Basic Life Support Training and Results for Non-Health Hospital Employees

Ⓘ Attila Beştemir[1], Ⓘ Alpay Tuncar[2], Ⓘ Hayri Canbaz[3]

[1]University of Health Sciences Turkey, Bakırköy Dr. Sadi Konuk Training and Research Hospital, Clinic of Emergency Medicine, İstanbul, Turkey
[2]Department of Medical and Specialization Education, Department of Emergency Medicine, Ankara, Turkey
[3]Department of Tissue-Organ Transplantation and Dialysis Services, Department of Emergency Medicine, Ankara, Turkey

ABSTRACT

Introduction: Basic life support (BLS) is a non-medicated intervention to ensure that oxygen is delivered to the lungs and blood is pumped from the heart to save life in emergency situations where the heartbeat stops, respiratory functions become dysfunctional or both. The aim of this study was to evaluate the knowledge of non-healthcare staff on BLS and to investigate the contribution of BLS training to the development of their knowledge levels.

Methods: The current study was a retrospective, non-invasive descriptive study. It covers the BLS training given to hospital employees who are not health personnel and have not received BLS training before. Between June 1, 2021 and December 1, 2021, we performed pre-education knowledge measurement test and post-education evaluation test at Mardin State Hospital. The data were recorded on the spreadsheet program and their percentage changes were calculated using the tabulation program statistical formulas.

Results: A total of 594 subjects were included in the study plan, of which 290 did not complete the study. Of the 304 people who completed the study, 238 successfully passed the test at the end of the training process. Sixty-six people failed the test. The occupations of 304 people were examined and it was seen that these people consisted of 29 different occupational groups who had not received BLS training and were not health personnel.

Conclusion: As a result of the research, it has been seen that the BLS information of the personnel other than the healthcare workers is insufficient, but this problem can be overcome to a large extent with the regular training given and to be given. It was found that the knowledge levels of the employees who participated in the study and received BLS training were significantly higher than before they received BLS training.

Keywords: Basic life support, pretest, posttest

Introduction

Basic life support (BLS) is a non-medicated intervention to ensure that oxygen is delivered to the lungs and blood is pumped from the heart to save life in emergency situations where the heartbeat stops, respiratory functions become dysfunctional or both (1,2). The aim of BLS is to meet the oxygen needed by the tissues (1,2). BLS is the part of the resuscitation outside the hospital and is mostly applied by non-professional people. During the BLS, no additional tools, equipment and drugs are used except for basic training information and applied intervention information for cardiopulmonary resuscitation (CPR) (3).

CPR is defined as maintaining the airway and breathing and circulation of a patient whose breathing and circulation have stopped due to any reason (4). If CPR is not immediately applied to the patient with cardiopulmonary arrest, the brain will begin to be damaged within 4-6 minutes following the cessation of breathing and circulation. If the

oxygen-free time of the brain tissue exceeds 10 min, irreversible brain damage will occur. For this reason, BLS to be carried until the professional health team arrives at the scene is critical (1-3).

CPR consists of two parts as BLS and Advanced Cardiac Life Support (ACLS). BLS includes simple treatment methods. It can be applied by all health personnel and people who have been trained in this subject. ACLS includes special treatment methods. It can be applied by doctors and specially trained health personnel (5). Extremely BLS practices are not limited to healthcare professionals, and that these life-saving interventions are well learned and applied by all individuals living in the country. For this purpose, it is necessary to provide compulsory BLS training in health institutions and to update this training at regular intervals (6). The aim of this study was to evaluate the knowledge of non-healthcare staff on BLS and to investigate the contribution of BLS training to the development of their knowledge levels.

Methods

The current study was a retrospective, non-invasive descriptive study. It covers the BLS training given to hospital employees who are not health personnel and have not received BLS training before and it also includes the knowledge measurement test before the training, and the evaluation test after the training in Mardin State Hospital between June 1, 2021 and December 1, 2021. With the BLS training, training was planned for 594 people and during this period, the participants consisted of 304 people who took part in the entire training and they were asked to answer the pre-test and end-test questions. Two hundred and ninety people who did not participate in the training, could incomplete their education, or did not participate in any pre-test and end-test were excluded from the study. In our training, the current BLS information was measured and the BLS information in the American Heart Association (AHA) Guide, which was published in 2015 and 2020, was included. The study consisted of 10 questions prepared from current sources and measuring the knowledge level of BLS. Each question was taken as 10 points, calculations were evaluated out of 100 points. Those who answered 7 questions or more correctly were considered successful in the exam. The test lasted for 20 min. Pre-test mean score and post-test mean score of 238 people who were successful with a score of 70 and above in the post-test and 66 people who failed with a score below 70 were examined. Persons from 29 different occupational groups, who are healthcare workers, were included in the study.

The study was approved by the Ethical Committee of Ankara City Hospital (approval number: E2-22-1658, date: 13.04.2022). The study was conducted in accordance with the ethical standards of the 1964 Declaration of Helsinki and its subsequent amendments.

Statistical Analysis

The data were recorded on the spreadsheet program and their percentage changes were calculated using the tabulation program statistical formulas.

Results

In the study, the data of 304 people from 29 different occupational groups who were not healthcare professionals, who completed BLS training, pre-test and post-test after training, were analyzed. Seventy-nine cleaners, 41 security guards, 36 information processing officers workers, 32 maid, 16 patient receptionists, 16 data operators included 72% of the employees, and the remaining 28% consisted of 23 different occupational groups (Table 1). Of the 304 people who attended the training and completed the tests, 218 (71.7%) were male and 76 (29.3%) were female employees.

When the pre-test results were examined, it was seen that the average of the number of questions answered correctly was 4.5 questions, the average of the number of questions that were answered incorrectly was 5.5, there were no questions left blank, and the average of the pre-test score was 45. It was determined that there were 60 participants who passed the 70 points threshold in the pre-test, and 244 participants failed to pass the threshold (Table 2).

Table 1. Occupational groups participating in the study

Occupation	Number	Occupation	Number
Warehouse officer	3	Officer	14
Kitchen cook	1	Kitchen staff	6
Supply manager	2	Engineer	1
Information processing officer	36	Civil defense officer	1
Computer operator	6	Permanent worker	3
Environmental health technician	4	Chef	1
Ergotherapist	1	Driver	2
Dead washer	1	Technical personnel	10
Security staff	41	Technician	1
Patient admissions officer	14	Assistant technician	1
Patient reception officer	16	Cleaning staff	79
Maid	32	Tailor	1
Administrative support officer	2	Medical secretary	6
Employee	2	Data operator	16
Drugstore	1	Total	304

When the post-test results applied at the end of the training process were examined, it was seen that 238 people were successful by getting 70 points and above, and 66 people were unsuccessful with a score below 70 points. In the post-test results, it was determined that the average of the number of correct questions was 8, the average of the number of incorrectly answered was 1.93, and the average of the number of questions left blank was 0.063. It was determined that the mean score of 45 in the pre-test increased to 80 points in the post-test (Table 2). When the post-test and pre-test answers were examined, it was observed that 8 people got the same score in both tests and their average score was 80 points, and 5 people got higher scores in the pre-test, although they had 70 points in both pre-test and post-test mean scores.

The study revealed that the number of correct questions answered by 291 people in the post-test increased. Although there were 244 people who failed to pass the 70 points threshold in the pre-test before the training, the number of people who failed the 70 points threshold in the post-test after the BLS training was 66. While the pre-test mean score of the participants who could not pass the threshold in the pre-test was 38.5 points, the mean score of the participants who could not pass the threshold in the post-test was 53.5 (Table 2).

Discussion

The effects of BLS practices on human life, which were carried out in accordance with the published guidelines regarding BLS, were noticed by experts, and then the BLS Guidelines were updated and published at regular intervals. One of the most well-known among these guidelines is this guide published every 5 years by the AHA and was last updated in 2020. According to the AHA, BLSs are interventions applied by healthcare personnel and trained first responders for critically ill patients both before and within the hospital (7). In the European Resuscitation Council guideline, which is another widely known guide, having BLS

Table 2. Test evaluations of participants before and after training

Test	Average of correctly answered questions	Average of questions answered incorrectly	Number of successful participants (ratio)	The number of unsuccessful participants (ratio)	Unsuccessful participant average score	Average score of all participants
Pretest	4.5	5.5±1.35	60 (19.7)	244 (80.3%)	38.5	45
Post-test	8	1.93±0.32	238 (78.3)	66 (21.7%)	53.5	80

knowledge and skills is defined as a duty for doctors, nurses and other health personnel working in risky areas (8). Although health personnel and other health personnel are mentioned in these guidelines, there are also many occupational groups that are not health personnel in health institutions. In the health institution or in the garden, a non-healthcare professional can greet a patient first. For this reason, the importance of BLS training of non-health personnel, that are in the context of the study emerges. BLS is a link in the life-saving chain in CPR practices performed by professional healthcare professionals to establish life (6,7). These life-saving chains are early intervention, early BLS, early defibrillation, and early advanced life support. Each link in this chain increases survival (6,7). Studies have shown that the survival of a person who witnesses the arrest requires BLS two to three times more (6,7). For this reason, BLS is one of the critical links of the life-saving chain and it is recommended to offer BLS training to both healthcare and non-health personnel (6,7). Since there may not be health personnel in every living area of society, apart from the hospital, BLS training comes to the fore in saving lives. The fact that deaths resulting from cardiac arrest occur mostly outside the hospital has made it necessary to provide BLS training to non-health personnel as well as healthcare personnel (9,10). However, significant changes in patient habits have been reported during the Coronavirus disease-2019 (COVID-19) pandemic, such as a decrease in the hospital admissions in life-threatening situations or an increased rate of high-risk patients rejecting treatment despite medical advice (11-13). In particular, civilians who have received BLS training are as valuable as health professionals to respond quickly and effectively to many patients in disasters. BLS training is given regularly to people who are not health personnel, except those who receive BLS and advanced life support training (9,10).

In the study, the results of pre-test that was conducted before the BLS training showed us that 80.2% of the non-health personnel had no knowledge about BLS practices, and 19.8% had a lack of knowledge. Simultaneously, it reveals the importance of measuring the effectiveness of the training with pre-test and post-test while giving BLS training.

After the training, these deficiencies were largely eliminated, and the number of 244 (80.2%) people who failed the tests decreased to 66, that is, there was a 72.9% decrease in the rate of unsuccessful people. Achieving this success in a training period led us to suggest that if the training was given continuously or at frequent intervals, the success would be much higher. In the study, it was determined that the average score of 66 people (21.7%) who failed the pre-test, which was 38.5 points before the training, increased to 53.5 points in the post-test after the training. This result is another useful indicator of BLS training. The training materials and the language of the topics covered in BLS training have been prepared in a way that can be understood by non-health personnel from current sources. Another reason for the increase in the

successful person and achievement score average between the pre-test and the post-test in our study may be the language of instruction used and the subjects. Similarly, it is recommended that rescuers who are not health personnel in the community attend more BLS training, with simplifications to be made in BLS guidelines. The number of rescuers can be increased thanks to simplified and memorable training. In a study on the prevalence of BLS training, it was reported that 19% of the population in Switzerland and 75% in Poland were trained on the BLS (14).

Study Limitations

The limitations of the study are the small number of pretest and posttest questions and the inability to examine the knowledge in more detail.

Conclusion

It was found that the knowledge levels of the employees who participated in the research and received BLS training increased significantly compared with their knowledge levels before they received BLS training. The results of the research suggested that the BLS knowledge of non-health personnel is insufficient, but it is possible to overcome this problem to a large extent with the regular training given and provided. In our country, it is recommended to create serious knowledge and awareness of BLS practices in society by providing repetitive training in many centers and to increase the number of life savers. Thus, it is expected that both the morbidity and mortality rates will decrease.

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