ORIGINAL ARTICLE

Suicidal ideation and associated factors in adults: population-based study from Brazil

Ideação suicida e fatores associados: estudo de base populacional do Brasil

Ideación suicida y factores asociados en adultos: estudio de base poblacional en Brasil

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ABSTRACT

Introduction: Suicide is a public health problem and one of its main risk markers is suicidal ideation. The objective of this study was to estimate the prevalence of suicidal ideation and associated factors in the population from a city in Southern Brazil. **Methodology:** Cross-sectional population-based study carried out in 2019, with adults (≥18 years old) from Criciúma, a city located in Santa Catarina. Suicidal ideation was assessed by the *Patient Health Questionnaire*. Poisson regression with robust variance was used to assess the association between the outcome and sociodemographic, behavioral, anthropometric, and health variables. Crude and adjusted prevalence ratios are presented. **Results:** A total of 820 individuals with a mean age of 54.8 years were studied. The prevalence of suicidal ideation was 7.8%. After adjustment, individuals who reported having two comorbidities were 3.49 times more likely to have suicidal ideation than those who did not have comorbidities. In addition, young individuals with depressive symptoms and feelings of sadness were respectively 1.81, 6.09, and 2.94 times more likely to have suicidal ideation when compared to their peers. The cross-sectional design does not allow the establishment of a temporal relationship between exposures and outcome and therefore, the results should be interpreted with caution. **Conclusion:** Young adults, individuals with multiple comorbidities, depressive symptoms, and feelings of sadness had a higher prevalence of suicidal ideation. Thus, mental health promotion directed at these most vulnerable risk groups is recommended.

Keywords: Suicide, Suicidal Ideation, Mental health, Self-injurious behavior.

RESUMO

Introdução: O suicídio é um problema de saúde pública, e um de seus principais marcadores de risco é a ideação suicida. O objetivo deste estudo foi estimar a prevalência de ideação suicida e fatores associados na população de uma cidade do sul do Brasil. **Metodologia:** Estudo

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transversal de base populacional realizado em 2019, com adultos (≥18 anos) de Criciúma, uma cidade localizada em Santa Catarina. A ideação suicida foi avaliada pelo Questionário de Saúde do Paciente. Regressão de Poisson com variância robusta foi utilizada para avaliar a associação entre o desfecho e variáveis sociodemográficas, comportamentais, antropométricas e de saúde. São apresentadas razões de prevalência brutas e ajustadas. **Resultados:** Um total de 820 indivíduos com idade média de 54,8 anos foram estudados. A prevalência de ideação suicida foi de 7,8%. Após ajuste, indivíduos que relataram ter duas comorbidades tinham 3,49 vezes mais chances de ter ideação suicida do que aqueles sem comorbidades. Além disso, os jovens com sintomas depressivos e sentimentos de tristeza tinham, respectivamente, 1,81, 6,09 e 2,94 vezes mais chances de ter ideação suicida em comparação com seus pares. O desenho transversal não permite estabelecer uma relação temporal entre exposições e desfecho, e, portanto, os resultados devem ser interpretados com cautela. **Conclusão:** Jovens adultos, indivíduos com múltiplas comorbidades, sintomas depressivos e sentimentos de tristeza apresentaram maior prevalência de ideação suicida. Portanto, recomenda-se a promoção da saúde mental direcionada a esses grupos de risco mais vulneráveis.

Palavras-chave: Suicídio, Ideação suicida, Saúde mental, Comportamento autodestrutivo.

RESUMEN

Introducción: El suicidio es un problema de salud pública y uno de sus principales marcadores de riesgo es la ideación suicida. El objetivo de este estudio fue estimar la prevalencia de ideación suicida y factores asociados en la población de una ciudad del sur de Brasil. **Metodología:** Estudio transversal de base poblacional realizado en 2019, con adultos (≥18 años) de Criciúma, una ciudad ubicada en Santa Catarina. La ideación suicida fue evaluada mediante el Cuestionario de Salud del Paciente. Se utilizó la regresión de Poisson con varianza robusta para evaluar la asociación entre el resultado y variables sociodemográficas, conductuales, antropométricas y de salud. Se presentan razones de prevalencia crudas y ajustadas. **Resultados:** Se estudiaron un total de 820 individuos con una edad promedio de 54,8 años. La prevalencia de ideación suicida fue del 7,8%. Después del ajuste, las personas que informaron tener dos comorbilidades tenían 3,49 veces más probabilidades de tener ideación suicida que aquellas que no tenían comorbilidades. Además, los jóvenes con síntomas depresivos y sentimientos de tristeza tenían, respectivamente, 1,81, 6,09 y 2,94 veces más probabilidades de tener ideación suicida en comparación con sus pares. El diseño transversal no permite establecer una relación temporal entre las exposiciones y el resultado, por lo tanto, los resultados deben interpretarse con precaución. **Conclusión:** Los adultos jóvenes, las personas con múltiples comorbilidades, síntomas depresivos y sentimientos de tristeza presentaron una mayor prevalencia de ideación suicida. Por lo tanto, se recomienda la promoción de la salud mental dirigida a estos grupos de riesgo más vulnerables.

Palabras clave: Suicidio, Ideación suicida, Salud mental, Conducta autodestructiva.

INTRODUCTION

Suicide is a public health problem, which affects more than 700,000 individuals every year worldwide, especially in low- and middle-income countries, where approximately 77% of the suicide cases occur[1]. One of the high-risk markers associated with suicide is suicidal ideation[2]. Ngwena et al. (2017) define suicidal intent as the seriousness or intensity of an individual's desire to end their own life[3].

The prevalence of suicidal ideation varies by country, as seen in the study by Stolz et al., (2016), carried out in different European countries, showing that it depends on the most prevalent individual risk factors in each nation[4]. In a Brazilian study, the prevalence of suicidal ideation was 3.8% among the adult population[5]. Of note, Santa Catarina is one of the ten states with the highest prevalence of suicidal ideation in the country, with a rate of 4.2%[5].

Suicidal behavior is a multifactorial phenomenon; therefore, suicidal ideation involves numerous variables, including sociodemographic, socioeconomic, behavioral, and nutritional variables[6]. Suicidal ideation tends to be higher in women, as seen in a cross-sectional study carried out with middle-aged and older adults from China, Ghana, India, Russia and South Africa, low- and middle-income countries[7]. It also is higher in young individuals, as reported in adults from Canada and United States[8] and in patients of Puerto Rico[9], and in those with brown and black skin color in a south Brazilian city sample[6]. It was also demonstrated by Dumith et al., (2020) that low income was associated with a higher likelihood of suicidal ideation. From the same perspective, Faria et al., (2020) related a significantly higher suicidal ideation among unemployed[10]. Moreover, higher prevalence of suicidal ideation was also observed in individuals from Puerto Rico with lower educational levels[9].

Regarding behavioral and nutritional variables, substance abuse is associated with higher rates of suicidal ideation[11]. The excessive consumption of alcoholic beverages is associated with higher rates of suicidal ideation in the majority of studies[12]. It is not known if it is alcohol consumption that leads to suicidal ideation or the other way around, but suicide ideation seems to increase the addiction to alcohol, as well as long-term consumption increases the symptoms of mental health dysregulation, which seems to further increase the risk of suicidal ideation[13]. Smoking addiction also seems to have this association[14,15], perhaps because of the lower's levels of serotonin, which increases the impulsivity or the decrease in neurotransmitters in a general way, which are related to depressive symptoms[15].

Poor sleep quality[6,7] and food insecurity[16] are also associated with higher rates of suicidal ideation. There are many ways in which food insecurity can interfere suicidal thoughts, between them poor nutrition, stress and stigma, which increase mental health disorders, conditions highly associated with suicidal behaviors[17]. Furthermore, individuals with a higher Body Mass Index (BMI) also have higher frequency of suicidal ideation and a greater sense of perceived burden, compared to individuals with a lower BMI[18]. On the other hand, the practice of physical activities is a protective factor[19].

Another factor related to suicidal ideation is the presence of comorbidities or health problems[4,6,14,16], probably because of increased levels of inflammatory mediators

such as interferon-α (IFN-α), interleukin (IL)-1, IL-6, tumor necrosis factor-α (TNF--α), and IFN-γ, which are observed in victims and those who attempt suicide[20]. Mental health is also a factor highly associated with suicidal ideation[14]. Negative emotions such as shame, hopelessness, guilt, giving up, and anger generate emotional pain and the individual see suicide as the only escape from the pain[21].

The need to establish the factors associated with suicidal ideation is extremely relevant, since suicide is a complex and poorly understood phenomenon. Thus, the present study aimed to evaluate the prevalence of suicidal ideation, as well as its associated factors, from a population-based study developed with adults and the elderly in southern Brazil, region where there are very few studies with data about suicide behavior. It is important knowing these factors, because suicide still represents a complex and poorly understood phenomenon worldwide.

METHODS

This is a population-based cross--sectional study carried out in a city from Southern Brazil: Criciúma, located in the state of Santa Catarina. The municipality is located approximately 200 km south of Florianópolis, the state capital. It has a population of approximately 214,493 inhabitants (the 295th in the state and the 5570th in the country) and a gross domestic product (GDP) per capita of R$ 40.518,91 (the 8th in the state and the 142th in the country[22]. The Human Development Index (HDI) is 0.788 (the 20th in the state and the 76th in the country) and the population density is around 913.26 inhabitants per km^2 [22].

The population studied was individuals aged 18 years or older, who resided in the urban area of Criciúma. The sampling process took place in multiple stages, based on data from the 2010 Demographic Census[23]. Initially, all urban census sectors with private properties in the municipality of Criciúma were placed in order according to the code of each sector. A systematic selection of 25% of the census sectors was carried out, totaling 77 census sectors and 15,218 households in them. Within each sector, a systematic selection was made with probability proportional to the number of households in the sector, totaling 750 households. All adults aged 18 years and over who lived in the selected households were invited to participate in the study. Individuals with physical and cognitive impairments were excluded from the study.

A questionnaire was applied with an average application time of 30 minutes and with questions about sociodemographic, behavioral, anthropometric, and health aspects, developed and applied by trained interviewers, who were undergraduate students and health professionals from a multiprofessional residence. This questionnaire was unique, standardized, and pre-coded. After collection, the data were reviewed by the fieldwork supervisor coded by the interviewers, and double-entered into EpiData software version 3.1

The outcome studied was suicidal ideation, assessed through the *Patient Health Questionnaire-9* (PHQ-9)[24] validated for the Brazilian population with sensibility of 42.5% (95%CI 27.0-59.1) and specificity of 95.3% (95%CI 92.8-97.2). This instrument consists of 9 questions considering a two-week recall period. The final question refers to on how many days the individual thought about injuring themself in some

way or that it would be better to be dead ("no days", "less than a week", "a week or more", or "almost every day"). Individuals who chose any response other than "no days" were considered positive cases for suicidal ideation[24]. Study has already demonstrated that suicidal ideation identify by the PHQ-9 is a robust indicator of suicidal ideation in different ages[25].

The sociodemographic, behavioral and health variables studied as exposures were: sex (female, male); age (18-39, 40-59, 60 or older); marital status (single, married, separated/divorced, widowed); living with a partner (yes, no); skin color (white, other); living alone (a) (yes, no); years of schooling (0-4, 5-8, 9-11, 12 or more); monthly income in reais (≤1000.00, 1001.00-2000.00, >2000.00); physical activity (assessed through the International Physical Activity Questionnaire[26] and classified according to the World Health Organization (WHO) recommendations, in which the achievement of 150 minutes or more per week of exercise is considered as having sufficient practice physical activity[27]. Categorized in: yes, no); overweight (identify by the Body Mass Index (BMI) calculated with self-reported data of height and weight through the questions "Do you know your weight?" and "What is your height?", and classify according to the WHO recommendations for adults (until 59 years old), in which a BMI ≥25kg/m² indicates overweight[28], and to the Lipschitz recommendations for the elderly, in which a BMI >27kg/m² indicates overweight[29]. Categorized: in no, yes); food insecurity (assessed through the complete version of Brazilian Food Insecurity Scale[30] and categorized in: no, yes); health perception (self-reported through the question "In general, how do you evaluate your health?"; categorized in: very good/good, regular, bad/very bad); number of comorbidities (self-reported assessment of diagnosis and categorized in: none, 1, 2, or ≥ 3); consultation with a doctor in the previous month (yes, no); sleep quality self-reported through the question "How do you consider the quality of your sleep?"; categorized in: very good/good, regular, poor/very poor); current smoking (yes, no) and current alcohol consumption (no, yes) (assessed through the questions "Do you currently smoke?" and "How many days a week do you usually drink alcohol?" in which drinking one or more days per week was considered as having current alcohol consumption[31]).

In addition, depressive symptoms (no, yes) were assessed, using the PHQ-9 in which each question has a frequency of the symptom response in a likert-type scale from 0 to 3 (never, less than once a week, once a week or more, and almost every day, respectively). The cut-off point of ≥ 9 was used for a positive screening of depressive symptoms, according to the recommendations of Santos et al. (2013)[24]. Perceived stress was assessed through the Perceived Stress Scale (PSS), an instrument with 14 questions and reliability score of 0,86. In which question, the responses are in a likert-type scale from 0 to 4 (never, almost never, sometimes, fairly often, and very often). The total score ranges from 0 (lower stress) to 56 (higher stress)[32] and was categorized into quintiles, with individuals in the highest quintile classified as having perceived stress[33]. In addition, feelings of sadness (yes, no) were assessed using the faces scale[34].

Descriptive analyses of all the variables were performed, presenting absolute (n) and relative (%) frequencies. Crude analysis of association between suicidal ideation and the exposures variables were performed using Pearson's chi-square test, with a 5% significance level (p-value <0.05).

To ensure that the association between suicidal ideation and the exposures variables was independent of potential confounders, adjusted analysis of association was conducted, using Poisson regression with robust variance. For this, a hierarchical model was constructed and the variables selected through the backward method, according to each hierarchical level[35] All variables associated with a significance of 20% (p-value <0.20) were considered as confounders and remained in the final model of analysis. In this way, when one of the independent variables was the exposure, the others variables (previously associated with a p-value <0.20) remained as possible confounding factors of the analysis.

Poisson regression results were presented as prevalence ratio (PR) and their respective 95% confidence intervals (95%CI)[36]. A significance level of 5% (p-value <0.05) was also considered and corresponded to the Wald test for heterogeneity or linear trend.

The software IBM Statistical Package for the Social Sciences (SPSS) software version 22.0, was used for the statistical analysis.

The Criciumense Population Health project was approved by the Human Research Ethics Committee under protocol no. 3,084,521. The participants authorized its performance by signing the Free and Informed Consent Form.

RESULTS

A total of 820 individuals were studied (86.1% response rate), with a mean age of 54.8 (±17.4) years. The majority (63.8%) were female, 60 years or older (44.9%), white (80.7%), and lived with a partner (65.1%). In addition, the minority of participants had 12 years or more of schooling (13.9%) and lived alone (8.8%) (Table 1).

Approximately 14% of the individuals reported poor or very poor self-perception of health (13.7%) and approximately a fifth reported poor or very poor sleep quality (19.9%). Alcohol consumption and insufficient physical activity were reported by approximately 20% of the participants (Table 2). Moreover, approximately a third of the sample reported depressive symptoms (29.2%) and stress (38.8%) (Table 3).

The prevalence of suicidal ideation was 7.8% (95% CI 6.2; 9.9). After adjusting for possible confounding factors, suicidal ideation showed an inverse linear trend with age, that is, the younger the age, the higher the prevalence of suicidal ideation (p=0.035) (Table 1). In addition, after adjustment, individuals who reported having two comorbidities were 3.49 times more likely to have suicidal ideation than those who did not have comorbidities (95% CI 1.05; 11.6), and those who reported a medical appointment in the previous month had a prevalence 76% higher of suicidal ideation compared to their peers (95% CI 1.09; 2.84) (Table 2). Finally, also after the adjusted analysis, it was observed that individuals with depressive symptoms were 6.09 times more likely to have suicidal ideation than those without depressive symptoms (95% CI 2.78; 13.3), and that those who reported feelings of sadness were 2.94 times more likely to present this outcome when compared to their peers (95% CI 1.72; 5.04) (Table 3).

Table 1. Sociodemographic characteristics and crude and adjusted association with suicidal ideation. Criciuma, Santa Catarina, Brazil, 2019.

	Total	**Crude analysis***		**Adjusted analysis****		
	n	%	n (%)	p-value	PR (95%CI)	p-value
Sex				0.051		0.053
Male	297	36.2	16 (5.4)		Reference	
Female	523	63.8	48 (9.2)		1.72 (0.99;3.00)	
Age (years)				0.129		0.035[a]
18-39	193	23.5	19 (9.8)		1.81 (1.00;3.28)	
40-59	259	31.6	24 (9.2)		1.61 (0.92;2.81)	
60 or more	368	44.9	21 (5.7)		Reference	
Skin color				0.076		0.068
White	660	80.7	57 (8.6)		Reference	
Non-white	158	19.3	7 (4.4)		0.50 (0.23;1.06)	
Marital status				0.430		0.728
Single	147	17.9	15 (10.2)		Reference	
Married	495	60.4	33 (6.6)		0.49 (0.22;1.06)	
Separated/divorced	77	9.4	8 (10.3)		1.34 (0.54;3.31)	
Widowed	101	12.3	8 (7.9)		1.07 (0.36;3.15)	
Lives with partner				0.859		0.395
No	286	34.9	23 (8.0)		Reference	
Yes	534	65.1	41 (7.6)		1.29 (0.72;2.31)	
Schooling (years)				0.569		0.069
0-4	219	26.7	21 (9.5)		Reference	
5-8	220	26.9	17 (7.7)		0.67 (0.34;1.32)	
9-11	266	32.5	20 (7.5)		0.53 (0.25;1.16)	
12 or more	114	13.9	6 (5.2)		0.39 (0.13;1.15)	
Monthly income (reais)				0.017		0.121
≤1000.00	317	39.9	33 (10.4)		Reference	
1001.00-2000.00	248	31.2	18 (7.2)		0.85 (0.49;1.48)	
>2000.00	230	28.9	9 (3.9)		0.54 (0.25;1.19)	
Lives alone				0.112		0.052
No	744	91.2	54 (7.2)		Reference	
Yes	72	8.8	9 (12.5)		2.09 (0.99;4.41)	

PR: prevalence ratio. * Pearson's Chi-Square Test. ** Poisson regression. Adjusted analysis for the variables in this table with p<0.20. [a]p-value corresponding to Wald test for linear trend.

Table 2. Behavioral characteristics and crude and adjusted association with suicidal ideation. Criciuma, Santa Catarina, Brazil, 2019.

	Total		**Crude analysis***		**Adjusted analysis****	
	n	%	n (%)	p-value	PR (95%CI)	p-value
Excess weight				0.317		0.226
No	333	42.8	22 (6.6)		Reference	
Yes[a]	446	57.2	38 (8.5)		1.42 (0.80;2.52)	
Food insecurity				0.002		0.842
No	417	74.2	19 (4.5)		Reference	
Yes[b]	145	25.8	17 (11.7)		1.09 (0.45;2.66)	
Perception of health[c]				<0.001		0.865
Very good/good	406	49.6	15 (3.6)		Reference	
Regular	300	36.7	33 (11.0)		1.06 (0.42;2.65)	
Bad/very bad	112	13.7	16 (14.2)		0.91 (0.34;2.44)	
Number of comorbidities				<0.001		0.016
None	145	20.1	6 (4.1)		Reference	
1	123	17.1	4 (3.2)		0.87 (0.20;3.87)	
2	144	20.0	13 (9.0)		3.49 (1.05;11.6)	
≥3	309	42.8	31 (10.0)		2.95 (0.88;9.83)	
Medical appointment in the previous month				0.030		0.022
No	484	59.0	29 (6.0)		Reference	
Yes	336	41.0	35 (10.4)		1.76 (1.09;2.84)	
Sleep quality[c]				<0.001		0.400
Very good/good	425	51.8	23 (5.4)		Reference	
Regular	232	28.3	15 (6.4)		0.50 (0.22;1.11)	
Bad/very bad	163	19.9	26 (16.0)		0.76 (0.43;1.34)	
Current smoking				0.021		0.248
No	702	85.6	50 (7.1)		Reference	
Yes	118	14.4	14 (11.8)		1.46 (0.77;2.79)	
Current alcohol consumption				0.357		0.421
No	655	80.0	54 (8.2)		Reference	
Yes	164	20.0	10 (6.1)		1.35 (0.65;2.78)	
Sufficient practice of physical activity				0.015		0.840
No	611	74.9	56 (9.1)		Reference	
Yes[d]	205	25.1	8 (3.9)		1.08 (0.52;2.26)	

PR: prevalence ratio. * Pearson's Chi-Square Test. ** Poisson regression. Adjusted analysis for the variables in this and in the previous table with p<0.20.

[a]Body mass index (BMI) ≥25kg/m² for adults (until 59 years old) and BMI >27kg/m² for the elderly (≥60 years old).

[b]Score from 1-5 points for households with children/adolescents and from 1-3 for households with adults only.

[c]Self-reported.

[d]150 minutes or more per week of physical activity.

Table 3. Mental health variables and crude and adjusted association with suicidal ideation. Criciuma, Santa Catarina, Brazil, 2019.

	Whole sample		Crude analysis*		Adjusted analysis**	
	n	%	n (%)	P-value	PR (95%CI)	P-value
Depressive symptoms				<0.001		<0.001
No	568	70.8	13 (2.2)		Reference	
Yes[a]	324	29.2	46 (19.6)		6.09 (2.78;13.3)	
Perceived stress				<0.001		0.494
No	486	61.2	20 (4.1)		Reference	
Yes[b]	308	38.8	44 (14.2)		0.80 (0.42;1.52)	
Feeling of sadness				<0.001		<0.001
No	700	85.5	32 (4.5)		Reference	
Yes[c]	119	14.5	32 (26.8)		2.94 (1.72;5.04)	

PR: prevalence ratio. * Pearson's Chi-Square Test. ** Poisson regression. Adjusted analysis for the variables in this and in the previous tables with p<0.20.

[a]Score ≥9 indicated positive screening of depressive symptoms.

Body mass index (BMI) ≥25kg/m² for adults (until 59 years old) and BMI >27kg/m² for the elderly (≥60 years old).

[b]Score from 1-5 points for households with children/adolescents and from 1-3 for households with adults only.

[c]Highest quintile classified as perceived stress.

DISCUSSION

The present study, which aimed to assess the prevalence and factors associated with suicidal ideation in adults and older adults in a city in the south of Santa Catarina, found that suicidal ideation was observed in 7.8% of respondents. It was also found that young adults, individuals with multiple comorbidities, with depressive symptoms and feeling of sadness had a higher prevalence of suicidal ideation.

Some limitations of the study need to be highlighted. The cross-sectional design does not allow establishment of a temporal relationship between exposures and the outcome, therefore, the results should be interpreted with caution. Suicidal ideation, depressive symptoms, feelings of sadness, and perceived stress were assessed with validated, but screening tools that cannot be used as a diagnosis. However, the PHQ-9, PSS, and face scale are easy and quick to apply, and widely used in population-based studies[24,32,34] The study had 13.9% of losses and refusals in the sample. Moreover, despite being a representative study, it was carried out with the population of a specific municipality in Southern Brazil, and the assessment of biochemical variables was not possible due to the logistics of a population-based study.

As a strength, it is emphasized that this is a population-based survey, with a

representative sample of adults and the elderly, which presented updated data on suicidal ideation, an important public health issue. Furthermore, all interviewers were properly trained to apply the questionnaire. In addition, the hierarchical model of determination for suicidal ideation used in the multivariate analysis enabled us to understand the factors related to this outcome.

The suicidal ideation prevalence found in this study (7,8%) is higher than the prevalences found in Brazil in 2013 (3.8%)[5] and in a similar study carried out in southern Brazil in 2016 (6.6%)[6]. This difference can be explained by the methodology of these studies. The study by Carpena et al., (2019) was based on the National Health Survey[5], which being an all-embracing study, may not have had the correct way to address such a complex topic as suicide; and the study by Dumith et al., (2020) was carried out by interviewers pre-trained in the subject[6]. Data from the National Health Survey (PNS) showed that in Santa Catarina state the prevalence of suicidal ideation was 4.2% in 2013[5]. With regard to suicide globally, data from the WHO report points to an age-adjusted suicide rate of 9 per 100,000 inhabitants. In relation to Brazil, this rate was 6.4 per 100,000 inhabitants[1].

In the present study, among the demographic factors associated with suicidal ideation, age was an important factor, with a higher prevalence of the outcome observed in young adults (18 to 39 years of age). These data corroborate other studies carried out with representative sample of American and Canadian samples[8], and with patients from the Pennsylvania Health System, from United States, who had answered question 9 of the PHQ-9[37]. However, the findings of some studies are divergent and report a higher prevalence of suicidal ideation in older adults[4,5,16,38].

According to a study carried out with women at a university in Sweden, an increasing trend in suicidal ideation was observed between 1989 and 2015, among young and middle-aged women, demonstrating that sociodemographic factors may have patterns of change over time in association with suicidal ideation[38]. A possible explanation would be the openness of young people to topics that are considered taboo by older people, such as suicide and suicidal behavior itself, leading this group to widely reporting suicidal ideation, in a society where mental health is becoming more and more important[39].

External pressure on the young population regarding academic and financial performance is another factor capable of influencing suicidal behavior. Accordingly, two cohort studies carried out in Sweden showed that worse school performance between 13 and 16 years of age was directly related to suicide attempts in the following years[40] In one study, being positioned in the lowest quartile of academic performance in the final year of compulsory education was associated with a 4.9-fold greater risk of suicide attempt in the following years[40].

Although some studies show that other sociodemographic characteristics can impact suicidal ideation, the present study did not find an association with sex, skin color, schooling, marital status, and living with a partner or alone. This may have been influenced by the lesser diversity of the epidemiological profile of the participants, since de majority of those respondents were women, white, married, had more than 9 years of schooling and lived with a partner.

Considering the health variables, it was observed that the presence of comorbidities and the number of comorbidities were directly proportional to the prevalence of suicidal ideation. This is in line with data in the literature that also show the impact of comorbidities on suicidal ideation[4,6,8,16]. This fact can probably be explained by the non-acceptance of the disease, since in most cases, suicidal behavior occurs at the beginning of treatment for serious medical diseases, such as end-stage renal disease and the beginning of dialysis[11], in addition, of course, to the perceived suffering itself.

Another factor analyzed was medical consultations in the previous month. In the present study, it was observed that the majority of the individuals who reported suicidal ideation had a medical consultation in the previous month, perhaps, due the higher number of comorbidities or the higher prevalence of psychiatric disorders, which are factors associated with suicidal ideation.

The strong association of mental health disorders with suicidal ideation is unanimous among studies, whether for depression, affective disorders, perceived stress, anxiety, or feelings of sadness[4,6], which corroborates the findings of the present study. This alerts to the fact that suicidal ideation is not a normative psychological process, it is a marker of distress, which predicts the risk of suicide in a relevant and important way[2]

Maybe depression alone is not responsible for suicidal behavior in a generalized way, but it is a pre-established risk factor[11]. Data in the literature shows that suicidal ideation is 11 times higher among individuals with moderately to severe depression, compared to people with mild to moderate symptoms of depression. In individuals with severe symptoms, the risk was 18 times greater, suggesting that the greater the severity of the depressive symptoms, the greater the rate of suicidal ideation and the risk of suicidal behavior[9].

Among strategies to cope with suicidal ideation, social support, both from family and friends, is of a great important and a protective factor for this outcome[10]. Comprehensive multidisciplinary actions and social support for the person with suicidal ideation, can prevent ideation from becoming an attempt. Furthermore, suicidal ideation is a marker of poor mental health[2], indicating that early psychological and psychiatric interventions can prevent the suicidal ideation and its progressing to suicide.

In conclusion, the prevalence of suicidal ideation reached almost eight per 100 individuals. In addition, young adults, those with a medical consultation in the previous month, individuals with multiple comorbidities, with depressive symptoms, and with feelings of sadness had a higher prevalence of suicidal ideation. Thus, mental health actions direct at these vulnerable risk groups is recommended. It is believed that this study can bring new discoveries to corroborate the diagnosis of suicide ideation and, consequently, prevent suicide. The importance of longitudinal studies to understand the relationship between risk factors for the outcome of suicidal ideation is also highlighted.

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Authors' contribution

LB and RFB contributed to the interpretation of the data, participated in writing the preliminar version and in the approval of the final version, and are responsible for the accuracy or completeness of any part of the study. FOM and AAS contributed to the design of the study and the interpretation of the data; participated in writing the preliminary version, in the review and approval of the final version, and are responsible for the accuracy or completeness of any part of the study. LMM and MRQ participated in writing the preliminar version and in the approval of the final version, and are responsible for the accuracy or completeness of any part of the study.

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