absence**	**Lightweight**	**Mode-grado/engraved**	**P-value**
Medication for anxiety				
No	39 (57,4)	11 (16,2)	18 (26,5)	0,002
Yes	6 (20,7)	5 (17,2)	18 (62,1)	
Class PSS10				
Baixo	10 (90,9)	0 (0,0)	1 (9,1)	<0,001
Moderate	30 (52,6)	12 (21,1)	15 (26,3)	
High	5 (17,2)	4 (13,8)	20 (69,0)	
Class HAD-D				
Absence	42 (56,0)	13 (17,3)	20 (26,7)	<0,001
Lightweight	2 (25,0)	2 (25,0)	4 (50,0)	
Moderate	1 (7,1)	1 (7,1)	12 (85,7)	

Source: prepared by the authors.

This disorder can be defined as apprehension, tension or restlessness due to the anticipation of danger, the source of which is largely unknown or unrecognized. Studies show that anxiety in medical students can deteriorate academic performance, resulting in difficulties in assimilating complex content and managing the demands of the course. In addition, the presence of this disorder is associated with a reduction in students' empathy and enthusiasm when interacting with chronic patients. Decreased empathy is of particular concern as it can affect the quality of care provided, negatively influencing patients' experience and potentially compromising clinical outcomes (Bernardelli, LV *et al*, 2022). The worst quality of life was observed among those with moderate or severe anxiety, affecting not only psychological health, but also social relationships and the environment in which they live (Table 6).

A 2019 systematic review revealed a global prevalence of 33.8% of anxiety among medical students. In addition to intense feelings of fear and panic, anxiety can manifest itself with physiological symptoms such as palpitations, fatigue, dizziness, headache, nausea, and shortness of breath. Like depression, anxiety can impair attention, working memory, and perceptual-motor function, all of which are essential for the safe and effective practice of medicine (Quek TT *et al*, 2019).

It was also observed that the use of medications to treat anxiety does not completely eliminate symptoms, since 62% of individuals who use these medications continue to have high levels of anxiety. In addition, the increase in anxiety proportionally accompanies the increase in stress levels, corroborating the findings that these conditions are interconnected and mutually intensifying (Table 6).

This information reinforces the importance of appropriate and effective interventions to address anxiety among medical students, aiming not only to improve their well-being, but also to ensure the quality of care they will provide in the future.

CONCLUSION

The survey revealed worrying levels of stress, anxiety, and depression among medical students at UNIT, highlighting the fragility of mental health in this group. With a sample composed predominantly of women and a significant portion of students living with their parents, the data indicate that 58.7% of students have moderate stress, while 53.6% show signs of anxiety. The direct relationship between these factors suggests that the transition to university life, marked by new academic demands and pressures, intensifies emotional distress, impacting levels of performance and quality of life. In addition, the emphasis between stress and depression underscores the need for targeted interventions.

However, it is important to recognize some limitations of the research, such as external factors that also influence the stress and quality of life of students, in addition to the demands of the medical school itself.

Therefore, the growing concern with mental health in medical training is a call for the implementation of curricular changes that prioritize the well-being of students. Dr. Jing Mai's tragedy serves as a wake-up call about the urgency of promoting an educational environment that values mental health, integrating self-care practices and emotional support from the early years of training. It is recommended that future studies suggest viable interventions to lessen the negative impact that medical school has on students' mental health. Only in this way will it be possible to prepare medical futures that are not only competent, but also resilient and healthy.

ACKNOWLEDGMENT

With immense gratitude, I begin by thanking God, who has sustained and guided me to this moment. I am grateful to my advisor, Halley Oliveira, whose patience and wisdom brought me calm and direction in the most challenging moments, being a fundamental pillar in my academic journey. To my parents, Fábio e Silva, my infinite love and gratitude. It was his sacrifices, his dedication and trust that paved the way for me to dream big and conquer everything I celebrate today. There are no words to express how grateful I am for all the unconditional support. To my family, especially to my siblings Renata, Rafael and Maria Danielle, you made the days lighter, the difficulties smaller and filled my life with joy. Thank you for every gesture of affection and for being my base.

To my dear friends, Janaína, Isadora and Cecilia, who offered me much more than smiles – you gave me the strength to move forward and the support that kept me steadfast. And to Tricia, Laís and Dani, who, in one of the most challenging moments of college, welcomed me and made me feel at home, even in the storms, I am eternally grateful for that.
Finally, my Julius Caesar, my love, you are my light in dark days, peace in the midst of struggles and the reason why I seek to be a better person every day. Your hugs strengthen me, your presence inspires me, and for you, I thank you every day.
To all of you, who in some way were part of this journey, my most sincere and profound thanks. Each one of you was essential in building this achievement.

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