Mental and behavioral disorders due to the use of psychoactive substances: Covid-19 pandemic

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ABSTRACT

Mental disorders (MD) are directly associated with increased morbidity and mortality due to their potential to cause somatic illnesses. They encompass both emotional suffering and pathophysiological factors, being little identified and treated: which generates a strong impact on society. The present study aims to calculate data quantifying the morbidity and mortality of Mental and Behavioral Disorders (CMD) due to the use of alcohol and other psychoactive substances in the Brazilian regions in the period before and during the COVID- 19 pandemic. This is an ecological study of a quantitative nature, which is necessary since, according to the databases: the Hospital Information System (SIH/SUS) and the Mortality Information System (SIM), in this interval of pandemic, the population was more exposed to factors that trigger mental disorders: social, genetic, psychological and environmental factors. The selection on these platforms will be directed to the hospital morbidity of CMD due to the use of alcohol and other psychoactive substances, focusing on the early diagnosis and prevention of such pathologies according to each Brazilian region. It is hoped that this study can contribute with health guidance actions that help in the promotion and prevention of health risks in the country. With the results presented in this research, it can be seen regarding the overall prevalence of hospitalizations due to CMD due to alcohol use that the North region had the lowest, 0.20/100,000hab, and the South had the highest prevalence, 4.77/ 100,000 inhabitants. As for the overall prevalence of deaths from these disorders, the North region also had the lowest, 0.26/100,000 inhab, and the South region had the highest prevalence, 1.56/100,000 inhab. Furthermore, the North region had the lowest general prevalence of hospitalizations for CMD due to the use of multiple drugs and psychoactive substances, 0.47/100,000 inhab, and the South region had the highest prevalence, 5.79/100,000 inhab. The Southeast region had the lowest overall prevalence of deaths from these disorders, 0.00/100,000 inhab, and the South region had the highest prevalence, 0.67/100,000 inhab. Regarding age groups, our study revealed that the highest rates occurred in the population whose age was related to the period of greater productivity at work and in the elderly population. Another variable analyzed was gender, whose result showed that males had a higher prevalence than females in hospitalizations and deaths. In this way, this public should receive greater focus from public policies through awareness campaigns and early intervention related to the use of psychoactive substances.

Keywords: Mental Disorders, Illness Behavior Mental Health, Pandemics, Indicators of Morbidity and Mortality.

1 INTRODUCTION

In January 2020, the World Health Organization (WHO) declared the emergence of a new disease caused by a coronavirus-type virus – COVID-19. It was considered a public health emergency, of

international concern, with a high risk of spreading to other countries around the world.[1] However, on March 11, 2020, the WHO assessed that COVID-19, due to its high rate of transmissibility and spread, was characterized as a pandemic.[2] After just over two years, on June 1, 2022, according to the BBC news world map, a total of 530,081,455 million people were infected and there were 6,292,740 million deaths worldwide.[3] In view of this scenario, it was possible to observe the growing increase in studies to analyze the mental health of the population that experienced this moment in their lives.[1]

According to the World Health Organization (WHO), mental health refers to a well-being in which the individual develops his personal skills, is able to cope with the stresses of life, works productively and is able to make his contribution to his community.[4] On the other hand, according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), a Mental Disorder is a syndrome characterized by a clinically significant disturbance in an individual's cognition, emotional regulation, or behavior that reflects a dysfunction in the psychological, biological, or developmental processes underlying mental functioning.[5]

These disorders are little identified and treated, which has a strong impact on society, as usually the greatest attention related to these disorders is only for the physical symptoms, when present. This leads to the use of unnecessary medications and tests, in addition to the use of ineffective interventions that compromise the prognosis and adherence to the proposed treatments, that is, they provide procedures that briefly treat its physical manifestations, but do not treat its underlying disease.[6]

In epidemiological terms, studies indicate that the global prevalence of Mental and Behavioral Disorders (CMD) is 17.6% for an adult in the last 12 months and 29.2% over a lifetime. In Brazil, the prevalence is between 17% and 35%: which represents a significant portion of the population, which indicates the relevance of research related to this topic in terms of public health.[6]

The increased spread of the SARS-CoV-2 virus has generated anguish in the world's population.[2] Because, in the pandemic, people have been exposed to factors that significantly contribute to the risk of psychological problems such as: the direct action of the Covid virus-19 in the central nervous system, the traumatic experiences associated with the infection or death of loved ones, and the stress induced by the change in routine due to social distancing measures or the economic challenges faced.[1] All of these factors can influence the trajectory of the COVID-19 pandemic and the period after it.[7]

Consequently, with the increase of these factors during this scenario, an increase in the use of psychoactive substances and alcohol is expected, and this group consists of marijuana, tobacco, cocaine, opioids, caffeine, benzodiazepines, LSD, alcohol, among others.[8]

Studies indicate that the use of these substances is the main extrinsic cause that causes a greater predisposition of the individual to develop mental disorders throughout life. Because such addictions affect the ability to concentrate, memory, brain function and cause changes in the mental state, in the psyche.[4,8] Therefore, it is extremely important to recognize that individuals present in this pandemic period are more

likely to develop mental disorders due to the use of psychoactive substances.

Because it encompasses both emotional suffering and other related pathophysiological factors, the abusive consumption of psychoactive drugs is an important public health problem and is associated with an increase in mortality and morbidity rates because it is closely related to the development of mental illnesses such as anxiety and depression, in addition to causing loss of quality of life due to family and social complications of the individual.[5,9]

Substance use are important mediators of the relationship between pandemic challenges and mental health. Since the pandemic of the new coronavirus has exposed people to vulnerability and the need to adapt to this reality, according to all the wear and suffering they have faced both physically and psychosocially. [2] Thus, it requires strategies that promote mental health and offer treatment and psychosocial rehabilitation to patients with mental illnesses due to the use of psychoactive substances.

Faced with a moment of intense challenge from the point of view of health, with vaccination uncertainties, lack of scientific basis to fight the infection, shortage of Personal Protective Equipment (PPE), emergence of new variants, the Brazilian population suffered and still suffers a strong emotional impact that began with the spread of the virus and lasts until the present day. [10]

The impact of the pandemic is undeniable: large-scale natural, environmental, or traumatic disasters are commonly accompanied by increased rates of substance use disorders. In addition, evidence from previous infectious outbreaks has identified deleterious effects of social isolation on mental health. [11] During the outbreak of the disease epidemic Ebola virus from 2014 to 2016, an increasing number of people reported mental health and psychosocial problems. [12] It was identified in a follow-up study of survivors affected by this disease that half of the patients had mild anguish, depression, anxiety disorders, grief, and social problems, while another small portion of patients had psychosis in need of medication.[13] Another study of the 18th and 19th century influenza pandemic reports an association with increased insomnia, anxiety, depression, mania, psychosis, and delirium.[14] Similarly, in 2003, during the SARS-CoV-1 pandemic, increased levels of anxiety in the general population were identified, which were associated with an increase in somatic symptoms during quarantine.[15] Based on reports of previous pandemics and current COVID-19 data, an increase in substance use is expected. [16]

In addition, it has already been concluded by the department of psychiatry at the University of Oxford that COVID-19 infection is associated with an increased incidence of psychiatric diagnoses in the three months after infection, even in patients with no history of psychiatric history. [17th]

Thus, knowing the seriousness of the situation caused by the COVID-19 outbreak in the world, addressing psychopathological issues cannot be a neglected attitude. [18] Therefore, it is necessary to create measures that assist in the early diagnosis and prevention of such pathologies according to each Brazilian region for health promotion in the country.

2 JUSTIFICATION

Despite the increase in the number of studies in the period of the COVID-19 pandemic that address Mental and Behavioral Disorders, many of these studies do not have high methodological quality. In addition, in this period, even with the progressive increase of numerous reports of people globally facing economic challenges and experiencing emotional suffering, the analysis of the epidemiological profile of Mental and Behavioral Disorders due to the use of psychoactive substances remains scarce, even though the use of these substances is considered the main cause of mental changes in an individual's life.

In addition, the investigation of the morbidity and mortality profile of Mental and Behavioral Disorders is necessary, since in addition to these disorders having a high prevalence in the Brazilian population, during the pandemic period people were more exposed to triggering factors of mental disorders, which is a risk factor that culminates in the increase in cases.

3 OBJECTIVES

3.1 GENERAL OBJECTIVE

To calculate the data obtained from the Hospital Information System (SIH/SUS) and the Mortality Information System (SIM), quantifying the cases involving morbidity and mortality due to Mental and Behavioral Disorders in the Brazilian regions in the period from 2015 to 2021.

3.2 SPECIFIC OBJECTIVES

To conduct a data survey on the number of hospitalizations and deaths due to Mental and Behavioral Disorders in the Brazilian regions in the period from 2015 to 2021 according to the variables: age group, gender, ICD10-F10 to ICD10-F1919. Aiming to research Mental and Behavioral Disorders due to the use of all psychoactive substances, including alcohol. This study included the population that developed these disorders due to the combination or isolated use of only one of these substances.

Calculate the prevalence of morbidity and mortality coefficients. To compare the indicators calculated in the Brazilian regions.

Provide information for health planning in the context of mental disorders in order to promote health in Brazil.

4 MATERIALS AND METHODS

4.1 TYPE OF STUDY

This research is an epidemiological study, with an ecological design, regarding the morbidity and mortality of cases of Mental and Behavioral Disorders due to the use of alcohol and other psychoactive substances in the regions of Brazil.

In ecological studies, the association between a disease or health condition and exposure to the cause is compared with other populations. In this type of study, it is possible to evaluate different locations, with different socioeconomic and sociocultural characteristics, and their relationship with the disease or disease/death. In addition, the analysis includes different time periods in a time series, comparing the same population at different times.[20th]

4.2 PLACE OF STUDY

Brazil is subdivided into five regions, and this country was constituted with about 214.7 million inhabitants in 2022, according to the Brazilian Institute of Geography and Statistics (IBGE)[21], and has a territorial extension of approximately 8,516,000 km2.

The northern region consists of 7 states: Acre, Amapá, Amazonas, Pará, Rondônia, Roraima and Tocantins. Its estimated population is 3,853,575.6 inhabitants (IBGE – 2010). The Northeast region is composed of 9 states: Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Rio Grande do Norte and Sergipe. Its estimated population is 57,071,564 inhabitants (IBGE – 2015). The South region has 3 states: Paraná, Santa Catarina and Rio Grande do Sul, with an estimated population of 30,192,315 inhabitants (IBGE, 2020). The Southeast region has 4 states: Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo and 89,012,240 inhabitants (IBGE – 2020). Finally, the Midwest region has 3 states: Goiás, Mato Grosso, Mato Grosso do Sul, the Federal District and its population is 16,504,303 inhabitants (IBGE, 2020).

4.3 DATA COLLECTION

The data analyzed will be extracted from the Hospital Information System (SIH/SUS) and the Mortality Information System (SIM), available on the DATASUS website. The period to be researched will be from 2015 to 2021, and the selection on this platform will be directed to hospital morbidity of Mental and Behavioral Disorders due to the use of alcohol and other psychoactive substances. This period was chosen to analyze more accurately the differences between the periods before the pandemic and during it.

The filters used will be: "Brazil by Region and Federation Unit", "General, by place of residence", "Group V. Mental and behavioral disorders (ICD Chapters – 10)", "Alcohol use disorder" and "Behavioral disorders".

The variables to be used for the study will be: gender (female and male), age group (less than 1 year, 1 to 4 years, 5 to 9 years, 10 to 14 years, 15 to 19 years, 20 to 29 years, 30 to 39 years, 40 to 49 years, 50 to 59 years, 60 to 69 years, 70 to 79 years, 80 years and over), list of morbidities ICD10-F10 to ICD10-F19.[19] Aiming to research Mental and Behavioral Disorders due to the use of all psychoactive substances, including alcohol. This study included the population that developed these disorders due to the combination or isolated use of only one of these substances.

4.4 STATISTICAL ANALYSIS

The data were tabulated and organized in Excel, and statistical analysis was performed with the ActioStat software. The results were expressed as prevalence values and summary measures (median, IQR (interquartile deviation), minimum and maximum). The paired Wilcoxon test was used to compare the prevalences between genders and age groups, since no normality was observed in the data set. To compare the prevalences between the regions of Brazil, the Kruskal-Wallis test was used, and choropleth maps were used to present them, made in the QGis software. The level of significance adopted in all tests was $\alpha = 5\%$ (p<0.05).

4.5 ETHICAL ASPECTS

Regarding the ethical aspects, it is worth clarifying that, as the data obtained from the Hospital Information System (SIH/SUS) and the Mortality Information System (SIM) are freely available for consultation, and do not have any identification of the users (aggregated data), it will not be necessary for this research to be approved by a Research Ethics Committee involving human beings. In addition, the present work will not be developed until a favorable opinion is obtained.

5 RESULTS

The Brazilian Unified Health System must be prepared to offer support services in the area of mental health, because the mental health situation in Brazil influences the life of the individual in his or her collective environment.

The following topics present the results and statistical analysis of the data for mental and behavioral disorders due to alcohol use (topics 5.1 and 5.2), and for mental and behavioral disorders due to the use of multiple drugs and psychoactive substances (topics 5.3 and 5.4). The prevalence, the comparison test between the genderes and the region, as well as the graphs of these distributions and the maps with the spatial distribution of the data are presented.

5.1 HOSPITALIZATIONS DUE TO MENTAL AND BEHAVIORAL DISORDERS DUE TO ALCOHOL USE

We observed a statistically significant difference between the genderes for all regions: North (p=0.003), Northeast (p=0.005), Southeast (p=0.005), South (p=0.010) and Midwest (p=0.014) (Table 1, Figure 2). The North region had the lowest overall prevalence of hospitalizations due to alcohol use, 0.20/100,000 inhabitants, followed by the Northeast, with 1.04/100,000 inhabitants, the Southeast with 1.36/100,000 inhabitants, the Midwest with 1.72/100,000 inhabitants, and the South with the highest prevalence, 4.77/100,000 inhabitants. The differences between the regions were considered significant

(p=0.001) and the prevalences can be seen in the map in Figure 1.

Table 1 – Prevalence of hospitalizations for mental and behavioral disorders due to alcohol use, by age group, gender, and regions of Brazil – 2015 to 2021, per 100,000 inhabitants.

Age group	North		Northeast		Southeast		South		Midwest	
	Masc Gender	Female Gender	Masc Gender	Female Gender	Masc Gender	Female Gender	Masc Gender	Fem Gender	Masc Gender	Fem Gender
0 to 4 years	0,03	0,02	0,36	0,33	0,23	0,21	0,40	0,47	2,53	2,70
5 to 9 years	0,03	0,05	0,08	0,09	0,13	0,12	0,22	0,17	0,41	0,38
10 to 14 years	0,13	0,10	0,17	0,18	0,30	0,55	0,86	1,15	1,20	2,57
15 to 19 years old	0,70	0,23	2,05	0,65	2,14	1,30	7,72	3,40	6,07	5,81
20 to 29 years old	1,84	0,45	10,55	1,52	8,61	2,34	30,44	5,47	13,17	4,78
30 to 39 years old	5,12	0,84	29,07	2,85	30,33	5,40	98,56	12,59	41,06	6,46
40 to 49 years old	9,37	1,29	47,88	4,34	54,39	8,12	198,57	21,33	64,58	10,00
Age group	North		Northeast		Southeast		On		Midwest	
	Masc Gender	Fem Gender	Masc Gender	Fem Gender	Masc Gender	Fem Gender	Masc Gender	Fem Gender	Masc Gender	Fem Gender
50 to 59 years old	9,40	0,79	47,16	3,51	54,99	6,99	219,57	19,30	66,56	9,04
60 to 69 years old	5,11	0,49	25,52	1,81	30,97	3,29	120,16	8,77	40,09	4,78
70 to 79 years old	5,07	0,41	9,77	0,81	11,85	1,47	37,40	3,05	17,41	1,66
80 years and over	2,52	0,32	3,04	0,79	4,18	0,57	9,81	1,18	6,08	0,94
Minimal	0,03	0,02	0,08	0,09	0,13	0,12	0,22	0,17	0,41	0,38
Maximum	9,4	1,29	47,88	4,34	54,99	8,12	219,57	21,33	66,56	10,00
With	2,52	0,41	9,77	0,81	8,61	1,47	30,44	3,4	13,17	4,78
IIQ	4,99	0,69	28,71	2,52	30,67	4,85	119,3	11,44	38,53	4,8
P-value Wilcoxon	0,003*		0,005*		0,005*		0,010*		0,014*	
P-valor Kruskal-Wallis	0,001*									

Statistically significant (p≤5%). IQR: interquartile range.

Figure 1 – Map of the prevalence of hospitalizations due to mental and behavioral disorders due to alcohol use in the regions of Brazil – 2015 to 2021, per 100,000 inhabitants.
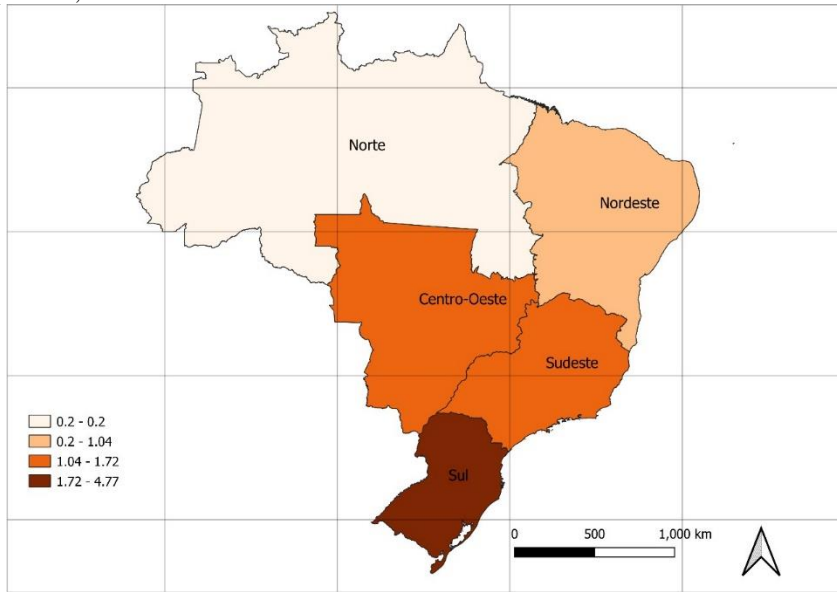

Figure 2 - Prevalence of hospitalizations for mental and behavioral disorders due to alcohol use, by age group, gender, and regions of Brazil – 2015 to 2021, per 100,000 inhabitants.

According to figure 2, the age group of 40 to 59 years had the highest prevalence of hospitalizations for mental and behavioral disorders due to alcohol use among all Brazilian regions and in both genderes. Such a pattern may have occurred due to the fact that mental illnesses are among the most prevalent chronic illnesses in people of advanced age.[22]

5.2 DEATHS DUE TO MENTAL AND BEHAVIORAL DISORDERS DUE TO ALCOHOL USE.

We observed a statistically significant difference between the genderes for all regions: North (p=0.036), Northeast (p=0.022), Southeast (p=0.015), South (p=0.021) and Midwest (p=0.015) (Table 2, Figure 3). The North region had the lowest overall prevalence of deaths due to alcohol use, 0.26/100,000 inhabitants, followed by the Northeast, with 0.81/100,000 inhabitants, the Southeast with 0.94/100,000 inhabitants, the Midwest with 0.74/100,000 inhabitants, and the South with the highest prevalence, 1.56/100,000 inhabitants. The differences between the regions were not considered significant (p=0.252) and the prevalences can be seen in the map in Figure 4.

Table 2 – Prevalence of deaths due to mental and behavioral disorders due to alcohol use, by age group, gender, and regions of Brazil – 2015 to 2021, per 100,000 inhabitants.

Age group	North		Northeast		Southeast		On		Midwest	
	Masc Gender	Fem Gender	Masc Gender	Fem Gender	Masc Gender	Fem Gender	Masc Gender	Fem Gender	Masc Gender	Fem Gender
0 to 4 years	0,00	0,00	0,01	0,01	0,00	0,01	0,00	0,00	0,00	0,00
5 to 9 years	0,00	0,00	0,01	0,01	0,00	0,00	0,00	0,00	0,00	0,00
10 to 14 years	0,00	0,00	0,13	0,01	0,00	0,00	0,00	0,01	0,02	0,00
15 to 19 years old	0,00	0,00	0,47	0,04	0,01	0,00	0,04	0,03	0,00	0,02
20 to 29 years old	0,00	0,00	0,34	0,03	0,05	0,02	0,05	0,02	0,05	0,01
30 to 39 years old	0,04	0,00	0,34	0,05	0,18	0,03	0,17	0,01	0,17	0,03
40 to 49 years old	0,14	0,01	0,22	0,03	0,51	0,06	0,60	0,05	0,34	0,01
50 to 59 years old	0,38	0,00	0,11	0,01	0,57	0,05	1,08	0,10	0,71	0,05
60 to 69 years old	0,07	0,00	0,04	0,01	0,56	0,05	1,30	0,09	0,29	0,08
70 to 79 years old	0,30	0,14	0,00	0,00	0,35	0,03	0,99	0,04	0,18	0,00
80 years and over	0,21	0,00	0,00	0,00	0,19	0,06	0,00	0,00	0,16	0,00
Minimal	0	0	0	0	0	0	0	0	0	0
Maximum	0,38	0,14	0,47	0,05	0,57	0,06	1,3	0,10	0,71	0,08
With	0,04	0	0,11	0,01	0,18	0,03	0,05	0,02	0,16	0,01
IIQ	0,21	0	0,33	0,02	0,51	0,05	0,99	0,05	0,29	0,03

P-value Wilcoxon	0,036*	0,022*	0,015*	0,021*	0,015*
P-valor Kruskal-Wallis	0,252				

Statistically significant (p≤5%). IQR: interquartile range.

Figure 3 - Prevalence of deaths from mental and behavioral disorders due to alcohol use, by age group, gender, and regions of Brazil – 2015 to 2021, per 100,000 inhabitants.

According to Figure 3, the age group of 50 to 59 years had the highest prevalence of deaths due to mental and behavioral disorders due to alcohol use among the North, Southeast and Midwest regions, in

both genderes. However, in the Northeast and South, the age group 15 to 19 years and 60 to 69 years led the ranking, according to their respective regions.

Figure 4 - Map of the prevalence of deaths due to mental and behavioral disorders due to alcohol use in the regions of Brazil – 2015 to 2021, per 100,000 inhabitants.

5.3 HOSPITALIZATIONS FOR MENTAL AND BEHAVIORAL DISORDERS DUE TO THE USE OF MULTIPLE DRUGS AND PSYCHOACTIVE SUBSTANCES

We observed a statistically significant difference between the genderes for all regions: North (p=0.014), Northeast (p=0.001), Southeast (p=0.001), South (p=0.002) and Midwest (p=0.001) (Table 3, Figure 5). The North region had the lowest overall prevalence of hospitalizations due to mental and behavioral disorders due to the use of multiple drugs and psychoactive substances, 0.47/100,000 inhabitants, followed by the Northeast with 0.87/100,000 inhabitants, the Southeast with 1.52/100,000 inhabitants, the Midwest with 1.58/100,000 inhabitants, and the South with the highest prevalence of 5.79/100,000 inhabitants. The differences between the regions were considered significant (p=0.001) and the prevalences can be seen in the map in Figure 6.

Table 3 – Prevalence of hospitalizations for mental and behavioral disorders due to the use of multiple drugs and psychoactive substances, by age group, gender, and regions of Brazil – 2015 to 2021, per 100,000 inhabitants.

Age group	North		Northeast		Southeast		On		Midwest	
	Masc Gender	Fem Gender	Masc Gender	Fem Gender	Masc Gender	Fem Gender	Masc Gender	Fem Gender	Masc Gender	Fem Gender
0 to 4 years	0,23	0,27	0,75	0,60	0,69	0,59	0,91	0,68	2,16	1,89
5 to 9 years	0,05	0,07	0,36	0,19	0,23	0,22	0,36	0,40	0,58	0,38
10 to 14 years	0,76	0,96	1,75	1,43	3,35	2,00	17,87	10,13	2,71	2,42
15 to 19 years old	7,89	3,52	16,95	5,39	25,96	9,24	130,48	36,84	19,54	8,89
20 to 29 years old	13,95	3,79	30,97	5,60	43,07	15,46	200,82	46,25	42,87	12,68
30 to 39 years old	11,58	3,77	26,41	5,00	46,77	15,28	183,92	45,31	49,17	13,86
40 to 49 years old	8,68	3,51	15,71	3,77	28,57	9,38	104,43	24,25	31,28	8,66
50 to 59 years old	4,93	2,42	8,61	1,74	12,29	4,36	38,86	10,71	14,03	4,82
60 to 69 years old	3,08	1,25	3,54	0,97	3,75	1,50	10,05	3,40	5,43	1,38
70 to 79 years old	1,97	0,96	2,42	0,88	1,57	1,02	2,57	2,43	2,83	1,14
80 years and over	3,56	2,55	2,53	1,04	1,55	0,88	2,59	2,48	2,96	2,24
Minimal	0,05	0,07	0,36	0,19	0,23	0,22	0,36	0,4	0,58	0,38
Maximum	13,95	3,79	30,97	5,6	46,77	15,46	200,82	46,25	49,17	13,86
With	3,56	2,42	3,54	1,43	3,75	2	17,87	10,13	5,43	2,42
IIQ	7,92	2,56	15,2	4,12	27,02	8,5	127,91	34,41	28,57	7,51
Q.- Wilcoxon Value	0,014*		0,001*		0,001*		0,002*		0,001*	
P-value Kruskal-Wallis	0,047*									

Statistically significant (p≤5%). IQR: interquartile range.

Figure 5 - Prevalence of hospitalizations for mental and behavioral disorders due to the use of multiple drugs and psychoactive substances, by age group, gender, and regions of Brazil – 2015 to 2021, per 100,000 inhabitants.

According to figure 5, the age group of 20 to 39 years had the highest prevalence of hospitalizations due to mental and behavioral disorders due to the use of multiple drugs and psychoactive substances among all Brazilian regions and in both genderes.

Figure 6 – Map of the prevalence of hospitalizations due to mental and behavioral disorders due to the use of multiple drugs and psychoactive substances in the regions of Brazil – 2015 to 2021, per 100,000 inhabitants.

5.4 DEATHS DUE TO MENTAL AND BEHAVIORAL DISORDERS DUE TO THE USE OF MULTIPLE DRUGS AND PSYCHOACTIVE SUBSTANCES

We observed a statistically significant difference between the genderes for all regions: North (p=0.014), Northeast (p=0.014), Southeast (p=0.018), South (p=0.025) and Midwest (p=0.126) (Table 3, Figure 7). The Southeast region had the lowest overall prevalence of deaths due to mental and behavioral disorders due to the use of multiple drugs and psychoactive substances, 0.00/100,000 inhabitants, followed by the Midwest with 0.35/100,000 inhabitants, the North with 0.37/100,000 inhabitants, the Northeast with 0.42/100,000 inhabitants, and the South with the highest prevalence of 0.67/100,000 inhabitants. The differences between the regions were not considered significant (p=0.668) and the prevalences can be seen in the map in Figure 8.
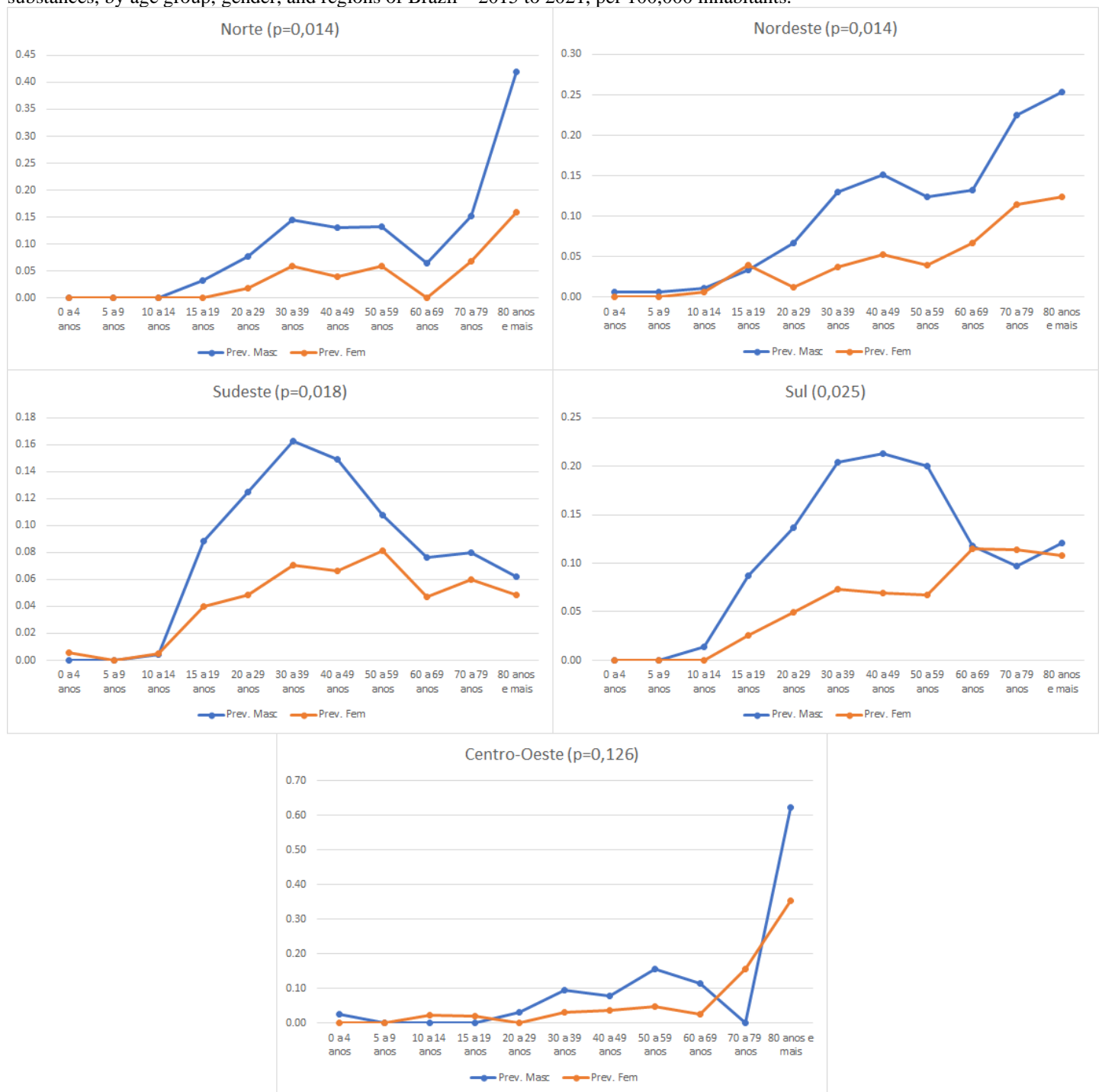
Table 4 – Prevalence of deaths due to mental and behavioral disorders due to the use of multiple drugs and psychoactive substances, by age group, gender, and regions of Brazil – 2015 to 2021, per 100,000 inhabitants.

Age group	North		Northeast		Southeast		On		Midwest	
	Masc Gender	Fem Gender	Masc Gender	Fem Gender	Masc Gender	Fem Gender	Masc Gender	Fem Gender	Masc Gender	Fem Gender
0 to 4 years	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.03	0.00
5 to 9 years	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10 to 14 years	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.02
15 to 19 years old	0.03	0.00	0.03	0.04	0.09	0.04	0.09	0.03	0.00	0.02
20 to 29 years old	0.08	0.02	0.07	0.01	0.12	0.05	0.14	0.05	0.03	0.00
30 to 39 years old	0.14	0.06	0.13	0.04	0.16	0.07	0.20	0.07	0.09	0.03
40 to 49 years old	0.13	0.04	0.15	0.05	0.15	0.07	0.21	0.07	0.08	0.04
50 to 59 years old	0.13	0.06	0.12	0.04	0.11	0.08	0.20	0.07	0.16	0.05
60 to 69 years old	0.07	0.00	0.13	0.07	0.08	0.05	0.12	0.12	0.12	0.03
70 to 79 years old	0.15	0.07	0.22	0.11	0.08	0.06	0.10	0.11	0.00	0.16
80 years and over	0.42	0.16	0.25	0.12	0.06	0.05	0.12	0.11	0.62	0.35
Minimal	0	0	0.01	0	0	0	0	0	0	0
Maximum	0.42	0.16	0.25	0.12	0.16	0.08	0.21	0.12	0.62	0.35
With	0.08	0.02	0.12	0.04	0.08	0.05	0.12	0.07	0.03	0.03
IIQ	0.14	0.06	0.14	0.06	0.12	0.06	0.19	0.11	0.12	0.05
Q.- Wilcoxon Value	0.014*		0.014*		0.018*		0.025*		0.126*	
P-value Kruskal-Wallis	0,668									

Statistically significant (p≤5%). IQR: interquartile range.

Figure 7 - Prevalence of deaths due to mental and behavioral disorders due to the use of multiple drugs and psychoactive substances, by age group, gender, and regions of Brazil – 2015 to 2021, per 100,000 inhabitants.

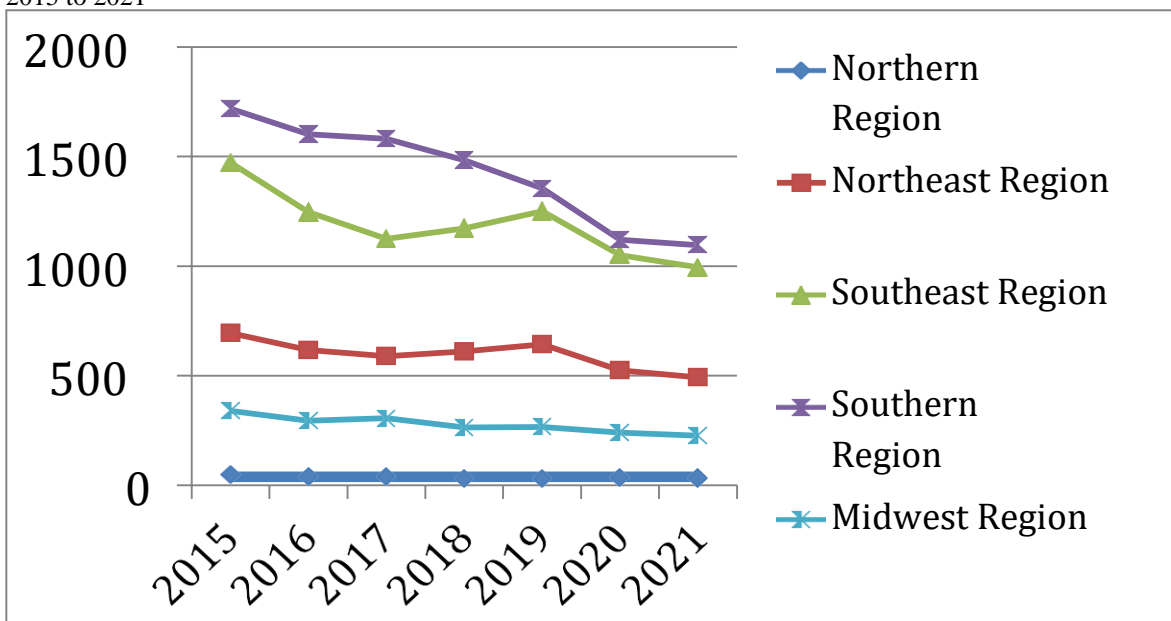

According to Figure 7, the age group of 80 years and over had the highest prevalence of hospitalizations due to mental and behavioral disorders due to the use of multiple drugs and psychoactive substances in the North, Northeast and Midwest regions, in both genderes. But in the South region, there was a higher prevalence between 40 and 49 years of age in males and 60 to 69 years of age in females. In the Southeast region, there was a higher prevalence between 30 and 39 years of age in males and 50 to 59

Figure 8 – Map of the prevalence of deaths due to mental and behavioral disorders due to the use of multiple drugs and psychoactive substances in the regions of Brazil – 2015 to 2021, per 100,000 inhabitants.
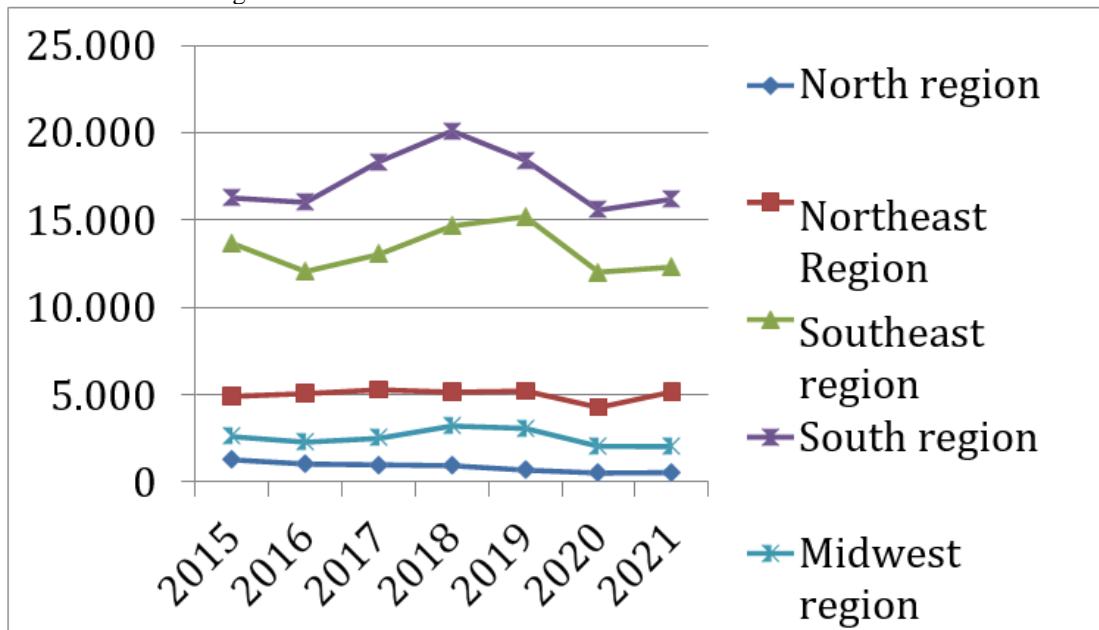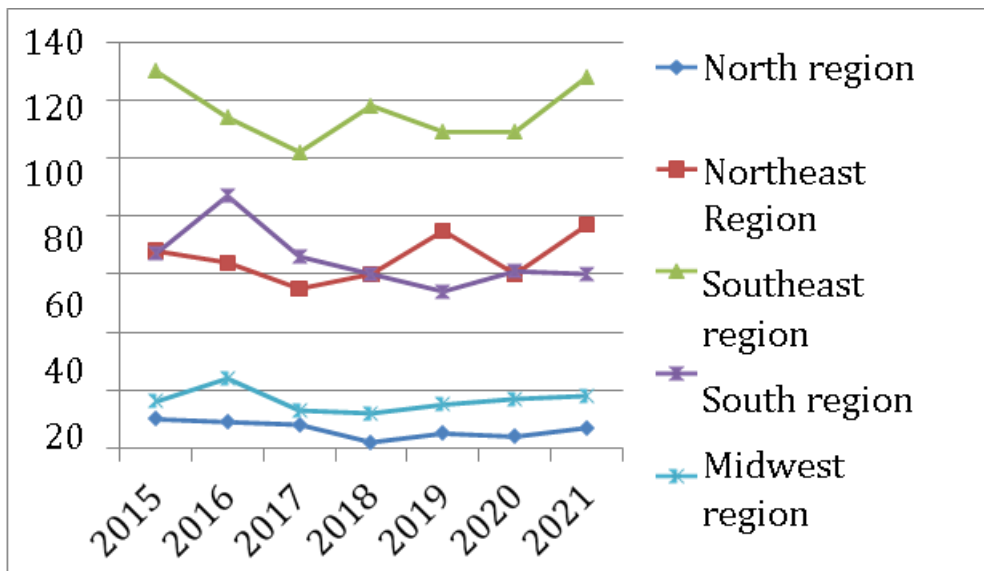

Figure 9 – Map of the number of hospitalizations due to mental and behavioral disorders due to alcohol use in the regions of Brazil – 2015 to 2021

Figure 10 – Map of the number of hospitalizations for mental and behavioral disorders due to the use of multiple drugs and psychoactive substances in the regions of Brazil – 2015 to 2021.

Figure 11 – Map of the number of deaths due to mental and behavioral disorders due to alcohol use in the regions of Brazil – 2015 to 2021.
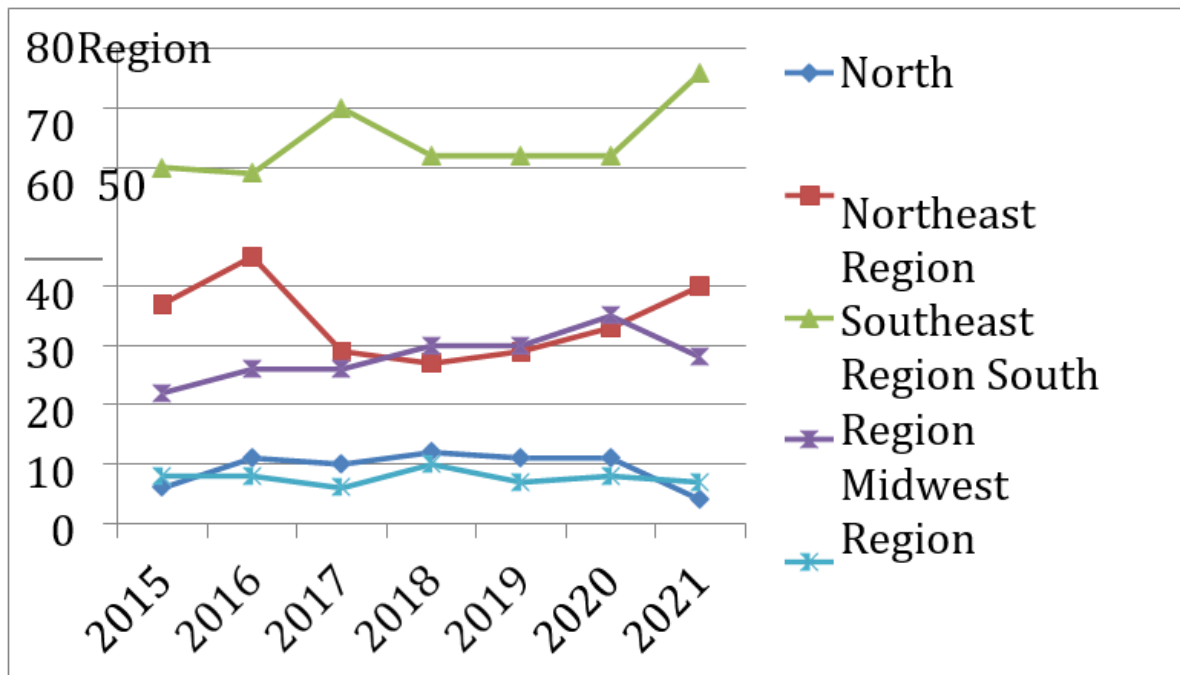
Figure 12 – Map of the number of deaths due to mental and behavioral disorders due to the use of multiple drugs and psychoactive substances in the regions of Brazil – 2015 to 2021.

6 DISCUSSION

Mental and behavioral disorders affect a large number of individuals around the world, causing harm not only to the patient, but also to society in general.[22] Hospitalizations for these disorders, in addition to those related to alcohol use, use of multiple drugs and psychoactive substances (addressed in the present study), also include dementia, mood disorders, mental retardation, schizophrenia, neurotic, stress-related and somatoform disorders, among other causes.[23rd]

The number of people with mental disorders is growing globally, especially in less developed countries. It was identified that in 2019, the prevalence of mental disorders in the world was more than 1 billion people, while the incidence was 400 million individuals; in Brazil, this number was 39 million and 15 million, respectively.[24th]

The results presented show a decrease in the number of hospitalizations for mental and behavioral disorders, both for alcohol use and for the use of multiple drugs and other psychoactive substances in the regions of Brazil during the period of the COVID-19 pandemic. This reduction is in line with a recent article by the World Health Organization that highlighted the interruption of essential mental health services in about 93% of countries in this period of social isolation.[25, 26, 27] In addition, it was identified that some beds intended for patients with mental disorders were transformed into wards and intensive care beds, due to the high demand for beds in intensive care units (ICUs) for people diagnosed with COVID-19.[26th]

In addition, the downward trend in hospitalizations due to mental disorders is a reflection of the Psychiatric Reform movement, which culminated in the expansion of out-of-hospital services included in

the Psychosocial Care Network (RAPS), with the readjustment of the Hospital Admission Authorization (AIH), and the incorporation of a Specialized Referral Unit in a General Hospital, which guides care to the various levels of care. such as primary care and psychosocial care services in their different modalities. [26, 27]

It was identified that the Southeast region had the highest number of deaths due to mental and behavioral disorders due to the use of alcohol and other psychoactive substances in all the years analyzed when compared to other regions of Brazil, a fact explained by the high urbanization and social deprivation, since according to the IBGE, this region leads the ranking with the It has the highest percentage of urban population (93.14%) and has 85.1 million inhabitants, at the same time, with the generalized increase in urban violence, the feeling of insecurity among people living in the most populous region of Brazil increases. These findings may be consistent with previous reports that psychiatric disorders are more common among inhabitants of urbanized areas.[28, 29, 30, 31] Since mental health is directly related to the environment in which the population is inserted. In addition, it can be observed that the North and Midwest regions had the lowest numbers of deaths due to mental and behavioral disorders due to the use of alcohol and other psychoactive substances in all the years analyzed, since the least populous region of the country is the Midwest, with 15.2 million people and the second region with the fewest people is the North region. with 17.3 million people.[30th]

The prevalence of deaths and hospitalizations due to mental and behavioral disorders due to the use of alcohol and other psychoactive substances was more frequent among males than among females. There are gender differences related to alcohol use in morbidity and mortality, as well as in alcohol consumption levels and patterns. The percentage of overall deaths attributable to alcohol among men is 7.7% compared to 2.6% of all deaths among women. Total per capita alcohol consumption in 2010, in litres of pure alcohol, among male and female consumers worldwide averaged 19.4 litres for men and 7 litres for women.[32] Thus, factors included in this situation were identified: poverty, marginalization,[33] men are predisposed to take more risks, exposure to psychoactive substances in adolescence by friends is higher among boys,[34] the social imaginary that sees men as invulnerable beings ends up trusting them so that they take less care of themselves and expose themselves more, work-related issues, [35] among other factors that contribute to the greater use of psychoactive substances in this gender, consequently a higher prevalence of its complications. In addition, the predominance of these pathologies in males can be explained by the fact that women seek health services more, while men wait for the disease to advance, and only then seek help. [35th]

Regarding age, it was identified that men aged 40 to 59 years had a higher prevalence of hospitalizations for mental and behavioral disorders due to alcohol use, a situation related to the fact that mental illnesses are among the most prevalent chronic diseases in people with advanced age.[22]

However, men aged 50 to 69 years had a higher prevalence of deaths due to mental and behavioral

disorders due to alcohol use in all regions, but in the In the Northeast, it was identified that male adolescents had a higher prevalence. According to the IBGE, 63.3% of students have already tried alcoholic beverages in the pre-pandemic period, and 47% of them reported having had episodes of drunkenness. [36] Thus, experimentation or exposure to drug use rose from 8.2% in 2009 to 12.1% in 2019 among schoolchildren. This is important because the use of these substances is related to suicide, traffic accidents and interpersonal violence, the main causes of death among young Brazilians according to the World Health Organization. [37, 38] Therefore, promoting health and well-being, in addition to expanding equitable access to comprehensive, qualified health services centered on this population, is extremely important. [39th]

It was identified that the prevalence of hospitalizations for mental and behavioral disorders due to the use of multiple drugs and psychoactive substances was higher in people aged 20 to 39 years, a period of greater labor production in people's lives, suggesting an impact during the important years of employment in the workforce.[22]

Regarding the prevalence of deaths due to mental and behavioral disorders due to the use of multiple drugs and psychoactive substances, it was identified that the elderly had a higher prevalence in the North, Northeast and Midwest regions, in both genderes. However, in the South region, there was a higher prevalence between 40 and 49 years of age in males and 60 to 69 years of age in females. In the Southeast region, there was a higher prevalence between 30 and 39 years of age in males and 50 to 59 years of age in females.

Thus, the findings indicate that the pandemic has significantly reduced mental health hospitalizations, and additional studies are needed to better understand the consequences of this finding. In addition, it is important to work on the promotion of mental health and the early recognition of cases, especially among men. [40th]

7 CONCLUSION

It is indisputable that the use of psychoactive substances is a public health problem in Brazil. Conducting this epidemiological study and characterizing the portion of the population that represents the most significant number of hospitalizations due to mental and behavioral disorders, due to its use, is a crucial step for the creation and determination of strategies and public policies.

With the results presented in this study, it can be seen that the general prevalence of hospitalizations due to mental and behavioral disorders due to alcohol use was found in the North region, 0.20/100,000 inhabitants, and in the South with the highest prevalence, 4.77/100,000 inhabitants. Regarding the overall prevalence of deaths due to mental and behavioral disorders due to alcohol use, the North region also had the lowest, 0.26/100,000 inhabitants, and the South region had the highest prevalence, 1.56/100,000 inhabitants.

In addition, the North region had the lowest overall prevalence of hospitalizations due to mental and behavioral disorders due to the use of multiple drugs and psychoactive substances, 0.47/100,000 inhabitants, and the South region had the highest prevalence, 5.79/100,000 inhabitants. The Southeast region had the lowest overall prevalence of deaths due to mental and behavioral disorders due to the use of multiple drugs and psychoactive substances, 0.00/100,000 inhabitants, and the South region had the highest prevalence, 0.67/100,000 inhabitants.

Regarding age groups, our study revealed that the highest rates occurred in the population whose age was related to the period of greater productivity at work. Another variable analyzed was gender, the result of which showed that males had a higher prevalence than females in hospitalizations and deaths.

Thus, this public should receive greater focus in public policies through awareness campaigns and early intervention related to the use of psychoactive substances.

In addition, this study can be used as an indication for directing the promotion of mental health and prevention of psychiatric disorders to the planning of services, thus being able to reduce social and economic costs, since spending on psychiatry currently represents the second source of expenditure on hospital admissions in Brazil. However, as this is an ecological study, future research should investigate the causes that resulted in the statistics presented in this research.

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