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Research Article

KNOWLEDGE AND ATTITUDE TOWARDS BASIC LIFE SUPPORT AMONG HEALTHCARE STUDENTS AT UMM AL-QURA UNIVERSITY IN MAKKAH: A CROSS-SECTIONAL STUDY IN 2020

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Abstract:

Background: patients requiring cardiopulmonary resuscitation are considered in a critical and life-threatening. Consequently, clinicians dealing with these patients should have a good knowledge of cardiopulmonary resuscitation, which should start before their graduation. Hence, understanding the practices and knowledge of healthcare students towards this condition is essential. our study aims to evaluate the level of knowledge and attitude of healthcare students towards basic life support in Umm Al-Qura University, Makkah, Saudi Arabia.

Method: A cross-sectional and questionnaire-based study was conducted from January to February 2020. the participates were healthcare students from seven different faculties across Umm Al-Qura University, Mekkah, Saudi Arabia. The survey included questions on student demographics, Knowledge, and attitude towards basic life support, with a score calculated to compare students. Data analysis was excuted through SPSS program version 26.

Results: hundred and twenty-three students participated in the study. 44.4% of the students were from the College of Medicine, where 22.5% were interns. 98.1% heard before about CPR previously, while 74.5% heard about EMS, and almost all the students (99.5%) had a previous BLS training. The most common source of information for 66% was lectures. As for knowledge score, the mean score was 4.5 ± 1.9 . There was a significant difference in knowledge score among different faculties (p value < 0.001), academic year (p value $= 0.002$), previous knowledge of CPR (p value $= 0.009$), previous knowledge of emergency medical service (p value < 0.001), and source of information (p value $= 0.036$)

Conclusion: The level of knowledge of healthcare students towards basic life support and cardiopulmonary resuscitation is considered average and requires improvement. Classes of CPR should be added to all health and non-health schools.

Keywords: Basic Life Support, Healthcare, students, Saudi Arabia

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INTRODUCTION:

Cardiovascular disorders are considered the leading cause of increased mortality all over the globe. [1] Cardiac arrest is a prompt condition that might occur at any age and requires urgent actions that are lifesaving and can decrease the incidence of sudden cardiac death. [2] One of the initial interventions to return victims to spontaneous circulation is through cardiopulmonary resuscitation (CPR). [3]

According to the American heart association (AHA), victims with unwitnessed cardiac arrest are at higher risk of mortality compared to witnessed cardiac arrest. [4] Unwitnessed types most commonly occur in a non-hospital setting, such as roads and homes. [5] Accordingly, AHA recommends holding campaigns and educational lectures for the public on basic life support and cardiac arrest initial identification and treatment, including CPR. [6]

Providing basic life support (BLS) as early as cardiac arrest is detected, can significantly reduce the incidence of morbidity and mortality in these patients. [7] However, to provide competent BLS care, this requires good training based on the recommendations of the AHA. [8] Hence, theoretical courses will not help with BLS training; instead, it should be replaced by hands-on training. [9]

Additionally, effective CPR requires that the CPR provider has updated information and efficient skills on BLS as well as self-confidence that the trainee can save a victim's life through what they have learned in BLS courses. These courses are usually provided by established cardiology organizations and Universities. [10,11]

Over the past decade, there have been multiple advances and updates in BLS and advanced life support (ALS) courses. [12] Though, BLS is endorsed for any member of the public, students, and, most importantly healthcare undergraduate students. [13] BLS courses also include modules on providing effective CPR in different settings. [14] Additionally, BLS is integrated into the medical curriculum in healthcare schools in many universities in the early stages of university education. [15] These courses do not only provide the students with the steps and techniques for BLS and CPR but also give them the knowledge about the importance of applying these techniques when needed and how they could save a life. [16] In addition, these courses provide information on the primary interventions to maintain an open airway and breathing. [17]

The European Society of Cardiology (ESC) also advises decision-makers and governmental bodies

to make automated electric devices available in public areas to reduce the incidence of mortality with cardiac arrest occurring in public areas. [18,19] These devices will be of no value if people from the public or at least healthcare students do not have the basic information on BLS. [20]

Consequently, an adequate level of knowledge on BLS and CPR is essential to ensure that healthcare students can provide such a lifesaving measure in case of emergency. [21] Therefore, the goal of this qualitative study is to estimate the level of knowledge and attitude of healthcare students towards BLS and CPR at Umm Al-Qura University, Makkah, Saudi Arabia.

MATERIALS AND METHODS:***Study design:***

This is a cross-sectional observational study which was carried out in the Alabdiah campus of Umm Al-Qura University, Makkah, Saudi Arabia, through face to face interview by well-trained data collectors. All participants from Medicine, Dentistry, Pharmacy, Nursing, Applied Medical Sciences, Public Health faculties, and Medical Preparatory Year of Umm Al-Qura University were included. Students from theoretical faculties were excluded.

Data collection:

The questionnaire was developed based on similar previous studies. [22,23] The answers to CPR knowledge were in accordance with the basic life support guidelines of the American heart association (AHA). [24]

The questionnaire had three sections; The first section described personal demographic characteristics. The second section assessed the awareness and attitude involved in BLS. The third section assessed the knowledge level of BLS. [25] The knowledge of participants was scored according to the number of the correct answer from question 1 to 9. Scores calculated as each question considered as one point. Total scores of the BLS knowledge was poor if the participant got a score (≤ 3), average if the participant got a score (4 - 6) and good if the participant got a score (≥ 7). [26]

Statistical analyses:

Data were described in terms of means and standard deviation for numerical variables, and frequencies and percentages for categorical variables. One-way ANOVA analysis was carried out for comparison of means among different groups. All P values < 0.05 were considered statistically significant. IBM SPSS (Statistical Package for the Social Science; IBM Corp, Armonk, NY, USA) was used to perform all

statistical calculations, version 26 for Microsoft Windows.

Ethical considerations:

The Ethical approval was obtained from Research Ethics Committee in Umm Al-Qura University, Saudi Arabia, Makkah (Identification Number: UQU-COP-EA#143716)

RESULTS:

Four hundred and twenty-three students responded to participated in this study. Only students who completed all the questions in the questionnaire

were included. Socio-demographics of participants and analysis of the questionnaire are shown below.

General Characters of responders:

Out of 423 students, 83.7% of the students were males. As for the included faculties, 44.4% of the students were from the College of Medicine, while only 0.7% were from the college of medical preparatory year. The academic year was also reported. 22.5% of the participants were interns, while 1.4% were in their first academic year, as shown in table 1.

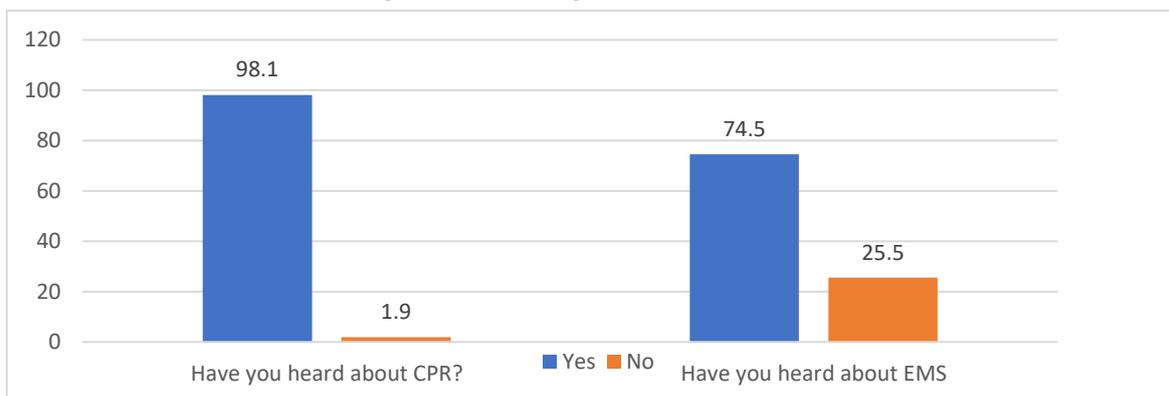
Table 1. Demographic data of responders to the questionnaire.

		Count	Percent
Gender	Male	69	16.3
	Female	354	83.7
College	College of Medicine	188	44.4
	College of Applied Medical Sciences (Laboratory, Nutrition, Physiotherapy)	123	29.1
	College of Pharmacy	39	9.2
	College of Nursing	34	8.0
	College of Dentistry	20	4.7
	College of Public Health and Health Information	16	3.8
	College of Medical Preparatory Year	3	0.7
Academic year	1st year	6	1.4
	2nd year	26	6.1
	3rd year	77	18.2
	4th year	94	22.2
	5th year	82	19.4
	6th year	43	10.2
	Intern	95	22.5

Knowledge about CPR and EMS

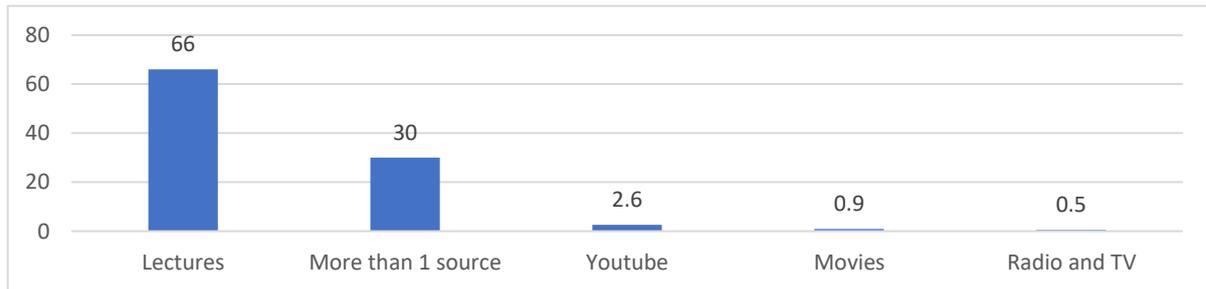
Students were asked if they had previously heard about CPR and EMS. 98.1% of the students heard before about CPR, while 74.5% have heard about EMS, as shown in figure 1.

Figure 1. Knowledge about CPR and EMS



Students were also asked about their sources of information about basic life support. The most common source of information was lectures, for 66% of students, on the other hand, only 0.5% of the students relied on radio and TV to get information on basic life support. It is worth noticing that one-third of the students (30%) used more than one source of information, as shown in figure 2.

Figure 2. Sources of information on Basic life support



Awareness and attitude towards basic life support

Students were asked a set of questions to evaluate their awareness and attitude towards basic life support. 61.7% of the responders strongly agreed that CPR classes should be given in all health and non-health faculties. Additionally, 48.9% strongly agreed that undergraduate healthcare students should have a major role in helping patients who may have sudden events. Furthermore, almost all the students (99.5%) had previous BLS training, where 31.9% of the students had their training in more than one place, as shown in table 2.

Table 2. awareness and attitude towards basic life support

		Count	Percent
I support including CPR classes in all health and non-health faculties:	Strongly agree	261	61.7
	Agree	55	13.0
	Neither agree nor disagree	26	6.1
	Disagree	15	3.5
	Strongly disagree	66	15.6
I think under graduating healthcare students should have a major role in helping patients face sudden events	Strongly agree	207	48.9
	Agree	87	20.6
	Neither agree nor disagree	42	9.9
	Disagree	27	6.4
	Strongly disagree	60	14.2
Have you had previous BLS training?	Yes	421	99.5
	No	2	0.5
Where have you had BLS training?	In college	114	27.0
	Outside college	106	25.1
	Self-learning (videos, books)	14	3.3
	Workshops	54	12.8
	More than one place	135	31.9

Attitudes towards victims requiring CPR

Students were asked how they would behave if they found a patient who requires CPR. Three quarters (75.2%) of the students mentioned that they would look for safety as a first response. However, only one quarter (26.5%) of the students have previously participated in providing CPR for a victim. The most common reason for students who did not provide CPR before was poor exposure in 25.5%, while 43.3% had more than one reason, as shown in table 3.

Table 3. Attitudes towards victims requiring CPR.

		Count	Percent
When you find someone unresponsive in the middle of the road, what should your first response be?	Give two breathings	2	0.5
	Look for safety	318	75.2
	Open airway	74	17.5
	Start chest compression	21	5.0
	I don't know the answer	8	1.9
Did you participate in providing CPR for a victim?	Yes	112	26.5
	No	311	73.5
If No, what was the cause	Poor exposure	108	25.5
	I have not faced a case that needs a CPR	52	12.3
	Lack of training	47	11.1
	Lack of confidence	29	6.9
	Lack of willing	4	0.9
	More than one reason	183	43.3

Knowledge about CPR

Students were asked about their knowledge of CPR in adults and infants. 38.5% of the students knew that mouth to mouth and nose breaths should be used to rescue infants and that the correct chest compression for neonates is 15 compression and two breaths (43.3%). 68.8% of the students knew that the best way to relieve severe choking is to give five back slaps followed by five chest thrusts. Furthermore, 40.9% of the students knew that the correct heart rate for both adults and children is 100 beats per minute.

Also, 37.4% of the students would make chest compressions of 2.5 to 3 inches in adults, and 81.8% believed that high pitch noise while inhaling, inability to speak, and poor air exchange are all signs for airway obstruction, as shown in table 4.

Table 4. Knowledge about CPR

		Count	Percent
How do you give rescue breaths to infants?	Mouth-to-mouth and nose	163	38.5
	Mouth-to-mouth with nose pinched	127	30.0
	Mouth-to-mouth without nose pinched	63	14.9
	Mouth-to-nose only	5	1.2
	I don't know the answer	65	15.4
What is the correct depth of chest compression for adults?	½ – 1 inch	10	2.4
	1 – 1½ inches	34	8.0
	1½ – 2 inches	153	36.2
	2½ – 3 inches	158	37.4
	I don't know the answer	68	16.1
What is the correct rate of chest compression for adults and children?	70 / min	41	9.7
	80 / min	38	9.0
	90 / min	81	19.1
	100 / min	173	40.9
	I don't know the answer	90	21.3
What is the correct chest compression: ventilation ratio for a neonate when there are two rescuers?	15:2	183	43.3
	3:1	10	2.4
	30:2	99	23.4
	5:1	17	4.0
	I don't know the answer	114	27.0
What does the abbreviation AED stand for?	Advanced Electrical Defibrillator	77	18.2
	Advanced External Defibrillator	9	2.1
	Automated Electrical Defibrillator	159	37.6
	Automated External Defibrillator	99	23.4
	I don't know the answer	79	18.7
Which of the following are signs of airway obstruction?	High-pitched noise while inhaling	12	2.8
	Inability to speak	24	5.7
	Poor air exchange	22	5.2
	All the above	346	81.8
	I don't know the answer	19	4.5
What is the best way to relieve severe choking in a responsive infant?	Give five back slaps, followed by five chest thrusts	291	68.8
	Perform abdominal thrusts	49	11.6
	Start CPR immediately	17	4.0
	Give two breaths, repositioning the airway after each breath	8	1.9
	I don't know the answer	58	13.7

Comparison of knowledge score over different variables

The total score was calculated as described in the methods section. The minimum score was zero while the maximum score was nine, with an average score of 4.5 ± 1.9 , which is considered an average score based on our classification. The total score was compared over different variables using one-way ANOVA at a level of significance p value < 0.05 .

There was a significant difference regarding knowledge scores among different faculties (p value < 0.001), where students in nursing college had the highest calculated score. Additionally, based on the academic year, students in the fifth and sixth academic year showed the highest scores (p value = 0.002) significantly; furthermore, students who have previously heard about CPR and about emergency medical service at p value = 0.009 and < 0.001 , respectively. Finally, students who had their information from lectures showed a significantly higher level of knowledge compared to other students (p value = 0.036), as shown in table 5.

Table 5. Comparison of the level of knowledge towards CPR over different variables.

		Mean	SD	Minimum	Maximum	P-value
Gender	Female	4.4	1.9	0	9	0.159
	Male	4.8	1.8	0	9	
College	College of Applied Medical Sciences (Laboratory, Nutrition, Physiotherapy)	4.7	1.7	1	9	<0.001*
	College of Dentistry	2.9	1.6	1	7	
	College of Medical Preparatory Year	2.0	1.7	1	4	
	College of Medicine	4.5	1.8	1	9	
	College of Nursing	4.94	2.074	0	9	
	College of Pharmacy	4.62	2.413	1	9	
	College of Public Health and Health Information	3.63	1.408	0	5	
Academic year	1st year	2.3	1.9	0	4	0.002*
	2nd year	3.7	2.2	0	9	
	3rd year	4.2	1.8	1	8	
	4th year	4.4	1.7	1	9	
	5th year	4.9	1.9	1	9	
	6th year	4.9	1.5	2	8	
	Intern	4.5	2.0	1	9	
Have you heard about CPR?	No	2.8	1.8	1	6	0.009*
	Yes	4.5	1.9	0	9	
Have you heard about emergency medical service?	No	3.9	1.7	1	9	<0.001*
	Yes	4.7	1.9	0	9	
Sources of Information	Lectures	4.5	1.8	1	9	0.036*
	Movies	4.0	2.4	1	6	
	Radio and TV	4.0	0.0	4	4	
	YouTube	4.0	2.0	1	7	

* p -value at a level of significance < 0.05

DISCUSSION:

Healthcare students should play a vital role in the prompt conditions that might occur in the community. [27] In order to achieve this role, these students have to be well prepared for it through their schools. One of the most important topics is basic life support and CPR, which is a lifesaving when needed. [28] Hence, assessment of the knowledge and behaviors of healthcare students towards BLS and CPR is critical, and continuous updating and improvement are always required. [29]

The present cross-sectional study aimed to assess the knowledge and attitude of healthcare students towards BLS and CPR. The study demonstrated that 98.1% heard before about CPR previously, while 74.5% heard about EMS, and almost all the students (99.5%) had a previous BLS training. Additionally, more than half of the students depended mainly on lectures as their source of information (66%).

As for their level of knowledge, the mean knowledge score was 4.5 ± 1.9 , which is considered an average score. There was a significant difference concerning knowledge scores among different faculties, as students in nursing college had the highest score (p value < 0.001). Also, students in the fifth and sixth academic year showed significantly the highest scores (p value = 0.002), as well as students who have previously heard about CPR and emergency medical service at p value = 0.009 and < 0.001 , respectively. The Source of information also caused a significant difference in knowledge level (p value = 0.036).

The knowledge, as well as the attitude towards BLS and CPR have been evaluated in different settings. Al-Mohaissen *et al.* [26] evaluated the knowledge and attitudes of Saudi female students in healthcare schools in Riyadh, Saudi Arabia, towards BLS. Through including 2955 student, Al-Mohaissen *et al.* [26] demonstrated that 87.9% of the students had poor knowledge about BLS, while students with previous training showed a significantly higher knowledge, yet it remains poor knowledge.

Conversely, the present study in Makkah, Saudi Arabia showed higher knowledge levels compared to those presented by Al-Mohaissen *et al.* [26] Though the average score of knowledge calculated in this study showed that the overall level of knowledge is average and requires further improvement.

In another setting, Arora *et al.* [27] evaluated the knowledge of the first-year medical students in an Indian university towards BLS through a survey analysis, which was carried out after implementing

a program on BLS for the students. Arora *et al.* [27] showed that students showed an unsatisfactory level of knowledge despite their rating for the program as excellent.

The present study demonstrated that students from medical school had the highest level of knowledge towards BLS and CPR significantly compared to other faculties (p value < 0.001); however, students in the first-year medical school showed the lowest knowledge levels significantly compared to their peers (p value = 0.002). Also, more than half of the included cohort depended mainly on lectures as their source of information.

In Oman, Aldahakhri *et al.* [28] evaluated the knowledge and attitude among the general non-medical public towards BLS in Muscat city. Through 426 responders to a survey. Aldahakhri *et al.* [28] showed that the level of knowledge of the Omani population towards BLS and CPR is very low and requires further improvement. These findings are compliant with the findings of Al-Mohaissen *et al.* [26] despite the different study settings and populations.

Back to Saudi Arabia, Alhakamy *et al.* [29] examined the knowledge and attitude of pharmacy students towards emergency medical services and BLS at King Abdulaziz University, Jeddah, Saudi Arabia. Alhakamy *et al.* [29] included 235 students in their survey study and concluded that the level of knowledge of pharmacy students was below average, where some of the students had not heard before about BLS and CPR.

On the contrary, healthcare students at Umm Al-Qura University, Mekkah, Saudi Arabia demonstrated an average level of knowledge towards BLS and CPR, yet further improvements are encouraged. Additionally, the present study included all healthcare students from seven faculties instead of including pharmacy students only.

Additionally, the present study had some limitations; the study included a small sample size, which could affect the reliability of our findings; furthermore, the study was carried out in one university in one city in Saudi Arabia, which could reduce the external validity of the outcomes. This is the first study to evaluate the level of knowledge of healthcare students at Umm Al-Qura University towards BLS and CPR.

CONCLUSION:

The level of knowledge of the included cohort representing healthcare students is considered average. This level requires improvement, which is particularly important in health-related schools.

Classes on basic life support and CPR should be implemented in all schools, not only health faculties. Furthermore, other similar studies in other areas in Saudi Arabia should be carried out in order to draw a national figure on the knowledge of students on BLS and CPR.

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