

Knowledge of Adult Life Support Among Nurses at a Tertiary Hospital in Somalia

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Abstract

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

Materials and Methods: A questionnaire comprising 10 questions related to demographic data and 24 objective questions assessing knowledge about BLS and ALS was administered to 104 nurses working in the hospital's clinics. The questionnaire responses were analyzed, and the results were compared across different clinics.

Results: Among the 104 participants, 48 were male and 56 were female nurses. The age distribution analysis revealed that 58 participants were aged between 26 and 30 years or older. Most (n=30) nurses were stationed in the intensive care unit. Participants with over 4 years of professional experience constituted the largest group. Female nurses demonstrated higher accuracy in survey responses than their male counterparts. The emergency medicine department yielded the highest number of correct answers based on the services provided. Significant correlations were identified between years of professional experience and correct answers to ALS questions. A noteworthy difference surfaced between the ability to effectively implement adult life support and accurate responses to the BLS survey questions.

Conclusion: Periodic informative training on adult life support should be provided to all nurses. In particular, nurses working in critical departments should be afforded opportunities to familiarize themselves with new guidelines through periodic reviews. This approach will substantially enhance knowledge levels and service quality in the application of adult life support.

Keywords: Advanced life support, basic life support, cardiopulmonary resuscitation

Introduction

Timely and efficient cardiopulmonary resuscitation (CPR) performed by healthcare professionals plays a pivotal role in the survival of individuals experiencing cardiopulmonary arrest. Despite the low overall survival rates in such situations, the prompt application of effective CPR and defibrillation significantly enhances the likelihood of survival. Basic life support (BLS) is a critical link in the survival chain and constitutes a fundamental aspect of healthcare professional training.

In the United States (US), BLS training has been recommended for all healthcare professionals since 1966, particularly those involved in resuscitation efforts. Conversely, in developing nations like Nepal, BLS is optional in training programs. However,

promoting BLS knowledge within communities is crucial for saving lives and enhancing the overall quality of life. Recent BLS guidelines address shortcomings and errors in prehospital and in-hospital CPR, motivating healthcare professionals to enhance their skills (1).

BLS is vital until the patient receives appropriate medical care. Nurses and emergency medical technicians are the primary providers of BLS. Advanced life support (ALS) involves advanced techniques such as intravenous (IV) fluids, medication administration, intubation, and efforts to restore airway patency, breathing, and circulation.

ALS is typically practiced by nurses and physicians, and while the techniques used for ALS and BLS overlap, the associated



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concepts may vary across countries. The diversity in ALS and BLS concepts, coupled with variations in prehospital care due to political, geographical, cultural, and economic factors, has led to controversies in research outcomes (2).

Despite the constant emphasis on the importance of BLS, post-training studies reveal challenges in acquiring related skills. Feedback from training sessions indicates that only 1.7% of rescue breaths and 3.5% of chest compression are correctly performed. Understanding ventilation training proves challenging, and a decline in the comprehension of BLS concepts, CPR, and ventilation occurs as early as 2 weeks post-training, reaching pre-training levels within 1-2 years (3).

In the realm of ALS, guidelines were initially established in 1974 by the American Heart Association (AHA) to enhance post-cardiac arrest survival rates and improve the knowledge and skills of healthcare practitioners. Subsequent revisions, aligned with decisions from the 2010 International Liaison Committee, Consensus on Science and Treatment Recommendations (CoSTR), are recognized as the gold standard for managing cardiac arrest and other life-threatening emergencies. The CoSTR emphasizes education's role in enhancing resuscitation quality and post-cardiac arrest care. Globally, substantial financial resources are allocated to provide standardized ALS training courses, with resuscitation committees recommending the renewal of ALS training every two years (3).

Accordingly, in this study, we assessed the knowledge level of nurses in clinics at the Somalia Mogadishu Turkey Recep Tayyip Erdoğan Training and Research Hospital concerning BLS and ALS.

Materials and Methods

In this study, we engaged 104 actively practicing nurses in the Somalia Mogadishu Turkey Recep Tayyip Erdoğan Training and Research Hospital. Participants were given a questionnaire that included 24 objective questions assessing knowledge levels regarding BLS and ALS. Demographic data were also collected. Notably, administrative nurses were excluded from the study. Ethical approval for our research was obtained from the Ethics Committee of Somalia Mogadishu Turkey Recep Tayyip Erdoğan Training and Research Hospital (ethics committee decision number: 2022/472, date: 07.02.2022).

Statistical Analysis

The obtained questionnaire data were compiled, with the results expressed as median values along with the corresponding minimum and maximum values. The Shapiro-Wilk test was employed to evaluate the data distribution.

Analysis of variance between independent groups was performed using either the unpaired t-test or the Mann-Whitney U test. Group differences were further explored by applying one-way ANOVA or the Kruskal-Wallis tests.

Statistical significance was set at $p < 0.05$. All statistical calculations were performed using SPSS statistical software (SPSS for Windows version 21.0; SPSS Inc., Chicago, IL).

Results

The results of our observational study analyzing the responses from 104 nurses regarding BLS and ALS based on the 2021 guidelines of the European Resuscitation Council (ERC) provided valuable insights into their knowledge and experiences.

Nurses aged between 20 and 25 years constituted 25% ($n=26$), whereas those aged between 26 and 30 years constituted 55.8% ($n=58$) of the study population. In addition, those aged 31 years and over constituted 19.2% ($n=20$) of the entire group.

The study involved 46.2% ($n=48$) male nurses and 53.8% ($n=56$) female nurses. The distribution of nurses across different departments was as follows: emergency medicine 12.5% ($n=13$), intensive care unit (ICU) 28.8% ($n=30$), surgery 10.6% ($n=11$), internal medicine 17.3% ($n=18$), operating room 14.4% ($n=15$), delivery room 6.7% ($n=7$), and dialysis 9.6% ($n=10$).

Nurses with less than 1 year of employment constituted 9.6% ($n=10$), those with more than 1 year and less than 2 years 20.5% ($n=21$), those with more than 2 years and less than 3 years 22.1% ($n=23$), those with more than 3 years and less than 4 years 9.6% ($n=10$), and those with 4 or more years of employment constituted 38.5% ($n=40$) of the entire study population.

While 17.3% ($n=18$) had never received adult life support training, 37.5% ($n=39$) received training at the faculty, 14.4% ($n=15$) received training within 1 year, 7.7% ($n=8$) received training more than 1 year and less than 2 years ago, 9.6% ($n=10$) received training more than 2 years and less than 3 years ago, and 13.5% ($n=14$) received training more than 3 years ago.

Our analysis also revealed that 27.9% ($n=29$) of the participants never read a guideline on adult life support, 24% ($n=25$) read the ERC 2021 guideline, 28.5% ($n=30$) read the AHA 2020 guideline, and 19.2% ($n=20$) read a guideline published before 2020.

The analysis regarding the performance of adult life support revealed that 8.7% ($n=9$) did not perform at all, 32.7% ($n=34$) performed it every weekday, 34.6% ($n=36$) performed it once a week, 21.2% ($n=22$) once a month, and 2.9% ($n=3$) once a year. The answers given to the three critical questions included in the questionnaire are displayed in Table 1. The demographic data

of the participants are shown in Table 2. Analysis of the answers given in the BLS and ALS questionnaires revealed no significant impact of age on the rates of correct answers. However, gender-related differences were significant ($p=0.03$), with female nurses showing higher accuracy in the BLS questionnaire than male nurses. The department of the nurse did not have a significant effect on the responses to the BLS-related questions.

In ALS-related questions, emergency medicine nurses were significantly more successful than internal medicine ($p=0.01$), delivery room ($p=0.004$), and dialysis nurses ($p=0.006$). On the other hand, ICU nurses gave a significantly higher rate of correct answers than internal medicine ($p=0.005$), delivery room ($p=0.003$), and dialysis nurses ($p=0.008$). Surgery nurses were significantly more successful than the delivery room ($p=0.01$) and dialysis nurses ($p=0.02$) in answering ALS-related questions. There was a significant difference ($p=0.03$) between the internal medicine and operating room nurses in this regard. Similarly, there was a significant difference between the operating and delivery room nurses ($p=0.03$).

While no significant difference was found in the distribution of years of working life for BLS-related questions, a significant difference was found ($p=0.04$) for ALS-related questions. The frequency of receiving adult life support training or reading the guidelines did not create a significant difference in answering BLS and ALS questions. The frequency of performing adult life support also did not significantly impact the correct answer rates in the BLS and ALS questions. The yes and no answers to the question "Do you think that all nurses should have knowledge and skills about adult life support?" did not significantly differ in answering the BLS and ALS questions. However, a significant difference ($p=0.03$) was observed between the yes and no answers to "If necessary, can you effectively implement adult life support?" and answering BLS questions. In contrast, no significant difference was found for the ALS questions. The answer to the question "Do you think repeating ALS training would be beneficial for nurses?" did not relate to answering BLS and ALS questions (Supplementary 1).

Discussion

CPR, involving chest compression and artificial ventilation, is a critical medical intervention to sustain blood flow to vital organs, particularly the brain. Trained healthcare professionals performing CPR contribute to a reduction in in-hospital cardiac deaths. In hospital settings, nurses often play a crucial role as first responders to identify patients experiencing cardiopulmonary arrest and initiate intervention.

Our study, an observational, cross-sectional, single-center survey, aimed to assess nurses' knowledge of adult life support. The

Table 1. Answers to three critical questions included in the questionnaire

Question	Yes	No
Do you think that all nurses should have knowledge and skills about adult life support?	59.6% (n=62)	40.4% (n=42)
If necessary, can you effectively implement adult life support?	77.9% (n=81)	22.1% (n=23)
Do you think repeating adult life support training would be beneficial for nurses?	94.2% (n=98)	5.8% (n=6)

Table 2. Results of the survey based on demographic patient data

	BLS	p value	ALS	p value
Age				
20-25	8 (3-11)	0.11	8 (5-11)	0.128
25-30	8 (5-11)		7 (3-10)	
>30	6.5 (4-10)		7 (3-11)	
Gender				
Male	7 (4-11)	0.03	8 (3-11)	0.364
Female	8 (3-11)		7 (3-10)	
Unit				
Emergency medicine	7 (6-11)	0.65	8 (6-10) ^{1,2,3}	0.003
ICU	8 (4-11)		8 (5-11) ^{4,5,6}	
Surgery	8 (4-11)		7 (6-9) ^{7,8}	
Internal medicine	6.5 (5-9)		6.5 (3-10) ⁹	
Operating room	7 (3-11)		8 (6-11) ¹⁰	
Delivery room	8 (6-8)		6 (3-8)	
Dialysis	7.5 (6-9)	6.5 (4-8)		
Duty period				
<1 year	7.5 (3-10)	0.278	8 (5-9)	0.04
1-2 years	8 (5-11)		8 (3-10)	
2-3 years	8 (4-11)		7 (6-10)	
3-4 years	7.5 (6-9)		8 (4-10)	
>4 years	7 (4-11)		7 (3-11)	
Most recent ALS training				
Never	6.5 (4-8)	0.52	7 (3-9)	0.36
At the faculty of nursing	8 (3-10)		8 (4-11)	
Before <1 year	7 (5-11)		8 (6-10)	
Before 1-2 years	8 (5-10)		8.5 (3-10)	
Before 2-3 years	7.5 (5-11)		8 (4-11)	
Before >3 years	7 (4-9)		7 (5-10)	
Most recent ALS guidelines				
Never	7 (4-9)	0.08	7 (3-9)	0.08
ERC 2021	8 (5-11)		8 (4-10)	
AHA 2020	8 (3-11)		7 (3-10)	
Published before 2020	8 (5-11)		8 (5-11)	

Table 2. Continued				
	BLS	p value	ALS	p value
Frequency of ALS performance				
Never	7 (5-8)	0.5	7 (4-9)	0.18
Daily	7 (5-11)		8 (4-11)	
Often (every week)	8 (3-11)		8 (3-10)	
Not often (once a month)	8 (4-11)		7 (3-10)	
Once a year	8 (7-8)		8 (8-11)	
BLS: Basic life support, ALS: Advanced life support, ERC: European Resuscitation Council, AHA: American Heart Association, ICU: Intensive care unit ¹ The rate of correct answers to questions about ALS in the emergency medicine department was found to be significantly higher than that in the internal service (p=0.01). ² The rate of correct answers to questions about ALS in the emergency medicine department was found to be significantly higher than in delivery room (p=0.004). ³ The correct answer rate to questions about ALS in the emergency medicine department was found to be significantly higher than in dialysis (p=0.006). ⁴ The rate of correct answers to questions about ALS in the ICU was found to be significantly higher than that in the internal service (p=0.005). ⁵ The rate of correct answers to questions about ALS in the ICU was found to be significantly higher than in delivery room (p=0.003). ⁶ The correct answer rate to questions about ALS in the ICU was found to be significantly higher than in dialysis (p=0.008). ⁷ The correct answer rate to questions about ALS in surgical service was found to be significantly higher than in delivery room (p=0.01). ⁸ The correct answer rate of surgical service to questions about ALS was found to be significantly higher than dialysis (p=0.02). ⁹ The rate of correct answers to questions about ALS in the internal service was found to be significantly lower than in the operating room (p=0.03). ¹⁰ The correct answer rate to questions about ALS in the operating room was found to be significantly higher than in the obstetrics and delivery room (p=0.03).				

mean age and gender ratio of the nurses in our study is consistent with the existing literature.

Unlike some studies, our findings indicated that female nurses provided more accurate answers to survey questions measuring knowledge about adult life support than male nurses (4).

A multicenter study evaluating CPR knowledge among healthcare workers found higher knowledge levels among cardiology, ICU, and emergency medicine department workers compared with other clinics.

In another study, it was observed that nurses working in places with cardiac risk patients were more successful in answering BLS and ALS questions than those working in other places.

Similarly, in our study, the emergency medicine department and ICU demonstrated higher success in answering survey questions than other units.

Additionally, our study revealed a positive correlation between the number of correct answers about ALS and nurses' years of experience, which is consistent with findings from previous studies (5-7).

Adult life support practices have been in place for over 50 years, and ongoing training remains crucial. Some studies suggest a decline in nurses' knowledge and skills six months after initial adult life support training, highlighting the need for recurrent training and certification (4). However, contrary to the existing literature, our study did not find a significant correlation between the frequency of training and correct responses to questionnaire questions (8).

Another study emphasizes that adult life support training is forgotten after a certain period of time; therefore, it is important to repeat the training at certain intervals (9). Another study suggested that nurses should receive frequent training on the subject (10). While most studies argue that there is a decrease in adult life support knowledge and skills over time, two different studies say that knowledge and skills are not forgotten during the working period, as in our study (11,12).

Contrary to findings emphasizing the importance of the guidelines reading for self-improvement in adult life support knowledge, our study did not reveal a significant impact (13). They found that nurses in a particular branch were quite insecure when applying BLS effectively (14). Nonetheless, our study identified a high confidence level among nurses in adult life support practices. Overall, our findings contribute to the understanding of nurses' knowledge and practices related to adult life support, emphasizing the potential impact of experience and training frequency on performance.

Study Limitations

The study has notable limitations, primarily stemming from the fact that the participating nurses served temporarily in our hospital, having been assigned voluntarily from different hospitals. Consequently, information regarding the participants' educational backgrounds and experiences was unavailable, introducing a potential source of variability. Our study was a small-volume, single-center study. Enhanced reliability and a more accurate reflection of adult life support knowledge levels could be achieved with a more extensive and diverse sample, ideally involving participants from multiple centers. Further epidemiological studies are warranted to provide comprehensive insights into the subject.

Conclusion

Our study indicates a high level of self-confidence among nurses regarding adult life support. When we scanned the literature regarding our study, we found that knowledge and skills regarding adult life support generally decrease when it is not repeated for 2 years or longer. Although we could not find any significant results regarding the repetition of training in our

study, our recommendation is; In terms of practice, it is obvious that adult life support training should be repeated at certain intervals and that it is important to read the current guideline on the subject.

Regular training for all hospital nurses, particularly those caring for critically ill patients, conducted by dedicated adult life support trainers could reduce in-hospital deaths and enhance the overall quality of adult life support practice. Implementing periodic questionnaires to measure knowledge levels within the hospital, addressing knowledge gaps, finding solutions, and implementing best practices are deemed essential contributions to the healthcare system.

Ethics

Ethics Committee Approval: Ethical approval for our research was secured from the Ethics Committee of Somalia Mogadishu Turkey Recep Tayyip Erdoğan Training and Research Hospital (ethics committee decision no: 2022/472, date: 07.02.2022).

Informed Consent: Survey questionnaire study.

Authorship Contributions

Surgical and Medical Practices: Ş.Y., Concept: N.B., Design: N.B., Data Collection or Processing: H.H.M., Analysis or Interpretation: H.H.M., Literature Search: A.Ş.A., Writing: A.Ş.A.

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Supplementary 1. Survey form

Hello and welcome to this survey exploring the knowledge and practice of adult life support (ALS). The survey contains questions about your demographic features in part-1(1-10) and your current knowledge of basic and advanced ALS in part-2 (11-34).

It is planned to prepare an article with the data to be obtained from the questionnaires.

Please read each question carefully and click the appropriate box (tick one box only per question).

Demographics features

1. Age 20-25 25-30 30-35 >35
2. Gender Male Female
3. Which unit are you working in?
 Emergency Department Intensive Care Unit (ICU)
 Internal service (service-3) Surgical service (service-1)
 Operating room
4. How long have you been working in this unit?
 <1 year 1-2 years 2-3 years 3-4 years >4 years
5. When did you attend training on Adult Life Support (ALS)?
 At Faculty of Nursing Before <1 year
 Before 1-3 years Before 2-3 years
 Before >3 years Never attend
6. What is the current guide you have read about ALS?
 European Resuscitation Council Guidelines 2021
 2020 American Heart Association Guidelines
 ALS guidelines published before 2020
 Never read
7. How often do you perform ALS in your unit or hospital?
 Daily Often (Every week)
 Not often (once a month) Once a year Never
8. Do you think that all nurses should have knowledge and skills about ALS?
 Yes No
9. If necessary, can you effectively implement ALS?
 Yes No
10. Do you think repeating ALS training would be beneficial for nurses?
 Yes No

Basic life support	True	False
11. Ensure you, the victim, and any bystanders are safe.		
12. Open the airway; in trauma patients, you can use the head-tilt chin-lift maneuver.		
13. Look, listen, and feel for breathing for no more than 5 s.		
14. If alone with an adult patient, activate the Emergency Medical Services (EMS) first and then start cardiopulmonary resuscitation (CPR).		
15. If alone with an adult patient, leave the victim to receive an automated external defibrillator (AED) if available.		
16. Compress to a depth of at least 5 cm but not more than 6 cm.		
17. Compress the chest at a rate of 120-130 min.		
18. Alternate between providing 30 compression and 2 rescue breaths.		
19. The AED will advise a shock for all cardiac arrest patients.		
20. If no shock is advised by AED or if no AED is available, continue CPR.		
21. Don't interrupt resuscitation until the victim is definitely waking up, moving, opening eyes, and breathing normally.		
22. If the patient is unresponsive and breaths abnormally, place in the recovery position.		
Advanced life support		
23. If the patient is unresponsive with absent or abnormal breathing, start CPR 30:2 and attach a defibrillator.		
24. Use a basic or advanced airway technique. Rescuers with high success should use tracheal intubation.		
25. Give low-flow oxygen during CPR.		
26. Immediately resume chest compression at non-shockable regions.		
27. Use adrenalin early for non-shockable cardiac arrest.		
28. During CPR, give 1 mg IV adrenalin every 5-10 min.		
29. Pulseless ventricular tachycardia (pVT) and pulseless electrical activity (PEA) are shockable rhythms.		
30. For biphasic waveforms, deliver the first shock with an energy of at least 150 J.		
31. Assess rhythm after giving shock, then start CPR.		
32. Assess rhythm after giving shock, then start CPR.		
33. Consider intraosseous (IO) access if attempts at IV access are unsuccessful or IV access is not feasible		
34. Stop CPR if the patient has not recovered after 15 min of resuscitation.		