

<http://dx.doi.org/10.1590/0104-070720180002110016>

TIME-TREND ANALYSIS OF SUICIDE AND OF HEALTH INFORMATION SYSTEMS IN RELATION TO SUICIDE ATTEMPTS¹

Nilva Maria Ribeiro², Sybelle de Souza Castro³, Lúcia Marina Scatena⁴, Vanderlei José Haas⁵

¹ Article extracted from the dissertation 'Analysis of the Health Information Systems SIM and SINAN in relation to suicide in the city of Uberaba/MG', presented to the Post Graduation Program in Healthcare at the *Universidade Federal Triângulo Mineiro (UFMT)*, in 2016.

² M.Sc. in Healthcare. Nurse *Hospital Municipal de Rio Parnaíba*. Rio Parnaíba, Minas Gerais, Brazil. E-mail: nilva.enf@hotmail.com

³ P.h.D. in Public Health Nursing. Professor, Health Sciences Institute. Department of Collective Health, UFMT. Uberaba, Minas Gerais, Brazil. E-mail: sybelle@mednet.com.br

⁴ P.h.D. in Physics Applied to Medicine and Biology. Professor, Health Sciences Institute. Department of Social Medicine, UFMT. Uberaba, Minas Gerais, Brazil. E-mail: vjhaas@uol.com.br

⁵ P.h.D. in Hydraulic Engineering and Sanitation. Professor, Health Sciences Institute. Department of Collective Health, UFMT. Uberaba, Minas Gerais, Brazil. E-mail: lmscatena@uol.com.br

ABSTRACT

Objective: to analyze the epidemiological profile of cases of suicide and suicide attempts on the databases of the Mortality Information System and Information System for Notifiable Diseases and the time trend of suicide mortality.

Method: quantitative and time-series study, the databases of the Mortality Information System for deaths by suicide and the Information System of Notifiable Diseases were used to analyze cases of suicide attempts and deaths by suicide reported by exogenous auto intoxication and self-destructing violence, in the city of Uberaba/Minas Gerais/Brazil.

Results: 169 suicide attempts and 11 deaths by suicide were analyzed. The Mortality Information System is more sensitive to the capture of deaths by suicide than the Information System of Notifiable Diseases. In the suicide attempts of females the use of medicines and poisoning stand out, between the ages of 15 and 29. In the Mortality Information System, suicide occurred mainly between the ages of 30 and 59, especially for men, and the main means of aggression were hanging followed by self-intoxication. The time series presented a growing trend of 0.065 per year and negative acceleration of 0.007.

Conclusion: the suicide attempt is prevalent in adolescents and young adults; women attempt to suicide more than men, and through less aggressive methods. Mortality is highest between the ages of 30 and 49, 45.4% by hanging. The time series analysis indicated an increasing trend and higher incidence for males.

DESCRIPTORES: Suicide. Suicide attempt. Health information systems. Time-series studies. Epidemiology.

ANÁLISE DA TENDÊNCIA TEMPORAL DO SUICÍDIO E DE SISTEMAS DE INFORMAÇÕES EM SAÚDE EM RELAÇÃO ÀS TENTATIVAS DE SUICÍDIO

RESUMO

Objetivo: analisar o perfil epidemiológico dos casos de tentativas de suicídios e suicídios nos bancos de dados do Sistema de Informação de Mortalidade e Sistema de Informação de Agravos de Notificação e a tendência temporal da mortalidade por suicídio.

Método: estudo quantitativo e de série temporal, utilizou-se as bases de dados do Sistema de Informação de Mortalidade para os óbitos por suicídio e o Sistema de Informação de Agravos de Notificação para análise dos casos de tentativas de suicídios e óbitos por suicídio notificados por autointoxicação exógena e violência por autoextermínio em Uberaba/Minas Gerais/Brasil.

Resultados: 169 tentativas de suicídio e 11 óbitos por suicídios foram analisados. O Sistema de Informação de Mortalidade é mais sensível à captação de óbitos por suicídio que o Sistema de Informação de Agravos de Notificação. Nas tentativas de suicídio do sexo feminino destacaram-se o uso de medicamentos e envenenamento, entre 15 e 29 anos. No Sistema de Informação de Mortalidade, o suicídio ocorreu principalmente entre 30 e 59 anos, destaque para homens e os principais meios de agressão foram enforcamento seguido de autointoxicação. A série temporal apresentou tendência crescente de 0,065 ao ano e aceleração negativa de 0,007.

Conclusão: a tentativa de suicídio é predominante em adolescentes e adultos jovens, mulheres tentam mais suicídio do que os homens através de métodos menos agressivos. A mortalidade é maior entre 30 e 49 anos, 45,4% por enforcamento. A análise de série temporal indicou tendência crescente e incidência maior para o sexo masculino.

DESCRIPTORIOS: Suicídio. Tentativa de suicídio. Sistemas de informação em saúde. Estudos de séries temporais. Epidemiologia.

ANÁLISIS DE LA TENDENCIA TEMPORAL DEL SUICIDIO Y DE SISTEMAS DE INFORMACIONES EN SALUD EN RELACIÓN A LAS TENTATIVAS DE SUICIDIO

RESUMEN

Objetivo: analizar el perfil epidemiológico de los casos de tentativas de suicidios y suicidios en las bases de datos del Sistema de Información de Mortalidad, el Sistema de Información de Agravios de Notificación y la tendencia temporal de la mortalidad por suicidio.

Método: estudio cuantitativo y de serie temporal en el que se usaron las bases de datos del Sistema de Información de Mortalidad para los óbitos por suicidio y el Sistema de Información de Agravios de Notificación para el análisis de los casos de tentativas de suicidios y óbitos por suicidio notificados por autointoxicación exógena y violencia por autoexterminio, en la ciudad de Uberaba/Minas Gerais/Brasil.

Resultados: 169 tentativas de suicidio y 11 óbitos por suicidios han sido analizados. El Sistema de Información de Mortalidad es más propenso a la captación de óbitos por suicidio que el Sistema de Información de Agravios de Notificación. En las tentativas de suicidio del sexo femenino se destacaron el uso de medicamentos y el envenenamiento entre los 15 y 29 años. En el Sistema de Información de Mortalidad, el suicidio ocurrió, principalmente, entre los 30 y 59 años de edad, destacándose los hombres y los principales medios de agresión fueron ahorcamiento seguido de autointoxicación. La serie temporal presentó una tendencia creciente de 0,065 al año y una aceleración negativa del 0,007.

Conclusión: la tentativa de suicidio sucede, predominante, entre adolescentes y jóvenes adultos. Las mujeres intentan suicidarse más que los hombres y a través de métodos menos agresivos. La mortalidad es mayor entre los 30 y 49 años, siendo que el 45,4% se suicida por ahorcamiento. El análisis de serie temporal indicó una tendencia creciente y una mayor incidencia para el sexo masculino.

DESCRIPTORES: Suicidio. Tentativa de suicidio. Sistemas de información en salud. Estudios de series temporales. Epidemiología.

INTRODUCTION

Suicide is a conscious act of self-annihilation, experienced by one in a vulnerable situation, who perceives it as the best solution to leave an unbearable psychological pain.¹ The result is to voluntarily finish their own lives.² It is seen as violence and aggressiveness, being categorized as "external cause" in the 1^{0th} International Classification of Diseases (ICD).

The classification of urgency can be divided in: a) low, suicidal ideation occurs, but without specific planning and with low intentionality, the patient can still find alternatives to deal with their suffering; b) medium, feasible suicidal plans occur, but the patient projects the action in the future, in case the crisis situation does not change favorably; c) high, clear planning and intention to execute the suicide in the next hours or days occurs.³ In another study, the Suicide Risk Index (SRI) was used, a psychometric instrument to assess the risk through scores, being <5: reduced risk; ≥5 and <10: intermediate risk; ≥10: high risk.⁴

Another classification for the suicide risk is proposed with a scale from 0 to 6, being 0: no perturbation or discomfort; 1: mild emotional perturbation; 2: vague ideas of death; 3: vague ideas of suicide; 4: ideas of suicide, without mental disorder; 5: ideas of suicide, along with mental disorder or serious social stressor; 6: ideas of suicide, along with mental disorder or serious social stressor or unrest and previous attempt.⁵ Notoriously there is no common sense for the suicide risk classification due to various types of approach.

With the construction of the psychiatric reform proposal, the mental health field goes through important changes as of the 1980s, characterized by the creation of the Centers of Psychosocial Attention (CAPS - Centros de Atenção Psicossocial), which emerged as the basis for the opening of new possibilities for public mental health. It is an open and community health service that serves as a reference for the treatment of people in psychological distress, with psychoses, severe neuroses and other pictures, whose severity and/or persistence justify their stay in intensive, community, personalized and life-promoting care. It is characterized as an 'intermediate structure' between the hospital and the community, which offers people an institutional space which makes it possible to understand them and enable them for the civilian life.⁶

Brazil is the eighth country in number of suicides in the world. In 2012, 11,821 deaths were registered, being 9,198 men (six deaths/100,000 inhabitants). Between 2000 and 2012, there has been an increase of 10.4% in these deaths, being this increase of 17.8% among women and 8.2% among men.⁷ In a study conducted on the Brazilian population between 1980 and 2000, there was a 32.8% increase in the male suicide rate, with growth in all the age groups. Among females, the rates are higher in suicide planning and attempts, whereas among males successful suicide is higher.²

National data on suicide are provided by the Department of Informatics of the Unified Health System (DATASUS) through information systems, among them the Mortality Information System (SIM) and the Information System of Notifiable Diseases (SINAN).⁸

Thus, investigating these two health information systems in order to verify which one best captures the suicide event can contribute with information to the development and reformulation of health strategies aimed at reducing this public aggravation.

The studies with SIM and SINAN databases are important to have an overview of the quality of these systems as regards the methodological clarity of documentation and the consistency of the data received in Health Information Systems (SIS - Sistemas de Informação em Saúde), in addition to being able to verify whether there is underreporting of suicide events in some of these SIS. It is important to remember that the greatest purpose of these systems is to generate timely information for decision-making in public health.

The monitoring of this data is important, this study aims to analyze the epidemiological profile of suicide attempt cases and suicide and their time trend, in order to contribute to a better understanding of this increase for the reduction of cases in the city of Uberaba.

METHOD

It is a quantitative, times-series, territorially-based study. For the year of 2014 the epidemiological profile was described through the design of an ecologic study. And between 1996 and 2014 a time trend analysis of mortality by suicide was conducted.

The survey was developed using two secondary databases relating to notifications involving suicides and attempted suicides in the city of Uberaba/ Minas Gerais/ Brazil, using the database of SINAN for the year of 2014, where self-destruction attempts and deaths by suicide were notified in the records of 'Exogenous intoxication' and 'Domestic Sexual Violence and/or Other Violence' and, in the SIM database through the 'Death Certificate' between 1996 and 2014. As for the SIM database the period between 1996 and 2014 was used to analyze the time series of mortality by suicide and the year of 2014 for comparison purposes on the deaths on SIM and SINAN. Both were given by the Municipal Secretariat of Health of Uberaba/MG (SMS), after approval by the Committee of Ethics in Research with Human Beings at the Federal University of Triângulo Mineiro (UFTM - Universidade Federal do Triângulo Mineiro), via Brazil Platform under the opinion No. 1,060,226 and CAAE 44011515.5.0000.5154. The research was conducted in accordance with the ethical standards required.

It was requested to the SMS the SIM database, according to the root cause encoded between X60 and X84, which refers to the intentional self-harm according to the 10th ICD. The selection criteria for Exogenous Poisoning record was the field number 55 on the circumstances of the exhibition, the records selected were only the ones in which the number 10 (referring to suicide attempts) was marked. On Violence records, the selection criterion was the markup for the field number 50, which is related to the self-inflicted lesion.

Data exploratory analyses (descriptive) were performed, from the assessment of simple and absolute frequencies and percentages for categorical variables. The analyzed variables were those with less than 20% incompleteness, considered intermediate by the criteria proposed by the Economic Commission for Latin America and the Caribbean (ECLAC).⁹

The description of the epidemiological profile of the cases of suicide attempts and deaths by suicide was made through descriptive statistics and the coefficients of incidence and mortality (100,000 inhabitants/year), the lethality (%) and the ration of sex by incidence of attempted suicide and mortality were calculated. It was verified the deaths by database and the presence of the same individuals in SIM and SINAN through linkage between banks.

For the analysis of time trend, the mortality by suicide (per 100,000 inhabitants) between 1996 and 2014 was calculated. The series was patterned after the smoothing process with polynomial regression. The modeling process began with the simple linear regression model, then second degree, third degree and exponential models were tested. The chosen model was one with significant trend, $p < 0.05$, and, of a lower order, whereas there is similarity between two models from the statistical point of view. The transformation of the variable year (X) in the variable centralized year (X - the midpoint of the period) was used to reduce the autocorrelation among the terms of the equation of the polynomial regression models. As model precision measurement the coefficient of determination was used (R^2).

It was also verified the time trend of mortality by suicide (1.000.000 inhab./month) according to sex, between 2006 and 2014. The following steps were used: 1) descriptive analysis, including the position measurement and the variability of total mortality, as well as by sex, of deaths by suicide in the period under consideration; 2) visual presentation, using line charts of the monthly evolution of the total mortality of deaths by suicide in the

period, as well as its development to the variable sex; 3) decomposition of the series, in the pursuit of its trend elements and seasonality, if existing, using diagnosis obtained with the graphical view of the autocorrelation and partial autocorrelation functions. This search also identified the presence of autoregressive processes and moving averages in potential models of (ARIMA) (Autogressive Integrated Moving Average) adjustment.

RESULTS

Regarding the epidemiological profile of the reports, 89 cases of suicide attempts were made by exogenous intoxication, of which five people died. The age group with the highest number of attempts was 20-29, with 25 cases (28.1%), followed by 15-19 with 17 cases (19.0%), consisting mostly of women, 68 cases (76.4%).

It was found a higher incidence of suicide attempts in the female population aged 15 to 19, with 49.6 cases (100,000 inhab./year). The total incidence for the means of aggression through medication intake was 10.3 self-destruction attempts (100,000 inhab./year) in females and 2.0 self-destruction attempts (100,000 inhab./year) in males. Females attempted suicide 5.1 times more than men through the intake of medications.

The place of exposure for exogenous intoxication was usually the residence, corresponding to 65 cases (73.0%) through the use of medicine, followed by rodenticides with 17 cases (19.2%). The predominant exposure route was digestive, 86 cases (96.6%), and usually the only one, with 76 cases (85.4%).

On Violence Records, 80 cases of attempted self-destruction were registered in 2014, with women prevailing over men, 61 cases (76.2%) and 19 cases (23.8%) respectively. The most frequent age group was 20-29 (26.2%), followed by 15-19 (23.8%).

The victim's own residence was the predominant location for self-destruction violence, 68 cases (85.0%). Most of them had no declared marital commitment, 46 cases (57.6%); and the remainder were single, 40 cases (50.0%); widows, five cases (6.3%) and the married ones totaled 19 cases (23.8%).

Intoxication was the predominant nature of harm in cases of violence by self-destruction, 26 cases (32.4%). The most commonly used means of aggression were through poisoning, 21 cases (26.2%); followed by the use of medicine, 19 cases (23.8%).

There were 11 deaths due to suicide in death certificates in 2014, mainly in the age groups 30-39 (three deaths) and 40-49 (three deaths), six of them in males. Regarding the means that resulted in death, five cases were by hanging and two by autointoxication. As for the place of occurrence of the deaths, five cases were in the hospital (45.4%), three cases (27.3%) at home and three cases (27.3%) on public roads.

In 2014, the suicide mortality coefficient coming from the SIM was slightly higher for males than for females, being respectively 4.1 and 3.2 deaths (100,000 inhab./year). In relation to the age group, for males, the population between 70 and 79 years old stood out, with 19.6 deaths (100,000 inhab./year); and for females aged 40 to 49 years old, 13.3 deaths (100,000 inhab./year), according to table 1.

Table 1 - Distribution of mortality coefficients through suicide (100,000 inhab./year) by sex, age group and sex ratio. Uberaba, MG, Brazil, 2014. (n=11)

Age Group	Mortality rate Male (M)	Mortality rate Female (F)	Mortality Sex ratio (M/F)
10 to 14 years old	-	-	-
15 to 19 years old	-	-	-
20 to 29 years old	3.5	-	-
30 to 39 years old	4.2	4.2	1.0
40 to 49 years old	0	13.3	-
50 to 59 years old	12.4	5.5	2.2
60 to 69 years old	10.8	-	-

Age Group	Mortality rate Male (M)	Mortality rate Female (F)	Mortality Sex ratio (M/F)
70 to 79 years old	19.6	-	-
80 years old or >	-	-	-
Total	4.1	3.2	1.3

Source: SIM, 2015 - SMS of Uberaba / MG. Indicators calculated by the author.

The self-destruction attempt reported through violence records according to table 2, for males, revealed a mortality rate of 0.7 deaths (100,000 inhab./year), incidence of 13.5 suicide attempts (100,000 inhab./year) and lethality of 5%.

In females, the mortality rate was 2.6 deaths (100,000 inhab./year), the incidence of 38.7 suicide

attempts (100,000 inhab./year) and the mortality rate of 6.7%. On violence records it is highlighted that the incidence of suicide attempt in the age group 15-19, in both sexes is greater when compared to the other age groups, corresponding to 115.8 attempts for a female death and 40.1 for no male deaths, according to table 2.

Table 2 - Distribution of the suicide attempt incidence coefficients, suicide mortality (100,000 inhab./year) and lethality, according to sex and age group, of self-inflicted violence notifications. Uberaba, MG, Brazil, 2014. (n=80)

Age group	Mortality	Lethality	Incidence	Mortality	Lethality	Incidence	Sex incidence ratio (F/M)
	Male (M)			Female (F)			
10 to 14 years old	-	-	-	-	-	27.9	-
15 to 19 years old	-	-	40.1	8.3	7.1	115.8	2.9
20 to 29 years old	-	-	14.2	-	-	62.4	4.4
30 to 39 years old	4.2	11.1	38.1	4.2	12.5	33.3	0.9
40 to 49 years old	-	-	4.9	4.4	12.5	35.5	7.2
50 to 59 years old	-	-	6.2	5.5	16.7	32.9	5.3
60 to 69 years old	-	-	-	-	0	34.8	-
70 to 79 years old	-	-	-	-	0	-	-
≥ 80 years old	-	-	-	-	-	-	-
Total	0.7	5.0	13.5	2.6	6.7	38.7	2.9

Source: SINAN, 2015 - SMS of Uberaba / MG. Indicators calculated by the author.

On table 3, it was observed that women between 15 and 59 years old made more suicide attempts by exogenous intoxication than men. In notifications by exogenous intoxication, for males, the incidence rate was 14.2 cases of suicide attempts (100,000 inhab./year) and the lethality was 4.8%. The incidence rate for suicide attempts in males

between 10 and 14 years old was 26.4 deaths (100,000 inhab./year).

In females the mortality rate was 2.6 deaths (100,000 inhab./year), the suicide attempts incidence was higher for the age group 15-19, females having 16.5 times more chances of attempting suicide than males, according to table 3.

Table 3 - Distribution of the suicide attempt incidence coefficients, suicide mortality (100,000 inhab./year) and lethality, according to sex and age group, of self-inflicted violence notifications. Uberaba, MG, Brazil, 2014. (n=89)

Age group	Mortality	Lethality	Incidence	Mortality	Lethality	Incidence	Sex incidence ratio (F/M)
	Male (M)			Female (F)			
	10 to 14 years old	0	0	26.4	0	0	
15 to 19 years old	0	0	8.0	8.3	6.3	132	16.5
20 to 29 years old	0	0	17.7	0	0	73.4	4.1
30 to 39 years old	4.2	20.0	21.1	4.2	10.0	41.6	1.9
40 to 49 years old	0	0	19.5	4.4	9.1	48.8	2.5
50 to 59 years old	0	0	12.4	0	0	32.9	2.6
60 to 69 years old	0	0	0	8.7	100.0	8.7	0
70 to 79 years old	0	0	19.6	0	0	0	0
≥ 80 years old	0	0	0	0	0	0	0
Total	0.7	4.8	14.2	2.6	5.9	43.9	3.1

Source: SINAN, 2015 - SMS of Uberaba / MG. Indicators calculated by the author.

In SIM and SINAN death reports for 2014, it was found that on SINAN records there were seven deaths and on SIM forms there were 11 deaths. Among these, only one case was repeated in three databases. The ICDs informed on the Death Certificate were pneumonitis due to inhalation of food or vomit (J69.0), shock, unspecified (R57.9), ill-defined

and unknown cause of mortality (R99.0) and poisoning (intoxication) due to exposure to other chemicals and noxious substances and to unspecified, intention not determined (19.9).

The time series indicates that there is an erratic trend in suicide events between 2006 and 2014, according to figure 1.

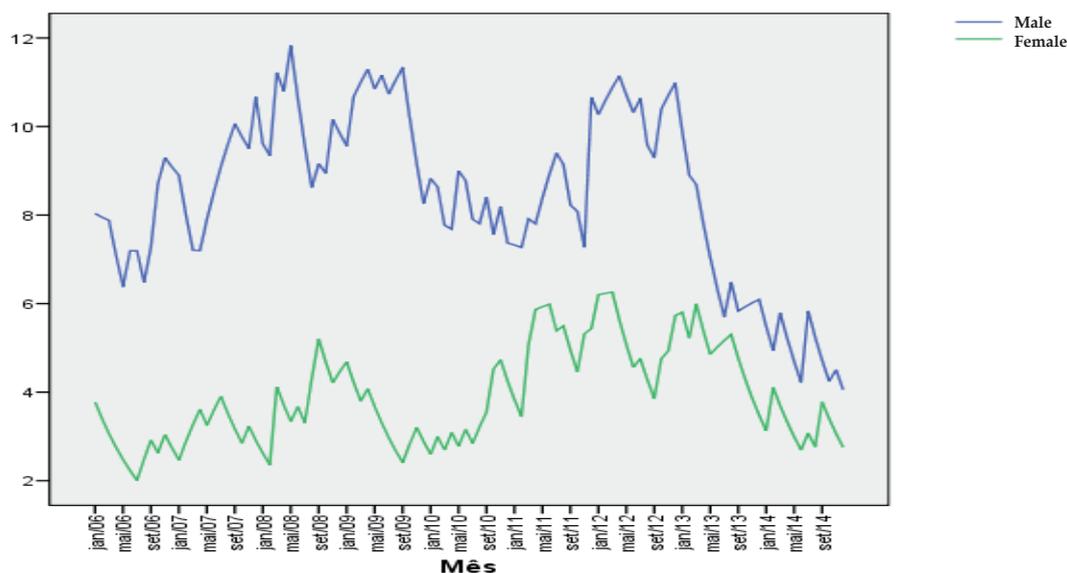


Figure 1- Temporal evolution (monthly) of incidence adjusted by exponential smoothing (by 1 million inhabitants) of deaths through suicide, for males and females between 2006 and 2014. Uberaba, MG, Brazil

As for the time series in a wider range of time (1996 to 2014) of deaths through suicide relating to Death Certificates, it was observed, after the exponential smoothing Alpha 0.1, a mortality rate of 6.73 deaths (100,000 inhab./year) with increasing

tendency of 0.065 per year and negative acceleration of 0.007 per year, as shown in Figure 2.

Still in figure 2, it was found that, in this period, 356 deaths through suicide occurred, being 254 cases of males (71.35%).

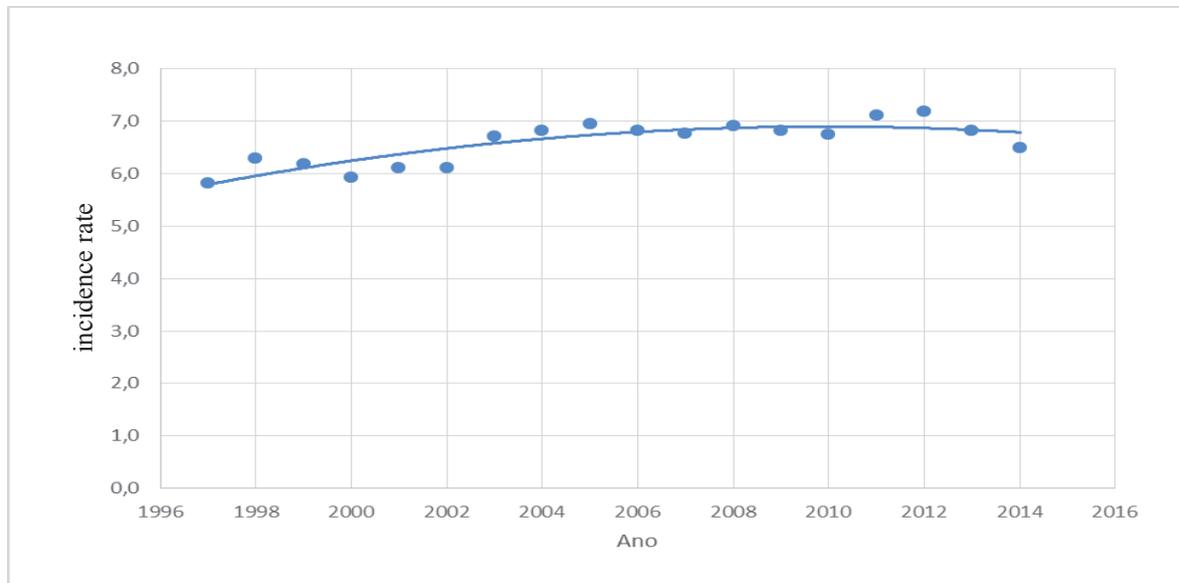


Figure 2 - Time series (annual) of the mortality incidence rate (100,000 inhab./year) through suicide adjusted by the polynomial regression model between 1996 and 2014. Uberaba, MG, Brazil.

DISCUSSION

The population that attempts suicide is predominantly composed of teenagers and young adults in notifications by exogenous poisoning; furthermore, women attempt suicide more than men. Studies show that men commit suicide more than women and the methods used are of a high degree of lethality, such as hanging, firearm use and falling from high places.¹⁰ Women show a higher number of attempted suicides through ingestion of medicines and other toxic substances, which was also verified in this study.¹¹

The choice of the preferred exposure place for the suicide attempt is the victim's residence, which may be due to easy access to the means for this act, such as intoxication through medicines and rodenticides. This does not mean that it was the main cause of deaths, but that it requires more attention from health and family services. Studies show that the place of residence is connected to the suicide attempt, mainly through the use of medications and rat poison.¹²⁻¹³ Besides favoring the use of substances, the residence appears to be the most conducive place for the consummation of the death by hanging, a commonly used method by men.

People who are without a partner may present greater risk for suicide attempts/suicide, according to a study carried out in 15 municipalities of Minas Gerais, between 2003 and 2009. Suicide attempts were more frequent among single people and younger people.¹⁰ In another study conducted between 2004 and 2014 in Jundiaí, the sample showed that single people were more likely to commit suicide.¹⁴

On violence records, it was also observed more female suicide attempts than male. It also reveals that the age group that attempts suicide is predominantly young. Easy access to toxic substances has an influence over suicide attempts and its restriction could work as prevention, such as, for example, requiring greater accuracy for marketing. Results presented in this article corroborate other studies, in which the main agents of self-destruction were the pesticides and medicines.¹⁵ A study conducted between 2013 and 2014 in a reference hospital for exogenous intoxication cases indicated that most suicide attempts in the State of Ceará were through drugs and toxic agents such as the rat poison.¹⁶

On the Death Certificate forms it was found that the deaths occurred in an older age than what was observed in suicide attempts reported in SINAN.

There was practically no difference in the amount of deaths by suicide between the sexes in this study, which differs from the historical regions of Minas Gerais between 1997 and 2011, in which men corresponded to a total of 81.9% of all suicides.¹⁷ In another study conducted in São João da Boa Vista, São Paulo (Brazil) between 2006 and 2013, the predominance of male deaths in relation to female deaths was observed, and it concluded that most of the cases of suicide is linked to males in more violent ways, such as hanging.¹⁸

A worrisome aspect was seen on exogenous intoxication records, noting that the suicide attempt begins in adolescents of both sexes, between 10 and 14 years old, increasing considerably in the female population of 15 to 19 years old, calling the attention to the fact that people attempt suicide earlier and earlier, with greater tendency to women. In the violence records it was also noted a much higher incidence of attempts in females than in males, with special attention to the age group 15-19. In an integrative review, it was observed that most of the discussed studies identified greater prevalence of suicide attempts in women, teenagers and youth, people who live alone, unemployed people and individuals with low schooling. This information is clinically useful, making it possible to identify risk groups in populations for better follow up and evaluation.¹⁹

The reasons for the self-destruction attempts were linked to the adolescent universe and its peculiarities. The teenager, not feeling heard or recognized and for their own difficulty in expressing themselves, searches, by their actions, the attention that they are owed by their family and society. These acts are driven by immediacy and impulsivity, thus conveying a cry for help, showing that something does not go well.²⁰

With regard to the means used for the aggression, they may vary according to the community or country, due to easy access to certain offending agents. In the United States the most used resources by older men are firearms and, in China, intoxication by pesticides. Older women tend to use "softer" resources worldwide, such as the ingestion of toxic substances.²¹

The deaths by suicide occurred out of the hospital are referred directly to the Medico-Legal Institute (MLI) or the Death Verification Service (Serviço de Verificação de Óbito - SVO), thus not being notified in SINAN, only in SIM.

With respect to death coverage in SIM and SINAN it was verified that SIM collects deaths by suicide better than SINAN, probably because the cases found in SINAN are related to suicide attempts that needed care in health units/hospitals, resulting in hospital death or discharge. Some cases may pass by the health units/hospitals and not being notified to SINAN for reasons such as excess demand for service, causing the filling plug of SINAN stay in the background; preparation for the implementation of the notification or even lack of knowledge about the importance of completing the individual sheets of notification to surveillance in health systems and health information. In addition, in certain situations it may be difficult for the doctor to identify whether there was intent to die, in which case the root cause is classified as undetermined. It must be also considered the fact that deaths occurred at home are directly taken to the SVO or the MLI, where only the Death Certificate is usually registered and SINAN is not notified.

Besides that, the family, either because it is a taboo subject or even because of issues related to life insurance benefits, may request that the cause of death is not informed as suicide. This might be why, during the research, four cases leading to death were found notified in SINAN, but they are not registered in SIM within the basic causes of suicide, ICD between X60 and X84, even though there was the ingestion of medicines with suicidal purpose.

A limitation of this study is the use of a secondary database from SIM and SINAN. Despite having national scope, not all health services and competent professionals adhere to the records, for issues such as lack of punishment and time for filling and excess of forms, what may cause omission, ignorance or even undeclared forms, failing to complete medical records, completion of forms by administrative professionals, among others.²²⁻²⁴ The omission or incompleteness may influence the final result, however they are the available official bases and deserve attention to the quality of completion.

On the time series, it is clear that there is a higher incidence of suicide deaths among men than women, in comparison with the information provided in another study where it was verified that in the historical series of suicide there is a predominance of male adults, a situation that can be observed in most countries that have data collection.¹⁷

In addition to the emotional issues that affect the whole family of the suicidal patient, this aggravation causes significant costs for SUS. This was verified in a study that analyzed hospital admissions

and deaths by suicide in Brazil between 1998 and 2007. 77,648 deaths and 102,031 hospitalizations were identified, in addition to expenses exceeding R\$ 35 million for these causes. In this same study, between 1998 and 2012, in a public teaching hospital in the city of Uberaba/MG, there was an expenditure of R\$574.922,60, mainly due to exogenous intoxication for suicide purposes.²⁵

For the formulation and implementation of prevention measures to reduce suicide rates, it is important to identify individuals who are at risk (especially those with a history of previous suicide attempt) and vulnerable (individuals with suicidal characteristics).²⁶ The challenge is to avoid deaths, through actions aimed at health promotion and prevention, in addition to having a service network that must be organized to meet the demand, identifying key determinants for suicide.²⁷

The strategy formulation to reduce suicidal events requires incidence rates analysis and psychosocial characteristics of those involved in the act; moreover, risk factors need to be identified and monitored through appropriate prevention and treatment programs. There is a need for sensitization and training of professionals to work in the identification and specialized monitoring through the whole care and humanization in the relationship with families.²⁸

This study is important for the development of strategies to treat and give support to vulnerable individuals, since many go through health units/hospitals due to suicide attempts several times before they die, generating emotional distress on family members and spending on care which could be avoided if there were a sensitized and organized care network.

Advances have been made on this subject, but there is much to develop, for example the Municipal Secretariat of Health of Rio de Janeiro, which published a Guide for Suicide Risk Assessment and Prevention, emphasizing the importance of the team of the Nucleus for Family Health Support (NASF) to work together with the Psychosocial Care Center (CAPS) for the reception and appropriate care in groups and to assess the need for individualized care of patients with imminent risk of self-destruction.²⁸

The nurse's work in the Family Health Strategy (ESF) and CAPS has a key factor for the identification and reception of patients at risk of suicide. The nurse can have a therapeutic hearing, assessing the anguish and needs of the health service users and manage the case with referrals to other profes-

sionals, in addition to appropriate home care with the support of the Community Health Agents.

CONCLUSION

The suicide attempt is prevalent in adolescents and young adults (15 to 29 years old), especially in women. It has been found that women attempt suicide more than men through less aggressive methods. SINAN records emphasized suicide attempts due to poisoning and self-medication. It is assumed that there is an easy access to medicines, rodenticides, pesticides, among others, which make the suicide attempt easier, especially in the victim's own home. A strategy definition is necessary to restrict the purchase of poisons and pesticides.

For suicide attempts, the methods are milder between 15 and 29 years old, and suicide mortality is higher between 30 and 49 years old, in which 45.4% of the cases used hanging to end their lives according to the SIM data. Regarding the coverage of deaths, it is noted that more deaths are recorded in SIM than in SINAN for the aggravated suicide.

The time series analysis indicated a higher incidence for male suicides. Although there is a negative acceleration, the number of suicide cases is still increasing, which generates significant public and social expenses.

A link between Mental Health and ESF/NASF is needed to strengthen suicide prevention. ESF, as a gateway to the health system, forms a permanent link with the community, identifying its problems, working with a multiprofessional team, and may be more successful in monitoring cases with potential for suicide/suicide attempt. The nurse, for his skills and abilities inherent to the profession, can greatly contribute to the identification and management of cases.

The improvement of mental health promotion actions through the network of psychosocial care and basic care is important to prevent suicide attempts and deaths by suicide, the damage caused by suicidal behavior and the negative impact on the family and community. The CAPS teams are responsible for monitoring these people, because they constantly deal with patients in crisis situations. They have a lasting contact, facilitating the necessary intervention to prevent suicide. However, it is not an easy reality to achieve, since suicide is a multifactorial and complex problem, requiring individual and prolonged attention.

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Correspondence: Nilva Maria Ribeiro
Rua Ibiá, 255, Apto 302
38810-000 - Progresso, Rio Paranaíba, MG, Brasil
E-mail: nilva.enf@hotmail.com

Received: August 28, 2016
Approved: August 10, 2017
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