

ANALYSIS OF SUICIDE CASES BETWEEN THE YEARS FROM 2018 TO 2021 AS A COMPARISON BETWEEN THE PRE- PANDEMIC YEARS AND THE INITIAL YEARS OF THE COVID-19 PANDEMIC

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Abstract: Suicide is one of the main causes of death in the world, among the triggering factors are psychological and social issues, these became more incident and evident during the pandemic Covid-19, when there were significant changes in the family structure, deaths and financial difficulties. The objective of this study was to evaluate the possible association between the increase in Covid-19 cases and the increase in suicides, comparing the pre- and post-pandemic periods in the state of Mato Grosso. A cross-sectional study was carried out using the database of the state health department of Mato Grosso (SES/MT). The dependent variable was the number of suicide cases, comparing the periods before and during the pandemic (COVID-19). Descriptive, bivariate and stratified analyzes were performed to investigate possible associations. During the period from 2018 to 2021, 403 individuals died, the cause of which was suicide. Of these, n= 320 were male, with the predominant age range being 20 to 49 years old (n= 264), the place of highest occurrence was at home/public roads (n=374). Regarding work activity, there is a higher incidence in individuals who are not healthcare professionals, representing 99.1% of cases. The stratified analysis made it possible to evaluate the main factors associated with a higher risk of suicide, which were: being male, having the death occur at home, not belonging to the yellow and white ethnicities, and living in a situation of separation. Although no significant increase in suicide mortality was observed between the periods observed, suicidal behavior during the COVID-19 pandemic in the state of Mato Grosso was predominant in male individuals, who lived alone, and not health professionals.

Keywords: SARS-COV-2; suicide; social isolation; psychiatric disorders; self-destructive behavior.

INTRODUCTION

In December 2019, a pneumonia outbreak emerged in Wuhan, China, which was associated with a seafood and live animal market (LI et al., 2020). Subsequent analyzes identified the causative agent as a new coronavirus, called SARS-CoV-2 (ZHU et al., 2020).

This virus is the seventh known member of the coronavirus family that has the ability to infect humans (GORBALENYA et al., 2020), the disease resulting from this infection was officially named COVID-19 (World Health Organization, 2020).

COVID-19 quickly spread across the world, creating a global public health crisis. In just four months, more than 2 million people were infected and almost 150,000 deaths were recorded in 185 countries (World Health Organization, 2020). In response to this situation, social distancing measures were adopted with the aim of containing the spread of the virus, which include social isolation and working from home (BROOKS et al., 2020). However, these measures can have social consequences, which can affect the mental health of individuals. In previous epidemics, it has been observed that isolation and restriction measures can have negative effects on the mental health of the population, including an increase in the risk of suicidal behavior (GUNNELL et al., 2020).

The COVID-19 pandemic brought with it a series of consequences that significantly impacted people's mental health. Anguish, uncertainty, fear of contagion, chronic stress, economic difficulties, social isolation and insomnia were some of these (HOLMES et al., 2021). These factors may contribute to the development or worsening of psychiatric disorders and increase the risk of suicidal behaviors, especially in vulnerable populations such as individuals with pre-existing psychiatric disorders, the elderly, healthcare

professionals, and people who have lost family members during the pandemic (SHER, 2020).

According to the WHO (world health organization) and the CDC (center of disease control), suicide is one of the main causes of death in the world, representing a growing challenge for global public health (CABALLERO-DOMÍNGUEZ; JIMÉNEZ-VILLAMIZAR; CAMPO-ARIAS, 2020). To this end, the purpose of this research is to verify whether the increase in social isolation and other associated risk factors, in addition to the morbidity and mortality of Covid-19, influenced in any way the increase in the number of suicides during this period. Therefore, the present study aims to evaluate the association between the increase in Covid-19 disease and the increase in suicide comparing the period before and during the pandemic in the state of Mato Grosso.

METHODS

Cross-sectional study on deaths by suicide in the state of Mato Grosso in the years 2018 to 2021, making a comparison between the two pre-pandemic years and the two initial years of the pandemic. The state makes up the central-western region of Brazil with an estimated population of 3,567,234 inhabitants, distributed across 141 municipalities.

The information used in the study was obtained through secondary data from the database of the health department of the state of Mato Grosso (SES/MT), and the dependent variable chosen for the preparation of the study was "suicide", the same compared to the period of two years prior to the pandemic and the first two years of COVID 19. The database was generated by filtering the inclusion criteria, which are: cause of death by suicide, gender, age group, education, marital status, race/color, place of occurrence, period from 2018 to 2021. Data that did not meet any of these criteria were excluded. After obtaining

the database, the information collected was processed in the Microsoft Excel® spreadsheet editor.

Throughout the study, descriptive, bivariate and stratified analyzes were carried out, demonstrated through tables. The sociodemographic profile was determined based on simple and relative frequencies, with the following variables being analyzed: age group, education, marital status, race/color, gender, place of occurrence, health worker.

RESULTS

According to the data collected, 403 individuals died in the period from 2018 to 2021 in the state of Mato Grosso, whose cause of death was suicide. Among the cases analyzed, it was observed that males had the highest incidence, corresponding to 79.40% of cases, which represents a proportion 3.51 times higher compared to females, which corresponded to 20.60% of cases.

In relation to marital status, it was observed that individuals who live alone, such as widowed, single, separated and divorced, had a higher incidence of suicide, representing 63.77% of cases. On the other hand, those who were married or living in a stable relationship comprised 36.23% of the cases. Regarding the age group, the predominance occurred among individuals aged between 20 and 49 years old, totaling 65.51% of cases, while those over 50 years old represented 34.49% of cases. Regarding the race/color variable, it was found that white and yellow people accounted for 34.49% of cases (Table 1).

The most frequent location of suicide cases was in homes/public streets, representing 92.80% of cases, followed by health establishments, with 7.20% of cases. When comparing the pre-pandemic period (2018 and 2019) with the pandemic period (2020 and 2021), it is noted that the first period corresponded to 50.87% of cases, while

the second period corresponded to 49.13% of cases. Regarding the functional situation of individuals, specifically those who remained in the health sector during the pandemic period, it was observed that they represented 0.99% of cases, while 99.01% had other occupations (Table 1).

In relation to gender, considering the entire period, both during the pandemic and outside it, it was observed that there were almost three times more cases of suicide among men compared to women, showing a 33% increase in cases. However, during the pandemic period, this difference between male and female suicide was even greater, corresponding to an increase of 94%. Regarding marital status, it is clear that suicide cases in separated individuals are 40 times higher than those who live with a partner.

Assessing the non-pandemic period, there is a 36% increase in suicide among people who do not have romantic relationships. When analyzing the race/color variable, throughout the entire period, it was observed that there were 1.25 times more cases of suicide among individuals of non-yellow or white color compared to the others.

During the pandemic period, this suicide rate relationship was even higher, with a relative risk of 1.34 (95% CI 1.01-1.79), while in the pre-pandemic period there was no statistical significance, with a risk relative statistical value of 1.15 (95% CI 0.86-1.54), (Table 2).

Throughout the period, regardless of the pandemic, the age group between 20 and 49 years old had an 11 times higher risk of suicide compared to individuals aged 50 or over. In the non-pandemic period, this relationship was even higher, with a relative risk of 13.74 (95% CI 10.21-18.48) (Table 2). When evaluating the level of education through years of study, it was observed that individuals with high school or higher education had an almost

50 times greater risk of suicide compared to people with a lower level of education. When comparing strata, in the non-pandemic period, the suicide rate among people with a higher educational level was 65 times higher.

When investigating the relationship between the place where suicide occurred, the occurrence on public roads or at home was 94 times higher than the occurrence in hospitals, with high statistical significance (relative risk of 60.94, 95% CI 41.79-88.86) (Table 2).

Regarding occupation, when comparing healthcare workers, it was found that during the pandemic period, people who do not work in the healthcare sector had a 56 times greater risk of suicide when compared to those whose occupation falls within the Health area. However, there was no significant difference between the data analyzed (relative risk 1.56, 95% CI 0.22-11.08).

During the periods studied, no statistically significant associations were found with the causes of death.

This means that it is not possible to determine the means by which the victims decided to cause the deaths. However, it is clear that there was a significant increase in the number of deaths during the post-pandemic period and a negative impact on the state's public health situation.

DISCUSSION

As the COVID-19 pandemic continues to evolve, researchers have begun to observe a large potential negative impact on mental health, including an increase in suicidal ideation and suicide attempts (FITZPATRICK; HARRIS; DRAWVE, 2020). Due to the global proportion and biological catastrophe inherent to the pandemic, this can be considered a highly traumatic event and consequently increases the risk of suicide (CAMPBELL, 2020). The suicide rate is considered an indirect global indicator of

mental disorders in the general population (CABALLERO-DOMÍNGUEZ; JIMÉNEZ-VILLAMIZAR; CAMPO-ARIAS, 2020).

As in other epidemiological studies on suicidal behavior, in this study a higher prevalence of mortality was observed in males, an increase in which was also noted during the pandemic period. Although some studies corroborate these findings, others report a higher prevalence of suicide ideation and attempts in females, it is believed that this occurs due to greater female vulnerability and greater propensity to psychiatric disorders when compared to men. Studies confirm that women have a higher frequency of suicide attempts compared to men, a fact that can be explained by differences in the methods used. While men resort to more aggressive methods, such as hanging and using firearms (MOREIRA et al., 2017; BAÉRE, 2019; NISHIMURA et al., 2021).

In relation to marital status, it was observed that individuals who live alone, whether single, widowed or divorced, presented higher mortality due to suicide both in the pandemic period and in the previous period, it is assumed that these results are in line with the literature, which identifies the fact of living alone, including being divorced, widowed or never having married, as a risk factor for suicide (CFM, 2014). Furthermore, the research revealed an increase in the suicide rate among individuals aged 50 and over.

However, an interesting fact is that there was a decrease in the proportional reasons for suicide among the youngest and most educated during the pandemic period compared to the non-pandemic period. This decline may be related to the effects of isolation, which provided more time with family, increased social cohesion and reduced school problems and academic rates (ORELLANA; DE SOUZA, 2022). Suicide attempts and successful cases usually occur in

Variable	N	%
Sociodemographic aspects		
Age group (n=403)		
20 to 49 years old	264	65.51%
50 years or more	139	34.49%
Years of study (n=403)		
Fundamental	193	47.89%
Medium or higher	210	52.11%
Marital status (n=403)		
Married and consensual union	146	36.23%
Single, separated and divorced	257	63.77%
Race/color (n=403)		
Yellow/white	139	34.49%
Others	264	65.51%
Gender (n=403)		
Feminine	83	20.60%
Masculine	320	79.40%
Place of occurrence (n=403)		
Home or public street	374	92.80%
Hospital	29	7.20%
Pandemic (n=403)		
Yes	205	50.87%
No	198	49.13%
Health worker (n=403)		
Yes	4	0.99%
No	399	99.01%

Table 1 - Main sociodemographic aspects referring to suicide cases in the period from 2018 to 2021 in the state of Mato Grosso.

Variable	Stratified analysis			
	Gross PR (CI 95%)	Pandemic (CI 95%)	Non- pandemic (95% CI)	Pandemic/ non- pandemic reason
Gender	2.94	3.82	2.88	1.33
(male Female)	(2.31-3.74)	(2.14-4.24)	(2.05-4.05)	
marital status	1.40	1.40	1.36	1.03
(separately/together)	(1.14-1.71)	(1.06-1.86)	(1.02-1.82)	
Race/color	1.25	1.34	1.15	1.16
(others/ yellow and white)	(1.02-1.53)	(1.01-1.79)	(0.86-1.54)	
Age range/years	11.22	9.48	13.74	0.69
(20 to 49/50 or +)	(9.16-13.77)	(7.15-12.58)	(10.21-18.48)	

Years of study (middle or +/-fundamental)	2.49 (2.06-3.03)	2.31 (1.75-3.03)	2.96 (2.24-3.90)	0.78
healthcare worker (no / yes)	0.69 (0.26-1.85)	1.56 (0.22-11.08)	0.39 (0.13-1.20)	4.08

Table 2 - Gross prevalence ratios and suicide strata, in the pre-pandemic and pandemic periods of COVID-19 in the state of Mato Grosso.

PR – Prevalence ratio; CI – Confidence interval; (a) pandemic period (2020 and 2021); (b) pre-pandemic period (2018 and 2019); (c) ratio between pandemic and pre-pandemic period; (d) percentage in relation to the increase and decrease in suicide cases during the pandemic period.

places such as homes. During the pandemic, greater contact and vigilance on the part of family members towards younger people can be considered a significant protective factor (SUEN; CHAN; WONG, 2020).

In the study, it was observed that the number of people who attempted suicide was higher among the population that self-identifies as non-white. However, it is important to highlight that it cannot be said that attempted self-harm depends exclusively on the ethnicity, color or social class involved. Fundamentally, this behavior is related to the social context in which the person is inserted and circumstantial factors that influence this act, such as socioeconomic level, drugs and alcoholism (NISHIMURA et al, 2021., SCHLICHTING; MORAES, 2018).

According to this study, home (92.80%) was identified as the main location chosen for suicide. These results highlight the direct impact of the family environment on feelings and decisions, which can lead to trauma and suicidal ideation. Family conflicts, relationship endings, lack of dialogue, misunderstanding and other events are triggers that contribute to tragic decisions, such as attempted suicide. This research emphasizes the importance of the family in preventing new cases (GRIGOLETTO et al., 2020).

During the pandemic, the suicide mortality rate among non-healthcare workers increased

by 300%. It was observed that those who were in social isolation had a higher incidence of suicide. Although health professionals had exhaustive workloads and stress, the increase in suicide mortality during the pandemic period was in individuals who occupy other work positions. Several studies demonstrate that the economic factor and unemployment are strongly related to suicidal behavior during this period.

International studies have shown repercussions in the economic sphere, revealing a two- to three-fold increase in the relative risk of suicide-related deaths (DEADY et al., 2020). In a survey of 130 patients treated by urgent and emergency psychiatric services in Teresina-PI, it was reported that 30.0% of the sample faced loss of income, and unemployment was associated with suicide ideation and attempts (ROCHA et al., 2022). Furthermore, the reported difficulties in accessing emergency income transfer programs, especially considering the need for digital means, can also become stressful events during the COVID-19 pandemic period.

Stratified analysis makes it possible to evaluate the consistency of associations observed in different subgroups of the studied population, helping to identify groups at greater risk of exposure or disease. In this study, the main factors associated with suicide were identified: being male, having the death

occur at home, not belonging to the yellow and white ethnicities, and living in a situation of separation.

Some limitations must be presented in this study, one of which is the use of a secondary database where the quality of the information tends to be lower than that of primary data due to the multiplicity of those responsible for entering the information. However, the mortality information system is the most intensely criticized and reviewed by the health information service, as there is a mandatory investigation and confirmation of the cause of death, and this service is implemented throughout the country. Still, this study is a pioneer in the assessment of suicide in relation to the COVID-19 pandemic. The effect of the pandemic has changed several social aspects, with direct impacts on mental health, aggravating psychopathological conditions already present and responsible for the increase in alcohol and drug consumption by some patients (GARRIDO; RODRIGUES, 2020).

CONCLUSION

Suicide mortality in the state of Mato Grosso during the COVID-19 pandemic was predominant among males, those living alone, young adults and non-health professionals. It is assumed that although there was no significant difference between the periods evaluated, social isolation measures and the impact of the pandemic on family income are factors that may have contributed to the increase in suicide mortality in this population. The data collected reinforces the need for effective and evidence-based public policies for early identification, implementation of prevention strategies and adequate management of risk states. It is also noteworthy that new investigations are essential to measure the clinical conditions related to the risk of self-inflicted violence as psychological constructs.

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