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Research Article

Parents' Knowledge and Perception Toward Unintentional Home Injury in Children and Safety Measures in Qatar: A Cross-Sectional Study

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Abstract

Background: Unintentional injuries are an alarmingly growing public health problem globally. Home is considered the main site or contributing factor in most unintentional injuries. **Objectives**: This study aims to assess parents' knowledge and perception of unintentional home injury in children and safety measures and determine the relationship between parents' sociodemographic variables and their knowledge and perception regarding unintentional home injury in children and safety measures. **Materials and Methods**: This descriptive cross-sectional study involved parents who visited the Pediatric Emergency Department in Al Wakra Hospital, Qatar. The mother or father was selected using a convenience sampling technique. A validated questionnaire about parents' knowledge and perceptions about unintentional injuries and safety measures was used. **Results**: A total of 384 parents participated in the study. The results revealed that parents have inadequate knowledge and moderate perception of home injury in children and safety measures. The mean score of parents' injury prevention was 31.6 (±3.4) out of 55 and the mean score of knowledge was 6.9 (±2.3) out of 16. Occupation and education are associated with higher knowledge, while nationality and number of children are associated with a higher level of perception. **Conclusion**: Overall, the results show that children are protected from intentional injury in multidimensional ways. In cooperation with public sectors, community initiatives are essential to implementing and evaluating children's injury prevention programs.

Keywords: Child Injuries; Knowledge; Perception

Highlights:

Parents' knowledge and perception toward home injury in children and safety measures.

Improving child safety and preventing unintentional injuries.

Introduction

Unintentional injuries are an alarmingly growing public health problem globally [1]. As defined by the World Health Organization [2], unintentional injuries happen without a predetermined or harmful intent which results in the death of hundreds of thousands of children yearly while millions of others suffer the consequences of non-fatal injuries. The most prominent death-related unintentional injuries include pedestrian and traffic accidents, drowning, burns, falling, and poisoning and can be affected by a child's home environment and parenting styles [2-7]. Furthermore, these injuries may have an additional tragic impact on families; the lives of more than 2000 families around the world are ripped apart daily by the loss of a child by an accidental or unintentional injury that could have been avoided and or prevented

[8, 9].

Children are especially curious in early childhood and spend most of their time exploring their surroundings. The lack of supervision and inability to protect children may expose them to fatal unintentional injuries that may lead to disabilities or deaths [10-12]. Children under the age of five are the most vulnerable group to road accidents, drowning, burns, falls, poisoning, and strangulation as the leading causes of childhood mortality and morbidity, with 5.82 million deaths occurring globally among children under the age of five in 2015, and the injury specific mortality rate was 73 per 100,000 population [13-16]. The incidence of unintentional poisoning among children aged 1 to 5 years is higher and seen predominantly in male non-Qatari children. Most home cases occurred in the living room and typically in the afternoon. There has been an increase in the accidental consumption of medications such as analgesics and antipyretics, known to be common poisons consumed by children [17]. Foreign body ingestion and insertion are common in the pediatric population ranging from infants to preschoolers. If not identified and appropriately treated, they can result in serious morbidity and mortality [18]. According to [19] Nour et al. (2018), injuries are the leading cause of death in Saudi Arabia. In Egypt, unintentional injuries have become a public health problem; in Turkey, it accounts for 1.5% of all pediatric deaths. A study in Baghdad City, Iraq, showed that more than 70% of unintentional injuries occurred between 0 and 5 years of age, while a similar study in Iran revealed that drug and oil ingestion is one of the unintentional risk factors [1, 3, 16, 20]. In Qatar, there is a lack of available information about the knowledge and perception of the population regarding home injury in children and safety measures. Previous local studies have focused on epidemiological research, such as the prevalence of child injury [21] and poisoning among children [17]. However, how people perceive injury significantly impacts how they practice safety behaviors. Home injury is becoming a concern in public health in different parts of the world, especially for preschoolers and the elderly [7]. The primary caregivers need to possess accurate knowledge, practice, and behavior on home safety and child injury prevention to improve child safety [22].

Methods

Study Design, Setting, and Sampling

This quantitative descriptive cross-sectional study involved parents who visited Al Wakra Hospital, Pediatric Emergency Department (PED), Al Wakra, Qatar. Al Wakra Hospital has a capacity of 325 beds. Pediatric Emergency Department is a 26-bed capacity unit that provides medical care from birth up to 14 years old for both males and females and caters to more than 100,000 patients annually (PED census report). At PED, parents (mother or father) with children aged up to 5 years eligible for the inclusion criteria were approached to participate in the study using a convenience sampling technique. Sample size was calculated based on the Cochran formula. The required sample size was 384 as the proportion in the target population (parents with at least one child under 5 years old) was set at 0.5, as no estimate was available. A questionnaire was used to collect data and answer the research question based on sociodemographic data, knowledge, and perception assessment.

Aim and Objectives

The objectives of this study are to assess parents' knowledge and perception of unintentional home injury in children and safety measures and determine the relationship between parents' sociodemographic variables and their knowledge and perception regarding unintentional home injury in children and safety measures. This research aimed to improve child safety and prevent unintentional injuries by developing child safety awareness programs for families and caregivers involving healthcare practitioners in safety education to achieve a better level of knowledge and perception toward unintentional child injury and safety measures and coordinating activities and collaborating across sectors for the implementation and evaluation of child injury prevention programs.

Inclusion Criteria

The inclusion criteria for this study are parents, mother or father, who have at least one child aged up to 5 years old who visited PED. Parents who visited the PED with a clinically stable child and were triaged based on Canadian Triage and Acuity Scale (CTAS). as Priority 4, Less Urgent (to be seen < 60 min) or Priority 5, Non-Urgent (to be seen < 120 min) and parents who visited PED who can read and write in English or Arabic.

Exclusion Criteria

The researchers excluded parents, mother or father, who attended PED for unintentional and intentional home injury-related visits and parents who visited PED with a clinically unstable child and triaged based on CTAS as Priority 1, Resuscitation to be seen immediately) or Priority 2, Emergent (to be seen < 15 min), or Priority 3 Urgent (to be seen < 30 min). Parents who visited PED with children with developmental or metabolic disorders were not included in the study.

Instruments and Reliability

For this study, the researchers adopted a validated questionnaire approved by the original author, "*Knowledge and perception toward unintentional home injury in children and safety measures among Malaysian urban* mothers." [7]. The researchers checked the reliability and validity of the questionnaire for the Arabic version. Content validity was assessed by four experts in

the department who were not involved in the research. Consistency and reliability were evaluated by distributing the questionnaire to 50 subjects, and their response was collected and analyzed. Factor analysis was used to determine the questionnaire's construct validity, including knowledge and perception, and Cronbach's alpha was used to assess the factor loading. The scores gained from all items within two questionnaire domains, knowledge and perception of Cronbach's alpha, were 0.79 and 0.67, respectively. The knowledge, 0.79 [0.66; 0.87], and perception, 0.67 [0.48; 0.80], domains were under acceptable limits of 0.60–1.00 (34), in turn indicating a good internal consistency.

Ethical Consideration

Before conducting this study, ethical approval was obtained first from the research HMC-IRB. The research was performed according to the ethical principles of the Declaration of Helsinki and Good Clinical Practice Guidelines and Regulations of MoPH in Qatar and the policies of the HMC research committee.

Statistical Analysis

Statistical analysis was conducted using STATA 15.1. Categorical variables were described using absolute and relative frequencies, n (%) or (n; %). Continuous variables were described by the mean and standard deviation. The continuous variables between demographic variables and scores of the t-test and one-way ANOVA test were compared. The comparison of categorical variables was made using the chi-squared test. Internal consistency and reproducibility were performed for the reliability of the questionnaire. For internal consistency, Cronbach's α coefficient was used to examine the homogeneity of question items in each domain index. A coefficient of 0.6 and above is considered to be internally consistent for the questionnaire [23]. Each domain score in the form of an index variable at the pre- and post-level was also calculated using intraclass correlation [24]. A p-value of 0.05 (two-tailed) is considered a significant level. STATA 16.0 statistical package is used for the analysis.

Results

Sociodemographic Characteristics

A total of 384 parents participated in the study. The average age of mothers was 34.4±6.4, and 55.7% were females. About 21.9% of the parents had secondary schools and lower educational degrees, and 76.6% had college and university degrees. About 78.1% of parents have more than one child. In terms of occupation, most of the parents (67.2%) were working full-time; 26.3% were unemployed. Most parents (58.6%) had 10,000 QAR or more monthly income. 77.1% had no history of child injury. Regarding nationality, 55.5% of parents were from the Eastern Mediterranean Region, 36.5% from the Southeast Asian Region, 4.4% from the African Region, 2.3% from the Western Pacific Region, 0.8% from European Region, and 0.5% from the Americas (Table1).

Variables	Level	N (%) & Mean (SD)
N		384
Age, mean (SD)		34.4 (6.4)
Nationality	African Region (AFR)	17 (4.4%)
	Eastern Mediterranean Region (EMR)	213 (55.5%)
	European Region (EUR)	3 (0.8%)
	Region of the Americas (AMR)	2 (0.5%)
	Southeast Asian Region (SEAR)	140 (36.5%)
	Western Pacific Region (WPR)	9 (2.3%)
Gender	Male	170 (44.3%)
	Female	214 (55.7%)
Number of children	single	84 (21.9%)
	more than one	300 (78.1%)
History of child injury	Yes	88 (22.9%)
	No	296 (77.1%)
Income	Less than 5000 QAR	32 (8.3%)
	5000–10000 QAR	127 (33.1%)
	10000–15000 QAR	104 (27.1%)
	Above 15000 QAR	121 (31.5%)
Occupation	Working full-time	258 (67.2%)
	Working part-time	25 (6.5%)
	Unemployed	101 (26.3%)
Education	Primary school	16 (4.2%)
	Secondary school	68 (17.7%)
	College/university	294 (76.6%)
	None	6 (1.6%)

Table 1: Sociodemographic characteristics of participants.

Perception

The parents' injury prevention perception mean score was calculated to be 31.6 (±3.4) out of 55. About 43.2% of parents agreed to prevent injuries in their homes. Table 2 shows parents' responses to a specific perception item. Approximately 5.7%

of parents agreed that children are vulnerable to injury, 31.5% that supervision practice reduces the risk of child injury, 64.8% that supervision by siblings is safe for their child, 37.2% that injury costs could be avoided through injury prevention practice, 21.1% that they are unable to control their children from becoming injured at home, and 30.7% that injuries such as falls and cuts are preventable. Furthermore, 88.0% of parents believe that injury in children is unpreventable, and 45.1% believe that minor injury is normal in children. Approximately half (52.9%) of mothers agreed that they would practice safety behavior based on the severity of the injury, 43.2% felt that the risk of their child getting injured at home is low, and about 74.7% of parents felt that safety devices such as electric socket cover did not reduce injury risk in their child.

No	Item	Agree	Neutral	Disagree
P1	Children are vulnerable to home injury.	22 (5.7%)	44 (11.5%)	318 (82.8%)
P2	Supervising children's activities at home can reduce their risk of injury.	121 (31.5%)	87 (22.7%)	176 (45.8%)
P3	The risk of my child getting injured at home is low.	166 (43.2%)	90 (23.4%)	128 (33.3%)
P4	Cost of treatment could be avoided if injury prevention is practiced at home.	143 (37.2%)	84 (21.9%)	157 (40.9%)
P5	Child injury at home is something that cannot be prevented.	338 (88.0%)	19 (4.9%)	27 (7.0%)
P6	Minor injuries are considered normal in children.	173 (45.1%)	92 (24.0%)	119 (31.0%)
P7	Safety devices such as electric socket cover do not reduce the risk of injury to my child.	287 (74.7%)	43 (11.2%)	54 (14.1%)
P8	Children are safe when they are supervised by their siblings (brothers/sisters).	249 (64.8%)	82 (21.4%)	53 (13.8%)
P9	Falls and cuts are less dangerous as compared to poisoning and drowning.	118 (30.7%)	47 (12.2%)	219 (57.0%)
P10	I am totally unable to prevent my child from being injured at home.	81 (21.1%)	89 (23.2%)	214 (55.7%)
P11	I would practice injury prevention depending on the severity of the injury.	203 (52.9%)	108 (28.1%)	73 (19.0%)

Table 2: Parents' perception toward home injury in children and safety measures.

Knowledge

Figure 1 shows parents' knowledge of the home injury in children and safety measures. The average knowledge score was 6.9 (2.3) of 16 points. 42.89% of parents are aware of home injury prevention. According to the findings (Figure 1), 22.4% of parents have correct knowledge on the potential of vitamins as a cause of child poisoning at home, 18.2% of parents have correct knowledge on the usefulness of baby walkers, only 35.4% of parents admit to having knowledge on cardiopulmonary resuscitation for children, 40.6% know the appropriate age for children to bathe alone. About 54.2% of parents having the correct knowledge of the injury that could happen due to a fall from height, 50.5% of parents understand that it is dangerous for children to play with small objects such as coins, 54.9 % have correct knowledge regarding the sleeping position suitable for babies under one year of age, and 44.3% have proper knowledge regarding the use of fabric swing to put a baby to sleep. On the other hand, they were knowledgeable regarding injuries that could happen due to an accidental knock from the sharp edge of a table (90.3%), the importance of having a stair gate at home (87.5%), the unsuitability of having glass ornaments in the living room (79.9%), the risk of suffocation if a child plays with plastic (79.4%), the risk of keeping bleach in an unlocked cabinet under the kitchen sink (75%), the risk of drowning in shallow waters (78.4%), and injury from an exposed electrical socket (63.3%).

Factors associated with Parents' Knowledge and Perception

Table 3 shows the relationship between demographic characteristics, parents' knowledge, their perception of injuries at home, and the safety measures for preventing injuries to parents. Parents who work full-time also have higher knowledge (7.3±1.8) than those working part-time (7.0±2.1) and those who are unemployed (6.6±2.1), p=0.001. Parents who completed college (7.4±1.8) and secondary schools (6.4±1.9) have significantly higher knowledge than those who completed primary school (6.6±2.4) and those with no education (3.7±2.3), p=<0.001. There was no significant association found between the age, gender, number of children, nationality, history of injury, and income and the risk of knowing the loss of parents' knowledge (Table 3). The average perception score was higher among

parents with more than one child (31.8±3.3). Parents from the Eastern Mediterranean Region (32.3±3.3), European Region (32.0±4.6), and African Region (32.0 ±4.2) had a significantly higher perception than those from other regions, such as Western Pacific Region (31.2±5.1), Southeast Asian Region (30.6±3.0), and Region of the Americas (31.0±2.8), p=<0.001. However, other variables were not statistically significant in terms of perception.

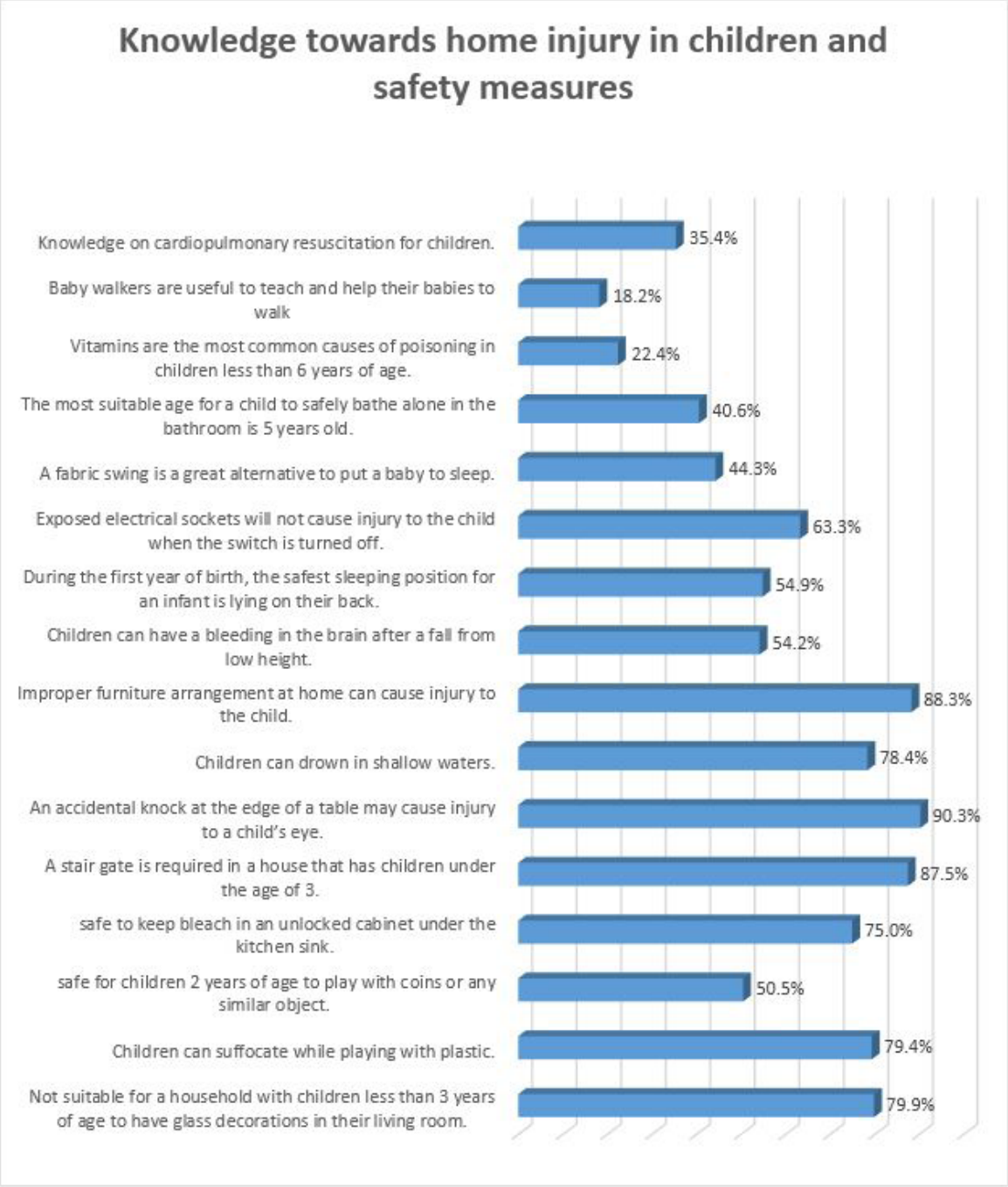

Figure 1: Knowledge of home injury in children and safety measures.

	N	Perception, mean (SD)	Knowledge, mean (SD)
Age			
18-40yrs	331	31.7 (3.4)	7.1 (2.0)
45-65yrs	53	31.5 (2.9)	7.5 (1.3)
p-value		0.67*	0.15*
Nationality			
African Region (AFR)	17	32.0 (4.2)	7.1 (2.1)
Eastern Mediterranean Region (EMR)	213	32.3 (3.3)	7.2 (2.0)
European Region (EUR)	3	32.0 (4.6)	7.7 (2.5)
Region of the Americas (AMR)	2	31.0 (2.8)	5.5 (0.7)
Southeast Asian Region (SEAR)	140	30.6 (3.0)	7.0 (1.9)
Western Pacific Region (WPR)	9	31.2 (5.1)	8.0 (1.2)
p-value		<0.001**	0.55**
Gender			
Male	170	31.6 (3.3)	7.2 (1.7)
Female	214	31.7 (3.4)	7.0 (2.1)
p-value		0.70*	0.23*
No. of children			
Single	84	31.0 (3.5)	7.0 (1.8)
more than one	300	31.8 (3.3)	7.1 (2.0)
p value		0.07*	0.51*
History of child injury			
Yes	88	32.0 (3.3)	6.9 (2.1)
No	296	31.5 (3.4)	7.2 (1.9)
p-value		0.29*	0.32*
Income			
Less than 5000 QAR	32	31.9 (3.3)	6.9 (1.7)
5000–10000 QAR	127	31.8 (3.6)	7.1 (2.2)
10000–15000 QAR	104	31.2 (3.3)	7.0 (1.7)
Above 15000 QAR	121	31.7 (3.1)	7.2 (1.9)
p-value		0.57**	0.84**
Occupation			
Working full-time	258	31.5 (3.2)	7.3 (1.8)
Working part-time	25	31.8 (3.8)	7.0 (2.1)

Unemployed	100	31.9 (3.5)	6.6 (2.1)
p-value		0.6**	<0.001**
Education			
Primary school	16	31.9 (3.7)	6.6 (2.4)
Secondary school	68	32.1 (3.5)	6.4 (1.9)
College/university	294	31.5 (3.3)	7.4 (1.8)
None	6	32.5 (3.1)	3.7 (2.3)
p-value		0.43**	<0.001**

Table 3: Factors associated with parents' knowledge and perception in terms of injury prevention.

Discussion

Sociodemographic Characteristics

The relationship between sociodemographic variables and knowledge and perception of parents toward unintentional home injury and safety measures in children is important to improve parents' safety practices to prevent unintentional injuries [16]. Our study revealed that 55.7% of the parents were females and 55.5% of parents were from Eastern Mediterranean Region. [25] This is similar to study; mothers are the main caregivers of young children in Qatari culture, and fathers play a supportive role in parenting when children are older. [26] An Iranian study by Sadati et al. 2020 noted that mothers play a crucial role in child development at care compared to fathers. Our study also revealed that the average age of mothers was 34.4±6.4, 78.1 % of the parents had college and university degrees, most parents (67.2%) worked full-time, and 58.6% had 10,000 QAR or more monthly income. A high socioeconomic status could decrease home injuries, as 77.1% of parents did not report any history of child injuries. A study by Nadeeya et al. (2016) [7] has shown that older mothers, their status of work, and the income of households are related to a higher level of knowledge. [1, 27] These results are similar to those who concluded that well-educated and older mothers had better knowledge, attitude, and practice regarding home injuries than other mothers.

Perception

Parents' level of awareness, attitude, and self-efficacy are the most incriminated factors for the misuse of first aid steps, especially in the case of children's home injuries [28]. Parents' perception of children who have suffered injuries has been shown to determine their security behavior [7]. In our study, the parents' perception of injury prevention mean score was 31.6 (±3.4) out of 55. About 43.2% of parents agreed to prevent injuries at home, and 88.8% said they were unable to control children at home. In addition, 88.0% of parents perceived that injuries cannot be prevented in children, and 45.1% perceived that small injuries were normal in children. These results coincide with other research showing that parents did not think it was possible to prevent unintentional injuries [29]. A 1993-to-2007 report [30] revealed the leading causes of child injury death in Qatar to be road traffic incidents (71.3%), drowning (9.3%), and accidental falls (6%). The data gathered [30] is an essential factor in spreading awareness on injury prevention and child safety, as our study revealed that 30.7% of the parents perceived that injuries such as falls and cuts are less serious than drowning and poisoning.

Knowledge

According to our study, approximately 42.89% of parents are aware of preventing accidental injuries at home. The average knowledge score was 6.9 (2.3) of 16 points. However, less than half of the population have knowledge of specific safety measures such as cardiopulmonary resuscitation, vitamins as a possible cause of poisoning, the suitable age of children to bath alone, hazards of fabric swings, the importance of covering electrical sockets, and keeping proper storage of chemicals and choking hazards. Only 35.4% of parents are aware of CPR for children. Similar to a 2014 study in Egypt [27] 22.3% of mothers had never heard of first aid; the difference in the result may be due to different demographic characteristics of the population involved, as our study involves parents from different regions globally. More than half of parents (54.9%) know the safest sleeping positions for babies. In a Croatian study [31], only 13.7% of parents and 1.1% of community nurses know the safest sleeping position for children. The conclusions revealed that there was no assurance that working in the medical field is a good indicator of awareness of this information. In addition, 44.3% of the parents believed that a fabric swing is a great alternative to putting a baby to sleep, which is almost similar to the result of a study in Egypt [27]. Home injuries are becoming a major public health concern in various regions of the world, especially among preschools and older adults [7]. The incidence of unintended poisoning in children between the ages of 1 and 5 is high and is seen primarily in non-Qatari male children, with

most cases occurring in the living room, usually in the afternoon [17]. The most common type of poison ingested by children was medicines, namely, analgesics and antipyretics, specifically paracetamol [17]. A similar study by [3] In Iran revealed that drug and oil ingestion is one of the unintentional risk factors. Our study showed that only 75% of parents admit it is safe to keep bleach in an unlocked cabinet under the kitchen sink, about 22.4% have the correct knowledge on the potential of vitamins as a cause of child poisoning at home, and 63.3 % of parents have proper knowledge regarding injury from and exposed electrical socket. Moreover, a child's home environment and the characteristics of their parents are contributing factors to unintentional childhood poisoning [3].

Factors associated with Parents' Knowledge and Perception

Our study revealed that parents who work full-time also have higher knowledge than those working part-time and those who are unemployed. The parents who completed college and secondary schools have significantly higher knowledge than those who completed primary school and had no education. Similar studies suggest that well-educated, working mothers and those with a university education who attended first aid training were significantly more knowledgeable and had proper practices [19, 27, 29]. The average perception score in our study was higher among parents with more than one child. This is similar to a study [32], which suggests that mothers with more children and those whose children have already been involved in an accident have been found to have a higher level of awareness. However, other variables in our study, except nationality, were statistically insignificant. Many studies identified several contributing factors that may lead to unintentional injuries. As a physical or environmental factor, the home is considered the main site where most unintentional injuries occur especially among the preschool-aged children [33, 34, 35]. The result recommends home modification to prevent unintentional child injury. Three categories of injury prevention methods are education, environmental change, and government action. Educational interventions focusing on parents play an essential role and are considered the most effective method for preventing injuries. For that, identifying parents' perceptions related to home injuries and preventive measures are the foundation for implementing appropriate education for families and caregivers on environmental modifications at home [10, 36, 37, 38,39]. Intervention is required to resolve the awareness gap and strengthen mothers' attitudes and behaviors, in addition to joint government and community initiatives [19].

Conclusion and Recommendation

Overall, findings suggest that protecting children from unintentional injuries is a multidimensional approach. Overall, the results show that children are multidimensionally protected from intentional injury. In cooperation with public sectors, community initiatives are important to implement and evaluate children's injury prevention programs. It is recommended that families and caregivers are properly educated about family environmental changes.

Limitations of the Study

The study involves mothers attending the Pediatric Emergency Department, Al Wakra Hospital, Al Wakra, and Qatar. The study's generalizability is restricted because the sample was drawn from persons who attended the emergency department during the research period. The response rate may be another limitation because not all participants are not ready to answer the questionnaires. Furthermore, most participants were from other nationalities (non-Arabic) and English is their second language, which might affect the understanding of some questions, which may not reflect their actual knowledge and perception of home injury. The wording used in the questionnaire may also be biased toward the participants' answers. Literacy issues may have introduced information bias as the research assistant helped those participants to complete the survey as parents may give socially desirable answers when providing their responses.

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Authors' contributions

Ghadeer and Khalil was responsible for the concept, design, literature search, data acquisition, analysis, and manuscript preparation and editing. **Lorenzo and Reyes** were involved in the concept, design, manuscript preparation and editing. **Singh** Data analysis and manuscript review.

All authors were involved in literature search, data acquisition, manuscript preparation. All authors read and approved the final manuscript questionnaire.

Ethics approval and consent to participate

The study was approved by the Medical Research Centre (MRC) and Institu tional review board (IRB) of Hamad Medical Corporation, Qatar. Being retro spective and the subjects being de-identifed by coding, the need for consent was waived of by the IRB

of Hamad Medical Corporation, Qatar (Approval no: MRC-01-20-1122). All methods were carried out in accordance with relevant guidelines and regulations. The institutional approval letter is uploaded as a supporting document consent for publication: Since the study was retrospective and all the subjects were de-identified by coding, consent for publication was not required from the subjects.

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