



Public Attitude and Knowledge in the Makkah Region Regarding Providing First Aid before and after the COVID-19 Pandemic

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Aims: To evaluate attitude toward and knowledge of first aid of the public in Makkah region, Saudi Arabia, considering the effects of the COVID-19 pandemic on changing perceptions.

Study Design: A descriptive cross-sectional study.

Place and Duration of Study: Department of Medicine, between June 2020 and November 2021.

Methodology: A descriptive cross-sectional study targeted the whole accessible population in Makkah region. All those aged 18 or older living in the region were invited to participate in the survey. Data collection was through an online pre-structured questionnaire from July 15th to August 12th, 2021. It covered sociodemographic data, knowledge, and attitude regarding first aid, and the effects of the COVID-19 pandemic.

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Results: A total of 1,368 participants met the inclusion criteria. Ages ranged from 18 to 70 years. A total of 1,132 (82.7%) participants had poor knowledge, and 1,028 (75.1%) reported they would help in providing first aid.

Conclusion: Despite high motivation and readiness to attain knowledge of first aid, public knowledge was very low. Attitudes were very good, but practice was restricted by some barriers.

Keywords: First aid; CPR; knowledge; attitude; Makkah region.

1. INTRODUCTION

First aid is the immediate care that can be provided by any member of the community to an ill or injured person until the arrival of emergency medical services [1]. The importance of first aid is mainly in saving lives and decreasing morbidity by stabilizing the casualty and preventing their condition from deterioration [1,2]. First aid can be provided with any level of training. A general characteristic of such training is being able to recognize situations in which emergency medical services are needed [3]. Though research in this area is scarce, studies have shown that early correct cardiopulmonary resuscitation enhances the general outcomes of out-of-hospital cardiac arrest cases [4].

First aid and basic life support include life-saving medical techniques that a person, either in the medical field or not, can be trained to perform with available equipment. If persons are properly equipped with basic first aid information, this can save lives, lessen morbidity, and reduce the costs of treatment or rehabilitation [5,6]. The proper application of first aid can help immensely in some emergency cases [7–9]. With an upward trend in the incidence of emergencies, all individuals must be adequately trained to deal with such events [10].

Public attitude and knowledge in the Makkah region regarding providing first aid have not yet been comprehensively explored. To provide targeted education and training, we must first measure the level of knowledge and willingness to help, especially now in the COVID-19 era. This study aimed to assess the public knowledge and attitude in the Makkah region regarding providing first aid, explore COVID-19 changes to the perceptions of providing first aid, and estimate whether the public are aware of guidelines to protect themselves and the casualty in the COVID-19 era.

2. MATERIALS AND METHODS

A sample size of 1067 was determined with a confidence level of 95% and a confidence

interval of 3 in the context that the Makkah region population was 8558000 people. This descriptive cross-sectional study targeted the whole accessible population in the Makkah region, Saudi Arabia. All those aged 18 or older living in the region were invited to participate in the survey. A total of 1,570 individuals received the study survey, and 1,368 were eligible and completed the questionnaire, giving a participation rate of 87.1%. The data was collected using an online pre-structured questionnaire, carefully constructed with an extensive literature review and expert opinions in mind. The questionnaire then was reviewed for applicability and approved by a panel of three experts. Its reliability was assessed using a pilot study of 30 participants, giving a reliability coefficient (Cronbach's α) of 0.79 for knowledge and 0.71 for attitude. The questionnaire covered participants' sociodemographic data; knowledge, assessed using eight questions with one correct answer for each; attitude, assessed by four items with agree/disagree choices; and practice regarding first aid, assessed using two questions. The questionnaire was uploaded online using social media platforms from July 15th to August 12th, 2021.

2.1 Data Analysis

All collected data were extracted, revised, and coded, then processed using IBM SPSS version 22 (SPSS, Inc., Chicago, IL, USA). Two-tailed tests were used for all statistical analyses. P-values less than .05 were considered statistically significant. For knowledge items, each correct answer was scored one point, and the total of the item scores was calculated. A participant with a score less than 60% (6 points) of the maximum was considered to have poor knowledge, and a good knowledge level was considered a score of at least 60% (7 points or more) of the maximum. Descriptive analysis based on frequency and percent distribution was done for all variables, including demographic data, history of first aid training, and knowledge and attitude regarding first aid learning and its importance. Crosstabulation was used to assess the

distribution of knowledge level according to participants' demographic data. Relationships were tested using Pearson's chi-square test.

3. RESULTS AND DISCUSSION

A total of 1,368 participants met the inclusion criteria. Their ages ranged from 18 to 70 years, with a mean age of 27.6 ± 10.8 years, and 1,124 (82.2%) were women. Of the participants, 405 (29.6%) were non-healthcare workers, 87 (6.4%) were healthcare workers, and 746 (54.5%) were students. A total of 439 (32.1%) participants had taken a first aid course, 218 (49.7%) of them at school or work and 221 (50.3%) by their own effort (Table 1).

Asked about the first step for a middle-aged person lying on the ground motionless, 47.4% correctly selected monitoring breathing and calling to them to assess consciousness, 18.6% of participants said they would place them in the recovery position to help breathing, and 34.1% reported they would call an ambulance.

Identifying the cardiopulmonary resuscitation (CPR) procedure for an adult, 34.9% correctly responded that chest compressions are more important than rescue breaths, 47.1% answered that chest compressions should be in the middle

of the chest and to a depth of 8 cm, and 17.9% said that the rate of chest compressions should not exceed 90 per minute.

Regarding how to help a person who needed CPR during the COVID-19 pandemic, 53.7% correctly responded that the rescuer can perform chest compressions without rescue breaths while wearing a mask, 36.1% selected that chest compressions can only be performed if the casualty's COVID-19 status is known, and 10.2% thought that wearing a mask for the rescuer or casualty is not important and the chance of infection transmission is small.

In the scenario of a person standing from their chair, pointing to their neck and unable to speak or cough, 70.4% of participants knew that they should perform back blows with the palm between the shoulders up to five times, 18.3% chose trying to retrieve the stuck object from the mouth even if it was unseen, and 11.3% selected calling an ambulance.

To help a person after a traffic accident who was bleeding heavily from a cut on the arm but not unconscious, 42.9% correctly selected ensuring the safety of the crash site and then applying pressure to the bleeding site with a clean cloth, 36.1% said they would cover the bleeding site

Table 1. Personal data of study participants in Makkah region, Saudi Arabia

Personal data	No	%
Age in years		
< 20	341	24.9%
20-29	592	43.3%
30-39	169	12.4%
40+	266	19.4%
Gender		
<i>Male</i>	244	17.8%
<i>Female</i>	1124	82.2%
Educational level		
<i>Below secondary</i>	51	3.7%
<i>Secondary</i>	299	21.9%
<i>University / above</i>	1018	74.4%
Job title		
<i>Not working</i>	130	9.5%
<i>Non-health care worker</i>	405	29.6%
<i>Health care worker</i>	87	6.4%
<i>Student</i>	746	54.5%
Had training course for first aid		
<i>Yes</i>	439	32.1%
<i>No</i>	929	67.9%
Who provided the training		
<i>Provided at school / work</i>	218	49.7%
<i>By my own search</i>	221	50.3%

Table 2. Reveals the distribution of public knowledge of first aid in the Makkah region

First aid knowledge items	No	%
A middle-aged person is lying on the ground motionless, what is the first step to help them?		
<i>Put in recovery position to help breathing</i>	254	18.6%
<i>Call ambulance</i>	466	34.1%
<i>Monitor the breathing and call the person to assess consciousness</i>	648	47.4%
Regarding CPR for an adult, which of the following is correct?		
<i>The chest compressions should be in the middle of the chest and at a depth of 8 cm</i>	645	47.1%
<i>The rate of chest compressions should not exceed 90 per minute</i>	245	17.9%
<i>Chest compressions are more important than rescue breaths</i>	478	34.9%
During the COVID-19 pandemic, I encountered a person who needed CPR, which of the following is correct?		
<i>The rescuer can perform chest compressions without rescue breaths, while wearing a mask</i>	734	53.7%
<i>If the rescuer knows the covid status of the injured person, only then they can perform chest compressions</i>	494	36.1%
<i>Wearing a mask for the rescuer and the injured is not important and the chance of transmission of infection is small</i>	140	10.2%
While you are in a restaurant, you notice that a person stands up from their chair pointing to their neck and cannot speak or cough. What is the first step to help them?		
<i>Back blows with the palm between the shoulders up to 5 times</i>	963	70.4%
<i>Try to get the stuck object out of the mouth even if you can't see it</i>	250	18.3%
<i>Call the ambulance</i>	155	11.3%
A person was injured in a traffic accident in their hand, and he was bleeding heavily, but was not unconscious. What is the first step to help them?		
<i>Tie the hand above the bleeding site, then raise it above the level of the heart</i>	287	21.0%
<i>Ensure the safety of the crash site and then apply pressure to the bleeding site with a clean cloth</i>	587	42.9%
<i>Cover the bleeding site with a clean cloth, then raise the hand above the level of the heart</i>	494	36.1%
Someone poured boiling water on their hand, how do you deal with the situation?		
<i>Wash the hand with ice water, then cover with a clean cloth</i>	375	27.4%
<i>Wash the hand with tap water for 10 minutes</i>	761	55.6%
<i>Put a layer of toothpaste on the burn</i>	232	17.0%
A person stumbled and fell while playing sports, after examining the leg and found that it was swollen and the bone seemed to be in an abnormal position, how do you deal with the situation?		
<i>Keep the leg in its current position and limit its movement, then call an ambulance</i>	1107	80.9%
<i>Compress the leg with ice and then return the bone to its normal position</i>	118	8.6%
<i>Returning the bone to its normal position and then tying it with an elastic bandage to reduce swelling</i>	143	10.5%
A family member was bitten by a snake, which of the following is the right thing to do while you wait for the ambulance?		
<i>Tie the affected part over the sting site to limit the spread of poison</i>	1103	80.6%
<i>Limit the movement of the affected part and place it below the level of the heart</i>	212	15.5%
<i>Compressing the affected part with ice to reduce pain</i>	53	3.9%

with a clean cloth and raise the hand above the level of the heart, and 21% reported they would tie the hand over the bleeding site, then raise it above the level of the heart.

For someone who poured boiling water on their hand, 55.6% correctly chose washing with tap water for 10 minutes, 27.4% selected washing with ice water then covering with a clean cloth, and 17% thought that they should put a layer of toothpaste on the burn.

For a person who stumbled and fell while playing sports, whose leg was swollen with the bone seemingly in an abnormal position on examination, 80.9% of participants said they would keep the leg in its current position, limit its movement, and then call an ambulance. Another 10.5% chose returning the bone to its normal position and then tying it with an elastic bandage to reduce swelling.

In case of a snake bite, only 15.5% knew that they should limit the movement of the affected body part and place it below the level of the heart, whereas 80.6% reported that they would tie the affected part over the bite location to limit the spread of poison.

Fig. 1 shows the overall public knowledge of first aid in the Makkah region. Of the participants, 237 (17.3%) had a good level of knowledge, whereas 1,132 (82.7%) had a poor knowledge level.

Table 3 illustrates the distribution of public practice and motives for first aid. Of the study participants, 75.1% reported that they would help

with providing first aid for a person who appeared to need it, whereas 26.2% would not help because they had insufficient knowledge. Other reasons included fear that the person may have COVID-19 (8.5%), fear of legal responsibility (8.9%), and thinking that someone else would help (5.1%). The most common motive for participants to take a first aid course was helping community members (80.9%), followed by helping relatives when needed (52.4%), to strengthen their curriculum vitae (27.6%), and as a requirement for a job they had or wanted (11.8%).

Table 4 demonstrates the distribution of public attitudes toward first aid. Most participants (99%) agreed that knowing first aid is important for all members of society; only 11.2% agreed that learning and providing first aid is solely for health workers and students. Additionally, 99.2% thought that correctly providing first aid improves the chances of survival or recovery for the casualty, and 40.3% reported that the COVID-19 pandemic had changed their view of providing first aid for fear of infection.

Table 5 shows the distribution of overall public knowledge of first aid by participant demographics. A good knowledge level was found among 23.2% of young participants (aged 18-20 years) compared to 8.6% of those aged 40 years or above, a statistically significant

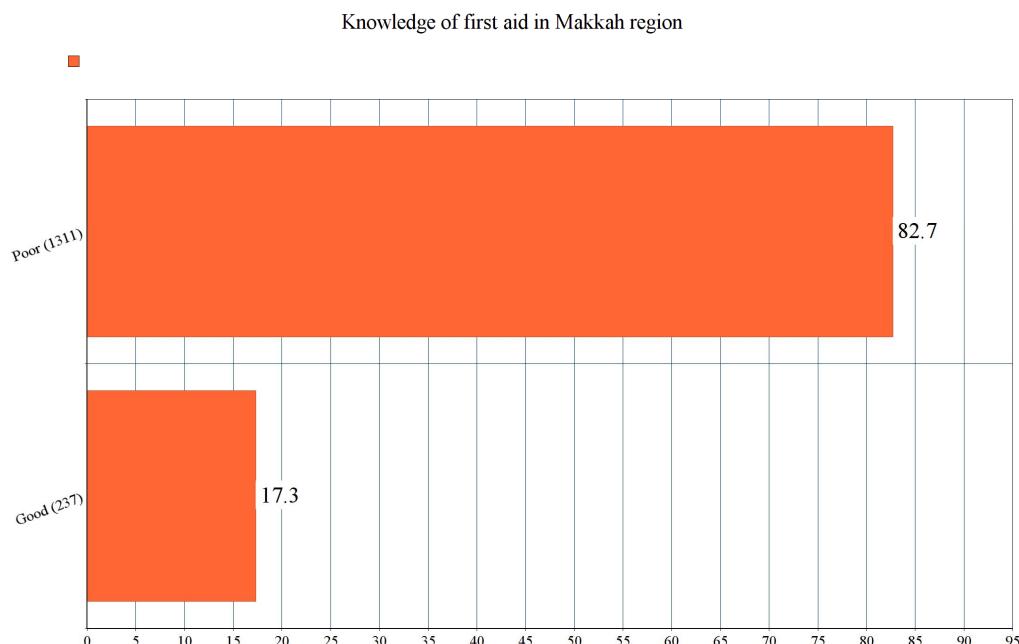


Fig. 1. The overall public knowledge of first aid in the Makkah region

Table 3. Distribution of public practice and motives for first aid in Makkah region, Saudi Arabia

Practice items	No	%
If you see an injured person who appears to need help, what will you do?		
<i>Help with providing first aid</i>	1028	75.1%
<i>I will not interfere as I don't have enough knowledge to help</i>	359	26.2%
<i>I will not interfere as I am afraid that the person may have COVID-19</i>	116	8.5%
<i>I will not interfere as most likely someone else will help the person</i>	70	5.1%
<i>I will not interfere as I am afraid of legal responsibility</i>	122	8.9%
What might prompt you to take a first aid course?		
<i>To help my community</i>	1107	80.9%
<i>To help my relatives when needed</i>	717	52.4%
<i>To be in my CV</i>	377	27.6%
<i>Compulsory for the job I work/want to work for</i>	162	11.8%
<i>I don't think I need it</i>	48	3.5%

Table 4. Distribution of public attitude towards first aid in Makkah region, Saudi Arabia

Attitude items	Agree		Disagree	
	No	%	No	%
Knowing first aid is important for all members of society	1354	99.0%	14	1.0%
Learning and providing first aid is for health workers and students only	153	11.2%	1215	88.8%
Providing first aid correctly improves the chances of survival or recovery of the injured person	1357	99.2%	11	.8%
The COVID-19 pandemic has changed my view of providing first aid for fear of infection	551	40.3%	817	59.7%

difference ($P=.001$). Additionally, 28.7% of healthcare workers had a good knowledge level of first aid compared to 10.6% of non-healthcare workers ($P=.001$). Of those who had training in first aid, 22.3% had a good knowledge level, compared to 15% of participants who did not ($P=.001$). Good knowledge of first aid was found among 28.1% of those who had independently sought learning, compared to 16.5% of those who had the training in a work setting ($P=.004$).

3.1 Discussion

Through this study, we aimed to investigate the evidence on public knowledge and awareness regarding first aid in the Makkah region, as well as the COVID-19 pandemic's effects on the public's beliefs about first aid and whether they are aware of guidelines to protect themselves and casualties in the COVID-19 era. The issue of knowledge and attitude regarding first aid is rarely researched in Saudi Arabia. Though a very important subject, we found that it has only been researched on a smaller scale inside schools or universities. Correct application of first aid, such as maintaining upper airway patency, CPR, applying pressure on an injured vessel, and positioning the casualty safely, has a significant

role in saving the lives of many, especially following accidents [11–13].

This study found that public awareness and knowledge in the Makkah region was very poor, with less than one fifth of participants having a good knowledge level (17%). Less than half of the participants correctly reported safe actions for each situation, except for the choking scenario. Knowledge of putting the casualty in the recovery position, maintaining airway patency, CPR and rescue breath techniques, dealing with burns from hot fluids, emergency fracture management, and dealing with snake bites was not satisfactory among the study population. Calling an ambulance was a moderately commonly selected solution for some situations. This study did not assess the public awareness of CPR techniques in more detail or public knowledge of emergency care contact numbers.

Knowledge was significantly higher among healthcare workers (explained by their medical background), younger participants (who were mainly students or healthcare workers), and those who had first aid training. Surprisingly, those who self-initiated learning had higher

Table 5. Distribution of public knowledge regarding first aid by participants personal data

Personal data	Knowledge level				p-value	
	Poor		Good			
	No	%	No	%		
Age in years					.001*	
< 20	262	76.8%	79	23.2%		
20-29	480	81.1%	112	18.9%		
30-39	146	86.4%	23	13.6%		
40+	243	91.4%	23	8.6%		
Gender					.209	
Male	195	79.9%	49	20.1%		
Female	936	83.3%	188	16.7%		
Educational level					.770	
<i>Below secondary</i>	44	86.3%	7	13.7%		
<i>Secondary</i>	248	82.9%	51	17.1%		
<i>University / above</i>	839	82.4%	179	17.6%		
Job title					.001*	
<i>Not working</i>	116	89.2%	14	10.8%		
<i>Non-health care worker</i>	362	89.4%	43	10.6%		
<i>Health care worker</i>	62	71.3%	25	28.7%		
<i>Student</i>	591	79.2%	155	20.8%		
Had training course for first aid					.001*	
Yes	341	77.7%	98	22.3%		
No	790	85.0%	139	15.0%		
Who provided the training					.004*	
<i>Provided by school / work</i>	182	83.5%	36	16.5%		
<i>By my own search</i>	159	71.9%	62	28.1%		

P: Pearson χ^2 test

* P < 0.05 (significant)

knowledge of first aid than those who were trained at work or school. This could be explained by the assumption that most of those who trained at work or school were obligated but not motivated and thus attending with little care, in contrast to others who were motivated to learn and searched for courses themselves.

Krammel et al. [14] reported that more than half (52%) of participants in Vienna, Austria, would correctly provide first aid for an out-of-hospital cardiac arrest and would properly initiate basic life support attempts. Only 33% reported that they would be willing to perform CPR, and 50% would use an automated external defibrillator device. Brooks et al. [15] found that 61.1% of urban residents in the UK had basic life support training. Around 70% knew what an automatic external defibrillator was, and 26.1% know how to use one. Only 3.3% of participants would attempt locating a defibrillator, but 2.1% would retrieve and use it. Krzyszkowska [16] found that 164 of 250 (65.6%) respondents had a good level of knowledge of first aid. Only 80 respondents (32%) had an average level of knowledge.

In Saudi Arabia, no study has assessed public awareness regarding first aid. In Khobar, Al-Turkistani et al. [17] found that 80.8% of females and 86.5% of males were totally unaware of CPR. Of female participants, 15.5% had attended CPR courses, in comparison to 6.1% of males; 18.7% of females had reviewed CPR programs or videos versus 11.1% of male participants. More females (59.4%) were enthusiastic about learning CPR than males (29.3%). A 2019 study of Taif University students showed a very poor attitude toward providing first aid, matching with the current study findings [18]. Another study, conducted on female students in Princess Norah University, Riyadh, showed that participants had a good attitude. However, 35% of participants did not provide CPR when faced with a situation in which it was needed, due to a lack of knowledge, nervousness, and other reasons unspecified by the study [19]. A study published in 2020 showed that more than half of university students in Saudi Arabia (medical and non-medical specialties) had good knowledge of first aid, possibly correlating to higher education [20].

This study showed that most participants had good attitudes toward the importance of first aid, who should know it, and its role in reducing casualties' morbidities. Less than half of the participants changed their view of providing first aid for fear of infection during the COVID-19 pandemic. Regarding practice, more than three quarters of participants reported they would help an ill or injured person, but a lack of knowledge, fear of legal responsibility, and fear of infection with COVID-19 were barriers.

4. CONCLUSION

Despite the promising high motivation and readiness to attain knowledge of first aid, public awareness and knowledge regarding first aid were very low among the community of the Makkah region. Furthermore, although attitudes were very good, practice was restricted by some barriers, including poor knowledge, fear of legal responsibilities, and the COVID-19 pandemic. Most people need to attend first aid courses, but the inaccessibility of these events to the public and scheduling issues were the most common barriers to applying, especially through campaigns. We recommend a national strategy to implement regular first aid courses and campaigns for the public, using demonstration manikins. CPR should also be included in high school programs because this could introduce significant support for the community.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

Ethical approval was obtained from Directorate of Health Affairs – Taif, Research and Studies Department by the number of 566 at 02/06/2021.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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