



# Knowledge Level of Residents of A Tertiary Care Center in Somalia Regarding Adult Life Support

## Somali'de Üçüncü Düzey Sağlık Kuruluşunda Çalışan Asistan Doktorların Temel Yaşam Desteği Hakkındaki Bilgi Düzeyi

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### Abstract

**Aim:** This study aimed to assess the knowledge level of resident doctors in clinics at the Somalia Mogadishu Turkey Recep Tayyip Erdoğan Training and Research Hospital concerning basic life support (BLS) and advanced life support (ALS).

**Material and Method:** A total of 102 residents, actively engaged in the clinical practice, voluntarily participated in the study. Participants completed a questionnaire encompassing demographic data and 34 objective questions measuring knowledge levels about BLS and ALS. The questionnaire responses were analyzed, comparing the results across different clinics.

**Results:** Among the 102 participants, 84 were male and 18 were female resident doctors. Age distribution analysis revealed that 58 participants were aged between 26 and 30 years or older. Most of the resident doctors (n=10) were working in emergency medicine and gynecology (n=10). Regarding professional experience, the highest proportion (n=36) had less than one year of work experience. Statistical analyses revealed no significant differences in correct answers between female and male residents (p=0.58, p=0.34), between medical and surgical departments (p=0.31, p=0.34), or based on years of professional experience (p=0.69, p=0.65).

**Conclusions:** Periodic informative training on adult life support should be provided to all resident doctors. This approach will substantially enhance knowledge levels and service quality in applying adult life support.

**Keywords:** Advanced life support, basic life support, cardiac arrest

### Öz

**Amaç:** Bu çalışmada Somali Mogadişu Türkiye Recep Tayyip Erdoğan Eğitim ve Araştırma Hastanesi kliniklerinde asistan hekimlerin temel yaşam desteği (BLS) ve ileri yaşam desteği (ALS) konusundaki bilgi düzeylerinin değerlendirilmesi amaçlandı.

**Gereç ve Yöntem:** Çalışmaya klinikte aktif olarak görev yapan toplam 102 asistan gönüllü olarak katılmıştır. Katılımcılar, BLS ve ALS ile ilgili bilgi düzeylerini ölçen, demografik verileri ve 34 objektif soruyu içeren anketi doldurdu. Anket yanıtları, farklı kliniklerdeki sonuçlar karşılaştırılarak analiz edildi.

**Bulgular:** 102 katılımcının 84'ü erkek, 18'i kadın asistan doktordu. Yaş dağılımı analizi, 58 katılımcının 26 ila 30 yaş veya üzerinde olduğunu ortaya çıkardı. Asistan doktorların çoğunluğunun (n=10) acil tıp ve jinekoloji (n=10) branşlarında görev yaptığı belirlendi. Mesleki deneyime bakıldığında en yüksek oranın (n=36) bir yıldan az iş tecrübesine sahip olduğu görülmektedir. İstatistiksel analizler, kadın ve erkek asistanlar arasında (p=0,58; p=0,34), tıbbi ve cerrahi departmanlar arasında (p=0,31; p=0,34) veya mesleki deneyim yıllarına göre doğru yanıtlar arasında anlamlı bir fark olmadığını ortaya çıkardı. (p=0,69; p=0,65).

**Sonuç:** Tüm asistan doktorlara yetişkin yaşam desteği konusunda periyodik bilgilendirme eğitimleri verilmelidir. Bu yaklaşım, yetişkin yaşam desteğinin uygulanmasında bilgi düzeyini ve hizmet kalitesini önemli ölçüde artıracaktır.

**Anahtar Kelimeler:** İleri yaşam desteği, temel yaşam desteği, kardiyak arrest



## INTRODUCTION

Sudden cardiac arrest stands as the foremost cause of global mortality. Prompt diagnosis and proficient cardiopulmonary resuscitation (CPR) are pivotal for patient survival. The American Heart Association (AHA) and the European Society of Cardiology (ESC) periodically release updated guidelines to optimize CPR effectiveness. All physicians, regardless of specialty, are expected to possess sufficient knowledge and skills in CPR. Demonstrated standardized approaches have proven effective in diminishing morbidity and mortality associated with sudden cardiac arrest.<sup>[1]</sup>

Effective CPR ensures adequate cerebral and coronary perfusion and enhances neurological survival in patients. Despite the introduction of novel techniques and technological advancements, the importance of effective CPR in patient survival persists.<sup>[2]</sup>

For patients in cardiac arrest, a series of interventions is imperative, including recognizing the arrest, ensuring the readiness of the emergency response team, administering early CPR, prompt defibrillation, and effectively applying advanced life support (ALS) alongside subsequent intensive care support. Basic life support (BLS) represents a globally standardized intervention that relies solely on human resources without requiring technological support. The correct application of essential techniques and maneuvers is crucial. Timely and effective BLS was shown to increase survival rates two to fourfold.<sup>[3]</sup>

In contrast to BLS, ALS involves interventional procedures such as intravenous fluids, drug administration, and intubation. The ALS is practiced by physicians and healthcare professionals, incorporating most BLS techniques. Technical applications related to both BLS and ALS vary across countries due to differences in geographical location, cultural considerations, and economic factors.<sup>[4]</sup>

The European Resuscitation Council (ERC) emphasizes the propensity for technical skills related to CPR, BLS, and ALS to wane between three and six months, underscoring the need for ongoing training. The CPR performance is particularly expected to improve post-training.<sup>[5]</sup>

The American Heart Association first published ALS guidelines in 1974, subsequently updating them at intervals to enhance practitioner knowledge and skills. The treatment approaches outlined in these guidelines for cardiac arrest and other life-threatening emergencies serve as the gold standard. The most recent ALS guidelines from the AHA, updated based on decisions from the 2010 International Liaison Committee (ILCOR) Consensus on Science and Treatment Recommendations (CoSTR) include a section on education and practice to enhance resuscitation quality and subsequent patient care.<sup>[6]</sup> International resuscitation committees recommend ALS training every two years.<sup>[7]</sup>

In light of this, our study aims to assess the knowledge levels of resident doctors regarding BLS and ALS.

## MATERIAL AND METHOD

The study was carried out with the permission of Recep Tayyip Erdogan Training and Research Hospital Ethics Committee in Mogadishu, Somalia (Date: 07.02.2022, Decision No: 473).

The study was conducted at Recep Tayyip Erdogan Training and Research Hospital in Mogadishu, Somalia. They were included in the study after obtaining an informed consent form from the participants. The prepared survey form was sent to all assistant physicians actively working in the hospital where the study was conducted via e-mail and mobile phone. The assistants' e-mail and mobile phone information were obtained from the institution, and assistants with incomplete or incorrect information were not included in the study. Again, assistants who did not want to participate were excluded from the study. Finally, a total of 102 residents, actively engaged in the clinical practice, voluntarily participated in the study. Participants completed a questionnaire encompassing demographic data and 34 objective questions measuring knowledge levels about BLS and ALS. The questionnaire was based on the 2021 guidelines of the European Resuscitation Council, and demographic data were also examined.

### Statistical Analysis

Survey results were compiled, and the normality of data distribution was assessed by histograms, q-q plots, and the Shapiro-Wilk test. Variance homogeneity was tested using the Levene test. Continuous variables were compared for group differences using an independent sample t-test. On the other hand, a one-way variance analysis (ANOVA) was employed to compare group differences involving two or more groups. For repeated binary measurement comparisons of quantitative variables, a paired t-test was utilized. The analysis was performed using R 4.3.2 ([www.r-project.org](http://www.r-project.org)) software, and a p-value less than 5% was considered statistically significant.

## RESULTS

In this observational study, encompassing 102 residents, we analyzed questionnaire results to assess their knowledge and experience regarding BLS and ALS. Most participants fell within the 26-30 age range, constituting 56.9% (n=58) of the study population. Male residents accounted for 82.4% (n=84). In comparison, female residents comprised 17.6% (n=18) of the study participants. Predominant specialization areas included emergency medicine at 9.8% (n=10) and gynecology at 9.8% (n=10). Regarding professional experience, the highest proportion (35.3%; n=36) had less than one year of work experience. Approximately 54% (n=55) received ALS training during medical school. While 26.5% (n=27) had never read any guidelines on ALS, 24.5% (n=25) read the ERC 2021 guidelines, 28.4% (n=29) read the AHA 2020 guidelines, and 20.6% (n=21) consulted guidelines published before 2020. The highest frequency of performing ALS occurred once a month, with 29.4% (n=30) reporting such frequency. Answers to three critical questions from the questionnaire are detailed in **Table 1**, and demographic data and survey results are presented in **Table 2**.

**Table 1. Answers Given to Three Critical Questions Included in the Questionnaire**

Question	Yes	No
Do you think that all physicians should have knowledge and skills about adult life support?	67.6% (n=69)	32.4% (n=33)
If necessary can you effectively implement adult life support?	65.7% (n=67)	34.3% (n=35)
Do you think repeating adult life support trainings would be beneficial for physicians?	95.1% (n=97)	4.9% (n=5)

**Table 2. Demographic data of the study participants**

	Frequency/ Percentage
Age ranges	
20-25	18 (17.6%)
25-30	58 (56.9%)
30-35	26 (25.5%)
Gender	
Male	84 (82.4%)
Female	18 (17.6%)
Duty unit	
Emergency Medicine	10
Obstetrics	10 (9.8%)
Anesthesiology	9 (8.8%)
General surgery	9 (8.8%)
Internal medicine	8 (7.8%)
Orthopedics	8 (7.8%)
Radiology	7 (6.9%)
Neurology	5 (4.9%)
Pulmonary disease	5 (4.9%)
Ophthalmology	5 (4.9%)
Neurosurgery	4 (3.9%)
Cardiovascular surgery	4 (3.9%)
Infectious diseases	4 (3.9%)
Urology	4 (3.9%)
Cardiology	3 (2.9%)
Thoracic surgery	2 (2%)
Otolaryngology	2 (2%)
Dermatology	2 (2%)
Psychiatry	1 (1%)
Duty period	
<1 year	36 (25.3%)
1-3 years	19 (18.6%)
3-4 years	29 (28.4%)
>4 years	18 (17.6%)
Most recent Adult Life Support training	
Never	14 (13.7%)
At faculty	55 (53.9%)
After faculty	33 (32.4%)
Most recent Adult Life Support guideline reading	
Never	27 (26.5%)
ERC 2021	25 (24.5%)
AHA 2020	29 (28.4%)
Published before 2020	21 (20.6%)
Frequency of ALS performance	
Never	18 (17.6%)
Daily	18 (17.6%)
Often (Every week)	13 (12.7%)
Not often (once a month)	30 (29.4%)
Once a year	23 (22.5%)

In the analysis of true/false survey questions related to BLS, correct response rates were high for crucial aspects such as ensuring safety (86.3%, n=88), activating Emergency Medical Services (EMS) when alone with an adult patient before starting CPR (81.4%, n=83), alternating between providing 30 compressions and 2 rescue breaths (93.2%, n=95), continuing CPR if no shock is advised by an automated external defibrillator (AED) or in the absence of AED (88.2%, n=90), and placing an unresponsive patient with an abnormal breathing pattern in the recovery position (71.6%, n=73). These results are summarized in **Table 3**.

**Table 3. Responses given to true/false questions regarding BLS and ALS**

Basic life support	Frequency/ Percentage	
	True	False
Make sure you, the victim and any bystanders are safe.	88 (86.3%)	14 (13.7%)
Open the airway; in trauma patients you can use head-tilt chin-lift maneura.	33 (32.4%)	69 (67.6%)
Look, listen and feel for breathing for no more than 5 seconds.	26 (25.5%)	76 (74.5%)
If alone with an adult patient, activate the EMS first and then start CPR.	83 (81.4%)	19 (18.6%)
If alone with an adult patient, leave the victim to get an AED if available.	79 (75.5%)	23 (22.5%)
Compress to a depth of at least 5 cm but not more than 6 cm.	68 (66.7%)	34 (33.3%)
Compress the chest at a rate of 120-130 min.	58 (56.9%)	44 (43.1%)
Alternate between providing 30 compressions and 2 rescue breaths.	95 (93.1%)	7 (6.9%)
The AED will advise a shock for all cardiac arrest patients.	59 (57.8%)	43 (42.2%)
If no shock advised by AED or, if no AED available continue CPR.	90 (88.2%)	12 (11.8%)
Don't interrupt resuscitation until, the victim is definitely waking up, moving, opening eyes and breathing normally.	60 (58.8%)	42 (41.2%)
If the patient unresponsive and breath anormally, place in the recovery position.	29 (28.4%)	73 (71.6%)
<b>Advanced life support</b>		
If patient unresponsive with absent or abnormal breathing, start CPR 30:2 and attach defibrillator.	78 (76.5%)	24 (23.5%)
Use a basic or advanced airway technique-onlr rescuers with a high success should use tracheal intubation.	81 (79.4%)	21 (20.6%)
Give the low-flow oxygen during CPR.	72 (70.6%)	30 (29.4%)
Immediately resume chest compressions at non-shockable rhtyms.	84 (82.4%)	18 (17.6%)
Use adrenalin early for non-shockable cardiac arrest.	87 (85.3%)	15 (14.7%)
During CPR give 1 mg IV adrenalin every 5-10 min.	41 (40.2%)	61 (59.8%)
pVT and PEA are shockable rhtyms.	43 (42.2%)	59 (57.8%)
For biphasic waveforms, deliver the first shock with an energy of at least 150 J.	72 (70.6%)	30 (29.4%)
Assess rhtym after giving shock, than start CPR.	31 (30.4%)	71 (69.6%)
Give 300 mg IV amiodarone after 2 shocks.	38 (37.3%)	64 (62.7%)
IO access if attempts at IV access are unsuccessful or IV access is not feasible	89 (87.3%)	13 (12.7%)
Stop CPR if the patient has not recovered after 15 minutes of resuscitation.	68 (66.7%)	34 (33.3%)

AED:Automated external defibrillator, ALS: Advanced life support, BLS: Basic life support, CPR: Cardiopulmoner resusitasyon, EMS: Emergency Medical, IO: Consider intraosseous, PEA: Pulseless electrical activity, pVT: Pulseless ventricular tachycardia

In the analysis of true/false survey questions related to ALS, correct response rates were observed for aspects such as immediately resuming chest compressions at non-shockable rhythms (82.4%, n=84), using adrenaline early for non-shockable cardiac arrest (85.3%, n=87), and considering intraosseous (IO) access if attempts at IV access are unsuccessful or IV access is not feasible (87.3%, n=89). However, 67.2% (n=64) incorrectly answered the question regarding administering 300 mg IV amiodarone after 2 shocks. It was thought that the incorrect answer rate was so high because participants did not have enough information about the use of amiodarone recommended in the guideline or they did not read and understood the question carefully enough. These results are also summarized in **Table 3**.

Statistical analyses revealed no significant differences in correct answers between female and male residents ( $p=0.58$ ,  $p=0.34$ ), between medical and surgical departments ( $p=0.31$ ,  $p=0.48$ ), or based on years of professional experience ( $p=0.69$ ,  $p=0.37$ ). Additionally, the frequency of reading and complying with Adult Life Support guidelines did not significantly impact correct answers related to BLS and ALS questions ( $p=0.38$ ,  $p=0.99$ ,  $p=0.60$ ,  $p=0.93$ ) (**Table 4**).

## DISCUSSION

Basic life support and ALS are integral practices that all physicians should be acquainted with during their primary medical education. Regular training intervals are essential to staying abreast of innovations and maintaining proficiency in these practices. This cross-sectional observational survey, conducted at a single center, aimed to measure residents' knowledge regarding adult life support. The study included 102 resident doctors, with a higher representation of male residents. The mean age and gender distribution were comparable to findings in other studies in the literature.<sup>[8]</sup>

While some studies reported that male healthcare workers exhibited more correct responses to questions measuring the knowledge of resident physicians about current guidelines regarding adult life support, we did not find a significant difference between genders in our study.<sup>[9]</sup> It is thought that due to the unbalanced ratio of male and female participants in our study, different results were obtained from the literature.

Do you think that all physicians should have knowledge and skills about adult life support? The majority answered yes to the question. In a study, they suggest that all doctors should be effectively informed about adult life support in order to save the patient.<sup>[10]</sup> If necessary can you effectively implement Adult Life Support? We received a majority yes answer to the question. A study has shown that doctors can effectively provide adult life support.<sup>[11]</sup> Do you think repeating Adult Life Support training would be beneficial for physicians? The majority said yes to the question. In a survey conducted on adult life support, it was observed that doctors who received repeated training were more successful.<sup>[12]</sup>

**Table 4. Comparisons of gender, department, duration, reading and application frequency regarding BLS and ALS**

		BLS		ALS	
<b>Gender</b>					
Female	Correct	8.22±1.48	$P=0.58$	Correct	7.33±1.75
	Incorrect	3.78±1.48		Incorrect	4.67±1.75
Male	Correct	7.98±1.79	$P=0.34$	Correct	7.76±1.73
	Incorrect	4.02±1.79		Incorrect	4.24±1.73
<b>Department</b>					
Medical	Correct	7.82±1.70	$P=0.31$	Correct	7.82±1.71
	Incorrect	4.18±1.70		Incorrect	4.18±1.71
Surgical	Correct	8.18±1.76	$P=0.48$	Correct	7.58±1.76
	Incorrect	3.82±1.76		Incorrect	4.42±1.76
<b>Working period (Years)</b>					
<1	Correct	7.83±1.52	$P=0.69$	Correct	7.78±1.61
	Incorrect	4.17±1.52		Incorrect	4.22±1.61
1-3	Correct	8.42±1.80	$P=0.37$	Correct	8.11±1.56
	Incorrect	3.58±1.80		Incorrect	3.89±1.56
3-4	Correct	7.97±1.97	$P=0.37$	Correct	7.24±1.96
	Incorrect	4.03±1.97		Incorrect	4.76±1.96
>3	Correct	8.06±1.73	$P=0.37$	Correct	7.78±1.77
	Incorrect	3.94±1.73		Incorrect	4.22±1.77
<b>ALS guideline</b>					
Never	Correct	8.07±1.80	$P=0.99$	Correct	7.70±1.77
	Incorrect	3.93±1.80		Incorrect	4.30±1.77
ERC2021	Correct	8.36±1.82	$P=0.38$	Correct	7.72±1.70
	Incorrect	3.64±1.82		Incorrect	4.28±1.70
AHA2020	Correct	8.07±1.73	$P=0.99$	Correct	7.69±1.77
	Incorrect	3.93±1.73		Incorrect	4.31±1.77
Before2020	Correct	7.48±1.54	$P=0.99$	Correct	7.62±1.80
	Incorrect	4.52±1.54		Incorrect	4.38±1.80
<b>ALS performing</b>					
Never	Correct	8.22±1.66	$P=0.60$	Correct	7.78±1.70
	Incorrect	3.78±1.66		Incorrect	4.22±1.70
Daily	Correct	8.50±1.82	$P=0.93$	Correct	7.50±2.07
	Incorrect	3.50±1.82		Incorrect	4.50±2.07
Often	Correct	7.92±1.80	$P=0.93$	Correct	7.92±1.93
	Incorrect	4.08±1.80		Incorrect	4.08±1.93
Not often	Correct	7.93±1.70	$P=0.93$	Correct	7.53±1.63
	Incorrect	4.07±1.70		Incorrect	4.47±1.63
Once a year	Correct	7.65±1.77	$P=0.93$	Correct	7.83±1.61
	Incorrect	4.35±1.77		Incorrect	4.17±1.61

ALS: Advanced life support, BLS: Basic life support

In a multicenter study assessing the knowledge level of CPR, BLS, and ALS among European healthcare workers, it was observed that Emergency Medicine Department and ICU workers had a better knowledge level than other departments. However, in our study, the knowledge level was similar between departments. Since the knowledge level comparison in our study was made between internal and surgical departments, it is thought that different results were obtained from the literature. Similarly, while other studies reported that the knowledge level increased with increasing professional experience, we did not find a significant difference in our study concerning years of work experience.<sup>[13,14]</sup> Again, the lack of difference in knowledge levels according to years of experience in our study may be related to the small number of participants and the fact that the groups did not include equal numbers of participants.

The practice of adult life support has a longstanding history, and current guidelines on the subject have been available for years. Some studies suggest a decline in the knowledge and skills of healthcare professionals six months after initial adult life support training, resulting in a lack of training frequency and manual reading.<sup>[9]</sup> In another study, it was observed that the knowledge and skills of healthcare professionals regarding adult life support decreased when they did not receive repeated training within 6 months to 1 year, and their knowledge levels remained good with repeated training throughout their working lives.<sup>[12]</sup> In contrast, contrary to existing literature, our study did not find a significant difference between the frequency of guideline reading and knowledge level in answering survey questions.

Although the frequency of reading guides of the assistant doctors who participated in our study was not sufficient, it is seen that their level of knowledge about adult life support is praiseworthy. When we look at other studies in the literature, it is clear the importance of continuous training and awareness initiatives to ensure that healthcare professionals maintain their competence in life support applications throughout their careers.

## CONCLUSION

Our study indicates a commendable theoretical knowledge level among resident doctors regarding adult life support. Residents demonstrate robust theoretical knowledge even in departments where this practice is only occasionally performed. However, it is evident that our residents, particularly those in high patient-density departments with heavy workloads, need help keeping up with current guidelines due to time constraints.

The recommended periodic reading of current guidelines may need to be consistently followed. To address this issue, we propose the mandatory repetition of adult life support training at regular intervals, ideally integrated into the curriculum every two years during the residency training process. This approach is anticipated to elevate knowledge levels, facilitate adherence to current guidelines, and enhance the self-confidence of our residents in practical applications.

The most important limitations of our study are that it is a single-center study, the number of participants is small, and the participant groups are not homogeneous.

## ETHICAL DECLARATIONS

**Ethics Committee Approval:** The study was carried out with the permission of Recep Tayyip Erdogan Training and Research Hospital Ethics Committee in Mogadishu, Somalia (Date: 07.02.2022, Decision No: 473).

**Informed Consent:** All patients signed the free and informed consent form.

**Referee Evaluation Process:** Externally peer-reviewed.

**Conflict of Interest Statement:** The authors have no conflicts of interest to declare.

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**Author Contributions:** All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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