

Readiness of Omani Families to Prevent Accidental Injuries at Home in Children Younger than Six Years Old

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ABSTRACT

Objectives: We sought to assess the attitude of Omani families toward accidental injuries among children (aged < 6 years) and evaluate the safety measures and available preventive measures to reduce child injuries at home. **Methods:** We conducted a cross-sectional survey examining the self-reported attitudes of Omani parents about accidental injuries (poisoning, falls, burns, and drowning) at home among children younger than six and house safety measures. A total of 220 parents of children aged < 6 years, admitted to a tertiary healthcare teaching hospital, were invited to participate over a period of six months (May to November 2018). Analysis of 178 participant data was performed using SPSS, as 44 of the answered questionnaires had missing data, or were related to children over the age of six. **Results:** Only 16.9% of the Omani families had a history of a child injury in the year before the study. Males were more injured (61.0%) and 66.0% were younger than three years at the time of injury. A door to control access to stairs was available for 53.8% of the families. In 42.5% and 16.0% of the houses, children could access electrical sockets and wires, respectively. Fire alarms and extinguishers were not available in 90.8% and 82.1% of houses, respectively. Those who did not store medications and chemicals in safe places out of reach of children accounted for 56.7% and 63.3% of families, respectively. **Conclusions:** Many of the studied families are not providing an adequate safe environment for children in their houses. Therefore, actions should be taken to increase awareness about accidental injuries prevention within homes and to implement actions so that a safe home environment can be enjoyed by children.

Accidental injuries are a growing global public health problem, becoming a significant concern for children older than one year.¹ Children's physical and cognitive abilities, degrees of dependence, activities, and risk behaviors change substantially as they grow older. Their curiosity and desire to experiment as they develop, are not always matched by their capacity to understand or to respond to danger. Therefore, children are particularly more susceptible to injuries.^{2,3} The World Health Organization (WHO) defines injury as "the physical damage that occurs when the human body is suddenly subjected to amounts of energy that exceed the physiological threshold or is deprived of vital elements such as oxygen...the energy can be mechanical, thermal, chemical or radiant".³ When the sustained damage is permanent, the child's quality of life will be negatively affected, having a major impact on the family, society, and community in general.

Globally, as reported by UNICEF > 1600 children and adolescents below the age of 19 die every day from preventable injuries.⁴ The main causes of unintentional injuries are road traffic injuries, drowning, poisoning, thermal injuries, and falls with younger children being the most affected.^{5,6} From 2010–2011 to 2018–2019, unintentional injury death rates decreased by 11%.¹ However, rates increased among some groups, including an increase in deaths due to suffocation among infants (20%) and increases in motor-vehicle traffic deaths among some ethnic groups children.^{1,4,7} The availability and efficacy of prevention programs that address specific type of accidents and certain age groups or communities could explain such variabilities in accident rates.

Deaths caused by injuries have an immeasurable impact on the families and communities affected, whose lives are often changed irrevocably by these tragedies.⁸ Falls are the most common cause

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of hospitalization and visits to the emergency department due to unintentional injuries in children aged one year.⁹⁻¹¹ Studies point to an association between social class and the trend of severity of injuries in which children from deprived families had more frequent and serious accidents. It is of note that burns, scalds, and poisoning were much more likely to be severe than the other types of accidents.^{1,10}

In Oman, according to the 2021 Ministry of Health statistics, injuries and poisoning were one of the top leading causes for morbidity and mortality among non-communicable diseases. For example, head injuries are the fifth reason of morbidity requiring admission among children 1-19 years old.¹² Studies indicate that severe accidents requiring hospital admission were more common among under-fives and males. The high incidence of falls, home injuries, and burns highlights the need for age-targeted interventions and injury control programs.^{11,13} Another study found that the prevalence of traumatic monocular visual damage was 0.19%. Next to amblyopia, injury is the main reason for monocular loss of vision in childhood; however, both are preventable.¹⁴

Supervision of children is an essential factor in preventing injuries and reducing injury severity, frequency, and severity of the outcome. Studies point out that the risk of injury was reduced by 57% among children supervised by their parents and lack of parental supervision; for example, increased the risk of injury to child pedestrians and cyclists.² Hence, the identification of the attitude of parents and the readiness of families to implement actions for the prevention of accidents is important to map the gaps in practices and bridge them. This will help in planning prevention programs that could address such gaps in attitude and home structures in relation to safety. The objectives of this study were to assess the attitude of Omani families toward accidental injuries among children (aged < 6 years) and to evaluate the safety measures and available preventive measures to reduce child injuries at home.

METHODS

This is a prospective cross-sectional survey that examines the self-reported attitude and practice of Omani parents about the prevention of accidental injuries at home among children younger than six years old. Data were collected through a self-completed

questionnaire developed by the researchers to fulfill the study objectives and based on a literature review related to accidental injuries in children such as the common types of home accidents, variables, and risk factors. The questionnaire was validated through the opinions of four experts (one methodologist and three pediatric consultants) who reviewed the tool and suggested modifications that were discussed by the research team and accommodated accordingly. The questionnaire was piloted on 10 parents and the comments raised by them were also considered, leading to minor changes to the tool. The questionnaire, self-reported by the participants, contains three sections. The first part address participants' demographic data. The second part evaluates the history of previous accidental injury among children in the family in the last year, and the last part assesses the attitude of the care provider toward accidents and their readiness to implement preventive measures at home for different types of accidents.

Ethical approval was obtained from the Medical Research Ethics Committee at the College of Medicine and Health Science, Sultan Qaboos University (SQU). Participants were parents of children aged < 6 years admitted to SQU Hospital or visited the outpatient department with acute illness over a period of six months (as these patients' parents are expected to be more ready to fill out the questionnaire). Parents were invited to participate in the study during the study duration on different days of the week and at different times of the day. Consent was verbally taken from the available care provider when participation was accepted. The questionnaire was explained briefly, and the participants filled out it independently with their queries addressed at the time of collection. Recruitment of participants continued from May to November 2018. The targeted sample size was 200, decided by the statistician based on the estimated total number of children admitted to SQU Hospital over the six months before the study. Simple descriptive statistical analysis using frequencies and percentages was used to assess the findings. Analysis of the participant data was done using SPSS (IBM Corp. Released 2015. IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp.).

RESULTS

A total of 220 parents accepted to participate in this study. Forty-two were excluded from the

Table 1: The care-provider in the absence of both parents (at work).

Care-giver	Frequency	Percentage
Nursery	10	5.6
House-worker	24	13.5
Neighbor	2	1.1
Relative	31	17.4
N/A (non-working parent)	111	62.4
Total	178	100

analysis as 20 responded to only a few questions with many missed answers. The remaining 22 did not have children who were less than 6 years old and were excluded from data analysis. Of a total of 178 participants, 82.0% were mothers and 60.0% lived in Muscat and Al Batinah governorates. Most families (88.0%) have at least three children below six years of age. Median maternal and paternal age were 30 and 35 years, respectively. Around half of the families (46.0%) had a medium-income with 50.0% of parents having postgraduate educational status. Among them, 37.0% of mothers and 96.0% of fathers were working. In families with both parents working, 17.4% kept their children with close relatives, 13.5% with house-worker, and 5.6% in nurseries when at work [Table 1].

Accidents and related factors

Only 6.8% of the families reported having a swimming pool at home, with a fence surrounding it and a door

to control access in 60.0% of the pools. Although, 91.0% of the parents stated that they supervise their children while swimming, only 33.0% of the children use floating devices while using the swimming pool. Some of the participants (20.7%) also reported the habit of keeping water in big containers in the house environment, which also could be a risk for drowning. For factors related to accidental falls, only 53.8% of the parent's reported availability of protective measures to control stairs access at homes. On the other hand, 87.2% reported having window guards and 90.7% have safe balcony guards [Table 2].

When asked about fires and electrical injuries protective measures, the responses indicated that fire alarms and extinguishers were not available in 90.8% and 82.1% of houses, respectively. Children also could access electrical sockets and wires in 42.5% and 16.0% of the houses, respectively. The cooker was accessible by children in 46.9%, and 61.6% of the participants reported that the gas cylinder was located inside the kitchen [Table 3].

In relation to the proper storage of medications and chemicals, only 39.9% of parents reported storing such items in special box that is not accessible by their children, and 8.4% were using water and juice bottles to store cleaning substances and chemicals. A first aid box was available in 66.3% of the participants' homes. Although a playing room was not available in 41.6% of the houses, 94.4% of the participants reported selecting toys suitable for the child's age [Table 4].

Table 2: Safety in the house in relation to falls and drowning.

Response	Presence of SP, n (%)	Keeping water in containers, n (%)	Presence of stairs, n (%)	Door to control stair-access, n (%)	All windows have guards, n (%)	Presence of balcony, n (%)	Balcony has guards, n (%)
Yes	12 (6.8)	35 (20.7)	145 (84.8)	78 (53.8)	143(87.2)	54 (32.3)	49 (90.7)
No	164 (93.2)	134 (79.3)	26 (15.2)	67 (46.2)	21 (12.8)	113 (67.7)	5 (9.3)
Total	176	169	171	145	164	167	54
Missing	2	9	7	0	14	11	0
Total	178	178	178	145	178	178	54

SP: swimming pool.

Table 3: Safety in the house in relation to burns and electric injuries.

Response	Access to electrical sockets, n (%)	Access to electrical wires, n (%)	Access to cooker, n (%)	Gas cylinder locked guard, n (%)	Presence of fire alarm, n (%)	Presence of fire extinguisher, n (%)
Yes	74 (42.5)	28 (16.0)	82 (46.9)	69 (61.6)	16 (9.2)	31 (17.9)
No	100 (57.5)	147 (84.0)	93 (53.1)	43 (38.4)	158 (90.8)	142 (82.1)
Total	174	175	175	112	174	173

Table 4: Place of storing medications and cleaning materials and presence of other accident prevention factors.

Variables	n (%)
Store medications in a special box unaccessible by children	71 (39.9)
Store medications in handbag	2 (1.1)
Store medications in fridge	78 (43.8)
Store medications in a special drawer	7 (3.9)
Store medications in a special box and fridge	11 (6.2)
Store medications in both handbag and fridge	2 (1.1)
Store medications in both a special drawer and fridge	1 (0.6)
Store cleaning materials in a special box unaccessible by children	70 (39.3)
Store cleaning materials on the roof	69 (38.8)
Store cleaning materials on the floor	15 (8.4)
Store cleaning materials in a special drawer	12 (6.7)
Store cleaning materials in a special box on the roof	5 (2.8)
Store cleaning materials in a special box on the roof or floor	1(0.6)
Store cleaning substance in water and juice bottles	15 (8.4)
Presence of a first aid box	118 (66.3)
Presence of a playing room	104 (58.4)
Using appropriate toys for the child's age	168 (94.4)

Accidents history

Of the studied Omani families, 16.9% reported a history of their child sustaining injury in the last year before the study (61.0% males). Of the reported injured children, 66.0% were younger than three years-old at the time of injury and only 22.0% had medical diseases. Of the injured children, 50.0% had parents with postgraduate certificates, and 63.0% of their mothers were not working. The majority (83.0%) were from low- and medium-income families. History of injury has a statistically significant relation only with easy access to cooker ($p = 0.014$). Those with a history of injuries are more likely not to store medications and chemicals in safe places (out of reach of children); 56.7% and 63.3%, respectively [Table 5]. Interestingly, 67.0% of the parents stated that they think that those injuries could have been prevented with protective measures.

The percentage of children who sustained accidental injuries was more among families without fire alarm and extinguisher at home compared to families with preventive equipment [Table 5].

Table 5: Relation between history of accidental injury and place of storing medications and cleaning materials, presence of fire alarm, fire extinguisher, first aid box, special playing room, and providing toys appropriate for the child's age.

Variables	History of accidental injury in the last year, n (%)	
	Yes	No
Store medications in a special box unaccessible by children	13 (43.3)	58 (40.3)
Store cleaning materials in a special box unaccessible by children	11 (36.7)	59 (41.0)
Presence of a fire alarm at home	2 (6.7)	14 (9.7)
Absence of a fire alarm at home	28 (93.3)	130 (90.3)
Presence of a fire extinguisher at home	4 (13.3)	27 (18.9)
Absence of a fire extinguisher at home	26 (86.7)	116 (81.1)
Presence of a first aid box at home	23 (76.7)	95 (65.1)
Absence of a first aid box at home	7 (23.3)	51 (34.9)
Presence of a special playing room for children	21 (70.0)	83 (56.8)
Absence of a special playing room for children	9 (30.0)	63 (43.2)
Toys appropriate for the child age	28 (93.3)	140 (95.2)
Toys inappropriate for the child age	2 (6.7)	7 (4.8)

Parents who had a child with an accidental injury during the last year reported having a first aid box (76.7%) compared with only 65.1% of those who did not have accidental injuries. A similar trend of providing better protective measures by parents who had a history of accidents among their kids in the last year was noted with regards to allocating a special playing room and selecting appropriate toys for their age [Table 5].

DISCUSSION

Of the 178 participants, most were young mothers and 37.0% were working mothers. Looking after the children when parents are at work is mainly non-institutional with only 5.6% taking the children to nurseries. Such factors could contribute to the risk of accidental injuries among children and should be further evaluated in Oman. There is evidence that

daycare programs for children younger than six years could reduce the risk of drowning.¹⁵

Of the studied Omani families, 16.9% reported a history of injury in the year before the study. Around two-thirds (61.0%) of the injured children were males, and 66.0% were younger than three years at the time of injury, which is similar to other studies.^{6,13,16} Although there were clear correlations between the history of injury and some of the injury risk factors, it did not reach statistical significance ($p > 0.05$). Studies did find that parents' awareness of the prevention of an accident and the promotion of its safety was inadequate.¹⁷ The fact that 67.0% of the current study's parents stated that they think that those injuries could have been prevented with protective measures points to the same inadequate safety performance.

Considering the injury risk factors in Omani families' home environment, it was found that only 60.0% of the homes' swimming pools are secured with a fence and door to control their access, and only 33.0% of the children use floating devices while using the swimming pool. Hence, around 40.0% of swimming pools are not secured. Nevertheless, only 9.0% of the parents reported that supervision while swimming is not practiced. Also, 20.7% of the participants reported the habit of keeping water in big containers in the house environment, which also could be a risk for drowning. Such findings indicate the need to reduce related accidental injuries by addressing such risk factors. Centers for Disease Control indicates that among infants under one, two-thirds of all drownings occur in bathtubs while most drownings happen in home swimming pools among children ages 1–4 years. It is evident that securing swimming pools with four-sided fence reduces a child's risk of drowning.^{18,19}

Doors to control stair access and prevent falls were reported by only half of the participants. However, more than two-thirds of the families reported having window guards and safe balcony guards. Preventive measures for fire accidents are less practiced by families, as only 9.2% and 17.9% have fire alarms and extinguishers at home, respectively. A good number of children could access electrical sockets, wires, and the cooker. Only 39.0% of parents store medications and chemicals in safe places that cannot be accessed by children, and the majority do not store liquid chemicals in water and juice bottles, which is a safe practice. Considering that burns,

falls, collisions with objects, and poisoning are the most common causes of injuries among children, with home being the most common location of accident, requires special attention from families for preventive measures.^{13,20}

Most of the participants take care in selecting toys that are suitable for the child's age and more than half have a suitable place/playroom in which the children can play. Around two-thirds of the families had a first aid kit at home. This is a positive practice that ideally should have a positive impact on reducing accidents' frequency, severity, and outcome. Nevertheless, one study showed that > 58% of the mothers had an appropriate level of home-injury prevention attitude. However, the performance of mothers was not at an acceptable level.²¹ Another study reported that only 20.2% of injured children received care at the scene of injury, and family/relatives (56.5%) most commonly provided initial care or first aid, and only 3.4% of children received on-scene care by trained prehospital personnel.¹¹

An effective plan for the prevention of accidents in children should be community-focused with an emphasis on educating parents, creating safer environments, and increasing awareness about risk factors associated with accidents in children. A multi-pronged approach is essential to addressing this issue, involving parents, healthcare providers, educators, and policymakers. In addition, age-appropriate injury prevention education should be integrated into school curricula and community-based programs.^{22,23}

This study has some limitations. The study was conducted in a single tertiary healthcare teaching hospital in Oman, which may limit the generalizability of the findings to the entire Omani population. The data were collected through self-reported questionnaires, which are subject to recall bias and social desirability bias. The study relied on the parents' self-report of accidents and preventive measures, which may not accurately reflect the actual situation at home. Despite these limitations, the study provides valuable insights into the attitudes and practices of Omani families in preventing accidental injuries among children at home.

CONCLUSION

The study highlights that many Omani families are not providing an adequate safe environment for

their children at home, as evidenced by the reported history of accidental injuries and the lack of proper safety measures. There is a need for targeted public health interventions to increase awareness about accidental injuries prevention and to promote the adoption of preventive measures at home. Health education campaigns, community-based programs, and routine counseling by healthcare providers can contribute to creating a safer home environment for children. Further research is needed to explore the effectiveness of specific interventions and to assess the long-term impact on reducing accidental injuries among children in Oman.

Disclosure

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