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Assessment of Knowledge of Undergraduate Medical Students Regarding Basic Life Support at Taif City of Saudi Arabia

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Abstract

Objectives: To assess the knowledge of basic life support of medical students of 5th and 6th academic year studying at Taif Medical College, Taif, Saudi Arabia.

Background: The Basic Life Support (BLS) is the key component of health care delivery in all major trauma, accidents and sudden cardiac arrest. Although there are proper programs and trainings to educate the health care professionals about BLS, there is a paucity of data regarding the knowledge, ability and preparedness of medical students to serve as rescuers in both in-hospital and out-of-hospital cardiac emergencies. Therefore, the present study was planned to access the knowledge of the undergraduate medical students of Taif, Saudi Arabia.

Methodology: This cross-sectional study of six months duration was conducted at Taif Medical College in Taif, Saudi Arabia from March to September 2019. After taking informed written consent 196 undergraduate medical students from 5th and 6th academic year were enrolled. Previously validated questionnaire was piloted on 20 students, revised tool was used for data collection. For knowledge evaluation each correct answer was given 10 mark and wrong answer 0. Score less than 50% was categorized as poor, 51-59% fair, 60-70% good, 70-80% very good and above 80% as excellent. Data was entered and analyzed through SPSS version 21. Descriptive statistics was presented in the frequencies and percentages. The associations between scores were assessed by using the Chi-square test and p value < 0.05 was considered as significant.

Results: Of total 196 students 84 (42.9%) were male and 112 (57.1%) were Female. Mean age of respondents was 19.4 years with age range of 21-26 yrs. Awareness level on Basic Life Support was poor i.e. less than 50% in 128 (65%) study participants, while knowledge was fair in 43(21%) study participants. While only 25 (12.8%) of the participants were good participants had adequate knowledge i.e. good and above while none of them had excellent knowledge. Further male students had a better understanding of BLS but the difference was statistically insignificant. Knowledge of the BLS was poor in 70.8% of the 5th year students while knowledge was poor in 54.5% of 6th year students. Similarly, 71% did not know about the steps to be taken for managing a choking person while majority gave wrong answers to the questions related to the steps taken in the management of an unresponsive person.

Conclusion: Knowledge of medical students who are ready to enter in professional life is poor. It is the dire need to include the BLS training at early level of medical education with frequent refreshers so that medical students when enter in professional filed would have sufficient knowledge and skills to manage the emergencies.

Key Words: Basic Life Support; BLS; Compression Ventilation ratio

Introduction

Bassic Life Support (BLS generally refers to the type of care that first-responders, healthcare providers and public safety professionals provide to anyone who is experiencing cardiac arrest, respiratory distress or an obstructed airway. It requires knowledge and skills in Cardio Pulmonary Resuscitation (CPR), using Automated External Defibrillators (AED) and relieving

airway obstructions in patients of every age [1].

It is an established fact that survival of Out-of-Hospital Cardiac Arrest (OHCA) patients can be improved by reduced response times, which specifically include immediate Cardio-Pulmonary Resuscitation (CPR), early defibrillation and early advanced care.

As per the guidelines of International Liaison Committee on Resuscitation (ILCOR), in case of cardiac arrest one of the key determinants for survival is the presence of a trained rescuer who is ready, willing, and able to act [2]. Data reveals that survival and outcome in patients of (OHCA) is very poor and even the quality of immediate (CPR) and early defibrillation provided by the health care professionals is insufficient which even resulted in bad patient outcome [3].

Many studies conducted at institutional levels in different parts of the world indicate that factual knowledge regarding (BLS) in undergraduate medical students and health care professionals is very poor. For example, in a study conducted in medical students of Karachi city revealed that more than 50% of the study participants had no knowledge on BLS [4]. Similarly, another study conducted in Indian city of North Kerala revealed that over all mean score of knowledge was 45% in the medical students [5]. On the other hand, situation is not different even in developed world. A study conducted on the junior doctors of the United Kingdome also revealed that majority of them were unable to carry out effective cardiopulmonary resuscitation in spite of being trained on BLS in near future [6].

CPR and AED (Automated External defibrillator) trainings are included in the guidelines of The American Heart Association (AHA) and the International Liaison Committee on Resuscitation. These guidelines are being frequently updated. CPR and AED trainings are frequently offered in Saudi Arabia and is also the requirement of the Saudi Commission for Health Specialties to renew their certification for licensure. In spite of the fact that these trainings are now the requirement even for the renewal of the licensing of senior medical professionals, the quality of the BLS is still a question and needs to be evaluated.

Similarly very little data is available regarding the knowledge, ability and preparedness of medical students to serve as rescuers in both in-hospital and out-of-hospital cardiac emergencies. Therefore keeping in view the importance of the topic the present study was planned to access the knowledge of the undergraduate medical students of Taif Saudi Arabia.

Methodology

This cross-sectional study of six months duration was conducted at Taif Medical College in Taif, Kingdom of Saudi Arabia from March to September 2019. We study participants included 5th and 6th year Medical students. The Sample size was calculated based on the findings of another study conducted in Riyad city of Saudi Arabia [1] in which 15% of the sample had very good and excellent knowledge about BLS, while margin of error was taken as 5% and at 95% Confidence Interval minimum (CI) required sample size turned out to be 196.

In order to access the knowledge of basic life support a previously validated questionnaire was revised according to the recent guidelines of the American Heart Association (AHA) and the International Liaison Committee on Resuscitation. This revised tool was pretested and piloted on 10 male and 10 female students, followed by another revision based on experiences during piloting so as to ensure that all question are clear and relevant to the study objectives. Final revised version was then used for data collection from the study participants. The revised tool comprised of 20 questions with a breakup of 13 questions for evaluation of basic knowledge about BLS and 07 questions were to evaluate the awareness of the skills of BLS. For knowledge evaluation each correct answer was given 10 mark and wrong answer 0. Score less than 50% was categorized as poor, 51-59% fair, 60-70% good, 70-80% very good and above 80% as excellent.

The Ethical approval was obtained from the institutional biomedical research ethics committee. The purpose of this research was explained to the participant and confidently of the data was ensured. The student's participation in this study was voluntary. No written consent was sought, as there were no personal identifiers on the questionnaires. Any participant could decline to return the questionnaire. Submission of responses to the questionnaire was considered to constitute implied consent. This self-administrated questionnaire was filled by each participant in the presence of research coordinator with in 10 to 15 minutes during college hours.

Data was entered and analyzed through Statistical Package for Social Sciences (SPSS version 21.0, IBM Corporation, USA) for MS Windows. Descriptive statistics was presented in the frequencies and percentages. The associations between scores were assessed by using the Chi-square test and p value < 0.05 was considered as significant.

Results

This cross sectional study of 6 months duration was conducted at Taif Medical College, Taif Saudi Arabia. Total 196 students of 5th and 6th year of academic session were enrolled with a breakup of 130 students of 5th year and 66 students of 6th year. Eighty four (42.9%) students were male and 112 (57.1%) were female with age range of 21-26 years and average age of 39.4 years. Majority 184 (93.9%) of the students were unmarried while parents of around 179 (91.3%) students were non doctors by profession. Medicine and allied was the most preferred specialty reported by 67 (47.9%) students followed by surgical and allied preferred by 39 (27.9%) of them (Table 1).

		Number	Percentage (%)
Marital Status	Single	184	93.9%
	Married	11	5.6%
	Divorcee/Widow	1	0.5%
Academic Year	5th	130	66.3%
	6th	66	33.7%
Parents Profession	Doctors	17	8.7%
	Non-doctors	179	91.3%
Preferred Specialty	Medicine & allied	67	47.9%
	Surgery & allied	39	27.9%
	Obstetric& Gynecology	15	10.7%
	Others	19	13.6%

Table 1: Demographic variables of the study participants.

Awareness level on Basic Life Support was poor i.e. less than 50% in 128 (65%) study participants, while knowledge was fair in 43(21%) study participants. While only 25 (12.8%) of the study participants had adequate knowledge i.e. good and above while none of the participant had excellent knowledge (Table 2).

Awareness level		Frequency	Percent
Category	**Percentage**		
Poor	Less than 50%	128	65.3
Fair	51-59%	43	21.9
Good	60-69%	19	9.7
Very Good	70-79%	6	3.1
Excellent	Above 80%	Nil	0
Total	Total	196	100.0

Table 2: Awareness level of the undergraduate medical students of Taif Medical College.

In majority of the female (70.5%) and male (58.3%) students the awareness level about BLS was poor. Overall female students had comparatively lower understanding of BLS. Only 7.8% of the females as compared to the 16.7% of the male had adequate knowledge of the support (Figure 1).

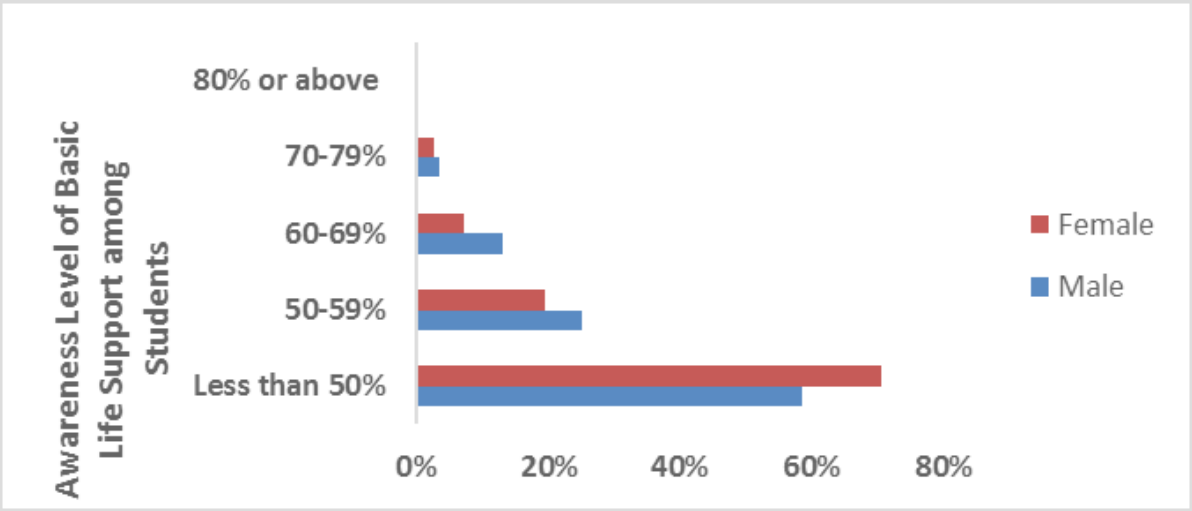

Figure 1: Gender wise distribution of awareness levels of Basic Life Support.

Knowledge of the BLS was poor (<50%) for majority (70.8%) of the 5th year , and (54.5%) 6th year students. Greater proportion of students from 5th year were falling in lower catagories of knowledge level. Only 7.7% of the 5th yr students as compared to the 22.7% of 6th year had adequate awaeness level on BLS (Figure 2).

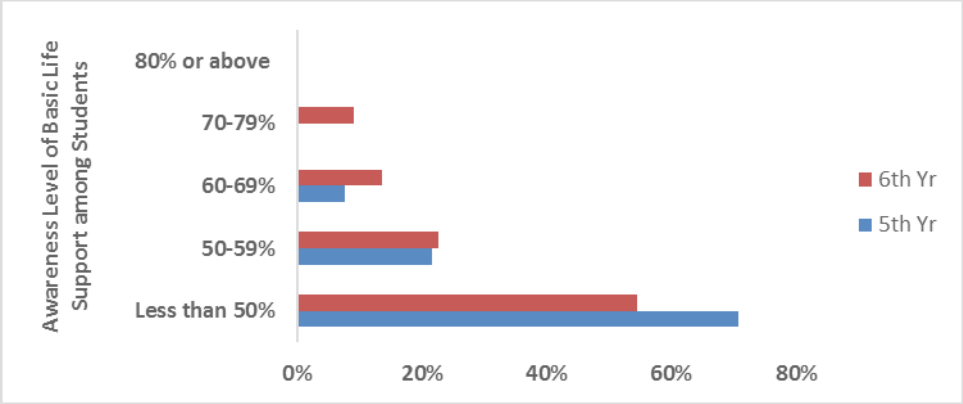

Figure 2: BLS awareness levels according to their academic years.

Maximum 154 (78.6%) students could not expand AED. A great proportion 102 (52%) & 117 (59.7%) of participants could not correctly reply to question on location for chest compression in adults and infants.

140 (71.4%) student did not know about the technique to be applied to rescue breathing in infants. Majority 170 (86.7%), 136 (69.4%), & 133 (67.9%) of the students could not properly identify the depth of compression during CPR in children, adults, & neonates respectively. 173 (91.3%) students did not know that the compression ventilation ratio in new born was 3:1.

Results on awareness levels of location of chest compression in infants, depth of compression in neonates during CPR, EMS (Emergency Medical Service) standing for were statistically significant (p-value ≤ .05) when stratified by academic year. Results on knowledge about the abbreviations of BLS & EMS, location of chest compression in adults, technique to rescue breathing in infants, depth of compression in children during CPR were statistically significant (p-value .05) after being stratified by gender (Table 3).

Questions	Correct response		P-Value	Correct response			P-Value
	Gender			Academic Year			
	Male (N=84) n (%)	Female (N=112) n (%)		5th (N=130) n (%)	6th (N=66) n (%)	Total (N=196) n (%)	
BLS stands for	81(96.4)	84(75)	<0.001	109(83.8)	56(84.8)	165(84.2)	0.856
Level of chest compression in adult	49(58.3)	45(40.2)	0.012	63(48.5)	31(47)	94(48)	0.843
Level of chest compression in infants:	30(35.7)	49(43.8)	0.256	43(33.1)	36(54.5)	79(40.3)	0.004
Other option if mouth-to-mouth CPR not possible	46(54.8)	55(49.1)	0.433	65(50)	36(54.5)	101(51.5)	0.547
Applicability of mouth-to-mouth and nasal resuscitation	16(19)	40(35.7)	0.011	38(29.2)	18(27.3)	56(28.6)	0.774
Depth of compression in adults during CPR	5(6)	21(18.8)	0.010	21(16.2)	5(7.6)	26(13.3)	0.120

Depth of compression in children	28(33.3)	32(28.6)	0.474	37(28.5)	23(34.8)	60(30.6)	0.359
Depth of compression in neonates	31(36.9)	32(28.6)	0.216	33(25.4)	30(45.5)	63(32.1)	0.004
Chest compression rate in adult & children in CPR	26(31)	38(33.9)	0.660	39(30)	25(37.9)	64(32.7)	0.266
Ratio of CPR in adult	58(69)	71(63.4)	0.409	85(65.4)	44(66.7)	129(65.8)	0.858
Chest compression & ventilation ratio in newborns	5(6)	12(10.7)	0.309	8(6.2)	9(13.6)	17(8.7)	0.079
Automated External Defibrillator	16(19)	26(23.2)	0.300	27(20.8)	15(22.7)	42(21.4)	0.752
Emergency Medical Service(EMS)	63(75)	69(61.6)	0.048	81(62.3)	51(77.3)	132(67.3)	0.035

Table 3: Current state of knowledge regarding Basic Life Support among study participants.

Most 132 (67.3%) of our students had poor awareness level regarding immediate action of activating EMS in case of an unresponsive person. 139 (70.9%) of them did not know about the first response to a choking person. Questions on the steps taken to help an unresponsive person with shallow breathing, a stroke case and an MI case was wrongly answered by 148(75.5%), 104(53.1%), 61 (31.1%) students respectively. Awareness levels about step to help a freshly rescued drowning person (unresponsive person with shallow breathing), & an acute cardiac disease patient were statistically significant (p-value ≤ .05) when stratified both by academic year & gender (Table 4).

Question	Gender		P-Value	Academic Year			P-Value
	Male (N=84) n (%)	Female (N=112) n (%)		5th (N=130) n (%)	6th (N=66) n (%)	Total (N=196) n (%)	
1st response towards non- responsive person on road	54(64.3)	71(63.4)	0.898	82(63.1)	43(65.2)	125(63.8)	0.775
Reaction at non-response and Activating EMS	22(26.2)	42(37.5)	0.095	42(32.3)	22(33.3)	64(32.7)	0.885
1st response on choking	26(31)	31(27.7)	0.617	33(25.4)	24(36.4)	57(29.1)	0.110
Response towards chocking infant (unable to cry/ cough)	50(59.5)	51(45.5)	0.052	61(46.9)	40(60.6)	101(51.5)	0.070
Immediate action for drowning rescue	29(34.5)	19(17)	0.005	24(18.5)	24(36.4)	48(24.5)	0.006
Response towards EMS-Thrombolysis	52(61.9)	40(35.7)	<0.001	59(45.4)	33(50)	92(46.9)	0.541
Response towards retrosternal chest discomfort, profuse sweating & vomiting in older person	66(78.6)	69(61.6)	0.011	79(60.8)	56(84.8)	135(68.9)	0.001

Table 4: Academic year and gender wise correct response regarding awareness of skills of Basic Life Support (BLS) among study participants.

Most 132 (67.3%) of our students had poor awareness level regarding immediate action of activating EMS in case of an unresponsive person. 139 (70.9%) of them did not know about the first response to a choking person. Questions on the steps taken to help an unresponsive person with shallow breathing, a stroke case and an MI case was wrongly answered by 148(75.5%), 104(53.1%), 61 (31.1%) students respectively.

Awareness levels about step to help a freshly rescued drowning person (unresponsive person with shallow breathing), & an acute cardiac disease patient were statistically significant (p-value ≤ .05) when stratified both by academic year & gender (Table 4).

Discussion

Health emergencies are common in Saudi Arabia due high rate road traffic accidents and sudden cardiac deaths. The Basic life support is the key component of health care deliver in all major trauma, accidents and sudden cardiac arrest. Awareness about the BLS is essential for all health staff. Proper programs and hands on trainings of the health staff for an early response in a safe timely effective manner is crucial to save lives in during accident and emergency situation [7]. In this study the level of knowledge on BLS was below average in majority 128 (65.3%) of the study participants with only a small proportion 25(11.9%) of them having adequate knowledge Studies on awareness of health care staff regarding BLS conducted in other parts of KSA have produced similar results [7,8].

Our study participants had sufficient knowledge about the BLS, EMS, first response in BLS i.e. safety, ratio of CPR in adult and early signs of myocardial infarction. However, a large proportion was unaware about AED, immediate action of activating EMS for an unresponsive person, proper location for chest compression in adults and infants. Knowledge about the exact location, rate, and depth of compressions is critical in BLS because compression at the proper site helps in sufficient blood supply to keep brain perfusion [9]. However, in our study majority of the participants could not identify the depth of compression properly in children (87%), adults (69%), and neonates (68%) which is alarming. The findings of our study consistent to previous report from Saudi Arabia where only 28% of the participants correctly answered about chest compression site [7]. Similarly studies from other countries also identified similar gaps in knowledge of health care providers about the chest compression [10].

A large proportion (91.3%) of the study participants was unaware about the compression ventilation ratio in newborn. Similarly, 71% did not know about the steps to be taken for managing a choking person while majority gave wrong answers to the questions related to the steps taken in the management of an unresponsive person. These findings are inconsistent to the previous report from Saudi Arabia where 83% participants had sufficient knowledge [7].This difference of the knowledge in managing a choked person could be because of the fact that participants in our study were medical students while in previous they were working health professional. It is pertinent to mention that a reasonable proportion (64%) of students correctly reported first response in BLS i.e. safety. Similarly, 66% of them knew the ratio of CPR in adult i.e. 30:2 and also about the methods of removing foreign substance from an infant.

Myocardial infraction is one of key cause of fatal emergencies.[10]In our study about 69% participants could easily identify the early signs of myocardial infarction. These findings are encouraging and indicate that proper trainings and inclusion of BSL in curriculum in the earlier years of medical education might help in improving the knowledge, attitude and practices of BLS in medical students. Though there was no major difference of BLS awarness levels among male and female students, however, male students had a better understanding of BLS with 25% ,13%, 3.6% falling in the levels between 50-59%, 60-69%,& 70-79% respectively. These findings are contrary to the previous report where comparison of knowledge between male and female participants did not reveal any significant difference [7].

Conclusions

Time to safe life during emergencies especially due to cardiac arrest is very important. Knowledge of medical students who are ready to enter in professional life is poor. Time to safe life during emergencies especially due to cardiac arrest is very important. It has been reported that survival rates decreased 7-10% after every minute if there is no resuscitation while it can be increased up to 75% if the CPR and defibrillation processes are completed within 03 to 05 minutes [11-13]. Hence the poor level of awareness of students about BLS can have serious consequences in terms of handling an accidents and emergencies.

Recommendations

Health care providers should have sufficient knowledge about BLS. There is a need to include the BLS training at early level of medical education in Saudi Arabia so that the medical students could also have sufficient knowledge to manage the emergencies. Besides this, the general public may also be educated about BLS as the role of a bystander is also important in early management of out of hospital emergencies.

Competing interests

The author has no competing interests.

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