

# Determining factors of domestic accidents in early childhood

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## Abstract

**Introduction:** Domestic accidents are one of the main causes of death among children, characterized by an event that involves multiple determinants, emphasizing, among others, intrapersonal, interpersonal, cultural and institutional factors.

**Objective:** To analyse the determinants of domestic accidents in early childhood.

**Methods:** This is an exploratory, descriptive, and cross-sectional study carried out in the Emergency Hospital of Teresina city, Piauí, Brazil, between January and March 2016. The population was composed of 21 caregivers of children under five years old, hospitalized between January and March 2016. For data collection, a structured interview was conducted on aspects related to the risk factors associated with the incidence of domestic accidents involving children. A descriptive analysis was performed, with absolute and relative frequencies for the variables. The Human Research Ethics Committee approved the research with Protocol No. 1324184.

**Results:** In relation to intrapersonal factors, pre-school children were the main victims (57.2%). For interpersonal factors, it was observed that most of participants (85.7%) considered the household unsafe for children. The evaluation of institutional factors showed that most caregivers (52.4%) had not been advised about the prevention of accidents at home. In terms of cultural factors, most participants (81%) had not heard news about domestic accidents.

**Conclusion:** Parents and caregivers have very limited knowledge about the prevention of childhood accidents at home, with male pre-schoolers the main victims of domestic accidents.

**Keywords:** accidents, child, nursing.

## INTRODUCTION

Domestic accidents in children are considered a public health problem<sup>1</sup>. It is estimated that ten million children are injured victims and a million die from accidents each year<sup>2</sup>. Fatal injuries are, however, one of the social impacts, because for each infant death caused by domestic accidents, there are numerous cases of non-fatal injuries with varying degrees of morbidity<sup>3</sup>.

Most studies on childhood accidents indicate indices higher than 50 per cent for events at home and statistically associate the domestic environment with accidents in children. A survey conducted in five hospitals in five countries (Bangladesh, Colombia, Egypt, Malaysia and Pakistan) aimed at analysing the epidemiology of accidental childhood injuries found that among the 2,660 (99%) records in which information on the site of the injury was available, 1,510 (56.8%) occurred at home<sup>4</sup>. A study con-

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ducted in 16 European countries also found a relationship between the home environment and the risk of accidents involving children less than five years of age<sup>5</sup>.

In the national context, the results of a research carried out in Cuiabá, Mato Grosso, Brazil, to identify the environmental, chemical, biological and cultural factors associated with death in accidents with children, adolescents and young adults showed that children can easily get hold of tools and plastic bags and, in all households, children had free access to the kitchen, bathroom, laundry and stove<sup>6</sup>.

However, it is essential to clarify that domestic accidents involving children have complex causes and consequences, since, besides involving the environment, determinant factors also include aspects related to the caregiver, the family and the child. That said, the interaction of these various factors, added to the social, cultural differences and expectations of society, shows a complex context that can play a role in both injury and in the mitigation of accidents<sup>7</sup>.

Therefore, identification of these factors can contribute to reducing accidents and, consequently, traumatic situations that often lead to fatal consequences<sup>7</sup>.

Thus, the objective of this study is to analyse the determinants of domestic accidents in early childhood.

## METHODS

This is an exploratory and descriptive cross-sectional study with a quantitative approach, performed at the Hospital de Urgência de Teresina (HUT), Piauí, Brazil, part of the urgency and emergency network.

The population comprised caregivers for children under five years old who were hospitalized between January and March 2016 at the paediatric clinic of the Hospital de Urgência de Teresina. The inclusion criteria were as follows: being over 18 years old; being a caregiver for one or more children from zero to four years, 11 months and 29 days, for at least six months; and performing this function for a minimum of four hours per day. The exclusion criteria were: caregivers who had a diagnosis of mental disorder and with severe motor impairment who cared for children.

Data collection for the research was performed at the HUT, in an appropriate and private place in the immediate vicinity of the hospitalization unit by performing researchers who received previous training. To carry out the interview, a form was used, in its first part composed of variables that aimed to characterize the caregiver of the child who suffered the accident (socio-demographic indicators), the care provided and hospitalization. The second part aimed to analyse the determinants of the occurrence of domestic accidents with children<sup>8,9</sup>.

The data collection instruments were organized and typed in Microsoft Excel software version 2010; they were then saved into Statistical Package for Social Sciences for Windows (SPSS) version 18.0 to generate the results from which to carry out the descriptive statistical analysis. Data were presented in tables.

Regarding ethical and legal aspects, it is worth

mentioning that the research was carried out with the approval of the Research Ethics Committee of the Federal University of Piauí, receiving favourable opinion under No. 1,324,184 in order to comply with the requirements of the National Health Council related to researches with human beings according to Resolution 466/12<sup>8</sup>.

## RESULTS

Twenty-one caregivers of children who were hospitalized during the period from January to March of 2016 in the paediatric units of the Hospital de Urgência de Teresina participated in the study. All participants were female, with the majority being between 25 and 31 years old (38.1%), and incomplete elementary school (33.3%) as a level of education. The population was also divided into single (47.6%) and married (47.6%) caregivers.

Regarding the characterization of the care provided by these caregivers to the victims of domestic accidents, it was observed that the type of caregiver most often found was the mother (95.2%) who was exclusively dedicated to the care of the child and household tasks (66.7%). The number of hours spent on care was more than eight hours per day (81%) in three shifts (81%). The majority of caregivers (52.4%) cared for two children in the first decade of life in the same household and exercised the role of caregiver for a period of time between three and four years (42.9%).

The main accident causing the hospitalization of children was falls, corresponding to 52.4 per cent. The afternoon (66.7%) was the time when the largest number of accidents occurred, while the living room (28.6%) and the garden (28.6%) were the most cited places. The predominant hospitalization time was between 12 and 24 hours (81%). Most of the evaluated cases (52.4%) had not undergone surgery and 95.2 per cent did not require hospitalization in the intensive care unit (ICU).

The upper limbs were most affected by domestic accidents in the children studied (52.3%), followed by the face (19%), the lower limbs and the abdomen (14.2%) (see Table 1).

### Analysis of the determining factors for domestic accidents with children

Child safety depends on determining factors that involve interaction between family habits, cultural norms and the environment, including intrapersonal factors (age and sex of the child, occurrence of previous accidents and blame of the child); interpersonal factors (number of persons living in the household, age of the mother of the child who suffered the accident, age of the father of the child who suffered the accident, perception of safety at home, family income, supervision of the child, presence of domestic animals in the home, accidents previously suffered by the child, provision of family and child guidance on the prevention of domestic accidents); and cultural factors (presence of firearms at home, receiving information on prevention of childhood accidents)<sup>9</sup>.

It was verified that in relation to intrapersonal factors capable of determining the occurrence of domes-

**Table 1:** Body region\* affected by domestic accidents in children hospitalized at the Hospital de Urgência de Teresina, Piauí, Brazil, 2016

Variables*	F	%
Upper limbs	11	40.7
Face	4	14.8
Abdomen	3	11.1
Lower limbs	3	11.1
Front thorax	2	7.4
Back thorax	1	3.7
Scalp	1	3.7
Genital organs	1	3.7
Neck	1	3.7

\*One or more body regions may be affected

tic accidents involving children, with regard to age, pre-school children were the main victims (57.1%). Male children (57.1%) suffered the most accidents and the majority (95.2%) of the children studied had not suffered an accident before. When asked if they thought

they were to blame for the accident, 85.7 per cent of caregivers said they did not feel guilty about the incident (see Table 2).

In the analysis of interpersonal factors, the majority of participants (85.7%) considered the household

**Table 2:** Intrapersonal factors of child victims of domestic accidents hospitalized at the Hospital de Urgência de Teresina, Piauí State, Brazil, 2016

Variables	F	%
<b>Child age when suffered the accident</b>		
Infant (28 days < 1 year)	1	4.8
Toddler (1 years < 3 years)	8	38.1
Pre-escolar (3 years < 5 years)	12	57.1
<b>Gender of the child who suffered the accident</b>		
Male	12	57.1
Female	9	42.9
<b>The child had already suffered previous accidents</b>		
Yes	1	4.8
No	20	95.2
<b>Do you think you were blamed because of child accident?</b>		
Yes	3	14.3
No	18	85.7

unsafe for children. The monthly family income of 61.9 per cent of caregivers was one to three times the minimum wage (at the time of the research 262.02 US\$). The child was being monitored in 57.1 per cent of the cases in which the accident occurred and 61.9 per cent of the interviewees considered that accidents are normal events of childhood. In 66.7 per cent of the households, there were domestic animals, as shown in Table 3.

As for previous domestic accidents, 47.6 per cent of hospitalized children had previously fallen from a chair or high places and 23.8 per cent had suffered a fall from a cart/bicycle/speed bike/motorcycle; choking had occurred in 19 per cent of children; 14.3 per cent had

been burned and none had ingested cleaning products/drugs/plants/toxins.

Concerning situations that constitute a risk for the occurrence of domestic accidents involving children, according to caregivers, 23.4 per cent of the children were bathing alone and using buckets/bowls/toilets for play. As for staying on the sidewalk or inside the home without supervision, or sleeping alone, 76.2 per cent of the caregivers responded that they did not allow it. According to the caregivers, 66.7 per cent of the children did not use a walker.

The evaluation of institutional factors showed that the majority (52.4%) of carers had not been ori-

**Table 3:** Interpersonal factors of children victims of domestic accidents hospitalized at the Hospital de Urgência de Teresina, Piauí State, Brazil, 2016

<b>Variables</b>	<b>F</b>	<b>%</b>
<b>Do you consider the home safe for the child to stay?</b>		
Yes	3	14.3
No	18	85.7
<b>Familiar income R\$</b>		
<1 minimal wage*	8	38.1
1-3 minimal wages	13	61.9
<b>When the child suffered the accident he was being monitored</b>		
Yes	12	57.1
No	9	42.9
<b>Do you think that domestic accidents are part of childhood?</b>		
Yes	13	61.9
No	8	38.1
<b>Are there pets at home?</b>		
Yes	14	66.7
No	7	33.3
<b>The child was choked before</b>		
Yes	4	19.0
No	17	81.0
<b>The child has already been burned</b>		
Yes	3	14.3
No	18	85.7
<b>The child has already ingested cleaning products/ medicines/toxic plants</b>		
Yes	0	0
No	21	100
<b>The child has already fallen off the chair or other high places</b>		
Yes	10	47.6
No	11	52.4
<b>The child bathes alone</b>		
Yes	5	23.8
No	16	76.2
<b>Child uses bucket/basin/can/bathtub for bathing or playing</b>		
Yes	5	23.8
No	16	76.2
<b>The child stays on the sidewalk of his house alone</b>		
Yes	5	23.8
No	16	76.2
<b>The child has already suffered a fall of trolley/ bicycle/speedboat/motorcycle</b>		
Yes	5	23.8
No	16	76.2

<b>The child uses/has already used walker</b>			
	Yes	7	33.3
	No	14	66.7
<b>The child sleeps alone</b>			
	Yes	5	23.8
	No	16	76.2
<b>Is there a firearm at home?</b>			
	Yes	1	4.8
	No	20	95.2

\*Minimum wage: 262.02 US\$

ented, before the child suffered the accident, regarding the prevention of accidents at home. In cases where orientation had occurred, community health agents and family members (14.3%) were mainly responsible for this action. After the accident, during hospitalization, 95.2 per cent of caregivers stated that they had not received any guidance regarding the prevention of accidents. Most of the children (42.9%) in the research

did not attend school; however, of those that did, 38.1 per cent did not receive guidance on the prevention of accidents in school settings (see Table 4).

Regarding the cultural factors associated with domestic accidents involving children, it was verified that the majority of the participants (81%) had not been aware of news about domestic accidents. Of the caregivers who had had contact with that type of news (19%),

**Table 4:** Institutional factors of child victims of domestic accidents hospitalized at the Hospital de Urgência de Teresina, Piauí State, Brazil, 2016.

Variables	F	%
<b>Before the child suffered the accident, you had been advised on how to prevent accidents at home</b>		
	Yes	10 47.6
	No	11 52.4
<b>Professional who advised on the prevention of domestic accidents in childhood before the accident which led to hospitalization</b>		
	ACS	3 14.3
	Nurse	1 4.8
	Doctor	1 4.8
	Familiar	3 14.3
	Other	1 4.8
	Not applicable (when answer above is no)	1 4.8
<b>After the child suffered the accident, you were asked about how to prevent accidents at home</b>		
	Yes	1 4.8
	No	20 95.2
<b>Professional who advised on the prevention of childhood domestic accidents during hospitalization</b>		
	Not received guidance	20 95.2
	Nurse	1 4.8
<b>Has the child ever received any guidance in the day-care centre or school on how to prevent accidents at home</b>		
	Yes	4 19.0
	No	8 38.1
	Not applicable (not attending)	9 42.9

66.7 per cent stated that it was through television. As for knowing about government initiatives to prevent domestic accidents with children, 81 per cent stated that they had no

previous experience and 81 per cent considered that it was not possible for the child to pass through childhood without accidents (see Table 5).

**Table 5:** Cultural factors of child victims of domestic accidents hospitalized at the Hospital de Urgência de Teresina, Piauí State, Brazil, 2016

Variables	F	%
<b>Have you seen/heard/read any news about occurrences of domestic accidents involving children</b>		
Yes	17	81.0
No	4	19.0
<b>Source of information</b>		
Television	14	66.7
Newspaper	1	4.8
Other	2	9.5
<b>Have you seen/heard/read any news about government initiatives (county/state/union) to prevent domestic accidents involving children</b>		
Yes	4	19.0
No	17	81.0
<b>Do you think it is possible for the child to pass through childhood without having accidents</b>		
Yes	4	19.0
No	17	81.0

## DISCUSSION

The caregivers participating in this research were young adults, and it is possible to affirm that there is a relationship between age and the prevention of the risk of accidents. The mother's age may interfere with the occurrence of domestic accidents with children because the younger the mother, the less experience she has and the greater the risk not only of accidents but of mortality related to them<sup>10</sup>.

Low levels of schooling may also be directly related to knowledge about accident prevention. A research conducted in Turkey which aimed to determine the frequency of injuries caused by accidents and related factors in children up to five years of age showed that the greater the educational level, the greater the likelihood of identifying risks<sup>11</sup>. In addition, results of a study conducted in Baghdad that aimed to assess the level of women's knowledge about domestic accidents involving children and to demonstrate their association with some demographic factors showed that mothers had poor knowledge regarding the most common domestic accidents. However, the preventive knowledge of mothers may be inversely proportional to their level of study. One possible explanation for this is that mothers with higher education work outside the home and are absent during the day, which makes children prone to accidents. It was also determined in this research that widowed and divorced parents have more information on how to protect children from accidents than married parents, perhaps because they give closer consideration to the value of their children<sup>12</sup>.

Trauma is the most significant cause of mortality and disability, accounting for more deaths than all diseases combined. The most common causes of injury in a study in Dhaka, Bangladesh, were falls, burns, injuries and traffic injuries<sup>3</sup>. According to the WHO, the five most common causes of unintentional injury are traffic injuries, falls, burns, drowning and poisoning. Such accidents affect not only children but also their families and society<sup>4</sup>.

In this research, the most frequent accident sites were living room and the garden a result similar to another study that found a higher percentage (75.8%) of domestic accidents occurring in the bedroom and living room<sup>11</sup>.

The kitchen is considered the most dangerous place in the house for children. In this study, this was the second highest place of occurrence of domestic accidents, which may be due to lack of knowledge on the part of mothers/caregivers on how to keep kitchen tools out of the reach of children<sup>12</sup>.

As a consequence of the accident, upper limb injuries were more common than lower limb injuries, as was the case in a study in Delhi, India, on the identification of the relationship between injury in children and multiple sociodemographic indicators, which demonstrated that upper limbs were affected in 53 per cent of occurrences of domestic accidents, compared to the lower limbs which were injured in only 33 per cent of cases. Moreover, there were also similar results for head and neck (5%) and chest (9%) injuries<sup>13</sup>.



The frequency of accidents is higher between three and five years of age<sup>14</sup>. It can be inferred from this observation that one year old children have a lower risk of accidents, probably due to greater supervision by those responsible, since after one year of age the child begins to acquire some independence. However, different injury risks are associated with different ages and stages of child development and require different preventive and enforcement practices.

The results of the study also show a higher prevalence of males involved in the occurrence of domestic accidents. Theories have been developed to explain this phenomenon, among which are the fact of boys to engage in high-risk activities and behave more impulsively than girls. It is also suggested that male children socialize differently from female children, under surveillance and restrictions on games and activities.<sup>15</sup> Most of the children in the study had not suffered previous accidents. Studies show that the knowledge of mothers on the prevention of domestic accidents involving children is enhanced when there is occurrence of previous accidents: they learn from their past experiences<sup>12</sup>.

Most caregivers did not feel responsible for what happened, which may relate to the belief that some accidents are inevitable in early childhood.<sup>1</sup> Still, it is possible to verify that accidents can be prevented by means of an improvement of environmental conditions, particularly conditions at home, wherein it is necessary to prioritize and recognize mothers as key factors<sup>11</sup>.

Most study participants did not consider the home a safe environment for children. This fact, coupled with parents' resistance to changing their safety behaviours, can serve as a risk factor for the development of accidents. A recent study also showed that living in rented accommodation constituted an obstacle because parents did not install safety equipment in homes they did not own<sup>1</sup>.

Children from families with less income and belonging to an unfavourable socioeconomic status are at increased risk of unintentional injury<sup>15</sup>. However, we also found in the literature results that do not show a statistically significant difference in the frequency of accidents according to income level. One explanation could be that families with a low monthly income do not report accidents because the injuries are not serious, as they would be more concerned with providing food for the family and other living conditions<sup>11</sup>.

Among the household accidents that occurred and were reported by the caregivers investigated, falls occurred in the greater proportion. Falls are often the leading cause of unintentional injury<sup>13</sup>, but not the leading cause of death. Risk factors are age, gender, income and level of schooling. In Turkish research among children who fell, 59.6 per cent were seen on an outpatient basis, which suggests that falling is the most serious type of accident to produce injuries in children under five years of age<sup>11</sup>.

It was also shown that, according to the caretakers, despite the accident, children were supervised during the development of their daily activities, such as when taking a shower, staying inside the home or on the pavement, and sleeping. This is important, since direct supervision of the child is able to significantly reduce accidental events, in-

cluding those that could be fatal<sup>16</sup>. Use of a walker was also infrequent, corroborating studies conducted by the American Association of Paediatrics on accidents in early childhood, which indicated a considerable risk of major and minor injuries and even death associated with the use of infant walkers<sup>17</sup>.

The study also found that most caregivers had not been informed about preventing domestic accidents involving children. The importance of the data is the fact that children under five are vulnerable to accidents at home when the parents' knowledge of potential risks is insufficient<sup>11</sup>. Some parents say they get a lot of information about accident prevention concerning toddlers and less information as they grow up. There are also parents who consider that they have received information; however, afterwards, access to knowledge is through personal initiative<sup>1</sup>.

In this sense, the data corroborate a survey conducted in Bogotá on accidents involving paediatric patients, which showed that 76 per cent of caregivers have never received information about accident prevention<sup>15</sup>. Therefore, the lack of implementation of prevention programmes can result in unfavourable demands on children's epidemiological profiles and the quality of life of children, thus hampering their healthy development<sup>18</sup>.

Although childhood accidents occur predominantly within homes, the school environment is not free from risks of falls and other types of accident. Thus, it is currently sought with public policies to use the school environment as an important place for preventive activities and health promotion. The recommendations aim to raise awareness and mobilization to reduce damage to the quality of life<sup>14</sup>.

The results of the study evidence that there is little action from health professionals regarding guidelines on measures to prevent domestic accidents. Health professionals have a great responsibility for educating and alerting the family to the prevention of accidents, since they give it great credence. They are active in changing behaviours and attitudes, in the sense of preventing accidents and minimizing the consequences that can arise from them. The role of the health professional is one of great responsibility in terms of sensitizing and providing information to caregivers on this issue in the scheduled or incidental contacts they have with the child<sup>19</sup>. It is necessary, therefore, to be educated to build a new way of acting inside hospitals with the aim of basing care on promoting health rather than curing disease<sup>20</sup>.

In the context of primary care, professional performance is expanding to become in reality a more citizen-based collaboration, founded on the health education practice recommended by the Ministry of Health<sup>21</sup>. This aspect is important because the paediatric consultation is a privileged space for discussion and presentation of the main information to parents and caregivers on the prevention of accidents. In addition, the focus of prevention should be not only on caregivers, but also on health professionals, politicians, legislators, the media and private companies, so that they are also properly prepared<sup>15</sup>.

Therefore, it is important to emphasize the importance of health professionals who work in children's

health on the family health strategy. It is essential that these professionals have knowledge about child development guided by the health programmes in place so there is less emphasis on the accountability of caregivers and more support from the programme guidelines<sup>18</sup>.

It is also important to involve all sectors related to health and education, along with engineering and specialized industry sectors, to implement appropriate measures in technical assistance and necessary legislative activities to reduce the risk of injury or death resulting from the causes identified<sup>3</sup>.

It is necessary to understand the culture and perceptions of society so that it is possible to promote behaviour change, even in visions strongly established regarding childcare. For the team that assists and prepares the guidelines on children's domestic accidents, knowledge of the cultural aspects of the group is fundamental to the assimilation and needs of the families of the children. There are gaps in knowledge sharing, transforming research into practice and how to obtain significant evidence on effective interventions for routine practice<sup>22</sup>.

The study presents as a limitation the fact that it is not representative of accidents that do not cause hospitalization, which are influenced by determining factors that also need to be understood. In addition, this cross-sectional study depended on self-reported information involving

the perceptions and opinions of the participants and, despite proximity to the occurrence of the accident; the data may be subject to recall bias.

It is believed that this work is innovative and pioneering in Piauí State, proposing as it does an assessment of the risk of domestic accidents involving children with the factors listed in the literature as determinants for their occurrence. These findings maintain that there are situations that, together with the development process and characteristics of the child itself, contribute to the occurrence of these accidents, enabling public health and education agencies to use this information to develop strategies for future interventions.

Thus, the evaluation of the factors concerned in domestic accidents involving children in a social, cultural and institutional context allows a greater understanding of this reality and serves as a guideline for professionals, either at primary or tertiary level, for preventive practices and attitudes according to the family context. In addition, the results of the study demonstrate the importance of the quality of the professional health worker-user relationship, since from this communication it is possible to establish links that facilitate the transfer of information on accident prevention and health promotion for healthy child development.

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## Resumo

**Introdução:** O acidente doméstico é uma das principais causas de morte entre crianças, caracterizando-se por ser um evento que envolve múltiplos fatores determinantes, destacando-se os fatores intrapessoais, interpessoais, culturais e institucionais.

**Objetivo:** Analisar os fatores determinantes para ocorrência de acidentes domésticos na primeira infância.

**Método:** Trata-se de um estudo exploratório e descritivo, transversal, realizado no município de Teresina-PI, no Hospital de Urgência, no período de janeiro a março de 2016. A população foi composta por 21 cuidadores de crianças menores de cinco anos internados entre janeiro a março de 2016. Para coleta de dados realizou-se uma entrevista estruturada sobre os aspectos relacionados aos fatores determinantes para ocorrência de acidentes domésticos com crianças. Realizou-se uma análise descritiva, a partir de frequências absolutas e relativas para as variáveis. Foi aprovado pelo Comitê de Ética em Pesquisa sob parecer de nº 1.324.184.

**Resultados:** Em relação aos fatores intrapessoais para ocorrência de acidentes domésticos, os pré-escolares foram as principais vítimas (57,2%). Na análise dos fatores interpessoais, averigua-se que a maioria das participantes (85,7%) não considerava o domicílio seguro para crianças. A avaliação dos fatores institucionais demonstrou que a maioria (52,4%) das cuidadoras não havia sido orientada quanto à prevenção de acidentes no domicílio. Sobre os fatores culturais, a maioria das participantes (81%) não havia tido conhecimento de notícias sobre acidentes domésticos.

**Conclusão:** O pré-escolar do sexo masculino é a principal vítima de acidentes domésticos e são incipientes as orientações de pais e cuidadores sobre a prevenção de acidentes na infância.

**Palavras-chave:** acidentes, criança, enfermagem.