Artigo Original

https://www.revistardp.org.br https://doi.org/10.25118/2763-9037.2023.v13.428

Characterization of the suicidal epidemiological profile and the increase in the number of suicide cases in the city of Juiz de Fora, Minas Gerais, Brazil, between 2012 and 2020

Caracterização do perfil epidemiológico suicida e o aumento do número de casos de suicídio na cidade de Juiz de Fora, Minas Gerais, Brasil, entre 2012 a 2020

Caracterización del perfil epidemiológico suicida y del aumento del número de casos de suicidio en la ciudad de Juiz de Fora, Minas Gerais, Brasil, entre 2012 y 2020

Ruan Teixeira Lessa ORCID - Lattes

Francielle Bianca Moreira de Mesquita - ORCID - Lattes

Vitória Leite Silva - ORCID - Lattes

Vilnei Nunes Ladeira Veríssimo da Silva - ORCID - Lattes

Tayná Beato Ferreira - ORCID - Lattes

Marcia Mieko Yamashita - ORCID - Lattes

Fausto Pereira de Almeida Júnior - ORCID - Lattes

Isabela Pereira Fernandes - ORCID - Lattes

Anna Marcella Neves Dias - ORCID - Lattes

Nathália Barbosa do Espírito Santo Mendes - ORCID - Lattes

Guilherme Henrique Faria do Amaral - ORCID - Lattes

ABSTRACT

Introduction: Suicide is a global and serious problem. It is considered a multidimensional phenomenon and its incidence is related to socioeconomic and cultural aspects. **Objective:** To identify the suicidal epidemiological profile and to assess the increase in suicide cases in the

city of Juiz de Fora, Minas Gerais, Brazil, between 2012 and 2020. **Methods:** Observational and retrospective study with data collected systematically and provided by the State Department of Justice and Public Security. **Results:** There was an association between sex and suicide (p<0.0001) and being a man increased the chance of this outcome (PR= 2.731; 95%CI= 2.057 – 3.623). The age group with the highest incidence was between 20 to 39 years old. The most used means in the occurrences were: chemical substances (p<0.0001), asphyxiation (p<0.0001) and firearms and other guns (p=0.004). The year 2019 had the highest overall suicide rate observed during the period (10.43 per 100,000 population), which had been increasing since 2016. **Conclusion:** The suicidal epidemiological profile observed was characterized by males, aged between 20 to 39 years old, using the asphyxiation method. In addition, there was an increase in suicide rates in the general population of the city.

Keywords: suicide, public health, epidemiology.

RESUMO

Introdução: O suicídio é um problema global e grave. É considerado um fenômeno multidimensional e sua incidência está relacionada à aspectos socioeconômicos e culturais. **Objetivo:** Identificar o perfil epidemiológico suicida e avaliar o aumento de casos de suicídio na cidade de Juiz de Fora, Minas Gerais, Brasil, entre 2012 e 2020. **Métodos:** Tratou-se de um estudo observacional e retrospectivo com dados coletados sistematicamente e cedidos pela Secretaria de Estado de Justiça e Segurança Pública. **Resultados:** Verificou-se associação entre sexo e suicídio (p<0,0001) e ser homem aumentou a chance desse desfecho (RP= 2,731; IC95%= 2,057 – 3,623). A faixa etária de maior incidência foi entre 20 e 39 anos. Os meios mais utilizados nas ocorrências foram: substâncias químicas (p<0,0001), asfixia (p<0,0001) e armas brancas e de fogo (p=0,004). O ano de 2019 obteve a maior taxa de suicídio geral observada durante o período (10.43 por 100.000 habitantes), que vinha aumentando desde 2016. **Conclusão:** O perfil epidemiológico suicida observado caracterizou-se por homens, na faixa etária entre 20 e 39 anos, pelo método de asfixia. Ademais houve aumento das taxas de suicídio na população geral do município.

Palavras-chave: suicídio, saúde pública, epidemiologia

RESUMEN:
Introducción: El suicidio es un problema global y grave. Se considera un fenómeno multidimensional y su incidencia está relacionada con aspectos socioeconómicos y culturales. **Objetivo:** Identificar el perfil epidemiológico suicida y evaluar el aumento de casos de suicidio en la ciudad de Juiz de Fora, Minas Gerais, Brasil, entre 2012 y 2020. **Métodos:** Se trata de un estudio observacional y retrospectivo con datos recopilados sistemáticamente y cedidos por la Secretaría de Estado de Justicia y Seguridad Pública. **Resultados:** Hubo una asociación entre el género y el suicidio (p<0,0001) y el hecho de ser varón aumentó la probabilidad de este resultado (RP= 2,731; IC 95%= 2,057 - 3,623). El rango de edad con mayor incidencia fue el de 20 a 39 años. Los medios más utilizados en las ocurrencias fueron: sustancias químicas (p<0,0001), asfixia (p<0,0001) y armas blancas y de fuego (p=0,004). El año 2019 obtuvo la mayor tasa global de suicidios observada en el periodo (10.43 por cada 100.000 habitantes), que venía aumentando desde 2016. **Conclusión:** El perfil epidemiológico suicida observado se caracterizó por los hombres, en el rango de edad entre 20 y 39 años, por el método de asfixia. Además, hubo un aumento de las tasas de suicidio en la población general del municipio.

Palabras clave: suicidio, salud pública, epidemiologia.

Como citar: Lessa RT, Mesquita FBM, Silva VL, Silva VNLV, Ferreira TB, Yamashita MM, Almeida Júnior FP, Fernandes IP, Dias AMN, Mendes NBES, Amaral GHF. Characterization of the suicidal epidemiological profile and the increase in the number of suicide cases in the city of Juiz de Fora, Minas Gerais, Brazil, between 2012 and 2020. Debates em Psiquiatria, Rio de Janeiro. 2023;13:1-22. https://doi.org/10.25118/2763-9037.2023.v13.428

Conflito de interesses: declaram não haver

Fonte de financiamento: declaram não haver

Parecer CEP: não se aplica

Recebido em: 07/11/2022

Aprovado em: 19/12/2022

Publicado em: 24/01/2023

Introduction

Suicide is a recognized global public health problem. According to the World Health Organization (WHO), it is estimated that 800,000 people die by suicide every year [1] and for each person who commits suicide, approximately 20 individuals make a self-extermination attempt [2]. Moreover, it is known that the most important risk factor for suicide is a previous attempt. Other relevant WHO data is that among individuals aged 15 to 29 years old, suicide is the second leading cause of death in this population, with most cases in low- and middle-income countries [1].

Regarding Brazil, data from the Brazilian Ministry of Health (BMH) revealed that, in the period from 2011 to 2018, 80,352 deaths by suicide were recorded, of which 21,790 (27.3%) occurred in the 15 to 29 age group, pointing to a 10% increase in the mortality rate for this age group. In addition, in this same period, a quarter (25.3%) of the people who committed suicide resided in the Northeast region of the country. In this sense, according to the BMH, women have a higher frequency of suicide ideation and attempts [3], while men have a higher frequency of consummated cases [3, 4].

As regards the state of Minas Gerais, during the period from 1996 to 2007, 123,986 deaths from external causes were reported by the Department of Informatics of the Unified Health System (DATASUS) in the state, and 7.6% of these were due to self-extermination. In relation to the years 2006 and 2009, there was an increase in the percentage, reaching the mark of 8.5%. Concerning the year 2013, statistics revealed 8.2%, representing a decrease in the rates of voluntary self-harm [5].

According to data collected in DATASUS and the Mortality Information System (SIM) between 1997 and 2011, 19,898 deaths from external causes were identified in the 10-19 age group, of which 4.87% were caused by self-extermination. In this context, the rate of death by suicide proved to be higher in young males when compared to females. For both, the most frequent method of execution was hanging. The second most expressive form of perpetration was autointoxication for females and gunshots for males [6, 7].

It is understood that suicide is a multidimensional phenomenon, and its incidence is related to health, social, economic, cultural, and historical aspects of each region. The complexity of this problem, which can be seen

as the maximum expression of human suffering, is linked to the contradictions of the social and economic context created by the capitalist system, which, through social inequality, aggravates the population's risk of suicide [8].

Suicide is most often preceded by a highly stressful triggering event that causes the victim a sense of helplessness, anguish, and despair. It has been estimated that about 90% of the individuals who put an end to their lives had some mental disorder and, when they decided commit suicide, 60% had a diagnosis of depression [9]. In addition, more mental disorders have been related, such as: other mood disorders, personality disorders, and schizophrenia [10].

As for the stratification of suicide risk, having previous suicide attempts, frequent and persistent suicidal ideation, planning and access to the way planned, characterizes a high risk for self-extermination. On one hand, impulsiveness, rigidity of purpose, despair, delirium, hallucinations, alcohol and/or drug abuse/dependence are aggravating factors. On the other hand, an individual with a history of previous suicide attempts and frequent and persistent suicidal thoughts, without planning, with no impulsiveness or abuse/dependence of alcohol or other drugs, shows moderate risk. Finally, the individual considered low risk would be the one with no history of previous attempt, suicidal ideation, and no planning [11-15].

Furthermore, economic crises have also been associated with mental health disorders and suicide, as well as increased unemployment rates related to higher prevalence of depression, alcohol and substance abuse disorders [4, 16]. Single men were also listed as a higher suicide risk group [4].

Therefore, discussing the theme without alarmism, together with confronting social stigmas, as well as raising awareness and stimulating its prevention, can contribute to addressing the problem. In fact, efficient interventions, well-founded and based on evidence, can be applied to certain groups and individuals to promote the prevention of suicide attempts and to avoid death from this cause [3]. Moreover, an open and responsible dialogue about suicidal ideation and its risk factors may be more effective ways to approach and promote an adequate handling of the subject [11].

Methods

An observational and retrospective study was done with the systematically collected data to identify the suicide epidemiological profile and assess the increase in suicide cases in the city of Juiz de Fora, Minas Gerais, Brazil, between 2012 and 2020.

The data collection was carried out through a request to the Secretaria de Estado de Justiça e Segurança Pública[1] (SEJUSP) and the information provided by the secretariat is public domain in the Social Defense Events Records (REDS). REDS is an initial administrative record of a fact brought to the attention of the police, without information from a course of criminal investigation by the judicial police and filled according to the availability of information at the time of its writing.

It is noteworthy that there is no possibility of identifying the individuals participating in the study, not requiring, therefore, prior approval of the Ethics Committee. Thus, the study is in accordance with Resolution No. 466 of December 12, 2012, of the National Health Council.

The information obtained was analyzed and interpreted quantitatively to compose tables and graphs. Furthermore, the number of suicide cases and attempts was identified in the city of Juiz de Fora which, according to the population estimate of the Brazilian Institute of Geography and Statistics (IBGE) for 2020, has 573,285 inhabitants. The data were organized by sex[2], age group, method of self-extermination, and the neighborhood where the attempt/suicide occurred to outline the profile of the cases verified in the study. In addition, incidence and lethality rate calculations were performed using the materials obtained by the application.

Only residents of Juiz de Fora, in the period from 2012 to 2020, who attempted or consummated suicide were included. In addition, the cases that were not duly reported by the competent bodies of the city, through the REDS, were excluded.

The data were stored in Excel 365, Microsoft Corporation®USA. For statistical analysis, the program SPSS 21.0, IBM®SPSS Statistic was used. Also, measures of position and central tendency were used for the description of continuous variables and proportions for the categorical variables studied.

https://doi.org/10.25118/2763-9037.2023.v13.428

In the bivariate analysis, differences between continuous variables were verified by means of the T-test for equality of two independent samples. In categorical variables, to examine differences between two independent samples, the chi-square test was employed and the association between exposure and outcome was estimated by the prevalence ratio (PR). Finally, the critical value was set at 95% for the p-value and confidence interval analysis.

Results

The characterization of the group (n= 904) by sex, age, occurrence sector and method used is described in Table 1. In the period from 2012 to 2020, Juiz de Fora, with an estimated population of 573,285 inhabitants, presented a total of 904 suicide cases notified through the Social Defense Events Records (REDS) with a significant prevalence of consummated ones in the male group (45.5%).

In relation to non-consummated cases (attempts), the female group was more prominent (77.1%). An association between sex and suicide ($p<0.0001$) was verified, and being male increased the chance of this outcome (PR= 2.731; 95%CI= 2.057 - 3.623).

The age range of higher prevalence of cases was between 20 and 39 years old for both males (51.8%) and females (46.9%). However, there was no difference in the age variable of males and females involved in the event – attempt and consummation ($p>0.05$). The same analysis by age group revealed a statistically significant difference by sex only among those over 60 years old ($p=0.050$).

The regions in the city of Juiz de Fora that had the highest suicide rate notifications were the Central region with 23.2%, the East region with 17.5%, and the North region with 16.3%.

Regarding the methods used in suicide (attempts and consummation), the three most frequent were: chemical substances (29.5%), asphyxiation (18%), and the use of firearms and other guns (17%).

Regarding the evaluation of the main methods described, there was a difference according to the sex of the individuals ($p<0.0001$), predominantly the use of chemical substances by females ($p<0.0001$),

asphyxiation methods (p=0.0001) and the use of firearms and other guns (p=0.004) by males.

According to the data described in Table 2, which illustrate suicide consummation, it was found that the median female age was 38 years old, and the median male age was 36.5 years old, so it did not characterize a statistically relevant difference (p=0.956). Also, the most used and effective method for suicide in both sexes in Juiz de Fora was asphyxiation (p=0.001).

In second place, the most employed method of self-extermination in the female group was the use of chemical substances (p>0.0001), while in the male group it was firearms and other guns (p=0.181). Regarding the consumptions by sector of occurrence, the Center had the highest number of deaths (n=70), whereas in the districts, only male individuals were successful in the attempt of self-extermination (p=0.050).

Figure 1 shows the suicide attempts and consummations in absolute numbers during the period 2012-2020. It was observed that between 2012 and 2016 the number of occurrences varied slightly. However, starting in 2016, there was a growth in cases. For the males, the year 2018 represented the highest peak of occurrences (n=75), whereas for females it was in 2019 that the number was the highest (n=91). In contrast to that, in 2020, the curve decreased for both sexes. Regarding suicide consummations, only in 2019 did the female sex exceed the male in absolute numbers of death.

Figure 2 compared the incidence of suicide attempts per 100,000 population with the lethality rate between the sexes. From 2016 to 2020, the occurrences in the female group were higher. Regarding the lethality rate, the male group was the protagonist throughout the highlighted period.

Figure 3 shows the suicide rate by sex. The population used as reference in each year for the calculations was obtained through the Department of Informatics of the Unified Health System (DATASUS), finding once again that being male is a risk factor for suicide. Despite this, in the year 2019, the difference in rates between the sexes was minimal in view of the greater female representation in number of deaths in that year, as observed in Figure 1. It was also in that same year that the overall suicide

https://doi.org/10.25118/2763-9037.2023.v13.428

rate had its highest peak (10.43 per 100,000 population), with an increasing line of rates observed between 2016 and 2019.

Regarding the distribution of suicide by sector in Juiz de Fora, the Northern and Western regions had higher occurrences referring to males. However, the Central, Eastern, Northeastern, Southeastern and Southern regions display a prevalence of females. It is worth pointing out that the Southeast region was the only one in which the female group had a higher number of consummated cases (n=21) – the male group number of deaths was 19.

Discussion

The absolute values of suicide occurrences and consummations in Juiz de Fora described by REDS were higher in the age group 20 to 39 years. Accordingly, the epidemiological profile outlined by the WHO, in 2016, was among young people aged from 15 to 29, this being the most common statistic found in worldwide surveys [1].

In Brazil, the highest prevalence of reported cases of self-harm, as well as suicide attempts, are found in the age range of 2000 20 to 49 [7]. In this way, a systematic review concatenated a series of data on the epidemiology of suicidal behavior in the country between the years 2010 to 2021 and confirmed the age cut-off of 15 to 44 years [4]. Suicide, indeed, is a serious public health problem, given that every year thousands of people take their own lives and a greater number of individuals attempt suicide [1].

In Juiz de Fora there is no data reported by REDS prior to 2012 by the Secretaria de Estado de Justiça e Segurança Pública (SEJUSP), which resulted in underreporting. Furthermore, the lack of standardization of nomenclature for the causes of death hampered the statistical analysis of suicide and made it difficult to properly quantify the occurrences. It is important to note that underreporting still represents a problem in the current scenario and, only in 2014, "suicide attempt" was included in the National List of Compulsory Notification of diseases, worsening cases and events of Public Health, with the publication of Ordinance GM/MS no. 1,271, of June 6, 2014, being, from that date, of immediate notification [6].

To address this scenario of underreporting prior to 2012 and create strategies to change it, the Surveillance System for Violence and Accidents

(VIVA) was created in Brazil in 2006, and it is responsible for collecting data through individual notification forms. In the same year, Ordinance No. 1876 of the Ministry of Health established the national guidelines for suicide prevention, stressing the need to notify cases of self-extermination.

In 2009, the Individual Notification Form of Interpersonal/Self-harm Violence was inserted in the Notifiable Diseases Information System (SINAN), collaborating to the expansion of VIVA and suicide notifications [17, 18].

Regarding the data collected in Juiz de Fora (MG), between 2012 and 2020, it was observed that women made more suicide attempts, and the predominant age group was the youngest. Whereas, from the age of 60 on, men stood out in the group of those who most attempted self-extermination. Similarly, the study conducted by de Almeida et al. [19], which gathered 446 cases of self-extermination pointed out that about 62.3% of them involving autointoxication by pesticides, medicines and household cleaning products was in the age group ≤ 30 years old. Moreover, 66.4% of the total suicide attempts were made by women. It is worth noting that in all age groups the number of females was higher than males, except for those aged > 60 years old.

Notably, it was not possible to establish a socioeconomic pattern for the number of occurrences of suicide in the regions of Juiz de Fora, however, de Almeida et al. [19] observed that in relation to neighborhoods with lower financial conditions there was an increase of 34.2% of cases compared with the rate of attempts of self-extermination in regions with better financial conditions. Nevertheless, it was the Central area of the community that had an increased incidence, even though it encompassed a high standard of living. Furthermore, it was pointed out that the populations present in areas of higher occurrence had a 38% increased risk (PR = 1.38; CI = 95%, p = 0.0029) of committing suicide. Baldaçara et al. [4] also pointed out that the increase in social and economic inequality in Brazil influences health, and in some cases heads to the self-extermination.

In the sample collected in Juiz de Fora during eight years revealed that, among the 904 cases, the use of chemical substances was more frequent in females, whereas in males, asphyxiation and the use of firearms and other guns were more prominent. In accordance with the aforementioned analyses, Rohling et al. [20] found 108 cases of attempted suicide, with 68.5% of the notifications on women, and the method most used by them

https://doi.org/10.25118/2763-9037.2023.v13.428

was the ingestion of medication (83.7%). In the same study, among men, hanging was the main method of attempted self-extermination (47.2%), followed by the ingestion of medication (41.1%). Moreover, as the main motivations for the act, marital and family conflicts stand out with 85% representation, and about 7% were due to financial difficulties. However, in the study by Ruíz Arango and Ku Pecho [21] the predominant cause in both genders was hanging.

According to what was verified in Juiz de Fora until 2020, it was not possible to establish a causality for suicide occurrences. However, the literature pointed out that women had a higher prevalence of suicide ideation and attempts when compared to men. This difference also showed that men had a higher risk of death by suicide compared to women. The differences observed have been associated with the male profile, which in general has a more aggressive behavior and a higher intention to die. Among men, the use of more brutal methods such as asphyxiation (suffocation/hanging) is accentuated, followed by firearms. In contrast, women presented more protective factors [22-24], such as religious practice [22-25], early recognition of risk factors, and a greater search for mental support. This is in fact conditioned by social determinants, based on a sexist society that tries to reaffirm the social roles between genders [22-24].

In this matter, sexual violence is also an important risk factor for self-harm, as well as other types of violence suffered mainly by women in the domestic environment. For instance, in the state of Rio Grande do Sul, from 2016, in the age group of 15 to 19, an increase in notifications of self-harm among women was noted, reaching 2.5 times more than among men in 2019 [18]. In addition, the lesbian, gay, bisexual, transsexual, transvestite, transgender, queer, intersex, asexual and more (LGBTQIA+) population, immigrants, indigenous people, black person [4] and those who lives in freedom deprivation are vulnerable groups to discrimination and consequently to suicide [2].

Just as asphyxiation was highlighted as one of the main methods of self-extermination used in Juiz de Fora (MG), this pattern was also observed in other states, such as Rio Grande do Sul, in which hanging was the most chosen method. Worldwide, the main methods of suicide include ingestion of pesticides, hanging and firearms, however, it is noted that the preference of the method often varies according to the population group [26, 27] and regions. As an example, pesticides use is more common in

micro-regions with a larger number of country houses [4]. In addition, licit and illicit substances, such as alcohol, anxiolytics, poison and nitrite were also relevant [28].

Factors such as family, income, education, social cycles, and society strongly influence suicidal episodes both for and against it. The greatest protection against suicide is the close coexistence between religion, family and society [29, 30]. In line with Durkheim, the study conducted by Sena-Ferreira et al. [31] demonstrated the main identified risk factors: mental disorders, alcohol and other drug abuse, disturbed family relationships, and history of previous attempts.

Furthermore to the mentioned data, Baldaçara et al. [25], pointed out risk factors related to the suicide attempts and self-extermination, listed by level of evidence. Among the main ones, the following were highlighted: acute alcohol use, smoking, violence in the community, family history of suicide, mood disorders, body dimorphic disorder, genetic polymorphisms, pesticides stored at home, schizophrenia associated with depression, and diseases correlated with sleep disorders. Regard protective factors, besides religiosity, the following were evidenced: sleep nights lasting at least 8 hours a day, confidence in one's own coping skills in difficult situations, and the use of selective serotonin reuptake inhibitors to treat depression in adults.

According to SINAN, between 2010 and 2015, 448,499 cases of poisoning based on chemicals such as medicines, drug abuse, pesticides, and household cleaning products were recorded. Of these, 33.2% were associated with suicide occurrences. Nationally, the incidence in the same period was 13.3 per 100,000 population [17, 19]. Thereby, in the present study, the year 2015 had a suicide rate equivalent to 6.33 per 100,000 population in Juiz de Fora. However, it was only in 2019 that the rate came closer to the highlighted period (10.43 per 100,000 population). As when considering the interval from 2000 to 2020 the suicide rates were between 4.6 and 6.6 per 100,000 in the country [4].

Additionally, the absence of socioeconomic and cultural data of the neighborhoods where the incidents occurred were factors that limited a deeper analysis in this study due to the lack of information available in the REDS. Also, this insufficiency was seen regarding the victims' profile – their level of education, the risk factors to which they were exposed to, and what triggered the attempts and consummations of self-extermination. This

https://doi.org/10.25118/2763-9037.2023.v13.428

information is crucial for understanding the peculiarities that could be specifically involved with the population of Juiz de Fora.

It is expected that this study can contribute to the recognition of the problem that suicide represents in the city of Juiz de Fora, MG and in the Brazilian health context so that new cases are avoidable. In addition, it is important that the municipal government with the support of the Ministry of Health and the State Health Secretariats, as well as other sectors and specialized programs, structure educational actions and strategies for the prevention of self-harm with greater robustness, so that the warning signs for suicide are detected early and, may be done an intervention, especially by health professionals in the daily practice of their profession, and therefore, lead to the reduction of suicide rates.

Conclusion

The suicidal behavior that occurs in the population of Juiz Fora is not specific to a city in Minas Gerais, but to Brazil as a whole. It is a public health problem that needs special attention for better understanding, since suicide is complex and multifactorial. In conclusion, the suicide epidemiological profile observed was characterized by males aged from 20 to 39 by the method of asphyxiation. Moreover, in Juiz de Fora, during the period from 2012 to 2020, there was a growth in the rates of self-extermination, both in relation to the absolute numbers of deaths by sex, and to the suicide rates that showed considerable variability over time.

Acknowledgments

The authors thank Professor Dr. Guilhermo Patricio Ortega Jácome, Professor Dr. Danielle Cristina Zimmermann Franco and Dr. Edelson Gleik Veríssimo da Silva for their support in the statistical analyses of this work.

Notes

[1] This refers to the State Secretariat of Justice and Public Safety of Minas Gerais. SEJUSP's mission is to promote the state policy for Public Security and Social Defense in Minas Gerais, in an integrated manner with the federal, state, and municipal Public Security agencies, in the scope of the Unified Public Security System (SUSP). This is done in coordination with the other powers and the various federal, state, and municipal agencies.

[2] We understand "sex" to be the biological sex of the participants. However, it is not possible to specify whether the data obtained by REDS strictly followed this definition, since each individual who registers the occurrence may have their own conception of sex and gender.

https://doi.org/10.25118/2763-9037.2023.v13.428

Referências

1. World Health Organization; Food and Agriculture Organization of the United Nations. Preventing suicide: a resource for pesticide registrars and regulators. Geneva: World Health Organization; 2019. https://www.who.int/publications/i/item/9789241516389

2. World Health Organization. Preventing suicide: a global imperative. Geneva: World Health Organization; 2014. https://www.who.int/publications/i/item/9789241564779

3. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. Mortalidade por suicídio e notificações de lesões autoprovocadas no Brasil. Brasília: Ministério da Saúde; 2021. (Boletim epidemiológico; vol. 52, no. 33). https://www.gov.br/saude/pt-br/centrais-de-conteudo/publicacoes/boletins/epidemiologicos/edicoes/2021/boletim_epidemiologico_svs_33_final.pdf

4. Baldaçara L, Meleiro A, Quevedo J, Vallada H, Silva AG. https://datasus.saude.gov.br/ Epidemiology of suicides in Brazil: a systematic review. Glob Psychiatry Arch. 2022;5(1):10-25. https://doi.org/10.52095/gp.2022.4377.1035

5. Brasil. Ministério da Saúde. Departamento de Informática do Sistema Único de Saúde (DATASUS). SIM. Sistema de Informação sobre Mortalidade. Brasília: Ministério da Saúde; [data desconhecida]. http://sim.saude.gov.br/default.asp

6. Brasil. Ministério da Saúde. Departamento de Informática do Sistema Único de Saúde (DATASUS). Óbitos por causas externas Brasil. Brasília: Ministério da Saúde; 2020? http://tabnet.datasus.gov.br/cgi/tabcgi.exe?sim/cnv/ext10uf.def

7. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. Perfil epidemiológico das tentativas e óbitos por suicídio no Brasil e a rede de atenção à saúde. Brasília: Ministério da Saúde; 2017. (Boletim epidemiológico; vol. 48, no. 30). https://portaldeboaspraticas.iff.fiocruz.br/biblioteca/boletim-epidemiologico-no-30-perfil-epidemiologico/

8. Krug EG, Dahlberg LL, Mercy JA, Zwi AB, Lozano R. (editores). Relatório mundial sobre violência e saúde. Genebra: World Health Organization; 2002. https://portaldeboaspraticas.iff.fiocruz.br/wp-content/uploads/2019/04/14142032-relatorio-mundial-sobre-violencia-e-saude.pdf

9. Stavizki Jr. C. Os riscos sobre o aumento dos casos de suicídio no contexto de pandemia: perspectivas para a prevenção no estado do Rio Grande do Sul-Brasil. Agora. 2020;22(2):4-21. https://doi.org/10.17058/agora.v22i2.15422

10. World Health Organization, Department of Mental Health. Practice manual for establishing and maintaining surveillance systems for suicide attempts and self-harm. Geneva: World Health Organization; 2016. http://apps.who.int/iris/handle/10665/208895

11. Oliveira JWT, Magalhães APN, Barros AC, Monteiro EKR, Souza CDF, Alves VM. Características das tentativas de suicídio atendidas pelo serviço de emergência pré-hospitalar: um estudo epidemiológico de corte transversal. J Bras Psiquiatr. 2020;69(4):239-46. https://doi.org/10.1590/0047-2085000000289

12. Norris D, Clarck MS. Evaluation and treatment of the suicidal patient. Am Fam Physician. 2012;85(6):602-5. https://www.aafp.org/pubs/afp/issues/2012/0315/p602.html?utm_medium=referral&utm_source=r360 - PMID:22534272

13. Mann JJ, Apter A, Bertolote J, Beautrais A, Currier D, Haas A, Hegerl U, Lonnqvist J, Malone K, Marusic A, Mehlum L, Patton G, Phillips M, Rihmer WRZ, Schmidtke A, Shaffer D, Silverman M, Takahashi Y, Varnik A, Wasserman D, Yip P, Hendin H. Suicide prevention strategies: a systematic review. JAMA. 2005;294(16):2064-74. https://doi.org/10.1001/jama.294.16.2064 PMID:16249421

14. World Health Organization. Preventing suicide: a resource for general physicians. Geneva: World Health Organization; 2000. https://apps.who.int/iris/bitstream/handle/10665/67165/WHO_MNH_MBD_00.1.pdf

15. LeFreve ML; U.S. Preventive Services Task Force. Screening for suicide risk in adolescents, adults, and older adults in primary car: U.S. Preventive Task Force recommendation statement. Ann Intern Med. 2014;160(10):719-26. https://doi.org/10.7326/M14-0589 PMID:24842417

16. Meneghel SN, Victora CG, Faria NMX, Carvalho LA, Falk JW. Características epidemiológicas do suicídio no Rio Grande do Sul. Rev Saude Publica. 2004;38(6):804-10. https://doi.org/10.1590/S0034-89102004000600008 PMID:15608898

17. Brasi. Ministério da Saúde. Sistema Nacional de Agravos e Notificação (SINAN). Intoxicação exógena. Brasília: Ministério da Saúde; 2016. https://portalsinan.saude.gov.br/intoxicacao-exogena

18. Fattah N, Lima MS. Perfil epidemiológico das notificações de violência autoprovocada de 2010 a 2019 em um estado do sul do Brasil. SMAD, Rev Eletrônica Saúde Mental Alcool Drog. 2020;16(4):65-74. https://doi.org/10.11606/issn.1806-6976.smad.2020.166310

19. Almeida TSO, Fook SML, Mariz SR, Camêlo ELS, Gomes LCF. Suicide attempts: epidemiologic trends towards geoprocessing. Cien Saude Colet. 2018;23(4):1183-92. https://doi.org/10.1590/1413-81232018234.12452016 - PMID:29694592

20. Rohling BSV, Ciesca D, Liebl G. Projeto Vida: integração da vigilância epidemiológica e setor da saúde mental frente às tentativas de suicídio em Fraiburgo, Santa Catarina, 2014-2017. Epidemiol Serv Saude. 2018;27(3):2017319. https://doi.org/10.5123/S1679-49742018000300014 PMID:30365696

21. Ruíz Arango JA, Ku Pecho V. Factores asociados al suicidio en Panamá según casos realizados en la Morgue Judicial 2011-2013. Med Leg Costa Rica. 2015;32(1):45-50. https://www.scielo.sa.cr/pdf/mlcr/v32n1/art06v32n1.pdf

22. Minayo MCS, Meneghel SN, Cavalcante FG. Suicídio de homens idosos no Brasil. Cien Saude Colet. 2012;17(10):2665-74. https://doi.org/10.1590/S1413-81232012001000016 PMID:23099754

23. Bando DH, Brunoni AR, Fernandes TG, Bensenor IM, Lotufo PA. Suicide rates and trends in São Paulo, Brazil, according to gender, age and demographic aspects: a joinpoint regression analysis. Braz J Psychiatry. 2012;34(3):286-93. https://doi.org/10.1016/j.rbp.2012.02.001 - PMID:23429774

24. D'Eça Jr A, Rodrigues LS, Meneses EP Filho, Costa LDLN, Rêgo AS, Costa LC, Batista RFL. Mortalidade por suicídio na população brasileira, 1996-2015: qual é a tendência predominante? Cad Saude Colet. 2019;27(1):20-4. https://doi.org/10.1590/1414-462x201900010211

25. Baldaçara L, Rocha GA, Leite VS, Porto DM, Grudtner RR, Diaz AP, Meleiro A, Correa H, Tung TC, Quevedo J, Silva AG. Brazilian Psychiatric Association guidelines for the management of suicidal behavior. Part 1. Risk factors, protective factors, and assessment. Braz J Psychiatry. 2021;43(5):525-37. https://doi.org/10.1590/1516-4446-2020-0994 PMID:33111773 PMCID:PMC8555650

26. Pires MCC, Silva TPS, Passos MP, Sougey EB, Bastos OC Filho. Risk factors of suicide attempts by poisoning: review. Trends Psychiatry Psychother. 2014;36(2):63-74. https://doi.org/10.1590/2237-6089-2013-0044 - PMID:27000706

27. Gondim APS, Nogueira RR, Lima JGB, Lima RAC, Albuquerque PLMM, Veras MSB, Ferreira MAD. Tentativas de suicídio por exposição a agentes tóxicos registradas em um Centro de Informação e Assistência Toxicológica em Fortaleza, Ceará, 2013. Epidemiol Serv Saude. 2017;26(1):109-19. https://doi.org/10.5123/S1679-49742017000100012 PMID:28226013

28. Franck MC, Sgaravatti AM, Scolmeister D, Fassina V, Bettoni CC, Jardim FR, Nunes CC, Morales AF, Limberger RP. Suicide and associated factors across life span. J Bras Psiquiatr. 2020;69(1):3-12. https://doi.org/10.1590/0047-2085000000254

29. Durkheim E. O suicídio. São Paulo: Martin Claret; 2003. (A obra-prima de cada autor); (Série ouro).

30. Vasconcelos Neto PJA, Moreira RS, Oliveira Jr FJM, Ludermir AB. Tentativa de suicídio, transtorno de estresse pós-traumático e fatores associados em mulheres do Recife. Rev Bras Epidemiol. 2020;23:e200010. https://doi.org/10.1590/1980-549720200010 PMID:32159623

31. Sena-Ferreira N, Pessoa VF, Boechat-Barros R, Figueiredo AEB, Minayo MCS. Fatores de risco relacionados com suicídios em Palmas (TO), Brasil, 2006-2009, investigados por meio de autópsia psicossocial. Cien Saude Colet. 2014;19(1):115-26. https://doi.org/10.1590/1413-81232014191.2229 PMID:24473609

Table 1. Characterization of the group, according to sex, involved in attempted and completed self-extermination (suicide) in Juiz de Fora (MG) between the years 2012 and 2020.

	Male		Female		p-value	Total	
	AF (n)	RF(%)[a]	AF (n)	RF(%)[a]		n	%
Total suicide occurrences	424		480			904	100%
Consummated	193	45,5%	110	22,9%	<0,0001*	303	33,5%
Attempts	231	54,5%	370	77,1%		601	66,5%
Age							
10 - 19 y.o.	60	14,2%	90	18,7%	0,073	150	16,6%
20 - 39 y.o.	220	51,8%	225	46.9%	0,280	445	49,3%
40 - 59 y.o.	104	24,5%	135	28,2%	0,226	239	26,4%
≥ 60 y.o.	38	9,0%	26	5,4%	0,050*	64	7,1%
Undeclared	02	0,5%	04	0,8%	0,690	06	0,6%
Total	424		480			904	
Occurrence sector							
Center	93	22,0%	117	24,3%	0,430	210	23,2%
East	71	16,8%	87	18,1%	0,661	158	17,5%
Northeast	37	8,7%	39	8,2%	0,810	76	8,4%
North	74	17,5%	73	15,2%	0,367	147	16,3%
West	36	8,5%	17	3,5%	0,002*	53	5,9%
Southwest	57	13,5%	88	18,3%	0,056*	145	16,0%
South	33	7,8%	42	8,7%	0,063	75	8,3%
Districts	08	1,9%	03	0,6%	0,126	11	1,2%
Unregistered	14	3,3%	15	3,1%	>0,999	29	3,2%
Total	423		481			904	
Method							
Chemical substances	78	18,4%	189	39,4%	<0,0001*	267	29,5%
Asphyxiation	120	28,3%	43	9,0%	<0,0001*	163	18,0%
Firearms and other guns	89	21,0%	65	13,5%	0,004*	154	17,0%
Jumping from high places	26	6,1%	16	3,3%	0,065	42	4,6%
Vehicle	07	1,7%	04	0,8%	0,355	11	1,2%
Flammables	05	1,2%	03	0,6%	0,544	8	0,9%
Other methods	74	17,4%	122	25,4%	0,005*	196	22,0%
No data	25	5,9%	38	8,0%	0,295	63	7,0%
Total	424		480			904	

AF: absolute frequency. **RF:** relative frequency. **a:** Relative frequency considering total cases by sex. ***Statistically distinct values between sexes ($p<0.05$).

https://doi.org/10.25118/2763-9037.2023.v13.428

Table 2. Characterization of the group, according to sex, involved in self-extermination (suicide) in Juiz de Fora (MG), between the years 2012 and 2020.

	Male		Female		Total	p-value
Consummated	193		110		303	-
Age						
mean [SD]	39,6 [16,0]		39,5 [15,7]			0,956
median	36,5		38,0			
Age	**AF (n)**	**RF (%)**	**AF(n)**	**RF(%)**		
10 - 19	16	8.3%	11	10.0%	27	0,752
20 - 39	85	44.0%	47	42.7%	132	0,936
40 - 59	64	33.2%	39	35.4%	103	0,754
≥ 60	27	14.0%	12	11.0%	39	0,555
Undeclared	01	0,5%	01	0,9%	02	>0,999
Total	193		110		303	
Occurrence sector						
Center	43	22.3%	27	24.5%	70	0,672
East	33	17.1%	17	15.5%	50	0,750
Northeast	14	7.3%	06	5.5%	20	0,636
North	34	17.6%	17	15.5%	51	0,750
West	19	9.8%	06	5.5%	25	0,201
Southwest	19	9.8%	21	19%	40	0,033*
South	17	8.9%	10	9%	27	>0,999
Districts	07	3.6%	0	0	07	0,050*
Unregistered	07	3.6%	06	5.5%	13	0,558
Total	193		110		303	
Method						
Chemical substances	10	5.2%	30	27.3%	40	>0,0001*
Asphyxiation	93	48.2%	31	28.2%	124	0,001*
Firearms and other guns	25	13.0%	08	7.3%	33	0,181
Jumping from high places	16	8.3%	09	8.2%	25	0,852
Vehicle	05	2.6%	02	1.8%	07	0,962
Flammables	02	1.0%	01	0.9%	03	>0,999
Other methods	32	16.5%	19	17.3%	51	0,874
No data	10	5.2%	10	9.0%	20	0,230
Total	193		110		303	

AF: absolute frequency. **RF:** relative frequency. **a:** Relative frequency considering total cases by sex. ***Statistically distinct values between sexes ($p<0.05$).

https://doi.org/10.25118/2763-9037.2023.v13.428

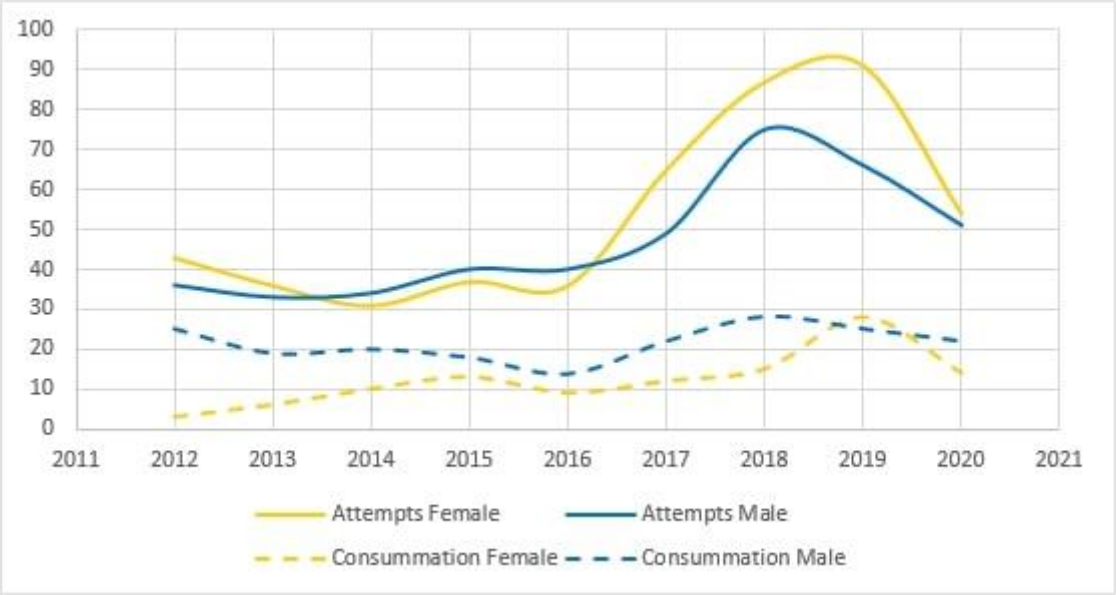

Figure 1. suicide attempts and consummations in absolute numbers during the period 2012-2020

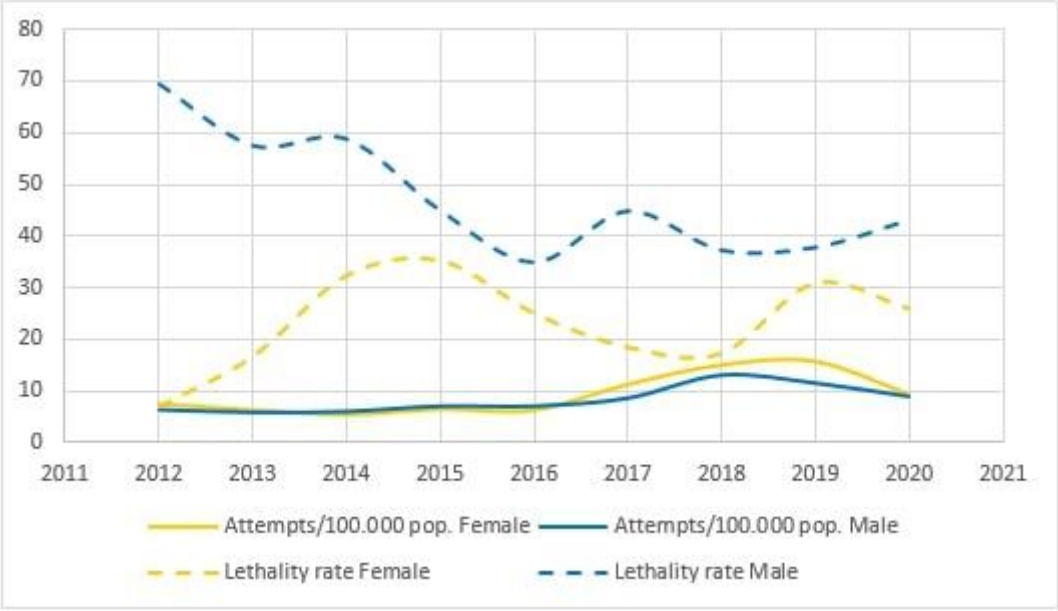

Figure 2. compared the incidence of suicide attempts per 100,000 population with the lethality rate between the sexes

https://doi.org/10.25118/2763-9037.2023.v13.428

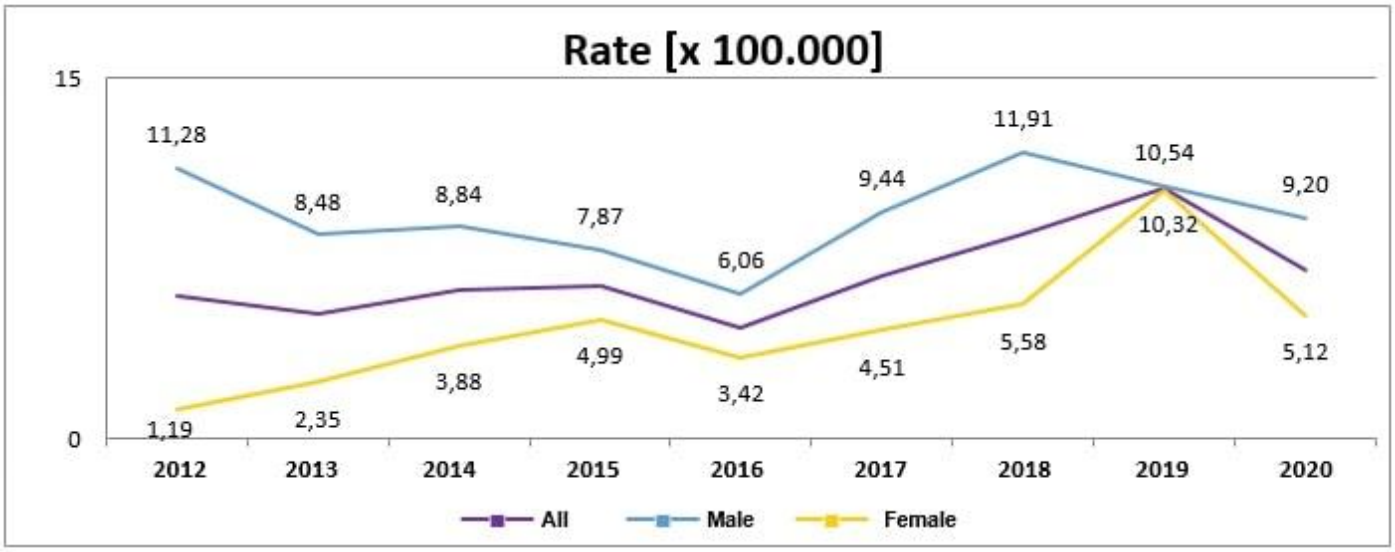

Figure 3. shows the suicide rate by sex.

https://doi.org/10.25118/2763-9037.2023.v13.428