

FACTORS ASSOCIATED WITH THE CARE OF CHILDREN AND ADOLESCENTS FOR EXTERNAL CAUSES IN EMERGENCY SERVICE

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ABSTRACT

Objective: to analyze the characteristics of children and adolescents treated for external causes in an emergency service.

Method: this is a retrospective, analytical study, developed in the emergency department of a sentinel hospital in southern Brazil. Seventy-nine children and adolescents, victims of external causes, participated in June to December 2018. Data were collected through access to medical records in May 2019. Descriptive analysis, frequency comparison and Odds Ratio were used to measure the association between the variables studied. Confidence Interval (CI) of 95% and P value of 5% were used.

Results: approximately 9.3% of pediatric emergency and emergency care were due to external causes; of these, 57% of the victims are under 12 years old and most of them are male (67%). Accidents are the most frequent events (71%), but violence is more frequent (61%) among women ($p=0.002$). The chance of violence is four times higher in women, especially self-inflicted violence/suicide attempts.

Conclusion: one out of ten pediatric emergency care is due to external causes, and emerging situations of violence and self-inflicted injuries stand out, a direct implication for public policies.

DESCRIPTORS: External causes. Child health. Adolescent health. Emergency nursing. Emergency medical services.

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FATORES ASSOCIADOS AO ATENDIMENTO DE CRIANÇAS E ADOLESCENTES POR CAUSAS EXTERNAS EM SERVIÇO DE EMERGÊNCIA

RESUMO

Objetivo: analisar as características de crianças e adolescentes atendidos por causas externas em um serviço de emergência.

Método: estudo retrospectivo, analítico, desenvolvido no serviço de emergência de um hospital sentinela no sul do Brasil. Participaram 79 crianças e adolescentes, vítimas de causas externas, nos meses de junho a dezembro de 2018. Os dados foram coletados por meio de acesso aos prontuários, no mês de maio de 2019. Utilizou-se análise descritiva, comparação de frequência e *Odds ratio* para medir a associação entre as variáveis estudadas. O Intervalo de Confiança (IC) de 95% e Valor de p de 5%.

Resultados: cerca de 9,3% dos atendimentos de urgência e emergência pediátricas foram por causas externas; destes, 57% das vítimas têm menos de 12 anos de idade e maioria do sexo masculino (67%). Os acidentes são os eventos mais frequentes (71%), porém a violência é mais frequente (61%) ao sexo feminino ($p=0,002$). A chance de violência é quatro vezes maior em meninas, especialmente as violências autoprovocadas/tentativas de suicídio.

Conclusão: um em cada dez atendimentos em emergência pediátrica é decorrente de causas externas, destaca-se as emergentes situações de violência e lesões autoprovocadas, implicação direta para políticas públicas.

DESCRITORES: Causas externas. Saúde da criança. Saúde do adolescente. Enfermagem em emergência. Serviços médicos de emergência.

FACTORES ASOCIADOS AL CUIDADO DE NIÑOS Y ADOLESCENTES POR CAUSAS EXTERNAS EN UN SERVICIO DE URGENCIA

RESUMEN

Objetivo: analizar las características de los niños, niñas y adolescentes atendidos por causas externas en un servicio de urgencias.

Método: estudio analítico retrospectivo realizado en el servicio de urgencias de un hospital centinela del sur de Brasil. 79 niños y adolescentes, víctimas de causas externas, participaron de junio a diciembre de 2018. Los datos se recolectaron mediante acceso a historias clínicas, en mayo de 2019. Se utilizó análisis descriptivo, comparación de frecuencias y *Odds ratio*. Para medir la asociación entre las variables estudiadas. El intervalo de confianza (IC) del 95% y el valor p del 5%.

Resultados: aproximadamente el 9,3% de la atención pediátrica de urgencia se debió a causas externas; de ellos, el 57% de las víctimas son menores de 12 años y la mayoría son hombres (67%). Los accidentes son los eventos más frecuentes (71%), pero la violencia es más frecuente (61%) entre las mujeres ($p=0,002$). La probabilidad de violencia es cuatro veces mayor en las niñas, especialmente violencia autoinfligida/intentos de suicidio.

Conclusión: una de cada diez visitas a urgencias pediátricas se debe a causas externas, se destacan las situaciones emergentes de violencia y autolesiones, una implicación directa para las políticas públicas.

DESCRITORES: Causas externas. Salud del niños. Salud del adolescente. Enfermería de urgencia. Servicios médicos de urgencia.

INTRODUCTION

Research in pediatric emergency has been poorly developed, requiring, in addition to resources to encourage research, training of researchers with mastery and knowledge in the field. Therefore, this is one of the challenges of the coming decades, and this field should be considered as a priority in research for the health of children and adolescents¹.

Among the care of pediatric emergencies, external causes are highlighted. They cause about 950,000 deaths annually, which corresponds to 40% in the infant-juvenile age group². External causes include accidents and violence that, in addition to currently representing the main cause of death among the population segment from one to fourteen years, also causing irreparable physical and psychological damage and providing a set of health problems, which reflects in high financial, social and family costs¹⁻².

From this perspective, accidents can be defined as a sequence of unintentional occurrences in a short period of time, where there is transfer of energy from the environment to individuals through an external agent that will lead to imbalance, leading to physical, material and/or emotional injuries. This energy can be defined as thermal (burns), chemical (poisonings), mechanical (collisions, falls), or even electrical (shocks)³.

Violence against children and adolescents includes physical and emotional abuse, sexual abuse and neglect. In infants and young children, violence arises in the form of ill-treatment of family members, caregivers and other authority figures. As children's age increases, violence between colleagues and in intimate relationships, such as bullying, fights, sexual violence and aggression, including violence by firearms or bladders, is common. During childhood, one in four children suffers physical abuse, while almost one in five girls and one in 13 boys are victims of sexual abuse. Homicide is one of the top five causes of death for adolescents. Despite the high prevalence, this type of violence is hidden and may not be reported, an index that can go unnoticed⁴.

The infant-juvenile population is extremely susceptible and vulnerable to these injuries. On average, 12 children are injured per minute and, every 101 minutes, a child dies in the world as a result of these injuries, mainly due to their curiosity, immaturity, their abuse of courage and consumption of alcohol and drugs by adolescents and young people, which are equally important determinants. Furthermore, the high rate of social inequality and the unstructured process of urbanization are highlighted as factors that influence this susceptibility, mainly due to violence and the exclusion of the low-income population^{3,5}.

In 2001, the Ministry of Health implemented the Brazilian National Policy for The Reduction of Morbidity and Mortality in Accidents and Violence (PNRMAV - *Política Nacional de Redução de Morbimortalidade de Acidentes e Violências*), aiming at its reduction through systematized and articulated actions. This policy establishes prevention and promotion actions aimed at avoiding episodes of accidents and violence as well as conduct directed to the treatment of victims⁶.

Similarly, in 2008, the World Health Organization (WHO) published the World Report on Child Injury Prevention. This report highlights that the prevention of child and youth injuries resulting from external causes should be a shared responsibility between governments, non-governmental organizations, institutions, academics, international companies and the business sector. Thus, the responsibilities of health services are: lead and perform research, data collection and analysis, implementation, monitoring and evaluation of interventions, and the primary, secondary and tertiary supply appropriate to the actions directed to this care^{2,7}.

Considering the above, it is evident that the characterization of external causes demands in children and adolescents is a preponderant aspect in the construction of strategies for care directed to this segment, emphasizing the importance of educational and preventive activities, aiming to mitigate the damage to individuals and society. Therefore, the present study aims to analyze the characteristics of children and adolescents treated for external causes in an emergency service.

METHOD

This is a documentary analytical study, developed in an emergency service of a large sentinel hospital, reference center in health, research and teaching of northern Rio Grande do Sul State for the Brazilian Unified Health System (*Sistema Único de Saúde* - SUS), which comprises 144 municipalities and a population of approximately 1,158,000 inhabitants⁸. The study participants were children and adolescents who were victims of external causes treated in an emergency unit. For the purposes of this study, persons up to incomplete twelve years old were considered children, and those between incomplete twelve and eighteen years old were considered adolescents⁹.

Medical records of children and adolescents assisted in the emergency unit of the aforementioned hospital, from June to December 2018, victims of external causes caused by accidents and/or physical or psychological violence were included. Medical records that did not present clear information for the development of the research were excluded.

Data collection was developed from April to June 2019, based on the information provided in the electronic medical records of the respective hospital. The definition of external cause was established through the Tenth Revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10), belonging to chapter XX-External causes of morbidity and mortality¹⁰.

A physical instrument specific to collect the data was used, which was tested by pilot test and subsequently filled out exclusively by research assistants [nursing students] duly trained by the responsible researchers. The study variables were determined by patient characteristics (sex and age), clinical and characterization of the external cause [classification of the external cause (accident or violence), nature of the injury originated and type of accident and violence].

A total of 853 visits to children and adolescents were recorded from June to December 2018, and 774 medical records that did not fit the inclusion criteria of the study were excluded, leaving 79 medical records for the research corpus. After being collected, double data entry and verification of possible inconsistencies was performed using the EpiInfo program. Inconsistencies were corrected with a return to the physical form. After the final constitution of the database, these were tabulated and analyzed by means of absolute and relative frequency and frequency comparison (between nominal, dichotomous variables) between the independent variables [type of external cause, sex, age group] with the dependent variables characterization. The SPSS program, version 17, was used, including the frequency comparison tests (chi-square and Fisher) and significance less than 5%. To analyze the external cause of violence, Odds Ratio (OR) was used, using 95% CI in the comparison between the variables suffered violence (yes; no), type of violence, with the independent variables sex (male; female) and age group (child; adolescent).

The study follows the recommendations of Resolution 466/2012 and was approved by the Institutional Review Board of *Universidade Federal de Santa Maria*.

RESULTS

In the period assessed, there were 853 emergency visits to children and adolescents. Of this total, 9.3% (n=79) corresponded to events due to external causes, in which 70.9% (n=56) were due to accidents and 29.1% (n=23) due to violence. The mean age of participants was 9.5 years. Analyzing age group, the results showed that the highest number of cases occurred with adolescents (43%), followed by schoolchildren (25.4%), preschoolers (20.2) and infants (11.4%). As for sex, the most prevalent was males, with 64.6% (n=51).

Accidents were the most frequent reasons for care in the male population (75%), when compared to females ($p < 0.01$). There was no significant difference in the shift in which the incidents occurred. Comparing type of occurrence in relation to age group, it is noteworthy that accidents in the population of children (73%) and violence in the adolescent population (65%) ($p < 0.01$) are more frequent.

Table 1 also highlights the relationship between type of occurrence and nature of injury. Thus, it is noted that in accidents, fractures, amputations and traumas are the most frequent occurrences ($p = 0.006$). With regard to violence, exogenous intoxication and cutting/laceration are more frequent in violence ($p < 0.05$) when compared to accidents, which can differentiate the nature of injury to type of occurrence. Table 2 shows, respectively, the relationship between accidents and age group.

Overall, falls (32.1%) were the most frequent accidents, followed by exposure to inanimate mechanical forces (23.2%) and transportation (12.5%), including incidents involving automobiles, motorcycles, bicycles and pedestrians. Also, in relation to age group, it is noticed that in the population of infants, burns were more frequent (33.3%), preschoolers were the greatest victims for inanimate mechanical forces (35.3%); for schoolchildren, falls were more frequent (52.9%); for adolescents, accidents with transportation were most prevalent (33.3%). Regarding violence, maltreatment was exclusively in the infant population as well as self-inflicted injuries in the adolescent population.

Regarding the differences in frequency and OR in the comparison between sex and age group of children and adolescents who suffered violence and types of violence, Table 3 is described.

Table 1 – Factors associated with the type of occurrence/reason for meeting the external cause. Passo Fundo, RS, Brazil. 2018. (N=79)

Variable		Accidents	Violence	p
Sex	Male	75% (42)	39% (9)	<0.001*
	Female	25% (14)	61% (14)	
Shift	Day	54% (30)	52% (12)	0.910*
	Night	46% (26)	48% (11)	
Age range	< 12 years	73% (41)	35% (6)	<0.001*
	12 to < 18 years old	27% (15)	65% (17)	
Nature of injury	No injury	11% (6)	17% (4)	0.320†
	Contusion/sprain/dislocation	12,5% (7)	-	
	cut/laceration	14,3% (8)	34,8% (8)	0.039*
	Fracture/amputation/traumas	50% (28)	17% (4)	0.006†
Nature of injury	Exogenic poisoning	5% (3)	35% (8)	0.002
	Burn	8,9% (5)	4,3% (1)	0.433†
	Others	8% (5)	4% (1)	0.481†
Total		71% (56)	29% (23)	

*Chi-square test; †Fisher's exact test.

Table 2 – Description of accidents and violence by age group of victims. Passo Fundo, RS, Brazil. 2018. (N=79)

	Infant	Preschool	School	Adolescent.	Total
Type of accident (n=56)			% (n)		
Falls	16.7% (1)	29.4% (5)	52.9% (9)	20% (3)	32.1% (18)
Inanimate mechanical forces	16.7% (1)	35.3% (6)	11.8% (2)	26.7% (4)	23.2% (13)
Transportation	-	-	11.8% (2)	33.3% (5)	12.5% (7)
EHS*	-	11.8% (2)	5.9% (1)	-	5.3% (3)
Burn	33.3% (2)	5.9% (1)	-	-	5.3% (3)
AVP†	16.7% (1)	5.9% (1)	-	-	3.5% (2)
ADS‡	0	5.9% (1)	-	-	1.8% (1)
Unspecified	16.7% (1)	-	5.9% (1)	6.7% (1)	5.3% (3)
Others	16.7% (1)	5.9% (1)	11.8% (2)	13.3% (2)	10.7% (6)
Total	10.7% (6)	30.4% (17)	30.4% (17)	26.8% (15)	100% (56)
Type of violence (n=23)					
SII§	-	-	100% (1)	84.2% (16)	73.9% (17)
Aggression	-	-	-	15.8% (3)	13% (3)
Maltreatment	100% (3)	-	-	-	13% (3)
Total	13% (3)	-	4.3% (1)	82.6% (19)	100% (23)

*EHS: exposure to harmful substances, †AVP: animals and venomous plants, ‡ADS: accidental drowning and submersion, §SII: self-inflicted injuries.

Table 3 – Associated factors and the ratio of chance between the most prevalent accidents and violence in comparison with sex and age group. Passo Fundo, RS, Brazil. 2018. (N=79)

	Male	Female	P value	Child	Adolescent.	P value
	% (n)			% (n)		
Suffered accident	75% (42)	25% (14)		73% (41)	27% (15)	
Accident type						
Falls	31% (13)	35.7% (5)	0.741*	36.6% (15)	20% (3)	0.199†
IMF‡	23.8% (10)	21.4% (3)	0.585†	22.0% (9)	26.7% (4)	0.483†
Transportation	16.7% (7)	-		4.9% (2)	33.3% (5)	0.012
Suffered violence	39.1% (9)	60.9% (14)	0.002*	26.1% (6)	73.9% (17)	<0.001*
Odds Ratio (95%) CI	1	4.667 (1.661-13.111)		1	7.744 (2.571-23.329)	
Type of Violence						
SII§	23.5% (4)	76.5% (13)	0.01†	17.6% (3)	82.4% (14)	0.121†
Odds Ratio (95%) CI	1	16.200 (1.442-183.093)		1	4.667 (0.614-35.488)	
Aggressiveness	100% (3)	-		0	100% (3)	
Maltreatment	66.6% (2)	33.3% (1)	0.332†	100% (5)	-	

*Pearson's chi-square test; †Fisher's exact test; ‡IMF: inanimate mechanical forces; §SII: self-inflicted injuries.

Similarly, the present study also analyzed the type of violence in relation to children's sex and age group. It is worth noting that no preschool child has suffered violence. Moreover, it was observed that violence is more frequent in girls, where the chance is 4 times higher when compared to boys. The age group of adolescents was more frequent to violence, when compared to the other age groups ($p < 0.001$), a 7.7 times higher chance when compared to children. The chance of self-inflicted injuries/ or suicide attempt was 16 times higher in prevalence in girls when compared to boys. For boys, the frequency is higher in aggression and adolescent age, since there was no frequency of this violence in the female population. Regarding maltreatment, they were frequent only in the population of children, with no significant difference between sexes.

DISCUSSION

Accidents and violence in childhood and adolescence comprise peculiarities in relation to age, sex, type of occurrence and circumstances in which they develop. Regarding the age group of care, the involvement of external causes in children may be related to their curiosity, immaturity and marked development and growth. In adolescence, this occurrence is influenced by factors such as marginality and alcohol and drug consumption. Thus, while for children these injuries occur mainly in the domestic environment, in the juvenile population the extradomiciliary space is the main place of these incidents¹¹.

The findings highlight that adolescents are the main victims of external causes when compared to other pediatric age extracts, which corroborates other national and international studies, such as a study conducted in Mexico, which also pointed out, in a given period, adolescents and young male adults as the main victims of these incidents. The difference can be justified due to social activities and behaviors that they assume and that places them in situations of greater vulnerability, since this population is then involved in occurrences of accidents and violence¹².

In addition to the age group, sex also has relationships with the higher occurrence of external causes. A study points out that boys are more affected by these diseases, given also found in this study, and this inequality is directly associated with cultural and social behavior¹³.

Regarding occurrences due to accidents, males showed a high prevalence in care rates. In general, boys are given freedom from parents and family members earlier, practice more sports and dynamic activities, consume more alcohol, and are more often involved in dangerous and high-speed driving occurrences compared to women¹³⁻¹⁴.

Stratification of accidents according to the type of occurrence, it is observed that falls were the main determinant of accidents, and the age group is the priority for schoolchildren, which is consistent with what is presented in literature^{3,15}. Falls configure multiple trauma mechanisms, presenting distinct health manifestations among victims, from minor injuries to death. Due to their high rate of occurrences, these are one of the main causes of morbidity and mortality worldwide, and children are the most affected in this risk group, due to their physical and psychological particularities^{11,16}.

In this sense, since the home space itself contributes to this type of accident, parents and family members should be alerted and aware of accidents and possible protective measures, such as the care of stairs and windows, wet floors, scattered toys and loose carpets¹⁶.

Furthermore, referring to the main types of occurrences perceived in the study, accidents by inanimate mechanical forces gain prominence, identifying a significant number of occurrences among the infant population, with predominance of the age group that covers preschoolers, corroborating findings evidenced in a study conducted in Cuiabá-MT, which aimed to analyze the profile of urgent and emergency care due to home accidents caused by inanimate mechanical forces in the infant-juvenile population¹⁷.

The prevalence of accidents due to inanimate mechanical forces among preschoolers may be justified due to the stage of psychomotor development they encounter, since the home environment and its different spaces begin to be a reason for interest and curiosity; however, they are not yet able to identify and protect themselves from situations that may offer them some kind of risk¹⁸. Additionally, in a study that assessed the relationship between the supervision of the responsible person and acute unintentional injury, it was noticed that the lower the direct supervision, the greater the occurrences and the severity of the injuries¹⁹.

Thus, considering the scope of this type of occurrence, it is necessary that the nursing professional act in the construction of educational activities in the home environment and collective housing, empowering caregivers to enable these children a safe space for their growth, development and recovery¹⁷.

Regarding traffic accidents, the study presents this as the third main cause of hospitalization in the emergency room for accidents in the infant-juvenile population, predominantly occurring with male adolescents. Correlated with this data, a study conducted in France points to this type of occurrence as the main cause of hospitalization in adolescence, and this age group is responsible for 23% of traffic deaths¹⁸. According to data from the Ministry of Health, from June to December 2018, which corresponds to the same time frame used in this study, in Brazil, 19,468 hospitalizations were recorded in SUS services due to traffic accidents (V01-V99) in the population from 0 to 19 years old, representing an expenditure of R\$ 24,148,578.15 (about US\$ 4,390,650.57) for the government and a mortality rate of 1.40/thousand inhabitants, with a total of 273 deaths²⁰.

Since adolescence is a period marked by the desires of intense experiences, added to risk behaviors, the aforementioned data can be justified by reckless behaviors associated with transportation, such as alcohol and psychoactive consumption, high-speed driving, attention deficit and cell phone use while driving¹⁸.

However, in the case of occurrences due to violence, it is perceived that the female sex is the main affected by these incidents, highlighting the marked prevalence of occurrences characterized by self-inflicted injuries/suicide attempt (X60-X84) in this public, consistent with the literature findings. Suicide attempts and self-inflicted injuries are multicausal and complex episodes, comprising existential biological, social, cultural, economic and philosophical determinants. They are characterized by a spectrum of externalizations, such as ideation, suicide plan and attempt, self-neglect and self-mutilation, the type of violence that affects victims, family members and the community²¹.

There is an intimate relationship between the sexual violence of girls under 19 years of age, about 60% of all sexual violence occurs with this victim profile, which aggregates and converges discussions with the highest chances presented in this study to this population²². This worrying data has a more serious repercussion when we analyze the response of health professionals who serve this population in emergency services. A study that analyzed professional practices, in the face of intrafamily violence against children and adolescents, highlighted that they are not effective in protecting victims, limited only to the care of physical injuries, without the necessary notification of suspected or confirmed cases of violence²³.

Among the external causes, self-inflicted injuries are worldwide among the three main causes of death, corresponding to 900,000 suicides annually with one death every 40 seconds and one suicide attempt every three seconds that, for the most part, occur in poor and emerging countries²¹. In 2018, a study conducted in Uberaba/MG also showed that females have an incidence of attempted attempts much higher than males, especially the age group 15 to 19 years, warning that women have a higher and increasingly earlier trend for this act. Among the determinants for the vulnerability of this audience, the particularities of the adolescent universe are accentuated. This, because they feel rejected, repressed and devalued, seeks, through their attitudes, the deserved attention of their family and community²⁴.

A study conducted in 2018, which aimed to analyze the distribution, prevalence and factors related to suicide attempts among young adolescents from 40 low- and middle-income countries, found that girls have a higher proportion to plan for suicide attempts in advance. Since people with a suicidal plan propose to use more lethal strategies and, consequently, are exposed to more serious injuries, there is a need for the implementation of systematic and multisectoral strategies aimed at preventing these injuries and assisting victims²⁵.

Also, with regard to violence by aggression, the findings in the present study show that the male sex is the most affected. The extent of this type of violence may be related to the premature introduction of symbols of male space, such as swords and toy revolvers, games and violent films, which in turn instigate aggressive conduct. Furthermore, the greater involvement of young males with trafficking, drug use and facilitated access to weapons are equally preponderant factors¹².

It is worth highlighting some weaknesses of the study such as the scarcity of information in filling out the records of some of the variables studied, such as the lack of standardization of notes, incomplete and disordered completion of medical records and outdated and inaccurate information of patients. It is also recognized as a limitation, the small number of cases, which restricts the possibility of data epidemiological inference, bringing only local characterization, but that instigates the performance of other studies, with larger populations, in order to draw an epidemiological profile, especially the mental health demands, evidenced in this population.

CONCLUSION

The male sex and the age group of adolescents represent the highest number of victims due to occurrences of external causes, with accidents being the main motivator of these diseases. The frequency of injuries is related to the age group of children and adolescents, in which maltreatment is more frequent in infants, falls in schoolchildren and traffic accidents, aggressions or self-inflicted injuries in adolescents. Violence is a type of external cause more prevalent in the female population, implicated in self-inflicted injuries or suicide attempts, which portray a new demand for mental health in this population.

The characterization of these children and adolescents assisted by external causes allows to give visibility to the theme in public agendas, alerting the population and managers about the dimensions of the problem constituted by a multifactorial issue, which requires multisectoral actions. Considering, therefore, that external causes are events that can be expected to predict and prevent, it is inferable that there is room for improvement with regard to an association of preventive measures in the field of justice, health, education, social welfare, finance and work, through cross-cutting activities, involving educational actions, constitutional norms, safety equipment and the opportunity for better socioeconomic conditions.

It includes preventive and universal measures, which is recommended by the Pan American Health Organization program, which includes strategies, evaluation and monitoring that can be implemented in different countries, according to their context and culture. In this way, progress towards the end of childhood violence can be accelerated.

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NOTES

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There is no conflict of interest.

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