ORIGINAL ARTICLE

CYPRUS
JOURNAL OF MEDICAL SCIENCES

A University Hospital Healthcare Personnel's Knowledge Levels About Adult Basic Life Support: A Descriptive Study

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Abstract

BACKGROUND/AIMS: This study was carried out to determine the knowledge level of adult basic life support (BLS) of nurses, paramedics and emergency medical technicians (EMT) who are working in a university hospital and its affiliated dispensaries in North Cyprus.

MATERIALS AND METHODS: This descriptive study included 137 nurses, paramedics and emergency medical technicians from 212 university and hospital dispensaries in North Cyprus, who agreed to participate. The data of the study were collected between 20 April–30 May 2017 by using personal information forms which consist of 9 questions about the socio-demographic characteristics and 14 questions about their knowledge of adult BLS to determine employees' features. The results were statistically evaluated and interpreted.

RESULTS: It was found that 37.23% of the health personnel were between the ages of 25–27, 82.48% were women, 72.99% were bachelors, and 35.77% were employed in inpatient services. 83.94% of the participants received in-service BLS training, 67.88% of them done BLS implementation, and 51.09% found themselves adequate for the BLS implementation. In the information form, the time of initiation of BLS in cardiac arrest (88.32%) question highly answered correct. It was determined that the average score is 62.04±16.11 out of 100 were taken from the BLS information form by participants as well as, the lowest score was 7.14 and the highest score was 92.86.

CONCLUSION: It is believed that: 'adding BLS theoretical and applied courses to vocational training programs, and supporting the training with in-service and orientation programs in business life' will increase the BLS abilities of health personnel to the desired level.

Keywords: Basic life support, nurse, paramedic, emergency medicine technician, knowledge level

INTRODUCTION

Cardiac arrest can develop at anytime and anywhere. In such cases, the lack of theoretical and practical knowledge of basic life support (BLS) may have tragic consequences. Knowing, applying and developing BLS skills to prevent undesired outcomes increases the chances of survival in cardiac arrest.[1] As is stated in the 1998 European Resuscitation Council Guidelines, the continuous of education is as essential as following scientific developments.[2]

The practices in the international guidelines for BLS are organized on two different grounds, depending on whether the rescuer is a healthcare professional or not, and are updated every five years.[3] Healthcare professionals with different working areas and responsibilities should not be expected to have the same level of

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current knowledge. Accordingly, when evaluated in terms of the medical duties of healthcare professional, significant problems can include the amount of BLS information they know and whether their knowledge on subject is continually updated.[4]

Various studies on BLS are available in the literature. In the study by Örsal et al.[5], the mean score of nurses' BLS knowledge level was determined as 6.37 (out of 17). According to the results of the study by Kara et al.[6], the correct response rate of nurses to questions about BLS was between 2.9% and 72.5%. The mean of the scores for BLS knowledge was determined as 4.85 (out of 10). In the study by Irfan et al.[7], nurses were determined to the group with lowest BLS knowledge scores (38.4%). In the study by Shrestha et al.[8], the average score levels for BLS knowledge of healthcare professionals were determined to be sufficient.

The current study evaluates healthcare professionals' BLS knowledge levels according to the departments in which they worked and the need to repeat training based on statistical evaluation of the obtained knowledge scores. Despite the importance of the subject, no study on BLS in Northern Cyprus has been found in the literature.

MATERIALS AND METHODS

This study is descriptive. The universe of the study consisted of nurses, paramedics and emergency medicine technicians who were working at a university hospital and the hospital's dispensaries in North Cyprus and voluntarily agreed to participate (n=137).

The data of the research were collected through a data collection form used with the permission of the real owner.[9] The data collection form consists of two parts. In the first part of the form, there are nine introductory questions about the socio-demographic characteristics of healthcare professionals and BLS. In the second part of the form, 14 questions assess the BLS knowledge levels of healthcare professionals. Each question in the second part has four options and one correct answer. Healthcare professionals marked an option they thought was correct. Oral information was provided to each participant for the implementation of the research. The correct answer to each item was multiplied by 100/14=7.14 to evaluate the total score from 14 items in the BLS information form out of 100. The range of points that can be obtained from the scale varies from 0 to 100. High and low scores obtained from the scale shows that the level of knowledge about BLS is high or low, respectively.

Approval was obtained from Near East University Ethics Committee (2017/403) for conducting the study, and written consent was obtained from the real owner of data collection form and the healthcare professionals who agreed to participate in the study.

Statistical Analysis

Statistical Package for Social Sciences (SPSS, version 18.0) program was used to analyse the data. The analysis of the identifying characteristics of the healthcare professionals was determined by frequency distributions. The compliance of the information points with a normal distribution was determined by calculating the Kolmogorov-Smirnov and Shapiro-Wilk tests, QQ plot, and skewness-kurtosis values. The homogeneity of the variances was examined by Levene test. Independent samples t-test, one-way ANOVA, Kruskal-Wallis, Mann-Whitney U tests were used to compare the data. The results of the study were evaluated at 95% confidence interval and a significance level $p < 0.05$.

RESULTS

The descriptive statistics of the healthcare professionals are shown in Table 1. According to this, 37.23% of the healthcare professional were between the ages of 25–27, 84.48% were women and 72.99% were undergraduates. It was determined that 35.77% of the healthcare professional worked in the in-patient department, 83.94% had received BLS training before, 67.88% had experienced BLS and 51.09% believed that they were sufficient in BLS (Table 1).

According to the results, time of starting to apply BLS in cardiac arrest (88.32%), the position that the patient should be placed in during implementation (83.21%), the rate of chest pressure/artificial respiration rate in adults (82.48%), and the place where the pulse should be taken to evaluate the circulation in adults (81.02%) were mostly answered correctly. Chest pressure (64.96%), the processes of respiration (60.58%), and time to evaluate respiration (56.93%) were answered incorrectly by more than half of the participants (Table 2).

It was determined that the average score achieved by the participants for the BLS information form was 62.04±16.11, while the lowest score was 7.14, and the highest score was 92.86. Accordingly, the average BLS knowledge score of healthcare professionals who were working in the emergency department was 69.05±14.70 (highest), while it was 65.71±15.17 for those working in the intensive care unit, 61.52±13.03 for professional in the in-patient department, 50.65±8.11 (lowest) in the operating room, and in the out-patient clinic, it was 57.97±22.97. A statistically significant difference was found between the worked departments in which the healthcare professionals worked and the average scores they received ($p < 0.05$). The knowledge scores of the healthcare professionals who were working in the emergency department are found to be higher than the other participants. Also, the knowledge scores of the healthcare professionals in the intensive care unit were higher than those in the operating room and the out-patient clinic (Table 3).

The average score of healthcare professionals who had performed BLS was determined as 63.98±15.62, while the score for those who had nor performed BLS was 57.95±16.54. A statistically significant difference was found between the knowledge point averages of the healthcare professionals who did and did not implement BLS (p<0.05) (Table 4).

When the independent sample t-test results of the healthcare professionals were analysed to compare the knowledge about BLS, it was found that the average score of healthcare professionals who believed that they were sufficiently knowledgeable about BLS was 66.53±14.26 and for those thought they were insufficiently knowledgeable, it was 57.36±16.68 (p<0.05). The knowledge scores of the participants who perceived themselves to be sufficient in terms of BLS were significantly higher than those who found themselves insufficient (Table 5).

Table 1. Distribution of the participants' socio-demographic characteristics and BLS training (n=137)		
Identifier features	Number (n)	Percent (%)
Age group		
24 years and under	48	35.04
25–27 years	51	37.23
28 years and older	38	27.74
Gender		
Female	113	82.48
Male	24	17.52
Education		
Health vocational high school	9	6.57
Associate degree	18	13.14
Undergraduate	100	72.99
Master's degree	10	7.30
Worked department		
In-patient department	49	35.77
Intensive care unit	30	21.90
Out-patient clinic	26	18.98
Emergency department	21	15.33
Operation room	11	8.03
Having in-service BLS training		
Yes	115	83.94
No	22	16.06
BLS implementation experience		
Yes	93	67.88
No	44	32.12
Finding him/herself sufficient in BLS		
Yes	70	51.09
No	67	48.91
Total	137	100.00
BLS: basic life support, n: number.		

DISCUSSION

According to the answers from the participants, the mean score of BLS was found to be 62.04, and it statistically evaluated at the intermediate level. In the literature on this subject, the level of knowledge of the BLS of healthcare professionals are generally reported to be moderate to low. In the study by Ateşli[9] in North Cyprus in 2011 on the BLS knowledge level of nurses who worked in state hospital, the participants' knowledge level was evaluated at an intermediate level. In the study of Sabir, which evaluated the nursing faculty students' BLS knowledge, the experience of 93.5% of the participants was found to be at the intermediate level.[10] In a similar study by Nambiar et al.[11], on 461 healthcare professionals, the overall average was low. Various factors could be behind these results. The most important of these is the fact that the healthcare professional do not participate in current BLS training unless it is mandatory during and after vocational training. Among other reasons, the healthcare professional may not receive BLS training periodically in their professional lives or do not ensure continuity, do not want to spend extra time on in-service training due to oppressive working conditions, or trainer does not have up-to-date information.[11] The higher the quality and consistency of the BLS training, the more successful resuscitation will be. The willingness of the healthcare professional toward this topic would help them increase their level of education.

According to the results obtained from our research, the rate of healthcare professionals who had previously applied BLS was 67.88%. In spite of this high rate, only 51.09% of the participants were found to be sufficient. In the study of Ateşli[9], it was concluded that; 51.63% of the healthcare professional considered themselves partially sufficient in the context of BLS.In a study by Pillow et al.[12], with fourth-grade medical students, 36.8% of the students concluded that the avoided resuscitation because their perceptions of inadequacy regarding cardiopulmonary resuscitation (CPR). In the study of Valarmathi and Parajulee[13], the rate of correct responses of 175 participants was determined as 57.14%. The main reason at this stage is the awareness of healthcare professional regarding how much knowledge they have. The obtained results were consistent with the literature and reveal the importance of continuing education and repetitive training for staff who do not believe they are adequate. Increasing the theoretical and practical training will increase the likelihood of survival.

When the correct response rates in the questionnaire were used to determine the knowledge level of BLS of the participants evaluated, the correct response rates of the questions about the time to initiate BLS (88.32%), the position to be given to the patient (83.21%), the rate of chest pressure and artificial respiration (82.48%), and the evaluation of circulation (81.02%) were right. The correct response rate was considerably low for

Table 2. Distribution of health personnel information questions according to correct/incorrect responses (n=137)

BLS Information Questions	Correct		Incorrect	
	n	%	n	%
Time to start BLS in case of cardiac arrest	121	88.32	16	11.68
The right position was given to the patient for the BLS implementation	114	83.21	23	16.79
The rate of chest pressure/artificial respiration rate in adults	113	82.48	24	17.52
The place to take a pulse to evaluate the circulation in adults	111	81.02	26	18.98
Proving the airway clearance of the unconscious patient without head/neck trauma	97	70.80	40	29.20
The processes that have to be done when the patient's circulation has stopped	87	63.50	50	36.50
The checks that need to be done before starting BLS	83	60.58	54	39.42
Definition of cardiopulmonary arrest	82	59.85	55	40.15
Ideal location for chest compression	79	57.66	58	42.34
The number of compressions applied per minute in chest pressure	78	56.93	59	43.07
How chest pressure has to be applied to adults	64	46.72	73	53.28
The time to evaluate the respiration of the patient	59	43.07	78	56.93
The processes that need to be done in the absence of respiration	54	39.42	83	60.58
The depth of the chest pressure in adults	48	35.04	89	64.96

BLS: basic life support, n: number.

Table 3. Comparison of BLS information points according to the department in which the health personnel worked (n=137)

Worked department	n	Mean	s	Mean Rank	X^2	p-value	Variance
Emergency department	21	69.05	14.70	87.05			1–3
Intensive care units	30	65.71	15.17	79.30			1–4
Operation rooms	11	50.65	8.11	35.36			1–5
In-patient departments	49	61.72	13.03	65.36	15.43	0.00*	2–3
Out-patients clinic	26	57.97	22.07	63.63			2–5

*p<0.05, BLS: basic life support, n: number.

questions related to the period of assessment of the respiratory rate (43.7%), the processes to be applied in the absence of respiration (39.42%), and the depth of chest pressure in adults (35.4%) (Table 2).

A similar questionnaire was used in the study by Chandrasekaran et al.[14], in which 1.054 people, 74 including various healthcare professionals, were asked to provide information about their BLS knowledge. The questions relate to time to start implementing BLS (89%), the position to be given to the patient during the implementation (74%), the depth of chest pressure in adults (67%), and the chest pressure/artificial respiration rate (34%) were answered incorrectly by the participants.[14] In Sabir's[10] study, he specified the significant difference between the levels of knowledge of BLS before and after training. Similar results were obtained in the study by Nambiar et al.[11], in which it was determined that the questions that generally evaluated the knowledge of the participants were not answered correctly by the participants. In Kaya et al.[15], study, the proportion of respondents who knew heart pressure and artificial respiration rate correctly was 21.5% and 90.9%. Successful implementation

of the BLS depends on the training of the rescuer with up-to-date information. In particular, it is necessary for the healthcare professional to handle the application as a whole and know each stage correctly. Generally, the questions that were answered correctly in our study were found to be compatible with the literature.

Concerning the participants' knowledge about BLS, it was found that the knowledge scores of the participants who found themselves to be sufficient in terms of BLS were higher than those who believed they were insufficient. These results are considered statistically significant (p<0.05). The knowledge scores of the participants who perceived themselves sufficient in terms of BLS were significantly higher than those who found themselves insufficient (Table 5). In a multicentre study by Akritia et al.[16], it was concluded that there was a correlation between the participants' self-sufficiency and high knowledge scores.

In the study conducted by Ateşli[9] in 2011, it was determined that the knowledge and implementation score averages of healthcare professional in the 35-year-old age had statistically

Table 4. Comparison of BLS information points of health personnel according to, BLS implementation status (n=137)

BLS implementation	n	Mean	s	t	p-value
Yes	93	63.98	15.62	2.07	0.04*
No	44	57.95	16.54		

*p<0.05, BLS: basic life support, n: number.

Table 5. Comparison of BLS information points of health personnel according to they find sufficient themselves about BLS (n=137)

Finding sufficient	n	Mean	s	t	p-value
Yes	70	66.53	14.26	3.47	0.00*
No	67	57.36	16.68		

*p<0.05, BLS: basic life support, n: number.

significant differences, and were lower than the other groups.[9] In the study by Kara et al.[6], in 2015, no correlation was found between the ages of the professional who participated in the study and the average point score of BLS. According to the study by Valamathi and Parajulee[13] in 2011, no correlation was found between the age of healthcare professional and the BLS information scores. It is normal for newly-graduated healthcare professional (24 years and below) to have high scores for BLS knowledge due to reasons such as recently completing their education and participating in-service training organized in the business environment in their new occupation. The reason for the decrease seen in the 25 and older age group could be that they were not following the innovations related to BLS and were not participating in the training, which may have let to them forget information due to the lack of cases in which their knowledge and application skills could be improved.

CONCLUSION

The following suggestions can be made in line with these results:

Theoretical and practical courses should be added to associate degree, undergraduate, and post-graduate programs to increase the healthcare professionals' BLS skills to the desired level.

The same classes or training should be supported through in-service and orientation programs in business life.

The continuity of on-the-job training related to the BLS, increasing participation should be ensured, while the healthcare professional should regularly attend relevant events such as seminars, conferences and congresses.

BLS training should be divided into groups and organized into different groups.

From healthcare professionals to normal citizens, if BLS information is increased throughout society, this is the basis of a successful emergency health system. Thus, the survival rate will be increased in emergencies. Hence, it is responsibility of institutions to provide vocational training and healthcare services to teach first aid to healthcare professionals and the wider community.

MAIN POINTS

- Cardiopulmonary resuscitation practices are life-saving when done correctly and effectively.

- It is of great importance that professionals working in the field of health know the basic life support steps completely and accurately.

- Thanks to the guides and trainings that are developed and updated every five years, the level of knowledge can be increased.

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