

Frequency and Associated Factors of Home Injuries in Pre-school Children over 3 Years of Age

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ABSTRACT

Aim: The home injury risk of children is high because of a lack of awareness to danger, a sensitivity to environmental risks and curiosity about finding and learning new things. The main aims of this study were to determine the frequency of home injuries in children over 3 years of age; to examine the relationship between the frequency of home injuries and the characteristics of the home and the safety measures taken.

Materials and Methods: The study data were collected through a questionnaire on socio-demographic characteristics, safety of the home and the "Scale for Identification by Mothers of the Safety Measures Taken to Prevent Home Injuries in Children between 0-6 Ages".

Results: In this study, it was determined that 26.4% of children had had a home injury at least once in their life, and 7.3% of the children had had a home injury during the previous year. The most common home injury was falling and the most frequently injured area was the upper and/ or lower extremity. It was determined that the injuries occurred most frequently in the lounge, in summer, on Tuesdays, and in the afternoon.

Conclusion: Supervision of children is very important in terms of preventing possible injuries. It should not be forgotten that home injuries are preventable. Parents should be educated with regards to home injuries.

Keywords: Home injuries, injuries, frequency, playschool, play age child

Introduction

An accident is an unplanned, unexpected, sudden occurrence of injury, damage, or loss of person/property that can be avoided (1). According to the World Health Organization, an accident is defined as "an unexpected event that leads to physical and mental impairment that occurs suddenly" (2). An injury that happens in a house or in the surrounding area is called a home injury. In other words, home injuries are injuries that occur in the living room, kitchen, bedroom, balcony, garden, garages, etc. Home injuries are considered to be an important public health problem as they can lead to injury, disability and

death (3). Children have a high risk of home injuries due to a lack of awareness of hazards, sensitivity to environmental risks, and a curiosity about finding and learning. Especially in the pre-school period, children who are at home are more susceptible to home injuries. Injuries affect the health of the child by acting physically, psychologically and socially, causing disorder, illness, disability and even death. Although there is no definite number for home injuries in Turkey, according to research, it has been determined that 18-25% of all injuries are caused by home injuries. In our country, the ratio of home injuries in children between 0-6 years old was reported to be 38% (4) and it was found that 50-80%

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of falling events in the same age group resulted in death (5). Injuries which are the result of misbehaviour or negligence are preventable by precautionary measures.

The purpose of this study was to determine the frequency of home injuries seen in children over 3 years of age who were attending kindergartens attached to the Directorate of National Education located in a provincial centre and to investigate the home-related characteristics of these injuries and any relationships between parental safety measures and home injuries.

Materials and Methods

This cross-sectional study was conducted at a provincial centre in the Mediterranean Region. The study sample included children over 3 years of age who were attending all kindergartens attached to the Directorate of National Education in the province centre (n=1,399). It was planned to reach the entire universe without sampling but only 1,240 children were included due to reasons such as absenteeism, not knowing Turkish, not accepting the questionnaire, etc. (88.6%). Data were collected by means of a questionnaire on the socio-demographic characteristics of children and the safety of the house in terms of home injuries, "The Scale for 0-6 age group of children in order to detect Security Measures Against Homicide" and by face-to-face interviews with their mothers. Çınar and Görak (6) developed a scale in order to recognize the measures to be taken by the mothers of children between the ages of 0-6 years for the protection of their children against home injuries. This scale is Likerttype 5 and includes a total of 40 items among which 34 were positive and 6 were negative. In this scale, answers are given in the form of always, often, sometimes, rarely or never. Among the responses to positive statements; always was assessed as 5 points, often as 4 points, sometimes as 3 points, rarely as 2 points and never as 1 point. Among the responses to negative statements; always was assessed as 5 points, often as 4 points, sometimes as 3 points, rarely as 2 points and never as 1 point. Scores were calculated by adding the points from each item of the scale. The lowest score that can be obtained from the scale is 40, and the highest score is 200. A high score indicates that the mothers displayed positive behaviour in taking security measures against home injuries. The Cronbach's alpha coefficient was reported to be 0.82, and was calculated to be 0.87 in this study.

All accidents, injuries and characteristics were classified using the International Classification of Diseases-10 diagnostic code system (7).

A 20-item checklist which identifies security measures to be taken at home was prepared and the number of security measures implemented/identified at home was determined. The minimum number of security measures that can be taken is 0, and the highest number of security measures is 20.

The dependent variable of research was the condition of child who had had a home injury in the past year; and independent variables were; age, gender, having a chronic illness, the presence of a person in need of special care at home, income status, mother's age, mother's educational status, mother's occupation, father's age, father's educational status, father's occupation, type of house, type of home heating system and the security measure scale points. Data were evaluated using descriptive statistics, t-test and chi-square analysis via the SPSS version 15.0 package program.

In univariate analysis, variables that were significantly related to home-related injuries (having chronic illness, low income, number of home-based measures) and the safety measure diagnostic score (not significant) were included in the logistic regression model. The analysis was performed by the backward-LR method. The model fit was assessed by the Hosmer-Lemeshow test and as the test result was p>0.05 (p=0.672), it was determined that the model had a high predictive value.

Required permissions for the study was obtained from the Ethics Committee of the Süleyman Demirel University Faculty of Medicine (Decision no: 200).

Results

In our study group, 50.4% were male, the average age was 55.8±9.0 months (Table I). 92.1% of the children's families were nuclear families and 8.2% of children's families had low income. The mean age of the children's parents was 33.1±5.0 years (mothers) and 36.3±5.4 years (fathers). 51.0% of the parents and 60.0% of the fathers had graduated from university. 40.7% of the parents and 1.7% of the fathers were not working. 81.5% of the houses in which the children live were apartments (Table II). 26.4% of the children had had a home injury at some point in their life and 7.3% of them had a home injury within the previous year. Within the previous year, the two most common types of home injuries resulted from falling from rest/armchair/furniture/tree (25.3%) or collision with objects (19.2%). The most commonly injured area of the body was the upper and/or lower extremity (53.5%). The most common cause of injury was household items/blunt

Characteristics	Tatala	Home injury occurance		
	Total	Positive	Negative	p-value
Age of children [Mean (±SD)]	55.8 (±9.0)	54.7 (±10.3)	55.9 (±8.9)	0.003
Gender [n (%)]				0.462
Male	615 (49.6)	48 (7.8)	567 (92.2)	
Female	625 (50.4)	42 (6.7)	583 (93.3)	
Number of siblings [Mean (±SD)]	0.9 (±0.8)	1.0 (±0.8)	0.9 (±0.7)	0.502
In which order [n (%)]				0.429
First-single	833	43 (6.8)	590 (93.2)	
Middle	73	8 (11.0)	65 (89.0)	
Last	534	39 (7.3)	495 (92.7)	
Chronic disease [n (%)]				
Yes	64 (5.2)	10 (15.6)	54 (84.4)	0.021
No	1176 (94.8)	80 (6.8)	1096 (93.2)	
Total [n (%)]	1240 (100.0)	90 (7.3)	1150 (92.7)	

Characteristics	Total ^a	Home injury occurance		
		Positive	Negative	p-value
Family type [n (%)]	·			
Nucleus	1142 (92.1)	84 (7.4)	1058 (92.6)	0.215
Extended family	66 (5.3)	2 (3.0)	64 (97.0)	
Single parent	32 (2.6)	4 (12.5)	28 (87.5)	
Number of people living at home [Mean (±SD)]	3.9 (±0.9)	4.0 (±0.9)	3.9 (±0.8)	0.612
People who needs special care at home				
Yes	21 (1.7)	1 (4.8)	20 (95.2)	0.657
No	1219 (98.3)	89 (7.3)	1130 (92.7)	
Income level of the family				
Poor	17 (1.4)	1 (5.9)	16 (94.1)	0.826
Middle and upper	1223 (98.6)	89 (7.3)	1134 (92.7)	
The income-expense balance of the family				
Income equal to expense or income more than expanse	1138 (91.8)	75 (6.6)	1063 (93.4)	0.002
Income less than expense	102 (8.2)	15 (14.7)	87 (85.3)	
Mother's age [Mean (±SD)]	33.1 (±5.0)	32.8 (±4.6)	33.1 (±5.0)	0.580
Educational status of mother [n (%)]				
High school and lower	608 (49.0)	49 (8.1)	559 (91.9)	0.286
University and higher	632 (51.0)	41 (6.6)	591 (93.4)	

	Total ^a	Home injury occurance		
Characteristics		Positive	Negative	p-value
The working condition of the mother [n (%)]				
Not working	505 (40.7)	42 (8.3)	463 (91.7)	0.234
Working	735 (59.3)	48 (6.5)	687 (93.5)	
Father's age [Mean (±SD)]	36.3 (±5.4)	36.3 (±4.5)	36.3 (±5.4)	0.952
Educational status of father [n (%)]				0.503
High school and lower	496 (34.0)	39 (7.9)	457 (92.1)	
University and higher	744 (66.0)	51 (6.9)	693 (93.1)	
The working condition of the father [n (%)]				0.882
Not working	16 (1.7)	1 (6.2)	15 (93.8)	
Working	1219 (98.3)	88 (7.2)	1131 (92.8)	
Type of house [n (%)]				
Apartment	1010 (81.5)	73 (7.2)	937 (92.8)	0.931
Single house	230 (18.5)	17 (7.4)	213 (92.6)	
Type of house heating [n (%)]				
Heater	1139 (91.9)	81 (7.1)	1058 (92.9)	0.504
Stove	101 (8.1)	9 (8.9)	92 (91.1)	
Number of security measures taken at home [Mean (±SD)]	15.9 (±2.6)	15.2 (±2.6)	16.0 (±2.6)	0.018
Security measure diagnostic score [Mean (±SD)]	174.5 (±15.2)	171.4 (±16.7)	174.8 (±15.1)	0.040
Total [n (%)]	1240 (100.0)	90 (7.3)	1150 (92.7)	

objects (68.7%). 63.6% of the children were treated in a health facility after their injury and 3.0% had permanent damage (Table III). The injuries mostly happened in the living room (25.3%). The injuries most frequently occurred in June-July-August (38.4%), on Tuesdays (19.2%) and in the afternoon (47.5%) (Table IV). The mean score of the security measures of the mothers was determined to be 174.5±15.2 (minimum: 98/maximum: 200). The safety measures score was lower in those mothers whose children who had had an injury (p=0.040). It was determined that fewer safety precautions were taken in the homes of those children who had had an injury (p=0.018) (Table II). Household injuries were more frequent among children with chronic illnesses and those living in families with lower incomes (p=0.021 and p=0.002) (Table I and II). There was no difference in the frequency of household injuries according to variables such as age of the child, number of siblings, number of children, number of people living at home, or the age of the parents or their education (Table I and II).

The variables and analysis results that were significant in this model when the variables that were significantly related in univariate analyses (having chronic disease, low income, home prevention measure, and security measure diagnosis score) were taken into the logistic regression model are shown in Table V. It was seen that a chronic illness in the child [odds ratio (OR)=2.68] and a low income in the family (OR=2.73) were found to increase the incidence of home injuries. On the other hand, a high security assessment diagnostic score of the mothers (OR=0.98) was found to reduce the incidence of home injuries.

Discussion

In this study, the frequency of home injuries in children over 3 years of age attending a kindergarten was determined and factors relating to these home injuries were examined. 26.4% of the children were found to have had a home injury during a period of their lives, and 7.3% were found to have had a home injury within the previous 1 year. Similarly, in a thesis study conducted by Boztaş (8) with children aged

between 0-48 months, the incidence of injuries as a result of home injuries during their lives was reported to be 24.5%. In a study conducted in a children's clinic of a university hospital, 30.2% of children in the 0-6 age group were found to have had at least one home injury (9). It is possible that

Table III. Characteristics of injuries due to home	injuries in the
last year in the research group	,
Characteristics	n (%)
Type of injury	
Falling from bed/sofa/furniture/tree	25 (25.3)
Collision with objects	19 (19.2)
Falling due to slipping/falling from the stairs	17 (17.2)
Compression, catching, crushing, pressing between objects	10 (10.1)
Contact with hot liquids/household appliances/materials	8 (8.1)
Contact with animals/biting	6 (6.0)
Contact with sharp object	5 (5.0)
Other**	9 (9.1)
Injured region	
Upper and/or lower extremity	53 (53.5)
Head -neck-eye-ear-face	40 (40.5)
Body-thorax-back	3 (3.0)
General (poisoning-drowning)	3 (3.0)
Injury-causing object	
Household goods/blunt objects	68 (68.7)
Hot objects (stove, hot water, fire)	7 (7.1)
Animals	6 (6.0)
Cutting/drilling tools	6 (6.0)
Electric/electric tools	2 (2.0)
Other	10 (10.2)
Intervention in health facility after injury	
Yes	63 (63.6)
No	36 (36.4)
Result after the injury	
Full recovery	95 (96.0)
Permanent damage	3 (3.0)
Temporary damage	1 (1.0)

^{*}In the past year, a total of 99 injuries happened including 82 children involved in one injury, 7 children involved in an injury for two times and 1 children for 3 times.

99 (100.0)

some families would not remember an injury after a certain period of time. At the same time, some families might try to conceal some of their home injuries. Considering these facts, it can be thought that the frequency of home injuries in children is higher than reported (10). This is an important public health problem because of the high incidence of home injuries in children and their consequences such as permanent injury or even death. One of the most important

Table IV. In the research group, spa of the home injuries in the last year	ce and time characteristics			
Characteristics	n (%)			
The place where the injury happened				
Lounge	25 (25.4)			
Living room	14 (14.1)			
Children room	14 (14.1)			
Kitchen	14 (14.1)			
Garden	8 (8.1)			
Master bedroom	7 (7.1)			
Entree	7 (7.1)			
Apartment vacancy, stairs, elevator	5 (5.0)			
Balcony, roof	3 (3.0)			
Bathroom	1 (1.0)			
Toilet	1 (1.0)			
The month of the injury				
December-January-February	19 (19.2)			
March-April-May	24 (24.2)			
June-July-August	38 (38.4)			
September-October-November	18 (18.2)			
The day of the injury				
Tuesday	19 (19.2)			
Monday	18 (18.2)			
Friday	16 (16.2)			
Wednesday	15 (15.2)			
Saturday	12 (12.1)			
Sunday	12 (12.1)			
Thursday	7 (7.0)			
Time period of the injury				
Afternoon	47 (47.5)			
Evening	27 (27.3)			
Morning	23 (23.2)			
Night	2 (2.0)			
Total	99 (100.0)			

Total

^{**}Contact with electrical devices/electric shock 2 times; ingestion of foreign bodies in to body cavities/skin 3 times foreign body evacuation/threats to breathing 2 times; medicine etc. biological substance poisoning 2 times

Table V. Logistic Regression Analysis Results					
Variable *	OR (95% confidence interval)	p-value			
Presence of Chronic Disease in Child	2.68 (1.30-5.51)	0.007			
Lower income of family	2.73 (1.49-4.99)	0.001			
Security Prevention Diagnostic Score	0.98 (0.97-0.99)	0.029			
Hoshmer-Lemeshow Test		0.672			

OR: Odds ratio (Estimated Relative Risk)

* In the Logistic regression analysis Backward-LR method; "Number of Security Measures to be taken at Home" is excluded from the model.

reasons for the frequent occurrence of home injuries is that these injuries are unpredictable. Many of these injuries happen in situations where risky behaviour is not foreseen by families (11). Another reason is that children have to live in an environment which was designated for adults (12). Designing children's environments according to the needs of children and taking precautions against injuries will significantly reduce the risk of home injuries.

In this study, it was determined that the two most common home injury types were falling and collision with objects respectively within the previous year. In a thesis study conducted by Gündüz and Aytekin (13), it was found that the most common causes of home injuries were falling (55.0%) and collision with objects (15.2%). In a study by Özmen et al. (14), it was found that falling was the most common type of home injury. This may be due to the fact that this age group is not yet aware of the danger, their muscular coordination has not yet reached a sufficient level, they have increased mobility and there is a lack of supervision by their parents.

In this study, it was determined that the most commonly injured area in children was the upper and/or lower extremity. As the most common home study accident is falling, extremity injuries can be seen more frequently. This result is compatible with other studies in the literature. In a survey conducted by Kılıç et al. (15), it was found that the most frequently injured body areas were hands, arms and fingers (55%), and legs and feet (27%) were second. In a study conducted by Sütoluk et al. (16), it was reported that the most common injury type was the upper extremity injuries.

In this study, it was determined that children had injuries the most frequently in the living room. In most of the studies in the literature, the most common location of accidents at home was identified as the living room (9,13,17).

This can be thought to be due to the fact that families spend most of their time in the living room, and that children use this part of the house as a playground.

In this study, home injuries were found to occur most frequently in summer. It is reported in the literature that injuries related to home injuries occur more frequently in spring and summer (18). This may be due to increased movement of children because of increased air temperatures and associated increased movements.

In this survey, it was found that home injuries most frequently occur on Tuesday. A study by Şahiner et al. (19) found that home injuries are most common on Monday. It is thought that injuries happen more often as a result of the parents being more tired after the first working day of the week and thus supervising their children less.

In this study, it was determined that home injuries were seen more frequently in the afternoon. This may be due to the fact that this part of the day is play-time for children. This result is similar to other studies in the literature. Boztaş's study (8) reported that home injuries occur most frequently between 12.00 and 19.00 hours. In a thesis study conducted by Yıldırım (20), it was found that children aged between 1-4 years had home injuries most frequently in the afternoon.

In this study, it was determined that the presence of a chronic disease in the child in multiple analyses was one of the determinants in the increasing incidence of home injuries. Children with health problems can be considered to have a higher risk of injury because they are more sensitive. Boztaş's study (8) found that children who had health problems experienced twice as many home injuries in a twoweek period when compared to children who did not have any health problems. In this study, it was determined that, in multiple analyses, a lower family income is a determinant in the increase in the frequency of home injuries. In other studies in the literature, it was stated that the children of families with low socio-economic levels have more home injuries (10,21,22). This may be due to the fact that families with low economic levels have poor housing. The priorities of spending may differ due to the inadequate economic situations of these families. As a result, the necessary arrangements may not have been made to prevent injuries at home.

In this study, it was determined that in multivariate analyses, high scores on the safety measures of the mothers were determinants in reducing the incidence of home injuries. In other studies in the literature, it was reported that children who had had home injuries had a lower score

in the diagnosis of security measures by their mothers (10,13). This age group of children are not conscious of protecting themselves against injury. For this reason, it is very important for the mothers to create safe environments for their children and to remove any dangerous objects or keep their children away from dangerous situations.

In this study, it was found that although there was not a decisive factor in the multivariate analysis of the lower security measures taken at home by some families, fewer safety measures had been taken in the homes of children who had had a home injury in univariate analyses. An unsafe home environment plays an important role in the occurrence of home injuries. Home injuries are preventable events when injuries are predicted by identifying risk factors at home. A study by Balibey et al. (23) reported a significant positive correlation between the home unsafety score and home injuries per child.

Study Limitations

In this study, due to the memory factor, it is possible that parents might not have remembered or not fully remember home injuries which had happened to their children. The findings from this study are specific to the city where the study was conducted and differences may be seen with other cities or across the country. This cross-sectional study has limitations. As the cause and the result were evaluated at the same time, it is difficult to say that the factor lead to the result.

Conclusion

It is important for healthy societies to be protected against risks and for individuals to be in a healthy environment throughout their childhood. Injuries are an important problem which affects all of the people in a society and these preventable events can occur frequently during childhood, having negative health effects by causing physical and psychological problems.

In this study, it was found that one in four children had had a home injury at one time in their lives, the most common home injury type being falling, and the most frequently injured area was the upper and/or lower extremity. It was determined that injuries occurred most commonly in the living room, during the summer months, on Tuesdays and in the afternoon. Those with chronic illnesses, those with lower family income, and those with lower scores on the identification of security measures by their mothers were found to have more frequent domestic injuries.

Children in this age group are very inquisitive. Parental supervision of their children is very important as a means of prevention from possible injuries. It should not be forgotten that home injuries are not a matter of bad luck and they can be avoided if measures are taken. In order to determine the precautions to be taken, parents should make observations in the house and in the garden by going down to the eye level of the child. As a result, possible hazards can be determined and eliminated. Children should be informed about the conditions they should be careful about and the actions that should not be done, and they should be informed about the results of their negative behaviour. Particularly, awareness studies should be carried out for mothers and other child carers regarding home injuries.

Ethics

Ethics Committee Approval: Required permissions for the study was obtained from the Ethics Committee of the Süleyman Demirel University Faculty of Medicine (Decision no: 200).

Informed Consent: Informed consent was obtained from the participants.

Peer-review: Internally peer-reviewed.

Authorship Contributions

Design: E.U., S.Y., M.V.Y., A.Ç., Y.T., Data Collection or Processing: E.U., S.Y., M.V.Y., A.Ç., Y.T., Analysis or Interpretation: E.U., S.Y., M.V.Y., A.Ç., Y.T., Writing: E.U., S.Y., M.V.Y., A.Ç., Y.T.

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