

## Aging And Vulnerability To Suicide: An Overview Of The Central-western Region Of Brazil

Envelhecimento e Vulnerabilidade ao Suicídio: Um Panorama da Região Centro-Oeste Brasileira

Envejecimiento y Vulnerabilidad Al Suicidio: Una Panorama de La Región Centro-oeste de Brasil

### RESUMO

**Objetivo:** Descrever o perfil epidemiológico dos idosos vítimas de suicídio na Região Centro-Oeste do Brasil. **Método:** Pesquisa epidemiológica, quantitativa, retrospectiva sobre as mortes por suicídio em idosos da Região Centro-Oeste no período de 2018 a 2022. Os dados foram obtidos por meio do Sistema de Informação sobre Mortalidade, considerando as lesões autoprovocadas voluntariamente (CID 10 X60 a X84), e analisados conforme a estatística descritiva. **Resultados:** Ocorreram 953 óbitos por suicídio entre a população idosa, com maior número de registros em 2022 e no Estado de Goiás. Predominaram vítimas do sexo masculino, entre 60 e 69 anos, casadas, com a cor da pele branca e de baixa escolaridade. Os meios mais utilizados para viabilizar os óbitos foram o enforcamento, estrangulamento e sufocamento. **Conclusão:** Os achados podem contribuir para formulação de intervenções voltadas ao perfil encontrado, com melhoria das estratégias de prevenção.

**DESCRITORES:** Epidemiologia; Idoso; Suicídio; Mortalidade.

### ABSTRACT

**Objective:** To describe the epidemiological profile of elderly suicide victims in the Midwest region of Brazil. **Method:** An epidemiological, quantitative, retrospective study of deaths by suicide among elderly people in the Midwest region between 2018 and 2022. The data was obtained from the Mortality Information System, considering voluntary self-harm (ICD 10 X60 to X84), and analyzed according to descriptive statistics. **Results:** There were 953 deaths by suicide among the elderly population, with the highest number of records in 2022 and in the state of Goiás. The majority of victims were male, aged between 60 and 69, married, white and with low levels of education. The most common means of death were hanging, strangulation and suffocation. **Conclusion:** The findings may contribute to the formulation of interventions aimed at the profile found, with improved prevention strategies.

**DESCRIPTORS:** Epidemiology; Elderly; Suicide; Mortality.

### RESUMEN

**OBJETIVO:** Describir el perfil epidemiológico de los ancianos víctimas de suicidio en la Región Centro-Oeste de Brasil. **Método:** Estudio epidemiológico, cuantitativo y retrospectivo de las muertes por suicidio de ancianos en la Región Centro-Oeste entre 2018 y 2022. Los datos se obtuvieron del Sistema de Información de Mortalidad, considerando las autolesiones voluntarias (CIE 10 X60 a X84), y se analizaron según estadística descriptiva. **Resultados:** Hubo 953 muertes por suicidio en la población anciana, con el mayor número de registros en 2022 y en el estado de Goiás. La mayoría de las víctimas eran hombres, con edades entre 60 y 69 años, casados, blancos y con bajo nivel de escolaridad. Los medios de muerte más comunes fueron ahorcamiento, estrangulación y sofocación. **Conclusión:** Los hallazgos pueden contribuir a la formulación de intervenciones dirigidas al perfil encontrado, con mejores estrategias de prevención.

**DESCRIPTORES:** Epidemiología; Ancianos; Suicidio; Mortalidad.

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**INTRODUCTION**

Suicide is considered a major public health problem and constitutes a complex behavior that involves personal, social, psychological, biological, cultural and environmental factors. Due to its complexity, prevention approaches require multidisciplinary interventions.<sup>(1)</sup>

Suicide is estimated to account for 1.3% of all deaths worldwide each year, and although suicide deaths continue to increase globally, the suicide rate fell by 45.8% from 1990 to 2019, taking into account population growth.<sup>(2)</sup> There is a variation in suicide according to age, sex and means used to commit suicide, with the highest rates found among men and the elderly, but it is also the second most frequent cause of death among young people.<sup>(3,1-2)</sup>

In Brazil, suicide, in addition to present-

ing high rates of both occurrence and attempts, remains a frequently underreported social issue. It is estimated that for every confirmed suicide, there are around 20 unsuccessful attempts. This problem is exacerbated in the elderly group.<sup>(4)</sup> According to the Epidemiological Bulletin of Attempts and Deaths by Suicide in Brazil<sup>(5)</sup>, released by the Ministry of Health, the average suicide rate among the elderly is 8.9 deaths per 100,000 inhabitants, exceeding the national average of 5.5 deaths for the general population.

Due to a series of factors, both intrinsic (such as anxiety, depression, dementia, chronic and degenerative diseases, physical dependence) and extrinsic (such as social isolation, neglect, abandonment, violence and migration), the elderly person becomes particularly vulnerable in this context. The interaction of these factors can result in feelings of dissatisfaction and unhappiness with the reality experienced, facilitating the

development of suicidal thoughts.<sup>(6)</sup> Thus, suicide appears as a personal choice, although it is influenced by multiple external and internal factors.

Even though it is a complex and multifactorial event, it is possible to prevent suicide by understanding and addressing the factors associated with the problem, such as abandonment, abuse, family conflicts, persistent physical or psychological suffering and a feeling of end of life.<sup>(7)</sup> To this end, it is essential to preserve family ties, promote healthy coexistence, strengthen the feeling of belonging to the community and encourage human contact. These bonds can be stimulated by both the family and caregivers, health professionals and other social entities that are part of the individual's support circle.

“ There are still few studies in the literature related to suicide among the elderly, as well as regional studies, which may differ from broader scenarios. ”

Information on the characteristics of the elderly population who died by suicide can be very useful for the development of specific preventive programs. Therefore, the objective of this study was to describe the epidemiological profile of elderly suicide victims in the Central-West region of Brazil.

## METHODS

This is an epidemiological, quantitative and retrospective study that analyzed deaths by suicide among individuals aged 60 or over living in the Central-West region of Brazil, from 2018 to 2022.

The Central-West region is one of the five regions of Brazil defined by the Brazilian Institute of Geography and Statistics (IBGE) in 1969 and comprises three states: Goiás, Mato Grosso and Mato Grosso do Sul, plus the Federal District, where Brasília, the capital of the country, is located. In the last Demographic Census, the population of this region totaled 16,289,538 inhabitants.<sup>(8)</sup>

Data on elderly suicides were collected via the Mortality Information System (SIM - Sistema de Informação sobre Mortalidade) available on the website of the Department of Statistics of the Unified Health System – DATASUS, in October 2024.

The variables considered were: location, year, sex, age group, marital status, educa-

tion, race, death by place of occurrence and cause, considering the 10th revision of the International Classification of Diseases and Related Health Problems (ICD), codes X60 to X84, which include intentionally self-inflicted injuries such as self-poisoning, injuries caused by firearms, sharp-blunt objects and other means.

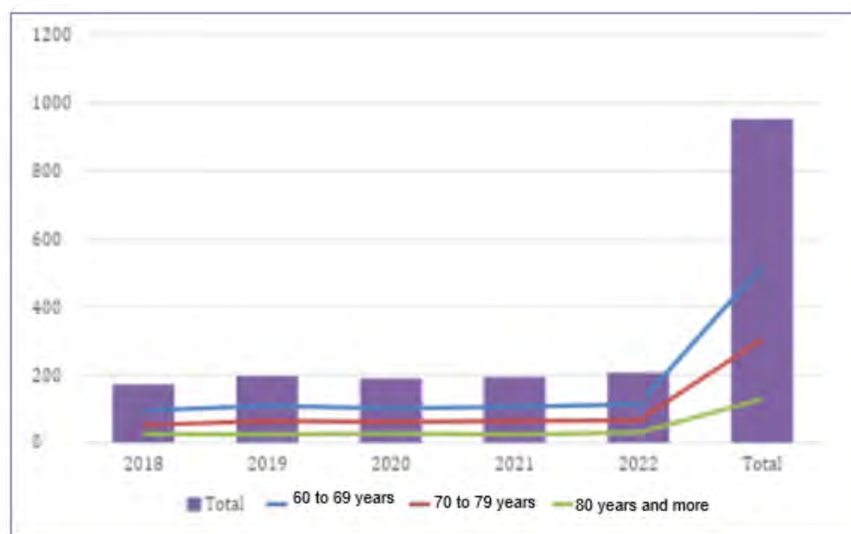
The data were organized in Excel spreadsheets and descriptive analyses were performed, presented by the absolute and relative frequencies of the variables included in the study. The results were organized and categorized by age group.

Since this was a secondary database study, with free access and without identifying the subjects, there was no need for submission to the Research Ethics Committee.

## RESULTS

During the period analyzed, there were 953 deaths by suicide among elderly people in the Central-West region of Brazil. Figure 1 shows the distribution of occurrences by year and age group. Elderly people between 60 and 69 years old were the most frequent victims, accounting for more than half of the cases (54.7%).

Figure 1. Deaths by suicide among elderly people in the Central-West region according to year of occurrence and age group.



Source: The authors.

The state of Goiás had the highest number of suicides, recording 52.2% of deaths, followed by the state of Mato Grosso with 19.5%; and the year with the highest number of occurrences was 2022 (Table 1).

**TABLE 1. DEATHS BY SUICIDE AMONG THE ELDERLY IN THE CENTRAL-WEST REGION ACCORDING TO YEAR OF OCCURRENCE AND STATE OF THE FEDERATION.**

Region	2018	2019	2020	2021	2022	Total	%
Federal District	27	26	17	13	28	111	11,6
Goiás	83	100	99	105	110	497	52,2
Mato Grosso	35	33	36	45	37	186	19,5
Mato Grosso do Sul	26	36	36	30	31	159	16,7
Região Centro-Oeste	171	195	188	193	206	953	100

Source: The authors.

Table 2 presents the sociodemographic data of suicide victims in the Central-West region, considering the distribution by age group. The majority of victims were male (82.2%), with 4 to 7 years of schooling (25.7%), white (49.3%) and married (41.1%).

**TABLE 2. SOCIODEMOGRAPHIC DATA OF ELDERLY SUICIDE VICTIMS IN THE CENTRAL-WEST REGION, ACCORDING TO AGE GROUP.**

Variables	60 to 69 years		70 to 79 years		80 years and +		Total	
	n	%	n	%	n	%	n	%
<b>Gender</b>								
Male	419	53,5	247	31,5	117	15,0	783	82,2
Female	102	60,0	57	33,5	11	6,5	170	17,8
<b>Education</b>								
None	56	41,2	52	38,2	28	20,6	136	14,3
1 to 3 years	85	48,8	64	36,8	25	14,4	174	18,2
4 to 7 years	137	55,9	76	31,0	32	13,1	245	25,7
8 to 11 years	101	64,7	37	23,7	18	11,6	156	16,3
12 years and more	57	65,5	23	26,4	7	8,1	87	9,1
Ignored	85	54,8	52	33,5	18	11,6	155	16,2
<b>Color/Ethnicity</b>								
White	237	50,4	155	33,0	78	16,6	470	49,3
Black	24	64,9	10	27,0	3	8,1	37	3,9
Yellow	1	25,0	2	50,0	1	25,0	4	0,4
Brown	246	58,4	130	30,9	45	10,7	421	44,2
Indigenous	4	90,0	1	10,0	-	-	5	0,5
Ignored	9	56,2	6	37,5	1	6,3	16	1,6
<b>Marital status</b>								
Single	111	67,7	34	20,7	19	11,6	164	17,2
Married	224	57,1	127	32,4	41	10,5	392	41,1
Widowed	38	29,2	52	40,0	40	30,8	130	13,6
Legally separated	76	54,7	50	36,0	13	9,3	139	14,6
Other	26	59,1	13	29,5	5	11,4	44	4,6
Ignored	44	54,3	27	33,3	10	12,4	81	8,5
<b>Total</b>	<b>521</b>	<b>54,7</b>	<b>304</b>	<b>31,9</b>	<b>128</b>	<b>13,4</b>	<b>953</b>	<b>100</b>

Source: The authors.

# Original Article

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Finally, Table 3 presents the intentional self-inflicted injuries by the elderly according to the ICD-10 categories. Intentional inju-

ries caused by hanging, strangulation and suffocation were the main means used by the elderly to commit suicide in all age groups,

with 647 (67.9%) records. Next come injuries caused by another firearm or unspecified firearm, with 66 (6.9%) cases.

**TABLE 3. ICD REFERRING TO THE MEANS OF SUICIDE OF THE ELDERLY LIVING IN THE CENTRAL-WEST REGION ACCORDING TO AGE GROUP.**

ICD-10 Category	60 to 69 years	70 to 79 years	80 years and +	Total
<b>Autointoxication</b>				
X60 Non-opiate analgesics, antipyretics and antirheumatics	1	-	-	01
X61 Anticonvulsant [antiepileptic] drugs, sedatives, hypnotics, antiparkinsonians and psychotropic drugs, unclassified	6	4	-	10
X62 Narcotics and psychodysleptics [hallucinogens] not elsewhere classified	3	-	-	03
X63 Pharmacological substances acting on the autonomic nervous system	-	-	1	01
X64 Other drugs, medicaments and biological substances and those not specified	12	7	1	20
X65 Intentional exposure by alcohol	6	1	-	07
X66 Organic solvents, halogenated hydrocarbons and their vapours	1	-	-	01
X68 Intentional exposure to pesticides	17	13	3	33
X69 Unspecified chemicals and harmful substances	5	4	1	10
<b>Intentional self-harm</b>				
X70 Hanging, strangulation and suffocation	363	193	91	647
X71 Drowning and submersion	4	4	-	08
X72 Discharge from a handgun	17	15	5	37
X73 Discharge from a shotgun, carbine or firearm of a larger calibre	2	1	-	03
X74 Shot from another firearm or unspecified firearm	31	23	12	66
X76 Smoke, fire or flames	7	6	2	15
X78 Sharp or penetrating object	15	14	5	34
X79 Blunt object	3	-	-	03
X80 Falling from a height	18	12	5	35
X82 Impact of a motor vehicle	1	1	1	03
X83 Other specified means	1	2	-	03
X84 Unspecified means	8	4	1	13
<b>Total</b>	<b>521</b>	<b>304</b>	<b>128</b>	<b>953</b>

Source: The authors

## DISCUSSION

Suicide has become a global imperative

and has been considered a public health problem. The WHO reports an occurrence of 703,000 suicides per year, with approximately 77% of these occurring in low- and middle-income countries. Given the relevance of the problem, the suicide rate indicator was

included as one of the targets of the United Nations Sustainable Development Goals (SDGs).<sup>(2)</sup>

It is believed that elderly people are more vulnerable to suicide, due to the changes that occur in their bodies due to the aging pro-

cess.<sup>(9)</sup> Compared to young individuals, they are more likely to die by suicide, and if they have a pathological condition such as depression or anxiety, suicidal ideation increases substantially.<sup>(10)</sup>

This study analyzed deaths by suicide in the elderly that occurred in the Central-West region of Brazil over a five-year period and observed that the profile of elderly people who are victims of suicide is predominantly male, between 60 and 69 years old, with low education, white skin color and married. The findings of a study on suicide mortality in Brazil between 1996 and 2017 corroborate those of the present study regarding sex (81.3% men), age range between 60 and 70 years (54.5%), marital status (51.5% married), low education level (19.2% with 1 to 3 years of schooling) and white skin color (62.4%).<sup>(11)</sup>

Data from a Brazilian study on suicide among the elderly in Brazilian capitals and the Federal District also demonstrated a higher occurrence of deaths in men, as did a survey carried out in the Northeast, with more than 80% of records related to the male sex.<sup>(12-13)</sup>

The prevalence of males over females in suicide deaths among the elderly is well established. International studies have shown that men have attempted suicide more than three times more often than women.<sup>(14-15)</sup> In the study by Zhong et al.<sup>(16)</sup> suicide among men in China was 40% higher than among women over a two-year period.

In terms of age group, the highest number of records was observed among younger elderly people. A study from Malaysia indicated that the age group of 60 to 74 years, considered the young-old age group, is a predictor of suicide and justifies this predominance due to the major transitions in this period of life, such as going from employed to unemployed status, bereavement, migration, increased physical and mental illnesses, as well as social and family changes.<sup>(17)</sup>

The high suicide mortality rate among the elderly is probably aggravated by frailty and the fact that many elderly people live alone, which contradicts the data from the present study, where married people had a higher prevalence of deaths. Other risk fac-

tors that stand out are mental and physical health problems and social problems, with mental health problems being those that are most consistently related to suicide in the elderly.<sup>(18)</sup>

A case-control study conducted in the United States demonstrated that 51.3% of individuals who died by suicide had at least one mental health condition diagnosed in the year prior to suicide. After adjusting for sociodemographic characteristics, these individuals were 6.8 times more likely to die by suicide.<sup>(19)</sup>

Regarding education, suicide was more prevalent among elderly individuals with no education or with up to seven years of education, corroborating data from a study conducted in Tocantins that indicated a moderate correlation between the level of education and suicide, with more cases of suicide

“ This fact could be explained by economic status, defined by educational level and other social factors, which can lead to great concerns and stress, low self-esteem and, consequently, suicide.<sup>(21)</sup> ”

among those with less education.<sup>(20)</sup>

This point is divergent in the literature, as a narrative review on socioeconomic determinants related to suicide highlighted that the higher the individual's level of education, the greater the risk of suicide, as the work of people with a high level of education can be

more stressful.<sup>(22)</sup>

Within the Central-West Region, the state of Goiás stood out as the territory with the highest number of suicide records among the elderly, accounting for just over half of the deaths in the period. Analysis of suicide data among the elderly in Brazilian capitals confirms that Goiânia is the capital of the Central-West region with the highest suicide mortality rate among the elderly, which may contribute to this state's predominance.<sup>(12)</sup>

Intentional injuries caused by hanging, strangulation and suffocation were the main means used by elderly people to commit suicide in all age groups in this study, followed by injuries caused by another firearm or an unspecified firearm. These methods coincide with those used by elderly suicide victims in other studies.<sup>(6,14,17)</sup>

Although successful suicides are more prevalent in men, the prevalence of suicide attempts is more frequent in women. This difference exists due to the fact that men choose more severe methods, such as hanging and the use of firearms, where the probability of survival is low. Women, on the other hand, resort to less fatal methods such as poisoning with drugs and chemicals, where there is a possibility of survival.<sup>(23)</sup>

A study carried out by Oh et al.<sup>(24)</sup> reports that the use of hanging, drowning and firearms, which are highly traumatic methods, account for only 16% of all methods used to attempt suicide. However, when it comes to deaths by suicide, these same methods account for 78% of cases.

“ The high suicide rates among the elderly and the existence of stigmas and taboos surrounding the issue make it even more relevant and necessary. ”



As the population aging process is a reality in Brazil and around the world, it becomes a challenge to confront and prevent this condition so that the numbers do not become more alarming.

Some factors can act as protectors against suicide and include individual and social resources that can protect the elderly from this act. Having good family support, building healthy relationships, showing a sense of importance, having high self-esteem, as well as professionals capable of identifying episodes of depression early and restricting access to lethal means, are some of the factors that can

“ In Japan, one of the main strategies of national suicide prevention plans is to promote the connection of individuals in need of psychiatric treatment with appropriate medical services. ”

contribute to suicide prevention.<sup>(25)</sup>

Improved treatment rates for high-risk groups may have contributed to the decline in suicide in the country.<sup>(26)</sup>

Other important measures include: preventing disabilities, adopting a caregiver for

the elderly; expanding and qualifying mental health services; intersectoral initiatives such as universities open to the elderly; preparing for retirement; community therapies and multidisciplinary interventions.<sup>(27)</sup> The elaboration of the National Policy for the Prevention of Self-harm and Suicide, enacted through Law 13,819 of April 2019, is highlighted (28), which can trigger the strengthening of mental health actions, as well as strategies related to health promotion and prevention of self-inflicted violence.

As this is a study with secondary data, some limitations can be considered, such as the quality of the records in the Datasus database, the time between data collection and publication on the platform, and under-reporting, with the possibility of incorrect classification of the cause of death.

“ In addition, there is still a low number of publications that specifically address suicide in the elderly population, which can weaken the discussion of the results. ”

However, these limitations did not make the study unfeasible and its importance.

## CONCLUSION

Between 2018 and 2022, there were 953 deaths by suicide among the elderly population in the Central-West region of Brazil, with a predominance of male victims, between 60 and 69 years old, married, white skin color and with low levels of education. The state of Goiás had the highest prevalence of suicides and the most commonly used means to cause deaths were hanging, strangulation and suffocation, in addition to the discharge of another firearm or unspecified firearm.

The findings may contribute to the formulation of interventions aimed at the profile found, with improved training of professionals who deal directly with the elderly, increasing actions to screen for mental disorders, classify risks and vulnerabilities, as well as multidisciplinary strategies for elderly care. It is expected that more studies can be carried out addressing this topic, which will help to expand knowledge in the area and provide a better basis for prevention strategies.

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