

Knowledge and Attitude of the Undergraduate Medical and Health Care Students Towards Basic Life Support in Saudi Arabia

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Abstract:

Introduction: Basic life support (BLS) is a set of essential skills that has been proven to decrease the mortality and morbidity following sudden cardiac arrest (SCA). The American Heart Association has emphasized on the importance of mastering the BLS skills for all health care providers. This study is aimed to evaluate the current level of knowledge, attitude and skills of the undergraduate medical and health care students towards BLS. **Methods:** A cross-sectional questionnaire-based study was conducted. A well-structured questionnaire was distributed among students of various healthcare-related colleges in Saudi Arabia. The questionnaire consisted of 3 major parts that evaluated different aspects of BLS skills and knowledge. **Results:** 750 undergraduate students in the fields of applied medical sciences, dentistry, medicine, nursing and pharmacy participated in the study. Only 369 (49.2%) students were BLS certified at the time of the study. Over 99% of the participants had a positive attitude towards BLS. However, up to 90% of the participants were not able to identify some of the essential skills of BLS such as how to conduct a pulse check, how to deliver rescue breaths or how to use an AED when available. Less than half of the participants had the confidence to use their knowledge and skills in real life situations. **Discussion:** The study has revealed the positive attitude towards BLS. However, there was a lack of adequate training, experience, knowledge and skills in a significant number of participating students. Frequent BLS training as well as incorporating the BLS skills in the academic curricula may improve students' BLS knowledge and skills.

Keywords: Basic Life Support, Health Care, Saudi Arabia

Introduction

Despite the advancement in preventative and resuscitative medicine, sudden cardiac arrest (SCA) still remains an extensively significant health problem and continues to be the primary cause of morbidity and mortality in both developed and developing countries⁽¹⁾. SCA can be caused by either cardiac or non-cardiac etiologies, can be witnessed or un-witnessed and can also occur inside or outside a hospital. Mortality secondary to sudden cardiac arrest can be decreased by strictly following basic life support (BLS) guidelines⁽²⁾. It has been shown that early recognition of SCA and immediate initiation of resuscitation increase the survival rates among SCA victims⁽³⁾. Basic aspects of BLS includes immediate recognition of SCA, activation of the emergency response system, early cardiopulmonary resuscitation (CPR) that includes chest compressions, and rapid use of automated external defibrillators (AED)⁽²⁾.

It is well known that survival after SCA is usually low but factors like early intervention, quality of CPR and time to defibrillation are important^(2,4). Numerous studies have shown that immediate CPR after collapse due to ventricular tachycardia (VT) and/or ventricular fibrillation (VF) doubles or even triples the chances of survival. In contrast, survival chances decrease by 7-10% for every minute of CPR administration delay⁽⁵⁾.

Therefore, the American Heart Association (AHA) recommends that every individual, regardless of their profession, have to learn the basic skills of performing CPR. Health care providers including physicians, nurses, medical and health care students are generally required to master CPR and other BLS skills⁽²⁾. Despite that, many studies showed that medical students don't have adequate training that makes them competent enough to provide BLS when needed⁽⁵⁾. Furthermore, a significant percentage of undergraduate students in medicine and other related health science programs lack the knowledge and/or the experience to perform BLS. Awareness of the BLS importance was shockingly reported in only 66.6% of medical students and its skills were present in only 18% of them in one study⁽⁶⁾.

The aim of this study is to evaluate the knowledge, attitude and skills of undergraduate medical and health care students towards BLS in various colleges in Saudi Arabia and compare that to what has been already published in the literature.

Methodology

This is a cross-sectional questionnaire-based study that was conducted in Saudi Arabia.

Study Subjects: Undergraduate medical and health care students who were actively enrolled in one of the following colleges: college of medicine, college of nursing, college of pharmacy, college of applied medical sciences and college of dentistry, in Saudi Arabia between June 2014 - July 2014.

Study Tools: The authors prepared a questionnaire that was comprised of three parts. The first part included 5 questions about general information regarding age, gender, field and level of study. The second and third parts listed a total of 19 questions to assess participants' knowledge and skills toward BLS. The language used in the questionnaire was Arabic with English translation. Four qualified physicians in internal medicine, ICU medicine, emergency medicine and anesthesiology have reviewed the questionnaire. Questions about BLS knowledge and skills were chosen based on their importance in light of the 2010 BLS guidelines. Subsequently, the questionnaire was validated by doing a pilot study on 25 randomly selected medical students. Their feedback was thoroughly examined and modifications on the questionnaire were made to ensure its readability and ease of understanding.

Data Collection: The authors circulated the questionnaire using emails and various social media platforms. The participants had the chance to have a thorough explanation about the aims and objectives of the study. Participants submitted their responses anonymously, so privacy of participants was maintained.

Data Analysis: Data were analyzed using Microsoft Excel and SPSS database (IBM SPSS Statistics, SPSS Inc., Chicago IL).

Results

750 undergraduate students in the fields of applied medical sciences, dentistry, medicine, nursing and pharmacy participated in the study. Of those, 439 (58.5%) were medical students, 109 (14.6%) were nursing students, 91 (12.1%) were applied medical students, 61 (8.1 %) were pharmacy students and 50 (6.7%) were dentistry students. Among all participants, 530 (70.7%) were female students and 220 (29.3%) were male students. Only 369 (49.2%) students were BLS certified at the time of the study. Table 1 shows participant's discipline, level of study and BLS training status.

Table 1 Participant's disciplines, level of study and BLS training status

Have you been trained in BLS?							
College/Gender	Yes		Yes Total	No		No Total	Grand Total
	Male	Female		Male	Female		
Applied Medical Sciences	13	27	40	9	42	51	91
2 nd year	1	7	8	5	17	22	30
3 rd year	0	5	5	3	9	12	17
4 th year	1	4	5	0	7	7	12
5 th year	1	1	2	0	2	2	4
6 th year	10	10	20	1	7	8	28
Dentistry	7	13	20	6	24	30	50
2 nd year	1	3	4	1	13	14	18
3 rd year	1	2	3	1	5	6	9
4 th year	1	5	6	2	5	7	13
5 th year	2	0	2	2	0	2	4
6 th year	2	3	5	0	1	1	6
Medicine	89	137	226	61	152	213	439
2 nd year	7	22	29	17	48	65	94
3 rd year	16	29	45	11	32	43	88
4 th year	3	21	24	8	26	34	58
5 th year	8	22	30	13	30	43	73
6 th year	55	43	98	12	16	28	126
Nursing	17	42	59	6	44	50	109
2 nd year	2	5	7	3	18	21	28
3 rd year	2	5	7	0	5	5	12
4 th year	3	10	13	0	8	8	21
5 th year	0	1	1	0	1	1	2
6 th year	10	21	31	3	12	15	46
Pharmacy	3	21	24	9	28	37	61
2 nd year	0	1	1	1	15	16	17
3 rd year	1	3	4	2	3	5	9
4 th year	0	7	7	0	4	4	11
5 th year	0	5	5	5	3	8	13
6 th year	2	5	7	1	3	4	11
Grand Total	129	240	369	91	290	381	750

In the second part of the questionnaire, students were asked about their perception of BLS. 746 (99.5%) students agreed about the importance of having BLS training for their career. In addition, 745 (99.3%) students thought that cardiopulmonary resuscitation can indeed save people's lives. Also, most of the students (96.3%) thought that BLS training should not be limited to health care providers. Furthermore, 742 (99%) students felt that BLS training should be integrated into their college curriculum with 733 (97.7%) students showing interest towards attending a BLS course when made available, even if previously certified. Table 2 shows all participants' responses.

Table 2 Participants attitude towards BLS

Question	Yes	No	Total
Do you think it's important to get BLS training?	746 (99.5%)	4 (0.5%)	750
Do you think that CPR can save people's lives?	745 (99.3%)	5 (0.7%)	750
Do you think getting BLS training should be limited to health care providers?	28 (3.7%)	722 (96.3%)	750
Do you think that BLS training should be incorporated into the teaching curriculum of your school?	742 (99%)	8 (1%)	750
Would you be interested in attending a BLS course if it was made available?	733 (97.7%)	17 (2.3%)	750

In the third section of the questionnaire (Table 3) students were asked about their knowledge and skills of the BLS basics. The percentage of correct answers varied from 5.3% to 84.5% for each question. When asked about the signs of cardiac arrest, only half of all students 51.5% have correctly identified the signs while 48.5% answered incorrectly. In addition, 401 (53.5%) participants did not know that calling the emergency response team is the first thing to do in case of a cardiac arrest. Likewise, 399 (53.2%) students could not identify the right location of hands for chest compression being in the center of chest. When asked about the sequence of CPR, only around half of the students (56.8%) knew that chest compressions should be started before rescue breaths.

Table 3. Participant's knowledge about BLS

	All Students			BLS Trained Students			Non-BLS Trained Students		
	Correct	Incorrect	Total	Correct	Incorrect	Total	Correct	Incorrect	Total
Which of the following would be a sign of cardiac arrest?	386 (51.5%)	364 (48.5%)	750	186 (50.4%)	183 (49.6%)	369	200 (52.5%)	181 (47.5%)	381
In case of a cardiac arrest, the first thing that needs to be done is?	349 (46.5%)	401 (53.5%)	750	215 (58.3%)	154 (41.7%)	369	134 (35.2%)	247 (64.8%)	381

Which of the following is true about pulse check?	43 (5.7%)	707 (94.3%)	750	24 (6.5%)	345 (93.5%)	369	19 (5%)	362 (95%)	381
In terms of the CPR sequence, what is true?	426 (56.8%)	324 (43.2%)	750	242 (65.6)	127 (34.4%)	369	184 (48.3%)	197 (51.7%)	381
What is true regarding rescue breathing?	40 (5.3%)	710 (94.7%)	750	24 (6.5%)	345 (93.5%)	369	16 (4.2%)	365 (95.8%)	381
What is recommended regarding chest compressions?	351 (46.8%)	399 (53.2%)	750	229 (62%)	140 (38%)	369	122 (32%)	259 (68%)	381
What is the correct sequence of action where an AED is available during cardiac arrest?	78 (10.4 %)	672 (89.6%)	750	49 (13.3%)	320 (86.7%)	369	29 (7.6%)	352 (92.4%)	381
Do you know what is the correct way to give information to the rescue team when there is an accident in front of you?	344 (45.9%)	406 (54.1%)	750	211 (57.2%)	158 (42.8%)	369	133 (35%)	248 (65%)	381
What is the right place to compress the chest for a person having cardiac arrest?	634 (84.5%)	116 (15.5%)	750	330 (89.4%)	39 (10.6%)	369	304 (79.8%)	77 (20.2%)	381
When doing rescue breathing , How would you know that the air has entered the lungs?	604 (80.5%)	146 (19.5%)	750	346 (93.8%)	23 (6.2%)	369	258 (67.7%)	123 (32.3%)	381

Astonishingly, 707 (94.3 %) students did not know that checking for pulse should not take more than 10 seconds. Similarly, 710 (94.7 %) students lacked essential information about rescue breaths. Also, 672 (89.6 %) students did not know that calling for help followed by using an AED then starting CPR is the right sequence when AED is readily available. On the other hand, majority of the students (84.5%) knew that chest compression should be done at a rate not less than 100/minute with 5 cm depth and that chest should fully recoil between compressions. Also, 80.5% of the students knew that chest rise was the right way to confirm if air has reached the lungs when doing rescue breaths. Finally, only about half of the students (n=344, 45.9 %) had enough confidence on how to give information to the rescue team.

Discussion

Basic life support (BLS) is a set of essential life-saving skills for health care workers. Despite that, many undergraduate programs don't incorporate these skills as part of their official curricula. Many studies have demonstrated that BLS skills are difficult to learn and are easily forgotten if not frequently practiced. The study was aimed to evaluate current level of knowledge, attitude and skills of undergraduate medical and health care students towards BLS.

Our study showed that almost all the students demonstrated an excellent attitude towards BLS training. They indicated that they believe that mastering BLS skills can actually save lives and that it should not be limited to health care workers. More than 95% of the students were even interested in attending a BLS training session even if previously BLS certified. Similar findings have been reported by previous studies⁽⁶⁾.

An alarming finding in our study was the paucity of knowledge and lack of required skills of BLS even among participants who had previous training. When comparing both groups, BLS trained students were able to score higher in the BLS knowledge test with a mean score of 5 (out of 10, SD= 1.5) comparing with 3.7 (SD=1.68) for the non BLS group ($p < 0.0001$, CI=1.06 to 1.52). Still, having a BLS training did not seem to significantly help students answer basic questions about BLS such as the CPR sequence, signs of cardiac arrest, awareness that calling for help is the first thing to do in case of a cardiac arrest and other vital information about chest compressions. What is more striking is that 86.7% of BLS-trained students mistakenly chose the incorrect sequence of using an available AED in case of a cardiac event, even though using an AED has been shown to improve the outcome of cardiac arrest and is considered an essential skill in BLS training. Additionally, 93.5% of BLS trained students were confused about simple yet vital information regarding pulse check. Checking pulse rate is an unnecessary step to be done by a non-healthcare provider while healthcare providers should not spend more than 10 seconds to check for a pulse. Also, 93.5% of BLS-trained students lacked essential information about rescue breaths. Multiple studies have already shown clear deficiencies in BLS knowledge and skills in medical professionals. (7-10)

Numerous studies have investigated the awareness of health professionals' knowledge and experiences of CPR. One study reported that medical and dental interns had less than 50% of the knowledge and skills required for mastering BLS⁽⁹⁾. Very interestingly, another study showed that despite realizing the importance of the BLS skills, 85% of them felt that their knowledge is significantly inadequate⁽¹¹⁾. Similarly, a study conducted in New Zealand have showed that 73% of students were completely unaware about proper CPR technique⁽¹²⁾. In comparison to this study, a US study showed that 9.1% of individuals did not perform CPR as they felt they would not be able to do it correctly⁽¹³⁾.

In conclusion, this study has revealed the positive attitude towards BLS but also highlighted the lack of adequate training, experience, knowledge and skills in a significant number of participating students. It is therefore important to train medical and undergrad healthcare students in mastering the skills of BLS at their level.

Author contributions:

Alhanouf Alhedaithy: Manuscript writing and data analysis. Ashwaq Almutairi, Asma Mohammad, Fatima Almutiri, Maysah Othman Badri and Adeebah Albogami: Data collection and analysis. Dr. Saud Aldubayan: manuscript writing and overall supervision.

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