

MORTALITY FROM EXTERNAL CAUSES AMONG TEENAGERS IN FEIRA DE SANTANA – BAHIA: A TIME SERIES STUDY

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ABSTRACT: Introduction In the first year of life, natural deaths represent almost all deaths, however, in this group of causes of death, the frequency falls progressively until the age of 14, when deaths from external causes exceed natural causes. **Objective:** To describe the mortality profile of adolescents aged 10-19 years in Feira de Santana, Bahia, Brazil, from 2010 to 2020. **Methods:** Descriptive time-series study that analyzed data from the Mortality Information System (SIM), from 2010 to 2020, regarding deaths in the population aged 10 to 19 years, residents of Feira de Santana, Bahia. Causes of death were identified and mortality rates and respective incidence curves of deaths by age group and cause of death were calculated. **Results:** Homicide was the predominant cause of death among adolescents aged 15 to 19 years, males, brown and black, with low education. The coefficient of death by homicide was 151.4/100,000 in 2010 and reached 125.9/100,000 in 2020, with a peak of 151.4/100,000 in 2010 in the 15-19 year old age group. **Conclusion:** It was observed that in the 10 to 14 and 15 to 19 age groups the most frequent causes of death were homicides and events of undetermined intention. Thus, most deaths in these age groups can be avoided with the adoption of preventive measures and health education through public policies aimed at the age group studied and the greater commitment of authorities in the health and public safety sectors.

Keywords: Mortality; Adolescence; External cause; Public policies.

INTRODUCTION

Adolescents have often been identified as the main victims of morbidity and mortality from external causes. Currently, mortality in this population has been recorded in the literature as very high, in factors such

as inexperience, impulsivity, emotional immaturity, thrill-seeking, pleasure in experiencing risky situations, consumption of alcoholic beverages, experimentation with illicit drugs, easy access to weapons white and fire, among others, make them more vulnerable (MATOS; MARTINS, 2012).

Mortality from external causes is a serious public health problem and is among the main causes of death in the world, with a strong expression in young age groups (CARDOSO, et al., 2020). External causes are considered a major public health problem and the increase in their incidence has influenced the organization of the Unified Health System (SUS) in Brazil. Thus, generating high costs for the health service.

According to the International Statistical Classification of Diseases and Related Health Problems – 10th Revision (ICD-10) (WHO, 2017), external causes are traumas or injuries generated by accidental or intentional causes. The types of accidental external causes are traffic accidents, falls, burns and drowning, and the intentional ones are aggression and self-inflicted injuries, such as: poisoning and suicide (SILVA, et al., 2018).

Mortality among the 10-19 age group, due to traffic accidents, drowning, poisoning, burns and suffocation is highlighted as responsible for most injuries that cause deaths in this population, according to data from the Centers for Disease Control and Prevention (CDC - 2017). It is observed that these types of injuries are predictable and preventable (SUNDBERG, et al., 2018).

The number of deaths from external causes in Brazil is extremely high and represents the third leading cause of death in the general population and the second in males. Thus, they are more likely to be victims or aggressors in acts of violence, which is strongly associated with the use of alcoholic beverages and other drugs (RODRIGUES;

ARRUDA, 2020). This relationship of violence and death from external causes is also present among the young population in high proportions and has been growing every year.

Consequently, this phenomenon has a negative social impact, also victimizing families that suffer from the consequences of this violence. In addition to causing low productivity in the economic sector of society, since most of the time, these young people are active in the formal and informal labor market.

Accidents, such as falls, burns, drowning, among others, also happen at home, at school and in the immediate vicinity, given that children and adolescents, due to their characteristics, are interested in exploring new situations and, at this stage of their development, skills, establish interactions that can cause accidents in these spaces (SILVA, et al., 2017).

Homicidal violence fluctuates throughout the life cycle of children and adolescents. From the age of 12, there is a marked growth that reaches a peak between 16 and 17 years of age. With 16 years of age, in 2014, 1,686 adolescents were victimized: 4.6 per day. The 17-year-old adolescent victims totaled 2,267: 6.2 per day (WAISELFISZ, 2017).

In Brazil, homicides are the main cause of mortality among young people, the age group of people between 15 and 29 years old. This fact shows the most perverse side of the phenomenon of violent mortality in the country, as more than half of the victims are individuals with full productive capacity, in a period of educational training, with a view to starting a professional career and building a family network. itself (CERQUEIRA, et al., 2020).

Based on Oliveira, et al (2019), mortality predominates in boys between 15 and 19 years old, reaffirming that behaviors and social

conditions have a serious impact on the health and development of adolescents, causing devastating effects on their health as adults (OLIVEIRA, et al. al., 2019). Regarding the causes of death in Brazil, the most expressive in terms of the number of deaths are traffic accidents, homicides, suicides, falls and intentional or accidental injuries (MODESTO, JG et al., 2019).

Deaths caused by violent causes contribute to the burden on health services, the judiciary system and social apparatuses, highlighting the existing flaws in public policy mechanisms in the face of the intensification of this process. Therefore, it can be inferred that the self-external cause mortality rate sounds like the result of systematic failures produced by the State that affect various population groups (MODESTO, JG et al, 2019).

Violence has been increasingly prominent on the national scene, due to its magnitude, severity, social impact and the ability to make victims and their families vulnerable (SILVA, et al., 2018). Homicides were the main cause of death among young men, responsible for 55.6% of deaths among young people between 15 and 19 years of age. For women in this same age group, the proportion of deaths due to homicide is considerably lower: 16.2% among those between 15 and 19 years old (CERQUEIRA, et al., 2020).

The phenomenon of homicides of young people in the country is, for the most part, a scenario of homicides of young men. This is an analysis that, for some time now, has been consolidated in research on violent lethality among Brazilian youth, especially when emphasis is placed on the representation of young males in the total number of homicides in this age group (CERQUEIRA, et al., 2020).

Brazil currently occupies the third place in deaths by homicide, among the population aged 10 to 19 years old, behind Mexico and El Salvador. With the current economic and

political crisis in the country, homicide rates have increased sharply, reaching an average annual growth of 8.9%. (WASELSELFISZ, 2017) On the other hand, traffic accidents stand out, both for morbidity and mortality, also constituting a public health problem (CUNHA; GODOY, 2017).

Among the factors that contribute to crime among adolescents and young people, the lack of educational and work opportunities stands out, which condemns them to material restrictions and various social needs. This reality has two dimensions: the first is characterized by the lack of work and productive occupations, the second by the loss of human lives. This way, the lack of opportunities ends up driving a growing wave of violence (CERQUEIRA, et al., 2019).

In view of this scenario, and understanding that most deaths from external causes can be avoided with the adoption of preventive measures, the importance and need for specific strategies and policies is highlighted, to be outlined, based on the dimension of the problem (CUNHA; GODOY, 2017) (SILVA; MESCHIAL; OLIVEIRA, 2016). This study aimed to describe the mortality profile among adolescents, aged 10 to 19 years, according to sociodemographic variables and group of causes of death, using the Information System on Mortality (SIM), in Feira de Santana, Bahia, from 2010 to 2020.

MATERIALS AND METHODS

This is a descriptive epidemiological study, of the time series type, carried out from the notifications of deaths, which occurred in the municipality of Feira de Santana, Bahia. Data referring to deaths and age group from 10 to 19 years in the period from 2010 to 2020 were extracted from the Mortality Information System (SIM) and the Superintendence of Health Surveillance and Protection (SUVISA), of the Health Department of the State of Bahia.

Data regarding deaths from external causes that occurred between 2010 and 2020, involving individuals aged 10 to 19 years and residents of Feira de Santana, Bahia, were selected.

The study population consisted of adolescents who died due to external causes. Adolescents were defined as individuals between the ages of 10 and 19, according to the W.H.O. (BRAZIL, 2013), residing in Feira de Santana, Bahia.) and the injury (place of occurrence and type of external causes).

In Feira de Santana, in 2020, the estimated resident population was 619,609 inhabitants, considering that the number of adolescents in the resident population estimated by sex and age group in Feira de Santana in the year 2020, in the range of 10 to 14 years old, was 4,641 and in the age group of 15 to 19 years, it was 5,2407. (BAHIA, 2022)

As inclusion criteria, we used the age group of 10 to 19 years old and all deaths that occurred in Feira de Santana, Bahia, registered in the SIM, in the period between 2010 and 2020. The exclusion criterion was based on deaths that occurred in this age group in other municipalities.

A form containing sociodemographic data with the following variables was prepared: gender (male and female); age group (10 to 14 years old and 15 to 19 years old); race/color (white, black, brown and indigenous, ignored); education in years of study (1-3,4-7,8-11).

The underlying causes of death were grouped as external causes (Homicide, Other Accidents; Drowning; Burning; Suicide; Falls; Events whose intent is undetermined) according to the Mortality Information System (SIM) and the Tenth Revision of the International Statistical Classification of Diseases and Health Related Problems (ICD-10). (WHO, 2017)

To calculate the coefficients, the following were considered: as the numerator, the number of deaths by Homicide; Events whose intent is undetermined; other external causes; and, in the denominator, the estimated population for the same age group and year, according to preliminary estimates prepared by the Ministry of Health/SVS/CGIAE (BRAZIL, 2013).

Subsequently, proportional mortality rates were calculated by subgroups (gender and age group) in relation to the total number of deaths from external causes: Assault (X85-Y09); Other External Causes of Accidental Injuries (W00-X59); Intentionally Injured Self (X60-X84); Events whose intent is undetermined (Y10-Y34); and other external causes (Y40-Y98). The spreadsheets generated by SESAB/SUVISA/DIVEP/SIM were exported to the Microsoft Office Excel program, enabling the descriptive analysis of data, calculation of mortality coefficients, as well as the construction of tables and graphs.

The analysis was carried out in two stages: in the first, the frequencies of the variables studied and the main variable “death” were calculated, in the respective age groups (10 to 14 and 15 to 19 years old), in the period from 2010 to 2020. stage, were calculated specific mortality rates and incidence curves were prepared, in the respective age groups (10 to 14 and 15 to 19 years old), in the period from 2010 to 2020. This research was evaluated and approved by the Research Ethics Committee (CEP) of the “Universidade Estadual de Feira de Santana”, Bahia (UEFS), with Research Ethics Committee, number: 2.4998.720/18 and (CAAE) 80179417.0.0000.0053.

RESULTS

In Table 1, it can be highlighted that among deaths from external causes, homicides accounted for 44.3% of the sample, most deaths in adolescents are in the age group of

15 to 19 years, male (84.4%).

Regarding the cause of death by gender shown in Table 2, the frequency of homicides, undetermined events and other causes is more prevalent at home for males, making a total of 85.2%, 87.5% and 62.5% respectively. The highest prevalences for males were also found in hospitals and other locations, however, only in hospitals was there a statistically significant difference by gender ($p=0.000$).

As for external causes of death by location, the age group 15 to 19 years old stands out, with 92.2% at home, 83.5% in the hospital and 81.5 in other locations (Table 3). There was no significant age difference due to external causes and location.

In Graph 1, it was found that, in the age group of 10 to 14 years old over the studied period, the homicide mortality rate was high, with the exception of 2013. Homicides showed peak incidence in 2011, 2014. It was observed that in 2010, deaths from other external causes had a high incidence, however, from 2010 onwards, there was a downward trend in this cause of death. Homicides showed irregular incidence profiles throughout the period. The mortality rate for events whose intent is undetermined reached its peak in 2018.

In Graph 2, in the age group of 15 to 19 years old, an increase in the incidence rate of deaths from external causes, homicide and events of undetermined intent was observed throughout the period studied. There was also a downward trend in the incidence of deaths from homicides from 2012 onwards. In addition to a low and irregular incidence of deaths from other external causes.

DISCUSSION

Behavioral changes related to masculinity from adolescence onwards as factors that influence the high occurrence of deaths from

Variables	n	BR
External causes		
Murder	213	44.3
Events whose intent is undetermined	160	33.3
Other external causes ¹	108	22.4
Total	481	100.0
Sex		
Male	406	84.4
Feminine	75	15.6
Total	481	100.0
age group		
10-14	80	16.6
15-19	401	83.4
Total	481	100.0
Breed		
White	31	6.4
black	118	24.5
brown	291	60.5
Other 2	41	8.5
Total	481	100.0
Education		
1-3 years	45	9.4
4-7 years	133	27.7
8-11 years	81	16.8
Others	222	46.2
Total	481	100.0
place of occurrence		
Residence	51	10.6
Hospital	182	37.8
Other locations	248	51.6
Total	481	100.0

¹Suicide; Fall; Drowning; Burn; Other Accidents.

²Yellow, indigenous, uninformed and ignored

n - Absolute frequency; % - Relative frequency;

Table 1: Sociodemographic distribution of deaths from external causes that occurred in Feira de Santana, Bahia, Brazil, from 2010 to 2020.

External Causes	MASCULINE		FEMININE		p value
	n	BR	n	BR	
Residence					
Murder	23	85.2%	4	14.8%	0.271
undetermined events	14	87.5%	two	12.5%	
Other external causes ¹	5	62.5%	3	37.5%	
Total	42	82.4%	9	17.6%	
Hospital					
Murder	74	92.5%	6	7.5%	0.000*
undetermined events	57	93.4%	4	6.6%	
Other external causes ¹	28	68.3%	13	31.7%	
Total	159	87.4%	23	12.6%	
Other locations					
Murder	89	84.0%	17	16.0%	0.550
undetermined events	70	84.3%	13	15.7%	
Other external causes ¹	46	78.0%	13	22.0%	
Total	205	82.7%	43	17.3%	

¹Suicide; Fall; Drowning; Burn; Other Accidents.

n - Absolute frequency; % - Relative frequency; *Pearson's chi-square test (p<0.05)

Table 2. Distribution of deaths by sex and place of occurrence, according to group of causes, in Feira de Santana, Bahia, Brazil, from 2010 to 2020.

Source: SESAB/ SUVISA/ DIVEP/ SIM (2010-2020).

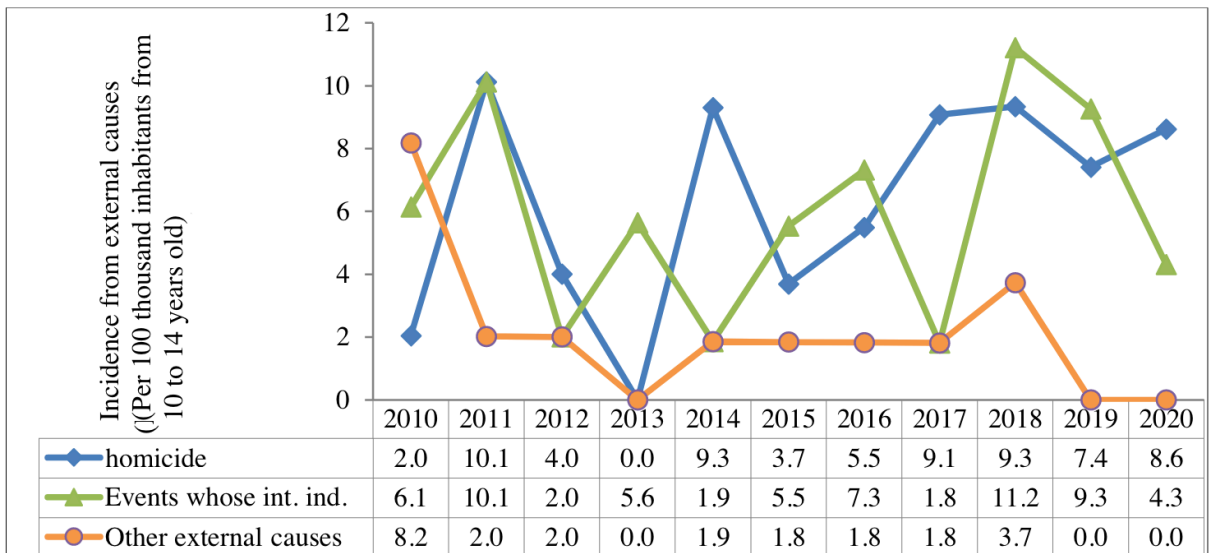
External Causes	10-14		15-19		p value
	n	BR	n	BR	
Residence					
Murder	3	11.1%	24	88.9%	0.567
undetermined events	1	6.3%	15	93.8%	
Other external causes ¹	0	0.0%	8	100.0%	
Total	4	7.8%	47	92.2%	
Hospital					
Murder	13	16.3%	67	83.8%	0.226
undetermined events	7	11.5%	54	88.5%	
Other external causes ¹	10	24.4%	31	75.6%	
Total	30	16.5%	152	83.5%	
Others					
Murder	18	17.0%	88	83.0%	0.849
undetermined events	16	19.3%	67	80.7%	
Other external causes ¹	12	20.3%	47	79.7%	
Total	46	18.5%	202	81.5%	

¹Suicide; Fall; Drowning; Burn; Other Accidents.

n - Absolute frequency; % - Relative frequency; *Pearson's chi-square test (p<0.05)

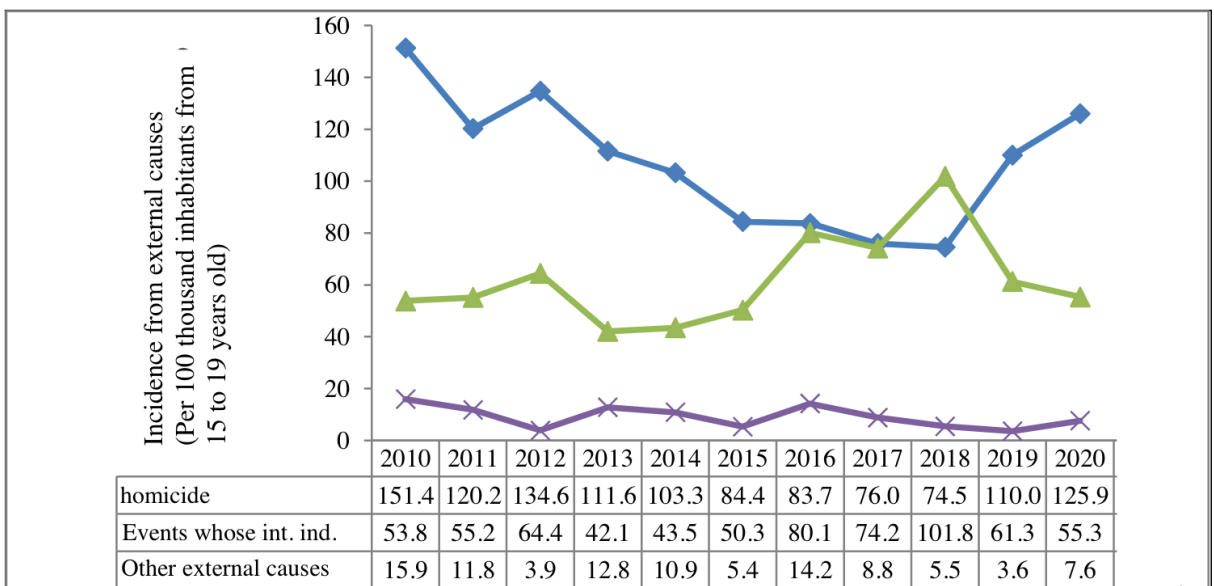
Table 3. Distribution of deaths by age and place of occurrence, according to group of causes, in Feira de Santana, Bahia, Brazil, from 2010 to 2020.

Source: SESAB/ SUVISA/ DIVEP/ SIM (2010-2020).



Graph 1. Coefficients of incidence of deaths from external causes, in adolescents, according to the age group of 10 to 14 years, in Feira de Santana, Bahia, Brazil, in the period from 2010 to 2020.

Source: MS / DATASUS / IBGE/ SESAB/ SUVISA/ DIVEP/ SIM (2010-2020).



Graph 2. Coefficients of incidence of deaths from external causes, in adolescents, according to the age group of 15 to 19 years old, in Feira de Santana, Bahia, Brazil, in the period from 2010 to 2020.

Source: MS / DATASUS / IBGE/ SESAB/ SUVISA/ DIVEP/ SIM (2010-2020).

external causes, especially in large centers, and configure a more vulnerable profile, due to the economic inequalities and health inequalities that they are subjected to (MARQUES, 2017).

There was a high frequency of homicide deaths in the city of Feira de Santana, Bahia, among males in the studied age groups (10 to 14 years and 15 to 19 years). The profile of deaths from homicides observed in the present study corroborates data available in the national literature, in which deaths from external causes among male adolescents are extremely worrying and must attract all the attention of public authorities and society in general (CARIBÉ; et al., 2016).

The literature points out that external causes remain a major public health problem in all countries, with young males, black and of low socioeconomic status, being the most exposed to mortality from external causes (MATOS; MARTINS, 2012). The results also showed that there are differences in mortality from external causes according to race/skin color (SILVA, et al., 2018).

External causes have determined an important impact in Brazil and other countries with economic, social and emotional consequences, which translate into days of absence from work, costs for health services, demands on social services, loss of productive life for the victims and their families (MATOS; MARTINS, 2012). Another important consequence of violent causes in mortality is the Potential Years of Life Lost (PLYL). The PYLL is a health indicator that translates the number of years that a person who died prematurely could have lived (MATOS; MARTINS, 2012). Between 2010 and 2015, the growth of homicides in the states of Sergipe (77.7%), Rio Grande do Norte (75.5%), Piauí (54.0%) and Maranhão (52.8%) (CERQUEIRA, et al, 2019).

In this study, deaths due to homicide in males, aged between 15 and 19 years old,

reveal a high frequency and in females, in the same age group, a frequency of 28.8%. In the age group of 10 to 14 years, the frequency of deaths by homicide was 36.4% in males and 25.0% in females.

Regarding the analysis of education, the most affected individuals are those with incomplete primary education, a factor that may be collaborating so that accidents and violence in their association with socioeconomic conditions have a greater incidence in relation to external causes (SILVA, et al, 2018).

Homicide victims have low education. However, of the total homicides recorded between 2008 and 2018, there was no information on education in 26.1% and 28.5% of deaths of men and women, respectively. As it is reasonable to assume that victims whose information on education is unknown are not proportionally distributed among the schooling ranges, but are more concentrated in the ranges with few years of study, the indicators described in the paragraph above would be underestimated (CERQUEIRA, 2020).

In this sense, we can say that the main victims of homicides are adolescents of both sexes, brown and black, with low education, which may be associated with the difficulties of life and the various forms of social exclusion.

Another major challenge, which demonstrates the effects of racial inequality in Brazil and on which the country needs to move forward, refers to the homicides of adolescents and young people, which especially affect male residents of the outskirts and metropolitan areas of urban centers. According to the 2019 Atlas of Violence, in 2017, 75.5% of homicide victims were black or brown. Among male adolescents and young people aged 15 to 19 years, homicides were responsible for 59.1% of deaths (CERQUEIRA, 2020).

Thus, the analysis of adolescent mortality indicators in the State of Bahia reveals that the field of citizenship production for this age group needs to be deepened with a view to promoting public policies that take into account universality, access, equity and the comprehensiveness of care. It is necessary to incorporate the political dimension, in addition to the technical dimension, from the construction of meanings for the taking and operationalization of decisions in the sense of transforming this reality. Therefore, it is expected that this study will enable the creation, implementation and/or improvement of policies in order to offer improvements in care, subsidize managers, professionals and others involved in the qualification of comprehensive care for adolescent health in the State (PINHEIRO, et al., 2019).

CONCLUSION

With this study, it was possible to trace the profile of victims aged between 10 and 19 years who died from external causes in the period from 2010 to 2020 in the municipality of Feira de Santana-Bahia, as well as the type of external causes suffered by these victims.

The results reveal that external causes for homicide were the main causes of death among male adolescents, in the black race/color, with emphasis on homicides in the brown race/color in the age group of 15 to 19 years.

Thus, the results obtained provide subsidies for the planning of health promotion actions, as well as specific protection, especially for the most vulnerable adolescents, providing a reduction in early deaths.

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