

Research Article

A Cross-Sectional Study of Pediatric First Aid Knowledge and Attitude among the General Population in the Makkah Region

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ABSTRACT

Background: Children are highly susceptible to injury and death from accidents. Appropriate intervention can limit disability and increase survival (Alshammari, 2021). In this review, we aim to assess the knowledge and attitudes of the public towards pediatric first aid in the Makkah region of Saudi Arabia.

Methods: In this cross-sectional study, a self-administered questionnaire was distributed among residents of the Makkah region. Descriptive statistics were employed to express numerical variables and categorical variables. A p-value of < 0.05 was considered statistically significant.

Results: The study included 397 respondents. More than half were female (60.2%). Approximately one-third of the respondents were aged > 50 years, and 28.5% were working or studying in the medical field. Most participants had heard about first aid (99.5%) and believed that training was required to provide first aid (93.7%). However, less than half of the respondents (45.1%) had attended first-aid training once. Almost half of the respondents (51.6%) had previously encountered an injury, accident, or medical emergency; of these, 77.6% had provided first aid to the individual who experienced the emergency, and the most common types of emergencies included cut wounds (38.5%), burns (37.6%), and fits (25.4%).

Conclusion: First aid is an important tool for providing immediate emergency care for all people, and it is particularly important for children. Knowledge of and attitude towards first-aid tools are essential for providing first aid when needed. In contrast, training in first aid is crucial for providing appropriate first aid, particularly for children and young infants.

1. INTRODUCTION

First aid provides initial and early care for an illness or injury by a trained person who is not an expert until access to proper medical treatment becomes possible. Providing first aid is essential for anyone, and it may be more necessary for people who are usually more susceptible to illness and injury, such as children. It can help implant confidence in a person's ability to react quickly and calmly in a life-threatening situation to preserve life, prevent the injury or illness from worsening, and minimize recovery time and unnecessary visits to the hospital.

According to the World Health Organization (WHO), 100 children worldwide die every hour due to accidental

injuries, with 90% unintentional injuries. In Saudi Arabia, in 2019, it was estimated that there were 699 cases of asphyxia, 15959 head injury cases, 3547 deep wound cases, 19639 lower limb fracture cases, 801 first-degree

burns, 420 second-degree burns, and 124 third-degree burns cases (Alshammari, 2021; azalghamdi01, 2019). Many people with a first-aid certificate do not respond when an emergency arises. There are many reasons why people don't respond, which can be caused by various factors, including the danger of attending, body fluids and the risk of contamination from bodily fluids, uncertainty about their ability to help, and fear of making the situation worse. All these barriers can be overcome with appropriate knowledge and attitude (Habeeb & Alarfaj, 2020).

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In a research study conducted in Al-Madinah Al-Munawara, with a sample size of 390, only 12.8% of parents knew how to handle a foreign body in the ear, 9.5% knew how to handle an insect sting without seeing the insect spike on examination, and only 9.2% knew how to handle toxic ingestion of chemical material (Al-Johani et al., 2018).

Children have a strong interest in the world around them, which puts them at a high risk of accidental harm and death. Rapid and appropriate intervention for injured children can limit disability and increase the likelihood of survival, thereby making a significant difference in the outcome. Thus, it is necessary for people to have a sufficient amount of first-aid knowledge and attitude.

The purpose of this study is to assess the knowledge and attitudes of the public towards pediatric first aid in the Makkah region of Saudi Arabia, in 2022.

2. MATERIALS AND METHODS

This is a descriptive cross-sectional study based on an electronic survey built-in Google Forms that was conducted in the Makkah region between May 20, 2022, and August 10, 2022. We included all residents of the Makkah region aged 18 and above.

2.1 Study design

This is a descriptive cross-sectional study based on an electronic survey built-in Google Forms that was conducted in the Makkah region between May 20, 2022, and August 10, 2022. We included all residents of the Makkah region aged 18 and above.

2.2 Sample size and sampling technique

According to the general authority for statistics, a sample size of 397 individuals—calculated using the Raosoft sample size calculator—was sufficient to produce a 95% confidence interval with a 5% accepted margin of error when the estimated proportion of pediatric first aid was 50%. Further, the survey was distributed among residents in a non-random snowball sampling fashion.

2.3 Ethical consideration

We delivered the questionnaire used in this study to the target population after ethical approval was obtained from the Biomedical Ethics Committee of the College of Medicine at Umm Al-Qura University, Makkah (Approval No. HAPO-02-K-012-2022-06-1133).

2.4 Study tools and variables

The questionnaire was validated and adapted from a published study (Al-Johani et al., 2018) Moreover, a pre-test was conducted by distributing the survey to 20 participants of our population, and then the survey was distributed on social media (Twitter and WhatsApp). The first author's email was included, with a message to answer questions or resolve issues. Informed consent was obtained from all participants.

The questionnaire included three sections. The first section assessed participants' demographic information, such as age, gender, education level, and whether or not they were working in the health field. The second section dealt with training in first aid and previous experience with first aid. The third section dealt with the knowledge of and attitude towards first aid and the action in certain situations at school.

The participants' knowledge score was computed so that correct answers were given a score of "1," whereas incorrect or missing answers were given a score of "0." Then, each participant's total score was estimated and used for comparisons.

Data analysis was conducted using a Windows-based statistical package for social science (SPSS). The descriptive statistics for each variable were calculated, including percentages, mean, median, mode, range, variance, standard deviation (SD), and frequency distribution.

2.5 Statistical Analysis

In the descriptive analysis, statistical analysis was conducted using RStudio (R version 4.1.1). Descriptive statistics were employed to express numerical variables (means and SD) and categorical variables (frequency and percentage). A knowledge score was computed by summing up the participants' correct responses to five knowledge items. For each question, the score ranged between 0 and 5. Factors associated with higher knowledge were investigated by conducting a univariate linear regression analysis. Then, the significantly associated factors were subsequently entered into a multivariate model, and the results were presented as beta values (β) and their respective 95% confidence intervals (95% CIs). A p -value of < 0.05 was considered statistically significant.

3. RESULTS

3.1 Demographic characteristics of the participants

We included data from 397 participants who agreed to fill out the questionnaire. More than half of the participants were female (60.2%) and had obtained a bachelor's degree as the highest educational level (55.4%). Approximately one-third of the respondents were aged over 50 years, and 28.5% were working or studying in the medical field (Table 1).

Table 1: Demographic characteristics of the participants.

Parameter	Category	N (%)
Age	17–19 y	31 (7.8%)
	20–30 y	125 (31.5%)
	31–39 y	24 (6.0%)
	40–50 y	91 (22.9%)
	>50 y	126 (31.7%)

Gender	Male	158 (39.8%)
	Female	239 (60.2%)
Highest educational level	Elementary school	0 (0.0%)
	Middle school	3 (0.8%)
	High School	82 (20.7%)
	Diploma	37 (9.3%)
	Bachelor	220 (55.4%)
	Master	28 (7.1%)
	Doctorate	23 (5.8%)
Student/work in the medical field	Yes	113 (28.5%)

3.2 Information and training in first-aid

Most participants had heard about first aid (99.5%) and believed that training was required to provide first aid (93.7%). The most common sources of information regarding first aid were TV, radio, and newspapers (66.2%) and textbooks in schools (37.5%). Less than half of the respondents (45.1%) attended first-aid training. Of these, 74.9% had practical training, and only 17.4% thought the training was beneficial (Table 2).

Table 2: Information and training in first aid.

Parameter	Category	N (%)
Ever heard about first aid?	Yes	395 (99.5%)
Sources of information regarding first aid	Textbooks in school	149 (37.5%)
	Doctors	121 (30.5%)
	Nurses	96 (24.2%)
	TV/Radio/Newspapers	263 (66.2%)
	Internet/social media	17 (4.3%)
	Courses	32 (8.1%)
	Other	22 (5.5%)
Do you think training is required to offer first-aid?	Yes	372 (93.7%)
Ever attended any training in first aid?	Yes	179 (45.1%)
The training included practical aspects*	Yes	141 (74.9%)

The training was beneficial*	Yes	33 (17.4%)
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3.3 Previous experience with first-aid

Almost half of the respondents (51.6%) had previously encountered an injury, accident, or medical emergency, of whom 77.6% had provided first-aid to the individual who experienced the emergency. The most common types of emergencies included cut wounds (38.5%), burns (37.6%), and fits (25.4%).

3.4 Knowledge of first aid for children

In the present study, five items were related to participants' knowledge of first aid. Approximately 47% of the respondents indicated that children who are knocked unconscious might return to play only if a physician clears them. Only 30% of participants accurately excluded percussion as the first-aid practice for a sprained ankle. In general, less than 20% of the participants provided correct responses to three items, including the application of pressure on the source of the bleeding point to care for bleeding wounds (19.6%), washing and storing a front tooth knocked out while playing (11.1%), and the importance of the assessment of responsiveness while approaching a collapsed, injured child (11.6%, Table 3,4).

Table 3: Participants responses to items related to their knowledge about first aid for children.

Parameter	Category	N (%)
A child who is knocked unconscious may return to play if he/she	regains consciousness within 2 minutes	34 (8.6%)
	presents no signs and symptoms of a head injury	51 (12.8%)
	is cleared by a physician*	186 (46.9%)
	feels capable of returning to play	32 (8.1%)
	do not know	94 (23.7%)
Standard first aid for a sprained ankle does not include	Ice	56 (14.1%)
	Compression	39 (9.8%)
	percussion*	119 (30.0%)
	Elevation	24 (6.0%)
The first step in caring for bleeding wounds is to	do not know	159 (40.1%)
	apply direct pressure on the wound with a clean or sterile dressing	200 (50.4%)

apply pressure at the source of the bleeding point*	78 (19.6%)
apply bulky dressings to reinforce blood-soaked bandages	10 (2.5%)
elevate the wound above the level of the heart	37 (9.3%)
do not know	72 (18.1%)

Table 4: Participants responses to items related to their knowledge about first aid for children.

Parameter	Category	N (%)
If a front tooth is knocked out during play, the tooth should be	washed in water and replaced in the sockets	17 (4.3%)
	stored in saline until the dentist can replace	62 (15.6%)
	stored in milk until the dentist can replace	74 (18.6%)
	any of the above is acceptable*	44 (11.1%)

do not know	200 (50.4%)	
The first action that should be taken when approaching a collapsed, injured child is to	move him away from the playing surface	25 (6.3%)
	determine responsiveness*	46 (11.6%)
	check for breathing	137 (34.5%)
	check for pulse	123 (31.0%)
	do not know	66 (16.6%)

*An asterisk indicates the correct answer

Based on the responses to the abovementioned items, the participants' mean knowledge score was 1.19 ± 0.10 (out of 5). Based on the univariate analysis, people aged 20 to 30 years ($\beta = 0.42$, 95% CI 0.04–0.81, $p = 0.032$), working or studying in the medical field ($\beta = 0.61$, 95% CI 0.40–0.82, $p < 0.001$), and having received any training in first aid ($\beta = 0.44$, 95% CI 0.25–0.64, $p < 0.001$) were more likely to know how to give first aid to children. However, when the variables were looked at together, high knowledge scores were linked to being a student or worker in the medical field ($\beta = 0.47$, 95% CI 0.23–0.71, $p < 0.001$) and having any training in providing first aid training ($\beta = 0.32$, 95% CI 0.12–0.51, $p = 0.001$, Table 5

Table 5: factors associated with knowledge scores regarding first aid

Parameter	Category	Univariate			Multivariate		
		Beta	95% CI	p	Beta	95% CI	p
Age	17–19 y	Ref	Ref		Ref	Ref	
	20–30 y	0.42	0.04, 0.81	0.032	0.27	-0.11, 0.64	0.167
	31–39 y	0.10	-0.42, 0.63	0.702	0.15	-0.36, 0.65	0.573
	40–50 y	-0.08	-0.48, 0.33	0.711	0.06	-0.33, 0.46	0.763
	>50 y	0.01	-0.37, 0.40	0.940	0.14	-0.25, 0.52	0.486
Gender	Male	Ref	Ref				
	Female	-0.07	-0.27, 0.13	0.488	NA	NA	
Highest educational level	Middle school	Ref	Ref				
	High School	0.18	-0.97, 1.34	0.756	NA	NA	
	Diploma	0.00	-1.18, 1.18	>0.999	NA	NA	

	Bachelor	0.22	-0.93, 1.36	0.708	NA	NA
	Master	0.21	-0.98, 1.41	0.725	NA	NA
	Doctorate	0.17	-1.03, 1.38	0.777	NA	NA
	Other	0.75	-0.75, 2.25	0.327	NA	NA
Student/work in the medical field	No	<i>Ref</i>	<i>Ref</i>		<i>Ref</i>	<i>Ref</i>
	Yes	0.61	0.40, 0.82	<0.001	0.47	0.23, 0.71 <0.001
Have you ever heard about first aid?	No	<i>Ref</i>	<i>Ref</i>			
	Yes	1.20	-0.19, 2.58	0.090	NA	NA
Have you attended any training in first aid?	No	<i>Ref</i>	<i>Ref</i>		<i>Ref</i>	<i>Ref</i>
	Yes	0.44	0.25, 0.64	<0.001	0.32	0.12, 0.51 0.001
Have you ever encountered injuries, accidents, or medical emergencies?	No	<i>Ref</i>	<i>Ref</i>			
	Yes	0.11	-0.09, 0.31	0.279	NA	NA

3.5 Participants attitudes towards first-aid practices

The detailed responses of the participants regarding their attitudes are listed in (Table 5 c,d,e,f). The behaviors that were most accurately perceived were gently tapping a child’s back gently while the child’s head was down. Their chest was up if a foreign body was choking them (79.1%), wrapping a child in a blanket if a fire had caught their clothes (77.8%), and washing any minor wounds that might develop while playing (75.6%). Conversely, the least correctly perceived items were raising the hands above the heart level in the instance of being bitten by a scorpion (8.6%), checking for airway breathing and circulation in a child who has consumed a poisonous substance (10.1%), and attempting to take out small objects that may accidentally enter a child’s ear (13.4%, Table 6(a),6(b),6(C)).

Table 6(a): Participants’ attitudes toward first-aid practices.

Parameter	Category	N (%)
A child gets a minor cut or wound while he/she is playing	Do nothing and go to a doctor immediately	39 (9.8%)
	Apply coffee powder	24 (6.0%)
	Apply herbal extract	5 (1.3%)
	Wash the wound first and apply pressure if required*	300 (75.6%)

	Do not know	29 (7.3%)
A child sustains a burn	Keep burned part under cold water*	198 (49.9%)
	Apply castor oil/egg white	26 (6.5%)
	Apply herbal extract	15 (3.8%)
	Do nothing and go to a doctor	117 (29.5%)
	Do not know	41 (10.3%)
Child clothes catch fire	Pour water on him/her and attempt to put out the flame	53 (13.4%)
	Wrap in a blanket*	309 (77.8%)
	Do nothing and go to a doctor	8 (2.0%)
	Do not know	27 (6.8%)
A child starts having fits	Just try to control him/her	36 (9.1%)
	Do not use force to stop the convulsions	39 (9.8%)

Remove objects that may cause injuries*	188 (47.4%)
Give metal keys in his/her hand	6 (1.5%)
Do nothing and go to a doctor	60 (15.1%)
Do not know	68 (17.1%)

Table 6(b): Participants' attitudes toward first-aid practices.

Parameter	Category	N (%)
A child has a foreign body/splash in the eyes	Rubbing the eye with a hand	5 (1.3%)
	Blink the eyelid in a cup of water	115 (29.0%)
	Make a point with the corner of a handkerchief/any cloth, moisten it, and attempt to remove the foreign body*	135 (34.0%)
	Do nothing and go to a doctor	90 (22.7%)
A peanut or other small object enters the nose of a child	Do not know	52 (13.1%)
	Try to take it out by any means	39 (9.8%)
	Ask the person to breathe using his/her mouth instead of nose	67 (16.9%)
	Make the person sneeze*	152 (38.3%)
A peanut or other small object enters the ear	Do nothing and go to a doctor	84 (21.2%)
	Do not know	55 (13.9%)
	Pour oil in the ear	31 (7.8%)
	Try to take it out by any means*	53 (13.4%)
A child is getting choked by a foreign body	Do nothing and go to a doctor immediately	260 (65.5%)
	Do not know	53 (13.4%)
	With the head down and chest up, gently tap on the back*	314 (79.1%)

Give them water to drink	10 (2.5%)
Do nothing and go to a doctor immediately	32 (8.1%)
Do not know	41 (10.3%)

Table 6(c): Participants' attitudes toward first-aid practices.

Parameter	Category	N (%)
A child consumes a poisonous substance	Induce vomiting with salt water	161 (40.6%)
	Check for airway breathing and circulation*	40 (10.1%)
	Do nothing and go to a doctor	144 (36.3%)
	Do not know	52 (13.1%)
A child bleeds from his/her nose	Use your hand to press the soft part of the nose and bend the head down*	229 (57.7%)
	Put cotton inside the nose	29 (7.3%)
	Wash the nose with cold water	86 (21.7%)
	Do not do anything and go to the doctor immediately	23 (5.8%)
A child falls from a high wall and suffers pain in his right hand and is suspected of having a broken hand	Do not know	30 (7.6%)
	Creating a hand brace and taking the child to hospital*	241 (60.7%)
	Apply ice to the affected hand to relieve swelling	39 (9.8%)
	Give the child a pain reliever medication	0 (0.0%)
A child who is bitten by a scorpion on his hand while playing	Do not do anything and go to the doctor immediately	82 (20.7%)
	Do not know	35 (8.8%)
	Raise the hand above the heart level and put ice on the injury spot.*	34 (8.6%)
	Apply pressure on the hand tightly to	269 (67.8%)

prevent the spread of the poison	
Do not do anything and go to the doctor immediately	37 (9.3%)
Do not know	57 (14.4%)

*An asterisk indicates the correct answer

4. DISCUSSION

Children are vulnerable to injuries because of their size and immature development. According to the WHO, preventable injuries are still the leading cause of death in children (Training and Learning, n.d.). The American Academy of Pediatrics (AAP) estimated that in the United States, nine million children are treated in the emergency department due to preventable injuries. Moreover, approximately 9000 children die annually due to these injuries, accounting for approximately 25 deaths per day in the US alone (Sleet, 2018). Knowledge of first aid, in general, is essential and can prevent injuries, particularly in children. Suppose parents and carers are experienced and knowledgeable regarding first-aid measures in children. In that case, it will lead to improved survival in children and prevent some of the complications associated with injuries.

Despite all this, there remains a gap in the knowledge of these important skills. A study in Jeddah, Saudi Arabia, published in 2017, assessed knowledge of first-aid measures among 390 parents and carers, and only 22 (5.6%) achieved the passing rate (Harere et al., 2017).

This represents a huge gap in our community's primary care of children.

While the attitude towards first aid is assumed to be of direct importance to providing appropriate first aid in emergency situations, the attitude towards learning first aid may be of greater importance, even if these are indirect. Our survey revealed that most respondents' attitudes towards pediatric first aid were positive, but increasing their actual first aid knowledge and skills remains necessary.

Further, most of the respondents were female, and approximately one-third of the respondents were over 50 years of age. Approximately 28% of the respondents in our research are healthcare professionals. Other international data revealed that this specific population has the highest awareness level and willingness to provide first aid when needed.

Our data has revealed that most participants are aware of first aid and have heard about it. In prior studies in Saudi Arabia on awareness of first aid, 56% of participants were aware, and only 6% of the participants were parents (Al-Johani et al., 2018; Habeeb & Alarfaj, 2020). Common sources of first aid were TV, radio, newspapers, and textbooks in school. However, a few previously published studies found that sources differed depending on the

location of participants. Those who live in urban areas have more access to the Internet, TV, and radio stations. On the other hand, for those who live in rural areas, their primary source of information is people who have knowledge of first aid and have directly informed or taught them (Bakke et al., 2016).

In our study, approximately half of the respondents had received some form of training in pediatric first aid, and approximately 80% had had practical training. Previous studies have revealed that 34% of surveyed parents have had practical training (Al-Johani et al., 2018).

Another study found that only 13% of the general population has had some form of training in pediatric first aid (Conrad & Beattie, 1996). These results emphasize the importance of conducting widespread hands-on training courses for pediatric first aid and encourage the public to attend such courses. This can be done by opening more training centres and making them cheaper and more reasonably priced so people can afford to attend.

As we know, bystander first aid is crucial and can save lives. International data has revealed that 40%–50% of surveyed random samples of people had encountered situations in which first aid was needed. In developed countries, 90% of surveyed people have had first aid training, and 89% used this training when needed (Conrad & Beattie, 1996). We do not have data on developing countries, but this percentage is likely much lower. In our study, almost 50% of the respondents have encountered situations requiring first aid, and approximately 77% provided first aid.

Further, general public knowledge of and attitude towards first aid in children are generally less than that among adults. International data reveals that only 10%–20% of surveyed random people had this training (Conrad & Beattie, 1996). We found that 23.8% of our respondents have had training in pediatric first aid. It must be noted that 50% acknowledged applying pressure as the first aid for bleeding, and only 30% could accurately identify percussion as not being a first aid measure for a sprained ankle; this is because bleeding is probably more common when compared to a sprained ankle.

Finally, attitudes towards pediatric first aid are generally unfavourable among the public and people dealing with children (schoolteachers, daycare staff, etc.). Providing knowledge about first aid to the general population can affect and improve an individual's attitude regarding immediate assistance to preserve life.

The study's strengths include a relatively large population and a simple questionnaire with closed questions. However, because this study assessed general population knowledge and attitudes towards pediatric first aid and took place in one city, the findings cannot be applied to all cities in every region of the KSA.

These results can help to design future first-aid workshops for the general population and we recommend further research that includes adult first-aid knowledge and national studies.

5. CONCLUSION AND RECOMMENDATION

First aid is an important tool for providing immediate emergency care for all people, and it is particularly more important for children. Knowledge of and attitude towards first-aid tools are essential for providing first aid when needed. In contrast, training in first aid is crucial for providing appropriate first aid, particularly for children and young infants.

AUTHOR CONTRIBUTION

The authors participated equally in each step of the research process.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this article.

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