

Prevalence of home related injuries among children under 5 years old and practice of mothers toward first aid in Buraidah, Qassim

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ABSTRACT

Background: Unintentional injuries are reported to be the most common mechanism of childhood injuries; large proportion of these occur in or around home. Quick response and appropriate first aid is vital in saving life and preventing negative outcomes. **Objectives:** The aim of this study was to determine prevalence of home injuries among children five years old and younger and to explore their mothers' knowledge, attitude and practice toward first aid. **Methods:** A cross-sectional study was conducted among 250 mothers attending well baby clinics at primary health care centers (PHCC) in Buraidah city. The survey was conducted from February to June 2020. Simple random sampling was used to select PHCCs and systematic random sampling was used for participant selection. A self-administered, semi-structured questionnaire was used to collect data. **Results:** A history of home-related injury to the youngest child was reported by 114 (46.3%) mothers. The common home injuries were falls (50%), cut wounds (15.2%) and burns (10.7%). Among less than one-year age, injuries were more prevalent among males (41.4%) as compared to females (27.6%). Majority (58.2%) of mothers had fair knowledge about first aid. Internet websites (53.6%) followed by social media (47.6%) were the main sources of their knowledge. Mothers showed appropriate practice in dealing with suspected fracture (85.9%) and foreign body ingestion (80%) while burn (55.5%) and choking (43.2%) had the lowest appropriate practice. **Conclusion:** Home injuries are common among children. However, mothers' knowledge and practice of first aid is inadequate. To reduce the injuries' related morbidity and mortality, increasing awareness and organizing first aid training courses are recommended.

Keywords: Children, first aid, home injuries, knowledge, practice, Qassim, Saudi Arabia

Introduction

Childhood injuries are one of the important public health problems which result in substantial morbidity and mortality.^[1] Injury is defined as the physical damage to human body on exposure to excessive amount of force which is beyond the physiological threshold of tolerance.^[2] An injury which is not caused to harm purposely or intentionally is known as an unintentional injury.^[3] It includes injuries caused by

traffic accidents, falls, burns, drowning, sport related injuries, poisoning and suffocation. Unintentional injuries are reported to be the most common mechanism of childhood injuries, large proportion of these injuries occur in or around home.^[4] Preschool children are highly susceptible to injury at home because they are excited to explore their environment and are unable to perceive the risks, leaving them at risk of injury that lead to death and disabilities.^[5] A quick and appropriate first aid in childhood emergencies can be life-saving and also improves the child's health outcome.

Although there are studies documenting that most of the childhood injuries occur at home and can lead to mortality and serious disabilities, there is a significant lack of local studies

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addressing this problem. Moreover, studies investigating mothers' knowledge, attitude and practice (KAP) regarding providing first aid are also limited generally, and in Saudi Arabia specifically. Thus, this study is designed to estimate the magnitude and pattern of home injuries among children 5 years and younger, and to determine the mothers' KAP toward first aid and to identify the factors affecting their KAP.

Subjects and Methods

A cross-sectional study was conducted among 250 Saudi mothers having children 5 years old and younger. The participants were selected by systematic random sampling. The study was conducted at well baby clinics of 8 PHCCs randomly selected out of total 37 PHCCs in Buraidah city, Qassim province. Ethical approval was obtained from Qassim Research Ethics Committee. After taking consent, participant mothers were asked to complete a semi-structured, self-administered questionnaire that was adapted from a validated and reliable instrument.^[6] The knowledge questions were reviewed and modified according to Guidelines from the American Heart Association and American Red Cross and American paediatric association.^[7,8] The data were collected during February to June 2020.

The gathered data was entered and analyzed using SPSS. Chi square test, t-test and ANOVA were used to assess association between variables. The results with P- value < 0.05 were considered statistically significant.

Results

A total of 282 eligible participants were contacted to complete the sample size of 250, resulting in the survey response rate of 88.6%. The mean age of the mothers was 30.8 ± 5.5 years. Majority of the participants were between 26-35 years (62.1%), and more than half of the participants (53.7%) had completed university education. About three quarters of the participants

were housewives (74.8%). More than half of the participants lived in apartments (55.4%), and 43.2% of mothers had a child aged younger than one year [Table 1].

A total of 114 (46.3%) participants reported a history of home injury to the youngest child since birth of that child [Figure 1]. The mean age of the children at the time of last injury was 1.8 (±1.16) years. Almost half of injured children were in age group 1-3 years (49.4%), followed by children at age younger than one year (36.8%). Among less than one-year age, injuries were more prevalent among males (41.4%) as compared to females (27.6%). However, among age group 1–3 years more females (58.6%) had suffered injures than males (44.8%).

Half of the home injuries were caused by fall (50%), followed by cut wounds (15.2%) and burns (10.7%). Boys had higher rates in all types of injuries except burns which had higher prevalence among girls (6.3%) in comparison to boys (4.5%).

Table 2 displays the knowledge questions, the options provided, and the frequency of responses of the participants. Almost two-third of the mothers (67.6%) knew that if fractured limb was suspected, it is important to try to keep the injured body immobile and get medical care. A total of 177 (71%) mothers knew that in case of getting chemicals in the eyes, they should flush the eyes with running water. Only 36.4% mothers stated correctly to seek medical care urgently in case of burns on the face, hands, feet, or genitals. More than two-third of mothers (68.7%) knew the ambulance number.

A total of 55 (22.1%) of mothers were categorized as having good knowledge (7-9 correct answers) about first aid. None of the participants answered all questions correctly [Figure 2].

Majority of the participants (53.6%) reported that they depend on internet website as main source of their knowledge about first aid, followed by social media (47.6%) [Table 3]. On enquiring about first aid course, only 20% of mothers had previously attended a first aid course.

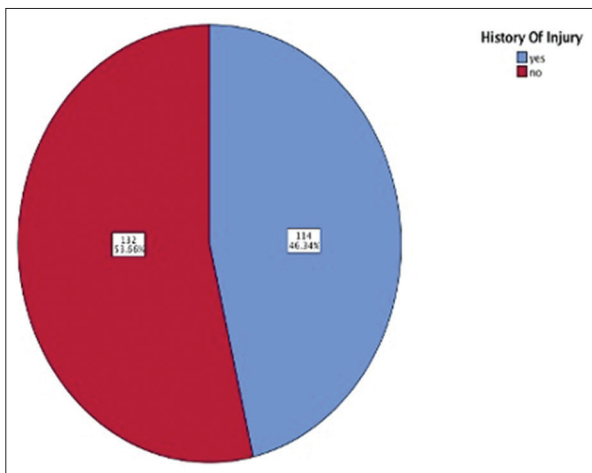


Figure 1: History of home- related injury among the youngest child of the participants (n = 246)

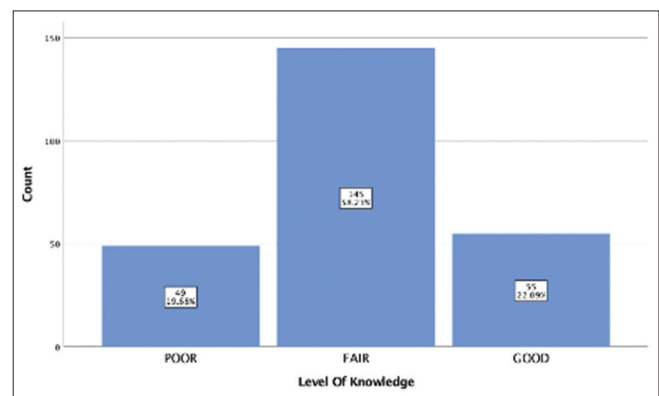


Figure 2: Participants' level of knowledge about first aid (n = 249) (Knowledge level based on a total score of 9: Good: score 7-9 Fair: score 4-6 Poor: score 1-3)

Table 1: Sociodemographic Characteristics of Participants

Characteristic	Number (n)	Percentage
Age of mother (years)		
17-25	40	17.2
26-35	144	62.1
36-45	48	20.7
Educational level		
University and above	130	53.7
Secondary	71	29.3
Intermediate	26	10.7
Primary/Read and write/Illiterate	15	6.2
Occupation		
Housewife	169	74.8
Educational field worker	28	12.4
Health care worker	18	8
Student	11	4.9
Type of housing		
Apartment	129	55.4
Villa	99	42.5
Farmhouse	5	2.1
Number of children from 0-5 years		
One	145	62.8
Two	76	32.9
Three	9	3.9
Four	1	0.4
Age of youngest child		
1 year and younger	102	43.2
>1-3 years	92	39.0
3 years and above	42	17.8
Gender of youngest child		
Male	142	56.8
Female	108	43.2

Mothers showed good attitude toward first aid but only slightly more than half of mothers felt confident to apply first aid measures and educate close family and friends about the first aid measures [Table 4].

Table 5 demonstrates the frequency of mothers who witnessed common injuries at home and whether their practices were correct for first aid for such injuries. Approximately three-quarters (74.3%) of mothers stopped the bleeding in cut wounds by applying pressure on the injured site until the bleeding stopped. Regarding burns (55.5%) used cold water to cool the burned area. Only small number of participant mothers had faced a situation in which a child suffered an electric shock and majority of them (65%) acted correctly with starting first aid by turning off the electrical sources before touching the victim. Regarding foreign body ingestion or aspiration, 80% of the mothers went to the emergency department immediately; however, only 43.2% of mothers managed choking correctly.

On exploring association of child injuries and demographic characteristics, children at age 1-3 years old had suffered more injuries as compared to other age groups ($P < 0.0001$). More males (76 out of 140) had a history of home injury compared with females (38 out of 106), and the difference was statistically significant ($P = 0.0004$). All other demographic characteristic such as the mothers' age, education, occupation, type of housing

as well as number of children were not significantly associated with the home injuries.

The association of demographic characteristics of mothers and mean knowledge scores was explored. The highest mean score (5.48 ± 1.93) was observed among mothers with university and above level of education. There was a significant difference in the mean knowledge scores according to mothers' educational level ($P = 0.013$). Also, there was statistically significant difference in knowledge scores among occupational groups ($P < 0.0001$). Health care and educational fields working mothers had higher mean knowledge score as compared to the students and housewife mothers. Mothers living in villa and farm-houses had a significantly higher mean knowledge score compared with mothers living in apartments ($P = 0.026$). Mothers with children who suffered home injuries had higher mean knowledge score (5.42 ± 1.72) compared with mothers whose children had not suffered a home injury (4.90 ± 1.88). The difference was statistically significant ($P = 0.026$). The mothers who attended first aid courses had higher mean knowledge score (6.28 ± 1.47) as compared to mothers who did not attend a course (4.83 ± 1.8), and the difference was statistically significant ($P < 0.0001$).

There was no statistically significant association between mothers' mean knowledge scores and mothers' age group, number of children, age group or gender of child.

Discussion

Our study explored the prevalence of home related injuries among children and the knowledge and practice of the mothers regarding first aid. In our study, 62.1% of mothers were between 26-35 years age. This finding agrees with another study^[9] in which 61% of the mothers were in the same age group. More than half (53.7%) of the mothers in present study were highly educated. This finding is comparable with other national studies^[10-12] which reported that around half or more of the mothers had university education. In our study, majority (74.8%) of the mothers were housewives which is comparable to other similar studies in which majority of mothers were housewives.^[6,10,11,13]

The place of residence may affect the frequency and severity of injuries. Apartment was the commonest (55.4%) accommodation in the present study, which is comparable with a study done in Jeddah^[10] in which 58.1% of mothers lived in apartments. In contrast, other studies found a much higher proportion reporting 88.4%^[9] and 86.7%^[11] of mothers living in apartments in Makkah.

The present study highlights the high burden of home related childhood injuries as it demonstrates that 46.3% of the participants reported a history of home injuries to their youngest child. The prevalence in our study is comparable with a study from Egypt reporting injury prevalence of 34.8% among 1-5 years age children.^[6] Similar findings were reported by another study which reported that 30.7% of children under five years had suffered home injuries from their birth to the study time.^[14] However, the

Table 2: Responses of mothers to the statement/question for assessment of knowledge about first aid (n=250)

Statement/Question	Number (%)
1. Pediatric first aid is	
a. Cardiopulmonary resuscitation (CPR)	58 (23.4%)
b. Immediate medical care given to a child who is injured or suddenly becomes sick*	127 (51.2%)
c. Providing first aid is the job of physicians and nurses	23 (9.3%)
d. I don't know	40 (16.1%)
2. A child's nose is bleeding. To control the nosebleed, you should	
a. Have the child tilt her head back	80 (32%)
b. Ask the child to blow the nose until the bleeding stops	15 (6%)
c. Pinch the soft parts of the nose and press against the bones of the face*	129 (51.6%)
d. I don't know	26 (10.4%)
3- If you suspect a fracture limb, you should	
a. Splint the injured body part right away	52 (20.8%)
b. Try to keep the injured body part away from moving and get medical care*	169 (67.6%)
c. Put the injured body part into an ice bath	18 (7.2%)
d. I don't know	11 (4.4%)
4- A child who has swallowed a foreign body you should:	
a. Go to the near emergency department*	136 (54.6%)
b. Try to let the child vomit	103 (41.4%)
c. Home for observation	6 (2.4%)
d. I don't know	4 (1.6%)
5- A child fell and cut her knee on a sharp rock. To control the bleeding, you should	
a. Press firmly on the area using a clean dressing*	156 (62.7%)
b. Put a cold pack on the wound	52 (20.9%)
c. apply herbal medicine on the wound such as (turmeric, carnation)	30 (12%)
d. I don't know	11 (4.4%)
6- If a child is burned on the face, hands, feet, or genitals, you should	
a. Arrange for the child to get medical care*	91 (36.4%)
b. Immediately apply burn ointment	92 (36.8%)
c. Pull off any clothing that is stuck to the burned area	48 (19.2%)
d. I don't know	19 (7.6%)
7- A child gets a chemical in the eye. The first thing you should do is	
a. Go to medical provider office	57 (22.9%)
b. Flush the eye with running water*	177 (71.1%)
c. Cover the eye with a clean bandage	6 (2.4%)
d. I don't know	9 (3.6%)
8- You are alone when you discover a child who has been under water and is not breathing. You should	
a. Call EMS [‡]	76 (30.4%)
b. Call EMS and wait by the child's side until they arrive	30 (12%)
c. Give about 2 minutes of CPR, then call EMS*	123 (49.2%)
d. I don't know	21 (8.4%)
9- Saudi Red Crescent ambulance number is	
a. 997*	171 (68.7%)
b. 998	38 (15.3%)
c. 999	10 (4%)
d. I don't know	30 (12%)

*Correct Answer. [‡]EMS=emergency medical services

prevalence in our study is low as compared to another national study that found 60% of mothers with children aged 2-6 years had history of child injury in home.^[11] The percentage is also low when compared with an international study which found that 61% of children under 5 years had suffered at least one injury at home during the previous year.^[13]

The age and gender of the child are important demographic factors in relation to injuries. The present study found that almost half of injured children (49.4%) were in age group 1-3 years, which

is similar to that reported by another study in which 56.4% of 1-5 years old injured children were in age group 1-3 years.^[6] In our study, males had experienced more home injuries compared with females, similar to a study from Egypt in which nearly two thirds (62.3%) of injured children under five years old were boys.^[13]

Regarding type of injuries, falls comprised the highest percentage of home related injuries in this study. Falls were followed by cut wounds and burns. Other studies have reported similar findings. Falls comprised 64.4% of injuries, followed by cut

wounds (20%) and burns (8.9%) in children up to 12 years old.^[9] Similarly, among children less than 5 years old, fall (33.6%) was the most frequent type of injury followed by cut wound (13.9%) and burn (8.2%).^[13]

Adequate knowledge of mothers regarding first aid is vital for their appropriate practices of first aid. In our study, the knowledge was good on some aspects of first aid while it was deficient in other aspects. The highest correctly answered question regarding first aid (71.1%) was for chemicals in the eye for which the proper first aid measure is to flush the eye with clean water. The lowest correctly answered question was observed in burns as only 36.4% of mothers knew that an urgent medical care is needed in case of burns on face, hands, feet or genitals. This might be related to their lack of knowledge about first aid measures in burns in general and burns in specific areas that need a medical care. However, another study has also found that only 45.9% of parents knew proper first aid measure for burns.^[12] Our study revealed that only 68.7% of mothers knew the correct ambulance number. However, other studies have

reported proportions lower than our study. Harere *et al.*^[10] found 40.3% of mothers while Al-Johani *et al.*^[12] reported 48.5% of the parents correctly knew the ambulance number.

Level of mothers' knowledge was significantly ($p = 0.013$) associated with their level of education, as the highest mean score was observed among mothers with university and above education. This may be attributed to provision of first aid training as extra-curricular activity among university students in Saudi Arabia. Furthermore, our finding is in agreement with other studies where highly educated parents tended to have a better knowledge in first aid than parents with lower education.^[10,12,15] In our study, health care and educational field workers had better knowledge. This may be attributed to inclusion of first aid training in university curriculum for health care providers and encouragement of teachers to participate in first aid courses. Míguez-Navarro *et al.* also found that parents working in health care and educational fields had better knowledge when compared with parents not working in these fields.^[15] We found that mothers with children who suffered home injuries had significantly higher mean knowledge score. Similarly, other studies found that mothers who experienced previous child injury had a significantly higher knowledge when compared to mothers who did not have such experience.^[10,12,15] Similar to other studies,^[10,12,15] our study also found that mothers who attended first aid courses had significantly ($P < 0.0001$) higher mean knowledge scores when compared to mothers who had not received any training.

In the current study, internet websites were the most commonly reported source of knowledge about first aid, which is in contrast to other studies^[5,12] where mass media was reported as the main source of first aid knowledge among parents. This difference may be attributed to the difference in studied mothers' age,

Table 3: Participants' source of knowledge about first aid

Source of knowledge	Number	Percentage [†]
Internet website	134	53.6%
Social media	119	47.6%
TV, newspaper, magazine	80	32.0%
Mobile application	79	31.6%
Relatives and friends	57	22.8%
First aid course	40	16.0%
Physician	39	15.6%
Nurses	24	9.6%
Total	572	228.8%

[†]Number of responses is greater than the number of the participants and the percentage is more than 100 because multiple responses were allowed

Table 4: Mothers' attitude toward first aid

Attitude	n (%)		
	Agree	Neither agree nor disagree	Disagree
Support including first aid in education (n=247)	240 (97.2%)	3 (1.2%)	4 (1.6%)
It is important to have first aid bag in house (n=248)	238 (96%)	5 (2%)	5 (2%)
It is important to attend first aid courses (n=247)	225 (91.1%)	14 (5.7%)	8 (3.2%)
Willing to attend first aid courses (n=247)	228 (92.3%)	11 (4.4%)	8 (3.2%)
Able to apply first aid measures in emergency situations (n=247)	140 (56.7%)	61 (24.7%)	46 (18.6%)
Able to educate first aid measures to family and friends (n=247)	145 (58.7%)	45 (18.2%)	57 (23.1%)

Table 5: Mothers' First Aid Practices

Injury	Yes** n (%)	No [‡] n (%)	Total n (%)
Control bleeding by applying pressure	150 (74.3%)	52 (25.7%)	202 (100%)
Cool burn	111 (55.5%)	89 (44.5%)	200 (100%)
Pinch soft part of nose in nasal bleeding	114 (60.6%)	74 (39.4%)	188 (100%)
Turn off electrical source at electrical shock	28 (65.1%)	15 (34.9%)	43 (100%)
Limb stabilization in fracture	67 (85.9%)	11 (14.1%)	78 (100%)
Remove child from water and start CPR if not breathing	28 (67.3%)	13 (31.7%)	41 (100%)
Go to emergency department if the child ingested or aspirated a foreign body	48 (80%)	12 (20%)	60 (100%)
Choking	80 (43.2%)	105 (56.8%)	185 (100%)

**Yes=did first aid appropriately, †No=first aid not done/done in a different way

educational level and social background. Our study finding underscores the role of internet web sites and social media in dissemination of health care information. Thus, it is important that health care organizations utilize this popular channel to provide accurate and correct information about first aid to general populations.

To design appropriate interventions, it is important to assess the practices regarding first aid. Although fire or burns are considered the 3rd leading cause of unintentional injury related mortality among 1-4 years old children,^[16] only 55.5% of participants in our study followed the appropriate action by cooling the burned area with cold water. This finding is in agreement with the study conducted in Riyadh^[17] that mentioned only 41% of caregivers treated burns with cold water while 32% treated burns with non-scientific remedies alone or in combination.

Children at aged 1–4 years are at greatest risk of drowning which could be fatal or lead to significant neurological damage.^[1] The present study found that two-thirds (67.3%) of mothers removed the child safely from the water and started a cardiopulmonary resuscitation (CPR) when they observed that the drowned child was not breathing. Choking is considered the leading cause of unintentional accidental mortality in children <1 year.^[16] Unfortunately, in the present study the lowest good practice was observed in this serious condition which needs a proper rapid response. Another study in Saudi Arabia has also found a significant lack of knowledge among mothers in dealing with choking.^[18]

In our study, around 80% of mothers had not received any first aid training, similar to other studies which reported 75.9%^[10] of mothers and 65.4%^[12] of parents not having first aid training. This lack of first aid training points to the need that health organizations conduct first aid educational programs on regular basis.

Our study has certain limitations. It only targets five years old and younger children. Therefore, it might be an underestimation of the injuries among children. This study has a long time period to recall child injury which may lead to recall bias. Our study assesses the prevalence of home injuries in only one city, thus limiting its generalizability. Moreover, we only assessed the mothers' KAP toward first aid as culturally, the mothers are the main caregivers, however, both parents should be assessed and trained to ensure that both of them have an adequate awareness toward first aid.

To reduce the home injuries' related morbidity and mortality, it is recommended to increase the awareness of the parents as well as whole community through educational programs on prevention of injuries at home. Safety measures at home should be known and followed by parents. The knowledge and practice of first aid can be improved by including training courses as extra-curricular activities in educational institutions; educating parents visiting the PHCCs; encouraging the employees in diverse fields to have first aid training; and utilizing internet websites and social media

to provide the correct information about first aid by authorized health care providers.

To conclude, home injuries are common among children. Children of age 1-3 years and boys are more likely to encounter an injury at home. Falls are responsible for half of these cases, followed by cut, wounds and burns. Well-educated, working mothers especially in education and health-related fields, mothers with children who had suffered home injuries and mothers who previously attended first aid courses tend to be more knowledgeable about first aid measures.

Minor home injuries and their first aid are generally managed at primary health care level by primary care physicians. Our study provides baseline information about knowledge and practices of mothers regarding first aid. This information will help in designing training and awareness program regarding first aid under supervision of primary health care physicians.

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Conflicts of interest

There are no conflicts of interest.

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