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CAN WE TEACH THE BASIC LIFE SUPPORT TO HEALTH SCIENCES STUDENTS?

SAĞLIK BİLİMLERİ ÖĞRENCİLERİNE TEMEL YAŞAM DESTEĞİ ÖĞRETEBİLİYOR MUYUZ?

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ABSTRACT

Objective: The study aims to evaluate the effectiveness of Basic Life Support training provided to health sciences students.

Method: A single group pretest-posttest intervention type study was completed with 91 students. Data was collected with the Participant Information Form and Basic Life Support Information Form, which were developed by the researchers. Within the scope of the First Aid course, together with a video and training notes explaining the Basic Life Support procedure were shared with the students via the university course information system one week before the lesson. Afterward, the video and the training content were discussed with the students using the discussion and question-answer technique, and a demonstration was made of the model. The effectiveness of the Basic Life Support training was assessed directly and one month after the training.

Results: The number of correct responses on the Basic Life Support Form was increased after training. There was a significant difference between the pre-test and post-test Basic Life Support knowledge scores of those who had not previously received Basic Life Support training ($p<0.05$). Basic Life Support knowledge score averages were found to be lower in those who did not provide first aid before.

Conclusion: Basic Life Support training was found to be effective for health sciences students. Since Basic Life Support is an applied intervention in which crisis management skills are used, creating the content of the training with interactive methods will increase the effectiveness of the training.

Key Words: Basic Life Support, Health Professionals, First Aid, Teaching Methods and Techniques

ÖZ

Amaç: Bu çalışmanın amacı sağlık bilimleri öğrencilerine verilen Temel Yaşam Desteği eğitiminin etkililiğini değerlendirmektir.

Yöntem: Tek grup ön-test ve son-test yarı deneysel tipteki çalışma 91 öğrenci ile tamamlandı. Veriler araştırmacılar tarafından geliştirilen Katılımcı Bilgi Formu ve Temel Yaşam Desteği Bilgi Formu ile toplandı. İlk Yardım dersi kapsamında, Temel Yaşam Desteği prosedürünü açıklayan bir video ve eğitim notları, dersten bir hafta önce öğrencilerle üniversite ders bilgi sistemi üzerinden paylaşıldı. Daha sonra video ve eğitim içeriği, tartışma ve soru-cevap tekniği kullanılarak öğrencilerle tartışıldı ve model üzerinde gösterim yapıldı. Temel Yaşam Desteği eğitiminin etkililiği eğitim bitiminde ve eğitimden bir ay sonra değerlendirildi.

Bulgular: Eğitimden sonra Temel Yaşam Desteği Bilgi Formu'ndaki doğru yanıt sayısı arttı. Daha önce Temel Yaşam Desteği eğitimi almamış olanların ön test ve son test Temel Yaşam Desteği bilgi puanları arasında anlamlı bir fark saptandı ($p<0.05$). Daha önce ilk yardım uygulamamış olanlarda Temel Yaşam Desteği bilgi puan ortalamaları daha düşük bulundu.

Sonuç: Temel Yaşam Desteği eğitiminin sağlık bilimleri öğrencileri için etkili olduğu bulundu. Temel Yaşam Desteği, kriz yönetimi becerilerinin kullanıldığı uygulamalı bir müdahale olduğundan, eğitim içeriğinin interaktif yöntemlerle oluşturulması eğitimin etkinliğini artıracaktır.

Anahtar Kelimeler: Temel Yaşam Desteği, Sağlık Çalışanları, İlk Yardım, Öğretim Yöntem ve Teknikleri

INTRODUCTION

Cardiac Arrest (CA) occurs as a result of circulatory arrest due to the inability of the heart to contract effectively. CA is a major problem and one of the leading causes of death worldwide [1]. The fact that perfusion deficiency due to CA leads to continuous cell death increases the risk of brain damage after the first four minutes and requires urgent intervention [2]. The first 10 minutes after CA are called the "golden 10" or "golden minutes", and failure to intervene during this period eliminates the individual's chance of survival [3]. Data show that only 10% of individuals who experience CA outside of the hospital survive, and 20% have neurological or moderate damage [4]. Survival after CA depends on early diagnosis of the condition and the right intervention, requiring a range of coordinated actions. Basic Life Support (BLS) is “the basic practice that ensures adequate blood supply to the tissues by pumping blood from the heart after CA” [5]. BLS, which includes cardiopulmonary resuscitation (CPR), rescue breathing, and the use of an automatic external defibrillator (AED), combines skills such as chest compressions and artificial respiration to maintain blood circulation to the patient's vital organs [6].

It is important for individuals who encounter situations that require BLS to have sufficient knowledge and awareness, to initiate a fast and accurate first aid intervention. BLS, which is considered an important qualification for all health professionals, does not require the use of any special equipment and drugs and should be known by all health

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professionals [7]. Considering the importance of BLS in saving lives when applied correctly and effectively, it is critical to empower health science students as future health professionals [8]. However, according to the results of the study evaluating the BLS knowledge levels of health science students, the knowledge level of the students varies between poor and average [9,10]. In a study conducted with 748 nursing students in Lithuania, Spain and Poland it was evaluated that they have an average theoretical and practical knowledge result in BLS [9]. Furthermore, according to the results of a study conducted by Baisakhiya et al. (2017) with physiotherapy students, 8% of the students had poor BLS knowledge and skills [10]. In the other study from India, evaluating BLS awareness, attitudes, and knowledge of medical, dental, and nursing students, it was found that their knowledge levels were low [11].

Students of health sciences are a group with a high probability of encountering a life-threatening emergency. BLS training in the USA has been a routinely recommended training procedure for all health workers since the 1960s [12]. For this reason, BLS training given within the scope of first-aid training is also important for this student group. Previous studies [9,10] revealed that the BLS training should be included in the education curricula of health science students in order to increase the level of BLS knowledge and skills. This study aims to evaluate the effectiveness of the BLS training given to health sciences students.

METHOD

Study Design

This quasi-experimental study used a single-group pretest-posttest design.

Sample Size and Study Participants

The population of the research consists of a total of 129 first-year students studying at the Faculty of Health Sciences, Nursing (n=59), Speech and Language Therapy (SLT) (n=42), and Physiotherapy (n=28) departments of a university and taking first aid courses. In the G Power software program, it was calculated that ±5 margin of error, 95% confidence interval, 80% power of the research, and a sample size of a minimum of 22 in the calculation made using the literature was sufficient [13]. The study included volunteer students who took the first aid course in the fall semester of the 2021-2022 academic year, attended the BLS training and completed the pre-test and post-tests completely. The research was completed with a total of 91 students from the departments of nursing (n=45), SLT (n=29), and physiotherapy (n=17).

Data Collection

The process of collecting data started with the announcement of the research to the students by the coordinator instructors of the first aid course when the 2021-2022 academic year spring semester classes started. The students who accepted to participate in the study were included by filling out the "Participant Information Form" and "BLS Information Form". Within the scope of the BLS training, a video and training notes explaining the specific BLS intervention steps for adult, child, and infant groups were shared with students one week before the lesson via the university course information system. Afterward, the training content was discussed with the students using the discussion and question-answer technique, both on the video and the training notes, and a demonstration was made on the anatomic model. Training notes include CA, BLS steps in the guide of ERC, BLS steps in adults, children, and infants, AED usage situations, and the user manual. The videos include both the BLS intervention demonstrated on the model in the laboratory and the images of the BLS intervention steps in a real case. The Bee Gees' song "Staying Alive", whose effectiveness has been evaluated by the studies, was used to practice the chest compression rhythm [14,15].

The students were asked to do chest compressions to the rhythm of the song they listened to. Afterward, the BLS Information Form was applied to the students directly after BLS training (post-test) and a month after BLS training (retention test).

Participant Information Form; The form consisting of 20 questions was created by the researchers and developed from previous studies [16-18]. It asked for background factors such as age, gender, department, previous BLS training and previously experienced a situation of BLS.

Basic Life Support Information Form: In this form, there are 20 statements prepared by researchers, based on current national and international guidelines [19,20]. There are "true" and "false" options for each item in the form. “True” options are coded with 1 point, and “false” options are coded with 0 points. In the form 10 questions are reverse coded. When reverse coded questions are marked as "false", they are considered correct. The form was calculated with the percentage of statements with correct answers. The form includes the definition of BLS, in which situations BLS is required, when to call 112, the number of heart pressures, compression/ventilation ratio, and BLS application in infants and children. The other questions of the form, which included two questions for adults and two questions for infants and children, were about general BLS knowledge and skills. Before applying the form, it was evaluated by two experts in the field.

Ethical Considerations

Ethical approval was obtained from the Health Sciences Non-Interventional Research Ethics Committee of the Ankara Medipol University (Date: 04.04.2022, Number: 101). During the implementation of the research, the Declaration of Helsinki Principles was applied and the consent of the students participating in the research was obtained.

Statistical Analysis

The data obtained from the research were analysed using the SPSS (Statistical Package for Social Sciences) for Windows 22.0 program. The conformity of the data to the normal distribution was evaluated with the Kolmogorov-Smirnov test. The data with skewness and kurtosis coefficients in the ±1.5 range were determined to be normally distributed [21]. Descriptive statistics were used to evaluate sociodemographic data. The repeated measurement scores of the BLS Information Form were measured with the Friedman test, and Post-hoc pairwise comparisons were evaluated with the Wilcoxon test. The analysis of sociodemographic data and BLS Information Form score comparisons were made with Student’s-tests in two-group data and the One-Way ANOVA test in more than two groups. The $p<0.05$ value was accepted as the statistical significance.

RESULTS

The students' mean age was 19.80±1.23 and the majority (84.6%, n=77) of them were female. Approximately half of the students (49.5%, n=45) were nursing students and 12.1% (n=11) have received training on BLS before. Of them, 30.8% encountered a situation requiring first aid and 17.9% (n=5) of these students provided first aid intervention (Table 1). The students answered correctly to 54.06±7.24% of the questions. They replied to the questions more than pre-training. As a result of the comparison of the BLS Knowledge Score averages before and after the training, a significant difference was found between the pre-training and the post-training knowledge scores ($X^2=54.119$, $p<0.001$). Significant differences were found between the pre-test and post-test ($Z=-5.246$, $p=0.000$), between the pre-test and retention test ($Z=-5.730$, $p=0.000$), and between the post-test and retention test ($Z=-4.067$, $p=0.000$) (Table 2). There was a significant difference between previous BLS training and retention test ($t=-2.037$, $p=0.045$). In addition, there was a significant difference between the previously experienced situation of BLS intervention and the retention test ($t=-5.883$, $p<0.001$). In all variables, except for previous BLS training and previously experienced a situation of BLS

intervention, BLS Knowledge Scores increased compared to previous measurements ($p \leq 0.001$). In further analyses carried out to determine which two measurements caused the difference; the difference was found between all measurements (Table 3).

Table 1. Distribution of descriptive characteristics of students

Characteristics		n	%
Gender	Female	77	84.6
	Male	14	15.4
Department	Nursing	45	49.5
	Speech and Language Therapy	29	31.9
	Physiotherapy	17	18.7
Previous BLS training	Yes	11	12.1
	No	80	87.9
Previously experienced a situation of BLS	Yes	28	30.8
	No	63	69.2
Previously experienced BLS intervention	Yes	5	17.9
	No	23	82.1

BLS: Basic life support

Table 2. Comparison of students' basic life support information form correct numbers

Score	Mean*±SD	Median	Min-Max	X^2	p
BLS1	47.20±10.75	50	20-75	54.119	<0.001 (BLS2>BLS1 BLS3>BLS1 BLS3>BLS2)
BLS2	54.06±7.24	55	35-70		
BLS3	58.93±8.97	60	30-75		

*X^2=Friedman test,*Percentage of the correct number obtained from the BLS Information Form, p<0.05 was considered significant, BLS1: Pre-test score, BLS2: Post-test score, BLS3: Retention test scores obtained one month after training.*

DISCUSSION

Effective BLS practice saves lives. American Heart Association (AHA) emphasizes that healthcare team members who are likely to encounter situations that require BLS should be competent in CPR practices [22]. This study aims to measure the knowledge levels of students studying in the fields of nursing, physiotherapy, and SLT before and after BLS training and to evaluate the permanence of this knowledge. When the success status of the students is evaluated according to the correct numbers, they have given to the BLS Information Form, the average of the correct number of students before the training is 47.20%. Many studies evaluating BLS training for health students revealed that BLS knowledge levels of students are not at the desired level, similar to this study [23-26]. Although 12.1% of the participants had previously received BLS training, the students could not answer almost one of the two questions correctly. This situation is interpreted as a finding that shows the necessity of adding BLS training to the curriculum at previous education levels. On the other hand, although 87.9% of the students have not received any training on the BLS, they answered almost half of the questions correctly. Today, this situation is considered to be the result of the increase in the information resources that individuals in this age group can reach, and therefore the increase in health literacy.

In this study, the post-test was performed directly after training and the retention test was completed a month after training. It was determined that the students' BLS knowledge scores increased significantly in the measurement after a month. These findings are interpreted as the achievement scores are not very high, but they are positively affected by the training. The previous studies also reported similar results [25, 27]. It has shown by studies that providing BLS training at an early stage and repetitive training facilitates students in acquiring and remembering BLS information [28]. Since the retention test was done 1 month later, it is assumed that there was no decrease in the post-test score. Furthermore, this increase in score may be attributed to the students' greater awareness of the statements they responded in the post-test and their study on the subject.

Individuals need to have knowledge and confidence in the implementation of BLS [29]. Similar studies have listed the important obstacles of individuals in applying BLS as the fear of harming the victim, being ineffective, and taking responsibility [30]. This shows that periodic repetition and updating of BLS training will increase permanence. A study evaluating the attitudes of healthcare professionals towards initiating CPR revealed that as the number of BLS training increases, the BLS attitude scores of individuals increase and their concerns decrease [31]. Another study evaluating nurses' CPR skills shows that retraining improves knowledge and skills [32]. Evidence shows that periodic training is necessary even for professional healthcare professionals. In addition, updating and revising the BLS guides from time to time also necessitates repeating the BLS training.

Current knowledge levels about BLS may differ in healthcare professional groups with different work areas and responsibilities [33]. According to the results of this study, it is seen that the pre-test scores of nursing students are higher as professional members who interact with the patient more than physiotherapists and speech and language therapists. Although there is no statistically significant difference, it has been determined that SLT and physiotherapy students who do not have treatment and care obligations and who work with patients for a limited time have higher post-test scores compared to nursing students. It is considered that this situation is because the training scope is given at the same content and level in all departments and the use of interactive training methods. First aid is a compulsory course in the nursing program curriculum and an elective course in the physiotherapy and SLT programs. When considering the effect of the readiness principle on educational efficacy, it is natural to conclude that students who pick and are interested in the course are more successful.

Students who did not receive BLS training before and those who did not previously experience a situation BLS intervention was positively affected by the training. This shows that the awareness level of these students is higher. Those who turn this training into an opportunity are more positively affected by the result. In addition, it is more difficult for individuals to change and update previously known practices that were learned only at the psychomotor skill level. According to the results of this study, it was more difficult to update the knowledge of students who received first aid training before.

Limitations

One of the limitations of this study is the evaluation of students within the scope of a single university. In addition, this study focused on the cognitive levels of BLS practice, and practical skills were not evaluated. Another limitation of this study was that the BLS Knowledge scores were measured only one month after the training. Waiting longer than one month to evaluate the permanence of the training would have shown that the skills had passed to the psychomotor skill level. Reaching the end of the academic year would make it difficult to wait longer for the measurement. Another limitation is that a 12.1% group who had previously received BLS training was included in the study and was not positively affected by the training.

Table 3. Comparison of students' basic life support scores with socio-demographic data

Characteristics		BLS1 Mean±SD	BLS2 Mean±SD	BLS3 Mean±SD	X^2/p	Post-hoc*
Gender	Female	46.75±10.18	54.41±7.47	58.17±8.94	41.766/ **<0.001**	BLS2>BLS1 BLS3>BLS2 BLS3>BLS1
	Male	47.50±11.39	53.92±6.84	62.91±8.38	15.826/ **<0.001**	BLS3>BLS2 BLS3>BLS1
	t	-0.248	0.227	-1.698		
	p	0.805	0.821	0.094		
Department	Nursing	49.22±9.47	53.33±7.90	56.70±9.39	18.186/ **<0.001**	BLS2>BLS1 BLS3>BLS2 BLS3>BLS1
	Speech and Language Therapy	43.96±8.90	56.03±5.57	62.35±7.92	14.431/ **0.001**	BLS2>BLS1 BLS3>BLS2 BLS3>BLS1
	Physiotherapy	45.58±13.44	54.11±8.33	60.88±7.75	26.381/ **<0.001**	BLS2>BLS1 BLS3>BLS2 BLS3>BLS1
	f	2.533	1.206	3.055		
	p	0.085	0.304	0.053		
Previous BLS training	Yes	51.36±11.85	50.90±7.68	53.33±12.50	0.788/ 0.674	-
	No	46.25±10.01	54.81±7.22	59.69±8.22	56.689/ **<0.001**	BLS2>BLS1 BLS3>BLS2 BLS3>BLS1
	t	1.553	-1.668	-2.037		
	p	0.124	0.099	**0.045**		
Previously experienced a situation of BLS	Yes	45.89±8.05	52.67±7.26	57.08±7.79	19.358/ **<0.001**	BLS2>BLS1 BLS3>BLS2 BLS3>BLS1
	No	47.30±11.21	55.07±7.32	59.80±9.43	35.037/ **<0.001**	BLS2>BLS1 BLS3>BLS2 BLS3>BLS1
	t	-0.559	-1.447	-1.228		
	p	0.551	0.151	0.223		
Previously experienced BLS intervention	Yes	51.00±6.51	49.00±8.21	43.75±2.50	1.400/ <0.497	-
	No	44.78±8.04	53.47±6.97	59.75±5.25	26.225/ **<0.001**	BLS2>BLS1 BLS3>BLS2 BLS3>BLS1
	t	1.609	-1.263	-5.883		
	p	0.120	0.218	**<0.001**		

*t=Student's t-test in independent groups, f= One way ANOVA test, X^2= Friedman test, *Wilcoxon test, p<0.05 was considered significant, BLS1: Pre-test score, BLS2: Post-test score, BLS3: Retention test scores obtained one month after training.*

CONCLUSION

BLS training is beneficial for health sciences students, but the content of the training could be improved further. It is recommended that BLS training be included in the university curriculum, preferably for freshmen and with refreshment courses offered in subsequent years.

Due to the nature of BLS training, it requires urgent decision-making and implementation. In a crisis, knowledge, and skills are very difficult to remember and require systematic training with appropriate methodology and entertaining training methods that will attract the attention of university students. In addition, it is necessary to repeat the training to increase the permanence and to teach the relevant updates.

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