A knowledge about basic life support (BLS) among health care workers in Dhamar, Yemen: A cross-sectional study.

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Abstract

Objectives: Appropriate BLS is crucial for outcomes of sudden cardiac arrest and traumatic cases. This study aimed at evaluating the knowledge of BLS among health care workers in the Dhamar governorate, Yemen.

Subjects and methods: A 7-month multi-center cross-sectional study was conducted and included 149 health care workers. Data were collected through a questionnaire, which is according to current American Heart Association (AHA)/European Resuscitation Council (ERC) guidelines of 2015. This self-explanatory questionnaire of 24 questions was designed to assess and compare the knowledge of BLS by the participants and consisted of two main domains: demography (composed of 4 questions) and knowledge of BLS (composed of 20 questions). Comparisons of the characteristics of demographic domains- gender, qualification, and previous training in BLS - in terms of the mean score of knowledge were considered, and statistically tested by independent-samples t-tests post-Leven's tests.

Results: Of the 149 respondents, 97 (65%) had a BLS knowledge score of at least 50% mark, corresponding to adequate knowledge about BLS, and 52 (35%) had a BLS knowledge score of less than 50% mark, corresponding to inadequate knowledge about BLS. The total mean score of BLS knowledge was 53.12 in the setting of a range of 0 - 100 with a standard deviation of 15.58. Statistically, the mean score among males and female participants was found to be non-significantly different, as was the mean score among participants who had ever had previous training in BLS and those who had never had any previous training in BLS. On the other hand, the mean score in participants who belong to the medicine field was significantly slightly higher than that in participants who belong to the nursing field.

Conclusion: Prevalence of programmed BLS courses was low among health care workers. Moreover, there was no association between such courses and adequate knowledge about BLS. Therefore, a high-quality strict accreditation program of BLS to the undergraduate curriculum and structured training of BLS for health care workers, along with regular reassessments along the career of the health professionals is recommended.

Keywords: Basic life support (BLS), Knowledge, Health care workers, Dhamar.

Introduction

Cardiac arrest is a life-threatening event that accounts for 15% of the global mortality and is more common in individuals with a preexisting cardiovascular condition [1,2]. With respect to acute coronary syndrome in Yemen, the overall in-hospital mortality was 8.6%, which was higher compared with the overall mortality in Gulf, which was 4.6% [3]. The emergency management of cardiac arrest involves a series of simple maneuvers, known as basic life support (BLS) [4]. These maneuvers include recognizing the signs of sudden cardiac arrest, heart attack, stroke and foreign-body airway obstruction, cardiopulmonary resuscitation (CPR), and defibrillation with an automated external defibrillator (AED) [5,6]. The simple skills a trained BLS provider should have can reduce the high mortality rate associated with cardiac arrest in patients with cardiovascular disease [7]. Cardiac arrest is an important acute emergency both within and outside the hospital set-ups and carries a high level of mortality risk. However, if early Basic life support (BLS)

cardiopulmonary resuscitation (CPR) is initiated; the survival rate can be substantially improved [8]. Up to 25% of out-of-hospital sudden cardiac arrests occur in individuals who were asymptomatic before the event [9]. Without treatment, the cardiac arrest survival rate declines by 5.5% per minute [10]. Globally, about 92% out-of-hospital cardiac arrest subjects lose their lives due to limited availability of CPR facilities [11]. Several studies have assessed the awareness, attitude, and knowledge of BLS among health care professionals in different countries. However, similar data in Yemen are lacking. Therefore, we conducted this cross-sectional study among health care workers to assess knowledge of BLS in Yemen.

Materials and Method

Study area and participants

The study of knowledge of BLS was performed in Dhamar governorate. The study was applied for total (149) graduated health care professionals, including graduated doctors and nurses. The study was performed during the period from May 2019 to Nov 2019 with graduated health care professionals who work at Dhamar city.

Study design

This was a cross-sectional study conducted in Dhamar, governerate, Yemen. Health care workers who wrought at various hospitals participated in the study.

Statistical methods

Data were analyzed using the statistical package for social science (SPSS), version 21, windows 10 system. Continuous variables (age and knowledge of BLS) and descriptive ones (faculty, gender and previous training in BLS) were presented as mean and standard deviation and frequency and percentage, respectively. Data were collected through a questionnaire, which is according to the current AHA/ERC guidelines of 2015. A self-explanatory questionnaire of 24 questions was designed to assess and compare the knowledge of BLS by the participants and consisted of two main domains: demography (composed of 4 questions) and knowledge of BLS (composed of 20 questions). A score range of 0-100 were set for knowledge of BLS, with scores of 5 and 0 were set for correct and incorrect answers to each question, respectively. Confidence intervals for the mean score of knowledge of BLS were calculated. In the setting of: confidence level of 95%, margin of error of 8%, population variance of 100 (for mean score of BLS knowledge), power of 80%, and hypothesis of no difference; the minimal required sample size would be 149. Comparisons of the characteristics of demographic domains, gender, faculty, and previous training in BLS - in terms of the mean score of knowledge were considered and statistically tested by independent samples to test post-Leven's test.

Results

Out of 200 subjects, 149 filled the questionnaire with a response rate of (83.7%). All of the 149 responses received were complete, so no responses were excluded from the study. Finally, 149 complete responses were selected for the final statistical analysis. The distribution of participants according to age, gender, education, and previous training in BLS is shown in detail in Table 1.

Of the 149 respondents; 94 (63%) were males; 55 (37%) were females; 93 (62.146%) were belonging to the nursing field, 56 (37.58%) were belonging to the medicine field; 102(70%) were not previously trained in BLS; and 47 (30%) were previously trained in BLS. Table 2 displays the distribution of adequate and inadequate BLS knowledge proportions. In total; of the 149 respondents, 97 (65%) had BLS knowledge score of at least 50% marks, corresponding to adequate knowledge about BLS and 52 (35%) had BLS knowledge scores of less than 50% marks, corresponding to inadequate knowledge about BLS. No respondent achieved BLS knowledge score of the full mark. As shown in Table 3, a majority of participants answered BLS-assessed questions except for question 3, question 8, and questions related to CPR in neonates, infants, and children. Tables 4-6 display a comparison of males and females, comparison of different education states, and the comparison of participants previously trained and participants not previously trained in BLS, respectively, in terms of the mean score of BLS knowledge. The total mean scores of BLS knowledge were 53.12 in the setting of a range of 0-100 with a standard deviation of 15.58. Statistically, the mean score among male and females participants was found to be no significantly different, so was the mean score among participants who had ever had previous training in BLS and those who had never had any previous training in BLS. On the other hand, the mean score in participants who belong to the medicine field was significantly slightly higher than that in participants who belong to the nursing field.

Table 1. *Demographic distribution.*

Characteristic	Mean +-Sd	Frequency	Percentage (%)
Gender			
Male		94	63
Female		55	37
Faculty			
Medicine		56	37.58
Nursing		93	62.416
Previous training inBLS			
Yes		47	30
No		102	70

Table 2. *Distribution of knowledge of BLS.*

Adequate knowledge of BLS.			Inadequate knowledge of BLS.		
Frequency	**Proportion (%)**	**Confidence interval**	**Frequency**	**Proportion (%)**	**Confidence interval**
97	65	57.35 - 72.65	52	35	27.35 - 42.6

Table 3. *Responses to BLS knowledge questions.*

N	Question	Correct answer	Frequency (%)
1	What is the abbreviation of BLS?	Basic life support	120 (81)
2	When you find someone unresponsive in the middle of the road, what will be your first response? (Note: You are alone there)	Look for safety	88 (59)
3	If you confirmed somebody is not responding to you even after shaking andshouting at him, what will be your immediate action?	Activate EMS	72 (48)
4	What is the location for chest compression?	Middle of the chest	104 (70)
5	What is the location for chest compression in infants?	One finger breadth below the nipple line	66 (44)
6	If you do not want to give mouth-to-mouth CPR, the following can be done EXCEPT	No CPR	90 (60)
7	How do you give rescue breathing in infants?	Mouth-to-mouth and nose	82 (55)
8	Depth of compression in adults during CPR?	1-1.5 inches	56 (38)
9	Depth of compression in children during CPR?	One-half to one-third	19 (13)
		depth of chest	
10	Depth of compression in neonates during CPR?	1.5 -2 inches	31 (21)
11	Rate of chest compression in adults and children during CPR is	100/min	73 (49)
12	Ratio of CPR, single rescuer in adult is	30:02:00	116 (78)
13	In a newborn, the chest compression and ventilation ratio is	3:01	22 (15)
14	What does abbreviation AED stand for?	Automated external	92 (62)
		defibrillator	
15	What does abbreviation EMS stand for?	Emergency medical	94 (63)
		services	
16	If you and your friend are having food in acanteen and suddenly your friend started expressing symptoms of choking, what will be your first	Give abdominal thrusts	75 (50)
	response?		
17	You are witnessing an infant who suddenly started choking while he was playing with the toy, you have confirmedthat he is unable to cry (or) cough, what will be your first response?	Back blows and chest compression of five cycles each then open the mouth and remove foreign body when it is seen	105 (70)
19	You noticed that your colleague has suddenly developed slurring of speech and weakness of right upper limb. Whichone of the following can be done?	Possibly stroke, he may require thrombolysis and hence activate emergency medical	91 (61)
		Services	
20	A 50-year-old gentelman with retrosternal chest discomfort, profuse sweating and vomiting. What is next?	Probably myocardial infarction, hence activate EMS, give aspirin tablet and	124 (83)
		allow him to rest	

Table 4. *Distribution of mean knowledge of BLS among male and female participants.*

	Male (n=94)		Female (n=55)		
Scores	**Mean**	**SD**	**Mean**	**SD**	**P-value***
Knowledge score	51.33	13.141	55.36	15.953	0.097 NS
* P-value by independent samples t test, post Levene's test for equality of variances. NS statistically non-significant.					

Table 5. *Distribution of mean knowledge of BLS among nursing and medicine.*

	Nursing (n=93)		Medicine (n=56)		
	Mean	**SD**	**Mean**	**SD**	**P-value***
Knowledge score	51.02	14.114	55.8	14.295	0.048**
* P-value by independent samples t test, post Levene's test for equality of variances. ** P-value<0.05 statistically significant.					

Table 6. *Distribution of mean knowledge of BLS among previously trained and non-trainedparticipants.*

	Previously trained in BLS (n=47)		Not previously trained in BLS (n=102)		
	Mean	**Sd**	**Mean**	**SD**	**P-value***
Knowledge score	55.32	13.039	52.11	16.582	0.204 NS
* P-value by independent samples t test, post Levene's test for equality of variances. NS statistically non-significant.					

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Discussion

In our study, the majority of participants had adequate knowledge of BLS and adequate knowledge about BLS, and the mean score about knowledge of BLS was accepted (mean score = 53.12 ±15.58). These findings are comparable to a study conducted in KSA by Shahabe. A Saquib et al. in which the mean score about knowledge of BLS was 4.02 ± 1.56 with a score range of 0-7. In contrast, the participants in studies from Pakistan [12] and India [13], had inadequate BLS knowledge percentages of 58.3% and 84.8%, respectively.

Comparison of knowledge of BLS between the male and female participants in the present study and previous literature, revealed no significance difference. Our study found that extremely adequate BLS knowledge of very good or higher score was not reached at all; similarly, just less than 2% and 4% of the participants of studies conducted in Pakistan [12] and Kerala [14] respectively were able to exceed BLS knowledge score of 80%. In the present study, medical participants had significantly high knowledge of BLS in comparison with nurses. This is been corroborated by previous literature [12], in which the mean knowledge of doctors and nurses were 53.5+_14.2 and 38.4+_15, respectively. Our study showed that there was no significant difference of BLS between participants who had ever had previous training in BLS and those who had never had any previous training in BLS, as opposed to the literature [16-18]. Inappropriate training of BLS and or lack of retention of knowledge about BLS was the possible reason for the absence of association. Finally, multiple factors lie behind the disappointed inadequate knowledge about BLS in our survey. Nevertheless, factors which restrict health care professionals from receiving regular BLS training are compelling [12]. Hectic residency schedules and scarcity of resources act as a major barrier [12]. Lack of passion to learn resuscitation during internship and residency training, limited number of BLS programs being offered, lack of assessment tools following a training course, decreased encounter with relevant patients, difficulty in retaining the knowledge and increasing number knowledge of BLS [12]. A study demonstrated that cardiopulmonary arrest can occur in some of the emergency cases in dental practice if they are not managed properly [19]. Starc et al. demonstrated how first year medical students had satisfactory BLS skills when assessed shortly after a course, thereby allowing the deduction that the more recent training greater the skillfulness [20]. This calls for refresher training courses in addition to the mandatory BLS course taken around graduation, to allow for persistent expertise in the skill. This is the case in our country where post-graduation career lacks any of such comprehensive courses which can refresh BLS skills [12]. Therefore, knowledge of BLS in these health professionals is important. BLS training should be made compulsory and must be included in the curriculum of all undergraduate and post-graduate training schools [21], as appropriate training of BLS improves survival rates and following resuscitation of cardiac arrest patients [22] and such courses with hands-on practice are essential for the betterment of CPR outcomes [12]. It has been shown in many studies that knowledge and skills of CPR performance decrease following 6 months after training [23,24], however the performance ameliorates when nurses are retrained in the same [25,26]. While adequate knowledge of CPR has been correlated with better performance, some studies have found that correct execution may be more dependent on regular practice through motor skills than on retention [12].

Conclusion

Although our study found that knowledge of basic life support among graduated health care workers at various hospitals of in Dhamar governerate was accepted, previous training in BLS was poor. A possible previous self-study educational material of BLS may behind the accepted knowledge of BLS among the participants in the present study. Accordingly, we recommend a strict accreditation program of BLS to the undergraduate curriculum and structured training of BLS for health care workers, along with regular reassessments along the career of health professionals.

Conflict of Interest

There are no conflicts of interest.

Consent of Ethics

The protocol of this study was approved by Thamar University Medical Ethics Committee (TUMEC-19030), Dhamar, Yemen. A clear description about the aim of the study and the nature of participation was provided to the participants who were informed that their participation were voluntary. Informed verbal consent was taken from each participant.

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