

Medical and Social Analysis of Preschool Children Under the Age of Six Years at Secondary and Tertiary Care after Home Accidents in Hilla City

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Abstract

Background: Accidents mainly occur at home, children are the most vulnerable to in any household. **Objectives:** The goals of this study were to identify the commonest causes of home accidents that necessitate secondary and tertiary care admission. And to find out social variables related to home accidents. **Patients and Methods:** It is a descriptive hospital-based cross-sectional study which was carried out on a convenient sample of 200 preschool children who were cared for Emergency Department in Babylon Maternity and Pediatrics Hospital and Imam Sadik General Teaching Hospital whose mothers accepted to participate in this study. It was conducted over a period of four months from April 1 to August 1, 2021. Data were collected through interviewing the participants who were asked to give their verbal consent to a structural questionnaire containing information about sociodemographic factors, child, and family variables. The information was analyzed using SPSS version 24. **Result:** The rate of home accidents (falls and blows by forceful sticks) among children under the age of six years were 55.50% and 24.50%, respectively. From the different investigated factors, Paternal educational level showed significant relation to home accidents, and other variables (maternal educational level, number of family members, and home size) were found to be risk factors for home injuries. **Conclusion:** Falls were the commonest cause of unintentional injuries; in children, home accidents are still the major problem and jeopardize the lives of children. Home accidents among children under the age of six years are increasing and this issue requires more attention and effort.

Keywords: Accidents, home, preschool children, tertiary care, unintentional injury

INTRODUCTION

The World Health Organization defines an accident as an event “that occurs unwillingly and causes physical and mental damage by a sudden external force. Unintentional home accidents involve events occurring inside the home or in the immediate vicinity of the home that result in injury, which is not done deliberately but happens by accident.”^[1]

The leading cause of unintentional injuries in children; include burns, fall from height (bed, sofa, cribs, stairs, high window, etc.), choking, poisoning, foreign body in orifice/ingestion, head injury, and superficial injury.^[2]

Children, being less aware of the danger, are one of the most vulnerable groups, which can be explicated with the ongoing development of neuromotor, cognitive, physical, sociopsychological, and sensory skills. Having deficiencies

in motor systems, comparatively unbalanced gait, slowness in reactions, limited visual field, underdeveloped skills of locating voices, inability to perceive two stimuli concurrently, hyperactivity, inclination to copy their parents' behaviors, curiosity towards learning new things, children inevitably become the primary victims of accidents.^[3]

Injuries arising from home accidents are increasing community health problems. Every year many children are injured or killed as a result of accidental poisoning,

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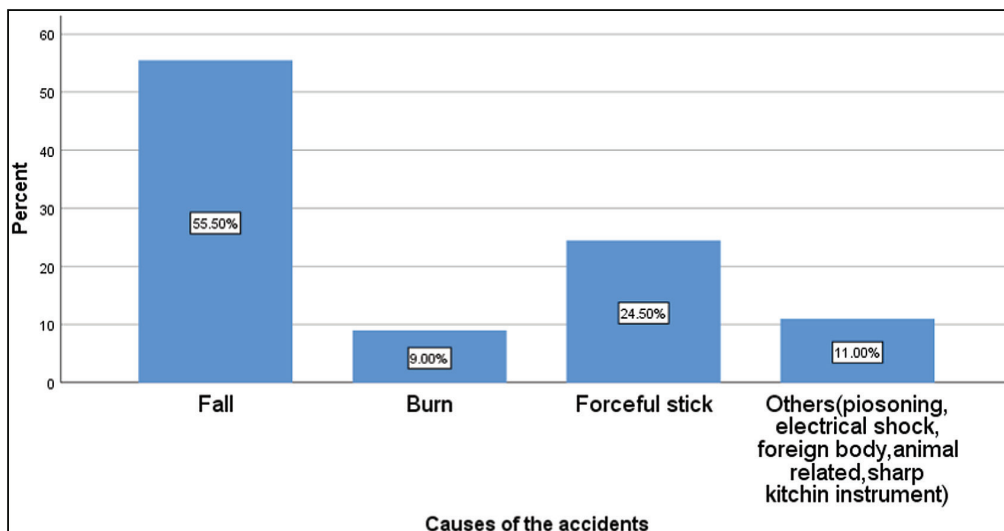


Figure 1: The main causes of unintentional home accidents that were falls followed by forceful blows by sticks. Less common were burns, electric shock, and foreign body ingestion among others

burns, and bites. Accidents are the leading cause of death and are the major reason for hospital admission and long-term disability.^[4] Small children are known to be curious; however, they are not equipped with the developmental competence to protect themselves from accidents. Furthermore, because they cannot easily maintain balance, home accidents happen to them more often.^[5] Children under the age of 6 years are most at risk from home accidents, who mostly spend their preschool period at home. Preschool years are a critical period in a child's development and preschool children are extremely vulnerable to home accidents and injury due to innate desire to explore their world and inability to perceive dangers of their actions that lead to death and disabilities.^[6]

The responsibility mostly falls upon parents in this regard. In our society, mothers usually take care of children at home; therefore, they have to take measures to prevent home accidents. Parents have three essential roles which are to protect their children from harm, promote emotional as well as physical health, enforce boundaries to ensure their children's safety, and optimize their children's development.^[7]

Parents are often knowledgeable about injury risks in the home. However, they are unaware of the scope of the child-injury problem and do not routinely think about injury risk during their day-to-day interactions with their child, they are responsible to provide a safer home environment to take protective measures and to audit the safety of living spaces of children coupled with close supervision.^[8] Parents are usually the primary decision-makers on matters affecting their children's health. Moreover, parents function as role models for their children. In addition, parents' characteristics and beliefs may be an important

consideration in attempts made to protect their children from unintentional accidents [Figure 1].^[7]

Objectives of the study

1. To identify the commonest causes of home accidents that necessitate secondary and tertiary care admission.
2. To find out social variables related to home accidents.

MATERIALS AND METHODS

Study design, setting, and time

A cross-sectional study was conducted at Babylon Maternity and Pediatrics Hospital, Imam Alsadik Teaching Hospital, Al Noor Pediatrics Hospital, and AlHilla General Teaching Hospital. The time for this study was over a period of 4 months beginning from April 1 to August 1, 2021.

Study population

This study included a convenient sample of 200 children younger than 6 years of age who attended secondary and tertiary care centers from the first of April to the first of August 2021.

Inclusion criteria

Children aged younger than 6 years of age who attended ED at secondary and tertiary care centers.

Exclusion criteria

1. Children aged 6 years old and older.
2. Intentional accidents, including accidents that occur with purposeful intent and include homicide, suicide, domestic violence, sexual assault and rape, bias-related violence, and firearms.

Pilot study

A pilot study was carried out before starting the collection of data for two weeks in AlHilla Teaching Hospital.

To test the questionnaire for any modification required, any other difficulties, to detect the time needed for data collection and to assess whether the research protocol is realistic and workable

The pilot sample included 20 respondents, who were excluded from the study sample

Sample size determination

The total sample was calculated according to the following equation:

$$n = Z^2 p(1-p)/d^2$$

where: n =sample size; $z=1.96$; P =the proportion; d =Relative precision = 0.05. The total sample required according to the equation is 200 children under six years of age.

Sampling technique

A convenient sample of children younger than 6 years of age in the above-mentioned hospitals.

Data collection tools

Data was collected by using a predesigned questionnaire by which the mothers were interviewed after giving their verbal consent, each mother was interviewed for about 15 minutes. The questionnaire included the following variables:

1. Child variables: Which included: gender, age, type of feeding, residence, numbers of children, and sleeping place.
2. Family variables: Which included: educational level of parents, occupation of parents, marital status, family income, ascended family, cigarette smoking.
3. Home variables: Which included: home size, location of home, storey of home, kitchen facilities, heating facilities, availabilities of electricity, presence of car, bicycle, working equipment, and firearms in home.

Limitation of study

1. Limited time and duration of the study.
2. Convenient sampling does not represent the whole target population.

Statistical analysis

Analysis of data was done utilizing SPSS version 20 computer software (statistical package of social science), categorical variables were presented as numbers and percentages, continuous variables were presented as mean and standard deviation, chi square test was used to show the association between categorical variables, analysis of variance was also used to determine the mean difference between groups, and P value of <0.05 was considered as statistically significant.

Ethical and administrative arrangements

1. Study protocol was reviewed and granted permission by the Ethical committee of Babylon University, College of Medicine.
2. After explaining the objectives of the study to the mothers, verbal consent was obtained from them prior to interviewing.
3. Names of participants were replaced by identification codes to keep data confidential.
4. To carry out the study, an official agreement was obtained from Babylon Health Directorate.
5. Ethical consideration: The study was conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki. It was carried out with patients verbal and analytical approval before sample was taken. The study protocol and the subject information and consent form were reviewed and approved by a local ethics committee according to the document number 95 (including the number and the date in 13/02/2021) to get this approval.

Table 1: Sociodemographic features of the children included in the study and their parents

		No.	%
Age	<2 years	38	19
	2–4 years	81	40.5
	4–6 years	81	40.5
Gender	Male	108	54
	Female	92	46
Residence	Urban	119	59.5
	Rural	81	40.5
Mother education	Illiterate	24	12
	Primary school	81	40.5
	Secondary school	37	18.5
	High school and above	58	29
Mother occupation	Employed	39	19.5
	Housewife	161	80.5
Father education	Illiterate	19	9.5
	Primary School	75	37.5
	Secondary school	30	15
Father occupation	High school and above	76	38
	Employed	193	96.5
The child lives with	Unemployed	6	3
	Both parents	196	98
Family Income	Single parent	4	2
	<300 IQD	45	22.5
	300–600 IQD	68	34
Parent smoking	>600 IQD	87	43.5
	Yes	56	28
No. of family members*	No	144	72
	3–7	131	65.5
	8–12	59	29.5
	13–19	10	5.0

*Including the extended family.

RESULTS

Table 1 shows that the majority of children were over two years of age, male, and live in urban areas. Their mothers had mostly a primary level of school education and their fathers were working. Family income was unevenly distributed with the balance tipping higher income.

Table 2: House conditions and family's properties

		No.	%
Does the family have car?	Yes	118	59
No. of rooms	1–5	143	71.5
	6–11	57	28.5
Toilet facilities	Inside home	132	66
	Outside home	68	34
Storeys in home	1	130	65
	2	70	35
Where does the child sleep?	Upstairs	36	18
	Downstairs	164	82
No. of children who share the room during sleep	0	37	18.5
	1	49	24.5
	2	59	29.5
	3	41	20.5
	4	12	6
	5	2	1
The child sleeps on	Floor	93	46.5
	Bed	93	46.5
	Crib	14	7
Presence working equipment	Yes	52	26
Presence of firearms	Yes	18	9
Toys stores	Adequate	123	61.5
	Inadequate	77	38.5
Extended family	Yes	80	40
Goods and chemicals	Yes	10	5
Bicycle	Yes	116	58
home location	Main street	16	8
	Side street	184	92
No. of cars	<30	182	91
	≥30	18	9
Type of cooker	Gas	199	99.5
	Electric	1	0.5
Location of cooker	Indoor	186	93
	Outdoor	14	7
Cooking in the religious occasions	Yes	134	67
Where does the cooking take place?	Indoor	109	54.5
	Outdoor	25	12.5
Does the family have domestic animals?	Yes	47	23.5
Type of animal	Cat	1	2.1
	Dog	1	2.1
	Cattle	24	51.1
	Others/birds	21	44.7
Availability of electricity	<12 hour	64	32
	≥12 hour	136	68
Electrical generator	Yes	100	50
Heating facilities	Oil	123	61.5
	Gas	19	9.5
	Electric	57	28.5
	Others	1	0.5

Almost all children were living with both their parents and the number of persons in the household ranged from 3 to 7.

Table 2 shows the participants living conditions and characteristics of properties their parents own and their relationship with the types of unintentional home accidents that required tertiary care.

Table 2 data show that most falls and forceful blows tend to occur in houses that have a car. Children tend to sleep downstairs as most homes have a single storey. These children tend to share their rooms with 2–3 others kids. A sizable number of participants slept on the floor. The table also shows variable percentages regarding using the home to store goods, chemicals, firearms, etc. Electrical generators and heating equipment tended to do more harm than indoor gas cookers.

Other variables like location of their homes and presence of domestic animals were insignificant.

Table 3 shows that the majority of falls and unintentional forceful blows by sticks were documented in children who were over 2 years of age, male, and living in urban areas. Their mothers had mostly a primary level of school education and their fathers were working. Family income was unevenly distributed with the balance tipping towards higher income. Almost all children were living with both their parents and the number of persons in the household ranged from 3 to 7 [Table 4].

DISCUSSION

Unintentional injuries among preschool children are the seventh leading cause of worldwide death.

Tokuhala G.K. reported that 91% of the injuries among preschool children are home injuries.^[9]

In our study, we found that the common causes of home accidents among children are falls (55.5%), followed by blows by forceful sticks (animate/inanimate) (24.5%), and remaining causes (burns, poisoning, electrical shock, foreign body, animal-related, and sharp kitchen instruments) constituted (19%). This study is in agreement with^[1] in Oman who found that the common causes were falls (53.7%), followed by blows by forceful

Table 3: Medical and accidents history of the children

Medical and accident history		No.	%
Autism	Yes	1	0.5
	No	199	99.5
ADHD	No	200	100
Child disability	No	200	100
Skeletal dysplasia	No	200	100
Previous history of accidents	Yes	58	29
	No	142	71

Table 4: Relationship between sociodemographic variables of the children and their parents with the causes of the accidents

		Causes of accident				Total	P value
		Fall (n = 111)	Burn (n = 18)	Forceful Stick (n = 49)	Others# (n = 22)		
Does the family have car?	Yes	68 (57.6%)	7 (5.9%)	30 (25.4%)	13 (11%)	118 (100%)	0.3
	No	43 (52.4%)	11 (13.4%)	19 (23.2%)	9 (11%)	82 (100%)	
No. of rooms	1-5	81 (56.6%)	13 (9.1%)	34 (23.8%)	15 (10.5%)	143 (100%)	0.9
	6-11	30 (52.6%)	5 (8.8%)	15 (26.3%)	7 (12.3%)	57 (100%)	
Toilet facilities	Inside	68 (51.5%)	12 (9.1%)	32 (24.2%)	20 (15.2%)	132 (100%)	0.07
	Outside	43 (63.2%)	6 (8.8%)	17 (25%)	2 (2.9%)	68 (100%)	
Storeys in home	1	77 (59.2%)	9 (6.9%)	32 (24.6%)	12 (9.2%)	130 (100%)	0.3
	2	34 (48.6%)	9 (12.9%)	17 (24.3%)	10 (14.3%)	70 (100%)	
Where does the child sleep?	Upstairs	19 (52.8%)	4 (11.1%)	8 (22.2%)	5 (13.9%)	36 (100%)	0.9
	Downstairs	92 (56.1%)	14 (8.5%)	41 (25%)	17 (10.4%)	164 (100%)	
Children who sleep with child	0	22 (59.5%)	39 (8.1%)	8 (21.6%)	4 (10.8%)	37 (100%)	0.2
	1	27 (55.1%)	5 (10.2%)	9 (18.4%)	8 (16.3%)	49 (100%)	
	2	28 (47.5%)	7 (11.9%)	18 (30.5%)	6 (10.2%)	59 (100%)	
	3	30 (73.2%)	2 (4.9%)	7 (17.1%)	2 (4.9%)	41 (100%)	
	4	4 (33.3%)	1 (8.3%)	5 (41.7%)	2 (16.7%)	12 (100%)	
	5	0 (0%)	0 (0%)	2 (100%)	0 (0%)	2 (100%)	
Child sleeps on	Floor	51 (54.8%)	9 (9.7%)	23 (24.7%)	10 (10.8%)	93 (100%)	0.4
	Bed	49 (52.7%)	7 (7.5%)	26 (28%)	11 (11.8%)	93 (100%)	
	Crib	11 (78.6%)	2 (14.3%)	0 (0.0%)	1 (7.1%)	14 (100%)	
Working equipment	Yes	28 (53.8%)	5 (9.6%)	12 (23.1%)	7 (13.5%)	52 (100%)	0.9
	No	83 (56.1%)	13 (8.8%)	37 (25.0%)	15 (10.1%)	148 (100%)	
Firearms	Yes	12 (66.7%)	2 (11.1%)	2 (11.1%)	2 (11.1%)	18 (100%)	0.6
	No	99 (54.4%)	16 (8.8%)	47 (25.8%)	20 (11%)	182 (100%)	
Toys stores	Adequate	66 (53.7%)	8 (6.5%)	31 (25.2%)	18 (14.6%)	123 (100%)	0.09
	Inadequate	45 (58.4%)	10 (13%)	18 (23.4%)	4 (5.2%)	77 (100%)	
Ascended family	Yes	49 (61.3%)	10 (12.5%)	16 (20%)	5 (6.3%)	80 (100%)	0.09
	No	62 (51.7%)	8 (6.7%)	33 (27.5%)	17 (14.2%)	120 (100%)	
Goods and chemicals	Yes	6 (60%)	3 (30%)	1 (10%)	0 (0%)	10 (100%)	0.06
	No	105 (55.3%)	15 (7.9%)	48 (25.3%)	22 (11.6%)	190 (100%)	
Bicycle	Yes	65 (56%)	7 (6%)	31 (26.7%)	13 (11.2%)	116 (100%)	0.4
	No	46 (54.8%)	11 (13.1%)	18 (21.4%)	9 (10.7%)	84 (100%)	
Home location	Main Street	6 (37.5%)	1 (6.3%)	8 (50%)	1 (6.3%)	16 (100%)	0.1
	Side Street	105 (57.1%)	17 (9.2%)	41 (22.3%)	21 (11.4%)	184 (100%)	
Numbers of cars	<30	104 (57.1%)	17 (9.3%)	40 (22%)	21 (11.5%)	182 (100%)	0.07
	≥30	7 (38.9%)	1 (5.6%)	9 (50%)	1 (5.6%)	18 (100%)	
Type of cooker	Gas	111 (55.8%)	18 (9%)	48 (24.1%)	22 (11.1%)	199 (100%)	0.4
	Electric	0 (0%)	0 (0%)	1 (100%)	0 (0%)	1 (100%)	
Location of cooker	Indoor	99 (53.2%)	18 (9.7%)	47 (25.3%)	22 (11.8%)	186 (100%)	0.1
	Outdoor	12 (85.7%)	0 (0.0%)	2 (14.3%)	0 (0.0%)	14 (100%)	
Religion cooking	Yes	74 (55.2%)	16 (11.9%)	30 (22.4%)	14 (10.4%)	134 (100%)	0.2
	No	37 (56.1%)	2 (3.0%)	19 (28.8%)	8 (12.1%)	66 (100%)	
Where does the cooking take place?	Indoor	57 (52.3%)	15 (13.8%)	24 (22.0%)	13 (11.9%)	109 (100%)	0.3
	Outdoor	17 (68.0%)	1 (4.0%)	6 (24.0%)	1 (4.0%)	25 (100%)	
Does the family have domestic animals?	Yes	26 (55.3%)	4 (8.5%)	12 (25.5%)	5 (10.6%)	47 (100%)	0.9
	No	85 (55.6%)	14 (9.2%)	37 (24.2%)	17 (11.1%)	153 (100%)	
Type of animal	Cat	0 (0%)	0 (0%)	0 (0%)	1 (100%)	1 (100%)	
	Dog	1 (100%)	0 (0%)	0 (0%)	0 (100%)	1 (100%)	
	Cattle	14 (58.3%)	2 (8.3%)	7 (29.2%)	1 (4.2%)	24 (100%)	
	Others	11 (52.4%)	2 (9.5%)	5 (23.8%)	3 (14.3%)	21 (100%)	
Availability of electricity	<12 Hr	43 (67.2%)	4 (6.3%)	12 (18.8%)	5 (7.8%)	64 (100%)	0.2
	≥12 hours	68 (50.0%)	14 (10.3%)	37 (27.2%)	17 (12.5%)	136 (100%)	
Electrical generator	Yes	65 (65.0%)	5 (5.0%)	22 (22.0%)	8 (8.0%)	100 (100%)	0.03*
	No	46 (46.0%)	13 (13.0%)	27 (27.0%)	14 (14.0%)	100 (100%)	
Heating facilities	Oil	69 (56.1%)	8 (6.5%)	34 (27.6%)	12 (9.8%)	123 (100%)	0.0001*
	Gas	8 (42.1%)	9 (47.4%)	1 (5.3%)	1 (5.3%)	19 (100%)	
	Electric	34 (59.6%)	1 (1.8%)	13 (22.8%)	9 (15.8%)	57 (100%)	
	Others	0 (0%)	0 (0%)	1 (100%)	0 (0%)	1 (100%)	
Previous history accidents	Yes	28 (48.3%)	5 (8.6%)	17 (29.3%)	8 (13.8%)	58 (100%)	0.5
	No	83 (58.5%)	13 (9.2%)	32 (22.5%)	14 (9.9%)	142 (100%)	

#Others (poisoning, electrical shock, foreign body, animal-related, sharp kitchen instrument).

*Significant.

sticks (15.1%). Such falls could hinder the child's ability to balance properly and might lead to the inability to be independently mobile and with poor hazard avoidance skills.

The current study showed that males (54%) had more home accidents. This is in agreement with a study^[10] in Denmark that found that males (51%) were exposed to home accidents more than females (49%). It has been reported that boys might be more physically active and adventurous compared to girls.

In general, the findings of this study indicated that toddlers and preschool children have increased rates of home accidents (40.5% and 40.5%, respectively) compared to other age groups (<2 years) that constituted (19%). This is consistent with other study findings^[11] in the United Arab Emirates. This could be because children at this age tend to explore the surrounding world.^[12]

Additionally, children at this age are spending most of their time at home compared to school-age children. Furthermore, toddlers and preschoolers are fragile as per their physical development. In fact, children's rapid increase in motor activities is not usually accompanied by a corresponding increase in cognitive abilities. This might place children of this age group at higher risk as they are not able to recognize dangers.^[13]

Mothers' sociodemographic traits have a quite essential effect on their children's exposure to different types of home accidents.

In regard to the educational level, the findings indicated that most of them (40.5%) had a primary school education level and (80%) were housewives. Unlike our study in Iraq, in 2019, which revealed that (41.3%) of mothers had high school and above educational level and (60.6%) were housewives.^[14]

In our study, most of the parents were married (98%) and 2% of them were unmarried (divorced, separated, and widowed), this is in agreement with the study by ALkhumis^[15] in Riyadh who found that 93.9% of parents were married.

Socioeconomic status has been documented to be an important determinant of injury, although the effect depends on the socioeconomic indicator considered.^[16] The frequency of injury-producing accidents was the highest (43.5%) among families with a monthly income of >600 (IQD), although this finding was not statistically significant when compared to the other income groups. This result was contradictory to other studies,^[17] but similar to a study in Malatya,^[18,19] (Gielen) which reported that as the family income decreases, accidents occur more frequently since physical conditions at home also become deteriorated. However, in this study, no statistically significant difference in the frequency of injury-producing accidents was found among groups according to the different income levels. An explanation may be that the mothers with low monthly

family income may not have reported the accidents if the child was not seriously hurt, since they were more preoccupied with providing food for the family and other living conditions. The slightly greater frequency of accidents in families with higher income may be due to the fact that those families with higher income did not belong to upper socioeconomic status but only had an income above minimum wage. It is obvious that the participants were mostly from low and middle-income groups.

In this study, homes with more than three children constituted 57% while homes with less than three children constituted 43%. This may be because as the number of children increases, the time spent with each child decreases, and the risk of accidents increases. This finding suggested that the mothers with fewer children pay more attention to the measures that need to be taken to prevent home accidents.^[20]

In our study, the household with less than two rooms has greater odds of injury when compared to a household with more than two rooms. This finding is in agreement with a study in Southern India^[21]; it might be due to household crowding conditions.^[22]

The rate of injury was higher among children living in a household without separate kitchens (93%) which is similar to a study in India that constituted 95%, as the kitchen is a place where most of the hazardous materials are kept.

The current study showed that (29%) of the children had experienced at least one injury during their lifetime. These findings indicate that the injury prevention strategies used at home in these families were inadequate, and therefore, could not protect them from repeated unintentional injury. In comparison, a study in KSA^[23] found that 32% of children were exposed to one injury during their lifetime.

In the present study, we found that the home accidents in children of family size less than seven (65.5%) are more than home accidents in children of family size more than seven, which is constituted 34.5%. This is in agreement with,^[21] study in India, but is disagreement with the study in Turkey^[24] that found that there is a significant relationship between the number of persons in the family and home accidents in child with increasing in the incidence by increasing number of persons.

In our study, we found that there is a significant relationship between unintentional injuries among preschool children and the educational level of their fathers ($P = 0.04$), but this is in disagreement with a study in Saudi Arabia, which found that there is no significant relationship between them.

CONCLUSIONS

Home accidents are an important cause of morbidity and mortality in children worldwide. This study has shown

that the most common types of unintentional home accidents in children were falls and followed by forceful sticks (animate/inanimate).

The educational level of the father was a variable that was statistically significant with an unintentional injury.

In the present study, the maternal educational level, family size, the number of children present in the house, and home size were found to be the risk factors for home injuries.

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Conflicts of interest

There are no conflicts of interest.

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