

Research Article

Suicide Attempts and Suicide in Brazil: An Epidemiological Analysis

Daniel Augusto da Silva^{ID}, João Fernando Marcolan^{ID}

Department of Clinical Surgical Nursing, Paulista School of Nursing, Federal University of São Paulo, São Paulo, Brazil

ORCID iDs of the authors: D.A.da S. 0000-0002-2716-6700, J.F.M. 0000-0001-8881-7311

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Abstract

AIM: To analyze epidemiological profile attempts and suicide deaths in Brazil.

METHODS: A retrospective and quantitative research was conducted. Data were obtained in September 2020 by the Department of Informatics of the Brazilian Unified Health System database.

RESULTS: The number of self-harm notifications has gradually increased in Brazil. Fourteen thousand nine hundred forty cases were reported in 2011 and 89,272 cases in 2018. Women represented the majority of suicide attempts cases. The age group between 20 and 59 years had the highest percentage of occurrences (65.6%) in 2018, with all Brazilian regions ranking the highest. Brazil recorded 108,020 deaths by suicide in the last 10 years (2009–2018; higher suicide rates in males, proportion 8:2 in relation to the females). In 2018, the proportion of deaths according to age groups was similarly distributed.

CONCLUSION: There is a significant and still increasing rate of suicide attempts and suicide in Brazil, with specificities for each Brazilian region and state. There is an emphasis on the increase in the death of indigenous people, men, Whites, single, divorced, widowed, with more years of schooling, in all age groups, death at home, and by hanging.

Keywords: Attempt suicide, epidemiology, mental health, suicide

Introduction

Suicide is a worldwide public health problem. Each year in the world, deaths by suicide are close to 800,000. For every suicide death, more than 20 attempts occur. In 2016, Southeast Asia (13.4 per 100,000), Europe (12.9 per 100,000), and Africa (12 per 100,000) had higher rates than the global rate (10.5 per 100,000). The lowest rates were found in the Eastern Mediterranean Region (4.3 per 100,000) (World Health Organization, 2019a, 2019b).

In Brazil, there were 183,484 suicide deaths recorded between 1996 and 2016, with an increase of 69.6% in suicide cases in this period (Marcolan & Silva, 2019; Silva & Marcolan, 2020). In 2018, Brazil recorded 12,733 suicide deaths, which accounts for a rate of 6.1 suicides for every 100,000 people and about 35 deaths per day this year. Thus, it is ranked as the eighth country with the most suicide cases in the world in absolute numbers (Brasil Ministério da Saúde, 2019).

According to official data from 2018, it is estimated that for every 45 min one person dies by suicide in Brazil, although without sufficient reliable data as there is still no adequate system for monitoring suicidal behavior, despite the improvements that have occurred in recent years. This makes underreporting and non-notification rates very high, with data masking when reporting the diagnosis (Marcolan, 2018).

Have significant regional variations that can be explained by several factors specific to each location, due to the continental dimension of the country and its population greater than 200 million inhabitants. As of 2011, Brazil has specific national legislation for suicide prevention and the information system has become more effective, working better in the last 5 years, pointing out to the increase in suicide rates. This situation is closely related to the low investment in mental health and scarce investment in suicide prevention.

This research emphasized that suicide is a preventable public health problem. And in this perspective, it is expected that the results presented produce actions to control the magnitude of this problem and subsidize the elaboration of public policies for suicide prevention.

This study aims to analyze the epidemiological data in relation to suicide attempts and suicide deaths in Brazil.

Research Questions

1. What is the epidemiological analysis on the suicide attempts in Brazil?
2. What is the epidemiological analysis on suicide deaths in Brazil?

Method

Study Design

This was a retrospective and quantitative study.

Sample

The variables selected from the database include: age group, skin color/race, education, place of occurrence, marital status, sex, Brazilian region and Federative Unit, and the methods used for the suicide.

Data Collection

Data on suicide attempts and suicide deaths were obtained in September 2020, by the Brazilian database of the Department of Informatics of the Brazilian Unified Health System (DATASUS). Data on population estimates were obtained from the Brazilian Institute of Geography and Statistics.

Based on data on mortality, according to the 10th international classification of diseases (ICD-10), deaths coded with X60-X84 (intentional self-harm) were considered (World Health Organization, 2017).

Statistical Analysis

With access to the data, they were tabulated in spreadsheets, using Microsoft Excel software, in order to allow data analysis with a retrospective and historical series character. In addition, a descriptive statistical analysis was carried out, which provided an understanding of the absolute frequency and relative frequency.

For the calculation of mortality rates, populations of 100,000 inhabitants were considered.

Ethical Considerations

This research uses publicly accessible information from a database of the Ministry of Health of Brazil, where the information is aggregated without the possibility of individual identification, therefore, the consent of the participants is waived, as it cannot be obtained, in accordance with the legislation of the National Health Council - Resolution no. 466/2012, thus ensuring the ethical precepts involving health research.

This study was complied with Brazilian legislation, approved by the Research Ethics Committee of the Federal University of São Paulo, with Opinion no. 2314347, of October 4, 2017.

Results

Data on attempted suicide started to be reported in 2011 and, therefore, are available at a shorter time than data on suicide deaths, justifying the time difference presented in the respective tables.

Suicide Attempt in Brazil (2011-2018)

Table 1 shows the evolution of cases of intentional self-harm reported in Brazil.

When analyzing the absolute numbers of notified cases of intentional self-harm by sex, in Brazil, women are the majority, with 68.1% of cases in 2017 and 68.9% of cases in 2018. A disparity occurs in the state of Amazonas, where the majority of notifications of self-harm are from men, with 53.4% in 2018.

Adulthood, aged between 20 and 59 years, has a higher percentage of suicide attempts, with 65.6% in Brazil, in 2018. In all Brazilian regions, the attempt suicide rate is higher for this age group, with a variation of 57.5% in the North region and 66.9% in the Southeast region. Also, in all Brazilian states, this is the age group with the highest occurrence, with a proportional percentage above 50% in all of them. In turn, adolescence, aged 10 to 19 years, represents the second-highest percentage of suicide attempts, with 29.8% in Brazil, varying from 28.1 to 38.3% between Brazilian regions.

Concerning skin color, in 2018, in Brazil, 49.4% of reports of self-harm violence were from White

Table 1.

Absolute Numbers of Intentional Self-Harm Reported in Brazil, Brazilian Regions and Federation Units in the Period From 2011 to 2018. Brazil, 2020

Region/Federation Unit	2011	2012	2013	2014	2015	2016	2017	2018
North Region	636	722	1081	1112	1577	1935	2819	3114
Rondônia	36	21	43	37	108	180	375	431
Acre	33	74	65	85	243	314	614	515
Amazonas	104	88	152	207	416	319	281	341
Roraima	56	128	166	142	115	149	269	324
Pará	90	69	104	158	177	212	298	254
Amapá	57	71	104	45	38	61	81	108
Tocantins	260	271	447	438	480	700	901	1141
Northeast Region	1995	2564	3646	3638	4976	5555	8623	12,105
Maranhão	61	166	173	185	375	198	283	454
Piauí	198	318	371	360	606	1045	1053	1247
Ceará	72	109	234	285	661	886	1400	1957
Rio Grande do Norte	107	126	251	233	334	441	728	1065
Paraíba	191	241	186	196	438	285	648	793
Pernambuco	421	443	998	1076	1124	1242	2169	3199
Alagoas	764	853	972	846	851	804	1227	1663
Sergipe	5	13	47	42	43	41	99	238
Bahia	176	295	414	415	544	613	1016	1489
Southeast region	7455	10,836	12,422	15,384	20,182	23,301	33,624	43,096
Minas Gerais	2377	4315	5782	7454	9153	8674	11,273	13,348
Espírito Santo	68	225	371	867	1238	1580	2001	3240
Rio de Janeiro	466	732	859	1121	1656	2125	3570	4246
São Paulo	4544	5564	5410	5942	8135	10,922	16,780	22,262
South region	3557	5342	6403	7524	10,142	11,562	18,766	24,264
Paraná	581	1367	1741	2356	3892	4754	7777	9950
Santa Catarina	1075	1480	2220	2476	2948	3131	4470	5816
Rio Grande do Sul	1901	2495	2442	2692	3302	3677	6519	8498
Midwest region	1297	1700	1918	2050	2812	3136	4369	6693
Mato Grosso do Sul	905	886	1018	1074	1244	1300	1734	1928
Mato Grosso	86	209	178	225	235	273	477	641
Goiás	218	472	561	580	977	1051	1395	2234
Distrito Federal	88	133	161	171	356	512	763	1890
Brazil	14,940	21,164	25,470	29,708	39,689	45,489	68,201	89,272

Source: Prepared by the authors with data from DATASUS, 2020.

people, followed by Brown people with 34.2%. However, one must consider the regional differences that characterize the Brazilian population: in Santa Catarina, the proportional percentage

for White people is 87.6% and in Amazonas, it is 3.8%. In Brown people, the proportional percentage varies from 82.7% in Roraima to 6.3% in Santa Catarina.

Suicide in Brazil (2009-2018)

In the last 10 years (2009 to 2018), according to the most recent data made available by DATASUS, Brazil recorded, in an ascending trend, 108,020 deaths by suicide, called intentional self-harm. Of these, 38.3% were registered in the Southeast region, a fact that, in absolute numbers, is related to a larger portion of the Brazilian population being present in that region.

Table 2 shows data on deaths by suicide in the period from 2009 to 2018 in Brazil, in the Brazilian regions, and the Federation Units.

Figure 1 represents the evolution of the mortality rate due to suicides in the period from 2009 to 2018.

The death of males is greater than that of females, in the proportion of 8:2, on average. In 2018, the five highest proportional percentages of male deaths were in Bahia (85.3%), Rio Grande do Norte (84.2%), Ceará (82.3%), Paraná (81.5%), and Pará (80.0%).

For females, the five highest proportional percentages of deaths were in Roraima (32.4%), Amapá (32.3%), Acre (28.8%), Rondônia (27.2%), and Piauí (26.6%).

The age group with the highest proportion of deaths in 2018 in Brazil was people aged between 30 and 39 years (20.7%), followed by people aged between 20 and 29 years (19.7%) and between 40 and 49 years (18.1%). The suicide of the elderly, people aged 60 or over, accounted for 17.9% of the occurrences in the same year. In the analysis of the historical series from 1996 to 2018, it can be seen that the rates increased by 162.2% in the 60 to 69 age group, 141.4% for people between 70 and 79 years, and 189.3% in the group aged 80 and over.

Brazil registers the majority of deaths by suicide in White (49.2%) and Brown people (42.8%). The analysis shows the regional differences that are characteristic of Brazil. In the Brazilian regions, the proportional percentages of death by suicide related to White and Brown people are, respectively, 12.2 and 75.0% in the North region, 15.2 and 75.7% in the Northeast region, 58.7 and 33.2% in the Southeast, 87.0 and 8.9% in the South and 36.0 and 53.9% in the Midwest.

In the historical series of extended data from DATASUS, there is a 176% increase in suicides among indigenous people considering the period from 2000 to 2018.

Among Brazilian states, the extreme percentages of deaths of White people range from 90.9% in Rio Grande do Sul to 2.9% in Alagoas. Likewise, Brown people account for 89.6% of deaths in Sergipe and 4.1% in Rio Grande do Sul.

Considering education, in Brazil, excluding the unreported information, in 2017 and 2018, the highest proportional percentage of suicide was of people with 8 to 11 years of education, being 33.1% and 35.6%, respectively. In previous years, 2013, 2014, and 2015, the highest percentage was of people with 4 to 7 years of education, with percentages of 33.5, 32.9, and 33.6%, respectively. In the historical series from 1996 to 2018, the rates increased by 824% for people between 8 and 11 years of education and 520.3% for those with 12 years and more of education.

Single people are the ones in the majority of occurrences of suicide in Brazil and all Brazilian regions and states, even with differences of 87.1% in Amapá and 31.2% in Paraíba.

Most individuals attempted suicide and committed suicide at home; the most used method, with increasing use, was hanging, followed by methods such as exogenous intoxication and firearms.

All regions had an increase in suicide rates in the historical series from 1996 to 2018, being 81.1% in the North, 126.5% in the Northeast, 26.6% in the Southeast, 17.8% in the South, and 28.5% in the Midwest.

Discussion

Brazilian data started to be better collected and reported as of 2014, due to the legislation in force, and this greatly influenced the high increase in reported cases from 2011 to 2018 (497.5%). It is believed that the legislation from 2011 on, with the adoption of the practices of reporting cases of attempted suicide and suicide deaths, increased the notifications and consequently started to reflect more effectively the rates, although still with low fidelity in some Brazilian states. Initiatives to prevent

Table 2.*Deaths by Suicide in Brazil, Brazilian Regions and Federation Units in the Period from 2009 to 2018. Brazil, 2020*

Region/Federation Unit	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
North region	593	624	692	694	759	708	881	826	896	991
Rondônia	85	82	78	73	86	84	109	103	113	125
Acre	31	41	41	43	44	49	39	56	64	59
Amazonas	152	162	188	185	225	233	263	194	207	234
Roraima	32	34	34	38	33	15	52	59	50	37
Pará	188	188	222	240	232	208	266	277	301	350
Amapá	26	30	37	21	45	34	53	36	46	62
Tocantins	79	87	92	94	94	85	99	101	115	124
Northeast Region	2101	2123	2297	2336	2494	2393	2540	2722	2981	2996
Maranhão	156	208	218	206	242	255	280	294	318	313
Piauí	207	201	234	233	227	244	271	321	317	331
Ceará	501	488	553	510	590	566	565	590	644	655
Rio Grande do Norte	144	137	177	171	157	169	156	181	180	196
Paraíba	166	158	163	189	199	158	221	181	250	237
Pernambuco	328	285	291	332	320	325	308	396	438	430
Alagoas	111	85	104	109	143	118	116	112	104	137
Sergipe	111	129	125	109	125	110	120	115	127	134
Bahia	377	432	432	477	491	448	503	532	603	563
Southeast region	3570	3735	3900	4002	3959	4283	4323	4249	4635	4675
Minas Gerais	1123	1102	1258	1264	1159	1357	1303	1302	1515	1530
Espírito Santo	150	160	162	178	158	172	189	175	207	239
Rio de Janeiro	321	509	433	463	437	522	531	573	607	699
São Paulo	1976	1964	2047	2097	2205	2232	2300	2199	2306	2207
South region	2279	2154	2156	2357	2365	2319	2494	2602	2862	2891
Paraná	648	588	593	629	655	620	716	760	774	915
Santa Catarina	519	530	520	548	568	587	637	674	739	735
Rio Grande do Sul	1112	1036	1043	1180	1142	1112	1141	1168	1349	1241
Midwest region	831	812	807	932	956	950	940	1034	1121	1180
Mato Grosso do Sul	205	188	211	210	228	204	230	223	259	268
Mato Grosso	190	161	158	185	177	157	145	178	197	226
Goiás	307	315	338	402	427	454	435	481	497	499
Distrito Federal	129	148	100	135	124	135	130	152	168	187
Brazil	9374	9448	9852	10,321	10,533	10,653	11,178	11,433	12,495	12,733

Source: Prepared by the authors with data from DATASUS, 2020.

suicidal behavior have led more individuals to seek care by recording these cases.

The same occurred in other countries in South America, with the death rate due to suicide per

100,000 inhabitants, such as Bolivia (12.5 in 2000; 12.2 in 2012; 12.9 in 2016), Paraguay (6.2 in 2000; 6.1 in 2012; 9.3 in 2016), Peru (4.4 in 2000; 3.2 in 2012; 5.1 in 2016), and Uruguay (14.7 in 2000; 12.1 in 2012; 16.5 in 2016) (World Health Organization, 2014, 2019).

Death rate due to suicides in Brazil

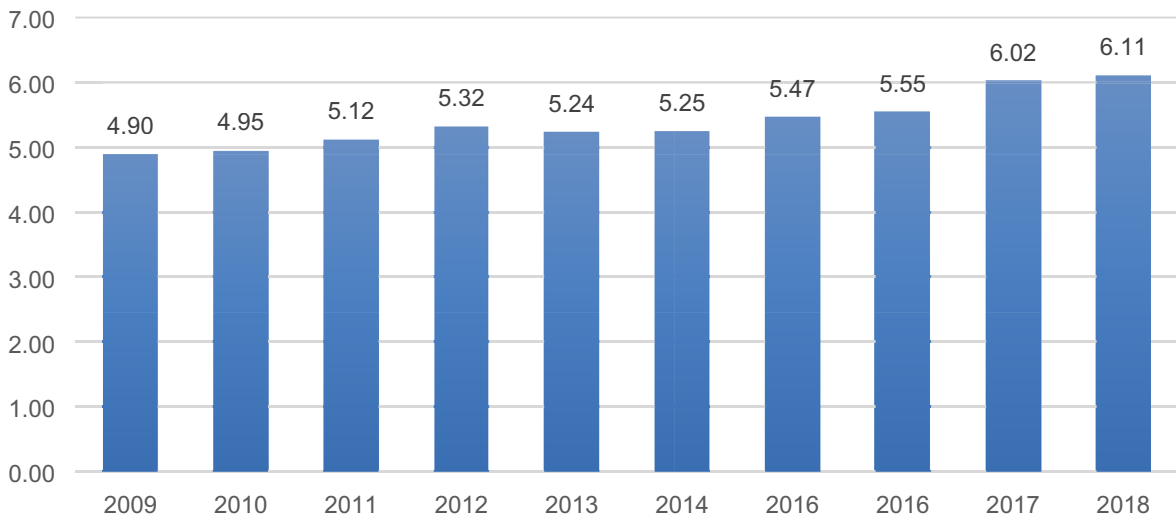


Figure 1. Evolution of the Mortality Rate Due to Suicides in Brazil From 2009 to 2018. Brazil, 2020 (Source: Prepared by the Authors With Data From DATASUS, 2020).

And, on the other hand, the countries that decreased the suicide mortality rate per 100,000 inhabitants were Argentina (12.4 in 2000; 10.3 in 2012; 9.1 in 2016), Chile (10.7 in 2000; 12.2 in 2012; 9.7 in 2016), Ecuador (8.9 in 2000; 9.2 in 2012; 7.2 in 2016) (World Health Organization, 2014, 2019).

The Brazilian bulletin with an epidemiological profile with information on suicide attempts and suicide by exogenous intoxication in the period from 2007 to 2017 revealed 220,045 notifications of exogenous intoxication characterized as suicide attempts, and of these, 69.9% were registered as female (Brasil Ministério da Saúde, 2019).

A study that analyzed suicide attempts, occurred between June 2017 and June 2018, with the use of toxic substances, revealed that the majority were female (62.1%) (Oliveira et al., 2018).

In Palmas (TO), of the 656 notifications of attempted suicide between 2010 and 2014, 67.1% were women (Fernandes et al., 2016).

The state of Amazonas was the only one with a male majority for suicide attempts, probably due to the concentration of the indigenous population and the occurrence of suicide deaths in these peoples,

mostly men. Rates among indigenous people in Brazil increased.

Data on ending one's own life by suicide, according to the World Health Organization's global health estimates for the year 2016, revealed a higher suicide mortality rate in men (13.7 per 100,000 inhabitants) than in women (7.5 per 100,000 inhabitants) (World Health Organization, 2019).

The significant majority of published studies that address the analysis of suicidal behavior related to sex show that the majority of suicides were committed by men compared to the majority of suicide attempts by women (Baére & Zanello, 2018).

Some factors are pointed out and correlated with this vulnerability, such as the social construction of gender, the higher prevalence of depression, the greater occurrence of eating disorders, problems with body image, unwanted pregnancy, postpartum psychosis, the great occurrence of suicidal ideation after induced abortion and in situations of low levels of estrogen and serotonin, the great vulnerability to the loss of children, domestic violence against them and their children, and sexual abuse (Correia et al., 2019; Ferreira et al., 2019).

The global disease burden study carried out in 2015 revealed that in the 10 to 24 age group, suicide was identified among the top five causes of mortality in all regions of the global disease burden, except in Africa (GBD 2016 Causes of Death Collaborators, 2017). Worldwide, almost a third of all suicides are carried out by young people (World Health Organization, 2018).

It is a worrying and complex public health situation as it involves a series of risk factors of which, for this age, the factors include mental disorders, such as mood disorders, use of alcohol and other drugs, and eating disorders; psychological factors, such as low self-esteem, hopelessness, and impulsiveness; psychosocial factors of adversity, such as exposure to violence, conflict environment, exposure to traumatic stressful events such as abuse or victimization, low confidence and low communication with the mother and the father, unstructured home, small number of friends, migration, and poverty. It also stands out in adolescents with suicidal behavior which include the existence of a history of violence, fights, and aggressions, the transgression of laws, and conduct problems in general (Charfi et al., 2019; Gomes & Silva, 2020; Soto-Sanz et al., 2019; Suárez Colorado & Campo-Arias, 2019; World Health Organization, 2018).

In adults, risk factors for suicide include the negative impact of maladjusted family relationships, conflictual interpersonal relationships, substance abuse, having a diagnosis for mental disorders, especially depression, unemployment, financial problems, and work relationships (Lima et al., 2018; Silva & Marcolan, 2021).

In the 1996 to 2018 historical series, rates increased by 162.2% in the 60-69 age group, 141.4% for people between 70 and 79 years, and 189.3% in the group aged 80 and over. In Brazil, aging takes on a characteristic of inactivity where the individuals reach a time when they cease to perform many of the activities that were once their responsibility (Fernandes-Eloi & Lourenço, 2019).

Expressive emotional losses are linked to these situations: contact with people, work, economic contribution to the home, devaluation of the sense of belonging and usefulness, situations that harbor the negative transformative potential for the elderly,

who start to acquire stigmatized self-perception of worthlessness. It also includes other factors such as physical and disabling problems such as chronic diseases, functional decline; psychiatric problems such as depression, abuse of legal and illegal substances, personality disorders, self-destructive behaviors, cognitive impairment; psychological problems such as persistent or traumatic suffering, feelings of loneliness, hopelessness and boredom, fragility; social problems such as suffering social isolation, living in family conflicts, low educational level, having experienced deaths and losses of close relatives or friends, absence of religiosity, inflexibility, and rigidity in relation to changes, particularly social ones; economic problems such as lack of autonomy to manage one's money, lack of security and social assistance and others (Fernandes-Eloi & Lourenço, 2019; Minayo et al., 2019).

To understand the relationship between suicidal behavior and skin color, one must consider the context of each location, as these are the ones that determine which groups may be most vulnerable (World Health Organization, 2018).

In Brazil, 49.2% of suicides were of people who self-declared as White and 42.8% of people who self-declared as Brown. It is a scenario that presents data contrary to the constitution of the Brazilian population, with 42.7% self-declared White and 46.8% self-declared Brown (Instituto Brasileiro de Geografia e Estatística, 2019).

It should be noted that the social determinants of suicidal behavior are related to structural violence, which in turn is associated with colonialism, a historical period in which groups were exploited, discriminated against, marginalized, and excluded. These people, classified in these groups, are today marked as vulnerable (Weber et al., 2020).

Marital status as a risk factor for suicide reveals the profile of single, divorced, or widowed people predominantly. These statuses resemble themselves by the condition of living or being alone, making them factors that contribute to vulnerability (Organização Mundial da Saúde, 2000).

Both for suicide attempts and suicide deaths in Brazil, regional differences within the South region should be taken into account, with its larger White

population, a lower miscegenation rate, socio-cultural values, religiosity, more years of study, and a small portion of indigenous people, which is largely due to European colonization. On the other hand, the Southeast and Northeast regions have greater miscegenation of races and peoples, cultural and religious diversity, the influence of Africans, Europeans, Indigenous, and Asians. The Midwest region has its agro-industrial corridor to receive people from all over Brazil, expanding and expelling indigenous people. Finally, the North region has its characteristics of the vastness of the Amazon and indigenous culture. It is important to consider these factors when performing a regional and local analysis for suicidal behavior and skin color, marital status, age, years of education, individual and family income, and other variables.

The discrepancy in the increase in suicide rates among Brazilian regions is because some regions have a more reliable system of historical records, while others have a relatively recent start of these records.

Increased rates of suicide point to the psychic suffering of the population related to living conditions and to the social, economic, affective, and relationship impact. It increases the demand for health services, specifically mental health services, as this may be due to the lack of a number of qualified professionals to carry out the care and follow-up of these individuals (Marcolan, 2018; Marcolan & Silva, 2019).

Conclusions and Recommendations

There is a significant and continuous increase in suicide attempts and suicide rates in Brazil, with specificities for each Brazilian region and states such as emphasis on the increase in the death of indigenous people, Whites, ones with more years of education, and places with better data collection and notification, although it is not yet a system of excellence.

The results presented here will help and guide studies that aim to explain this phenomenon and its relationship with the vulnerabilities presented and in the development, improvement, and implementation of public policies to prevent suicidal behavior.

It is necessary to carry out local and regional studies to analyze the factors and to make specific interventions for each reality, to expand health units, and employ qualified professionals to assist individuals with suicidal behavior.

Ethical Committee Approval: Ethical committee approval was received from the Ethics Committee of Federal University of São Paulo, (Opinion no. 2314347, of October 4, 2017).

Informed Consent: Written informed consent was obtained from all participants who participated in this study.

Peer-review: Externally peer-reviewed.

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Conflict of Interest: The authors have no conflict of interest to declare.

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