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Mothers' Knowledge Regarding Prevention of Home Accidents Among Toddlers: A Cross-Sectional Study

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Abstract

Background and aim: Home accidents are a leading cause of mortality and morbidity among young children. Effective prevention of home accidents relies on a combination of protection and education, with mothers playing a significant role as primary caregivers. This study aimed to assess mothers' knowledge regarding the prevention of home accidents among toddlers.

Methods: A descriptive cross-sectional study was conducted from July 2023 to September 2023 among mothers of toddlers aged 1-3 years in Jaipur using a convenient sampling technique. Data were collected using a structured multiple-choice questionnaire with 30 items across eight domains related to home accident prevention.

Results: A descriptive survey included 100 mothers, predominantly aged 21-25 years, Hindus, and with primary education. Most mothers had moderate knowledge (61%) about preventing home accidents, whereas 14% had inadequate knowledge. The highest knowledge was in the domains of foreign body aspiration (80.25%) and general information about home accidents (74.83%), while the lowest was in drowning (48.66%). Significant associations were found between mothers' knowledge and demographic variables, such as age, education, occupation, family income, type of family, number of toddlers, type of house, and source of knowledge.

Conclusion: This study highlights that while most mothers possess moderate knowledge regarding the prevention of home accidents among toddlers, critical gaps remain, particularly in drowning prevention. Enhancing educational efforts and integrating safety education into routine healthcare and community programs are essential to reduce the incidence of preventable home accidents among toddlers, thereby safeguarding their health and wellbeing.

Keywords: Accidents, Home, Accident Prevention, Caregivers; Child, Preschool, Drowning

Introduction

Today's children will become citizens of tomorrow, making it crucial to provide them with a safe and healthy environment. Home accidents are a leading cause of mortality and morbidity in young children and significantly contribute to the loss of productive life.[1,2] Public health experts have coined the term "Modern Day Epidemics" to describe the prevalence of home accidents.[3] Owing to their natural curiosity, impatience, and eagerness to learn new skills, children are particularly susceptible to injuries. Additionally, they often try to imitate adult behavior from a young age, with children under the age of five being especially prone to burns and falls.[4]

Preventing home accidents among toddlers relies on a balance between protection and education.[5] Infants require total protection from home accidents, whereas toddlers, through education, gradually require less parental protection.[6] As the child grows and gains experience, safe behavior is learned gradually through a step-by-step process. This behavior is shaped not by restrictions, but by fostering responsibility to manage personal freedom, thereby developing justified self-confidence.[7] Parental protection and supervision should be adjusted gradually in response to a child's growing responsible behavior.[8]

As primary caregivers, mothers play a crucial role in improving child safety. Childhood accidents can cause sudden death or emergencies, and are often linked to children's growth and development.[9,10] Rapid changes in their activities can increase the risk of accidents, and a lack of knowledge or ignorance of childcare can exacerbate this risk. Nearly 1.7 million children die each year in India, making it one of the countries with the highest child mortality rates.[11] Falls and injuries are the leading causes of death worldwide, with approximately 16,000 children dying from injuries each day.[12,13] As the incidence of accidental injuries in India continues to rise, particularly home accidents involving children, mothers' knowledge is crucial for taking preventive actions. This cross-sectional study assessed mothers' knowledge regarding the prevention of home accidents among toddlers, highlighting the importance of education and awareness in reducing these preventable incidents.

Materials and Methods

Study design, setting, and population

A descriptive cross-sectional study was conducted among mothers of toddlers aged 1-3 years living in the rural community area of Chomu, Community Health Center, between July 2023 and September 2023, using a convenient sampling technique. The inclusion criteria for the study were mothers who had children between one and three years of age and were able to read and write English or Hindi.

Ethical considerations

After obtaining approval from the research committee of the Government College of Nursing, Jaipur, additional permission was secured from CMHO-I Jaipur, BCMHO, and SMO of CHC Chomu, Jaipur. All subjects were thoroughly informed of the study, and written informed consent was obtained. The participants were assured that their information would remain confidential.

Sample size

Sample size was determined using the following formula: n =Z^2 P (1−P)/d^2. With a 95% confidence level, 10% margin of error, and estimated prevalence of good knowledge of 28.8% (14), the calculated sample size was 86. Accounting for a 10% nonresponse rate, the final sample size was adjusted to 100.

Tool for data collection

This study used two tools for data collection. Tool I consisted of the sociodemographic characteristics of caregivers, including age, religion, educational status, occupation, type of family, monthly family income, type of house, number of toddlers, and sources of information regarding the prevention of home accidents among toddlers.

Tool II is a structured multiple-choice questionnaire consisting of 30 items designed to assess knowledge about preventing home accidents among toddlers. It is divided into eight sections: general information about home and accidents, cuts and lacerations, burns and scalds, drowning, poisoning, insect and pet animal bites, foreign body aspiration, and electric shock. Developed by the researchers, the questionnaire was subjected to content validation, based on expert suggestions.

The items were distributed across three cognitive domains: knowledge (12 items), comprehension (30 items), and application (nine items). Each multiple-choice question had one correct answer. Scoring

was straightforward: one point for each correct answer and zero for incorrect responses, with a total possible score ranging from 0 to 30. Scores were categorized as follows: < 15 indicated inadequate knowledge, 16-22 indicated moderate knowledge, and > 23 indicated adequate knowledge. The reliability of the tool was confirmed using the split-half method (Kuder-Richardson formula-20 formula). The Kuder-Richardson formula 20 (KR-20) is a formula used to test the internal consistency of measurements with dichotomous choices, such as "yes" or "no."

$$KR20 = -1 \left[\frac{\sigma^2 X - \sum_{j=1}^{N} pj(1-pj)}{\sigma^2 X} \right]$$

In the above formula, pj represents the proportion of correct answers for item j, and $\sigma^2 X$ represents the total score variance of the entire test. The KR-20 formula is a special case of coefficient alpha, which is used to evaluate how individual items relate to the test as a whole. The KR-20 score ranges from 0.0 to 1.0, with a score closer to 0 indicating poor reliability and a score closer to 1.0 indicating high reliability. In the present study, the reliability coefficient was 0.81.

Statistical analysis

The collected data were checked for completeness and accuracy before analysis, and then coded and summarized in a master data sheet using Microsoft Excel. Statistical analyses were performed using SPSS Software version 20.0, using both descriptive and inferential statistics. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to provide a comprehensive overview of the participants' characteristics and to summarize the main variables of interest. These measures were chosen to capture the central tendencies and variability within the data, which are essential for understanding the general patterns and distributions of responses.

The Chi-squared test was used to determine the association between knowledge and demographic variables. This test was selected because it is suitable for analyzing categorical data and identifying significant relationships between independent and dependent variables. Given that our primary variables of interest are categorical (e.g., demographic characteristics and knowledge levels), the chi-square

test is an appropriate choice to evaluate whether differences in knowledge are associated with specific demographic factors. The level of significance was set at $P < 0.05$, aligning with conventional standards in social science research, to minimize the likelihood of Type I errors while ensuring that the detected associations are statistically meaningful.

Results

This study was conducted on 100 mothers of toddlers. The majority of the mothers were aged 21-25 years (50.0%), Hindus (87%), had primary education (35%), were housewives (50%), and lived in joint families (71%) (Table 1).

Table 1 : Frequency and percentage distribution of mothers according to the demographic variables (n=100)

Demographic variable	Category	Frequency
Age (years)	21-25	50
	26-30	43
	31-35	6
	36-40	1
Religion	Hindu	87
	Muslim	10
	Sikh	0
	Others	3
Education status	Illiterate	15
	Primary	35
	Matric & Senior Sec.	30
	U.G & P.G.	24
Occupation	House Wife	50
	Daily Wages	18
	Self-employee	25
	Govt. Service	7
Income of family (Rupees/Month)	<10000	35
	10001-15000	42
	15001-20000	16
	>20000	7
Type of Family	Nuclear	29
	Joint	71
Number of Toddlers	One	65
	Two	29
	>Three	6

Type of House	Pakka	72
	Semi Pakka	28
	Kaccha	0
Source of Knowledge	Family Members/ Peer group	25
	T.V. & Radio	43
	Witnessed Home Accident	16
	Newspaper & Magazines	16

Table 2 shows the level of knowledge regarding the prevention of home accidents among toddlers. The majority of respondents had moderate knowledge (61%), while 14% had inadequate knowledge regarding the prevention of home accidents among toddlers. These results highlight that a notable segment of the participants lacked sufficient knowledge, which could put toddlers at risk.

Table 2: Level of mothers' knowledge scores regarding prevention of home accidents (n=100)

Level of Knowledge	Scores	Frequency
Inadequate knowledge	< 50	14
Moderate knowledge	51-75	61
Adequate knowledge	>75	25

Table 3 shows domain-specific knowledge regarding the prevention of home accidents among toddlers. Participants had the highest mean percentages in the domains of foreign body aspiration (80.25%), followed by general information about home accidents (74.83%) and electric shock (73.33%). These findings suggest that participants are generally well-informed about the dangers of choking, inhaling foreign objects, and electric shocks, likely reflecting effective educational efforts in these areas. The least knowledge was observed in the domain of drowning (48.66%).

Table 3: Mean, Standard deviation and Mean Percentage (%) of knowledge score on different areas of prevention of home accident (n=100)

Areas	Maximum score	Mean	S.D.	Mean (%)
General information about home accidents	6	4.49	1.14	74.83%
Cuts and laceration	4	2.33	0.95	58.25%
Burns and scalds	3	2.19	0.59	73%
Drowning	3	1.46	0.92	48.66%
Poisoning	3	2.04	0.63	68%
Bites of insects and pet animals	4	2.57	0.81	64.25%
Foreign body aspiration	4	3.21	0.75	80.25%
Electronic shock	3	2.20	0.63	73.33%

The findings revealed a significant association between mothers' knowledge of preventing home accidents among toddlers and various demographic variables. Specifically, significant associations were found with age (χ^2 = 19.51), indicating that different age groups may have different levels of knowledge. Educational status (χ^2 = 173.13) showed a strong relationship, suggesting that higher education levels were correlated with greater knowledge. Occupation (χ^2 = 82.03) and family income (χ^2 = 70.75) were also significantly associated, indicating that socio-economic factors played a role in knowledge levels. Additionally, the type of family (χ^2 = 58.25), number of toddlers (χ^2 = 96.11), type of house (χ^2 = 17.40), and source of knowledge (χ^2 = 45.25) were all significantly related to mothers' knowledge, highlighting that family structure, living conditions, and how mothers obtain their information are critical factors influencing their understanding of home accident prevention (Table 4).

Table 4: Association between knowledge score with selected demographic variables

Variables	Total	Df	χ2	Table value	Inference
Age in years					
21-25 years	50				
26-30 years	43				
31-35 years	6				
36-40 years	1	6	19.51	12.59	S.
Religion					
Hindu	87				
Muslim	10				
Sikh	0				
Others	3	4	7.05	9.46	N.S.
Education status					
Illiterate	15				
Primary	35				
Matric & Senior Sec.	30				
U.G & P.G.	24	6	173	12.59	S.
Occupation					
House Wife	50				
Daily Wages	18				
Self-employee	25				
Govt. Service	7	6	82.03	12.59	S.
Family Income					
<10000	35				
10001-15000	42				
15001-20000	16				
>20000	7	6	70.75	12.59	S.
Type of Family					
Nuclear Family	29				
Joint Family	71	2	58.25	5.99	S.
Number of Toddlers					
One	65				
Two	29				
>Three	6	4	96.11	9.49	S.
Type of House					
Pakka	72				

Semi Pakka	28				
Kaccha	0	2	17.40	5.99	S.
Source of Knowledge					
Family Members/Peer group	25				
T.V. & Radio	43	6	45.25	12.59	S.
Witnessed Home Accident	16				
Newspaper & Magazines	16				

S= Significant at *P*<0.05; NS= Not significant

Discussion

This study was conducted to assess the level of mothers' knowledge regarding the prevention of home accidents among toddlers. The major findings of our study suggest that the majority of toddlers had moderate knowledge regarding the prevention of home accidents. Additionally, significant associations were observed between the mothers' knowledge and age, educational status, occupation, family income, family type, number of toddlers, house type, and source of knowledge.

Knowledge of mothers regarding the prevention of home accidents among toddlers is crucial for safeguarding their children's health and well-being, thereby reducing the risk of injuries and fatalities. Our findings revealed that the majority of mothers had moderate knowledge regarding the prevention of home accidents among toddlers, which is in line with previous studies.[14-16] A previous study from Baghdad demonstrated more than 90% of mothers had poor knowledge regarding domestic accident prevention involving children.[17] Mothers' moderate knowledge regarding the prevention of home accidents among toddlers raises concerns about the care of toddlers at home and the prevention of accidents that frequently occur in this age group.

Our study revealed that mothers had the highest knowledge of foreign body aspiration and general information about home accidents, followed by electric shock and burns. In contrast, a study conducted in Bangalore aimed to identify the most common types of home accidents, and found that cuts, wounds, falls, and burns were the most prevalent.[15] However, the notably lower knowledge in the domain of drowning underscores the need for targeted educational interventions to address this critical safety concern. The most common types of home accidents among children up to school-going age are falls, sharps, and burns.[18,19]

In examining the associations between mothers' knowledge and various demographic factors, we observed significant correlations between age, educational status, occupation, family income, family type, number of toddlers, house type, and source of knowledge. These associations suggest that socioeconomic and educational factors play a crucial role in shaping mothers' awareness and preparedness for preventing home accidents. Our findings align with those of earlier studies.[16,17] but also provide new insights by focusing on these specific variables within a rural community setting, an often underrepresented demographic.

Our study provides valuable insights into the knowledge levels of mothers regarding the prevention of home accidents among toddlers in a rural community, an area often underrepresented in research. The use of a structured knowledge questionnaire, validated by experts and demonstrating high reliability, ensured the accuracy and consistency of the data collected.

Limitations of the study

This study had several limitations. First, the use of a convenience sampling technique may not fully represent the broader population, potentially limiting the generalizability of the findings. Additionally, reliance on self-reported data from the participants could introduce response bias, as mothers may have overestimated or underestimated their knowledge regarding the prevention of home accidents. The cross-sectional nature of this study also limits the ability to establish causal relationships between the variables studied. Finally, the study was conducted in a specific rural community area, which may not reflect the experiences or knowledge levels of mothers in different regions or urban settings.

Implications for practice

This study's findings have several practical implications. Healthcare providers and public health practitioners

should prioritize educational interventions aimed at enhancing mothers' knowledge regarding the prevention of home accidents among toddlers, especially in areas where knowledge is lacking, such as drowning prevention. Tailored educational programs that address the specific needs and characteristics of rural populations can be developed to ensure a maximum impact. Furthermore, integrating safety education into routine health care visits and community health programs can reinforce the importance of accident prevention. Policymakers should consider incorporating home safety education into broader child health and welfare policies to reduce the incidence of preventable injuries and fatalities in young children. Finally, continuous assessment and refinement of these educational programs will be essential to adapt to evolving needs and ensure sustained improvements in child safety.

Conclusion

The study concluded that while the majority of mothers have a moderate level of knowledge regarding the prevention of home accidents among toddlers, significant gaps remain, particularly in areas such as drowning prevention. Strengthening educational efforts and integrating safety education into routine healthcare and community programs can play a pivotal role in reducing the incidence of preventable home accidents among toddlers and ultimately safeguarding the health and well-being of the next generation.

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