

ORIGINAL RESEARCH

Unintentional Home Injury Prevention in Preschool Children; a Study of Contributing Factors

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Abstract

Introduction: Different factors such as parents' knowledge and attitudes regarding preventive measures (PM) have a great role in reducing children unintentional home injuries. The present study aims to evaluate the contributing factors of unintentional home injury prevention in preschool victims presented to the emergency department.

Methods: The subjects consisted of all the mothers of preschool children who were presented to the emergency department of Imam Hossein and Shohadaie-Hafte-Tir Hospitals, with unintentional home injuries, from March 2011 to February 2012. The participants were divided into two groups according to implementation of preventive measures status. The significant confounding factors of PM application was determined by chi-squared test and entered into the backward multivariate logistic regression model. **Results:** 230 mothers with the mean age of 29.4 ± 5.2 years were evaluated. 225 (97.83%) of them were still married, 74 (32.17%) had high school education or higher, 122 (53.04%) were homemakers, and 31 (13.49%) worked outside the home for at least 8 hours daily. High level of knowledge (OR = 0.05; 95% CI: 0.002–0.32; P = 0.002), appropriate attitude (OR = 0.12; 95% CI: 0.03–0.51; P = 0.01), having at least three children (OR = 7.2; 95% CI: 1.1–32.9; P = 0.04), daily absence of mother for at least 8 hours (OR = 9.2; 95% CI: 2.2–35.46; P = 0.002), and a history of home injury during the previous 3 weeks (OR = 8.3; 95% CI: 2.1–41.3; P = 0.001) were independent factors which influenced application of preventive measures.

Conclusion: Increasing mothers' knowledge level and improving their attitudes were facilitating factors and mothers' absence from the house for more than 8 hours a day and having at least 3 children were obstacles to application of preventive measures. In addition, a history of same injury during the previous 3 weeks increased the risk of repeated event.

Keywords: Accidents, home; wounds and injuries; accident prevention; child, preschool

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Introduction:

Unintentional injuries are the most important causes of morbidity and mortality in 1–5 year-old children, responsible for 750,000 annual mortalities and 400 million severe injuries/year (1-3). A total of 16 million injured children are admitted to emergency units in the United States each year, 30,000 of which suffer permanent defects (4). The frequency of unintentional injury-induced mortality is very high in Iran, and has been reported to be 48 cases in 100,000 general population. It makes up 12% of the total annual mortalities and 82.6% of injury deaths in Iran. About 30% of these

accidents involve preschool children (5). Unintentional home injuries of children are on the rise and have become an important social problem (6, 7). 4 million preschool children suffer from such injuries annually, most important causes of which are falls, poisoning, and burns (8).

The most important risk factors reported for home injury include living in unsafe homes, low socioeconomic status, and mothers' low knowledge and inappropriate attitudes (9-14). A study performed in 14 European countries has shown that the most important obstacle for adopting preventive measures is the inability of



mothers to take continuous care of their children, followed by poor knowledge about factors involved in injuries (21). Several studies have evaluated the role of parents' preventive measures in decreasing the incidence of home injuries (15-17). Using PM can decrease the incidence of home injuries in some cases, but not in others. For example, the results of a review study showed that application of PM, reduces the incidence of poisoning in children to a great degree (18). However, the results of two other studies showed that, these measures have varying effects or no effect on reducing the incidence rate of falls and burns in children (19, 20). Many researches have placed great emphasis on motivations and obstacles faced by mothers to adopt PM. However, the exact role of the majority of these factors is still unknown. Although valuable efforts have been made to recognize such factors, the results have been different and even contradictory due to cultural, social, regional and even methodological differences (17, 18, 20). Based on the above-mentioned, the present study aims to evaluate the contributing factors of unintentional home injury prevention in preschool victims presented to the emergency department.

Methods:

Study design and setting

This prospective cross sectional study was carried out from March 2011 to February 2012 in Imam Hossein and Shohadaie-Hafte-Tir Hospitals, Tehran, Iran. The subjects consisted of the mothers of all the preschool children, who had sustained unintentional home injuries, and had been admitted to the emergency departments of the studied Hospitals. Mothers not interested in taking part in the study were excluded. Informed consent was obtained before being included in the study. The protocol of the study was approved by Ethics Committee of Shahid Beheshti University of Medical Sciences.

Data collection and setting:

Data were collected using a questionnaire, which consisted of the following sections:

A: Demographic data, socioeconomic status of mothers, history of unintentional injuries during the previous three weeks, and the condition of the current injury (type, cause, and site of injury).

B: 7 questions on the knowledge of mothers about home injuries of preschool children (scores ranged from 0 to 7).

C: 12 questions on mothers' attitude (scores ranged from 0 to 12).

D: 15 questions on adoption of preventive strategies (a score of 2 was given to "always", 1 to "sometimes" and 0 to "never", scores ranged from 0 to 30).

The median of scores gained by the study population was used as a classification cut-point, which is a customary technique for classification of groups (21-23). Finally, mothers were divided into two groups (poor and good)

based on their application of PM status. The questionnaire was designed under the supervision of two emergency medicine specialists and one epidemiologist. It was given to 20 mothers in a pilot study, and its reliability was confirmed using Cronbach's alpha coefficient ($\alpha = 0.78$). If the participants could not read or write, the questionnaire was completed by the aid of an oral interview. Data were collected after each child received standard treatment so that the mother's anxiety about her child's health would not affect data collection.

Data analysis:

The population size was determined, based on previous studies (24), where $p = 0.6$, $\alpha = 0.05$, and $d = 0.07$. A population size of at least 188 subjects was calculated but 230 mothers were evaluated, which increased the study power to 96%. STATA 11.0 statistical software program was used for data analysis. After descriptive analysis of data, the relationship between studied variables and application of PM was evaluated by chi-squared and Fisher's exact tests. Subsequently, the significant factors, determined by chi-squared test, were entered into the backward multivariate logistic regression model. Then the odds ratio (OR) was determined at a 95% confidence interval (CI). Statistical significance was set at $p < 0.05$.

Results:

Demographic:

230 mothers whose children had sustained unintentional home injuries were evaluated. The mean and the standard deviation (SD) of their age was 29.4 ± 5.2 years. The baseline characteristics of the participants are summarized in table 1. The most common home injury was falls with 145 (63.04%) cases and the most common locations of accidents was living rooms, with 85 (36.96%) cases. Table 2 summarizes the injury characteristics. Mean score gained by mothers regarding application of PM was 20.3 ± 8.5 . The status of PM application was poor in 101 (43.91%) cases and good in 129 (56.09%). 57 (24.78%) mothers had poor knowledge and 134 (58.26%) had inappropriate attitudes towards home injury PM.

Relationships:

Table 1 presents the relationship of the mother's characteristic and application of preventive measure status. In addition, the relationship of injury characteristics and application of preventive measure status is summarized in table 2. Multivariate logistic regression analysis showed that daily absence of mother ≥ 8 hours (OR = 9.2; 95% CI: 2.2-35.46; $P = 0.002$), having at least 3 children (OR = 7.2; 95% CI: 1.1-32.9; $P = 0.04$) and a history of a home injury during the previous 3 weeks (OR = 8.3; 95% CI: 2.1-41.3; $P = 0.001$) were predictive factors of poor preventive measure application status by mothers. However, high knowledge level (OR = 0.05; 95% CI: 0.002-0.32; $P = 0.002$) and appropriate attitudes (OR = 0.12;



Table 1: Relationship of the mothers' characteristics with application of preventive measures status

Variable	Total (%)	Preventive measures status (%)		P
		Poor	Good	
Age (year)				
< 25	53 (23.04)	12 (11.88)	41 (31.78)	<0.001
25-30	160 (69.57)	74 (73.27)	86 (66.67)	
> 30	17 (7.39)	15 (14.85)	2 (1.55)	
Marital status				
Married	225 (97.5)	99 (98.02)	126 (97.67)	0.99
Divorced or widowed	5 (2.2)	2 (1.98)	3 (2.33)	
Education level				
Less than Diploma	156 (67.83)	30 (29.70)	126 (97.67)	<0.001
Diploma or Higher	74 (32.17)	71 (70.30)	3 (2.33)	
Occupation				
Homemaker	122 (53.04)	0 (0.0)	122 (94.57)	<0.001
Employee	108 (46.96)	101 (100.0)	7 (5.53)	
Income (per month)				
< 200 US Dollars	24 (11.01)	24 (26.09)	0 (0.0)	<0.001
200-399 US Dollars	133 (61.01)	66 (71.74)	67 (53.17)	
400-800 US Dollars	47 (21.56)	2 (2.17)	45 (35.71)	
> 800 US Dollars	14 (6.42)	0 (0.0)	14 (11.11)	
Type of housing				
Leased	82 (36.44)	2 (2.02)	80 (63.49)	<0.001
Personal	143 (63.54)	97 (97.98)	46 (36.51)	
Type of family				
Core	124 (57.39)	95 (93.1)	29 (23.02)	<0.001
Widespread	98 (42.61)	1 (1.04)	97 (76.98)	
Number of Children				
1	63 (27.39)	23 (22.77)	40 (31.01)	<0.001
2	132 (57.39)	48 (47.52)	84 (65.11)	
≥ 3	35 (15.22)	30 (29.70)	5 (3.88)	
Number of children in preschool				
1	185 (80.43)	59 (58.42)	126 (97.67)	<0.001
≥ 2	45 (19.57)	42 (41.58)	3 (2.33)	
Presence at home				
The continued presence	84 (36.52)	2 (1.98)	82 (63.58)	<0.001
4 hours of absence	40 (17.39)	0 (0.0)	40 (31.01)	
8 hours of absence	75 (32.61)	71 (70.30)	4 (3.10)	
> 8 hours of absence	31 (13.49)	28 (27.72)	3 (2.33)	
Child injury in the past 3 weeks				
No	178 (77.39)	52 (51.49)	126 (97.67)	<0.001
Yes	52 (22.61)	49 (48.51)	3 (2.33)	
Knowledge				
Poor	57 (24.78)	54 (53.47)	3 (2.33)	<0.001
Good	173 (75.22)	47 (46.53)	126 (97.67)	
Attitude				
Inappropriate	134 (58.26)	8 (7.92)	126 (97.67)	<0.001
Appropriate	96 (41.74)	93 (94.8)	3 (2.33)	

95% CI: 0.03–0.51; P = 0.01) resulted in adoption of proper PM by mothers.

Discussion:

The results of the present study showed that only



56.09% of mothers whose children had sustained home injuries had applied proper PM. Mothers' characteristics including poor knowledge, inappropriate attitudes, absence from the house ≥ 8 hours, having more than 3 children, and history of child home injuries during the previous 3 weeks were independent predictive factors of poor preventive measure application status.

The results of 14 European studies showed that the majority of mothers believed that the most important obstacle for adopting PM was lack of constant care. Lack of knowledge about factors involved in injuries was the second most common cause in this regard (24).

Apart from knowledge, mothers' appropriate attitudes have an important role in adoption of PM. In the present study, only 58.26% of mothers had appropriate attitudes toward adoption of PM. Therefore, in addition to mothers' knowledge, appropriate attitudes also influence implementation of PM. The results of a study by Vladutiu et al. showed that parents' appropriate attitudes have a direct relationship with improvement in preventive behaviors (25). Several studies have placed great emphasis on the role of educational status in improving mothers' attitudes and performance in relation to the adoption of PM against home injuries. For example, Eldosoky et al. showed that educated mothers (university or college education) and mothers with high socioeconomic status

have better preventive behaviors (26). In addition, Tomruk et al. showed that higher education improves mothers' knowledge and attitudes regarding prevention of home injuries (27). The major limitation of such studies is ignoring the co-linearity of mothers' knowledge and her educational status. An increase in educational status results in an increase in mothers' knowledge level. Therefore, educational status is a cofactor for knowledge level. In three studies by Eldosoky et al., Tomruk et al. and Thien et al., this weakness is evident because in these studies mothers' knowledge was not included as a factor in multivariate regression analysis. To confirm this hypothesis, Vladutiu et al. demonstrated that when the relationship between preventive behaviors and mothers' characteristics (such as attitudes and knowledge) are evaluated, age, educational status, income or the condition of the house (rented or owned) have no effect on preventive behaviors (25).

The number of children in the family significantly influences mothers' preventive behaviors. A study by Gielen et al. showed that mothers with at least 3 children exhibit poorer preventive behaviors (28). This decrease in the adoption of PM is attributed to the short duration of time allocated by mothers to their children's care. A mother with three children dedicates less time to education, upbringing, and even care of each child, compared

Table 2: The relationship of injury characteristics and application of preventive measure status

Injury characteristics	Total (%)	Preventive measures status (%)		P
		Poor	Good	
Type				
Falling Down	145 (63.04)	54 (53.47)	91 (70.54)	<0.001
Sting	11 (4.78)	6 (5.94)	5 (3.88)	
Penetrating trauma	16 (6.96)	9 (8.91)	7 (4.43)	
Burns	11 (4.78)	7 (6.93)	4 (3.10)	
Poisoning	23 (10.0)	21 (20.79)	2 (1.55)	
Assaulted by other child	16 (6.96)	0 (0.0)	16 (12.40)	
Foreign body ingestion	8 (3.48)	4 (3.96)	4 (3.10)	
Place				
Room	85 (36.96)	28 (27.72)	57 (44.19)	0.001
Kitchen	65 (28.26)	48 (47.52)	17 (13.18)	
Stairs	48 (20.87)	18 (17.82)	30 (23.26)	
Bathroom	13 (5.65)	3 (2.97)	10 (7.75)	
Yard	12 (5.22)	3 (2.97)	9 (6.98)	
Parking	7 (3.04)	1 (0.99)	6 (4.65)	
Reason				
Lack of care	29 (12.61)	14 (13.86)	15 (11.63)	<0.001
Accident	75 (32.61)	11 (10.89)	64 (49.61)	
Caregiver < 10 years old	9 (3.91)	3 (2.97)	6 (4.65)	
Playing	38 (16.52)	14 (13.86)	24 (18.60)	
Availability of hazardous materials	13 (5.65)	7 (6.93)	6 (4.65)	
Unsafe home environment	66 (28.70)	52 (51.49)	14 (10.85)	



to a mother with one child or two children. Finally, it is suggested that programs be prepared in order to improve and increase mothers' PM. Improving mothers' knowledge and attitudes might be highly effective in modifying parents' behaviors. After implementation of such measures, a decrease in child home injuries can be expected. Informing mothers of the consequences of serious accidents such as falls, burns, drowning, and poisoning might encourage parents to adopt measures that are more effective.

This study had a number of limitations. First, it was a cross sectional study, so no inference can be made about causal relationships between variables. Second, the results are based on self-reported data; respondents may have over-reported their injury prevention measures due to social desirability bias.

Conclusion:

The results of the present study showed that only 56.09% of mothers whose children had sustained home injuries had applied proper PM. Mothers' characteristics including poor knowledge, inappropriate attitudes, absence from the house ≥ 8 hours, having more than 3 children, and history of child home injuries during the previous 3 weeks were independent predictive factors of poor preventative measure application status.

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Conflict of interest:

None

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Authors' contributions:

All authors passed four criteria for authorship contribution based on recommendations of the International Committee of Medical Journal Editors.

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