


Knowledge and attitude of healthcare workers toward advanced cardiac life support in Felege Hiwot Referral Hospital, Bahir Dar, Ethiopia, 2022

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Ousman Adal  and Solomon Emishaw

Abstract

Objective: The aim of this study was to investigate the knowledge and attitude regarding advanced cardiac life support among healthcare workers, 2022.

Methods: A cross-sectional study was conducted from March to May 2022 among healthcare workers who were working in Felege Hiwot Comprehensive Specialized Hospital Bahir Dar, Ethiopia. All physicians and nurses who were willing to participate this study were involved. A structured self-administered questionnaire was used for data collection. The data were entered into the statistical software Epi Data version 4.6.0.4 and analyzed with statistical package for social science version 26. Logistic regression analysis was used to differentiate the effects of each independent variable on the dependent variable.

Results: Among the total study participants (400) with a response rate of 96%, most (238) (59.5%) healthcare workers (nurses and physicians) had poor knowledge toward advanced cardiac life support. Two hundred twenty-five (56.25%) healthcare workers had positive attitude. Being a physician, having more than 6 years of work experience, working in an emergency department for more than 10 years, and having advanced cardiac life support training all contribute to superior knowledge of advanced cardiac life support.

Conclusion: Most healthcare workers, especially, nurses, have under estimated knowledge and a negative attitude toward advanced cardiac life support. This implies they require knowledge building and attitude empowerment regarding advanced cardiac life support. Being a physician, having training in advanced cardiac life support, having work experience of more than 6 years, and working in an emergency unit for more than 10 years were positively associated with better knowledge of advanced cardiac life support among healthcare workers.

Keywords

Advanced cardiac life support, attitude, knowledge

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Introduction

Advanced cardiac life support includes recognition of signs of sudden cardiac arrest (SCA), heart attack, and complete airway obstruction, as well as performing cardiopulmonary resuscitation (CPR) and defibrillation with an automated external defibrillator (AED).¹ It is a set of life-saving protocols and skills that extend basic cardiac life support to further support the body perfusion and provide an open airway and adequate ventilation.² It includes tracheal intubation, rapid sequence induction, cardiac defibrillation, transcutaneous pacing, intravenous cannulation, and medication

administration.³ Healthcare workers are educated and trained in advanced cardiac life support to provide effective and efficient health care during their professional lives.⁴ Because the dynamic and uncertain nature of the healthcare environment requires competent professional healthcare

Department of Emergency, College of Medicine and Health Sciences, Bahir Dar University, Bahir Dar, Ethiopia

Corresponding author:

Ousman Adal, Department of Emergency, College of Medicine and Health Sciences, Bahir Dar University, P.O. Box 75, Bahir Dar 6000, Ethiopia.
Email: adalousman5@gmail.com



workers to manage the rapidly changing clinical environment.⁴⁻⁶ Based on healthcare providers' level of education and experience, healthcare workers, especially nurses may have poor knowledge of advanced cardiac life support because it is often not a required part of their training and credentialing.⁷ Healthcare workers are usually the first responders in cases of hospital cardiac arrest. Their knowledge of advanced cardiac life support is important for improving patient outcomes. They need to be knowledgeable and have a positive attitude toward advanced cardiac life support. Since, advanced cardiac life support is a key component of the chain survival that increases the rate of survival to hospital discharge.^{4,8}

Most health professionals suggest that resuscitation knowledge is not well developed due to a lack of formal training with in medical and nursing careers.⁷ The resuscitation guidelines recommend that all medical personnel working in the intensive care unit and emergency room, as well as those who provide patient resuscitation, receive regular advanced cardiac life support training.^{2,9} Previous studies revealed that there is a lack of consistency in training health professionals on advanced cardiac life support.^{4,10}

Medical staff should have good knowledge of advanced cardiac life support before undergoing advanced drug administration, rapid sequence intubation, and cardiac resuscitation.¹¹ Every medical professional (doctor, anesthesia, paramedics, and nurses) who is prone to emergencies must be on standby at all times to save lives and improve the quality of cardiac resuscitation.^{7,11} Healthcare professionals frequently face life-threatening situations, and must predetermine the need for resuscitation by considering risk factors like hypoxia, hypothermia, hypoglycemia, acidosis, and trauma.¹²

Many countries have guidelines on how to provide advanced cardiac life support, which are expressed by professional medical bodies in those countries.¹ Creating awareness and educating the medical staff is essential to preventing delays in starting cardiac resuscitation.¹³ Medical staff are frequently the first responders to hospital cardiac arrests, and the success of a resuscitation may be a reflection of their knowledge and attitude of a recent advanced cardiac life support guidelines.^{2,9}

In Ethiopia, advanced cardiac life support is not as widely developed as in other developed countries due to the lack of modern medical instruments and well-trained professionals.^{14,15} However, in Addis Ababa, the capital of Ethiopia, there are governmental institutions that provide medical equipment and training to healthcare professionals (physicians and nurses).¹⁶ In addition, they are international and private institutions that provide the much needed training and equipment.¹⁶

Generally, the knowledge and attitude of most medical personnel regarding advanced cardiac life support are lower than expected.¹⁶ The study conducted in Gondar (Northwest Ethiopia) toward CPR showed that only 25.15% and 60.8%

of healthcare workers (physician and nurses) had good knowledge and a positive attitude, respectively.¹⁶ In this study setting (Felege Hiwot Comprehensive Specialized Hospital (FCSH), Bahir Dar, Ethiopia) there is no regular CPR and advanced cardiac life support training due to the limited resources in the country. According to the investigators' observations over the last 2 years, most healthcare workers (nurses and physicians) who work at FCSH have poor awareness of advanced cardiac life support. Currently, there are no studies have been conducted regarding knowledge and attitudes toward advanced cardiac life support among healthcare workers at Felege Hiwot Referral Hospital. Therefore, this study aimed to investigate knowledge and attitudes toward advanced cardiac life support among healthcare workers working at FCSH.

Methods

Study design, area, and period

An institutional-based cross-sectional study design was conducted from March to May 2022. The study was conducted at FCSH. It is located in Bahir Dar City, which is the capital city of Amhara National Regional State. It is one of the biggest Comprehensive Specialized Hospital in the Amhara region and in the country at large. It serves 2000 people per day and has more than 273 beds. Currently, the hospital has a total of 322 nurses and 94 physicians. Bahir Dar City is located on the southern beach of Lake Tana, the source of the Blue Nile (Abay). Bahir Dar City is one of the 10 most beautiful cities in Africa.¹⁷

Inclusion criteria

Healthcare workers who had frequently involved in advanced cardiac life support (nurses and physicians) were involved.

Exclusion criteria

Other healthcare workers who had not frequently involved in advanced cardiac life support (pharmacists, laboratory professionals, and midwives) were excluded.

Sample size, sampling procedure, and technique

The actual sample size for the study was calculated using the single population proportion formula $\{n = [(z\alpha/2)^2 p(1-p)]/d^2\}$, n = sample size, $z\alpha/2$ = 95% confidence level, p = the proportion of knowledge of healthcare workers toward advanced cardiac life support in the previous study (43.5%) was used.¹⁸ d = margin of error (0.05). Considering the 10% non-response rate, the final sample size of the study was 416 (322 nurses and 94 physicians). The authors considered the proportion of healthcare workers with a positive attitude and the factor that determines the knowledge of

healthcare workers using Epi-Info. However, the sample size that was calculated was less than the calculated proportion (knowledge), so the authors took the largest one. The data were collected consecutively for each physician and nurse, since all nurses and physicians who were willing to participate in this study were involved.

Data collection tools and materials

The English version of the self-administered questionnaire was used to collect the data. The tools were divided into three sections: participant sociodemographic, knowledge, and attitude questions, which measure the main finding of this study. Data were collected from the study population via structured, self-administered questionnaires, which were adapted from various pieces of literature.^{1,16} The questionnaires were distributed sequentially to each study participant. Before collecting data for 4 weeks, two professional experts (one from the English language and one from the medical field) validated the tool and confirmed its reliability (Cronbach alpha of 0.86).²

Data quality control

The data collectors were three nurses. The two nurses had degree in Bachelor of Science (BSc) and the other one has Master of Science (MSc) in nursing. Data collectors were trained 2 days before the actual data collection. During the data collection period, the principal investigator closely monitored and provided necessary corrections and directions.

Statistical analysis

Before analyzing the data, it was cleaned up and cross-checked. The data were entered into Epi Data version 4.6.0.4 and exported to Statistical Package for Social Science (SPSS) version 26 for further analysis. A binary logistic regression model was used to estimate the associated factors of all independent variables with a p -value of <0.05 . The model fitness of the variable was tested using Hosmer's and Lemeshow's test. All independent variables with a p -value of <0.05 from a bivariate logistic regression analysis were considered for fitting into a multivariable logistic regression analysis to control the possible effect of confounders. Descriptive statistics like percentage, mean, median, and standard deviation were used. Tables and narrations were used for data presentation.

Operational definitions

The variables were operationalized based on the previous study on the knowledge and attitude of healthcare workers toward basic life support (BLS).^{16,19,20}

Good knowledge: Healthcare workers who answered 50% or more of the knowledge questions correctly.

Poor knowledge: Healthcare workers who answered below 50% of knowledge questions.

Positive attitude: Healthcare workers who answered 50% or higher on attitude questions.

Negative attitude: Healthcare workers who answered below 50% on attitude questions.

Results

Sociodemographic characteristics of study participants

Of the total study population (416), 400 (96%) healthcare workers participated in this study. There were no missing items during the analysis. Slightly more than half (225, or 56.25%) of the study participants were female. The majority of healthcare workers (51.25%) were between the ages of 31 and 40, with mean age of 36 ± 8.45 . Two hundred eight (52%) participants were single. Most of the study participants, 317 (79.25%), were orthodox in religion. Three hundred twelve (78%) of healthcare workers were nurses (Table 1).

Knowledge of healthcare workers toward advanced cardiac life support

Among the study participants (400), most of them (238, or 59.5%) had poor knowledge. The mean score of the participants was 6.12 ± 1.57 standard deviations (from 15 knowledge questions) (Table 2).

Attitude of healthcare workers toward advanced cardiac life support

From the total study participants (400), 225 (56.25%) had a positive or good attitude, while 175 (44.75%) had a negative or poor attitude toward advanced cardiac life support (Table 3).

Factors associated with knowledge of healthcare workers toward advanced cardiac life support

The goodness of fit of the variable using Hosmer's and Lemeshow's test showed that 98% of the dependent variables were explained by the dependent variables. Based on the binary logistic regression analysis, profession, work experience, working in emergency, and having training in advanced cardiac life support were significantly associated with the knowledge of advanced cardiac life support. A physicians had twice higher knowledge compared with nurses. Those who had received advanced cardiac life support training had five times higher knowledge than those who had not. Healthcare workers who were worked in an emergency department for more than 10 years had 12 times higher

Table 1. Sociodemographic characteristic of study participants.

Variables	Category N = 400	Frequency (%)
Sex	Female	225 (56.25)
	Male	175 (43.75)
Age	18–30	133 (33.25)
	31–40	205 (51.25)
	41–50	35 (8.75)
	≥51	27 (6.75)
Marital status	Single	208 (52)
	Married	150 (37.5)
	Others	42 (10.5)
Religion	Orthodox	317 (79.25)
	Muslim	64 (15.25)
	Protestant	19 (4.75)
Work experience	0–1 year	39 (9.75)
	2–5 years	102 (25.5)
	6–10 years	154 (38.5)
	Over 10 years	105 (26.25)
Working duration in emergency	0–1 year	56 (14)
	4–5 years	157 (39.25)
	6–10 years	131 (32.75)
	Over 10 years	56 (14)
Training on advanced cardiac life support	No	189 (47.25)
	Yes	211 (52.75)
Profession	Nurses	312 (78)
	Physician	88 (22)
Monthly income (Ethiopian birr)	2500–4100	30 (7.5)
	4200–5200	25 (6.25)
	5300–6599	200 (50)
	6600–7499	70 (17.5)
	≥7500	75 (18.75)

knowledge than those who worked in an emergency department for less than a year. Healthcare workers who have more than 10 years of work experience had six times higher knowledge compared with those with less than a year of work experience (Table 4).

Discussion

In developing countries such as Ethiopia, SCA, along with poor basic and advanced cardiac life support practice, is one of the leading causes of death.¹⁶ In fact, following BLS, advanced cardiac life support is crucial to reducing mortality caused by cardiac arrest. In a developing country like Ethiopia, the importance of adequate knowledge and a positive attitude toward basic and advanced cardiac life support is underappreciated, along with poor knowledge and a negative attitude.²⁰ In this study, most healthcare workers had low knowledge regarding advanced cardiac life support, as did the total number of study participants (400); 238 (59.5%) had poor knowledge, while 162 people (40.5%) had good knowledge of advanced cardiac life support. This showed that most healthcare workers knowledge about advanced cardiac life support is under-estimated. This implies the knowledge of healthcare workers, especially nurses, was less than expected and needs attention to improve its current state. Therefore, they require special training in advanced cardiac life support to improve their knowledge of advanced cardiac life support. Because the patient's or causality's survival depends on the quality of BLS, the early initiation of basic and advanced cardiac life support, proper post-cardiac arrest care, and identifying the underlying cause of cardiac arrest. Empowering

Table 2. Knowledge level of healthcare workers toward advanced cardiac life support.

No.	Questions	Knowledge level of healthcare workers (with correct answer)
1	Abbreviation of advanced cardiac life support	158 (39.5%)
2	What is your initial intervention (assistance) for an unresponsive patient presented in your hospital?	142 (30.75%)
3	What is your immediate intervention (treatment) if the victim has no pulse?	142 (30.75%)
4	What is location of chest compression?	118 (29.5%)
5	What is depth of chest compression for adults?	139 (34.75%)
6	What is adult advanced cardiac life support maximum joule for shockable rhythm	239 (59.75%)
7	What are non-shockable rhythms?	156 (39%)
8	What is the CPR rate of compression for adults?	197 (49.25%)
9	What are shockable rhythms?	167 (41.75%)
10	What are the reversible causes of cardiac arrest?	179 (44.75%)
11	What is the dose and frequency of adrenalin for advanced cardiac life support?	56 (14%)
12	What is the indication of amiodarone for advanced cardiac life support?	78 (19.5%)
13	What is the dose of amiodarone for advanced cardiac life support?	97 (24.25%)
14	Is magnesium sulfate used for advanced cardiac life support?	34 (8.5%)
15	What is post-cardiac arrest care?	96 (24%)

Table 3. Response of healthcare workers for advanced cardiac life support attitude questions.

No.	Knowledge questions	Response	Frequency (%)
1	Do you understand the role of nurses or physicians in advanced cardiac life support?	Yes	204 (51)
		No	196 (49)
2	Have you thought advanced cardiac life support perform as a physician or nurse?	Yes	192 (48)
		No	208 (52)
3	Have you considered learning more about advanced cardiac life support?	Yes	179 (44.75)
		No	231 (57.75)
4	Can you document patient care thoroughly?	Yes	188 (47)
		No	212 (53)
5	Can you communicate effectively during advanced cardiac life support care?	Yes	200 (50)
		No	200 (50)
6	Have you thought advanced cardiac life support has legal and ethical issues?	Yes	165 (41.25)
		No	235 (58.75)
7	Can you recognize the signs and symptoms of cardiac arrest as a physician or nurse?	Yes	204 (51)
		No	196 (49)
8	Can you please prioritize actions for advanced cardiac life support?	Yes	216 (54)
		No	184 (46)
9	Can you take advanced cardiac life support action based on the patients' condition?	Yes	111 (27.75)
		No	289 (72.25)
10	Have you understood the principle of advanced cardiac life support?	Yes	192 (48)
		No	208 (52)
11	Can we evaluate patient responses based on the advanced cardiac life support protocol?	Yes	114 (28.5)
		No	286 (71.5)
12	I think I succeeded as a physician/nurse on advanced cardiac life support	Yes	197 (49.25)
		No	203 (50.75)

Table 4. Factors associated with knowledge of healthcare workers toward advanced cardiac life support.

S. no.	Variables	Category	Knowledge		COR (95%) CI	AOR (95%) CI	p-Value
			Good	Poor			
1	Work experience	0–1 year	24	15	1.00	1.00	
		2–5 years	50	52	0.29 (0.64, 1.821)	3.24 (0.66, 16.00)	0.114
		6–10 years	94	60	7.24 (3.023, 11.25)	5.72 (1.42, 10.27)	0.013*
		Over 10 years	70	35	3.121 (1.054, 5.728)	6.445 (1.35, 8.66)	0.019*
2	Duration of working in current emergency	0–1 year	19	37	1.00	1.00	
		4–5 years	109	48	1.553 (0.576, 4.183)	0.98 (0.07, 13.74)	0.992
		6–10 years	75	56	0.474 (0.243, 0.925)	9.24 (.65, 30.9)	0.100
		Over 10 years	35	21	3.214 (1.26, 6.030)	12.18 (11.01, 15.50)	0.049*
3	Training on ACLS	No	127	62	1.00	1.00	
		Yes	111	100	2.43 (1.264, 5.389)	5.13 (2.23, 7.32)	0.024*
4	Profession	Nurses	112	200	1.00	1.00	
		Physician	45	43	2.02 (1.514, 4.993)	1.79 (1.445, 3.24)	0.002*

AOR, adjusted odds ratio; 1.00, reference; COR, crude odds ratio; ACLS, advanced cardiac life support; CI, confidence interval.

*p-Value <0.05, which is significantly associated with healthcare workers toward advanced cardiac life support.

healthcare workers with advanced cardiac life support knowledge could potentially improve patient survival after cardiac arrest. In this study, the knowledge level of healthcare workers was contradicted with the studies conducted in New Zealand, Saudi Arabia, and Turkey; the knowledge level of healthcare workers in each country was 65%, 76%, 87%, and

86%, respectively,^{1,9,21} which is higher than the knowledge level of healthcare workers in this study. The difference could be attributed to differences in educational curriculum, study setting, study period, and accessibility of technology and machines like an AED. For example, in Ethiopia, advanced cardiac life support protocol is not incorporated into the

curriculum (credential). In addition, the availability and accessibility of technological medicine is limited. For instance, there is no AED in the majority of hospitals in Ethiopia. Most healthcare workers did not take refresher training on both BLS and advanced cardiac life support in this study setting. In Ethiopia, BLS and advanced cardiac life support were not initiated early due to a delay in presentation and unwitnessed cardiac arrest.^{7,16,20,22}

In this study, 225 (56.25%) healthcare workers were recorded as positive or having a good attitude regarding advanced cardiac life support, while 175 (43.75%) of them were negative or had a poor attitude toward performing advanced cardiac life support. This is different from the studies which were conducted in Saudi, Canada, Turkey, and Brazil which showed that 97%, 84%, 86%, and 79% had positive attitudes regarding performing advanced cardiac life support, respectively.^{9,21,23,24} This implies a more positive approach than the approach taken by healthcare workers in this study to perform advanced cardiac life support. This contradiction might be due to the knowledge difference, the overcrowding of emergencies in this study setting, and the unavailability of medication and equipment to provide advanced cardiac life support.¹⁶ In Ethiopia, medications like amiodarone are frequently unavailable, and equipment such as an AED is also unavailable in most hospitals, including in this study setting (FCSH). Altogether it contributes the discrepancy in the attitude of healthcare workers.

In this study, a physician had twice higher knowledge compared with nurses. Those who had received advanced cardiac life support training had five times higher knowledge than those who had not. Healthcare workers who worked in an emergency department for more than 10 years had 12 times higher knowledge than those who worked in an emergency department for less than a year. Healthcare workers who have more than 10 years of work experience had six times higher knowledge compared with those with less than a year of work experience. It is known that knowledge can be acquired through training and work experience, thus, individuals who had long clinical experience at emergency departments and had training on advanced cardiac life support had a high probability of getting patients with cardiac arrest, leading them to understand advanced cardiac life support. In the Ethiopian educational curriculum, physicians have acquired their credentials with 7 years of academic experience, while nurses have acquired their credentials with 4 years of academic experience, so that physicians have a better understanding of advanced cardiac life support. This finding was supported by studies conducted in the United States, Nigeria, and Turkey.^{19,21,25}

Limitation of the study

The study shared the cross-sectional study design's limitation, which could be response bias.

The study excluded the practices of healthcare workers due to time constraints.

The study did not show the knowledge and attitude difference between the status of healthcare workers, physicians (general practitioner, specialist, and subspecialist), and nurses (BSC degree and MSc degree).

Conclusion

This study showed that most healthcare workers have underestimated knowledge and have a poor or negative attitude toward advanced cardiac life support. Comparing the previous study that was conducted in other settings, in this study setting, the knowledge and attitude of healthcare workers toward advanced cardiac life support were particularly poor. This indicates that they require knowledge building and attitude empowerment regarding advanced cardiac life support. Being a physician, having training in advanced cardiac life support, work experience more than 6 years, and working in an emergency more than 10 years are strong positively associated with better knowledge of advanced cardiac life support. Therefore, providing consistent advanced cardiac life support training, accessing, and updating advanced cardiac life support guidelines for every healthcare workers are crucial to improving the knowledge and attitude of healthcare workers toward advanced cardiac life support.

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Author contributions

OA developed the proposal, analyzed the data, interpreted the results, and drafted the manuscript. SE revised the proposal, checked the data, and revised the manuscript. The author is read and approved the final manuscript.

Availability of data and materials

All the data that support to conduct this study are available on the manuscript.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval and informed consent to participants

Ethical approval for this study was obtained from College of Health Sciences at Bahir Dar University approved this study (ID no. ChM 299 bdu.net). Certify that the study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

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Informed consent

Written informed consent was obtained from all subjects (physicians and nurses) before the study.

ORCID iD

Ousman Adal  <https://orcid.org/0000-0001-7925-3411>

Supplemental material

Supplemental material for this article is available online.

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