Attitude and Awareness Toward Heart Attack Symptoms and Lifesaving Actions Among Population of Western Region, KSA

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Abstract

Background: Awareness of basic life support (BLS) and cardiopulmonary resuscitation (CPR) protocols ensure the patient's survival long enough before medical intervention. Objectives: The aim of this study was to assess the attitude and awareness about heart attack symptoms and lifesaving actions among the population.

Methods: A cross-sectional study was done through an online survey on 6,113 residents of the Western region in Saudi Arabia. A pre-designed questionnaire was used to collect data about sociodemographic characteristics, having heart disease, or a heart attack in the participant or one of their family, sources of information about the heart attack, and knowledge about heart attack and CPR.

Results: 40% of the participants had heard about heart attacks and 65.5% knew that the first step to take if they witness a person suffering from symptoms of heart attack was to call the ER. Only 30.7% of the participants had attended a CPR course and 14.7% had rescued someone from an emergency and only 30.9% knew how to arrange resuscitation steps in order of priority for an adult. Participants with a university education, who had a medical specialization, who had a heart disease themself or had a heart attack in one of their family and those who had a friend as a source of information had a significant higher mean Knowledge score about heart attack and CPR.

Conclusion: There is a need to raise knowledge about heart attack and train the Saudi population in lifesaving action by conducting training courses and awareness campaigns.

Key words: Attitude, Awareness, Heart, Attack, Lifesaving, Western, KSA

Introduction

Cardiac arrest or heart attacks are the commonest global emergency which end up in serious consequences and mortality (1). Heart attacks may be simply prevented by easy maneuvers and skills, with awareness of basic life support (BLS), therefore guaranteeing the survival of the patient (1).

The heart attack (also known as myocardial infarction) happens when a segment of the heart muscle does not get enough blood supply leading to major causes of heart problems. Sudden cardiac death (SCD) is a common deadly event outside the hospital worldwide, often happening in the early age of life (3.4).

The common manifestations of a heart attack are:
1) pressure, pain or squeezing sensation in the chest or arms, may spread to neck, jaw or back;
2) nausea and heartburn;
3) Fatigue and lightheaded, or sudden dizziness;
4) shortness of breath;
5) cold sweating (2).

Awareness of basic life support (BLS) and skills in cardiopulmonary resuscitation (CPR) protocols ensure the patient's survival long enough before professional medical support arrives, which is itself adequate for survival in most situations (1). Basic life support (BLS) translates to the skills that need virtually no or little resources to save lives of cardiac or respiratory arrest casualties. BLS involves cardiopulmonary resuscitation (CPR), the use of an automatic external defibrillator (AED) and the clearing of foreign bodies of obstructed airways for individuals among all ages (5). Early interference in case of a heart attack is important for avoiding mortality (2).

The CPR technique provides a variety of chest compressions which act as heart pumping to allow the brain and other vital organs to maintain flowing of blood oxygen (6), and act as lungs by delivering positive pressure breathing to the patient, all of this helps to prevent complications (5). There are two main elements for effective resuscitation and reduction of avoidable deaths such as knowledge of CPR and successful CPR performance at the earliest opportunity (7).

Not only are BLS skills important for healthcare workers, but every member in the community can learn easily by joining BLS courses (5). It is necessary to motivate families, friends and communities to know the obvious signs and symptoms of a heart attack and calling for emergency services then start doing CPR immediately (2).

In the Kingdom of Saudi Arabia (KSA), an old study done in 2008 found that 31% of university students in Riyadh did not have prior CPR knowledge, and of those with previous knowledge, 85% felt that it was inadequate, and the most common sources of information were television and movies (8).

In 2018, a study was done to assess knowledge, attitudes, and behaviors of the general Saudi society toward CPR. The study found that 78.3% of respondents had heard of CPR, with media being the primary source of information, and 60.9% of respondents knew the correct hand positioning for chest compressions. About 43% of respondents reported that they would refuse to perform CPR if required due to lack of knowledge (61.3%) and fear of making the situation worse (33.3%) (9). A study was done in 2018 to determine knowledge about CPR among the university Students in the Northern Region of KSA. The study found that medical students had a higher score of knowledge compered to non-medical students (10). However, other studies found that medical students still have low fundamental knowledge about BLS (5).

Another study was done in 2019 and found that knowledge about BLS and Emergency Medical Services among healthcare interns was below average (11). A study was done in Taif city in 2019 to assess knowledge about first aid skills among medical and non-medical students. The study showed a strong understanding of first aid and BLS among 56.6% of the participants. However, the attitude towards first aid was very bad and a positive attitude towards it was just 8% (12). Studies have revealed that frequent education to maintain an acceptable level of BLS skills is highly recommended (13), and increased experience of CPR would improve the students' functional skills (6).

There are no similar studies done in Western region of KSA that assessed population knowledge about heart attack symptoms and CPR. Thus, the aim of this study was to assess the attitude and awareness about heart attack symptoms and lifesaving actions among this population.

Subjects and Methods

Study design and time frame: A cross-sectional study was done from April to October 2020.
Study settings: An online survey was done on the population of the Western region in Saudi Arabia
Sampling and population: According to the estimated population of the western region of KSA, a sample size of 385 participants was estimated. The inclusion criteria were adults of both genders who are above the age of 18 years, and the exclusion criteria were all people under 18 years and people outside the Western region.
Data collection procedure: A pre-designed questionnaire was used to collect data. The first section of the questionnaire included items to collect sociodemographic data, having a heart disease, a heart attack in the participant or one of their family and sources of information about heart attack. The second section included knowledge items about heart attack and a one question for attitude "If you decided to change your behavior to reduce your risk of heart attack, how confident are you of changing your behavior?" The third section included items on knowledge about CPR.
Statistical design: The Statistical Package for Social Sciences (SPSS version 25) was used for data analysis. Qualitative data was expressed as numbers and

percentages and quantitative data was expressed as mean and standard deviation (Mean ± SD), where Mann-Whitney and Kruskal Wallis Tests were applied for non-parametric variables. Spearman's Correlation analysis was done, a p-value of less than 0.05 was considered significant.

Results

Table 1 shows that 82.6% of the participants had an age ranging from 18-49 years, 69.4% were females, 77.1% had a university education, 89.7% had a Saudi nationality, 45.7% were from Jeddah city and 26.5% were working in the medical field. Of the participants, 4.2% had heart disease, 3,7% had a heart attack, 27.9% had a family member who had a heart attack, 13.7% were present when family member had a heart attack and most of them (60.3%) got their information about heart attack from the internet.

Figure 1 shows that 19% and 12% of the participants were very confident and confident that if they decided to change their behavior to reduce their risk of heart attack they would change their behavior.

Table 2 shows that 40% of the participants had heard about heart attacks, or their treatment or prevention in the past year. Of them, 36.4%, 58.7%, 84.5%, 80.8%, and 24.4% knew that "pain or discomfort in jaw, neck, shoulder, arm or back", "feeling weak, lightheaded, faint or sweating", "chest pain or discomfort", "shortness of breath", "nausea and stomach or abdominal pain" were symptoms of heart attack, respectively. Of the participants, 65.5% knew that the first step to take if they witness a person suffering from symptoms of heart attack was to call the ER, 2% knew that on having a heart attack the person should go to a hospital immediately, and most of them (35.2%) knew 6 correct risk factors of heart attack.

Table 3 shows that 30.7% of the participants had attended a CPR course, 14.7% had rescued someone from an emergency, and 20% disagreed that a health practitioner is the only person who can save a patient. About 63% (63.6%) of the participants thought that there is a difference in the method of performing CPR between adults and children under 8 years old, 16.7% knew the correct emergency number in their area, and 61.1% knew that the emergency call is made before starting CPR. Only 30.9% knew how to arrange resuscitation steps in order of priority for an adult, 53.5% knew that the correct way to determine a person's non-response is moving the victim and talking to him: Are you ok?, and 56.3% knew that the best way to check the patient's breathing is to watch his chest whether it rises and comes down, and listens and feels the air coming out of his nose and mouth.

Most of them (83.7%) knew that the best position for a victim when you're doing CPR is lying on solid ground, 69.4% knew that the best way to open the airway before starting to ventilate from mouth to mouth return the head back and lift the chin upwards, and 40.6% knew that if the victim has a composite dental device to leave it in their mouth if it is in the right position.
About 87% of the participants (87.8%) knew that if they are at home and after they call an ambulance to report a heart attack they should open the door and start CPR, 34.2% and 22.8% knew that during CPR the proportion (chest pressure/ventilation) in adults and children is 30 pressures for two ventilations, 39.9% knew that the recovery situation is placing the patient on one side and 80% knew that after hospitals the most common place people have a cardiac arrest is at home.

The mean scores of knowledge regarding heart attack and CPR were 18.46 ± 2.45 and 20.86 ± 2.13 respectively. Table 4 shows that participants who had a university education, who had a medical specialization, were of Saudi nationality, residents of Taif and Makkah city, who had a heart disease themself or had a heart attack in one of their family and those who had a friend as a source of information had a significant higher mean Knowledge score about heart attack ($p=< 0.05$). On the other hand, a non-significant relationship was found between the Knowledge score about heart attack and participants' age, gender and having a previous heart attack ($p=> 0.05$).

Table 5 shows that participants with an age ranging from 18-49 years, who had a university education, who had a medical Specialization, were of Saudi nationality, residents of Taif city, who had a previous heart attack and who got their information about heart attack from a doctor, had a significant higher mean Knowledge score about heart attack ($p=< 0.05$). On the other hand, a non-significant relationship was found between the Knowledge score about CPR and participants' gender and having a previous heart disease or a previous heart attack in a family member ($p=> 0.05$).

Figure 2 shows that a significant positive correlation was found between the knowledge scores about heart attack and knowledge scores about CPR (($r= 0.12$, p-value=<0.001).

Table 1: Distribution of the studied participants according to their characteristics, having heart disease, a heart attack in the participant or one of their family and sources of information (No.: 6113)

Variable	No. (%)
Age	
18-49	5051 (82.6)
≥ 50	1062(17.4)
Gender	
Male	1871 (30.6)
Female	4242 (69.4)
Education	
Uneducated	43 (0.7)
Primary School	36 (0.6)
Intermediate school	144 (2.4)
High school	1177 (19.3)
University graduate	4713 (77.1)
Specialization	
Medical	1622 (26.5)
Non-medical	4491 (73.5)
Nationality	
Saudi	5482(89.7)
Non-Saudi	631 (10.3)
City	
Taif	1289 (21.1)
Makkah	1477 (24.2)
Jeddah	2793 (45.7)
Medina	347 (5.7)
Yanbu	207 (3.4)
Do you have heart disease?	
Yes	259 (4.2)
No	5854 (95.8)
Has anyone in your family ever had a heart attack?	
Yes	1703 (27.9)
No	4410 (72.1)
Have you ever had a heart attack?	
Yes	226 (3.7)
No	5887 (96.3)
Were you present when family member had a heart attack?	
Yes	838 (13.7)
No	5275 (86.3)
Where did you try to get information about heart attack from?	
Internet	3686 (60.3)
Doctor	1485 (24.3)
Friend	942 (15.4)

Figure 1. Percentage distribution of the participants response regarding" If you decided to change your behavior to reduce your risk of heart attack, how confident are you of changing your behavior?"

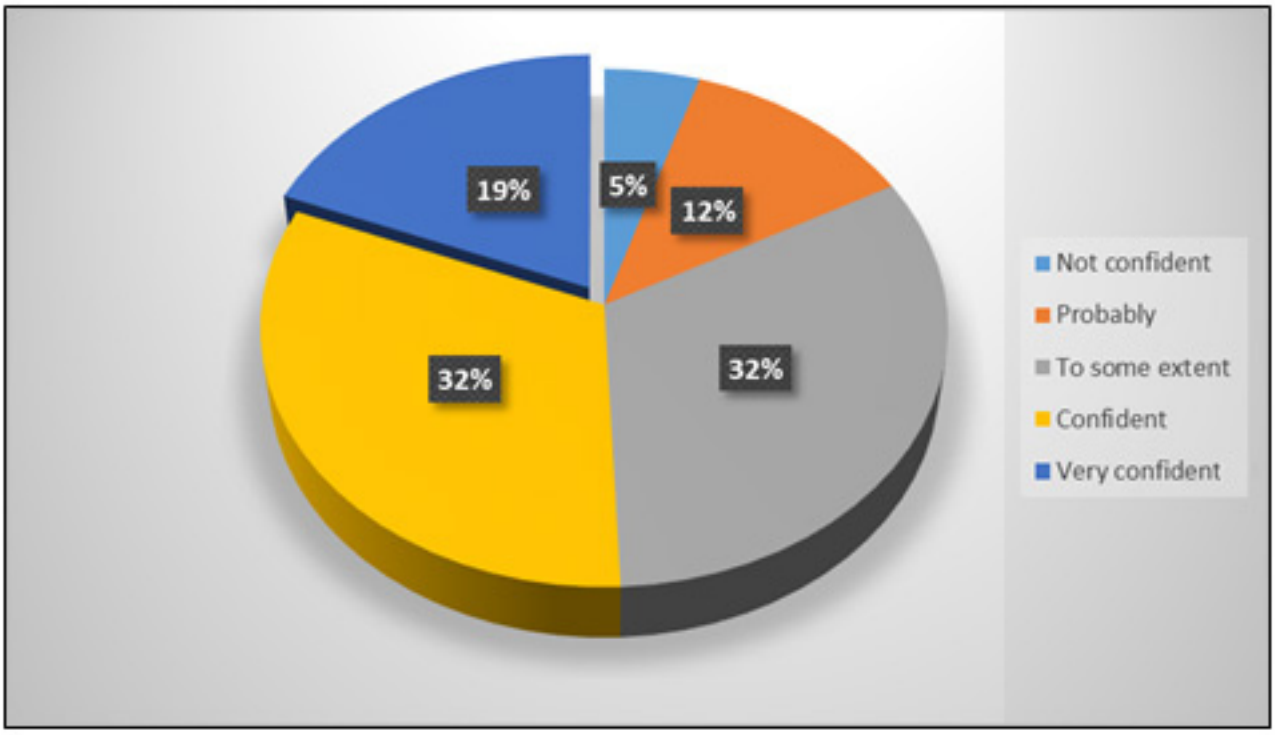


Table 2: Distribution of the studied participants according to their response to knowledge items about heart attack (No.: 6113)

Variable	No. (%)
Have you seen or heard anything about heart attacks, or their treatment or prevention in the past year?	
No	1970 (32.2)
Don't remember	1697 (27.8)
Yes	2446 (40)
Do you think pain or discomfort in jaw, neck, shoulder, arm or back are symptoms of a heart attack?	
No	3889 (63.6)
Yes *(Correct answer)*	2224 (36.4)
Do you think feeling weak, lightheaded, faint or sweating are a symptoms of a heart attack?	
No	2522(41.3)
Yes *(Correct answer)*	3591(58.7)
Do you think chest pain or discomfort are symptoms for a heart attack?	
No	945 (15.5)
Yes *(Correct answer)*	5168 (84.5)
Do you think shortness of breath is a symptom of a heart attack?	
No	1171(19.2)
Yes *(Correct answer)*	4942 (80.8)
Do you think nausea and stomach or abdominal pain are symptoms of a heart attack?	
No	4619 (75.6)
Yes *(Correct answer)*	1494 (24.4)
Do you think a heart attack can lead to heart arrest?	
No	712 (11.6)
Yes	5401 (88.4)
What is the first step you take if you witness a person suffering from symptoms of heart attack?	
Lay person down	980(16)
Give aspirin or nitroglycerin	1131 (18.5)
Call ER *(Correct answer)*	4002 (65.5)
If you or someone you know were having a heart attack, how quickly would the person need to go to a hospital?	
Immediately *(Correct answer)*	120 (2)
Same day	42 (0.7)
Next day	235 (3.8)
After your doctor tells you to go	5716 (93.5)
Which health conditions or risk factors increase someone's chances of having a heart attack?: answers were "Overweight, obesity, High blood pressure, High cholesterol, Not exercising, unfit, Smoking, Diabetes mellitus"	
1 correct answer	1016 (16.6)
2 correct answers	602 (9.8)
3 correct answers	960 (15.7)
4 correct answers	707 (11.6)
5 correct answers	677 (11.1)
6 correct answers	2151 (35.2)

Table 3. Distribution of the studied participants according to their response to knowledge items about CPR (No.: 6113)

Variable	No. (%)
Have you ever attended a CPR course?	
No	4234 (69.3)
Yes	1879 (30.7)
Have you ever rescued someone from an emergency?	
No	5214 (85.3)
Yes	899 (14.7)
Do you think a health practitioner is the only person who can save?	
No *(Correct answer)*	1220 (20)
Yes	4893 (80)
Do you think there is a difference in the method of performing CPR between adults and children under 8 years old?	
No	666 (10.9)
I don't know	1561 (25.5)
Yes *(Correct answer)*	3886 (63.6)
What is the emergency number in your area?	
997 *(Correct answer)*	1022 (16.7)
Any other answer	5091 (83.3)
The emergency call is	
Only when you need help	364(6)
During CPR	1466 (24)
After starting CPR	551 (9)
Before starting CPR *(Correct answer)*	3732 (61.1)
Arrange resuscitation steps in order of priority for an adult:	
Correct answer "Transferring the victim to a safe place / the casualty response / emergency call / breathing and pulse inspection / opening an air duct / give artificial respiration if no breathing apparatus is present" *(Correct answer)*	1890 (30.9)
Incorrect answer	4223 (69.1)
The correct way to determine a person's non-response is:	
Earlobe disc	906 (14.8)
Pour cold water on the person	427 (7)
Put something with a strong smell near the nose	1512 (24.7)
Moving the victim and talking to him: Are you ok? *(Correct answer)*	3268 (53.5)
The best way to check the patient's breathing is:	
Put the hand over his chest and note if it moves with the breathing.	2302 (37.7)
Move a candle to his nose and notice if the flame moves with the breath.	243 (4)
Tickle him and notice his movement and expression	
Watch his chest whether it rises and comes down, and listens and feels the air coming out of his nose and mouth *(Correct answer)*	128 (2.1) 3440 (56.3)
What's the best position for a victim when you're doing CPR?	
On a chair	330 (5.5)
In the bathtub	0 (0.0)
Lying on the couch	66 (10.9)
Lying on solid ground *(Correct answer)*	5096 (83.7)
What is the best way to open the airway before starting to ventilate from mouth to mouth?	
Push the head forward and press the neck	195 (3.2)
Tilt the head to the side and press the larynx	570 (9.3)
Return the head back and press the chest.	1226 (20.1)
Return the head back and lift the chin upwards *(Correct answer)*	4122 (69.4)

Table 3. Distribution of the studied participants according to their response to knowledge items about CPR (No.: 6113) continued.....

What should you do if the victim has a composite dental device ?	
Remove and wash with water and then return it to his mouth	288 (4.7)
Brush it	123 (2)
Take it out of his mouth	3218 (52.6)
Leave it in his mouth if it is in the right position *(Correct answer)*	2484 (40.6)
You're at home and after you call an ambulance to report a heart attack, what should you do?	
Open the door and wait for the ambulance to come	565(9.2)
Close the door and wait for the ambulance to come	183 (3)
Open the door and start CPR *(Correct answer)*	5365 (87.8)
During CPR, what is the proportion (chest pressure/ventilation) in adults?	
10 pressures for one ventilation	2280 (37.3)
20 pressures vs. 5 ventilations	1328 (21.7)
25 pressures for one ventilation	414 (6.8)
30 pressures for two ventilations *(Correct answer)*	2091 (34.2)
During CPR, what is the proportion (chest pressure/ventilation) in children?	
10 pressures for one ventilation.	3105 (59.8)
20 pressures vs. 5 ventilations.	1139 (18.6)
25 pressures vs. 10 ventilations.	478 (7.8)
30 pressures for two ventilations *(Correct answer)*	1391 (22.8)
What's the recovery situation?	
When he stands on his feet	211 (3.5)
Lift the legs up at the heart level	2471 (40.4)
Put the patient in a sitting position	991 (16.2)
Placing the patient on one side *(Correct answer)*	2440 (39.9)
After hospitals, what's the most common place the people have a cardiac arrest?	
Doctors' clinics	555 (9.2)
Mosques.	158 (2.6)
Restaurants	497 (8.2)
Home *(Correct answer)*	4836 (80)

Table 4: Relationship between the participants' mean knowledge scores about heart attack and their characteristics, having heart disease, a heart attack in the participant or one of their family and sources of information (No.: 6113)

Variable	Knowledge score about heart attack (Mean ± SD)	Test	p-value
Age			
18-49	18.46 ± 2.43	0.57*	0.561
≥ 50	18.40± 2.54		
Gender			
Male	18.37± 2.57	1.49*	0.13
Female	18.49 ± 2.4		
Education			
Uneducated	16.89 ± 2.8	4**	0.01
Primary School	17.45 ± 2.46		
Intermediate school	17.95 ± 2.71		
High school	18.37 ± 2.48		
University graduate	18.51 ± 2.42		
Specialization			
Medical	18.97 ± 2.4	9.74*	<0.001
Non-medical	18.27 ± 2.44		
Nationality			
Saudi	18.5 ± 2.43	3.75*	<0.001
None-Saudi	18.08± 2.56		
City			
Taif	18.54 ± 2.55	4**	0.004
Makkah	18.54± 2.41		
Jeddah	18.38 ± 2.42		
Medina	18.18± 2.54		
Yanbu	18.80± 2.26		
Do you have heart disease?			
Yes	19.09± 2.52	4.26*	<0.001
No	18.42± 2.44		
Has anyone in your family ever had a heart attack?			
Yes	18.73± 2.4	5.19*	<0.001
No	18.34 ± 2.46		
Have you ever had a heart attack?	18.62 ± 2.75	0.97*	0.33
Yes	18.45 ± 2.44		
No			
Where did you try to get information about heart attack from?	18.23 ± 2.39		
Internet	18.69 ± 2.5	2**	<0.001
Doctor	18.96 ± 2.49		
Friend			

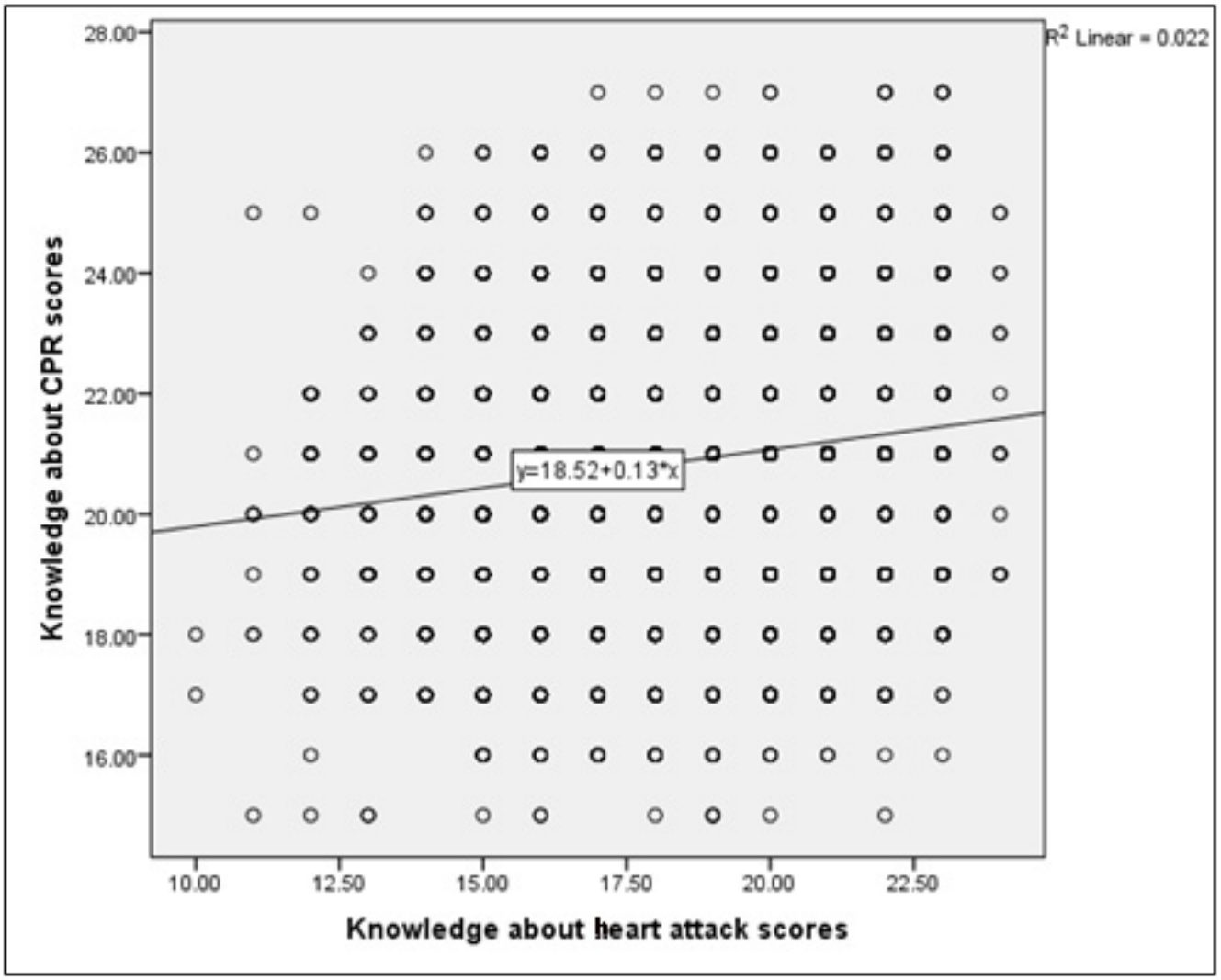
N.B: *Mann-Whitney **Kruskal Wallis test

Table 5: Relationship between the participants' mean knowledge scores about CPR and their characteristics, having heart disease, a heart attack in the participant or one of his/her family and sources of information (No.: 6113)

Variable	Knowledge score about CPR (Mean ± SD)	test	p-value
Age			
18-49	20.96 ± 2.18	8.23*	<0.001
≥ 50	20.36 ± 1.77		
Gender			
Male	20.82 ± 2.17	0.42*	0.67
Female	20.87 ± 2.1		
Education			
Uneducated	18.86 ± 1.94		
Primary School	19.5 ± 2.1	4**	<0.001
Intermediate school	19.84 ± 1.98		
High school	20.56 ± 2.03		
University graduate	20.99 ± 2.13		
Specialization			
Medical	22.11 ± 2.33	25.5*	<0.001
Non-medical	20.41 ± 1.86		
Nationality			
Saudi	20.91 ± 2.13	5.79*	<0.001
Non-Saudi	20.37 ± 2		
City			
Taif	21.05 ± 2.26	4**	<0.001
Makkah	20.98 ± 2.22		
Jeddah	20.75 ± 1.98		
Medina	20.56 ± 2.17		
Yanbu	20.78 ± 2.2		
Do you have heart disease?			
Yes	20.90 ± 2.13	0.48*	0.63
No	20.85 ± 2.13		
Has anyone in your family ever had a heart attack?			
Yes	20.87 ± 2.02	0.42*	0.67
No	20.85 ± 2.17		
Have you ever had a heart attack?			
Yes	20.37 ± 2.39		
No	20.88 ± 2.11	3.67*	<0.001
Where did you try to get information about heart attack from?			
Internet	20.71 ± 1.97	2**	<0.001
Doctor	21.55 ± 2.41		
Friend	20.33 ± 1.98		

N.B: *Mann-Whitney **Kruskal Wallis test

Figure 2: Spearman's correlation analysis between knowledge scores about heart attack and knowledge scores about CPR



Discussion

The present study was conducted to assess attitude and knowledge regarding heart attack and lifesaving actions. This study showed that the internet was the main source of information about heart attack. Another Saudi study found that the main sources of information on CPR are television and movies (8). In a study done in Jordan, schools and universities are most common sources of information (14). Schools and universities are a more accurate source of information than media but can't cover a large number of people, on the contrary, media may reach the largest number of people in the community (14).

According to our result 40% of the participants knew the symptoms of heart attacks such as chest pain or discomfort, pain in neck, shoulders, jaw or back, dyspnea, altered mental status, nausea and vomiting. Also, this finding is in accordance to studies conducted in Jordan (14) and Turkey (15) which indicated that the highest response rates were for chest pain, respiratory standstill, loss of consciousness and shortness of breath as signs of heart attack.

In the present study, 30.7% of the respondents stated that they had received CPR training, higher than that reported in Jordan 29% (14), Hong Kong (21%) (16) and mainland China (25.6%) (17), and comparable to data reported elsewhere, including 27% in New Zealand (18) and 28% in Ireland (19). The percentage reported in other studies done in Australia (20), Poland (21) and the US (22) were higher, with percentages of 58, 75 and 79%, respectively.

Most of our participants knew that the first step is calling emergency services before starting CPR, but only 16.7% knew the emergency number. Similarly, a study was conducted in Alqssim region which stated that the majority of their students would activate EMS as first step; but half of them did not know the emergency telephone (23). But another study conducted at King Saud University, revealed that 70% of their students knew the Red Crescent telephone number (8). Most of the students of King Saud University realize the importance of this skill, however, 85% still feel that their knowledge is inadequate. This is not that far from the 73% in New Zealand (18). This lack of knowledge resulted in the inability to perform CPR in about half of situations when it was required. In comparison, a US study showed that 9.1% of individuals

did not perform CPR as they felt they would not be able to perform it correctly (24).

In the present study only 16.7% knew the emergency number, a result that agrees with a previous Saudi study where a significant percentage of individuals do not even know the number to call in case of a medical emergency (8). In this work, participants with a university education and who had a medical Specialization had a significant higher mean Knowledge score about CPR. Chair et al. (16) mentioned that people with full-time jobs and higher levels of education were more likely to have received CPR training (16).

Limitations

The main limitation of the present study is being an online survey that can affect the generalization of the study results.

Conclusion

In this study 40% of the participants had heard about heart attacks and 36.4%, 58.7%, 84.5%, 80.8%, and 24.4% knew that "pain or discomfort in jaw, neck, shoulder, arm or back", "feeling weak, lightheaded, faint or sweating", "chest pain or discomfort ", "shortness of breath", "nausea and stomach or abdominal pain" were symptoms of heart attack, respectively. Of the participants, 65.5% knew that the first step to take if they witness a person suffering from symptoms of heart attack was to call the ER. Only 30.7% of the participants attended a CPR course and 14.7% had rescued someone from an emergency and only 30.9% knew how to arrange resuscitation steps in order of priority for an adult.

Participants with a university education, who had a medical specialization, who had heart disease themself or had a heart attack in one of their family and those who had a friend as a source of information had a significant higher mean Knowledge score about heart attack and CPR. A significant positive correlation was found between the knowledge scores about heart attack and knowledge scores about CPR. The present study demonstrated lack of knowledge regarding important aspects related to both heart attack and CPR. This result demonstrates the importance of raising knowledge about heart attack and training the population in lifesaving action by conducting training courses and awareness campaigns.

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