

## Do teachers know up-to-date basic life support? A field survey in Amasya

### Öğretmenler güncel temel yaşam desteğini biliyor mu? Amasya'da bir alan araştırması

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#### Abstract

**Purpose:** This study was aimed to determine teachers' knowledge levels about up to date Basic Life Support (BLS) in Amasya.

**Materials and methods:** 1,365 teachers in the province of Amasya constituted its sample. Data was collected using a questionnaire with 35 questions about the teachers' demographic information, attitudes towards BLS and knowledge about up-to-date BLS practices.

**Results:** The teachers' mean score on the BLS questionnaire was  $7.93 \pm 2.16$ . Their BLS knowledge levels were not associated with gender, age, education level or the number of years since their most recent BLS training ( $p > 0.05$ ). The ratios of teachers who knew emergency call numbers (98.4%), were able to evaluate respiration (80.6%), had the ability to maintain airway patency (66.9%) and knew the starting criteria for BLS (90.6%) were high. The ratio of teachers who knew the first assessment of process steps (4.5%) and maximum time that should be spent (23.7%), compression site (17.8%), the number of compressions and compression to respiration ratios (33.3%), depth of compression (37.6%), time for life-saving exhalation (8.0%), the number of compressions per minute (15.6%), and for civilian first aiders, knew how to use an automatic external defibrillator (AED) (24.2%) were low.

**Conclusion:** It has been observed that the teachers working in Amasya province have general knowledge about BLS (being able to evaluate breathing, knowing the starting criteria for BLS) but they do not have enough information about the details of the up to date BLS practices (the first BLS assessment process, knowing time for life-saving exhalation).

**Key words:** Basic life support, knowledge level, teacher.

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#### Özet

**Amaç:** Bu çalışma ile Amasya ilinde görev yapan öğretmenlerin güncel Temel Yaşam Desteği (TYD) uygulamaları hakkındaki bilgi düzeylerini belirlemek amaçlanmıştır.

**Gereç ve yöntem:** Örneklemi Amasya ilinde bulunan 1365 öğretmen oluşturdu. Veriler öğretmenlerin demografik bilgilerini, TYD'ye yönelik tutumlarını ve güncel TYD uygulama bilgilerini sorgulayan 35 soruluk form kullanılarak toplandı.

**Bulgular:** Öğretmenlerin TYD anketinde ortalama puanı  $7,93 \pm 2,16$  idi. TYD bilgi düzeyleri cinsiyet, yaş, eğitim düzeyi veya en son TYD eğitiminden bu yana geçen yıl sayısı ile ilişkili değildi ( $p > 0,05$ ). Acil çağrı merkezi numaralarını bilen (%98,4), solunumu değerlendirebilen (%80,6), hava yolu açıklığını sağlayabilen (%66,9), TYD'ye başlama kriterlerini bilen (%90,6) öğretmenlerin oranları yüksektir. TYD'de ilk değerlendirme işlem basamaklarını (%4,5) ve harcanması gereken maksimum süreyi (%23,7), kompresyon noktasını (%17,8), kompresyon sayısı ve solunum desteği oranını (%33,3), kompresyon derinliğini (%37,6), kurtarıcı soluk verme süresini (%8,0), bir dakikada uygulanması gereken kompresyon sayısını (%15,6), sivil ilkyardımcılar için otomatik eksternal defibrilatör (OED) kullanımını bilme oranlarının (%24,2) düşüktür.

**Sonuç:** Amasya ilinde görev yapan öğretmenlerin TYD konusunda genel bilgiye sahip oldukları (solunumu değerlendirebilme, TYD başlama kriterlerini bilme vb) fakat uygulamanın detayları (ilk değerlendirme işlem basamakları, kurtarıcı soluk verme süresini bilme) hakkında yeterince güncel bilgiye sahip olmadıkları görülmüştür.

**Anahtar kelimeler:** Temel yaşam desteği, bilgi düzeyi, öğretmen.

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## Introduction

Basic life support (BLS) includes medical practices such as cardiopulmonary resuscitation, restarting respiration and circulation, evaluating consciousness, maintaining airway patency, artificial respiration and cardiac massage [1]. BLS practices are known to increase survival and reduce possible disabilities. Not knowing up-to-date BLS or misunderstanding it increase mortality and morbidity rates. BLS practices before emergency department arrive increase survival rates in cases of out-of-hospital cardiac arrest [2]. School-aged children take part in life-threatening risky behaviors, and are frequently injured physically. Proper BLS from a bystander increases the chance of survival of cardiac arrest victims in public places such as schools [3]. As potential BLS providers, teachers should learn up-to-date BLS practices [4]. Determining knowledge level of individuals on BLS practices will prepare the ground to improve policies and practices to increase awareness about this issue. This study surveyed teachers at schools under the Amasya Provincial Directorate of National Education to determine their BLS knowledge.

## Materials and methods

### The type and purpose of the research

This study was conducted using the survey model. The survey method is a scientific approach that is used with larger groups of individuals to determine their characteristics, knowledge, opinions and attitudes regarding a fact or event [5].

### Study universe and sample

This study was conducted in schools under the Provincial Directorate of National Education of Amasya between July 2017-September 2017. Teachers at schools under the Amasya Provincial Directorate of National Education were the study universe. The universe of the research was composed of teachers working in the city center of Amasya. Sample selection was not performed, and 1.412 teachers who voluntarily agreed to participate in the study consisted the study sample. The final study was conducted with 1.365 participants since 57

questionnaires were unanswered or incomplete and thus excluded from the study.

### Inclusion criteria

Teachers who work in units that are not related with the health sciences were included in the study.

### Data collection tool

Data was collected by researchers using a questionnaire prepared after a review of the literature [6-8] and considering the AHA guidelines [4]. A multiple-choice questionnaire about sociodemographic characteristics and knowledge levels about BLS was applied to 25 individuals as a pilot test. Misunderstood and unclear parts were amended. The pilot test data were not included in the sample. The questionnaire has 35 questions in three sections: 8 questions about demographic and professional characteristics (gender, age, education level, years of work experience, branch, previous BLS training, etc.), 9 questions about attitudes and behaviors regarding BLS, and 18 questions about up-to-date BLS practices. These 18 questions were prepared to determine the participants' knowledge levels about BLS quantitatively. Each correct answer was scored as 1 point, and each incorrect answer was scored as zero. The highest possible score was 18 and the lowest was 0. Higher scores indicate more knowledge about BLS practices. This assessment method was based on several studies in the literature [8-10].

### Data collection

A protocol including the process and applicability of the research was signed by the Provincial Directorate of National Education. In accordance with the protocol, to provide necessary permissions of the relevant institutions, Governorship approval 47613789-44-E.5777400 was obtained. The Scientific Research and Publication Ethics Committee Amasya University gave consent was obtained. The objective, scope of the study and critical points to consider while filling out the questionnaires were e-mailed to the unit directors to ensure that the questionnaires would be filled out properly. The questionnaires were sent to

the schools, filled out and returned within two months. Declarations of voluntary participation were obtained by the administrative units of the schools. To increase its content validity, this study tried to reach a maximum number of participants, and data were collected from 1.365 participants. The questionnaire was prepared to be filled out in 15 minutes.

### **Statistical analysis**

SPSS 20 software was used to analyze the data as numbers, percentages, minimum and maximum values and means. The Mann-Whitney U test, Kruskal-Wallis variance analysis and the Bonferroni test were done. The threshold for significance was  $p < 0.05$ .

### **Results**

Of the 1.365 teachers included in the study, 57% were female, 90.8% were university graduates, and their mean age was  $39.45 \pm 8.87$  years. Of them, 90.8% were teachers of culture, and their mean work experience was  $15.70 \pm 9.34$  years. Of the teachers, 77.7% had never received BLS training. The mean time since their most recent BLS training was  $8.83 \pm 5.65$  years for the few teachers who had received BLS training. Of the participants who had received BLS training, 26.3% did so at seminars or congresses (Table 1) and 63.8% stated that they did not find the training sufficient (Table 2).

The teachers' mean BLS score was  $7.93 \pm 2.16$ . Their BLS knowledge levels were not associated with gender, age, education level or time since their most recent BLS training ( $p > 0.05$ ). The mean scores of the vocational course teachers ( $p = 0.000$ ) and the teachers who did not receive basic life support education ( $p = 0.000$ ) were higher. In addition, teachers who received basic life support education from publicly-supported courses ( $p = 0.007$ ) and who have 1-10 years of professional experience ( $p = 0.022$ ) were found to have higher level of knowledge (Table 1).

The teachers who had received BLS training did not find it sufficient for reasons such as short education time (69.5%), insufficient physical environment (49.4%) and lack of educational content (30.4%). Although the majority of the teachers thought that BLS training should be received by teachers (94.7%), only 79.7% indicated that they would like to receive BLS training. Only 14.5% of the teachers had encountered a situation that required BLS. The ratio of teachers who wanted to apply BLS techniques when necessary was very high (78.1%). It was found that the teachers hesitated to apply BLS for fear of harming patients (75.5%), being unsure about how to apply BLS (35.1%) or unwilling to take responsibility (32.4%). In addition, 62.5% of the teachers stated that even if they received BLS training they would hesitate to apply it (Table 2).

Of the teachers, 98.4% knew the national emergency call number, but only 18.2% correctly knew the sequence of steps after the emergency call. The majority of teachers knew correct information on recognizing signs of loss of consciousness (92.5%), BLS starting criteria (90.6%) and assessing respiration (80.6%). However, it was determined that they had insufficient knowledge about ranking the first assessment steps of the case (4.5%) and assessment time (23.7%). Although the ratio of individuals who knew how to provide airway patency for the person requiring BLS (66.9%) was high, the ratio of teachers who knew the respiration time (8%) was low. More than half of the teachers (62.3%) knew how long BLS can be maintained. On the other hand, correct answers on the depth, the number and the site of chest compression were 37.6%, 15.6% and 17.8%, respectively. Of the teachers, 64.7% were aware that chest compression is sufficient to maintain circulation when respiration support is not possible. The low number of teachers who knew that automatic external defibrillators can be used by civilian first aiders (24.2%) was one of the remarkable findings of the study (Figure 1).

**Table 1.** The teachers' personal characteristics, BLS experience and mean BLS scores.

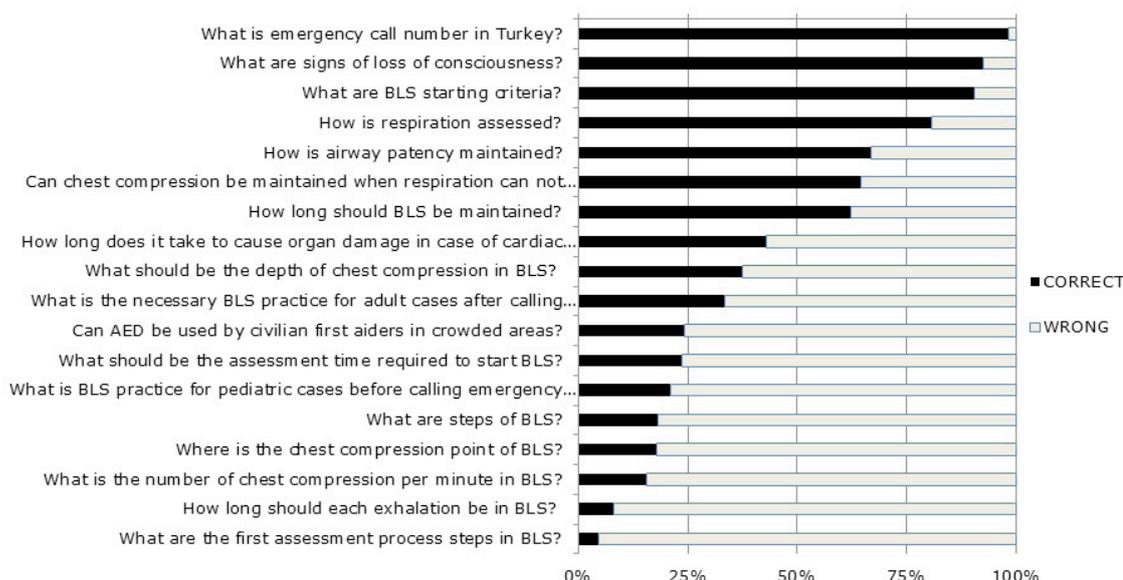
Descriptive Characteristics	Category	n	%	Min-Max	Mean ± SD	p
<b>Gender</b>	Female	778	57.0	0-15	7.93±2.10	0.748*
	Male	587	43.0	1-15	7.96±2.17	
<b>Age</b>	23-33	391	28.6	1-15	8.08±2.12	0.395**
	34-44	577	42.3	3-15	7.96±2.06	
	45 or older	397	29.1	0-14	7.77±2.23	
<b>Mean age (years)</b>				23-64	39.45±8.87	-
<b>Education Level</b>	University	1240	90.8	0-15	7.95±2.14	0.965*
	Graduate education	125	9.2	1-14	7.87±2.02	
<b>Branch</b>	Culture Teacher	1239	90.8	0-15	7.88±2.13	0.000**
	Vocational Course Teacher	126	9.2	4-14	8.58±1.96	
<b>Professional experience (years)</b>	1-10	474	34.7	1-15	8.14±2.13	0.022**
	11-20	507	37.1	4-15	7.82±2.11	
	At least 21 years	384	28.2	0-14	7.78±2.24	
<b>Mean professional experience (years)</b>				1-60	15.70±9.34	-
<b>Prior BLS Training</b>	Yes	304	22.3	1-15	7.62±2.02	0.000*
	No	1061	77.7	0-15	8.03±2.15	
<b>Time since most recent BLS training (years)</b>	1-5	83	27.3	2-15	7.75±2.20	0.593**
	6-10	148	48.7	1-12	7.65±1.90	
	At least 11 years	73	24.0	1-14	7.44±2.09	
<b>Mean time since most recent BLS training</b>		1.365	100	1-37	8.83±5.65	-
<b>Place of BLS training</b>	Private course	51	16.7	4-15	7.96±2.09	0.007**
		63	20.7	5-14	8.25±1.85	
	Publicly-supported course	71	23.3	4-12	7.63±1.88	
	School of employment	119	39.1	1-15	7.92±2.16	
	Other (education without practice)					
<b>BLS mean scores</b>		1.365	100	0-15	7.93±2.16	-

\*Mann-Whitney U test, \*\*Kruskal-Wallis Test. BLS: Basic Life Support.

**Table 2.** Teachers' attitudes and behaviors regarding BLS.

Descriptive Characteristics	Category	n	%
<b>Do you find your BLS training sufficient?</b>	Yes	110	36.2
	No	194	63.8
<b>Total</b>		<b>304</b>	<b>100</b>
<b>*How was the training insufficient?</b>	It was short	135	69.5
	The physical environment was not sufficient	96	49.4
	The content was not sufficient	59	30.4
	It was not interactive	54	27.8
	The educators did not know the subject well	24	12.3
	The language was unclear	19	9.7
	It was boring	17	8.7
	It was too detailed	15	7.7
<b>Do you think BLS training is necessary for teachers?</b>	Yes	1.292	94.7
	No	73	5.3
<b>Do you want to receive BLS training?</b>	Yes	1.088	79.7
	No	277	20.3
<b>Have you ever needed to use BLS?</b>	Yes	198	14.5
	No	1.167	85.5
<b>Have you ever used BLS?</b>	Yes	138	10.1
	No	1.227	89.9
<b>Do you want to learn BLS and apply it in necessary situations?</b>	Yes	1.066	78.1
	No	299	21.9
<b>*Why would you hesitate to learn BLS and use it when necessary?</b>	Fear of harming the patient	226	75.5
	Not knowing how to do BLS	105	35.1
	Unwilling to take responsibility	97	32.4
	Fear of infection transmission	25	8.3
<b>Would you still hesitate to use BLS after BLS training?</b>	Yes	853	62.5
	No	512	37.5
<b>Total</b>		<b>1.365</b>	<b>100</b>

\*Multiple answers were given. BLS: Basic Life Support.



**Figure 1.** Distribution of answers of individuals for BLS practices.

## Discussion

BLS is the most important way to sustain the lives of out-of-hospital cardiac arrest cases until the arrival of emergency department. It is important for teachers to have sufficient knowledge about BLS to reduce mortality and morbidity rates. The teachers' low knowledge levels about BLS practices were not sufficient in this study, but at in low or medium levels like other study findings in the literature [6, 8, 11-17]. BLS trainings should be provided to teachers in schools on a regular basis in an applied way [18, 19]. With the recommendation of the American Heart Association, BLS practices were included in school curricula to train all teachers and students in BLS, particularly in advanced countries [20]. Although regular BLS training is effective and necessary [21-22] individuals may also have inaccurate information regarding BLS [23]. Studies of this subject have found that knowledge levels about BLS should be improved by forward-looking studies and updates [10, 24-26].

In this study, a majority of the teachers wanted to learn up-to-date BLS practices in this study, which is similar to other findings in the literature [11, 15, 16, 27]. This may indicate that there are no regular publicly supported courses. The higher mean scores of the teachers who received BSL training from publicly supported courses confirms this finding. Our study found that even a high majority of teachers who had received BLS training may refrain from practicing BLS. This may be due to: fear of harming patients, not knowing how to apply BLS and being unwilling to take responsibility. Other studies have found similar reasons for not applying BLS [8-11, 28, 29]. A possible reason for not taking responsibility the possibility of being unable to put BLS knowledge into practice. Therefore, after providing up-to-date theoretical information, it is important to combine practice with simulation scenarios to show individuals how to managing similar cases. This kind of training will also increase self-efficacy.

It was determined that the knowledge scores of the teachers who had not ever received BLS training were higher. This interesting result may be associated with the facts that only one-fifth of the teachers had received BLS training, that their BLS training did not include up-to-date information, or that the teachers did not keep

up the changes in BLS guidelines. There are different research findings in the literature. Unlike our findings, it has been found that individuals who attended a life support course gave correct answers to questions about theoretical information [7, 9, 14] but there are also studies indicating that individuals who received prior training also have low knowledge levels [30, 31]. Another study of this issue found that knowledge scores of teachers who had received BLS training were higher than those of the teachers who had not [16]. There are also studies stating that individuals who received BLS training more recently have higher scores [10, 32]. In this study, almost nine years had passed since the teachers' most recent BLS training. Therefore, in addition to the importance of training, time since the last training and updated training content are also considered to affect BLS knowledge levels.

The BLS knowledge scores of the teachers who had worked less than 10 years were higher than those of the teachers who had worked more than 10 years in the profession. Like our study, Sönmez et al. [14] found that as professional experience increases, BLS knowledge scores fell. Patsaki et al. [9] also found a negative correlation between years of professional experience and BLS knowledge levels. Another study found no significant correlation between years of professional experience and up-to-date BLS knowledge [33]. This supports our finding that BLS knowledge levels fall increases along with years of work experience. Thus, older and more experienced employees should be directed towards in-service education.

It was determined that more than half of the teachers did not know the sequences in the first BLS assessment and required time for BLS, BLS steps, respiration period, compression site, depth and the number of compressions. Our findings are similar to those of previous studies [6, 14, 16, 33-35]. The literature indicates that teachers do not update their knowledge about providing heart massage and respiration support and these rates are confused with the rates in the previous guidelines. However, a study conducted in Norway where BLS training is compulsory in the academic calendar determined that a majority of the participants knew basic information on BLS such as heart massage and respiration support [11, 36].

Providing routine education within a determined curriculum will be helpful to keep information up-to-date. Like our study, Juha and Sihvonen found that participants have high levels of knowledge about calling for emergency aid, evaluating respiration and providing airway patency, but low levels of knowledge about the site for chest compression, depth of compression, the rate of compression and respiration support, and exhalation period [37].

Automatic external defibrillators (AEDs) have been associated with an increase in survival after out-of-hospital cardiac arrest [38]. AED has significant place in BLS practices to stop ventricular fibrillation and regulate heart functions. Although the ratio of individuals who know the purpose of the AED use in cardiac arrest cases is high, in case of necessity, the ratio of individuals who state they would use an AED was lower [36]. A study of teachers' attitudes toward AED use in Japan found that the number of Japanese individuals who are familiar with the concept of AEDs was very high [39]. In our study, almost one-fourth of the teachers knew that AEDs can be found in crowded areas and used by civilian first aiders if BLS is required. Çelikli et al. [33] found that a majority of participants saw AEDs as equipment that can only be used by doctors. These results indicate that individuals do not have sufficient awareness about the significance and function of AEDs. Society and all first aiders should be educated regarding the use of AEDs [40]. Courses on AED use should emphasize awareness about the benefits of early defibrillation and minimal risks to rescuers for laypersons in out-of-hospital settings.

To conclude, this study suggests that the teachers in do not have sufficiently updated information about BLS practices, and this should be improved. In spite of this, they also have positive attitudes. Although a majority of teachers want to receive BLS training, due to their low levels of knowledge, BLS training should be included in in-service education particularly in the publicly sector. In addition to theoretical education, applied training with emergency case scenarios should be provided. This combination will also reduce teachers' hesitance to apply BLS. And also providing routine education within a determined curriculum will be helpful to keep information up-to-date. Therefore, we

believe that school administrators should take on the responsibility.

### Study limitations

This study has several limitations. Only volunteer teachers were included in the search. There is no scale with validity and reliability to measure the BLS knowledge level.

**Conflict of interest:** No conflict of interest was declared by the authors.

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