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# Unintentional Injuries Among Children: An Observational Study in a Basic Health Unit in Ribeirão Preto, Brazil

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**Abstract:** Unintentional injuries are one of the most important public health problems in childhood that result in great medical costs, economic loss and serious consequences. Objective: the aim of this study was to determine the prevalence and some characteristics of unintentional injuries with children that are registered in childcare program in a Basic Health Unit in the city of Ribeirão Preto, Brazil. A cross-sectional study carried out in a Basic Health Unit in the city of Ribeirão Preto, Brazil, using interviews with parents or caregivers of children aged minor of 10 years, conducted after medical appointment and that contained questions related to the injury. As for the injury event the original question was: "the child suffered some kind of unintentional in the last 15 days?" Statistical analysis was conducted using descriptive statistics and differences between the genders were analyzed with the chi-squared test using the statistical program EPIINFO. The level of significance was set to  $p < 0.05$ . Among 1648 children under 10 years of age attended in the service 294 (17.8%) suffered some type of unintentional injury in the previous 15 days; of these 169 (57.5%) were males and 125 (42.5%) were females ( $p=0.126$ ). The main types of unintentional injuries were falls (50.5%), physical shock (15.4%) and cuts (14.7%). Injuries occurred more in the afternoon (50.5%), morning (32.6%) and night (17.8%). The majority occurred at home (69.4%). The distribution during the week showed that the injuries occurred more on Saturday (21.6%), Friday (17.5%) and Sunday (15.1%), but with no statistically significant difference ( $p > 0.05$ ). Regarding the care received by children, only 29 (9.9%) needed medical care. Even with all efforts to prevent nonintentional injuries, males, the domestic environment and falls still persist among the children in this study, demonstrating the importance to keep the topic in evidence considering that early infancy is a critical period for preventive strategies.

**Keywords:** Accidents, Child, Unintentional Injury, Accident Prevention

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## 1. Introduction

Actually unintentional injuries (also called accidents) are one of the most important public health problems in childhood that result in great medical costs, economic loss and serious consequences like physical and psychological sequelae that also reaches families and community [1]. Annually, in whole world, occurs more than 750000 deaths and 400 million severe injuries among 1 – 5 year-old children, many of them leading to disability and loss of productive potential years of life [2].

Children have their own characteristics that make them more susceptible to injuries and needs to evolve through

several stages of neurodevelopment until they reach adulthood. Although this transition is advantageous to development, it exposes children to several risks in periods of rapid bodily changes and the early phases of acquiring motor skills [3]. The physical, neurological and emotional immaturity that limits their physical and cognitive abilities, the curiosity and the desire to experiment, the inability to foresee and avoid dangerous situations, the motivation to imitate and repeat behavior, impatience, and anatomical characteristics (small stature, lower body mass, thinner skin than adults, large body surface, skull-body disproportion with center of gravity height of the chest and small diameter of the upper airways) are predisposing factors to injuries [4].

Nonintentional injuries occur mostly at home, in school, on roads and in recreational and sports areas [5] and the vast majority are preventable. In addition, it is important to know and to understand factors beyond the individual child in order to identify risks in different settings and populations [6].

The aim of this study was to know some characteristics of unintentional injuries occurred with children that are registered in childcare program in a Basic Health Unit in the city of Ribeirão Preto, Brazil.

## 2. Material and Methods

It is a cross-sectional study carried out in a Basic Health Unit in the city of Ribeirão Preto, Brazil, during the period from 01/07/2015 to 30/06/2016. This Basic Health Unit is responsible for a population of 19,000 and ensures follow up of approximately 4000 children. For data collection, interviews were conducted with parents or caregivers of children attending in a Basic Health Unit and who met the following inclusion criteria: age minor of 10 years, of both sexes, accompanied by a parent or a person who spends most time with them (other relatives or caregivers), which are not suffering from physical defects that impossible their mobility and are not using medicines that can change the behavior or their usual physical activities. The interviews were conducted after the medical appointment by a team of trained researchers, and the instrument used was a questionnaire that contained questions related to the child (age, sex) and the injury. As for the injury event the original question was: "the child suffered some kind of injury in the last 15 days?" This period of 15 days was established due to the higher probability of recall of events by the respondents, since for longer periods can induce people to remember the most striking facts to the detriment of those considered minor. When the answer was affirmative, information was requested about the injury: (type, place of occurrence, day of the week, time of day, and care received by child). Statistical analysis was conducted using descriptive statistics and differences between the genders were analyzed with the chi-squared test using the statistical program EPIINFO. The level of significance was set to  $p < 0.05$ . The study followed the ethical and legal aspects and was approved by the Ethics Committee at the Hospital das Clínicas, Ribeirão Preto Medical School, University of São Paulo.

## 3. Results

During the study period 1648 children under 10 years of age were attended in the service, of which 294 (17.8%) suffered some type of unintentional injury in the previous 15 days. Of these 169 (57.5%) were males and 125 (42.5%) were females. Although there was a predominance of male this difference was not statistically significant ( $p=0.126$ ).

The main types of unintentional injuries can be observed in table 1. Falls, physical shock and cuts were the most frequent. Unintentional injuries were distributed during the day and occurred in the afternoon (147/50.5%), morning

(95/32.6%) and night (52/17.8%). The majority occurred at home (202/69.4%) and the main dependencies where they occurred are shown in table 2. The distribution during the week showed that the injuries occurred more on Saturday (21,6%), Friday (17,5%) and Sunday (15,1%), but with no statistically significant difference ( $p > 0,05$ ). Regarding the care received by children, only 29 (9.9%) needed medical emergency care.

## 4. Discussion

Present study found a higher incidence of unintentional injuries among boys and this result also was observed which is in agreement with several studies of nonintentional injuries with children that have recorded more frequent involvement of boys than girls [7]. This can be justified, among other factors, to their dynamic life style and less controlled behavior [8]. It can also be verified that parents apply more supervision to girls compared to boys during play [9].

The falls predominated among injuries and this result is also similar to other authors. The literature shows that most frequent injuries among children are falls, cuts provoked by glass, knives or tools, crushing between furnitures and objects, and inadequate contact with domestic devices [7, 9]. In India, Bhamkar et al studied 351 child nonintentional injuries and found 36% falls, 23% bites, 11,7% poisoning and 8,3% burns [10]. A study of 924 Chinese children who were hospitalized showed that falls and burns/scalds were the main causes of hospitalization [11]. Similar results were found in England in a study of children under five years of age in the year 2002 [12].

The domestic environment continues to be the place with the highest incidence of nonintentional injuries since is a place where children spend most of their time, outstandingly the backyard (27,9%) and the kitchen (16,1%) as the highest risk places. These findings are in agreement with those verified by other authors such as Hurtado-Sierra [13] et al in Colombia and among children in a high-income Middle Eastern countries [14-16]. Also among Italian children [17] and in a large study conducted in the United Kingdom where it was found that accidents occur more commonly among boys and at home [13]. Previous study have also indicated that in India Inbaraj et al observed similar results [7].

In the present study the majority of the children received immediate care at home without needing to seek care in health services. Although the majority of injuries are minor, this does not diminish the importance of the impact on the morbidity profiles, emphasizing their relevant role in the health problems of the child and not being influenced by the false sense of harmlessness that can lead to negligence on the part of the caregivers [18].

Injury can and should be prevented or controlled and, for this, it is necessary to know the main characteristics related to the host, environment and causal agent [19]. Preventive actions taken with term effectiveness can reduce morbidity and mortality rates, as has occurred in the United States between 200-2009, when there was a reduction of almost

30% in unintentional injuries mortality [20].

The risks of unintentional injuries depend primarily on individual factors, adequate supervision and safety equipment that change over time because multiple reasons associated to people, behavior, customs and socioeconomic conditions [9, 21]. Parents' knowledge and practices are essential for behavior-forming of children and an appropriate use of interventions to prevent unintentional injuries [22]. Partnerships among parents, public health professionals, teachers, and community can lead to effective health promotion interventions to reduce barriers to accessing information and life-saving products [9, 23].

The primary care provider's role in injury prevention takes on increasing importance. Many injuries can be prevented through policies programs, and resources that ensure safe environments and promote safe behaviors [24]. Health professionals and those with whom they work in early years settings, have a central role to play in helping parents take action to reduce injuries. For this, it is necessary to establish some goals that must be achieved [5, 13, 25-27] such as: a) Engineering strategies (the physical environment - including any overcrowding; safety equipment - are these available and are they being used correctly?, and consumer products – medicines, cosmetics, cleaning and hygiene products, etc); b) Education strategies (child development – learn how the child development occurs and the acquisition of new skills that may expose the risk due to curiosity and mobility), the knowledge of parents and caregivers about the vulnerability of children and the major injuries to which they are subject, using the anticipatory guidance for all infants [20] c) Remove barriers to injury prevention: to anticipate injury risks and to understand some risk-taking behaviours, disclose that injuries can be avoided, do not interrupt the surveillance of the child, to request assistance when it is necessary to supervise several children, and to promote changes in the environment to reduce risk conditions [12, 20, 28].

It can be pointed out that the study has few limitations: the number of participants was small, the frequency and the characteristics of the unintentional injuries were obtained through a previous fifteen days to health service visit and parental reporting may be subject to recall bias, leading to underestimation of injuries. However, this result should serve as an alert to keep the topic in evidence considering that early infancy is a critical period for preventive strategies aimed at decreasing rates of morbidity and that education on unintentional injury prevention must be a permanent action in childhood.

**Table 1.** Distribution of major types of unintentional injuries according sex.

	male		female		p
	n	%	n	%	
fall	81	47,9	66	52,8	0,63
physical shock	27	15,9	18	14,4	0,75
cut	19	11,2	14	11,2	0,18
burn/scald	13	7,7	16	12,8	0,99
puncture	11	6,5	5	4,0	0,37
dog bite	7	4,1	3	2,4	0,43
electric shock	8	4,7	2	1,6	0,15

	male		female		p
	n	%	n	%	
foreign body ingestion	3	1,7	1	0,8	0,48
total	169		125		

**Table 2.** Distribution of unintentional injuries according place of home and sex.

	male		female		p
	n	%	n	%	
yard	54	50,0	42	46,6	0,78
kitchen	28	25,9	19	21,1	0,53
living room	17	15,7	16	17,7	0,74
bedroom	9	8,3	13	14,4	0,22
total	108		90		

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