

# Are Pakistani mothers aware of the Child Safety Measures? A Cross sectional study

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Received: November 2020; Accepted: December 2020; Published: January 1, 2021.

Citation: Tabinda Ashfaq et al. Are Pakistani mothers aware of the Child Safety Measures? A Cross sectional study. World Family Medicine. 2021; 19(1): 96-103 DOI: 10.5742/MEWFM.2021.93954

## Abstract

**Introduction:** Accidental injury and trauma is one of the most important causes of mortality among children <3 years. Parent's especially mother's knowledge has a vital influential role in care and safety of their children (2). The most common reasons for injury includes drinking hot drinks while holding a baby, leaving children alone in the bath, allowing children to play with toys small enough to go into their mouths and not wearing cycle helmets etc(3). The aim of this study was to assess the knowledge and practices of mothers regarding prevention of common accidents among preschool children in Karachi, Pakistan.

**Methodology:** This was a cross sectional survey conducted at family medicine clinics of Aga Khan University Hospital Karachi, Pakistan. The study participants included mothers of pre-school children (aged 3-5 years) identified through convenience sampling after taking informed verbal and written consent. The questionnaire included descriptive characteristics of the study participants along with questions related to knowledge and practices regarding the common accidents among pre-school children and strategies to prevent them. The data was entered on epi data version 3.1 and analysis was performed on SPSS version 16.

**Results:** Most of the mothers (79%) were between the ages of 31-40 years and were housewives. Children whose mothers were uneducated had a higher incidence of injuries. The most common types of accident among children were falls (88%) and approximately 90% of the mothers did not teach traffic rules to their children. The majority of mothers reported that continuous supervision is the best precaution to avoid injuries among pre-school children.

**Conclusion:** Home-related injuries may lead to many health problems and their prediction and prevention are necessary to prevent major health hazards. This study concludes that the majority of mothers have inadequate knowledge and improper practice on prevention of accidents among preschool children. There is a strong need to improve knowledge and awareness of mothers regarding home related injuries to prevent accidents in preschool children.

**Key Words:** Awareness, Mother, Injuries, young children

## Introduction

Injury among children is a major health issue globally. Around 830,000 children die every year and nearly 2,300 die each day due to injury worldwide (1). Road traffic crashes, drowning, burns, falls and poisoning are the leading causes of deaths due to injury. Every day 480 children die due to drowning, 260 die from burns, 130 die from falls and 125 die from poisoning worldwide (1). Previous studies have reported that across all age brackets; the highest incidence of unintentional injuries occurs in the preschool group (2-4). A study conducted among children (aged <15 years) showed that nearly half of the total number of children who visited the Emergency Center due to unintentional injury were less than 5 years of age (2). Similarly a study from Pakistan showed that during the second year of life; children had the highest number of injuries (3). Zhang et al also reported that among children of different age brackets; preschool age was significantly associated with unintentional injuries (4). A study from China reported that incidence of injury was 16 per 1000 children aged less than 5 years of age (5).

Injuries are the most important cause of mortality, morbidity and disability among children. Systematic review by Rivara reported that head injuries and burns have a marked impact on emotional and behavioral development (6). Preschool age is the most crucial period in life as 90% of the brain development occurs during this age (7). Hence, any traumatic injury occurring during this age can lead to lifelong physical and mental consequences. Disability-Adjusted Life Years (DALYs) lost due to road-traffic injuries and falls rank among the top 15 causes of global burden of disease (8). A national study from India reported unintentional injuries to be the sixth leading cause of death among children less than 5 years of age (9). Worldwide, injuries like drowning, road-traffic injuries and burns are among the top 12 leading causes of deaths among preschool children (10).

However this burden of injury among children is distributed unequally; with more than 95% of all child injury deaths occurring in middle- and low- income countries (11). It highlights the poor interventional practices in these countries to prevent injury among children. Furthermore, the World Health Organization reports that around 90% of injuries to children are "accidental", hence mostly preventable (1). Therefore, the prevention strategies can play a pivotal role in curtailing the rates of injury among children. Previous studies reported that most of the injuries to children take place at home due to household hazards (2-3, 5, 12). A study from Pakistan reported that 61% of injuries to children occurred at home with the highest number occurring in the courtyard, followed by stairs, kitchen and bedroom (3). This is particularly relevant for preschool children who spend most of their time at home. Therefore, prevention strategies taken by mothers to reduce the risk of household hazards can significantly suppress the incidence of injury among preschool children.

Pakistan is one of the five countries where about 50% of under-five age deaths are clustered (13). The Mortality rate under-5 (per 1000) in Pakistan was reported at 87 in 2009 (14). Among different causes of deaths in children less than 5 years; studies have reported high incidence of injury among children in Pakistan (3, 12). A study from Pakistan showed incidence rate of injuries that required care outside home was 19.7 per 100 children (3). However there is a lack of literature regarding mothers' knowledge about injury among preschool children. Therefore the aim of this study was to assess the knowledge of mothers regarding common injuries, their prevention and emergency management among preschool children. This would help to frame interventional strategies targeted toward curtailing the risk of injuries among preschool children and improving its emergency management by mothers.

## Methods

We conducted a cross sectional study at the Community Health Clinics (CHC) at the Aga Khan University Hospital Karachi, Pakistan. The Aga Khan University is a not-for-profit, private institution in Pakistan.

### Sample size calculation:

We required a sample size of 302 participants to achieve our study objective. The following assumptions were used to calculate it; prevalence of 50% was used to achieve maximum variance due to lack of studies of the same from Pakistan, at 95% confidence interval and 7% bound on error of estimation. The sample size was also inflated by 10% for the non-responders resulting in a total of 320 study participants.

### Data collection:

The study participants were recruited from the waiting area of CHC clinics during September to November 2019. CHC clinics were chosen as these clinics offer immunization and circumcision services and a large number of parents visit these clinics and hence easy recruitment of study participants is possible from here. Secondly, people from diverse socio economic backgrounds avail services from CHC so as to ensure representation of various socio economic strata in our sample. Those mothers who had one or more children of age 3-5 years were invited to participate in the study. However, those mothers who had acute problems like chest pain, acute abdominal pain etc. at the time of data collection were excluded.

The study sample was drawn in a convenience manner from CHC during the study period.

### Development of Questionnaire:

The questionnaire was initially developed in English language and then translated to Urdu for the convenience of the study participants and it took about 20-40 minutes to complete the questionnaire. The questionnaire was formulated after thorough literature search and was comprised of two sections. Section A, dealt with the descriptive characteristics of the study participants. The

subsequent section consisted of various categories of injuries such as burns, poisoning, foreign body aspiration etc.; different strategies were listed for these categories and the respondents were asked in a multiple response manner to pick the strategies which need to be used in order to avoid that particular type of injury. The data collectors hired were specifically trained for the task to identify eligible participants and for administering the questionnaire.

#### **Ethical consideration:**

Written informed consent was obtained from all the study participants after explaining to them the research protocol. The data was collected by ensuring strict confidentiality to the participants and they were interviewed in an environment where their privacy was ensured. The study was reviewed and approved by the Ethical Review Committee .

#### **Statistical Analysis:**

The data was double entered on epi data version 3.1 and analysis was performed on Statistical Package for Social Sciences (SPSS) version 19. Baseline information on demographics was analyzed using descriptive statistics and proportions were calculated for categorical variables such as age, occupation and education of mother, number of children etc. The outcome was to identify the common strategies used by mothers to avoid unintentional injuries among preschool children. Multiple responses were obtained for each category of interventions and percentages were reported for them.

## **Results**

A total of 320 mothers were recruited in the study. Out of these 18 (6%) were non responder and information of 302 participants was included in the final analysis. The socio-demographic characteristic of our study population is given in Table 1. Out of the total 302 participants, around half (49%) were between 21-30 years of age; followed by participants (34.8%) aged 31 to 40 years. On inquiring about educational status, the majority of the mothers had completed their high school education (44%) and about one quarter of the participants were graduate and above. Only a small number of participants did not have any formal education (6.6%). On questioning about family system, the majority of the mothers were living in an extended family system (70.2%). Regarding number of children nearly half of the mothers (48%) had 1 to 2 children, closely followed by 44% of mothers who had 2 to 3 children. Furthermore, almost 53.6 % of the mothers had less than 2 children of 5 years and less. It was interesting to note that more than half (54.3) of the study mothers (participants) were employed (private and government) and less than half 45.7% of the participants were housewives.

Graph 1 depicts mothers' perception of the most common injury among pre-school children less than 0 years. About 19% of the mothers responded that falls are the most common injury followed by cuts, lacerations (15%) and poisoning (15%). While 10% of the mothers believed that

electrocution can be the most common cause of injury among pre-school children.

Table 2 presents the knowledge of mothers of pre-school children to avoid unintentional injuries. To avoid cuts and lacerations 76% of the mothers believed that sharp objects should be kept out of the reach of children and 20% assumed that using unbreakable utensils can solve the problem. To prevent falls about 64.2% of the mothers responded that children should not be left unattended on roof tops and stairs to avoid falls and 37% said that children should not be left alone on high chair or bed. In order to prevent burn injury the majority of the mothers (67.9%) were of the opinion that children should not be left alone in the bathroom and kitchen while 63.9% of them stated to switch off the electrical appliance when they were not in use while only half 45% and 47% said that the stove should be kept in a high place and hot fluids should be out of reach of children. As far as injuries from drowning is concerned mothers (81.8%) responded to supervise children closely when they were near any source of water and advised to teach them swimming by a professional swimmer (46.4%). On asking about prevention from poisonous substances the majority of the mothers (74.2%) responded that all poisonous substances should be at a height which is out of child reach in a locker (47.7%). When asked about prevention of motor injury nearly all (98%) of the participants emphasize on the fact that children should not be left unattended when playing outside the house. Moreover, 43% of mothers believed that children should be taught not to run after balls and kites on the road.

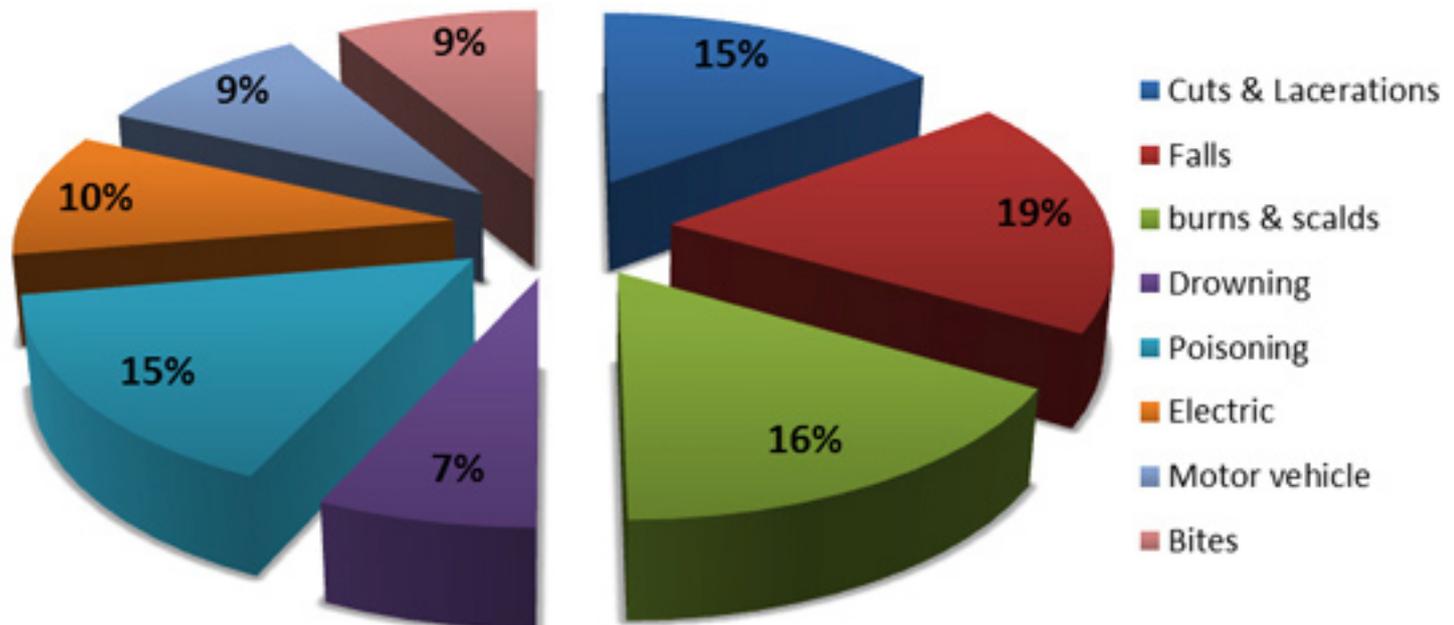
To prevent children from electrical injuries 91.4% of the mothers stated that children should not be allowed to play with electrical appliances and 73% said that open wires should not be used followed by the opinion that the electrical sockets not in use should be covered (69.2%). When asked about prevention from animal bite approximately 94% of the mothers thought that children should be taught to avoid stray animals, 87% said children should be taught to avoid abusing animals (84%) followed by 72% of mothers who think children should not be allowed to sit on uncovered grass. When asked about the prevention of foreign body aspiration among preschoolers the majority of the mothers replied; that children should not be allowed to play with small objects (coin, button) etc. (78.1%) and do not permit them to play with toys with small parts (46%). Moreover, remove all small objects from the floor before a child picks them up (88%).

Table 1: Sociodemographic Characteristics of the study participants

<b>Socio-demographic Characteristics of Study Participants</b>		
<b>Characteristics</b>	<b>Number (n)</b>	<b>Percentage (%)</b>
<b>Age of mother</b>		
<20 years	37	12.3
21-30 years	149	49.3
31-40 years	105	34.8
41-50 years	11	3.6
<b>Literacy Status</b>		
Literate but no schooling	20	6.6
Primary Education	31	10.3
Secondary Education	45	14.9
High School	133	44
Graduate & above	73	24.2
<b>Type of Family</b>		
Nuclear	90	29.8
Extended	212	70.2
<b>Number of Children</b>		
1-2 Children	145	48
2-3 Children	135	44.7
> 3 Children	22	7.3
<b>Number of children &lt; 5 years</b>		
less than 2 children	162	53.6
More than 2 children	140	46.4
<b>Occupation of Mother</b>		
Government Employee	34	11.3
Private employee	130	43
House wife	138	45.7

**Table 2: Preventive strategies adopted by Mothers for child safety**

Statements	Number	Percentage
<b>Cuts and lacerations</b>		
Supervise the child by not touching sharp objects	145	48.0
Sharp objects out of children's reach	230	76.2
Use non-breakable utensils	61	20.2
<b>Avoiding Falls</b>		
Never leave child unattended on high chair/bed	112	37.1
Not allow child to climb stairs/roof unattended	194	64.2
<b>Burns</b>		
Keep stove at a high place in kitchen	136	45.0
Keep hot fluids/food out of child reach	144	47.6
Switch off iron/heaters when not in use	193	63.9
Check temperature of child bath water	34	11.3
Never leave child unattended in kitchen or bathroom	204	67.5
<b>Drowning</b>		
Keep bathroom doors closed when not in use	89	29.4
Supervise children closely when near any source of water	247	81.8
Teach children swimming under adult/professional swimmer	140	46.4
<b>Poisoning</b>		
Never store toxic substances in food containers	122	40.4
Never remove labels from toxic substances	77	25.4
Keep all toxic substances at a height out of child reach	224	74.2
Keep all toxic substances in lock	144	47.7
<b>Motor Injury</b>		
Don't allow child to play behind parked cars	60	19.9
Teach child not to run after ball/kites etc	130	43.0
Supervise the children when playing outside home	296	98.0
<b>Electric Hazards</b>		
Electrical switches, wires, fuse, gas outlets out of children reach	132	43.7
Cover electrical sockets not in use	209	69.2
Avoid use of open wires	223	73.8
Teach electrical safety to children	161	53.3
Electrical wires hidden and out of reach of children	199	65.9
Don't allow child to play with electrical appliances	276	91.4
<b>Bites from animals/insects</b>		
Teaching the child to avoid abusing animals	263	87.1
Do not allow child to sit on uncovered grass	218	72.2
Applying insect repellent when exposure is anticipated	77	25.5
Teach the child to avoid stray animals	285	94.4
<b>Foreign Body Aspiration</b>		
Prevent the child playing with small objects (coin, button)	236	78.1
Do not permit child to play with damaged balloons	116	38.4
Remove all small objects from floor before child picks them up	267	88.4
Toys should be inspected for small removable parts	139	46

**Graph 1: Mothers' perception of the most common injury among pre-school children less than 0 years**

## Discussion

This was a cross sectional study in which we tried to explore how well our mothers know about the risk factors of injuries in children and what measures do they think can prevent child injury.

Most of the mothers who participated in this study were between age group 21-30 years highly educated and were living in a joint family system. There were four common types of home injury i.e., falls, burn injury followed by wounds by sharp objects and foreign body aspiration poison etc. This pattern of injuries was similar to that reported by CDC.(1)

Regarding type of injuries, the majority were of the opinion that falls were the most common type of injury followed by burns among children of preschool age groups. These results are similar to studies done by Rezapur-Shahkolai F et al (15) and Zia N et al (12) emphasizing that children need to be kept in a safe environment to prevent falls. When inquired about mothers attitude about safety measures on injury prevention, 76% of the mothers were of the correct belief on how to prevent sharps related injuries in their young ones. These results were similar to those presented by Black from New York which found that 74% of mothers knew how to protect their children from cuts/ lacerations/ sharps related injuries (17). To prevent falls, about 64.2% of the mothers responded that children should not be left unattended on roof tops and stairs to avoid falls and 37% said that children should not be left alone on a high chair or bed. In order to prevent burn injury the majority of the mothers (67.9%) were of the opinion that children should not be left alone in bathroom and kitchen. Other precautions against burn injuries reported by mothers were switching off the electrical appliance when they were not in use in 63.9%.

Approximately half of the mothers, around 45%, said that the stove should be kept at high place and hot fluids should be out of reach of children. This contrasts with the results reported by Carlsson A which showed that about 70% of the mothers were of the belief that warm fluids/water should not be kept within a child's reach 18. As far as injuries from drowning is concerned mothers (81.8%) responded to supervise children closely when they were near any source of water. Similar results have been reported by Silva et al from Brazil (19) and advised to teach them swimming by a professional swimmer (46.4%) (19). In our study only 40% of the mothers were of the view that toxic substances should not be kept in food containers. Bilgen Sivri et al from Turkey reported better preventive knowledge i.e 89.8% on keeping poisonous/ toxic substances in their original containers rather than putting them in food containers (20). Educating parents, especially mothers, regarding proper storage of poisonous substances, use of childproof containers, putting warning labels on containers of toxic/poisonous substances might significantly decrease the number of poisonings in children.

Motor vehicle related injuries account for 1.3 million deaths worldwide (21). Young people especially children are the vulnerable group (21). Mortality related to motor vehicle related injuries among children is three times higher in low income countries as compared to high-income countries (22). Since Pakistan is a low income country it becomes more relevant for us.

When asked about prevention from motor injury nearly all (98%) of the participants emphasize on the fact that children should not be left unattended when playing outside the house. Moreover, 43% of mothers believed that children should be taught not to run after balls and kites on the road.

Children are more vulnerable to motor vehicle injuries because they have small stature which makes it difficult for children to see and assess surrounding traffic and in addition to it drivers also cannot see them. Children may also find it difficult to interpret the various visual and aural stimuli, which may impair their judgement regarding the speed and proximity of moving vehicles. Therefore the responsibility of their safety lies mainly on their parents and according to our societal norms, on mothers. Hence education of mothers regarding safety measures becomes important.

To prevent children from electrical burns 91.4% of the mothers stated that children should not be allowed to play with electrical appliances and 73% said that open wires should not be used followed by the opinion that the electrical sockets not in use should be covered (69.2%). Carlsson A conducted a similar study in Sweden and found that 60% of the mothers believed that cords of electrical appliances and heating devices should be kept out of reach of children (18). According to the World Health Organization, animal bites account for significant morbidity and mortality all around the world with the highest risk among children (23). Animal bites especially secondary to snakes, dogs and cat bites can easily be prevented. When asked about prevention from animal bite a large number of mothers correctly identified the preventive measures. Approximately 94% of the mothers thought that children should be taught to avoid stray animals, 87% said children should be taught to avoid abusing animals (84%) followed by 72% of mothers who think children should not be allowed to sit on uncovered grass.

More than half of the mothers in our study were unaware of the fact that children, when given toys with small fragments can increase their chances of foreign body aspirations. These results are similar to those reported by Ozdogan S et al (24). Around two-third of the mothers identified that playing with small objects such as coins and batteries increases the risk of foreign body aspiration. This emphasizes the need of educating parents especially mothers with children younger than 12 months about the risk factors of foreign body aspiration.

In our study we observed an overall low level of awareness regarding preventive strategies. Therefore it becomes essential to improve mothers' awareness of child safety measures and make them fully aware of the consequences of the problem as well as the morbidity and mortality associated with it. One of the strategies that WHO and UNICEF have recommended to improve child safety at home is that home visits should be made in the first week of a baby's life (25). Several studies have proven that educational home visits encourage parents to take measures against potential risk factors thus reducing the risk of injuries in the home (26, 28). Social networks are also important in raising awareness and adherence to child safety advice. Unintentional home injury may result in temporary or permanent disability and requires medical attention and continuous care in millions of children. The findings suggest that timely childhood injury-related risk

messages should be delivered during pregnancy and in line with developmental milestones of the child, through a range of sources including social networks, mass media, face-to-face advice from health professionals and other suitably trained mothers.

## Conclusion

Home-related injuries may lead to many health problems and their prediction and prevention are necessary to prevent major health hazards. Enhancement of mothers' knowledge through awareness sessions and through media can be helpful to improve child injury prevention.

### Strengths and Limitations:

Since the objective of the study was to assess the awareness of mothers related to preventive measures against different modes of childhood injuries therefore no association /comparisons with other groups could be made. The strength of this study is that limited data on this topic is available from Pakistan therefore its results can be used as a baseline to devise interventions to improve parents', especially mothers' knowledge on child safety measures.

### Acknowledgements:

We are grateful to the management staff of the Medical University for their support throughout the data collection phase.

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