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INFANT MORTALITY RELATED TO VARIOUS TYPES OF ACCIDENTS FROM EXTERNAL CAUSES

MORTALIDADE INFANTIL RELACIONADA A DIVERSOS TIPOS DE ACIDENTES POR CAUSAS EXTERNAS

LA MORTALIDAD INFANTIL RELACIONADA CON VARIOS TIPOS DE ACCIDENTES POR CAUSAS EXTERNAS

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ABSTRACT

Objective: to analyze the deaths from unintentional injuries in children between 0 and 9 years old. **Method:** transversal, exploratory, descriptive study, with quantitative approach. Data were collected through a questionnaire. The data were analyzed in the program Microsoft Office Excel/Word 2010, presented in figures and a table, analyzed with descriptive statistics. **Results:** the results show that 58% of the victims were male and 64% of the deaths occur in the Metropolitan Region of Recife. **Conclusion:** the found data raise the need for the preparation of orientation campaigns for parents/tutors and improvement of public policies to reduce infant mortality. **Descriptors:** Infant Mortality; Epidemiological Profile; Cause of Death.

RESUMO

Objetivo: analisar os óbitos por injúrias não intencionais em crianças entre 0 aos 9 anos. **Método:** estudo transversal, exploratório, descritivo com abordagem quantitativa. A coleta de dados foi realizada por meio de um questionário. Os dados foram analisados no programa Microsoft Office Excel/Word 2010, apresentados em figuras e uma tabela, analisados com estatística descritiva. **Resultados:** constatou-se que 58% das vítimas eram do sexo masculino e (64%) dos óbitos ocorrem na Região Metropolitana do Recife. **Conclusão:** os dados encontrados suscitam a necessidade da elaboração de campanhas de orientação para os pais/responsáveis e melhoria de políticas públicas para redução da mortalidade infantil. **Descritores:** Mortalidade Infantil; Perfil Epidemiológico; Causas de Morte.

RESUMEN

Objetivo: analizar las muertes por lesiones no intencionales en niños de 0 a 9 años. **Método:** estudio transversal, exploratorio, descriptivo, con enfoque cuantitativo. La recolección de datos se realizó a través de un cuestionario. Los datos fueron analizados en Microsoft Office Excel/Word 2010, presentados en figuras y en una tabla, analizados con estadística descriptiva. **Resultados:** se encontró que 58% de las víctimas eran del sexo masculino y 64% de las muertes se producen en la región metropolitana de Recife. **Conclusión:** los datos encontrados demuestran la necesidad de desarrollar campañas de orientación a los padres/tutores y mejora de las políticas públicas para la reducción de la mortalidad infantil. **Descriptor:** Mortalidad Infantil; Perfil Epidemiológico; Causas de Muerte.

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INTRODUCTION

Accident is an unintentional, disastrous and avoidable event, triggered by the sudden and rapid action of an external cause, producing, or not, bodily injury, domestically or in other social environments, such as traffic, school, sports and leisure.¹

Children are vulnerable to accidents due to their immaturity, curiosity and developmental period at the time of their infancy, with a relationship between the types of accidents and the stages of development of the child.²

In Brazil, data from the Mortality Information System (SIM) indicate the occurrence of 4,111 deaths in children aged 0 to 9 years in 2009 (mortality rate of 12.6/100,000 inhabitants of this age group). Among these deaths, 1,129 corresponded to transportation accidents, 318 to assaults or homicides, 162 to falls and the rest to other accidents. In 2010, 89,650 hospitalizations were registered for external causes in the population aged 0 to 9 years in services funded by the Unified Health System, according to data from the Ministry of Health.³

When exposed to accidents, the pre-hospital service performs the initial care. In Brazil, SAMU (Emergency Mobile Care Service) mostly performs these services. The most common causes of care are falls, car accidents, burns, drownings.⁴

The World Health Organization considers some facts as universal in relation to childhood accident: it affects more the poor children, who are excluded in society, predominate in the male gender in a ratio of 2:1 (perhaps due to their greater motor activity) and there is a direct correlation between the child's age and the environment where the accident occurs, with more domestic accidents occurring in early life and more accidents in other environments over the years.⁵

Accidents can occur at any age; however, certain types of accidents have more incidence in certain age groups. In the last two decades, several studies in the pediatric area have focused that accidents constitute one of the greatest public health problems in any part of the world, thus perceiving the need, through epidemiological studies, to characterize the profile of children passing through pre-hospital care.

TBI is one of the most frequent problems, being the main cause of death that affects children in accidents in emergency rooms and emergencies. The most common causes of

traumatic brain injury are falls and traffic accidents.⁶

Another cause of fatal accident is traffic accident, considered as an unintended event involving at least one motorized, or not, vehicle, which circulates on a vehicle transit route, and may involve another vehicle, any physical object or pedestrian, in this case resulting in a run over.⁷

Burning is an important cause of mortality and morbidity in the pediatric age group. In the emergency services, burns correspond to approximately 3% of the attendances in children under 18 years and occupy the second place of accidental deaths, losing only to motor vehicle trauma.⁸ Damage caused by electric shock results from the direct effects of the electric current and conversion into heat during its passage through the tissues. The severity of the trauma depends on the type of current, magnitude of the applied energy, resistance, duration of contact and the path traveled by electricity.⁹

Airway obstruction is also one of the most frequent problems in accidents due to the presence of a foreign body in the throat, since suffocation can be defined as difficulty to breath, being unable to breathe, or shortness of breath.¹⁰ Foreign bodies, such as pieces of charcoal, dust, sand, fruit kernels, rice, beans or corn grains, fruit seeds, mosquitoes, flies, ants, beetles, fish bones, bone pieces, hooks, nails, thorns, needles and others can lodge in the eyes, nose, ear, throat, respiratory tract, digestive tract or under the skin.¹¹

The definition of drowning we will adopt for the present study is the respiratory discomfort caused by submersion or immersion in liquid, according to the concept adopted by Xavier¹², representing a significant cause of mortality in Brazil. These are the main external causes that occur in infant mortality registries and which are prefigured in epidemiological studies on the subject.

Child accidents have become a major public health problem, and often cause deaths and irreversible injuries. Therefore, the work is relevant, since it aims to contribute with information to subsidize the development of accident prevention strategies. The data obtained can be used for the development of public policies, thus minimizing the damages in society and contributing to a decrease in mortality statistics.

Thus, the present study aimed to analyze deaths from unintentional injuries in children aged 0 to 9 years.

METHOD

Cross-sectional, exploratory, descriptive study, with a quantitative approach, carried out at the Antônio Persivo Cunha Institute of Legal Medicine (IML) located in Recife, Brazil. The collection of population data was performed with inspection of the database of the aforementioned IML, and, when possible, the manual inspection of the book of necropsies was performed to record information on deaths. The sample consisted of 106 forms stored in the database and IML autopsy book of the deaths of children aged 0 to 9 years in the year 2012 from a questionnaire with closed questions produced by the authors themselves. The deaths inclusion criteria were individuals aged 0 to 9 years with external cause of death (Y01 to Y84 - ICD-10 code). Forms with incomplete data were excluded.

In this way, the sample was not probabilistic of the intentional type constituted by 106 forms. The data analysis and processing were performed in the programs Microsoft Office Excel and Word 2010, presented in graphs and tables,

analyzed with descriptive statistics and discussed with the literature.

Data collection took place after the approval of the research project by the Research Ethics Committee (CEP) of the Salgado de Oliveira University (UNIVERSO) under the number of CAAE: 33875814.5.0000.5289, complying with all the precepts of the resolution of the CNS 466/12.

RESULTS

Table 1 shows the deaths according to race/skin color. There were 71 victims of the pardo ethnicity (67%), 16 of the white color (15%) and 19 victims (18%) with uninformed skin color. The present study did not find black victims. Regarding the sex/gender, the male population, with 58%, is the most affected. As for the place of occurrence of the deaths, the metropolitan region of Recife presented the highest percentage (64%), followed by the state interior, with 28%.

Table 1. Distribution of victims according to race/skin color, sex/gender and deaths per region by the Institute of Legal Medicine of Pernambuco/Recife Headquarters from January to December 2012. Recife-PE, 2014.

Characteristics	Specifications	n=106	%
Race/Skin Color	White	16	15
	Pardo	71	67
	Black	--	--
	Uninformed	19	18
Sex/Gender	Female	45	42
	Male	61	58
Deaths per Region	Recife Metropolitan Region	68	64
	Inner Region of the State of Pernambuco	29	28
	Uninformed	09	08

Figure 1 shows the distribution of accidents over the study period. The number of

accidents was higher in the months of January, April, August and September.

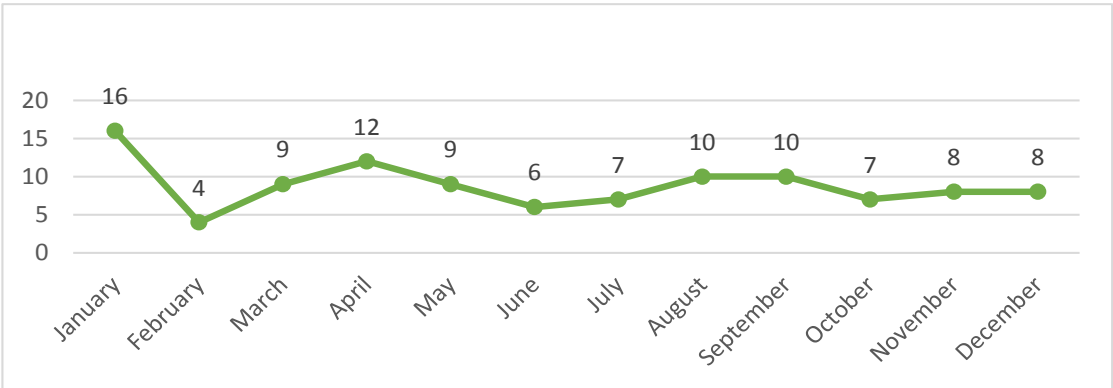


Figure 1. Temporal distribution of the 106 accidents due to external causes followed by death in the State of Pernambuco, according to the Institute of Legal Medicine of Pernambuco/Recife Headquarters, from January to December 2012. Recife (PE), Brazil, 2014.

Figure 2, analyzing the causes of death according to the age range of the victims, identified a predominance of airway obstruction accidents victimizing children under four years old (16%) and drowning accidents in individuals aged from two to nine years old (9%). Traffic accidents, although they occurred in all age groups, became more frequent from two years old and prevailed in the age group from three to nine years old (28%).

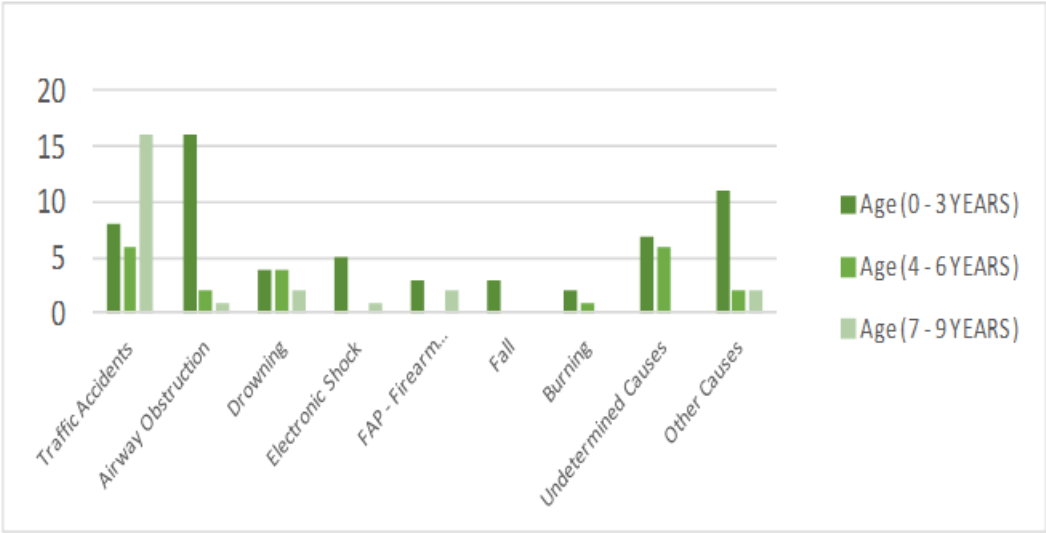


Figure 2. Distribution of accidents followed by death according to causes and age groups of the victims according to the Institute of Legal Medicine of Pernambuco/Recife Headquarters, from January to December 2012. Recife (PE), Brazil, 2014.

Figure 3 allows observing that the major cause of death were traffic accidents, with 32 victims (30%), a very significant number. The accidents due to airway obstruction were in second place, with 20 cases (19%), and drowning accidents, in third place, with 10 deaths (9%).

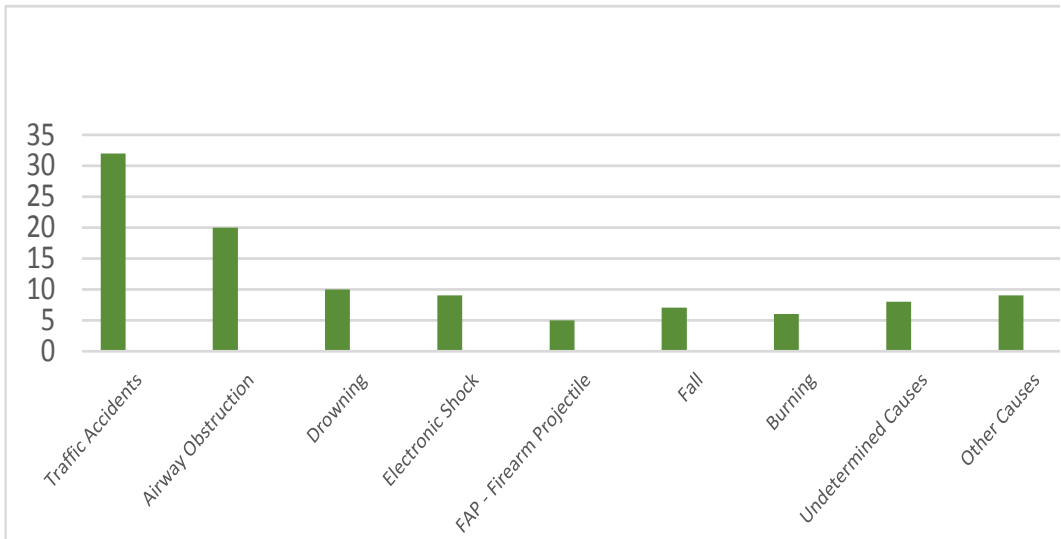


Figure 3. Distribution of accidents followed by death according to the total number of victims according to the Institute of Legal Medicine of Pernambuco /Recife Headquarters, from January to December 2012. Recife (PE), Brazil, 2014.

Figure 4 shows the locations of fatal accidents, according to the victims' gender. Regardless of this variable, accidents in households prevailed, predominantly for males at home, with 27 cases (25%). Interestingly, the female population presented a very significant number of deaths, with 15 deaths (14%).

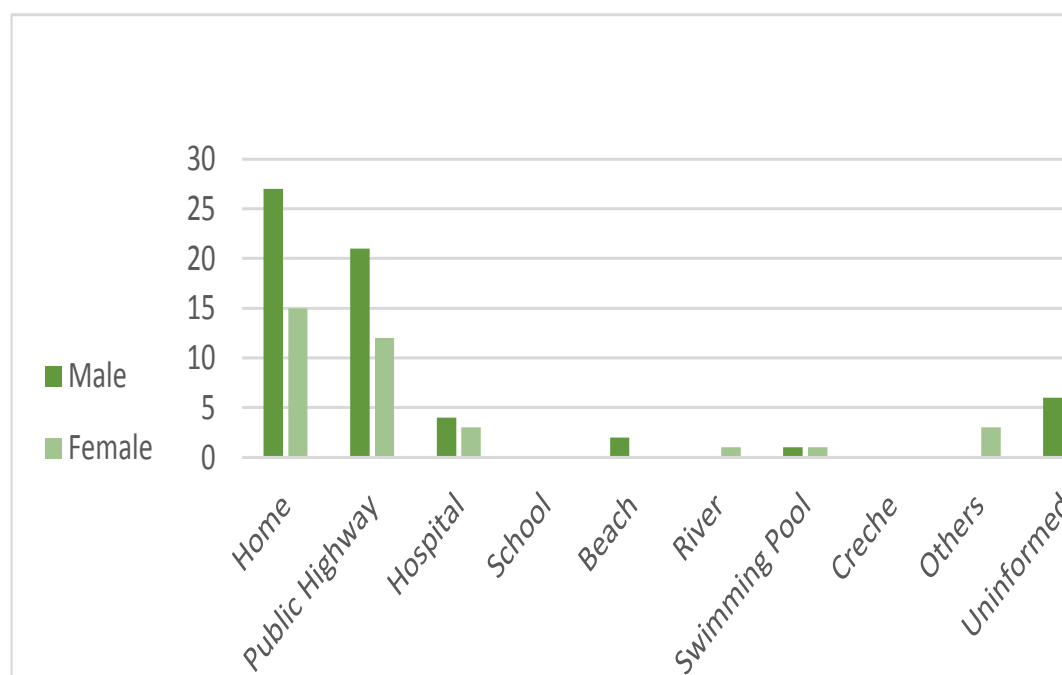


Figure 4. Distribution of accidents according to the place of occurrence and victims' gender according to the Institute of Legal Medicine of Pernambuco/Recife Headquarters, from January to December 2012. Recife (PE), Brazil, 2014.

DISCUSSION

In the present study, the main external causes were traffic accidents and airway obstruction. These main causes were followed by drowning as the third most frequent external cause, with differences occurring for the type of external cause according to age (the traffic accident was the most frequent cause for the 7-9 years-old age group, the airways obstruction, for the 0-3 years-old age group, and the 4-6 years-old age group presented the same amount for traffic accidents and undetermined cause).

The gender ratio indicates a higher number of deaths for males. Regarding color, the proportion of traffic accidents was higher for pardo and white color. These data partially agree with Martins and Matos' study; however, the present study presents traffic accident and airway obstruction as the main causes, whereas the study of Martins and Matos show traffic accidents and drowning as the main causes. A reason is that the sample obtained in the present study shows a predominance of victims in the 0-3 years-old age group, which would justify the prevalence of deaths due to airways obstruction, while the drowning external cause occurs as the third main cause of death.¹³

The present study shows the highest incidence of deaths in the month of January, corroborating the study of Santos, which presents a higher percentage in the months of July and August due to the vacation period.¹⁴

According to the analysis of place of occurrence and victims' gender, the present study verified that the male gender prevails in home accidents.¹⁵

The external cause with the greatest mortality was traffic accident (32 victims) and the age group with the highest occurrence was between seven and nine years (16 victims). Studies on morbidity from traffic accidents among young people highlight some circumstances associated with the automobile accident, such as unaddressed direction, absence of signaling, deterioration of the roadways, disrespect for signs, and consumption of alcoholic beverages and direction.¹⁶

A study on morbidity from traffic accidents in the Northeast region showed the epidemiological profile of the young victim, highlighting a predominance of deaths among the male population at all ages.¹⁷ Another study on the profile and trends of deaths from traffic accidents in the state of Pernambuco evidenced that the pedestrian profile prevailed regarding the quality of the victim, followed by car occupants and motorcyclists.

For the types of accidents, collisions prevailed. This study also showed that the coefficient of mortality for the motorcycle accident and collision category increased in the period between 1998 and 2007.¹⁸

According to the data found in the present study and in the mentioned literature, there is need for the implementation of public policies that aim at traffic education, as well as the use by the Government of coercive measures to enforce observance of the Brazilian Traffic Code. In addition, investment in road maintenance and signaling improvement is essential.

With regard to airway obstruction, it is the most common type of accident in children aged less than one year. As for the proportion,

it usually happens with male children. The reflux of gastric contents into the esophagus, oropharynx or airway causing esophageal or adjacent organ aggression, and leading to the appearance of a set of signs and symptoms, is defined as gastroesophageal reflux disease (GERD). Clinical manifestations include vomiting, dysphagia, abdominal or retrosternal pain, poor weight, irritability, apnea or ALTE, wheezing or stridor, cough and abnormal neck postures resulting from complications, such as esophagitis with or without stenosis, laryngitis, recurrent pneumonia and anemia.⁷

The existence of gastrointestinal reflux, more frequent in the first two trimesters of life, is predominant, according to literature, and can lead to death by aspiration of breast milk. Measures such as placing the infant to burp after each feeding and finding a suitable position for the infant's sleep can prevent the accident.²⁰ The guidelines need strengthening from prenatal to birth in order to avoid the occurrence of this type of accident.

The occurrence of drowning often associates with lack of care about environmental factors that cause death. Currently, there is a growing movement to investigate the factors that cause child vulnerability and, in the case of drowning, there is an association of this type of accident with the absence of vigilance by adults in a domestic environment (such as swimming pools) and leisure (such as beaches, lakes and reservoirs).

There is a belief that these environments are safe because they are frequently used environments. Among the factors associated with drowning, there are age (prevalent at both extremes), male gender, alcohol use, low socioeconomic status, and lack of supervision.⁵ Regarding *causa mortis*, drowning is the main cause of death among males aged between 5 and 14 years in the world, and the second in Brazil, demonstrating the need for preventive measures, such as the use of barriers and safety equipment.⁵

Regarding the fall category, the present study did not present a considerable result in view of the importance of this category of accident in the literature. This category of accident is responsible for almost half of the accidents recorded in the pediatric emergency room. It is more common in the male population and, in general, the parents provide assistance to the victims.²¹ In general, the occurrence of this type of accident associates with the organization of the physical space and the behavior rules imposed

on children. The measures to avoid this type of accident are family orientations, alterations of the physical space at home until the elaboration and/or enforcement of specific laws.²²

The literature shows that accidents prevail in males and shows that a significant part of childhood deaths occurs at home, constituting an important cause of death before the first year of life.²³

These data, therefore, lead to researches aiming to determine the factors of the residential environment that cause deaths from external causes and the association between their occurrence and the greater motor activity in the male individuals during childhood.

CONCLUSION

Children are exposed to innumerable environmental factors, whether at home or in other places of daily use, which pose a health risk and can lead to death, with frequent disinformation and neglect in this regard.

The results of this study point to the danger of death in children aged less than three years old, mainly due to airway obstruction. In addition, traffic accidents were also prevalent in all age groups, and drowning, which is characteristically important as a cause of death for children in Brazil, also had a significant number of cases.

The data suggest the need to develop strategies to reduce environmental risk factors for children, to develop orientation campaigns for parents and tutors, to develop new studies to understand better the conditions of these diseases and to implement and improve public policies to reduce child mortality.

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