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http://jept.ir
doi 10.34172/jept.2021.02

Journal of Emergency Practice and Trauma
Volume 7, Issue 2, 2021, p. 106-110

Original Article

Exploring nurses' knowledge of basic life support guideline of American Heart Association: a local study

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Received: 10 February 2021
Accepted: 1 May 2021
Published online: 16 May 2021

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Competing interests: None.

Funding information: None.

Citation: Asadi P, Zia Ziabari SM, Monsef-Kasmaei V. Exploring nurses' knowledge of basic life support guideline of American Heart Association: a local study. Journal of Emergency Practice and Trauma 2021; 7(2): 106-110. doi: 10.34172/jept.2021.02.

Abstract

Objective: Awareness of the changes concerning the clinical guidelines for cardiopulmonary resuscitation (CPR) is essential for nurses. This study aimed at assessing the nurses' knowledge of the 2015 American Heart Association basic life support guideline algorithm.

Methods: In a cross-sectional study, the knowledge of 183 nurses working in emergency departments, intensive care unit (ICU) and coronary care unit (CCU) regarding the 2015 American Heart Association basic life support guideline algorithm was investigated. Data were collected by a 20-item questionnaire regarding the knowledge needed for resuscitation operations as well as the identification of the early stages of cardiac arrest. Nurses with a score of 10 and less were put in the poor group, 11-15 in the fair group, and score of more than 15 in the good group.

Results: Results showed that the highest percentage of the right answer was observed in questions 20 (98.4%), 11 (93.4%), and 1 (88%), while the lowest percentage of the correct answer was found in questions 13 (30.6%), 2 (31.1%), and 3 (32.8%). Mean ± SD of knowledge score was 12.3±2.2. A statistically significant difference was observed between knowledge of ICU nurses with an experience of basic life support educational course and those with no experience of such education. The knowledge score of educated and non-educated nurses was 11.5±2.2 and 13.2±2.5, respectively.

Conclusion: This study indicated that ICU nurses do not have enough knowledge about basic life support of the 2015 American Heart Association guideline. Development of knowledge is one of the important components of professional expansion in nursing education programs.

Keywords: Knowledge, Nurse, Basic Cardiac Life Support

Introduction

Sudden cardiac arrest is a remarkable cause of death in many parts of the world, notwithstanding the significant developments in medical equipment (1). Sudden cardiac arrest is a medical emergency leading to cardiac death if not immediately treated. In fact, a quick and appropriate medical measure can lead to the survival of the patient (2). Cardiopulmonary resuscitation (CPR) has been emphasized in several studies in different countries which can reduce mortality by up to 50% (3).

Nurses are generally the first responders to a heart disorder in hospitals, and the first actions are taken by them (4,5). Therefore, they must first conduct basic life support (BLS) without losing time. In recent years, nursing education has focused on theoretical education, and a profound gap has been developed between theoretical and clinical education. Many nursing researchers reported that nursing students did not have enough skills in clinical settings despite having the right theoretical knowledge (6). The educational needs of nurses should be determined and evaluated on a regular basis in order to continue the assessment and effectiveness of the training (7). Dal and Sarpkaya in a study on evaluation of the effects of CPR education found that nursing students forgot the theoretical concepts of CPR and applied programs after several months (8). Consequently, nurses must be involved in BLS educational programs, and these programs should be updated at regular intervals with new guidelines. This study aimed at investigating the knowledge of the emergency, intensive care unit (ICU) and coronary care unit (CCU) nurses of Rasht teaching hospitals concerning the 2015 AHA BLS guideline algorithm.

Methods

In this cross-sectional study, we investigated the knowledge of 183 nurses working in emergency departments, ICU, and CCU of Rasht teaching hospitals concerning the 2015 American Heart Association BLS guideline algorithm in 2016. The census sampling method was used. Data were collected by a two-part questionnaire. The content

validity ratio (CVR) and content validity index (CVI) of the questionnaire were assessed by using the opinions of 10 experts. The CVR of all questions was greater than 0.62. Also, CVI was examined in three dimensions of relevance, simplicity and clarity. The lowest CVI was 0.7 and the highest was 1. Questions with a CVI ranging from 0.7 to 0.8 were partially reviewed, and other questions were high as CVI remained unchanged. Finally the CVI of all questions were more than 0.8. The first part of the questionnaire included demographic information such as age, sex, education level, job experience, BLS algorithm training, and workplace. The second part encompassed 20 multiple-choice questions regarding the knowledge needed for resuscitation operations as well as the identification of the early stages of cardiac arrest. The questionnaire was distributed among participants by one of the members of our research team. Each question had only one correct answer. The correct answer was assigned score 1 and the wrong answer did not get a score. Therefore, nurses' knowledge was assessed based on the score between 1 and 20. The nurses with a score of 10 or less were put in the poor group, nurses with 11-15 in the fair group, and nurses with a score more than 15 in the good group. Incomplete questionnaires were excluded from the study. Finally, the collected data were entered into SPSS software version 21. Data were analyzed using Mann-Whitney, Kruskal-Wallis, and Spearman correlation coefficient tests (P value <0.05 was considered significant).

Results

The present study included mostly women working in the emergency department. Mean and standard deviation of age were 31±5 years (min 22 and max 46 years). The highest frequency was recorded for those with a bachelor's degree and a mean job experience of 6.49 years. Most participants in the study had an experience of learning the BLS algorithm and were averagely trained (1.5±2.1) (Table 1).

Results of this study showed that most nurses were in the intermediate level of knowledge, and individuals with low and high knowledge were in the next ranks.

Table 2 depicts that the highest percentage of the right answer was observed in questions 20 (98.4%), 11 (93.4%) and 1 (88%), while the lowest percentage of the correct answer was seen in questions 13 (30.6%), 2 (31.1%), and 3 (32.8%). The mean and standard deviation of the knowledge score was 12.3±2.2. The lowest and highest scores were 7 and 17, respectively (Table 2).

The statistical tests of Mann-Whitney, Kruskal-Wallis, and Spearman correlation coefficient showed no statistically significant difference between the knowledge score and demographic variables in the present study (P>0.05).

On the other hand, Table 3 shows a statistically significant difference between the knowledge of ICU nurses with an experience of BLS educational course and those with no experience of such education. The knowledge score of educated and non-educated nurses was 11.5±2.2 and 13.2±2.5, respectively.

Discussion

The results of our study showed that most nurses were in the intermediate fair level of knowledge. According to the 2015 American Heart Association BLS guideline in both hospital and pre-hospital phases, chain of survival of cardiac arrest in adults, prompt diagnosis of cardiac arrest, rapid activation of emergency medical services, faster CPR and defibrillation as soon as possible are used for improving the survival chance (9). Theoretical knowledge and practical skills of BLS are important determinants of successful CPR technique. BLS techniques are very easy and even ordinary people should be aware of them. Due to the benefits of CPR, advanced countries have implemented its education even for high school students since some decades ago (10).

BLS educational programs should be inevitably conducted for nurses in hospitals and the effectiveness of these programs needs to be properly monitored. It is critically important for nurses to know the latest update of medical guidelines and have the suitable practical skills along with the theoretical knowledge.

AHA only issues a BLS card for people with a written test score of ≥84%. In the current study, we considered the score ≥80 as a high score. According to this formula, only 6% of the people had the acceptable information, and the majority of participants had moderate information. The most common wrong answers were given to questions about the exact location of massage in adults and the

Table 1. Demographic Characteristics of the Studied Samples

		Number	Percent
Sex	Woman	164	89.6
	Man	19	10.4
Age group (y)	< 25	32	17.5
	25-30	72	39.3
	30-35	44	24.0
	> 35	35	19.1
Education	Bachelor's degree	174	95.1
	Master's degree	9	4.9
Job experience (y)	< 2	37	20.2
	2-5	56	30.6
	5-10	56	30.6
	> 10	34	18.6
BLS algorithm education experience	Yes	97	53.0
	No	86	47.0
Workplace	Emergency department	106	57.9
	ICU	58	31.7
	CCU	19	10.4

Table 2. Knowledge of nurses about the 2015 AHA BLS algorithm guideline in Rasht teaching hospitals

	Incorrect		Correct	
	No.	%	No.	%
A 50-year-old man has suffered from a retrosternal chest discomfort, severe sweating, and vomiting. What is the next step?	3	1.6	180	98.4
What is the speed of chest massage in adults and children during CPR?	12	6.6	171	93.4
What does BLS stand for?	22	12	161	88
How deep is the chest compression in adults during CPR?	30	16.4	153	83.6
What is the ratio of CPR in adults when the rescuer is alone?	42	23	141	77
A baby has suddenly suffered from a choking. You make sure he/she is not able to cry or cough. What is your first reaction?	42	23	141	77
How do you do life-saving breathing in newborns?	49	26.8	134	73.2
If you do not want to have mouth-to-mouth CPR, all of the following can be done except:	51	27.9	132	72.1
How deep is the chest compression in children during CPR?	59	32.2	124	67.8
Your colleague has suddenly suffered from an interrupted speech and a weak right upper extremity. Which of the following could happen?	68	37.2	115	62.8
What does AED stand for?	74	40.4	109	59.6
What does EMS stand for?	87	47.5	96	52.5
Where is the chest compression in adults?	90	49.2	93	50.8
Where is the chest compression in newborns?	95	51.9	88	48.1
What will be your first reaction if you and your friend are eating food in a diner and suddenly there are signs of choking in your friend?	100	54.6	83	45.4
An adult has been immersed in freshwater with no response and has left it. He has breathing on his own, but without a response. What is the first step?	101	55.2	82	44.8
How deep is the chest compression in newborns during CPR?	105	57.4	78	42.6
If you are sure that someone will not respond to you even after shaking and calling him/her. What will your immediate action be?	123	67.2	60	32.8
What will be your first reaction when you find an unconscious person with no response on road? (Note: You are only there)	126	68.9	57	31.1
What is the chest massage and ventilation ratio in a newborn?	127	69.4	56	30.6

Table 3. Comparison of the Knowledge Scores of Emergency, ICU, and CCU Nurses Based on the Educational Course

Workplace		N	Mean	SD	Minimum	Maximum	*P*
Emergency department	Yes	52	12.2115	2.19032	7.00	17.00	0.64
	No	54	12.4630	2.10760	8.00	17.00	
	Total	106	12.3396	2.14204	7.00	17.00	
ICU	Yes	33	11.5152	2.16681	8.00	16.00	0.01
	No	25	13.2400	2.50466	7.00	17.00	
	Total	58	12.2586	2.45350	7.00	17.00	
CCU	Yes	12	12.9167	1.56428	10.00	15.00	0.10
	No	7	11.4286	1.98806	9.00	15.00	
	Total	19	12.3684	1.83214	9.00	15.00	

number of chest massages in children and adults. Alsayil et al showed that 44% of the participants did not know the exact location of the chest compression in adults, and 68.8% were not aware of the exact location of the chest compression of the infants (11). It seems that doing chest massages properly in the right place increases the likelihood of coronary circulation and reduces the risk of associated complications such as fracture. In addition, the high number of incorrect responses about the basic principle of the BLS is worrying.

All previous studies in assessing the knowledge and attitudes of health care providers in the BLS have indicated that staff information is poor (12-20). The effective factors included lack of interest in learning and updating their educational materials, time constraint and extremely intensive work schedules due to manpower shortage in many state hospitals of Iran, insufficiency of equipment such as advanced mannequins to train resuscitation skills due to being expensive, lack of appropriate teaching materials for pre-training study, forgetting the acquired knowledge over time, lack of job experience in newly employed staff in ICU, and the absence of any mandatory regulations for the BLS certification in the nurses, possibly due to lack of educational staff, work space and suitable

educational equipment. Therefore, such an educational program needs to be replaced in the curriculum.

This study found a statistically significant difference between the scores of the knowledge of the nurses who completed the BLS educational course and that of the nurses who did not complete this course. Therefore, the knowledge score of educated nurses was unexpectedly less compared to the second group. On the contrary, the results of the study by Yunus et al were inconsistent with our results. In this regard, the mean score of knowledge and practice of educated nurses was higher compared to those with no education, and this difference was statistically significant. However, the knowledge and practice score of a significant number of educated nurses was lower than the mean (21).

Non-practical education on mannequins, the time constraint, and forgetting the gained knowledge over time (22) can justify the low score in trained nurses. Therefore, continuous and systematic strategies for education with practical exercises are needed to keep the team performance in a good situation for caring cardiovascular and pulmonary arrest to prevent possible mistakes. Da Costa and colleagues have shown that continuous education serves as a tool for updating healthcare. They stated that attending classes with long hours can have a negative effect on the learning capacity and should be replaced with several educational classes at different times (23).

Our study had some limitations. Firstly, we only considered the level of nurses' knowledge. Due to the wide range of hospitals and the large number of study samples, their attitude and practice were not reviewed. Secondly, the teaching hospitals were specialized. For example, Poursina hospital is a trauma center, Razi hospital is an internal and infectious diseases center, and Heshmat hospital is a cardiology center. Therefore, the knowledge of ICU staff in Heshmat hospital was higher than that in other hospitals in the study investigating the relationship between the knowledge score and the type of hospital. It is important to mention that it was impossible to assimilate hospitals in terms of their specialty due to the limited number of hospitals. The last but not least, we only included nurses of three out of eight teaching hospitals in Rasht. Hence, the results of this study cannot be generalized to the whole society.

In order to improve knowledge and skills, frequent education is needed. Therefore, nurses must firstly acquire knowledge and skills about the BLS with regular planning at universities. Furthermore, these educational programs should be repeated at regular intervals and be updated in accordance with the guidelines during working periods.

Conclusion

The results of this study showed that the majority of emergency nurses as well as ICU and CCU nurses had average algorithms in Rasht teaching hospitals. The improvement of knowledge is one of the important components of professional development in nursing educational programs. Nurses are required to have knowledge and skills about the BLS because they have a key role in the healthcare team and the initial treatment of patients with cardiac arrest.

Authors' Contribution

We thank Guilan Road Trauma Research Center, Guilan University of Medical Sciences, Rasht, Iran.

Ethical issues

This study was approved by the Ethics Committee of Guilan University of Medical Sciences (IR.GUMS.REC.1395.212).

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