Knowledge and Practices of Mothers Regarding First Aid in Domestic Accidents: A Cross-Sectional Study in Sfax, Tunisia

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Abstract

Background: Domestic accidents are among the leading causes of morbidity and mortality in children worldwide, particularly in low- and middle-income countries. Mothers, as primary caregivers, play a critical role in preventing and managing these injuries through appropriate first-aid practices. However, their level of knowledge and preparedness remains poorly documented in Tunisia.

Aim: This study aimed to assess the knowledge and practices of mothers regarding first aid in domestic accidents among children in Sfax, Tunisia.

Methods: A descriptive cross-sectional study was conducted among 50 mothers attending the pediatric and pediatric intensive care units at Hadi Chaker University Hospital in Sfax during 2025. Data were collected using a structured questionnaire composed of 35 items evaluating knowledge and practical skills in six domains: fractures, burns, choking, wounds, poisoning, and electrocution. Scores were categorized as poor, moderate, or good.

Results: Most participants were aged between 31 and 40 years old (42%) and lived in urban areas (58%). Overall, 56% of mothers demonstrated an average level of first-aid knowledge, while only 22% achieved a good level. Knowledge gaps were most evident in the management of burns (65% poor knowledge) and poisoning (70% poor knowledge). Mothers with higher educational levels and previous first-aid training scored significantly better ($p < 0.05$).

Conclusion: The study highlights insufficient first-aid knowledge and practices among Tunisian mothers, especially in handling burns, poisoning, and choking. Integrating community-based education and structured first-aid training programs for mothers is crucial to reducing childhood morbidity and mortality related to domestic accidents.

Keywords: Domestic accidents; First aid; Mothers; Knowledge; Practices; Child safety.

INTRODUCTION

Domestic accidents represent a major public health problem and are a leading cause of preventable injuries and deaths among children. According to the World Health Organization, nearly 950,000 children die annually due to unintentional injuries, mostly occurring at home (1, 2). In developing countries, these accidents often result from limited parental awareness and inadequate first-aid responses (3).

Mothers, as primary caregivers, are often the first to respond when accidents occur. Their actions can determine whether a child recovers safely or faces long-term complications. However, studies across the Middle East and North Africa have revealed substantial gaps in maternal first-aid knowledge, with many relying on inappropriate traditional practices such as applying toothpaste to burns or inducing vomiting after poisoning (4). This study aims to assess the knowledge level and practices of mothers regarding first aid in domestic accidents in Sfax, Tunisia.

METHODS

A descriptive cross-sectional study was conducted between January and April 2025 in the pediatric and pediatric intensive care units of Hadi Chaker University Hospital, Sfax, Tunisia.

Participants: Fifty mothers aged 18 years or older who resided in Sfax and consented to participate were included.

Sampling: A non-probabilistic purposive sampling technique was used, selecting participants who met the inclusion criteria. The investigator explained to the patient and/or his accompanying relatives the aim of the study, obtained the consent, and then began the interview.

Data collection: A validated 35-item questionnaire (Appendix 1) assessed knowledge and practices regarding six types of domestic accidents: fractures, burns, wounds, choking, poisoning, and electrical injuries. A data collection instrument for calculating scores (Appendix 2). We used a questionnaire inspired by three studies focusing on home-related children's accidents (5-7). The questionnaire used consisted of 35 items. For each item, answers were proposed, and there was one correct option. Each correct answer was coded as 1 point. The overall Knowledge and Practice Score was 44 points. Knowledge and Practice were considered as low (score 0-13), moderate (score 14-25), or good (score ≥26). The overall Knowledge Score was 25 points. Knowledge was considered low (score 0-8), moderate (score 9-16), or good (score ≥17). Practice Score was 19 points. Knowledge was considered low (score 0-6), moderate (score 7-11), or good (score ≥12).

Data analysis: Data were analyzed with descriptive statistics and chi-square tests ($p < 0.05$).

Ethics: Oral informed consent was obtained before participation, and confidentiality was maintained.

RESULTS

Sociodemographic Characteristics

A total of 50 mothers participated in this study. Most participants were aged between 31 and 40 years (42%), followed by 18–30 years (36%) and 41–50 years (22%). The majority lived in urban areas (58%), while 42% resided in rural zones. Regarding education, 46% had completed secondary education, 22% university education, and 32% had primary or no formal education.

Most participants were married (86%), and 68% were housewives. Approximately 48% had two or more children, and 60% reported that at least one of their children had previously experienced a domestic accident (Table 1).

Table 1. Demographic characteristics of participating mothers (n = 50)

Variable	Category	n (%)
Age (years)	18–30	18 (36%)
	31–40	21 (42%)
	41–50	11 (22%)
Residence	Urban	29 (58%)
	Rural	21 (42%)
Education level	Primary or less	16 (32%)
	Secondary	23 (46%)
	University	11 (22%)
Marital status	Married	43 (86%)
	Divorced/Widowed	7 (14%)
Employment status	Housewife	34 (68%)
	Employed	16 (32%)

Overall Knowledge and Practice Scores

The overall knowledge mean score was 14.8 ± 4.3 out of 25, indicating a moderate level. Twenty-two percent of mothers demonstrated good knowledge, 56% had moderate knowledge, and 22% showed poor knowledge. Similarly, the mean practice score was 10.1 ± 3.9 out of 19, with 18% achieving good performance, 60% moderate, and 22% poor. Mothers who had previously received first-aid training scored significantly higher in both knowledge (mean 17.6 vs 13.4, $p < 0.01$) and practice ($p < 0.05$).

Sixty percent of mothers correctly identified fracture symptoms, but only 36% knew that immobilization is the first step. Good knowledge in 24%, moderate in 60%, and poor in 16%.

Sixty-five percent had poor knowledge; 72% incorrectly believed toothpaste or oil should be applied. Only 22% mentioned cooling the burn under running water. Knowledge correlated with education level ($p < 0.001$).

Forty-six percent had a poor understanding of choking management. Only 38% identified the Heimlich maneuver, while 30% proposed an unsafe method to insert fingers.

Fifty-eight percent showed moderate knowledge. Forty percent would wash with water and antiseptic, while 34% would apply inappropriate substances. Twenty-two percent mentioned tetanus prophylaxis.

Seventy percent had poor knowledge. Eighty percent reported they would induce vomiting, while only 12% would call emergency services.

Sixty-two percent failed to mention cutting electricity before touching the victim. Twenty-two percent knew resuscitation should begin after ensuring safety. Table 2 details mothers' knowledge regarding domestic accidents.

Table 2: Knowledge of Mothers Regarding Domestic Accidents

Domains		*Poor (%)*	*Moderate (%)*	*Good (%)*
Fractures	Knowledge	64	34	2
	Practical skills	78	22	-
Burns	Knowledge	70	30	-
	Practical skills	78	20	2
Choking	Knowledge	46	24	30
	Practical skills	58	38	4
Wounds	Knowledge	48	-	52
	Practical skills	38	46	16
Poisoning	Knowledge	90	-	10
	Practical skills	88	-	12
Electrical accidents	Knowledge	62	38	-
	Practical skills	70	-	30
Total	Knowledge	28	52	20
	Practical skills	28	64	8

A significant correlation was found between education level and both knowledge ($r = 0.62$, $p < 0.01$) and practice ($r = 0.54$, $p < 0.05$). Prior first-aid training was also associated with better performance ($p < 0.05$). No significant association was found with age, marital status, or employment.

DISCUSSION

This study offers a comprehensive assessment of mothers' knowledge and practices concerning pediatric emergencies-such as fractures, burns, choking, chemical intoxications, and electrical accidents—and highlights significant gaps that may compromise the safety and outcomes of affected children. The results demonstrate substantial discrepancies between theoretical knowledge and the practical ability to perform appropriate first-aid measures.

Overall, 52% of mothers had a moderate knowledge level, while 28% had insufficient knowledge and only 20% reached an adequate level. Practical performance was even more concerning, with 64% demonstrating moderate practices, 28% poor practices, and just 8% achieving a good level. This discordance between awareness and behavior likely reflects limited access to structured first-aid training, persistent cultural misconceptions, and reliance on informal and unreliable information sources. Although 30% of participants had received some form of first-aid education, only 16% held official certification, and fewer than half (44%) had a first-aid kit at home.

Specific emergencies revealed several critical shortcomings. Regarding fractures, although immobilization was generally known, recognition of clinical signs was limited, and some reported inappropriate actions, findings consistent with previous research (8). In burn management, cultural beliefs persisted, with 20% applying toothpaste and 8% using honey-unsafe practices also reported elsewhere (3, 9). Choking management emerged as the most alarming domain; only 14% of mothers knew the Heimlich maneuver, while many suggested potentially harmful responses such as giving water, echoing trends noted in other studies (10). Chemical intoxication responses were largely inaccurate, with dangerous behaviors such as inducing vomiting or giving milk remaining common, consistent with earlier findings (11). Electrocution management also reflected gaps: although 64% recognized the need to remove the child from the electrical source, only 30% mentioned turning off the power beforehand, a critical step emphasized in prior work (12).

Despite these shortcomings, partial knowledge in certain areas suggests that targeted educational strategies could be effective. Future programs should combine structured theoretical instruction with practical, hands-on training, adapted to the sociocultural context of the population to ensure optimal and sustainable improvements.

Limitations include the scarcity of local literature, time constraints, potential response bias, a relatively small sample size, and participant reluctance. Nonetheless, the study provides important insights: it is one of the first Tunisian investigations on maternal

preparedness for pediatric emergencies, employs a validated questionnaire, identifies clinically relevant deficiencies, and offers evidence-based recommendations for future community interventions.

CONCLUSION

Mothers in Sfax demonstrate moderate but insufficient knowledge and practices regarding first aid during domestic accidents. Implementing structured education programs and regular awareness campaigns is essential to improve emergency preparedness and reduce childhood morbidity and mortality.

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Appendix 1

Questionnaire on Mothers' Knowledge and Practices in Pediatric Emergency Situations

This questionnaire aims to assess mothers' awareness and behaviors regarding pediatric first aid. You are kindly requested to complete this questionnaire and share it with other participants.

I. Sociodemographic Data

Age:
City:
Region:
Marital Status: Married ( ) Divorced ( )
Educational Level:
Illiterate ( ) Primary School ( ) Middle School ( )
High School ( ) University ( )
Employment Status:
Housewife ( ) Employed ( )
Number of Children:
1 ( ) 2 ( ) ≥3 ( )
Children's Age Groups (multiple answers possible):
1 day–1 month ( ) 1 month–1 year ( ) 2–3 years ( ) 4–6 years ( )
7–12 years ( ) 13–18 years ( )
Self-assessed level of knowledge in pediatric first aid:
Good ( ) Very Good ( ) Excellent ( )
Insufficient ( )
Have you attended a first aid training course?
Yes ( ) No ( )
Do you hold a first aid certification?
Yes ( ) No ( )
Sources of information (multiple answers possible):
Physician ( ) Books/Articles ( )
Internet/Television ( )
Family/Relatives/Friends ( ) Other:
Do you have a first aid kit (bag, home, or car)?
Yes ( ) No ( )
In which of the following situations would you be able to provide first aid? (multiple answers possible)
Burns ( ) Fractures ( ) Minor wounds ( )
Choking ( ) Poisoning ( ) Other:

II. Knowledge and Practices in Emergency Situations

Fractures

Knowledge: (1)
Do you know how to manage a suspected fracture in a child?
Yes ( ) No ( )
Common symptoms of fractures (multiple answers possible):
Severe pain ( ) Swelling ( )
Bruising/discoloration ( )
Bleeding at fracture site ( ) Nausea/vomiting ( )
Fainting ( ) Deformity ( ) Inability to move ( )
Other:
Practices:
If you suspect a limb fracture, you should:
Immobilize with a splint immediately ( )
Prevent movement and seek medical care ( )
Place in an ice bath ( )
I do not know ( )

Burns

Knowledge:
Do you know the degrees of burns?
Yes ( ) No ( )
Do you know how to provide first aid for each degree?
Yes ( ) No ( ) First-degree only ( ) First and second degree only ( ) Other:

Most common causes of burns at home (multiple answers possible):
Fire ( ) Hot liquids/steam ( ) Sun exposure ( )
Household appliances ( ) Electricity ( )
Chemicals ( )
Have you ever managed a third- or fourth-degree burn?
Yes ( ) No ( )
Practices:
If yes, what did you do?
Treated as superficial burn ( )
Took child directly to hospital ( )
Applied ointment and waited ( )
Other:
Management of superficial burns (multiple answers possible):
Cold water ( ) Ice ( ) Toothpaste ( ) Honey ( )
Oils ( ) Other:

Choking

Knowledge: (2)
Is choking a major cause of death in preschool children?
Yes ( ) No ( ) I do not know ( )
Do you know first aid for choking?
Yes ( ) No ( ) I do not know ( )
At what age can children safely chew solid foods such as nuts?
1 year ( ) 2 years ( ) 3 years ( ) 4 years ( )
Practices:
Prevention measures (multiple answers possible):
Avoid small toys ( )
Supervise during eating and play ( )
Encourage laughing while eating ( )
Place large amounts of food in the mouth ( )
An 8-month-old infant is choking but conscious:
Back blows and chest thrusts ( )
Hang upside down ( )

Start CPR ( )
Unconscious 10-year-old choking in restaurant:
Abdominal thrusts ( )
Finger sweep ( )
Start CPR ( )
Back slap ( )
Conscious 7-year-old unable to speak:
Give water ( )
Abdominal thrusts ( )
Encourage coughing ( )
Ask to take a deep breath ( )

Wounds

Knowledge:
Most common superficial injuries (multiple answers possible):
Head injuries ( ) Dental trauma ( )
Limb injuries ( ) Eye injuries ( )
Practices:
Wash wound with water ( )
Apply pressure with a cloth ( )
Apply ice ( )
Disinfect and bandage ( )
Leave to heal ( )
Other:

Chemical Poisoning

Knowledge: (3)
Has your child experienced chemical or medication poisoning?
Yes ( ) No ( )
Practices:
If yes, what did you do?
Induce vomiting ( )
Give cold water ( )
Give milk and egg white ( )
Take to the hospital ( )
Other:

Electrical injuries:

Knowledge:
Electrocution is:
Passage of electric current causing injury ( )
Passage of electric current causing death ( )
Passage of electric current causes mild tingling ( )
Practices:
First action to take in case of an electrical accident:
Cut off the electricity source ( )
Move the victim away from the source ( )
Place in recovery position ( )

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Appendix 2
Data Collection Instrument and Scoring System

This study combined four validated questionnaires derived from a cross-sectional study, comprising 35 items.
Overall Knowledge and Practice Score (Total = 44):
0–13: Low
14–25: Moderate
≥26: Good
Overall Knowledge Score (Total = 25):
0–8: Low
9–16: Moderate
≥17: Good
Overall Practice Score (Total = 19):
0–6: Low
7–11: Moderate
≥12: Good

Subscores:

Fractures:
Knowledge (6): 0–2 Low | 3–4 Moderate | ≥5 Good
Practice (2): 0–1 Low | ≥2 Good
Wounds:
Knowledge (1): 0 Low | ≥1 Good
Practice (2): 0–1 Low | ≥2 Good
Burns:
Knowledge (6): 0–3 Low | 4 Moderate | ≥5 Good
Practice (4): 0–2 Low | 3 Moderate | ≥4 Good
Choking:
Knowledge (3): 0–1 Low | 2 Moderate | ≥3 Good
Practice (5): 0–2 Low | 3–4 Moderate | ≥5 Good
Chemical Poisoning:
Knowledge (1): 0 Low | ≥1 Good
Practice (1): 0 Low | ≥1 Good
Electrical accidents:
Knowledge (2): 0 Low | 1 Moderate | ≥2 Good
Practice (1): 0 Low | ≥1 Good