

# Knowledge and attitude of young population toward CPR training, results from largest training session in an official attempt to enter Guinness Book of Records: A cross-sectional study from Saudi Arabia

Rehab M. Gaafar<sup>1</sup>, Abdulmajeed S. Khan<sup>2</sup>, Soha Elmorsy<sup>3</sup>

<sup>1</sup>Saudi Board of Community and Preventive Medicine (SBCM), Associate Consultant at King Abdullah Medical City (KAMC), Makkah City, <sup>2</sup>Saudi Board for Internal Medicine (SBIM), Medical Consultant at Heraa General Hospital, Makkah City,

<sup>3</sup>Professor of Medical Pharmacology, Faculty of Medicine, Cairo University, Research Consultant at King Abdullah Medical City, Makkah City, Saudi Arabia

## ABSTRACT

**Objective:** It has been proved that bystander cardiopulmonary resuscitation (CPR) saves lives and it is important to rise the willingness of the general population to help cardiac arrest victims. The primary objective of the present study is to assess the levels of the knowledge and attitude toward CPR among the young population who underwent the largest CPR training session in an official attempt to enter the Guinness Book of Records. **Methods:** Through a cross-sectional design, the study had 2,528 subjects, who met the inclusion and exclusion criteria during the largest CPR training session at the King Abdul-Aziz Sports City Stadium, Makkah city, Saudi Arabia. **Results:** Descriptive statistics showed that two-thirds (72%) of the subjects were in the age category of less than 20 years. At least 50% of the subjects had a Bachelor's degree. Overall, the findings of this study suggested a good level of knowledge and attitude against CPR and this is might be attributed to certain factors which are mainly the high level of education, age, and gender factors ( $P$  value  $< 0.05$ ). **Conclusion:** Our findings support the need for proper and high-quality training for each member in the community about CPR as well as using social media and online training to highlight the importance of CPR among the young population.

**Keywords:** Attitude, bystander cardiopulmonary resuscitation, cardiopulmonary resuscitation, knowledge, public

## Introduction

Cardiovascular diseases (CVDs) are the commonest cause of death globally, responsible for about 30% of the annual mortalities worldwide,<sup>[1]</sup> which means around 17.3 million deaths reported

annually that may reach up to 23.3 million by 2030.<sup>[2-3]</sup> Saudi Arabia is considered as one of the rapidly developing countries, facing an increase in the burden of noncommunicable diseases—the annual proportional mortality rate due to cardiovascular disease is 42% of all deaths related to noncommunicable diseases.<sup>[5]</sup> In medical literature, the medical term of cardiovascular diseases (CVDs) is broad and describes a range of diseases related to the heart and blood vessels. Each of these diseases has distinct pathophysiology; some of which are caused by a clog in the blood vessels, leading to ischemic heart diseases such as myocardial infarction, angina, or stroke, while some affect the heart muscle, such as congestive heart failure.<sup>[6]</sup>

**Address for correspondence:** Dr. Rehab M. Gaafar,

Saudi Board of Community and Preventive Medicine, Associate Consultant at King Abdullah Medical City (KAMC), Basic Life Support Instructor at Saudi Heart Association (SHA), Riyadh, Saudi Arabia.

E-mail: Gaafar.R@kamc.med.sa

Received: 10-07-2021

Revised: 02-10-2021

Accepted: 12-10-2021

Published: 16-02-2022

### Access this article online

#### Quick Response Code:



Website:  
www.jfmpc.com

DOI:  
10.4103/jfmpc.jfmpc\_1367\_21

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow\_reprints@wolterskluwer.com

**How to cite this article:** Gaafar RM, Khan AS, Elmorsy S. Knowledge and attitude of young population toward CPR training, results from largest training session in an official attempt to enter Guinness Book of Records: A cross-sectional study from Saudi Arabia. *J Family Med Prim Care* 2022;11:531-6.

Cardiac arrest is a major public health problem. Approximately half a million people annually suffer from out-of-hospital cardiac arrest (OHCA) in the United States and Europe and their survival rate barely exceeds 10%.<sup>[7,8]</sup> Another study from Saudi Arabia was conducted through 96 adults of out-of-hospital adult arrests and showed a high mortality rate of 95.8% with a low performed rate of CPR among the bystanders.<sup>[9]</sup> Researches indicated that immediate cardiopulmonary resuscitation (CPR) can increase the victim's chance of survival by two- to three-folds.<sup>[7]</sup>

The American Heart Association (AHA) and Emergency Cardiovascular Care (ECC) set a goal to train millions of people globally every year by educating the health care providers, caregivers, and the general public on how to respond to cardiac arrest and first-aid emergencies.<sup>[10,11]</sup> This will empower community participation and eventually increase the rate of survival among patients with OHCA. Hands-on CPR has been documented to be as valuable as conventional CPR based on a new recommendation from the AHA.<sup>[12]</sup>

However, just relying on training the general public about the basics of CPR alone is not good enough, as the public still has challenges and self-problems in applying what they have learned in real life. Concerning that, results from a nationwide online survey showed that almost a third of the participants were afraid of legal consequences and a majority believed that CPR be preferably performed by qualified medical staff only.<sup>[13]</sup> Therefore, there is a need to estimate different communities on their levels of knowledge, awareness, and attitude toward CPR and that will help to implement effective training interventions and eventually lead to a proper level of training for the general public to compensate for the presence of the medical expert who might not be available in a serious incidence.

At the level of primary health care, there is a good opportunity to launch such important public health programs for an individual patient, family, and the whole community. In this regard, the leaders are required to collaborate with representatives from relevant governmental and non-governmental organizations to focus on the identification of health promotion and education needs. In Saudi Arabia, and based on local studies, more than 50% of the public had poor knowledge and attitude toward CPR.<sup>[10,14-16]</sup> Moreover, the studies found that a majority of the patients who experienced a sudden cardiac arrest were transported directly to the hospital without CPR.<sup>[14,17]</sup> The present study aimed to maintain a good knowledge and positive attitude among the general public that might empower the health care system and save the lives of the OHCA victims.

## Methodology

### Study rationale

Moving forward toward a better life and following the vision of 2030, the public needs to set a world-class model in the global health community. One of the essential skills to meet that goal is having a qualified public who is able to perform effective life-saving CPR.

### Objective

To assess the level of knowledge and attitude toward CPR among the young population who underwent the largest CPR training session in an official attempt to enter the Guinness Book of Records.

### Study design

This study is a descriptive cross-sectional study design.

### Study setting

The study was conducted during the largest CPR training session at the King Abdul-Aziz Sports City Stadium, Makkah city, Saudi Arabia.

### Population

All participants were attending the largest training session of CPR on Wednesday morning (18-6-1441/Feb 12, 2020).

### Inclusion criteria

All male and female participants who attended the CPR training.

### Exclusion criteria

Those who refused to participate in the study.

### Sample size and sampling process

Data were collected from 2,528 participants through a convenience sampling method. The population of the current study was approached on-site and after having the CPR training through the electronic questionnaire of 10 questions.

### Questionnaire

To ensure the face and content validity, the questionnaire was revised by an expert panel of specialists in health quality, health informatics, community medicine, and health administration. It was translated into the Arabic language and tested for reliability by measuring its internal consistency. The Cronbach's alpha coefficient was 0.861, indicating excellent reliability. The questionnaire of this study was an anonymous self-administered one and consisted of two sections:

1. The first section included the demographic data of age, gender, and level of education,
2. The second section included six closed-ended questions that aimed to assess the level of knowledge and attitude against CPR training as the following:
  - Do you have previous knowledge about CPR?
  - Your current knowledge (out of the present training) from which source?
  - What is the local emergency number (call number for help)?
  - After this training, are you confident to help someone in a case of cardiac arrest?
  - Would be interested to receive more training?
3. The third section with only one question for evaluation purposes by assessing the participants' satisfaction with the training.

### Study plan and ethical consideration

This research study planned to recruit the participants who were attending the largest training session of CPR on a Wednesday morning (18-6-1441/Feb 12, 2020). Data collection had started after getting permission from the ethical and scientific committees. The questionnaire was anonymously self-administered and distributed through the Internet after getting consent from each participant before starting to participate. The participants' confidentiality was also under keen observation, and the data were kept highly confidential along the course of the research.

### Data management and statistical analysis

For the data entry and statistical analysis, SPSS 20.0 statistical software package was used. Quality control was performed at the stages of coding and data entry. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard deviations, medians, and inert-quartile range for quantitative variables. The Chi-square test was used to record the statistical significance between the participants' level of knowledge and attitude with their demographic characteristics.

## Result

### Characteristics of the study subjects

According to the study design, 2,528 participants were included in the study; two-thirds of them in the age category of less than 20 years. A majority of them had a Bachelor's degree and the recorded male to female ratio was 1:1 [Table 1].

Figure 1 indicates 70% of the participants with previous knowledge of CPR mostly from direct teaching.

Moreover, at least 50% of the participants had the confidence to do CPR and a majority of them were knowing the correct emergency number to call for help, and also, they were expressing their interest in future training [Table 2].

### Relation between the participants' knowledge and attitude of CPR and their demographic characteristics (n = 2528)

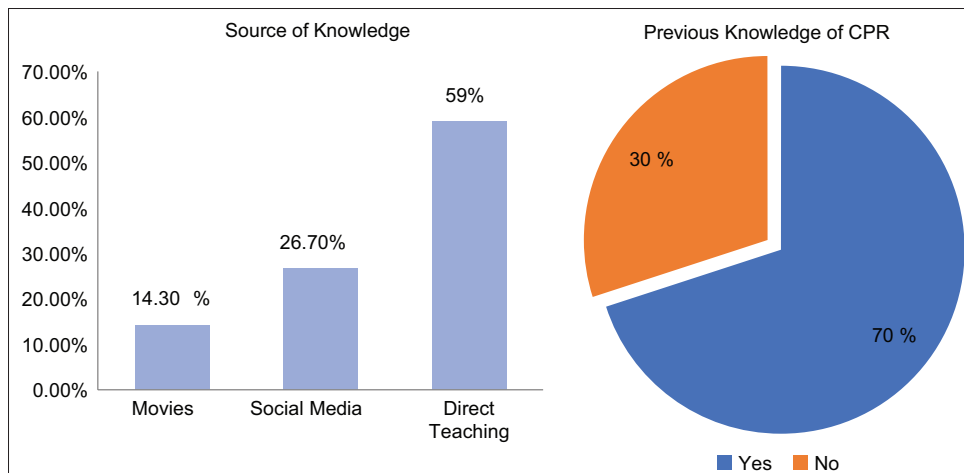
Table 2 demonstrates the association with statistical significance between the participants' knowledge and attitude of CPR and their age and gender ( $P$  value  $< 0.05$ ) that means the young (less than 20 years) and female participants had a good level of CPR knowledge and attitude compared with the participants who were male or more than 20 years old. Moreover, the result in Table 2 addressed that the young males and participants with a Bachelor's degree were aware of the correct emergency call number.

### Relation between the participants' satisfaction with CPR training and their demographic characteristics (n = 2528)

As regards the participants' satisfaction with CPR training, Table 3 indicates that the majority of them expressed very good to excellent satisfaction with the CPR training. The female participants showed a higher level of satisfaction compared with the male participants ( $P$  value  $< 0.05$ ). However, there was no statistical significance among other demographic characteristics of participants and their satisfaction with CPR training.

**Table 1: Demographic characteristics of the participants (n=2528)**

Demographic characteristics	Frequency	Percentage
Age		
Mean	19.23	
<20 years	1821	72
≥20 years	684	28
Gender of parent		
Male	1289	51
Female	1238	49
Educational level		
Preparatory school students	473	18.6
Secondary school students	589	23.2
University	1414	55.8



**Figure 1:** Assessment of the source and presence of previous knowledge about CPR among the participants (n = 2528)

**Table 2: Relation between participants' knowledge and attitude of CPR and their demographic characteristics (n=2528)**

Demographic characteristics	Answers to knowledge and attitude questions					
	Confidence		Knowledge of correct ER number		Interested in future training	
	Yes	No	Correct	Incorrect	Interested	Not interesting
Gender						
Male	1110 (44%)	158 (6%)	1077 (85.5%)	183 (14.5%)	1132 (89%)	140 (11%)
Female	1139 (45%)	108 (4%)	1016 (81.5%)	231 (18.5%)	1203 (96.5%)	43 (3.5%)
<i>P</i>	0.002*		0.01*		0.001*	
Age						
<20 year	1604 (64.3%)	207 (8.3%)	1517 (61.0%)	289 (11.6%)	1657 (66.4%)	158 (6.3%)
≥20 year	628 (25.2%)	55 (2.2%)	559 (22.5%)	122 (4.9%)	661 (26.5%)	21 (0.8%)
<i>P</i>	0.014*		0.432		0.001*	
Educational level						
Preparatory school students	402 (85.4%)	69 (14.6%)	398 (85.8%)	66 (14.2%)	413 (87.7%)	58 (12.3%)
Secondary school students	525 (89.7%)	60 (10.3%)	476 (81.4%)	109 (18.6%)	530 (90.1%)	58 (9.9%)
University	1277 (90.5%)	134 (9.5%)	1174 (83.3%)	236 (16.8%)	1344 (95.3%)	67 (4.7%)
<i>P</i>	0.002*		0.642		0.001*	

(\*) Statistically significant at  $P < 0.05$ **Table 3: Relation between participants' satisfaction with CPR training and their demographic characteristics (n=2528)**

Demographic characteristics	Participants' satisfaction with CPR training				
	Very Poor	Poor	Good	Very Good	Excellent
Gender					
Male	91 (7.9%)	61 (5.3%)	281 (24.2%)	437 (37.7%)	289 (24.9%)
Female	67 (5.5%)	76 (6.2%)	299 (24.5%)	468 (38.4%)	310 (25.4%)
<i>P</i>	0.037*				
Age					
<20 year	117 (6.9%)	97 (5.7%)	416 (24.6%)	656 (38.7%)	407 (24.0%)
≥20 year	38 (5.7%)	38 (5.7%)	157 (23.6%)	243 (36.5%)	189 (28.4%)
<i>P</i>	0.082				
Educational level					
Preparatory school students	24 (5.7%)	18 (4.3%)	119 (28.4%)	176 (42.0%)	82 (19.6%)
Secondary school students	36 (6.7%)	26 (4.9%)	104 (19.4%)	200 (37.3%)	170 (31.7%)
University	95 (6.9%)	91 (6.6%)	339 (24.6%)	512 (37.2%)	339 (24.6%)
<i>P</i>	0.506				

(\*) Statistically significant at  $P < 0.05$ 

## Discussion

CPR knowledge and skills are life-saving public health initiatives from which all members of a community benefit. The present study assessed the levels of the knowledge and attitude toward CPR among the general population who underwent the CPR training session that was registered in the Guinness Book of Records. Overall, the findings of this study suggested a good level of knowledge and attitude against CPR and this is maybe attributed to certain factors like the high level of education, age, and gender. The link between the level of knowledge and attitude of CPR among the public and the importance of bystander education level have been made in earlier works, and there is an evidence base for it.<sup>[15-17]</sup>

The participants' educational background and young age group were significantly associated with participants' knowledge and attitude of CPR in our study. The participants' education level is directly proportional to the attitude level and practice of CPR, which is consistent with some previous studies.<sup>[18,19]</sup> The higher

survival rate of the cardiac arrest victims was related to the educational background in another study.<sup>[20]</sup>

About 72% of the research sample consisted of participants with age category less than 20 years. Since the young generation has been identified as being main in the Saudi population, this might explain that more respondents were young. Moreover, the results of this study indicate the positive advantage of continuing to train the population in CPR knowledge and skills. Although a majority of the participants in the present study got CPR knowledge from direct teaching, the media can play a role in increasing the knowledge of the public.

In conclusion, the present study cited that instant and quick intervention using early CPR can be a life-saving strategy. Our findings support the need for proper and high-quality training for each member in the community about CPR as well as using social media and online training to highlight the importance of CPR.

The primary health care centers as the community resource for health services should lead such important public health programs to achieve the highest level of quality services as per the community needs.

### Limitation of the study

1. Our study was a cross-sectional design, and no assumption can be made about causal relationships between variables.
2. The Assessment of knowledge and attitude was based on questions that were precise, general, and short, and may need to be in-depth about the information and skills of CPR.

### Ethical approval

Approval date: 11-02-2020.

Approval number: H-02-K-076-0220-256.

### Authors' contributions

**Authors testify that:** All persons designated as authors qualify for authorship and have checked the article for plagiarism. If plagiarism is detected, all authors will be held equally responsible and will bear the resulting sanctions imposed by the journal thereafter.

Reh. conceived and designed the study, conducted research, provided research materials, and collected and organized data. Abdm analyzed and interpreted data. Soh wrote initial and final draft of article, and provided logistic support. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

### Key points

1. CPR is an emergency procedure that combines resuscitating a person's heart and lungs.
2. Nowadays, it has become a moral responsibility to extend a helping hand to those in need.
3. Primary health care is the community resource of health services and there is a need to launch the public health program to educate the public about the seriousness of cardiac arrest and possible help.

### Home message from this manuscript

Re-orient the primary health care center to include the preventive services and public health program side by side to the curative part.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

### References

1. Mendis S, Puska P, Norrving B. Global Atlas on Cardiovascular Disease Prevention and Control. World Health Organization; 2011.
2. Alwan A: Global status report on noncommunicable diseases 2010. In. Edited by WHO. Geneva, Switzerland: World Health Organization; 2011.
3. Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. *PLoS Med* 2006;3:e442.
4. Reddy KS, Yusuf S. Emerging epidemic of cardiovascular disease in developing countries. *Circulation* 1998;97:596-601.
5. Mathers C, Stevens G, Mascarenhas M. Global health risks: mortality and burden of disease attributable to selected major risks. World Health Organization; 2009.
6. Saudi Ministry of Health. Cardiovascular Diseases. Available from: <https://www.moh.gov.sa/en/HealthAwareness/EducationalContent/Diseases/Heartcirculatory/Pages/HealthDay-2013-9-25-001.aspx>. [Last accessed on 2019 Apr].
7. Bystander CPR Infographic. [ebook] American Heart Association. Available from: [https://ahainstructornetwork.americanheart.org/idc/groups/ahaecc-public/@wcm/@ecc/documents/downloadable/ucm\\_504227.pdf](https://ahainstructornetwork.americanheart.org/idc/groups/ahaecc-public/@wcm/@ecc/documents/downloadable/ucm_504227.pdf). [Last accessed 2021 Mar 31].
8. Benjamin EJ, Muntner P, Alonso A, Bittencourt MS, Callaway CW, Carson AP, *et al.* Heart disease and stroke statistics—2019 update: A report from the American Heart Association. *Circulation* 2019;139:e56-28.
9. Salleeh HM, Gabralla KA, Leggio WJ, Al Aseri ZA. Out-of-hospital adult cardiac arrests in a university hospital in central Saudi Arabia. *Saudi Med J* 2015;36:1071-5.
10. Al Haliq SA, Khraisat OM, Kandil MA, Al Jumaan MA, Alotaibi FM, Alsaqabi FS, *et al.* Assessment on CPR knowledge and AED availability in Saudi malls by security personnel: Public safety perspective. *J Environ Public Health* 2020;2020. doi: 10.1155/2020/7453027.
11. Neumar RW. Doubling cardiac arrest survival by 2020: Achieving the American Heart Association impact goal. *Circulation* 2016;134:2037-9.
12. Sayre MR, Berg RA, Cave DM, Page RL, Potts J, White RD. Hands-only (compression-only) cardiopulmonary resuscitation: A call to action for bystander response to adults who experience out-of-hospital sudden cardiac arrest: A science advisory for the public from the American Heart Association Emergency Cardiovascular Care Committee. *Circulation* 2008;117:2162-7.
13. American Heart Association Hands-Only CPR Research Tracking Study 03/14/17 Available from: <http://news.heart.org/wp-content/uploads/2017/04/Report-2016-HOCPR-Tracking-Study.pdf>. [Last accessed on 2021 Ma 31].
14. Al-Mohaisen MA. Knowledge and attitudes toward basic life support among health students at a Saudi women's university. *Sultan Qaboos Univ Med J* 2017;17:e59-65.
15. Al-Turki YA, Al-Fraih YS, Jalaly JB, Al-Maghlouth IA,

- Al-Rashoudi FH, Al-Otaibi AF, *et al.* Knowledge and attitudes toward cardiopulmonary resuscitation among university students in Riyadh, Saudi Arabia. *Saudi Med J* 2008;29:1306-9.
16. Almesned A, Almeman A, Alakhtar AM, AlAboudi AA, Alotaibi AZ, Al-Ghasham YA, *et al.* Basic life support knowledge of healthcare students and professionals in the Qassim University. *Int J Health Sci* 2014;8:141-50.
17. Aldhakhri AA, Gu C. Evaluation of public awareness, knowledge and attitudes toward basic life support among non-medical, adult population in Muscat City, Oman: Cross-sectional study. *medRxiv* 2020. doi: 10.1101/2020.05.16.20104323.
18. Nord A. Bystander CPR: New aspects of CPR training among students and the importance of bystander education level on survival. Linköping: Department of Medical and Health Sciences, Linköping University, 2017.
19. Li H, Shen X, Xu X, Wang Y, Chu L, Zhao J, *et al.* Bystander cardiopulmonary resuscitation training in primary and secondary school children in China and the impact of neighborhood socioeconomic status: A prospective controlled trial. *Medicine* 2018;97:e12673. doi: 10.1097/MD.00000000000012673.
20. Berger S. Survival from out-of-hospital cardiac arrest: Are we beginning to see progress? *J Am Heart Assoc* 2017;6:e007469. doi: 10.1161/JAHA.117.007469.