



**Assessment of Knowledge, Practice and Associated Factors on Advanced
Cardiac Life Support among General Practitioner and Nurses in Selected
Primary Hospitals, Oromia, 2022/2023G.C**

Principal Investigator: Tirunesh Geremew

Addis Ababa, Ethiopia

July, 2023



Assessment of Knowledge, Practice and Associated Factors on Advanced Cardiac Life Support among General Practitioner and Nurses in Selected Primary Hospitals, Oromia, 2022/2023G.

Principal Investigator: Tirunesh Geremew

Advisors: Helina Bogale (MSc in ECCN, PhD^C)

Co-Advisors: Seada Jemal (MSc in pediatric Nursing)

A Research Thesis to be submitted to St Paul Hospital Millennium Medical College; Nursing school, Department of Emergency and Critical Care Nursing; In Partial Fulfillment of the Requirements for the Degree of Masters of Science in Critical Care Nurse Practitioners.

Addis Ababa, Ethiopia

July, 2023

Name of investigator	Tirunesh Geremew
Full title of the research project	Assessment of knowledge, Practice and Associated factors on ACLS among General Practitioner and Nurses at Holota, Enchini and Ginchi primary hospitals in West shoa, Oromia, 2022/ 2023 G.C
Duration of the project	Started from September 2022 to May 2023 G.C
Study Area	Holota, Enchini and Ginchi
Total Cost of the project	The research was totally cost of 25,000 ETB.
Source(s) of Funding	St Paul Hospital Millennium medical college
Address of investigator	Cell Phone: 0910346978/ 0917350800
	Fax:
	P.O.Box:
	Email: <u>tiruneshgeremew78@gmail.com</u>
Name and address of Advisor(s)	Advisors: Ms. Helina Bogale (Msc ECCN, PhD ^C) Co- advisors: Ms. Seada Jemal (Msc Pediatric Nursing)

Acknowledgement

Firstly, I could not have undertaken this journey without God who helps me in all situations from starting to finishing my project.

Secondly, I would like to express my deepest gratitude to St Paul Millennium medical college, the College of Health Sciences, and the School of medicine department of emergency and critical care nursing for creating the opportunity to develop this postgraduate thesis.

Thirdly, I'm extremely grateful to my advisors Ms Helina Bogale (**MSc in ECCN, PhD^C**) and Ms Seada Jemal (MSC in Pediatric Nursing) for their unconditional guidance and constructive comments in carrying out the research thesis.

Fourthly, I would like to thank my organization, Oromia Regional health bureau, for providing me this opportunity and I have been happy to convey my most joyful and sincere appreciation to all staff of Holota, Enchini and Ginchi primary hospitals especially general practitioners and nurses., including data collectors and friends, for their overall unreserved contribution.

Last but not least words cannot express my gratitude to all my family members who stands close me by all situations.

ABSTRACT

Introduction: Advanced cardiac Life Support provides a standardized approach to the management of cardiac arrest, including manual defibrillation, advanced airway, drug therapy, pre-arrest circumstances, and post-resuscitation. In/out of hospital Cardiac arrest is major public health concern and cause mortality globally due to inadequate ACLS care. Therefore, assessing the knowledge, practice and associated factors among General Practitioner and Nurses of 3 selected Hospital is important as it gives baseline information on quality of ACLS care.

Objectives: The aim of the study is to assess knowledge, practices and associated factors of advanced cardiac life support among General Practitioner and Nurses in 3 selected primary hospitals from March 15 to April 15 2023 G.C.

Methods: An Institutional based cross-sectional study was conducted in 3 selected primary hospitals from West shoa Oromia Region. Data were collected using self-administered questionnaires. The tools reliability was mentioned by considering cronbach's $\alpha > 0.70$. Data were entered by Epi data version 4.6 and analyzed using STATA version 14. Bivariate and multivariable logistic regression analysis was used. All explanatory variables with p-value of < 0.25 from bivariate logistic regression model were fitted in the multivariable logistic regression to see the effect of each variable with the dependent variables. Crude and adjusted odd's ratios at 95 % confidence interval were used to show the strength of association at p value < 0.05 .

Results: 147 general practitioners and nurses participated in the study with a response rate of 94.23%, and among the study participants, 39.5% (95% CI: 32.3-47.7) and 35.37% (95% CI: 28.68-43.8) had good knowledge and good practice towards ACLS, respectively. Sex, Educational status, experience and availability of emergency equipment and medication, was significantly associated with Knowledge of health profession. In addition, profession, assigned place, exposure to cardiac case, training and experiences was significantly associated with health worker practice on multivariable logistic regression ($p < 0.05$).

Conclusion: In general, ACLS knowledge, practices were all low among study participants. As a result, further training, regular rotation of assigned place, frequently involved in resuscitation and advancement in education are required to achieve the desired result. Since district hospitals are the first line for immediate resuscitation to save life, so it needs greater attention on this area depend on the result.

Key Word: *ACLS, Associated factors, General Practitioner, Knowledge, Nurses, Practice*

TABLE OF CONTENT

Acknowledgement	III
ABSTRACT.....	IV
1. INTRODUCTION	1
1.1. Background of the Study.....	1
1.2. Statement of the Problem.....	3
1.3. Significance of study.....	5
2. LITERATURE REVIEW	6
2.1. World Wide.....	6
2.1.1. Practice of nurses and general practitioners towards Advanced Cardiac Life Support	6
2.1.2. Knowledge of general practitioners and nurses towards advanced cardiac life support.....	7
2.2. African context.....	8
2.2.1. Practice of nurses and general practitioners towards Advanced Cardiac Life Support	8
2.2.2. Knowledge of general practitioners and nurses towards advanced cardiac life support.....	9
2.3. Ethiopia	9
2.3.1. Practice of nurses and general practitioners towards advanced cardiac life support	9
2.3.2. Knowledge of general practitioners and nurses towards advanced cardiac life support.....	11
2.4. Conceptual Frame work.....	13
3. RESEARCH OBJECTIVE	14
3.1. General Objectives.....	14
3.2. Specific Objectives	14
4. METHODOLOGY	15
4.1. Study Area	15
4.2. Study Period.....	15
4.3. Study Design.....	16
4.4 Source and Study Population	16
4.4.1. Source population	16
4.4.2. Study Population.....	16
4.5. Eligibility Criteria	16
4.5.1. Inclusion criteria	16
4.5.2. Exclusion Criteria	16
4.6. Sample size determination	16

4.7. Sampling Technique and procedure.....	17
4.8. Measurements	18
4.8.1. Study variables.....	18
4.9. Data collection Tool and Procedures	19
4.10. Operational Definitions.....	20
4.11. Data quality control, processing and Management	20
4.12. Data analysis plan and procedure.....	21
4.13. Ethical Consideration.....	21
4.14. Dissemination of Results	21
CHAPTER FIVE	22
5. RESULTS	22
5.1. Socio-Demographic and personal characteristics of study participantselected at Governmental Hospitals in March/April 2023 G.C.....	22
5.2. ACLS related characteristics of the study participants	23
5.3. Knowledge of participants related to Advanced Cardiac Life Support	23
5.3.1. The overall knowledge of Study participants.....	26
5.4. Practice of participants related to Advanced Cardiac Life Support.....	26
5.4.1. The overall Practice of Study participants	28
5.6. Test for multi co-linearity and Heteroscedasticity.....	29
5.7. Factors associated with Knowledge of Study participants towards ACLS.....	30
5.8. Factors associated with practice of study participants towards ACLS	33
CHAPTER SIX.....	37
6. DISCUSSION	37
6.1. Socio-demographic and characteristics of the study participants	37
CHAPTER SEVEN	42
7. CONCLUSION AND RECOMMENDATION.....	42
CHAPTER EIGHT	44
8. STRENGTH AND LIMITATION OF STUDIES	44
CHAPTER NINE.....	45
9.1. REFERENCES	45
9. APPENDIX.....	50

LIST OF TABLES

Table1: Socio-Demographic and personal Characteristics of study participants at West shoa, 3 selected primary Hospitals, Oromia 2023 G.C.....	22
Table 2: ACLS associated characteristics of respondents who worked in 3 selected Primary Hospitals, West shoa, Oromia region, 2023 G.C.	23
Table 3: Responses of General practitioners and Nurses for ACLS knowledge questions in 3 selected hospitals West shoa, Oromia Region, 2023G.C.....	24
Table 4: Responses of Study participants for ACLS practice questions in 3 selected hospitals West shoa, Oromia Region, 2023G.C.	27
Table 5 Distribution of association between socio-demographic, associated factors of knowledge and practice about ACLS among study participants.....	29
Table 6: Multi-co-linearity test for among explanatory variables	30
Table 7: Bivariate and Multivariable analysis of factors associated with study participants knowledge towards advanced cardiac life support in selected primary Hospitals, Oromia, 2022/2023 G.C (N=147).31	
Table 8:Bivariate and Multivariable analysis of factors associated with nurses' and general practitioner practice towards advanced cardiac life support in selected primary Hospitals, Oromia, 2022/2023 G.C (N=147).....	35

LIST OF FIGURES

Figure 1: Conceptual framework on the assessment of Knowledge, practice and associated factors among general practitioners and nurses working at selected primary hospitals, West shoa, Oromia, 2022/2023 G.C.....	13
Figure 2 Sampling procedures on the assessment of Knowledge, practice and associated factors among general practitioners and nurses working at selected primary hospitals, West shoa, Oromia, 2022/2023 G.C.....	18
Figure 3: Overall knowledge level of respondents based on their profession in selected public primary hospitals West Shoa, Oromia Region, 2023 G.C.”	24
Figure 4: Overall knowledge level of respondents in selected public primary hospitals West Shoa, Oromia Region, 2023 G.C.”	26
Figure 5: Overall practice level of respondents based on their professions in selected public primary hospitals West Shoa, Oromia Region, 2023 G.C.”	27
Figure 6: Overall practice level of respondents in selected public primary hospitals West Shoa, Oromia Region, 2023 G.C.”	28

ABBREVIATIONS/ ACRONYMS

ACLS	Advanced Cardiac Life Support
AHA	American Heart Association
AOR	Adjusted Odd Ratio
BLS	Basic Life Support
BSc	Bachelor Of Science
CC	Contingency Coefficient
CI	Confidence Interval
CNN	Convolutional Neural Networks
COR	Crude Odd Ratio
CPR	Cardiopulmonary Resuscitation
CVD	Cardio Vascular Disease
DC	Data Collector
ECCN	Emergency And Critical Care Nursing
EM	Emergency Medicine
ER	Emergency Room
ERB	Ethical Review Board
ICU	Intensive Care Unit
IR-UWB	Impulse Radio Ultra-Wideband
MOH	Ministry Of Health
MW	Medical Ward
OPD	Outpatient Department
OR	Operation Theatre
PI	Principal Investigator
PW	Pediatric Ward
SCD	Sudden Cardiac Death
SD	Sudden Death
SPHHMMC	St Paul's Hospitals Millennium Medical College
SW	Surgical Ward
VIF	Variance Inflation Factor
WHO	World Health Organization
X2	Chi Square

CHAPTER ONE

1. INTRODUCTION

1.1. Background of the Study

Cardiovascular disease (CVD), cancer, chronic respiratory disease, and diabetes mellitus are on raising and the leading threat to human health and development (1). It causes about 35 million deaths each year, of which 85% are in developing countries (2).The proportion of adults projected to get increased by 60% in 2025(3).

Globally, cardiovascular diseases are the leading cause of cardiac arrest and death. Approximately 17.3 million deaths per year are attributed to cardiovascular diseases(4). The number is expected to grow to more than 23.6 million by 2030 (5). Sudden cardiac arrest is an acute onset of disruption of the heart's pumping ability, which leads to halting of blood flow to the brain, lungs, and other Organs. It's the leading cause of mortality and responsible for around half of all deaths from cardiovascular disease worldwide.(6). One of the study conducted in Thailand indicated knowledge and skill on ACLS seem to be waning within 3-6 months after ACLS training (7)and without sufficient training and practice, a significant amount of theoretical information will be forgotten after 12 months (8)

In the hospital, a cardiac arrest is an event that can potentially affect any hospitalized patients and associated with a high mortality rate if it's not recognized and managed within a minute(9). In Sub-Saharan countries 125.5million individuals were estimated to get diagnosed with cardiac related disease by the 2025 (10). Cardiac arrest is one of the most critical conditions found in medical care. It is an emergence, life-threatening conditions which requires rapid responses by an efficient team (11).

In Ethiopia most non-violent, unexpected sudden deaths in the young population are from cardiac causes and their occurrence is unpredictable(12). It is a major public health problem(13). More serious common in low socio-economic areas and is one of the most common unfortunate incidents that may occur in and out of the health facilities(12). In medical emergencies, it is

critical for ACLS to be administered at the right time as it aids in saving the lives of the patients involved(14). ACLS is an important knowledge among physicians to deal with cardiac arrest. While medical staff and residents who practice in high risk areas are required to possess ACLS practice, training and skills (7). In the modern times, medical professionals and health care studies should have advanced knowledge regarding ACLS and they should remain up to date with any changes implemented on various protocols as per-evidence in medical science(15)

ACLS course was first introduced in 1974 by the American Heart Association and subsequently updated in 1980, 1986, 1992, 2000, 2005, 2010, 2015 and 2020 (16). It provides a standardized approach to the management of cardiac arrest, including manual defibrillation, advanced airway, drug therapy, pre-arrest circumstances, and post-resuscitation (17). Even though it would ensure that in addition to equipping health professional with the proper skills to cope with most of the medical emergencies, medical facilities would avoid tragic consequences and legal hazards associated with negligence and improper care(18)

1.2. Statement of the Problem

Emergency medical care usually responds to hospital cardiac arrest and community emergency calls; therefore, their potential knowledge and practice in ACLS is important in improving patient outcomes (19).

In/out of hospital Cardiac arrest is major public health concern and cause mortality globally(19).WHO estimated that more than 17.5 million people died from cardio vascular diseases such as heart attack and stroke and more than three out of four occur in low income countries (12).Many surveys done on knowledge, attitude and skill/practice of Interns towards ACLS in India revealed that, their knowledge and practice status is low and they were not confident to do ACLS/Basic Life Support(20, 21). Study done in majmaah university shows almost half of study sample have poor knowledge of ACLS practice although many have attended ACLS courses or workshops (14). In another survey done about the recommended maneuver for opening the airway of the injured victim, only 40% of them answered jaw thrust with immobilization of the cervical spine (22). The Research done in the Tertiary Level Hospital of Nepal also revealed that most of the emergency medical professions working in high care units of the hospital did not have adequate knowledge and practice about ACLS /BLS intervention, Only 2% had adequate Knowledge and practice about ACLS (23).Among Kuwait dental physicians study focused on “BLS” which only comprises basic ACLS procedural sequence performance of health professionals are mainly different, due to training, and years of experience (24)

Evidence-Based African First aid guidelines and training materials indicate in sub-Saharan Africa, 41% of all deaths and 39% of the morbidity can potentially be addressed by cardiac emergency care (25). Consequently emergency care of critical patients is one of the most challenges facing front-line in sub-Saharan Africa. Rural district hospitals are often staffed by general physicians with only internship-level training mean that many curricula do not directly address the day-to-day clinical challenges facing African health professions(26). Moreover, Scarcity of research regarding practice of patients about ACLS risk factors in developing countries has been mentioned(27).Patient survival can even be three times increased when cardiac arrests are managed by persons able to provide immediate ACLS(28). However, only an

insignificant number of cardiac arrest victims receive adequate life-saving ACLS, thus indicating the need for improvement (29).

Ethiopia, where transition is being made from infectious disease to those non-infectious diseases (30). In 2021, WHO reported that around 30% of the Ethiopian population died due to non-communicable diseases, from this CVD contributes high rate due to extended lack of ACLS knowledge, practice, experience, education level, availability of emergency equipment and medication, training and inability to offer these medical emergency operations (31). In addition, in Ethiopia traumatic injuries that cause sudden cardiac arrest are one cause of morbidity and mortality due to lack of immediate ACLS intervention (25).

Study at Addis Ababa university college of health science concerning knowledge, practice level of health professionals on “BLS” which only comprises basic ACLS procedural sequence show participants 28.9% have poor practice level about BLS (12). Some local scholars have tried to study factors associated to BLS which only comprise basic ACLS procedural sequence in Ethiopia, however, several limitations can be found in their studies (25). For instance study in Bahirdar referral Hospital focused on exposure to cardiac arrested case and BLS/ACLS training (32).

Apparently, no other variables were tested in their studies. Another study conducted in Eastern Amhara region Hospital studied factors associated with ACLS updating of health workers such as additional training, work experience and professional level (25). Which internally show few emergency health workers were answered questions about how to perform first aid primary survey in Gondar and Bahirdar referral hospitals, Ethiopia, 2016 (33). While their studies missed some important variables such as age, sex, assigned place, and availability of emergency medication and equipment. However, the study on knowledge, practice and perspective of ACLS evidence indicated a knowledge and practice gap for emergency medical care professionals in ACLS guidelines (34).

Moreover, no research had been done on the subject at the study area which addresses the ACLS knowledge and practice of health professions regarding this highly effective and easy maneuver. However, knowledge, practice gap among health professionals with regard to ACLS and

management strategies for cardiac arrest is a country problem as a whole(19). Regarding the above gap in the respective literature, this study aims to empirically analyze knowledge, practice of ACLS and its associated factors among general Practitioner and nurses at Holeta, Ginchi and Enchini west Shoa, Oromia.

1.3. Significance of study

Assessing the level of knowledge, practice and associated factors on ACLS among General practitioners and Nurses will be valuable for policy makers (curriculum designers) and different stake holders to apply improvement in teaching-learning processes and to implement intervention strategies, to give priority for possible intervention and to select priority groups to allocate resources to increase quality of care.

Health workers can use this study to identify and focus on the gap to make the decisions on how to improve their knowledge and practice. Knowing level of knowledge, practice and associated factors may be important to attempt to display solutions or directions to resolve gaps and identify variables to provide sound ACLS care by health professional in hospital.

Researchers can also use the result of this study as base line information to conduct further studies by using different study designs and possible comparisons groups to perform different analysis in other settings.

CHAPTER TWO

2. LITERATURE REVIEW

2.1. World Wide

2.1.1. Practice of nurses and general practitioners towards Advanced Cardiac Life Support

Study done in Malaysia, 82.9% said they had attended cases of ACLS and 17.1% admitted that they had never attended any cardiac arrest before (20). Cross-sectional observation study done in Nepal showed that in recommended maneuver for opening the injured victim's airway, only 40% of them answered jaw thrust with immobilization of the cervical spine (22). According to study prohibited at Tabuk University on awareness of basic life support among medical and nursing students CPR and ACLS inadequate. However more than half of study samples have poor practice of ACLS(15). In fact, statistics from WHO confirm that survival rate for patients after a heart attack keep decreasing as the survival of these patients highly depends on the less exposure to cardiac arrest of the medical attendants within the vicinity, the quality of medical emergencies given, and the duration undertaken before the patient is placed on defibrillation after the attack (21).

An interview conducted in bhutan among 60 doctors, which included a mix of doctors working at regional referral hospitals, district hospitals and grade I BHUs, revealed among the 60 doctors interviewed, 25% reported “good” practice skills regarding ACLS(35). Majority reported the ability to create a tight seal during bag mask ventilation and the ability to open the airway of unconscious patients (94.7% and 84% respectively) (4). The doctors who had received prior training in ACLS had better practice skills. Similarly, doctors working at different primary and regional referral hospitals had better practices(35).

The study done in Japan revealed that experience has an impact to apply the ACLS knowledge into practice. Those experienced nurses face a lot of challenges in health settings which provide the courage, strength, and skill to apply cardiopulmonary resuscitation of ACLS(36).

Cross-sectional study in Saudi Arabia revealed, the major mean of transportation is the motor vehicle and road traffic accidents are common in Saudi Arabia especially during Ramadan. The

study recommended strategic prevention plans can be implemented by the healthcare policies, transportation and education authorities as well as the study accessed that there is a need of improvement in the ACLS awareness and training among the students of the Majmah University(14).

According to the study done on adult cardiopulmonary resuscitation among junior doctors in hospital University Sains Malaysia and hospital among Kuwait dental physicians, age, gender, years of experience and formal ACLS training were correlated with ACLS practice(32). Even though BLS and ACLS knowledge and skills tend to degrade after some time, and regular training and practice as a refresher course have been recommended in different studies(37). A study among Singapore primary care physicians showed that those who were less than 50 years old were more trained in BLS and ACLS and had good knowledge than those older than 50 years old (38). Also study conducted at this University stated that males had 3.98 times higher odds ratio in getting a good level of knowledge and skills as shown by the overall test (95%CI; 1.21, 13.14) compared to female. Another hospital-based study in Malaysia revealed that being a junior in clinical practice significantly increased the level of confidence in performing (39).A study on nurses in Turkey furthermore, reported that a significant correlation was found between level of education and performance of ACLS, as the highest performance mean score (238.7 ± 24.5) was presented by bachelor degree nurses as regard to level of education p value = (<0.05)(40). Cross-sectional study in a Jamaican university hospital indicated that physician seniority was inversely related to practice scores (32).

2.1.2. Knowledge of general practitioners and nurses towards advanced cardiac life support

Cross-sectional study on ACLS and BLS knowledge in Thailand indicated among seventy physicians was enrolled to take the test. Up to 15.7% (95% CI 8.1-26.4) of those participants have scored over 80% (7).A study done in Pakistan to compare the three categories of health professionals (doctors, dentists, and nurses) from five institutes shows that Nurse' Knowledge of ACLS was low(41). According to the study in Saudi journal of nursing and health care revealed that half of the study sample was 20-25 years of age group ((42). Furthermore, the nurses knowledge in pretest affected by the gender with mean 98.3 ± 5.5 had female, and the posttest knowledge affect by the majority of participants 99.0 ± 2.0 of competence between age 35-39 years and 99.0 ± 3.1 between 40-44 years.

Study in Saudi revealed that there is a significant difference between the competence of knowledge and nurses they had received previous training program ($p < 0.05$) (43). Similar finding in Pakistan shows BLS and ACLS knowledge and skills tend to degrade after some time, and regular training and practice as a refresher course have been recommended in different studies (37). Study in Thailand on ACLS Medical staff and residents with higher frequency of ACLS exposure have more knowledge than those with less exposure to ACLS practice data also showed that frequency of ACLS practice is an important factor in maintaining knowledge (7). Research conducted in Saudi women's university revealed that students who had previously received BLS and ACLS training had significantly higher knowledge scores ($P < 0.001$) (44).

Study done in Turkey to evaluate nurses' and doctors' knowledge of basic and ACLS shows health professionals working in more than one work area and in high-risk areas had more repeated exposures to cardiac arrest cases, and as a result they acquire good theoretical knowledge and positive attitudes (32). This is also supported by UK resuscitation guidelines, which state that staff that had more exposures to different patient care areas may have more advanced resuscitation knowledge and skills (45). Cross-sectional study in Pakistan showed educational level; year of experience, assigned place, resuscitation training, and prior exposure to cardiac arrest patients was positively associated with Knowledge of BLS and ACLS (41). Study done in Malaysia shows multivariate analysis, there were significant associations between gender ($p = 0.003$), designation ($p = 0.027$) and pre-test result ($p = 0.002$) with the level of knowledge and skill shown by overall test results and males had 5.43 times higher odds in getting good knowledge and skills (95%CI; 1.79, 16.56) compared to females (16).

2.2. African context

2.2.1. Practice of nurses and general practitioners towards Advanced Cardiac Life Support

Findings from Babcock university teaching hospital in Ilishan-Remo, Ogun State, Nigeria study revealed that nurses' qualifications had a significant association with good practice, where degree nurses are one times more likely to have good ACLS practice than diploma nurses. When a qualified professional nurse is advanced the scope of theoretical as well as practical sessions they cover is increased. Out of 53 respondents, 85% had been actively involved in the

resuscitation of patients 41.54% were rarely involved in the resuscitation of patients while 4.62% had never been involved in the resuscitation of patients (46)

2.2.2. Knowledge of general practitioners and nurses towards advanced cardiac life support

The study in Egypt was reported that nurses with less than one year of experience, as well as nurses working in less critical situation, find CPR comprise ACLS situations stressful. The Research in Rwanda shows that Ninety-two percent (92%) of the nurses don't know the correct sequence of steps for CPR and ACLS, while only 59.50% of nurses answered the methods to open the airway in cervical spine injury(47). Another similar study in East Africa in Kenya found that most clinicians answered the recommended maneuver to open the airway in the unresponsive trauma patient is the Jaw Thrust maneuver (48).

According to the Egypt study, 73% have no prior training, and 27% have no information about CPR that comprises ACLS(19). The study done in Rwanda showed categorized as good Knowledge (above mean) and poor Knowledge (below mean) and revealed that the nurses who reported good knowledge on questions towards basic life support were 25% (47). Cross-sectional study done in East Africa showed that who found a significant relationship between nurses' level of education, previous training, and BLS which comprises knowledge scores; where the subjects with the highest proportion of adequate knowledge were those with a Bachelor's degree and trained(49).

2.3. Ethiopia

2.3.1. Practice of nurses and general practitioners towards advanced cardiac life support

Cross-sectional study at Public Hospitals in Addis Ababa Ethiopia revealed only 38.2% of the participants in the study was able to correctly answer the question about why they needed to use oral airway device(50). According to cross-sectional study done at Amhara region referral hospital stated that Nurses' who had previous exposure to ACLS/BLS skills were 7.8 times more likely to practice BLS which only comprises basic ACLS performance sequence as compared to those who didn't exposed [AOR=7.8, 95% CI (4.2, 14.78). Similarly nurses who replied as they were confident in performing ACLS/BLS had 7.4 times more likely to practiced BLS skills than those who were not confident [AOR=7.4, 95% CI (4.1, 13.35)(36)

A cross-sectional study conducted in Mizan Tepi University teaching hospital, Tepi general hospital, Ethiopia shows there is significant association between CPR which only comprises basic ACLS good practice and experience. Those nurses who had work experience of 6–10 years and >10 years were two and one times more likely to have good CPR which only comprises basic ACLS practice than those nurses who had 1–5 years of experience, respectively with (AOR = 2.27, 95% CI: 1.25– 4.13) and having >10 years experiences (AOR = 1.81, 95% CI: 1.10– 2.98) compared with those nurses having 1– 5 years of work experience (51)

In a study done at University of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia Accordingly, health professionals who had greater than 5 years of work experience was 5.02 times more likely to have good knowledge than health professionals who had less than 2 years of work experience (AOR: 5.02, 95% CI 1.25 to 20.20). Similarly, the odds of having good knowledge towards adult CPR which only comprises ACLS were 6.52 times (AOR: 6.52, 95% CI 2.76 to 15.41) higher among health professionals working in more than one work area as compared with health professionals with exposure in only one work area (32)

According to the study conducted Amhara region referral hospitals, northwest Ethiopia, Bivariate logistic regression analysis revealed age, knowledge of ‘BLS’ which only comprises basic ACLS, assigned place, resuscitation training, previous exposure to cardiac arrest patient and self-confidence towards performing ACLS were factors associated with the practice of ‘BLS’ which only comprises ACLS; however, in the multivariate logistic regression analysis only knowledge, resuscitation, training, previous exposure and confidence in performing ACLS were factors found to be significantly associated with practice of nurses towards ACLS at p-value of <0.05 (36).

Findings from Mizan Tepi University the odds ratio of good practice were higher among nurses with a nursing degree (AOR = 1.54, 95% CI: 0.93–2.54) than nurses with a diploma (51). Similar findings from Amhara region revealed that nurses’ qualifications had a significant association with good practice, where degree nurses are one times more likely to have good CPR which only comprises basic ACLS practice than diploma nurses. Study done at Addis Ababa university shows among the 193 respondents, 124 (64.2%) had poor practice, whereas only 69 (35.8%) of

participants had good practice towards BLS which only comprises advanced cardiac life support. In addition to this from 53 females (4.1%) have excellent and 28(12.8%) have good 'BLS' which only comprises ACLS practice on the other hand from 126 male medical interns 9(4.1%) have excellent and 57(26.1%) have good practice about 'BLS' which only comprises ACLS which is statistically significant (19).

Cross-sectional study done at Wollo University revealed there was statistically significant association between profession (p-value 0.000) work experience (p-value 0.000) additional training (p-value 0.000) and educational (Professional level) (p-value 0.000) and the dependent variable knowledge and practice on advanced cardiac life support(25). Study prohibited at Mizan Tepi University the odds ratio of good practice were higher among nurses with a nursing degree (AOR = 1.54, 95% CI: 0.93–2.54) than nurses with a diploma(51). This finding is in harmony with a study done in Amhara region referral hospitals when a qualified professional nurse is advanced the scope of theoretical as well as practical sessions they cover is increased(36). The result of study at University of Gondar Ethiopia stated; cardiopulmonary arrest is a major health problem worldwide and is common especially in areas with low income, which may be associated with inadequate medical care and facilities. Hence poor-quality CPR which only comprises ACLS has been shown to have similar outcomes to patients receiving no CPR which only comprises ACLS (52).

A cross sectional study on practice and associated factors towards basic life support that comprise basic ACLS sequential procedure among nurses working in Amhara region referral hospitals, revealed that 71.6% of the participants had poor BLS practice. Only 31.4% of the respondents received BLS training, of which, almost 25% took training before their graduation as a pre-service training and 75.41% after their graduation as an in-service training. The rest of the participants had never had any resuscitation training towards BLS(33).

2.3.2. Knowledge of general practitioners and nurses towards advanced cardiac life support

Institutional-based cross-sectional study in Northwest Ethiopia indicated more than half 239, (58.9%) of the study participants had 2–5 years of work experience and exposure to cardiac arrest cases significantly influenced the CPR which comprises ACLS knowledge of health

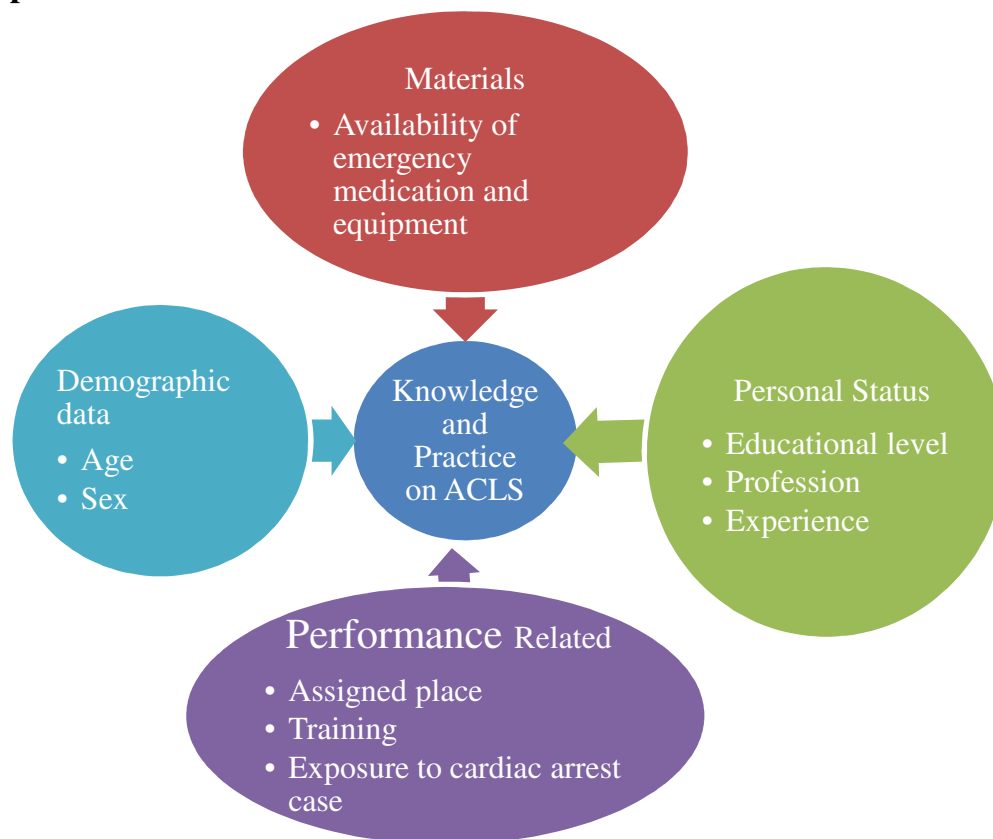
professionals. More than half (220, 54.2%) of the study participants had encountered cardiac arrest case in their work area and 145 (65.9%) of them resuscitated those cardiac arrest victims. On the other hand, 75 (34.1%) study participants did not resuscitate the victim due to different reasons (32). According to the study conducted in Ethiopia it is known that knowledge can be acquired through experience, so that individuals who had long clinical experience had high probability of getting CPR and ACLS cases, leading them to read, search and understand(33).

Some literature in Ethiopia also suggests that frequent training is important to retain good knowledge and attitude towards BLS and ACLS (37, 53, 54). Study in Addis Ababa Hospitals of Ethiopia, Bivariate logistic regression result revealed that Nurses' Who had >10 years of Clinical experience were 12 times more likely to practice BLS and ACLS as compared to those who had only <1 years clinical experience [COR 12.444 95% CI (2.292-67.561)] (19). Multivariate logistic regression result of study conducted in Ethiopia showed nurses' with master's degrees were 7.6 times more likely to practice ACLS as compared to those who had a diploma in nursing [AOR=7.634, 95% CI (1.036-56.239)](19). Finding in Gonder comprehensive specialist Hospitals shows that the current study, participants working in different wards were more knowledgeable compared with participants working in only one ward(32). Study at Addis Ababa University on Nurses who had been trained were 2.72 times more likely to be knowledgeable [COR = 2.72, 95% CI (1.11–6.67)] than those who had not been trained, and nurses with one to five years of emergency work experience were 2.54 times more likely to be knowledgeable [COR = 2.54, 95% CI (0.91–7.12)] than those with less than one year of work experience(50).

Bivariate result of study done at Amhara region referral Hospitals indicated, nurses who had first degree in nursing were 6.96 times more likely to be knowledgeable as compared to diploma holder nurses [AOR=6.96, 95%CI (3.36, 14.42)] and nurses who were working in medical ICU where very critical cases are being admitted and treated had about 5 times more likely to be knowledgeable as compared to nurses working in OPD [AOR=4.67, 95%CI (1.09, 19.86)](33). According to the of nurse working at adult emergency in Addis Ababa study participants showed that more than half of respondents in the adult emergency unit were dominated by females nurses 106(54.9%), and the mean age of respondents was 28.03 ± 3.504 (19).

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: Among the total study participants 40.5% healthcare workers (nurses and physicians) had good knowledge toward advanced cardiac life support. 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 and medications like amiodarone are frequently unavailable, and equipment such as an AED is also unavailable in most hospitals(55).

2.4. Conceptual Frame work



Source: (14, 19, 33, 55, 56)

Figure 1: Conceptual framework on the assessment of Knowledge, practice and associated factors among general practitioners and nurses working at selected primary hospitals, West shoa, Oromia, 2022/2023 G.C.

CHAPTER THREE

3. RESEARCH OBJECTIVE

3.1. General Objectives

- To assess Knowledge, practice and associated factors on advanced cardiac life support/ACLS/ among General practitioner and Nurses in selected Governmental hospitals in West shoa, Oromia from March 15 to April 15 2023 G.C.

3.2. Specific Objectives

- To evaluate the practice level of General practitioner and Nurses on advanced cardiac life support in selected Government hospitals at West Shoa, Oromia region from March 15 to April 15, 2023 G.C.
- To assess knowledge level of General practitioner and nurses on advanced Cardiac Life Support in selected Government hospitals in West Shoa, Oromia region from March 15 to April 15, 2023 G.C.
- To determine the factors affecting the knowledge, practice on advanced cardiac life support among General practitioner and Nurses in selected Government hospitals in west shoa, Oromia region from March 15 to April 15, 2023 G.C.

CHAPTER FOUR

4. METHODOLOGY

4.1. Study Area

The study was conducted in Holeta, Enchini and Ginchi primary hospitals in West shoa, Oromia Region. Holeta is found on Ambo road, which is 40km far from Addis Ababa to the West. This hospital is primary hospital which was started service in 2012 E.C .Which served for greater than 500,000 populations. This hospitals had Internal medicine =1, pediatrician =1, Surgeon=2, Gynecologists= 1, Emergency surgery =2, General practitioner= 15, Dentist= 1, Nurse=50, Midwifery= 16, Laboratory Technologist= 9, clinical pharmacy= 17 and other health professionals= 17and also had many supportive staff. This hospitals also served for greater than 300 per day and has more than 90 beds(57).

Enchini primary hospital is found in West shoa Zone Adeaberga Woreda in oromia. This hospitals started service in 2007E.C as primary hospitals which, served for more than 600,000 populations. It had Internal medicine =1, pediatrician =1, Surgeon=2, Gynecologists= 1, Emergency surgery =4, General practitioner= 15, Dentist= 1, Nurse=48, Midwifery= 14, Laboratory Technologist= 9, clinical pharmacy= 17 and other health professionals= 17 and also had many supportive staff. This hospitals also served for greater than 250 per day and has more than 75 beds(58).

Ginchi primary hospital is found in west shoa zone Dandi Woreda. This primary hospitals started service in 2012 E.C, which served for more than 500,000 populations. This hospitals had Internal medicine =1, pediatrician =1, Surgeon=2, Gynecologists= 1, Emergency surgery =2, General practitioner= 12, Dentist= 1, Nurse= 40, Midwifery= 15, Laboratory Technologist= 9, clinical Pharmacy= 12 and other health professionals= 10 and also had many supportive staff. This hospitals also served for greater than 200 per day and has more than 70 beds(59).

4.2. Study Period

The study was conducted in Holeta, Ginchi and Enchini primary hospitals from March 15 to April 15, 2023 G.C.

4.3. Study Design

A quantitative cross-sectional study design was employed in an institutional setting to investigate the knowledge, practice, and associated factors related to ACLS among health workers.

4.4 Source and Study Population

4.4.1. Source population

Source population was all general practitioner and nurses who were working in west shoa primary hospitals during study period.

4.4.2. Study Population

General practitioners and nurses who were available in three selected primary hospitals during the data collection period and met the inclusion criteria.

4.5. Eligibility Criteria

4.5.1. Inclusion criteria

All general practitioner and nurse those work in selected hospitals during data collection were included.

4.5.2. Exclusion Criteria

- Nurses who were working in neonatal intensive care unit
- Nurses who were working in obstetrics and Gynecology ward

4.6. Sample size determination

The sample size formula for cross-sectional study design is given by the single population proportion formula denoted by:

$$n = (Z\alpha / 2)^2 \times \rho(1 - \rho) / d^2$$

Here “n” is the minimum required sample size, $Z\alpha/2$ is the value under standard normal table for a given confidence interval (1.96 for 95% CI), p is the best estimate of prevalence from a previous, taking 50% (there is no research conducted on practice and associated factors on ACLS in primary hospitals found in Ethiopia) d^2 were margin of error. Then the sample size was 384 Nurse and General Practitioner. But the population in the study area is less than 10,000 then the study was used sample size determination correction formula,

$$n = \frac{no}{1 + no/N}, \text{ Where } N=350, n_o= 384$$

Then the sample size with non-respondent rate was required for Practice and associated factors were 201 with non- response rate. By using the statistical formula for single population proportion for knowledge and associated factors on ACLS that done at Bahidar(55) is 40.5% then the final sample size were 198 with non-response rate. Finally the study sample size were used the largest number. So the sample size was for both knowledge and practice is 201. But total sample size in study area was 180. Total study participants were planned to include in study.

4.7. Sampling Technique and procedure

Three primary hospitals were selected using a simple random sampling technique known as the lottery method out of the seven West Shoa primary hospitals. Holota, Enchini, and Ginchi primary hospitals were included in the study, while Guder hospital was selected for the pretest phase. All study participants in these hospitals were working in the emergency unit on a rotational basis. Therefore, all general practitioners and nurses who were present during the study period and working in all units were included. The study was conducted with a total of 156 participants. Where number of participants:

- Enchini primary hospital out of 63, General practitioner= 12, Nurse= 51.
- Ginchi primary hospital out of 47, General practitioner= 11, Nurse= 36.
- Holota primary hospital out of 46, General practitioner= 15, Nurse=31.

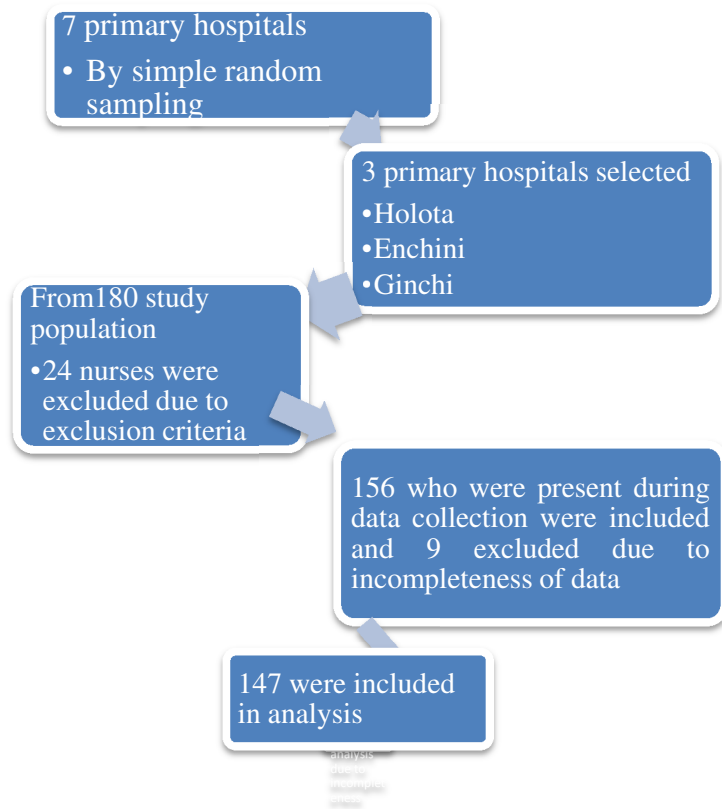


Figure 2 Sampling procedures on the assessment of Knowledge, practice and associated factors among general practitioners and nurses working at selected primary hospitals, West shoa, Oromia, 2022/2023 G.C.

4.8. Measurements

4.8.1. Study variables

Those study variable classified into two.

4.8.1.1. Dependent variables

- ❖ Knowledge
- ❖ Practice

4.8.1.2. Independent Variables

- Demographic data
 - Age
 - Sex
- Educational Level
- Experience

- Profession
- Assigned place
- ACLS training
- Exposure to cardiac arrest case
- Availability of emergency equipment and medication

4.9. Data collection Tool and Procedures

Data was collected by Self-administering structured questionnaire which used to assess level of knowledge, practice and associated factors on ACLS. Three data collectors were involved during the data collection process. They were trained on how to collect the relevant data using the data collection format. One supervisor was intermittently supervising the data collectors. Data collectors were the health professionals who had BSC degree qualification in ECCN. While performing this research, structured questionnaires was employed in order to obtain data. Since the study is meant was performed in three selected primary hospitals at Oromia Region, which includes physician (General practitioners) and Nurse. A number of medical professionals working in the nearby hospital facility were also contacted for pretest. All Participants who fulfill the eligibility criteria were included.

The questionnaire were derived from standard reference American Heart Association (AHA) guidelines for ACLS care based on the course content of the 2020 -2025 AHA BLS and ACLS and other similar studies(14, 16, 19, 55, 60). The study tools also checked for reliability with the result of cronbach's alpha for knowledge and practice 0.851and 0.818 respectively and were validated in accordance with AHA's teaching manual. The cronbach's alpha value of greater than (0.70) is an acceptable cutoff point of reliability test (61).This questionnaire had an English version only and had four parts. Socio-demographic characteristics and associated factors of respondents contain 12 questions. Knowledge of respondents on ACLS contains 17 questions, the score classified into two levels (good and poor knowledge). A practice-related question towards ACLS contains 9 questions, the score classified into two levels (good practice and poor practice).

4.10. Operational Definitions

- **ACLS:** A standardized approach to the management of cardiac arrest, including manual defibrillation, advanced airway, drug therapy, pre-arrest circumstances, and post-resuscitation(17).

Leveling of Practice and knowledge status of respondents

- ❖ **Good practice:** Who meet above the mean score of ACLS practice questions towards advanced cardiac life support
- ❖ **Poor practice:** Respondents who scored less than the mean score of ACLS practice questions towards advanced cardiac life support, Refers to academic application of practice and skills on ACLS. A Practice score of > 50% considered as **good practice** of ACLS, $\leq 50\%$ is considered as **poor practice** in this study (62).
- ❖ **Good Knowledge on ACLS:** study participants who answered 80% and above correct answers to the knowledge questions on ACLS were considered to have good knowledge(52).
- ❖ **Poor knowledge of ACLS:** participants who scored below 80% were considered to have poor knowledge. The test questions were modified from Advanced Cardiac life support guideline (American Heart Association)(52)
- **Training:** Study participants who have taken training for the last year are counted as having regular training (51).
- **Availability of emergency medication and equipment (AEME):** Emergency medication and equipment is those critical for patient care to alter cardiac and respiratory function or otherwise sustain life(63).

4.11. Data quality control, processing and Management

A pretest was done on 10% (15) of the respondents at Guder Primary Hospital. Then vague and incorrect questions were modified after the pretest was conducted. In addition to the pretest, the data collectors were trained for completeness of responses to questionnaires before collecting the actual data and how to collect data from respondents. The principal investigator also intermittently follows data collection and checked the data for completeness clarity, and

collected the filled question and the necessary feedback was offered to data collector. Finally coding, data entry, data cleaning and cross checking was done before data analysis.

4.12. Data analysis plan and procedure

The data was entered by Epi data version 4.6. Then the data was exported and analyzed using STATA version 14. Descriptive statistics such as frequency, cross-tabulation, percent, and pie chart were used to summarize the data. Chi-square (χ^2) tests was used for univariate comparisons of categorical variables. After checking all assumptions of logistic regression such as independent observations multi-co-linearity, heteroscedasticity and correlation linearity among independent variables, and Hosmer-Lemeshow goodness of fit also used to test the model's fitness at p-values of > 0.05 , all variables were entered in to model for making inferences. Binary logistic regression analysis was employed to assess the association between dependent and independent variables. The variables in bivariate logistic regression < 0.25 were entered into multivariable. The appropriate 95 percent confidence intervals for crude and adjusted odds ratios were computed. In multivariable logistic regression, independent variables with P-values < 0.05 were declared statistically significant.

4.13. Ethical Consideration

Ethical clearance was secured from St, Paul's Hospitals Millennium Medical College (SPHMMC) Research Ethical Committee (REC) of the Nursing Department. This ethical clearance letter was submitted to the head office of hospitals. Then a letter of permission was obtained from hospitals, and then this letter was submitted to the nursing department head and coordinators of each department before actual data collection began. Then informed consent was obtained from all study participants before proceeding with data collection. Confidentiality of the information obtained from each participant was maintained.

4.14. Dissemination of Results

The study result will be presented to St Paul's Hospital Millennium Medical College, Faculty of Post Graduated Nursing Department and documents will be disseminated to all responsible bodies in the study area, for the hospitals where the study is conducted, for Oromia Regional Health Bureau, MOH and St Paul's Hospital Millennium Medical College. Finally, efforts will be made to presentation scientific conferences and publish in national journals.

CHAPTER FIVE

5. RESULTS

5.1. Socio-Demographic and personal characteristics of study participant selected at Governmental Hospitals in March/April 2023 G.C

One hundred eighty samples were planned for the study, from that 24 were nurses excluded due to exclusion criteria. 156 were participated and Out of the participants, 147 were included in the analysis. Nine subjects were excluded from the analysis due to incompleteness and inconsistency of their responses, resulting in a response rate of 94.23%. Among the included participants, 75 (51.03%) were female. The participants had a median age of 30 years. 133 (90.47%), had a bachelor's degree (BSc). More than two third 109(74.15%) were nurses. The participants had a mean experience of 6.46(SD $\pm$ 4.466) years. The majority of participants 70 (47.6%), were assigned to the Emergency area.

Table1: Socio-Demographic and personal Characteristics of study participants at West shoa, 3 selected primary Hospitals, Oromia 2023 G.C

S.N	Variable	Frequency	Percent	
1	Sex	Male	72	48.97
		Female	75	51.03
2	Educational level	Bachelor degree	133	90.47
		Diploma	14	9.53
3	Profession	General practitioner	38	25.85
		Nurse	109	74.15
4	Assigned place	Emergency	70	47.6
		Medical ward	29	19.74
		OPD	22	14.98
		OR	5	3.40
		Pediatric ward	11	7.48
		Surgical ward	10	6.80
5	Age	Median(30)	Range(22-44)	
6	Experience	Mean(6.46)	SD(±4.466)	

5.2. ACLS related characteristics of the study participants

More than half 91(61.95%) of the study participants had never received ACLS training. A majority of the study participants, 135 (91.84%), had been exposed to cardiac arrest cases and had been involved in resuscitation efforts. Less than half of 29 (19.72%) respondents reported the availability of emergency medication and equipment in the study area.

Table 2: ACLS associated characteristics of respondents who worked in 3 selected Primary Hospitals, West shoa, Oromia region, 2023 G.C.

S.N	Variable		Frequency	Percent (%)
1	Training on ACLS on job in a last year	Yes	56	38.05
		No	91	61.95
2	Exposure to cardiac arrest case	Never	12	8.16
		Yes	135	91.84
3	Availability of emergency medication and equipment	Yes	29	19.72
		No	118	80.28

5.3. Knowledge of participants related to Advanced Cardiac Life Support

The number and percentage of each knowledge question scores of the respondents are listed in Table 3. The percentage of each question correct answered varied from 37.2% to 65.5%. Among the participants, about 96(65.5%) answers the correct abbreviation of AED. Followed by the three questions, “the critical characteristics of high quality CPR, the location of CPR for adults and the first drug of choice during cardiac arrest” were the most correctly answered questions which score 62%, 54% and 54% respectively. On the other hand, 62.8% were incorrectly answered when asked about contra indicated therapy for management of stroke patients and the correct sequence of electrical activity in the heart for normal sinus rhythm, definition of abbreviation of ACLS were 89(60.8%),88(60.1%) respectively. Regarding questions when to stop CPR, initial management of symptomatic bradycardia and immediate managements of ventricular fibrillation more than half correctly answered were, 53%, 52.7 %and 51% respectively.

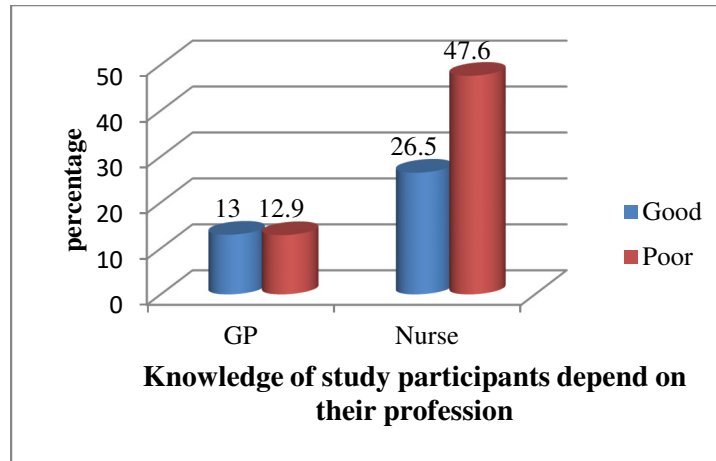


Figure 3: Overall knowledge level of respondents based on their profession in selected public primary hospitals West Shoa, Oromia Region, 2023 G.C.”

Table 3: Responses of General practitioners and Nurses for ACLS knowledge questions in 3 selected hospitals West shoa, Oromia Region, 2023G.C.

S.N	KNOWLEDGE	Correct Response		Incorrect Response	
		N(147)	%	N(147)	%
1	Definition of abbreviation of ACLS	59	39.9	88	60.1
2	The site of electrical impulse for normal cardiac activity originate	63	42.6	84	57.4
3	The correct sequence of electrical activity in the heart for normal sinus rhythm	58	39.2	89	60.8
4	The first drug of choice during cardiac arrest	80	54	67	46
5	Abbreviation AED stands for	96	65.5	51	34.5
6	The main piece of data is critical to obtain in all stroke individuals	62	41.9	85	58.1
7	The proper pairing regarding CPR for an adult:	64	43.3	83	56.7
8	A 55-year-old male has stroke symptoms, and the CT scan shows multiple infarction (more than one-third of the cerebral hemisphere).Therapy which is contraindicated	55	37.2	92	62.8
9	The critical characteristics of high-quality CPR include:	91	62	56	38
10	Factors indicated to stop performing CPR	78	53	69	47
11	Position of pregnant women during CPR	62	41.9	85	58.1
12	The location for CRP in adult	80	54	67	46
13	You have just administered a drug for an individual in supraventricular tachycardia (SVT). She complains of flushing and chest heaviness. The drug most likely cause this complains,	65	43.9	82	56.1
14	An individual presents with symptomatic bradycardia. Her heart rate is 32. The initially drug used for this case,	78	52.7	69	47.3
15	The location for chest compression in infants	65	44.3	82	55.7
16	The role of 2nd rescuer during CPR	62	42.2	85	57.8
17	The patient comes in ER with ECG interpretations of ventricular fibrillation what is your Immediate response to fix problems?	75	51	72	49

5.3.1. The overall knowledge of Study participants

The percentage of knowledge scores of the respondents are indicated in figure 4. Percentage of result varied from 29.4% to 94%. The mean score for knowledge question of the participants was 65.53 ± 18.97536 . Only 39.5% of study participants had good knowledge towards ACLS.

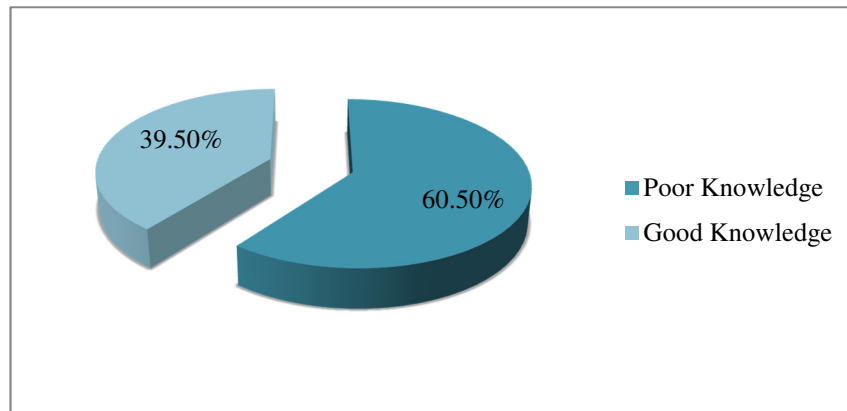


Figure 4: Overall knowledge level of respondents in selected public primary hospitals West Shoa, Oromia Region, 2023 G.C.”

5.4. Practice of participants related to Advanced Cardiac Life Support

The number and percentage of each practice question scores of the respondents are listed in Table 4. The percentage of correct answered for each question varied from 34.8% to 69.4%. Among the participants, about 102(69.4%) answers how to perform CPR for adult victims. Followed by the two questions: “The proper steps for operating an AED and how to manage immediately obstructed air way were, the most correctly answered practice questions 61.5% and 57.1% respectively. On the other hand, 65.2% were incorrectly answered how to perform CPR for the child and the correct step in management after delivery of a shock, the correct step to emergency care after witness to cardiac arrest were 94(63.9%),86(60.8%) respectively. Regarding practice questions witnessing an adult unresponsive victim who has been submerged in fresh water and just removed from it, while treating an individual who presented in ventricular fibrillation after CPR and one times attempt at defibrillation, then his new rhythm is third-degree AV block, questions almost less than half correctly answered were, 41.4%, 45.6 %respectively.

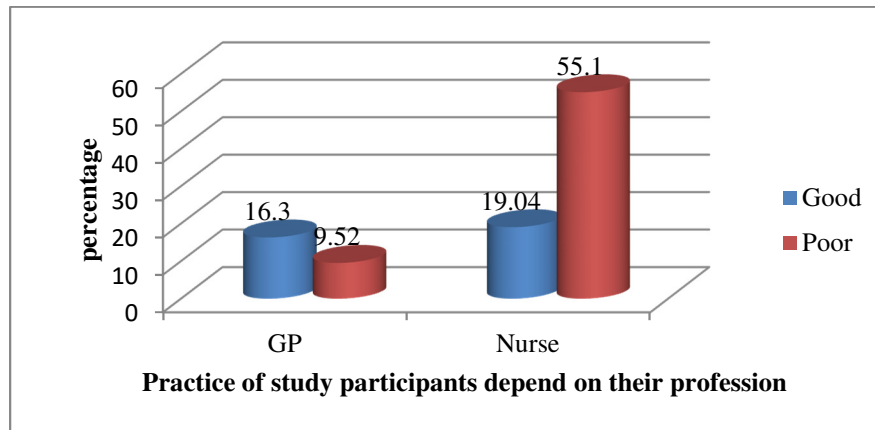


Figure 5: Overall practice level of respondents based on their professions in selected public primary hospitals West Shoa, Oromia Region, 2023 G.C.”

Table 4: Responses of Study participants for ACLS practice questions in 3 selected hospitals West shoa, Oromia Region, 2023G.C.

S. N	PRACTICE	Correct Response		Incorrect Response	
		N	%	N	%
		(147)		(147)	
1	The correct step for Emergency care	61	39.2	86	60.8
2	You are transporting an individual who goes into cardiac arrest during transport. IV access is unsuccessful, other steps was	77	52.4	70	47.6
3	In primary survey if you, suspect the patient air way is obstructed initial management	84	57.1	63	42.9
4	Steps to perform CPR for adult victims	102	69.4	45	30.6
5	Step in management after delivery of a shock	53	36.1	94	63.9
6	Baby “X “who is 6 years old, comes to ER with loss of consciousness, agonal breathing when you feel pulse there is no pulse, technique to perform CPR for this child	51	34.8	96	65.2
7	You are treating an individual who presented in ventricular fibrillation. After CPR and one attempt at defibrillation, his new rhythm is third-	67	45.6	80	54.4

	degree AV block. The next step in management was				
8	You are witnessing an adult unresponsive victim who has been submerged in fresh water and just removed from it, he has spontaneous breathing but he is un responsive. Next steps was,	58	41.4	89	58.5
9	The proper steps for operating an AED are:	90	61.5	57	38.5

5.4.1. The overall Practice of Study participants

Out of the total study participants only 52 (35.37%) demonstrated good practice, while the majority of respondents, 95 (64.63%) had poor practice towards ACLS. Nine practice-related questions were asked regarding ACLS. The mean score for the practice questionnaire was 50.508 ± 20.67891 with minimum and maximum of 11.1% and 100% respectively. Participants scoring above the mean value were classified as having good practice, whereas those scoring below the mean value were considered to have poor practice towards ACLS.

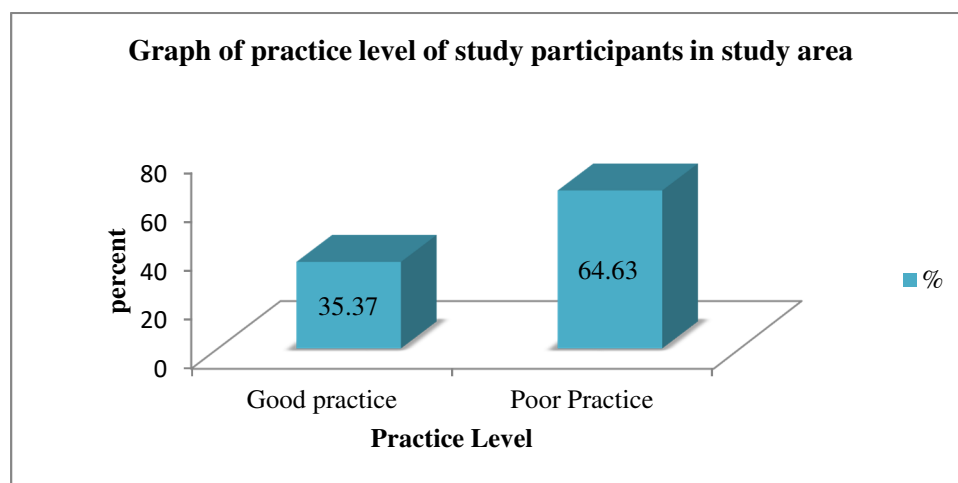


Figure 6: Overall practice level of respondents in selected public primary hospitals West Shoa, Oromia Region, 2023 G.C.”

5.5. Factors associated with study participant’s knowledge, practices and associated factors toward Advanced Cardiac Life Support

The results of the chi-square test indicate a significant correlation between demographic and associated factors on ACLS knowledge and practice of the study participants in the study area.

Table 5 Distribution of association between socio-demographic, associated factors of knowledge and practice about ACLS among study participants

S N	Variable		Frequency	Percent	Knowledge		Practice	
					X ² Value	P Value	X ² Value	P Value
1	Sex	Male	72	48.97	10.7011	0.005	6.7616	0.034
		Female	75	51.03				
2	Educational level	BSC	133	90.47	27.1141	0.000	7.9594	0.093
		Diploma	14	9.53				
3	Profession	GP	38	25.85	5.0974	0.0277	29.326	0.000
		Nurse	109	74.15				
4	Assigned place	Emergency	70	47.6	14.5333	0.0268	25.354	0.013
		MW	29	19.74				
		OPD	22	14.98				
		OR	5	3.40				
		PW	11	7.48				
		SW	10	6.80				
5	Training on ACLS	Yes	56	38.05	61.19	0.000	69.649	0.000
		No	91	61.95				
6	Exposure to cardiac arrest case	Never	12	8.16	1.6987	0.791	16.2616	0.003
		Yes	135	91.84				
7	Availability of emergency medication and equipment	Yes	29	19.72	73.085	0.000	43.5427	0.000
		No	118	80.28				

5.6. Test for multi co-linearity and Heteroscedasticity

The result shows that the mean value is 1.11. The result further shows that none of the variables of the model has VIF greater than 10. This indicates that there is no problem of multi-co-linearity among the independent variables considered in the model. The result of Heteroscedasticity test is also presented in Table 6. The Chi-square ($X^2=1.10$ $p=0.2937$) is not statistically significant. This shows that the error terms across the observations have constant variance and there is no problem of Heteroscedasticity in the data set.

Table 6: Multi-co-linearity test for among explanatory variables

Variables	Co linearity Statistics	
	Tolerance	1/Vif
Age	1.20	0.830975
Experiences	1.18	0.850513
Sex of respondents	1.16	0.859059
Training ACLS/BLS	1.14	0.876374
Education level	1.10	0.911506
Assigned Places	1.09	0.918415
Availability of emergency medication and equipment	1.08	0.924342
Profession	1.04	0.958742
Exposure to cardiac arrest case	1.03	0.969669
Mean vif 1.11		
Hetroscedesticity		
Test	X²	P Value
Breusch–Pagan (BP) test	1.10	0.2937

5.7. Factors associated with Knowledge of Study participants towards ACLS

In the unadjusted binary logistic regression analysis, nine variables were found to be added in ACLS knowledge. Out of these variables, six were found to be significantly associated with knowledge of ACLS based on a p-value of < 0.25 in the binary logistic regression analysis. For further extension male respondents in this study were found to be 7.83 times more knowledgeable compared to females [COR 7.83, 95% CI (1.72-35.53)]. Participants with a bachelor's degree had higher odds of good knowledge [COR = 10.84, 95% CI: 3.4-34.25] compared to nurses with a diploma. Those who had received training on advanced cardiac life support were 10 times more likely to have good knowledge [COR = 10, 95% CI (2.86-34.8)] compared to those without training.

Respondents assigned to the emergency department had a higher likelihood of good knowledge [COR = 5.41, 95% CI: 1.35-21.61] compared to those assigned to the outpatient department. Work experience was also associated with participants' knowledge of ACLS [COR = .718, 95% CI: .606 -.85], indicating that as work experience increased, knowledge levels tended to decrease. Furthermore, participants working in areas with more available emergency medication were more knowledgeable compared to those in less equipped areas [COR = 4.8, 95% CI: 1.20-19.12].

In the multivariable logistic regression analysis, the variables that were found to be significantly associated with ACLS knowledge at a p-value of <0.05 were sex, educational status, years of experience, and availability of emergency medication and equipment among the study participants. The Hosmer-Lemeshow test indicated a good fit for the model, was a p-value of 0.9297.

Male respondents were 3.84 times more likely to have good knowledge compared to female respondents [AOR = 3.84, 95% CI: (1.005-14.717)]. General practitioners and nurses with a degree had a significantly higher knowledge level, being 13.40 times more knowledgeable compared to diploma nurses [AOR = 13.40, 95% CI: (1.838-97.743)]. Obtaining a bachelor's degree increases the likelihood of acquiring ACLS knowledge, as higher education levels contribute to better knowledge acquisition.

Each additional increments of one year in experience are associated with 32% decrease in the odds of having good knowledge [AOR = .678, 95% CI: (.54-.85)]. The possible reasons for this as work experience increases theoretical parts of knowledge maybe forgettable.

The odds of getting good knowledge among study participants who work in areas with available emergency medication and well-equipped facilities were 5.3 times more likely compared to those working in areas without such resources [AOR = 5.32, 95% CI: (1.44-19.67)]. The availability of emergency medication and equipment plays a crucial role in enhancing knowledge and practice of ACLS.

Table 7: Bivariate and Multivariable analysis of factors associated with study participants knowledge towards advanced cardiac life support in selected primary Hospitals, Oromia, 2022/2023 G.C (N=147)

Variables	Knowledge					
	Good	Poor	COR	P Value	AOR	P Value
Sex						
Male	45(30.6%)	27(18.37%)	7.83(1.72 -35.53)	0.008***	3.84(1.05-14.71)	0.049**
Female	13(8.85%)	61(42.18%)	1		1	

Age	58(39.5)	89(60.5%)	3.33(.15-70.91)	0.44		
Educational Level						
Diploma	1(0.7%)	13(8.8%)	1		1	
Degree	57(39.5%)	75(51%)	10.84(3.43-34.25)	0.000***	13.4(1.84-97.74)	0.010**
Profession						
Nurses	39(26.53%)	70(47.6%)	1			
GP	19(12.97%)	19(12.9%)	1.79(.27-11.98)	0.851		
Assigned Places						
Emergency	30(20.44%)	40(27.21%)	5.4(1.35-21.61)	0.017**	1.45(.65-3.26)	0.357
MW	6(4.08%)	23(15.65%)	2.5(.50-12.46)	0.264		
OPD	10(6.8%)	12(8.16%)	1.875(.41-8.43)	0.413		
PW	5(3.4%)	6(4.08%)	1			
SW	4(2.7%)	6(4.08%)	1			
OR	3(2.04%)	2(1.36%)	1			
Training on ACLS						
Yes	40(27.2%)	16(10.9%)	10 (2.86-34.8)	0.000***	2.54(.706-9.142)	0.153
No	18(12.3%)	73(49.6%)	1		1	
Exposure to cardiac case						
Yes	55(37.4%)	80(54.4%)	.49 (.06-4.01)	0.511		
No	3(2.1%)	9(6.1%)	1			
Availability of Equipment						
Yes	16(10.88%)	13(8.84%)	4.8 (1.20-19.12)	0.026**	5.32(1.44-19.67)	0.012**
No	42(28.57%)	76(51.7%)	1		1	
Experiences	58(39.5%)	89(60.5)	.718(.60-.85)	0.000***	.678 (.54-.85)	0.001***

NB: COR: crude odds ratio/AOR: adjusted odds ratio *, significant at p-value <0.25

COR: crude odds ratio/AOR: adjusted odds ratio **, significant at p-value <0.05

COR: crude odds ratio/AOR: adjusted odds ratio ***, significant at p-value <0.01

5.8. Factors associated with practice of study participants towards ACLS

In the unadjusted binary logistic regression analysis, several variables were found to be associated with the practice of ACLS. These variables included sex, work experience, training, profession, assigned place, and exposure to cardiac arrest cases. However, in the multivariable binary logistic regression analysis, after controlling for other variables, the significant predictors of ACLS practice were found to be training, experience, profession, assigned place, and exposure to cardiac arrest cases among the study participants at a significance level of p-value <0.05. Variables with a p-value of < 0.25 in the binary logistic regression were included in the multivariable logistic regression analysis.

In the bivariate analysis, being male was associated with a higher likelihood of ACLS practice (COR = 9.9, 95% CI: 1.23-17.904). Male respondents were 9.9 times more likely to practice ACLS compared to female participants. There was also a significant association between the profession of study participants and ACLS practice. The study revealed that the likelihood of having good practice towards ACLS was 2.027[COR=2.027, 95% CI: (.99-3.22)] times higher among general practitioners as compared to nurses.

Participants who received ACLS training had 5.57 times higher odds of practicing ACLS compared to those who did not undergo ACLS training [COR = 5.57, 95% CI: (1.43-21.54)]. For each increment in clinical experience, the likelihood of good practice in ACLS increased by 1.23 times [(COR 1.23, 95% CI: 1.03-1.48)]. Nurses and general practitioners working in the emergency area were 5.4 times more likely to practice ACLS compared to healthcare professionals working in other wards [COR = 5.4, 95% CI: (1.35-21.61)]. The study also found that participants with more exposure to cardiac arrest cases were 9.7 times more likely to perform ACLS practice compared to those with no exposure [COR = 9.7, 95% CI: (2.56-37.21)]. In multivariable logistic regression analysis five variables (profession, assigned place, training, exposure to cardiac arrest case and work experience) were significantly associated with the practice of health professionals towards ACLS at the p-value of <0.05. The value of Hosmer-Lemeshow test of model goodness of fit p-value was 0.9992.

Similarly, the odds of having good practice among general practitioners towards ACLS was 7 [AOR=7.024, 95% CI: (1.27-38.78)] times higher as compared to nurses. Participants who worked in the emergency department were 4.9 times more likely to perform ACLS practice than those working in other departments [AOR = 4.879, 95% CI: 1.117-21.305].

For every additional increment in clinical experience of health professionals, the odds of having good practice in ACLS increased by 1.44 times [AOR = 1.44, 95% CI: 1.082-1.918]. Participants who received ACLS training were 13.6 times more likely to practice ACLS compared to those who did not undergo ACLS training on the job [AOR = 13.6, 95% CI: 2.66 - 65.74]. Previous exposure to cardiac arrest cases increased the likelihood of practicing ACLS by 14 times compared to those without prior exposure [AOR = 14.11, 95% CI:2.9- 48.05].

Table 8: Bivariate and Multivariable analysis of factors associated with nurses' and general practitioner practice towards advanced cardiac life support in selected primary Hospitals, Oromia, 2022/2023 G.C (N=147).

Variables	Practice		COR	P Value	AOR	P Value
	Good	Poor				
Sex						
Male	50(34%)	22(14.9%)	9.9 (1.23-17.904)	0.031**	1.914(.55- 6.7)	0.309
Female	14(9.5%)	61(41.6%)	1		1	
Age	52(35.37%)	95(64.63%)	1.018(.936-1.108)	0.667		
Educational Level						
Diploma	2(1.36%)	12(8.15%)	1		1	
Degree	50(34%)	83(56.4%)	3.6(.83-15.18)	0.088 *	2.722(.27-27.92)	0.399
Profession						
Nurses	28(19.04%)	81(55.1%)	1		1	
GP	24(16.3%)	14(9.52%)	2.027(.99-3.22)	0.001***	7.024(1.27-38.78)	0.025**
Assigned Places						
Emergency	33(22.45%)	37(25.17%)	5.41(1.35-21.61)	0.017**	4.879(1.12-21.31)	0.035**
Medical ward	5(3.4%)	24(16.32%)				
OPD	7(4.76%)	15(10.2%)	8.75(.91-8.394)	0.060*	1	
PW	4(2.72%)	7(4.76%)	1			
Surgical Ward	3(2.04%)	7(4.76%)	1			
OR	2(1.36%)	3(2.04%)	1			
Training on ACLS/BLS						
Yes	35(23.8%)	21(14.28%)	5.57(1.43-21.54)	0.013**	13.6(2.66 - 65.74)	0.010**
No	17(11.56%)	74(50.34%)	1		1	
Exposure to cardiac arrest case						
Yes	49(33.3%)	86(58.5%)	9.7(2.56-37.21)	0.001***	14.11(2.9- 48.05)	0.002***
No	3(2.04%)	9(6.12%)	1		1	
Availability of Equipment						

Yes	17(11.56%)	12(8.16%)	.45(.10-1.93)	0.288		
No	35(23.8%)	83(56.46%)	1			
Experiences	52(35.37%)	95(64.63%)	1.23(1.03- 1.48)	0.022 **	1.44(1.08-1.91)	0.006***

NB: COR: crude odds ratio/AOR: adjusted odds ratio **, significant at p-value <0.05

COR: crude odds ratio/AOR: adjusted odds ratio ***, significant at p-value <0.01

COR: crude odds ratio/AOR: adjusted odds ratio *, significant at p-value <0.25

CHAPTER SIX

6. DISCUSSION

In developing countries like Ethiopia, sudden cardiac arrest (SCA) is a significant contributor to mortality, and the lack of adequate basic and advanced cardiac life support (BLS and ACLS) knowledge and practices exacerbates the problem (64).

6.1. Socio-demographic and characteristics of the study participants

Among 147 respondents in this study, 51.03% were female. This aligns with the studies conducted in Ethiopia, reported as 54.9% and 52.9% were female(50). However, a study conducted at Wollo University showed a different trend, with 57.25% of the participants being male(25), which can be attributed to the specific study location.

The majority of the study participants, 133(90.47%), held a BSc degree. These findings are consistent with study conducted in Addis Ababa, where 92 (90.2%) of the study participants held a BSc degree(50). In terms of profession, 25.85% were general practitioners. A comparable study in Ethiopia reported that 26.61% were general practitioners (25).

Only 56 (38.05%) respondents received ACLS training, which was provided as in-service training after their graduation. Similar findings were reported in a study conducted in Karela, India, where 38.6% of the participants had received ACLS training (65). However, the percentage in this study was higher compared to a study conducted in Amhara Region Hospitals, where only 31.4% had received training(33), and lower compared to studies conducted at Jazan University in Saudi Arabia, where 47.7% had training (66). The difference in findings could be attributed to variations might be due to lack of report of cardiac arrest cases, study time and settings.

6.3 Knowledge towards Advanced Cardiac life Support

In this study, 58(39.5%) (95% CI: 32.3-47.7) of participants demonstrated good knowledge while the majority of study participants 89(60.5%) had poor knowledge regarding ACLS. These findings align with study conducted in Ethiopia and South-Indian study which scores 40.5% and 41.6% respectively(55, 67). However, these results lower than studies conducted in North-

Kerala, New Zealand, Saudi Arabia, and Turkey was reported as 44.5%, 65%, 76%, and 87%, respectively(65, 68-70).This study is higher than the study conducted in Saud Arabia 12.1% (71), Rwanda 25% (72), Egypt 33.9% (49), Nepal 34% moderate, 2% adequate (73).The possible reason may be they conducted a study on total hospital nurses who are not frequently involved in patient resuscitation. However, this study was conducted on study participants more times work in emergency units by rotation, and respondents were better exposed and frequently involved in resuscitation. These findings indicate that the knowledge of healthcare workers, particularly nurses, on ACLS is lower than expected, highlighting the need for improvement. Specialized training in advanced cardiac life support is crucial to enhance their knowledge and ensure the quality of advanced cardiac life support, early initiation of care, appropriate post-cardiac arrest management.

In the multivariable logistic regression analysis, sex, educational status, experience, and availability of emergency equipment and medication were found to be significantly associated with knowledge of ACLS. This finding is consistent with a study conducted in Pakistan, where educational level and experience were also found to be significant factors(41). Male respondents were 3.84 times more likely to have good knowledge compared to female respondents, which is supported by a study conducted in Sains Malaysia with males had 5.43 times higher odds in getting good knowledge(16).This might be male were more motivators to update themselves by reading and searching updated guidelines.

Work experience was found to be associated with participants' knowledge of ACLS. This is contradict to the study conducted in Ethiopia(19).The justification of this variation possibly be as the experience increase the theoretical part maybe forgettable as individuals develop more skills and study setting.

Degree-level study participants were 13.4times more knowledgeable compared to diploma nurses in this study, which is higher than the odds reported in studies conducted in Addis Ababa and Amhara(19, 33).The possible reason might be as quality and depth of education increase the ability to acquire more knowledge also increases. This variation might be due to study place.

Well-equipped with emergency medication and equipment were 5.3 times more likely compared to those working in areas without such resources [AOR = 5.32, 95% CI: (1.44-19.67)]. This finding is consistent with a study conducted at Felege Hiwot Hospital, where medications like amiodarone were frequently unavailable, and equipment such as an AED was not commonly found in most hospitals(55). The possible justification is that more emergency medication and equipment were not available in government hospitals which indicate that they had not got attention especially primary hospitals. This result was highly associated with knowledge of study participants because it might be who works in well-equipped place were more knowledgeable than who works less equipped one.

6.4. Practice towards advanced cardiac life support

In this study, the majority of study participants had poor practice on ACLS. Only 52(35.37%) (95% CI: 28.68-43.8) demonstrated good practice, while 64.63% had poor practice. This finding is consistent with a study conducted in Tabuk universities, where more than half of the participants had poor practice in ACLS(15). However, it is higher than a research conducted in Bhutan, which reported a 25% rate of good practice skill(35). The difference could be attributed to variations in the study time, study tools and context. In multivariable logistic regression result profession, assigned place, training, exposure to cardiac case and experience was significantly associated with ACLS practice ($p < 0.05$).

Furthermore, this study revealed that profession had a significant association with good practice, while general practitioners demonstrating better practice compared to nurses. This finding aligns with studies conducted in Turkey and Nigeria(40, 46). The possible explanation might be general practitioners in primary hospitals were more involved in critical patient resuscitation than nurses. It is worth noting that the findings contradict a study conducted in Jamaican universities, which concluded that being a physician was inversely related to ACLS practice scores(32). This might be due to study setting and study time.

In this study, the odds of having good practice among study participants who had training on ACLS more likely 13.6 times than non-trained [(AOR: 13.6, 95% CI 2.66-65.74)]. This indicates that training were the way to update the psychomotor skills of study participants in which,

demonstration can increase the proficiency and capability of study participants to practice more than non-trained one. This is higher than the study at Gonder likelihood of having good practice towards CPR/ACLS was 1.74 times (AOR: 1.74, 95% CI 1.42 to 3.53)(32).This might be because, without sufficient training and practice, a significant amount of theoretical information will be forgotten after 12 months, and there will not be any remaining adequate theoretical practical skills. This indicates the need for more training in ACLS to improve practice, as supported by studies conducted in Bhutan, Saudi Arabia (Majamh Universities), Sains Malaysia, Singapore Primary Care, and East Africa(14, 29, 35, 49, 54, 56)

In this study, work experience has a strong association with participants' practice towards ACLS at (AOR: 1.44 (1.08-1.91)).The possible reason for this was as experience increase the capability to perform practice were increase. This is less than study at Addis Ababa nurses' who had clinical experience were 12 times more likely to practice BLS/ACLS as compared to those who had only <1years clinical experience [COR 12.444 95% CI (2.292-67.561)](19).This variation might be due to study places which mean more experienced health professions were shifted to hospitals were nearest to more facilitated city places.

Previous exposure to cardiac arrest cases significantly influenced the ACLS practice of health professionals. Those who have been exposed to cardiac arrest cases were more practicable than those who have not been exposed[AOR: (14.11(2.9 -48.05))], which is in agreement with the results of study at Amhara region referral hospitals on BLS/ACLS practice of health professionals(32).This idea is supported by cross sectional study at Amhara region referral hospitals to evaluate the nurses' and doctors' knowledge and practice of basic life support, explained that those who had encountered frequently involved in cardiac arrest resuscitation, scored significantly better(36).This finding may be reasonable by the fact that when health workers frequently apply their psychomotor skills they have a greater tendency to use their knowledge to practice.

The present study revealed that study participants who were assigned in emergency area likelihood of good practice were 4.9 times more likely to perform ACLS practice than those with other wards [AOR=4.9, 95%CI: (1.117-21.305)].The possible explanation for this might be that

most of the time patients visiting emergency departments are those who are severe cases which require ACLS to sustain the life of the victims. As a result, general practitioners and nurses assigned to the emergency department have more chances to face patients who need ACLS procedures and perform the maneuvers repeatedly than others assigned to another ward. The idea is also well supported by UK resuscitation guideline 2010 which states that staff in critical care and emergency medicine may have more advanced resuscitation knowledge and skill than those who are not regularly involved resuscitation in their normal clinical role(45). This study is higher than study done at Tepi General Hospital, and Gebretsadik Shawo Hospital likelihood of good practice was higher among nurses assigned to the emergency department (AOR=1.02, 95% CI: 0.55–1.90) compared with those assigned to the outpatients department(51). This variation might be due to accident related to cardiac arrest cases is less for that study places and rotation of health profession.

CHAPTER SEVEN

7. CONCLUSION AND RECOMMENDATION

7.1. CONCLUSION

This study highlights a significant knowledge and practice gap in ACLS among the healthcare workers. The participants scored below 80% in knowledge assessment and less than 50% in practice assessment, indicating inadequate knowledge and practice levels according to the American Heart Association guidelines and other literature. This knowledge and practice gap can have a negative impact on patient survival rates during cardiac arrest unless regular and effective ACLS training is provided.

The multivariable logistic regression analysis identified several factors associated with knowledge of ACLS, including sex, educational status, experience, and the availability of emergency equipment and medication. Similarly, profession, assigned place, training, exposure to cardiac emergency cases and resuscitation and experience were significantly associated with the practice of ACLS. These findings suggest the importance of addressing these factors in improving knowledge and practice in ACLS.

In summary, this study emphasizes the need for targeted interventions and regular ACLS training to bridge the knowledge and practice gap among healthcare workers. Factors such as sex, educational status, experience, profession, assigned place, training, exposure to cardiac emergency cases and involved in resuscitation and availability of emergency equipment and medication should be considered in designing strategies to enhance ACLS knowledge and practice.

7.2. RECOMMENDATION

Based on the result of this study the following recommendation is planned to:

➤ **For Researchers**

- Further study based on Observational design is also required on practice level assessment
- Further studies are needed to determine other factors that influence ACLS knowledge and practice.

➤ **For Concern Body Regarding Training (FMOH, Oromia Regional Bureau)**

- Simulation-based education (Evidence based practice) with tangible procedure should be used to give continual refresher training and to establish protocols for practicing effective ACLS techniques.
- Strict mentoring should be needed to update their knowledge and practice.
- Since primary/ District hospitals are the first line and core area for immediate resuscitation of patient due to cardiac arrest to save life, so this research indicates that immediate improvement/ action is needed on those findings.

➤ **For those Hospitals**

- To make in-service simulation based training on ACLS.
- To Promote and provide opportunities for employees' in-service educational advancement.
- Providing regular work setting rotations is highly crucial.
- Must be fulfill the emergency medication and equipment those needed for emergency care

➤ **For General practitioners and Nurses**

- To participate in patient resuscitation, gain practical experience, work in emergency area and apply what they have learned.

CHAPTER EIGHT

8. STRENGTH AND LIMITATION OF STUDIES

Strength of study

- ❖ The study was done in primary hospitals which, the clinical research was almost not done in this area.

Limitation of study

- ❖ The use of only a questionnaire, which acts as a measure of mainly theoretical knowledge other than practical, is a limitation of this study. On the other hand, practical performance necessitates both theoretical and psychomotor abilities.
- ❖ There was no utilized simulation based assessment that make difficult to evaluate the practice of study participants in applying ACLS technique correctly.
- ❖ There was relatively incompleteness of data from respondents.
- ❖ Time constraints for data collectors supervision, to check data completeness daily and to analysis
- ❖ The study also Shares all weaknesses in cross-sectional studies.

CHAPTER NINE

9.1. REFERENCES

- 1.Organization Wh. Non- Communicable Diseases Country Profiles. Geneve; WHO Press; 2014 P-1210.<http://Www.Who.int/Nmh/Countries/Ben-Enpdf?Ua=1>. 2014.
- 2.Organization WH. Global Action Plan For The Prevention And Control Of Noncommunicable Diseases 2013-2020: World Health Organization; 2013.
- 3.Cohen DL, Townsend RR, Angell SY, Dipette DJ. The World Health Organization Recognizes Noncommunicable Diseases And Raised Blood Pressure As Global Health Priority For 2025. The Journal Of Clinical Hypertension. 2014;16(9):624.
- 4.Ministry Of Health B. Policy And Planning Division (Ministry Of Health, Bhutan).Annual Health Bulletin 2018. Bhutan: Ministry Of Health,Royal Government Of Bhutan;. 2018.
- 5.Benjamin EJ, Blaha MJ, Chiuve SE, Cushman M, Das SR, Deo R, Et Al. Heart Disease And Stroke Statistics—2017 Update: A Report From The American Heart Association. Circulation. 2017;135(10):E146-E603.
- 6.Wong CX BA, Lau DH, Chugh SS, Albert CM, Kalman JM, Et Al. Epidemiology Of Sudden Cardiac Death: Global And Regional Perspectives. Heart, Lung And Circulation,. 2019.
- 7.Boonmak P, Boonmak S, Chongarunngamsang W, Maharungruengrat K. Advanced Cardiac Life Support Knowledge Among Medical Staff And Residents In University Hospital. Srinagarind Medical Journal. 2019;24(4):296-301.
- 8.Alkandari SA, Alyahya L, Abdulwahab M. Cardiopulmonary Resuscitation Knowledge And Attitude Among General Dentists In Kuwait. World Journal Of Emergency Medicine. 2017;8(1):19.
- 9.Andersen LW, Holmberg MJ, Berg KM, Donnino MW, Granfeldt A. In-Hospital Cardiac Arrest: A Review. Jama. 2019;321(12):1200-10.
- 10.Damtew B, Tsige Y, Bizuwork K, Workineh S. Patient’S Knowledge Of Cardiovascular Diseases Risk Factors And Associated Factors Among Adult Cardiac Patients In Selected Health Institutions; A Cross Sectional Study, Addis Ababa, Ethiopia 2021 GC. 2021.
- 11.Association AH. Facts. A Race Against The Clock. Out-Of-Hospital Cardiac Arrest [Internet]. 2017.
- 12.Solomon M. Assessment Of Knowledge, Attitude And Practice And Associated Factors In Performing Cpr Among Medical Interns Of Tikur Anbessa Specialized Hospital And Yeketit 12 Hospital Medical College, Addis Ababa, Ethiopia, . 2020.
- 13.Benjamin EJ, Chen P-S, Bild DE, Mascette AM, Albert CM, Alonso A, Et Al. Prevention Of Atrial Fibrillation: Report From A National Heart, Lung, And Blood Institute Workshop. Circulation. 2009;119(4):606-18.
- 14.Musaed Fahad Rayzah Sha, Abdullah Shafi Almutairi, Hammam Fahad A Alkanhal And Meshari Abdulkarim Almutairi. Knowledge, Attitude And Practice Of Acls In Healthcare Professionals And Medical Students In Majmaah University. International Journal Research. 2019;Int. J. Adv. Res. 7(10), 1093-1100.
- 15.Alsayil SN, Alzahrán S, Alhawiti W. Awareness Of Basic Life Support Among Medical And Nursing Students At Tabuk University. Basic Res J Med Clin Sci. 2016;5(3):53-7.

- 16.Tengku Dtmab. A Study On Advance Cardiac Life Support Knowledge And Skills Among Health Care Professionals And Their Predicting Factors During Acls Course: Universiti Sains Malaysia; 2018.
- 17.Perkins GD KP, Bullock I, Clutton-Brock T, Davies RP, Gale M, Et Al. Improving The Efficiency Of Advanced Life Support Traininga Randomized, Controlled Trial. *Annals Of Internal Medicine*. 2012;157(1):19-28.
- 18.Alanazi A, Alsalmeh, M., Alsomali, O., & Almurshdi, A. Poor Basic Life Support Awareness Among Medical And College Of Applied Medical Sciences. 2014;Middle East J Sci Res., :21(5):848–54.
- 19.Bikamo E. Knowledge, Attitude, Practice, And Associated Factors Towards Basic Life Support Among Nurses Working At Adult Emergency Units Of Federal Hospitals, Addis Ababa, Ethiopia,. 2021.
- 20.Mendhe HG, Burra L, Singh D, Narni H. Knowledge, Attitude And Practice Study On Cardiopulmonary Resuscitation Among Medical And Nursing Interns. *Int J Community Med Public Health*. 2017;4(8):3026.
- 21.Tsegaye W, Tesfaye M, Alemu M. Knowledge, Attitude And Practice Of Cardiopulmonary Resuscitation And Associated Factors In Ethiopian University Medical Students. *Journal Of General Practice*. 2015:1-5.
- 22.Roshana S, Batajoo K, Piryani R, Sharma M. Basic Life Support: Knowledge And Attitude Of Medical/Paramedical Professionals. *World Journal Of Emergency Medicine*. 2012;3(2):141.
- 23.Bajracharya S, Nagarkoti L. Knowledge Regarding Basic Life Support Among Nurses Of A Tertiary Level Hospital Of Nepal. *Medical Journal Of Shree Birendra Hospital*. 2016;15(1):66-9.
- 24.Alkandari SA AL, Abdulwahab M. . Cardiopulmonary Resuscitation Knowledge And Attitude Among General Dentists In Kuwait. . *World J Emerg Med* 2017;;8:19.
- 25.Getachew Y, Kumar P, Deres A. AN ASSESSMENT OF CLINICAL EXPERTISE ON UPDATED CARDIAC LIFE SUPPORT AMONG HEALTH WORKERS AT GOVERNMENT HOSPITALS IN EASTERN AMHARA REGION WITH INTERVENTION TO FILL OBSERVABLE GAP. 2019.
- 26.Cayley Jr WE. Adapting The Advanced Cardiac Life Support For The Experienced Provider (ACLS-EP) Course For Emergency Care Education In Rwanda: Educational Material. *African Journal Of Primary Health Care And Family Medicine*. 2011;3(1):1-3.
- 27.Kibret KT, Mesfin YM. Prevalence Of Hypertension In Ethiopia: A Systematic Meta-Analysis. *Public Health Reviews*. 2015;36(1):1-12.
- 28.Mekonnen CK, Muhye AB. Basic Life Support Knowledge And Its Associated Factors Among A Non-Medical Population In Gondar Town, Ethiopia. *Open Access Emergency Medicine: OAEM*. 2020;12:323.
- 29.HA Z, SM S. Assessment Of Basic Life Support Knowledge Among Nursing Professionals. *Egyptian Journal Of Occupational Medicine*. 2020;44(1):455-70.
- 30.Negesa LB, Magarey J, Rasmussen P, Hendriks JM. Patients’ Knowledge On Cardiovascular Risk Factors And Associated Lifestyle Behaviour In Ethiopia In 2018: A Cross-Sectional Study. *Plos One*. 2020;15(6):E0234198.
- 31.Angaw DA, Ali R, Tadele A, Shumet S. The Prevalence Of Cardiovascular Disease In Ethiopia: A Systematic Review And Meta-Analysis Of Institutional And Community-Based Studies. *BMC Cardiovascular Disorders*. 2021;21(1):1-9.

32. Mersha AT, Egzi AHKG, Tawuye HY, Endalew NS. Factors Associated With Knowledge And Attitude Towards Adult Cardiopulmonary Resuscitation Among Healthcare Professionals At The University Of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia: An Institutional-Based Cross-Sectional Study. *BMJ Open*. 2020;10(9):E037416.
33. Kelkay M, Kassa H, Birhanu Z, Amsalu S. A Cross Sectional Study On Knowledge, Practice And Associated Factors Towards Basic Life Support Among Nurses Working In Amhara Region Referral Hospitals, Northwest Ethiopia, 2016. *Hos Pal Med Int Jnl [Internet]*. 2018;2(2):123-30.
34. Varughese S, D'Silva B. Knowledge And Perspective On CPR Among Staff Nurses. *IOSR Journal Of Nursing And Health Science (IOSRJNHS)*. 2018;7(1):12-4.
35. Pradhan S, Tenzin K, Pelzom D, Dorji JL, Dorji P, Gurung MS. Knowledge, Attitude And Practice On Advanced Cardiac Life Support (ACLS) Among The General Duty Medical Officers In Bhutan. *Bhutan Health Journal*. 2019;5(1):35-7.
36. K. MM. Knowledge, Practice And Associated Factors Towards Basic Life Support Among Nurses Working In Amhara Region Referral. 2016.
37. Ilyas R, Shah-E-Zaman K, Pradhan N, Feroz H, Jamal Z, Amjad N, Et Al. Retention Of Knowledge And Skills Of Basic Life Support Among Health Care Providers Trained In Tertiary Care Hospital. *Pakistan Heart Journal*. 2014;47(1).
38. Howell P TI, Augier R, Et Al. Physicians' Knowledge Of cardiopulmonary Resuscitation Guidelines And Current Certification Status At The University Hospital Of The West Indies, Jamaica. . *West Indian Med* 2014;J 2014;63:739.
39. Sánchez García AB, Fernández Alemán JL, Alonso Pérez N, Hernandez Hernández I, Navarro Valverde R, Rosillo Castro D. Assessment Of The Knowledge Level And Its Relevance In Terms Of CPR In Medical Personnel Of The Hospital Emergency Medical System Of The Autonomous Community Of The Region Of Murcia. *Enferm Glob*. 2015;14:230.
40. Kaye W, Mancini ME, Rallis SF, Linhares KC, Angell ML, Donovan DS, Et Al. Can Better Basic And Advanced Cardiac Life Support Improve Outcome From Cardiac Arrest? *Critical Care Medicine*. 2015;13(11):916-20.
41. Irfan B, Zahid I, Khan MS, Khan OAA, Zaidi S, Awan S, Et Al. Current State Of Knowledge Of Basic Life Support In Health Professionals Of The Largest City In Pakistan: A Cross-Sectional Study. *BMC Health Services Research*. 2019;19(1):1-7.
42. Ahmed Abd El Hamid L, Mostafa Shazly M, Faisal Fakhry S, Fathy Saad N. Self-Learning Package Related To Patient Safety Goals And Its Effect On Nurse Interns' Performance And Awareness Of Patient Safety Culture. *Egyptian Journal Of Health Care*. 2018;9(1):316-33.
43. Abass NI, Soliman MT. Effect Of Implementing Advanced Cardiovascular Life Support (ACLS) Guidelines 2016 On Nurse's Knowledge And Performance. *American Journal Of Biomedical Research*. 2020;8(5):534-42.
44. Al-Mohaissen MA. Knowledge And Attitudes Towards Basic Life Support Among Health Students At A Saudi Women's University. *Sultan Qaboos University Medical Journal*. 2017;17(1):E59.
45. Kiszka J, Tabaczek-Bejster I, Walicka-Cupryś K. Preparation Of Lifeguards To Basic Life Support In The Drowning. *The American Journal Of Emergency Medicine*. 2018;36(12):2335.
46. Olajumoke TO AJ, Raji SA, Adekunle MA. Cardiopulmonary Resuscitation - Knowledge, Attitude & Practices In Osun State, Nigeria. *J West Afr Coll Surg*. . 2012;(2):23–32.
47. Usabuwera MC. Assessment Of Knowledge And Skills About Basic Life Support Among Nurses In One Referral Hospital In Rwanda: A Theoretical Approach 2017.

- 48.Kivungi EM, Njoroge G. Determinants Of Knowledge And Attitude On Basic Life Support Among Clinicians At Mbitini Health Centre, Kitui County. *International Academic Journal Of Health, Medicine And Nursing*. 2018;1(2):30-43.
- 49.Ha Z SS. Assessment Of Basic Life Support Knowledge Among Nursing Professionals. *Egypt J Occup Med*. . 2020 Jan 1;44(1):455–70.
- 50.Nigatu M, Debebe F, Tuli W. Assessment Of Knowledge, Practice, And Associated Factors Towards Airway And Breathing Management Among Nurses Working In The Emergency Departments Of Selected Public Hospitals In Addis Ababa, Ethiopia: A Cross-Sectional Study. *Open Access Emergency Medicine: OAEM*. 2022;14:235.
- 51.Guteta M. Factors Affecting Cardiopulmonary Resuscitation Practice Among Nurses In Mizan Tepi University Teaching Hospital, Tepi General Hospital, And Gebretsadik Shawo Hospital, Southwest Ethiopia. *Open Access Emergency Medicine: OAEM*. 2022;14:165.
- 52.AHA. Highlights Of The 2015 American Heart Association Guidelines Update For CPR And ECC. Dallas, USA, 2015. 2015.
- 53.Cheskes L, Dainty K, Beaton D. Assessing Public Perceptions Of Cardiopulmonary Resuscitation And Bystander Willingness To Act In Out-Of-Hospital Cardiac Arrest: University Of Toronto; 2014.
- 54.Howell P, Tennant I, Augier R, Gordon-Strachan G, Harding-Goldson H. Physicians' Knowledge Of Cardiopulmonary Resuscitation Guidelines And Current Certification Status At The University Hospital Of The West Indies, Jamaica. *The West Indian Medical Journal*. 2014;63(7):739.
- 55.Emishaw Oaas. Knowledge And Attitude Of Healthcare Workers Toward Advanced Cardiac Life Support In Felege Hiwot Referral Hospital, Bahir Dar, Ethiopia. 2022.
- 56.Sona Pradhan¹ KT, Dorji Pelzom³, Jigme L Dorji¹, Passang Dorji¹, Mongal Singh Gurung⁴. Knowledge, Attitude And Practice On Advanced Cardiac Life Support (ACLS) Among The General Duty Medical Officers In Bhutan. 2019.
- 57.Report Hphd. Annual Report. 2022.
- 58.Hospital Ep. Annual Desk Report. 2022.
- 59.Hospital Gp. Annual Desk Report. 2022.
- 60.Disque BDK. Advanced Cardiac Life Support. 2020-2025.
- 61.D. MTR. Making Sense Of Cronbach's Alpha. *International Journal Of Medical Education*, . (2011).2(1), 53-35.
- 62.Mendhe HG BL, Singh D, Narni H. Knowledge , Attitude And Practice Study On Cardiopulmonary Resuscitation Among Medical And Nursing Interns. 2017;;4(8):3026–30.
- 63.Rule A. Emergency Drugs. *Medical Dictionary*. 2018;657-23.5(124,155A).
- 64.Abebe TA ZL, Assega MA, . Health-Care Providers' Knowledge, Attitudes, And Practices Regarding Adult Cardiopulmonary Resuscitation At Debre Markos Referral Hospital, Gojjam, Northwest Ethiopia. . *Et Al Adv Med Educ Pract* ; . 2021;12: 647.
- 65.Nambiar M, Nedungalaparambil NM, Aslesh OP. Is Current Training In Basic And Advanced Cardiac Life Support (BLS & ACLS) Effective? A Study Of BLS & ACLS Knowledge Amongst Healthcare Professionals Of North-Kerala. *World Journal Of Emergency Medicine*. 2016;7(4):263.

- 66.Ahmad A AN, Mandal RK, . Knowledge Of Basic Life Support Among The Students Of Jazan University, Saudi Arabia: Is It Adequate To Save A Life? . 2018;Alexandria J Med. ;54(4):555–559. Doi:10.1016/J.Ajme.2018.04.001.
- 67.Aroor AR SR, Attar NR, Saya GK, Ravinanthanan M. Awareness About Basic Life Support And Emergency Medical Services And Its Associated Factors Among Students In A Tertiary Care Hospital In South India. J Emerg Trauma Shock 2014; .7: 166.
68. Derinoz-Guleryuz O U-YM, Udurgucu M, Et Al. The Skills Of Defibrillation Practice And Certified Life-Support Training In The Healthcare Providers In Turkey. Int J Clin Pract 2021; ;75(12): E14978.
- 69.Lockey A CP, Bland A, Et Al. Educational Theory And Its Application To Advanced Life Support Courses: A Narrative Review. . 2021;Resus Plus 2021; 5: 100053.
- 70.Srinivasan AP AM, Issrani R, Et Al. . Awareness, Knowledge, And Attitude Of Saudi Students Towards Basic Life Support: A Cross-Sectional Study. Pesquisa Brasileira Em Odontopediatria 2021;Clínica Integrada 2021; 21: E0043.
- 71.MA. A-M. Knowledge And Attitudes Towards Basic Life Support Among Health Students At A Saudi Women's University. 2017.
- 72.UM. C. Assessment Of Knowledge And Skills About Basic Life Support Among Nurses In One Referral Hospital In Rwanda: A Theoretical Approach 2017.
- 73.Bajracharya S NL. Knowledge Regarding Basic Life Support Among Nurses Of A Tertiary Level Hospital Of Nepal. Medical Journal Of Shree Birendra Hospital. . 2016.

9. APPENDIX

9.1. Assurance of Principal Investigator

I the undersigned agree to accept all responsibilities for the scientific and ethical conduct of the research project. I will provide timely progress report to my advisor and seek the necessary advice and approval from my primary advisors in the course of the research. I will communicate timely to my advisors all stakeholders involved in the study including any source of funding for this research.

Name of the student: _____

Signature: _____

Date: _____

Approval of the Primary Advisor

Name of the primary advisor: _____

Signature: _____

Date: _____

Approval of the Co-Advisor

Name of the primary advisor: _____

Signature: _____

Date: _____

Approval of Examiners

Name _____

Signature_____

Date_____

9. 2. Informed Consent

Dear participant, I, Tirunesh Geremew (Msc, candidate in critical care nurse practitioner) currently working on research project **On knowledge, Practice And Associated Factors On ACLS Among Health Professionals Working In Holota, Enchini And Ginchi Primary Hospitals** as fulfillment for my post graduate critical care nurse practitioner. I believe that knowing this fundamental information is important in improving and contribute efforts on better quality of life care for emergency and critically ill patients.

So, I ask you to be part of the research and respond accordingly to the questions. I will assure you that all your responses will be kept confidential and anonymous as well as any personal information will never be collected/ published and never be passed to any individuals or any institutions during the study period as well as during dissemination of the study result. Your participation is very crucial to complete this study successfully. Thank you for participation!

I am very grateful for your participation. However you will not receive compensation of any kind for participating in this study. Contact information about the study if you have any questions or require further information about the study you may contact to Tirunesh (0910346978). If you have any concerns about your rights as research subject you may contact to SPHMMC Department of Emergency and critical care Nursing. Consent we intended for your participation in this study to be pleasant and stress-free. Your participation is entirely voluntarily and you may refuse to participate or withdraw from the study at any time. Your consent to participate in this study is assumed once you have completed the questionnaire.

Do you like participate in this study? A. yes B. NO

Sign of respondent_____

Sign of data collectors_____

Thankyou !!!

9.3. Data collection Questionnaire

Part 1: Socio-Demographic factor

Please encircle your own answer for the following questions from the given alternatives

	Code.....	
	Variable	
1.1	Sex	A. Male B. Female
1.2	Age	_____ Years
1.3	Place of work	A. Holota B. Enchini C. Ginchi
1.4	Educational status	A. Diploma(Level IV) B. BSc Degree C. Masters
1.5	Profession	A. nurse B. General practitioner
1.6	Assigned place	A. Emergency

		B. OPD C. Ward Specify_____
1.7	Experience	_____

Part 2: Associated Factors

	Variables	
2.1	Have you ever had on job ACLS training within last year ?	A. Yes B. No
2.2	Did you ever involve in patient resuscitation during your experience?	A. Yes B. No
2.3	If question 2.3 is “YES” for how many times involved in resuscitation and management of cardiac arrest case?	A. Never B. 1-5 times C. 6-10 times D. >10 times
2.4	Do you think that availability of emergency equipment and medication can affect your knowledge and practice on ACLS?	A. Yes B. No
2.5	Is there all listed below emergency medication and equipment available in your assigned place? N.B : Ambubag, oral airway, oxygen with delivery set, atropine, adrenaline, defibrillator, monitor ,Iv cannula, back board, AED, Amiodarone, Adenosine, Magnesium Sulphate, Lidocaine	A. Yes B. No

Knowledge assessment questionnaires

Q1	What is abbreviation of ACLS?	A. Adult cardiology life Sustain B. Advanced Cardiac Life Support C. Adult Care Lifelong Support D. Automated Cardiac Life Support
Q2	Where does the electrical impulse for normal cardiac activity originate?	A. Unknown B. SA node C. AV node D. Purkinje fiber
Q3	Choose The correct sequence of electrical activity in the heart for normal sinus rhythm?	A. SA node, Purkinje, AV node, Bundle of His B. Purkinje, Bundle of His, AV node, SA node C. SA node, AV node, Bundle of His, Purkinje fibers D. AV node, SA node, Bundle of Hers, Purkinje fibers
Q4	What is the first drug of choice during cardiac arrest?	A. Atropine B. Adrenalin C. Vasopressin D. Magnesium sulphate
Q5	What does abbreviation AED stands for?	A. Automated external defibrillation B. Automated electrical defibrillation C. Advanced electrical defibrillator D. Advanced external defibrillator
Q6	What piece of data is critical to obtain in	A. Date of birth B. Hemoglobin A1c C. Bilateral

	all stroke individuals?	arm blood pressure	D. Time last seen normal
Q7	Select the proper pairing regarding CPR for an adult:	A. Chest compressions 60 to 80/minute; 2 inches deep (5cm) B. Chest compressions 80/minute; 1.5 inches deep (4cm) C. Chest compressions 100/minute; 3 inches deep (8cm) D. Chest compression 100 to 120 per minute; 2 to 2.4 inches deep (5-6cm)	
Q8	A 55-year-old male has stroke symptoms, and the CT scan shows multilobar infarction (more than one-third of the cerebral hemisphere). What therapy is contraindicated?	A. Oxygen B. Monitoring glucose C. Thrombolytic therapy D. Blood pressure monitoring	
Q9	The critical characteristics of high-quality CPR include: which of the following	A. Starting chest compressions within 10 seconds of recognition of cardiac arrest with rate of 100-120/min B. Push hard, push fast C. Minimize interruptions D. All	
Q10	When can you stop performing CPR?	A. When relieved by another trained in CPR B. When you are exhausted C. When the causality is pronounced death D. All of the above	
Q11	Position of pregnant women during CPR best with	A. Supine position with firm wedge to support left side of the thorax B. Supine position with firm wedge to support right side of the pelvis and thorax C. Left lateral position D. Right lateral position	
Q12	What is the location for CRP in adult?	A. Left side of chest B. Mid chest (Centre of the chest on lower half of breast bone) C. Right side of chest D. Xiphisternum	

Q13	You have just administered a drug for an individual in supraventricular tachycardia (SVT). She complains of flushing and chest heaviness. Which drug is the most likely cause?	A. Aspirin B. Adenosine C. Amiodarone D. Amitriptyline
Q14	An individual presents with symptomatic bradycardia. Her heart rate is 32. How to manage this problem initially?	A. Atropine B. Epinephrine C. Dopamine D. All of the above
Q15	What is the location for chest compression in infants?	A. One finger breadth below the nipple line B. At the intermammary line C. One finger breadth above the nipple line D. At Xiphisternum
Q16	Suppose you are in Emergency Room and only with you one profession in emergency and the patient comes with cardiac arrest. While when you assess there is no carotid pulse and the first person start CPR, you are the 2 nd rescuer what is your role?	A. Summon help. B. Retrieve AED. C. Perform ventilations. D. All of the above
Q17	The patient comes in ER with ECG interpretations of ventricular fibrillation what is your immediate response to fix problems?	A. Start CPR B. Defibrillation immediately C. Cardio version D. Administer Epinephrine immediately

Part 3: Practice evaluation Questions

	Variables	
Q1	If the patient come emergency room with cardiac arrest what is the correct step to emergency care?	A. Call EMS ,Check Response, Get AED, Defibrillation, Effective ACLS B. Check response, Call EMS, Get AED, Defibrillation, Effective ACLS C. Get AED, Defibrillation, Call EMS, Check Response, Effective ACLS D. Check Response, Call EMS, Defibrillation, Get AED, Effective ACLS
Q2	You are transporting an individual who goes into cardiac arrest during transport. IV access	A. Terminate resuscitation. B. Obtain intraosseous access. C. Place a central line.

	is unsuccessful. What is the next step?	D. Administer all medications through ET tube.
Q3	In primary survey if you, suspect the patient air way is obstructed initially how to perform to fix the problems?	A. Use Jaw thrust maneuver in non- trauma patient B. Use head tilt chin lift maneuver in non- trauma patient C. Insert oral airway immediately D. place the patient in recovery position
Q4	How to perform CPR for adult victims?	A. 30:2, Depth of chest compressions at 5-6 cm with rate 100 to 120 compression per min. B. 15:2 , Depth of chest compression 2-3cm with rate maximum 100 per minute C. 30:2, Depth of chest compression 4-5cm with maximum rate 60 compression per min
Q5	Which of the following is the correct next step in management after delivery of a shock?	A. Check pulse. B. Ventilate only. C. Do chest compressions. D. Shock again.
Q6	Baby "X" who is 6 years old, comes to ER with loss of consciousness, agonal breathing when you feel pulse there is no pulse, How to perform CPR for this child?	A. Start CPR with ratio of 30:2 with 2 inches depth B. Start CPR with ratio of 3:1 with 2 inches depth C. Start CPR with ratio of 15:2 with chest compression of 2 inches depth D. I can't perform
Q7	You are treating an individual who presented in ventricular fibrillation. After CPR and one attempt at defibrillation, his new rhythm is third-degree AV block. What is the next step in management?	A. Repeat defibrillation B. Vasopressin C. Transcutaneous pacing D. High dose epinephrine
Q8	You are witnessing an adult unresponsive victim who has been submerged in fresh water and just removed from it, he has spontaneous breathing but he is unresponsive. What is the first step you act?	A. CPR for 2 min and inform EMS B. compress the abdomen to remove water 48 C. CRP for 1min and inform EMS D. Keep him in recovery position

Q9	The proper steps for operating an AED are:	A. On the AED, attach electrode pads, shock the patient, and analyze the rhythm B. On the AED, attach electrode pads, analyze the rhythm, clear the patient, and deliver the shock C. Attach electrode pads, check pulse, shock patient, and analyze rhythm D. Check pulse, attach electrode pads, and analyze rhythm, shock patient
----	--	---