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Knowledge and attitudes of schoolchildren about the prevention of accidents

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Abstract *Accidents are frequent in childhood because of the lower risk perception and greater vulnerability to disasters. This study aimed to analyze the knowledge and attitudes of schoolchildren concerning the prevention of accidents and associated factors. This is a cross-sectional and quantitative study conducted in November and December/2017 in Simão Dias, Sergipe, Brazil. Ninety-seven schoolchildren aged between 7 and 9 years of age from a sample calculation were evaluated through interviews with representative images. The results showed that little more than half of the children consider the use of personal protective equipment as a way of preventing injuries in case of accidents (58.8%; n=57), and is infrequent among those with low education level (PR: 0.66; 95%CI: 0.16- 0.99). The knowledge or use of this equipment was 60.8% (n=59) for safety belt, 54.6% (n=53) for helmet, 47.4% (n=46) for knee pad and 40.2% (n=39) for elbow support. Regarding attitudes, 20.6% (n=20) answered that there is no problem putting their (unwashed) hand on the wound and 12.4% (n=12) crossing the street accompanied without an adult. It was concluded that the knowledge and attitudes of schoolchildren concerning the prevention of accidents are misguided.*

Key words *Child, Accident Prevention, Protective Equipment*

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Introduction

Accidents are preventable and unintentional events that may cause physical or emotional damage. They may occur at the domestic or social level and are responsible for high morbimortality worldwide[1,2]. It is estimated that 10 million children are injured yearly as a result of accidents[3]. In Brazil, accidents have also reached considerable proportions, especially in childhood, becoming a severe public health problem[4,5]. According to the World Health Organization (WHO) and the United Nations Children's Fund (Unicef), around 830,000 child victims of accidents die every year around the world[6].

The Ministry of Health considers that the period of admission of the child to school is marked by remarkable advances in the construction of autonomous behavior, and that this increased independence may favor greater exposure to risks. It also emphasizes that, although the idea that accidents are mere fatalities is widespread, most would not occur if people were able to avoid them through safe and protective behaviors and habits that prevent the occurrence of illness or death caused by accidents[7].

It is known that the more immature the child is, the lower its perception of risk and the higher its vulnerability to accidents and disasters[5]. This vulnerability varies with the level of coordination of the nervous system, motor skills, sense of risk perception and protection given to the child by the mother and other relatives[8]. A survey conducted in Rio de Janeiro (BR), with people over 22 years of age identified a significant lack of knowledge about prevention of domestic accidents involving children[9]. This is worrying if we consider that an Italian study evidenced that 86% of patients hospitalized for burns were up to 9 years of age[10] and that Brazil recorded an increase of 37% in hospitalizations due to burns and 19% due to traffic accidents involving persons up to 14 years of age[11] between 2008 and 2015.

In 2013, the absolute number of deaths due to external causes among Brazilian children aged 0-9 years was 3,745, ranking third in the classification of child deaths[1]. External causes include unforeseen events (traffic, falls, drownings, among others) and intentional events (assault and self-harm)[12]. Also, a recent study in São Paulo identified that 2,636 cases of traffic accidents involving children and adolescents were reported during 2016, of which 1,579 were vehicle occupants (59.9%) and 990 pedestrians (37.6%)[13]. This reinforces society's need and duty to ensure that these population groups have a protective environment with adequate physical, mental and social development[1].

The role of the family or those responsible for ensuring a safe domestic environment is also mentioned. Simple measures such as removing/hampering access to sharp objects and cleaning materials are sufficient to reduce the risk of accidents in this age group[9]. Some factors such as high net, presence of stairs or steps without handrails, and exits and passages with the presence of toys, furniture, boxes or other obstructive items are associated with falls in children under five years of age[14].

It is believed that school is the ideal space to approach the prevention of accidents and first aid as early as in childhood[15]. A national study showed that educational activities are sufficient to increase knowledge about risks to children's accidents and preventive measures by children and their relatives/guardians[16]. Accident prevention measures must take place before the onset of any tasks and be maintained until their completion. First aid, in turn, is a supporting conduct in situations of suffering or risk of death and can be performed by lay or health professionals[17].

In cases of accidents at school, with the least knowledge about first aid, it is necessary to assist the children involved[18]. Therefore, it is essential to perform educational activities on this theme in different social segments and age groups, adapting only the language to the reality of the listeners[19].

In this perspective, this study can contribute to the formulation of specific strategies with a theoretical-practical approach to accident prevention and first aid for children in the school environment. Therefore, it aimed to analyze the knowledge and attitudes of schoolchildren concerning the prevention of accidents and associated factors.

Methods

This is a quantitative and cross-sectional study with descriptive and analytical approaches carried out in November and December 2017 in the municipality of Simão Dias, Sergipe, Brazil. Ninety-seven children aged 7 to 9 years of age proportionally distributed among three public elementary schools were evaluated through an interview using representative images.

The population eligible for this study consisted of 120 children based on the information

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provided by the management of the institutions. Then, the sample was calculated through the Barbetta formula[20], considering a 95% confidence level and a sample error of 5%. There was also a safety margin to cater for possible losses or withdrawals of 5% in the calculated number, which resulted in 97 children interviewed.

Schoolchildren were previously selected by simple random sampling from a daily presence list, and all those aged 7-9 years of age who were enrolled and attending classes were considered eligible. Then, at least one of the legal guardians for each selected child was summoned to attend the respective educational institution and, thus, could voluntarily sign the Informed Consent Form for the release of the child and start of the interview. Students with cognitive problems that could interfere in the comprehension of the questions of this study were excluded from the simple random selection.

Face-to-face interviews were carried out using representative images among children accompanied by their parents to collect data. The questionnaire consisted of sociodemographic and other questions related to risk behavior for accidents inside and outside the home environment and first aid. All questions were clear and objective and language appropriate to the age group. The images were used for a better understanding of the questions; they were illustrations about the correct way to cross the street, prevention of injuries when riding a bicycle, performing ironing activities, preparing food, handling hot pots, knife and stove, besides the means of protection during car, motorcycle or bicycle travel.

The following variables were used in the analysis of the individual factors associated with students' knowledge about accident prevention and first aid: gender (female vs. male), age (7 years vs. 8 or 9 years) and school series (1st or 2nd grade vs. 3rd or 4th grade) versus understanding the importance of the use of protective equipment in the prevention of accidents and correct action in case of burns.

Statistical Package for the Social Sciences (SPSS) 20.0 was used for statistical analysis. Univariate and bivariate techniques were applied to obtain the distribution of absolute and relative frequencies. Associations were investigated using the Chi-square test between qualitative/categorical variables. The prevalence ratio (PR) was estimated as a measurement of association and its respective 95% confidence intervals (95%CI). A 5% significance level was adopted for all cases.

This study was approved by the Research Ethics Committee of the Federal University of Sergipe. All care was taken to ensure the privacy and confidentiality of information, as recommended by Resolution No. 196/1996 of the National Health Council on human research. The legal guardians for the children signed the informed consent form with an assurance of refusal at any time, without the suffering any harm by the institutions.

Results

The mean age of the students was 7.9 years (SD=0.8), with 7 being the minimum and 9 the maximum (41.2%, n=40: 7 years; 30.9%, n=30: 8 years; 27.9%, n=27: 9 years). There was almost equal distribution between genders, with females corresponding to 49.5% (n=48) and males 50.5% (n=49). Regarding the series in which the child was enrolled, 27.8% (n=27) were first-graders, 38.1% (n=37) second-graders, 25.8% (n=25) third-grades, and 8.2% (n=8) fourth-graders. Most lived in urban areas (92.8%, n=90) and did not know the schooling level of their father (82.5%, n=80) and mother (72.2%, n=70). When asked if parents worked outside the home, 82.5% (n=80) of the children responded positively to the father figure and 42.3% (n=41) to the mother figure.

Just over half of the respondents believed that the use of personal protective equipment could prevent injuries in the event of accidents (58.8%; n=57) and the knowledge or use of this equipment was 54.6% (n=53) for the helmet, 47.4% (n=46) knee pad, 40.2% (n=39) elbow support, and 22.7% (n=22) for mouth guard. The use of seat belts when traveling by car or bus was mentioned by 60.8% (n=59) of the sample (Table 1).

Most schoolchildren answered that the appropriate way to cross the street would be accompanied by an adult in the crosswalk (87.6%, n=85). However, it is worth noting that 7.2% (n=7) said they would be accompanied by friends of the same age and 5.2% (n=5) alone (Table 1).

Also, in the case of superficial skin injuries, 44.3% (n=43) reported that they said to their parents that they must go to the hospital/doctor and 44.3% (n=43) washed the injured site with water and soap. Thus, attention is drawn to the fact that 11.4% (n=11) prefer to conceal the injury and say nothing to their parents. It was also verified that 20.6% (n=20) of the sample placed their (unwashed) hand on the wound site soon after any accident (Table 1).

Similarly, concerning risk behaviors for in-house accidents, 17.5% (n=17) of the children

considered that there were no problems if they wanted to use the "iron" and were unsure about the risk of skin burns with its use. Also, 25.8% (n=25) of schoolchildren think that they can cook/prepare food in the kitchen with or without the help of an adult (Table 2).

The analysis of the interference of the characteristics of the students in consideration of the importance of the use of protective equipment to prevent accidents showed that this thought was infrequent among those with less schooling (PR: 0.66; 95%CI: 0.16-0.99) ($p<0.05$). Also, although with no statistical evidence of association, the descriptive results also showed that this knowledge was higher among the older children at the time of the research (Table 3).

Concerning the analysis of the interference of the students' characteristics in the correct procedure in cases of burns, it was pointed out that no statistically significant association was found between gender, age or grade of children with this attitude ($p>0.05$) (Table 4).

Discussion

Knowledge and misconceptions regarding the prevention of accidents and first aid among

Table 1. Descriptive results of children's responses to risk behaviors for accidents outside the home and first aid (n=97). Simão Dias, Sergipe, Brazil, 2017.

Issues related to risk behavior for accidents outside the home and first aid	N	%
1. What is the correct way to cross the street?		
Accompanied by an adult in the crosswalk	85	87.6
Accompanied by friends of the same age	7	7.2
Alone	5	5.2
2. Do you think that using "protective equipment" can prevent injuries (for example by falling while on a bicycle)?		
Yes	57	58.8
No	0	0
Don't know	40	41.2
3. Do you know or have you ever worn a "helmet"?		
Yes	53	54.6
No	44	45.4
4. Do you know or have you ever worn a knee pad?		
Yes	46	47.4
No	51	52.6
5. Do you know or have you used any elbow support?		
Yes	39	40.2
No	58	59.8
6. Do you know or have you ever used a mouth guard?		
Yes	22	22.7
No	75	77.3
7. Do you usually wear a seat belt when traveling by car or bus?		
Yes	59	60.8
No	38	39.2
8. When you use a bike and an accident that results in "scratches", what do you usually do?		
I talk to my parents to take me to the doctor	43	44.3
I wash the scratches with soap and water	43	44.3
I try to hide and say nothing to my parents	11	11.4
9. Do you usually lay your (unwashed) hand at the site of "scratches/wounds" shortly after the accident?		
Yes	20	20.6
No	77	79.4

Note: N= Absolute frequency, %= Relative frequency.

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school children interviewed were evidenced. It is known that this public is vulnerable to accidents regardless of its social conditions. However, factors such as low maternal schooling, poor housing, large family composition and single and young mothers increase the risk of accidents this age group[21].

National researchers also argue that the presence and involvement of parents, constant vigilance for physical and emotional protection, stimulating developmental experiences, and nurturing networks for home childcare are all elements that facilitate the promotion of child safety. On the other hand, the inhibiting elements of this promotion are the poor perception of the characteristics of the child's development and of the singularities of the child and the overprotection and difficulties to establish limits by parents or responsible[22].

In this study, most did not know the parents' level of schooling, and when asked if they worked outside the home, 82.5% answered positively regarding the father figure and 42.3% with the mother figure. A national study showed that unemployed mothers pass on more behaviors to prevent domestic and leisure accidents in their children when compared to mothers who must go to work[23].

The children's responses to risk behaviors for accidents showed the need for a more exceptional approach to this issue since only a little more than half of the participants believed that the use of protective equipment could prevent injuries in accidents. A study indicates that the non-use of this equipment can cause more severe injuries in situations of fall or collision[24].

Regarding the use of seat belts, most respondents answered that they use this equipment. A Brazilian study has shown that two children who are victims of collision with vehicles die each day[25]. Article 1 of Resolution No. 277 establishes that the transport of children under the age of 10 should be in the back seat[26]. The use of a safety belt starts at 7 years of age; however, the spread of its use in the back seat is usually lower than expected[24].

Almost all schoolchildren responded correctly that the right way to cross the street would be accompanied by an adult in the crosswalk. However, worth highlighting are those who said they did so with their friends of the same age and alone. In this context, we stress that, when crossing the public highway, one must do so only in the proper crosswalk, obeying the signaling, and in the absence of such crosswalk, cross it perpendicularly to the sidewalks. Also, before crossing,

Table 2. Descriptive results of the children's responses on risk behaviors for accidents in the home and first aid (n=97). Simão Dias, Sergipe, Brazil, 2017.

Issues related to risk behavior for accidents in the home and first aid	N	%
1. Who do you think should use the "iron"?		
Adults	80	82.5
Adults and children	16	16.5
Children	1	1
2. Do you think the "iron" can cause skin burns in the event of an accident?		
Yes	80	82.5
No	3	3.1
Don't know	14	14.4
3. Do you think you can cook/prepare food in the kitchen?		
No, only adults can cook	72	74.2
Yes, with the help of an adult	22	22.7
Yes, without the help of an adult	3	3.1
4. How do you usually act when you have bodily injuries caused by "burns"?		
I put toothpaste or butter	45	46.4
I wash with cold water and dry with a clean cloth	40	41.2
I wash with water at room temperature	12	12.4

Note: N=Absolute frequency, %=Relative frequency.

Table 3. Associations between the profile of schoolchildren and knowledge about prevention of accidents using protective equipment (n=97). Simão Dias, Sergipe, Brazil, 2017.

Students' profile	Understands the importance of the use of protective equipment in the prevention of accidents		P-value (X^2)	P-value (Fisher)	PR (IC95%)
	Yes (n=57)	No (n=40)			
	N (%)	N (%)			
Gender					
Male	28 (49.1)	21 (52.5)	0.743	0.837	0.93 (0.51-2.57)
Female	29 (50.9)	19 (47.5)			
Age					
7 years	19 (33.3)	21 (52.5)	0.059	0.064	0.66 (0.19-1.03)
8 or 9 years	38 (66.7)	19 (47.5)			
School grade					
1st or 2nd grade	33 (57.9)	31 (77.5)	**0.045**	0.052	0.66 (0.16-0.99)
3rd or 4th grade	24 (42.1)	9 (22.5)			

Note: PR=Prevalence Ratio, 95%CI=95% Confidence Interval, X^2=Chi-square test, Fisher=Fisher's Exact Test. We employed bold to refer to statistically significant associations.

Table 4. Associations between the characteristics of schoolchildren and right action in case of burns (n=97). Simão Dias, Sergipe, Brazil, 2017.

Students' profile	Acts appropriately in case of burns		P-value (X^2)	P-value (Fisher)	PR (IC 95%)
	No (n=57)	Não (n=57)			
	N (%)	N (%)			
Gender					
Male	24 (60)	25 (43.9)	0.118	0.150	1.39 (0.84-4.36)
Female	16 (40)	32 (56.1)			
Age					
7 years	21 (52.5)	19 (33.3)	0.059	0.064	1.47 (0.19-1.83)
8 or 9 years	19 (47.5)	38 (66.7)			
School grade					
1st or 2nd grade	27 (67.5)	37 (64.9)	0.791	0.831	1.06 (0.37-2.09)
3rd or 4th grade	13 (32.5)	20 (35.1)			

Note: PR=Prevalence Ratio, 95%CI=95% Confidence Interval, X^2=Chi-square test, Fisher=Fisher's Exact Test.

one should still stay away from the curb, stand in a visible place, watch out for stalled cars or other objects that may be blocking sight, look both ways and make eye contact with the driver, to make sure one is being seen[27-29].

As for the first aid-related attitudes, in case of superficial skin injuries, it is noteworthy that some children prefer to hide the injury and say nothing to the parents, and others to place the (unwashed) hand on the wound site soon after the accident. It is essential to guide the child not to omit to the adults the occurrence of superficial skin injuries, avoiding possible complications due to inappropriate behavior such as placing the dirty hand on the wound site - an essential route for transferring disease-causing microorganisms[30].

It is worth highlighting that, in the home environment, some children answered that there are no problems if they want to use the "iron" and were unsure about the risk of skin burns following its use. Also, others have stated that they can cook/prepare food in the kitchen with or without the help of an adult. A national study

showed that, in agreement with these findings, most burns occur in the domestic environment, especially in the kitchen[31].

The understanding of the importance of the use of protective equipment for accident prevention was infrequent among those who had less schooling at the time of the research. Thus, guidance should be provided to children about the importance of the appropriate use of protective equipment for injury prevention. Authors also point out the need to sensitize parents and educators of the children so that, along with guidance, they may also present the necessary equipment for their protection[32].

Authors argue that the intersectoral perspective in the school environment to approach first aid/prevention of accidents should awaken in health professionals and training institutions the need to implement measures of permanent education for teachers, aiming at the theoretical basis, preventive measures and proper conducts[33]. It is understood that these partnerships with those who experience the problem are essential for the formulation of strategies more appropriate to the reality of the target audience. This also facilitates the socialization of these educational and public policy projects in communities and households, in order to shed light on the severity of domestic or traffic accidents in the several age groups.

This study evidenced the need for a more exceptional approach to these themes in the child population, since poor knowledge and attitudes regarding the prevention of accidents and first aid were found among children of the three public elementary schools where the study was carried out.

The children's limited knowledge about basic traffic rules, the importance of the use of protective equipment, the possible risks of accidents in the home and the minimum recommended behavior in cases of burns and other injuries were noted.

Therefore, we stress that schools can play a crucial role in this regard, including health professionals for collaboration in the sharing of this information with the students. We also suggest the introduction of this educational practice through playful activities so that the target audience can construct such knowledge in a more participative and productive way.

Collaborations

TS Reis, IS Oliveira, JMJ Santos and CKAC Freitas worked on the design, organization, design, research and writing. AGMC Farre, IDCV Rodrigues and AM Leite in design and editing. JMJ Santos and CKAC Freitas in the analysis and interpretation of data and editing, and all authors approved the final version.

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