



**COLLEGE OF HEALTH SCIENCES
DEPARTMENT OF EMERGENCY MEDICINE**

ASSESSMENT OF KNOWLEDGE, PRACTICE AND ASSOCIATED FACTORS TOWARDS BASIC LIFE SUPPORT AMONG NURSES WORKING IN PREHOSPITAL SETTING OF FIRE AND EMERGENCY RESPONSE AND RESCUE AUTHORITY OF ADDIS ABABA, ETHIOPIA, 2019

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A RESEARCH THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCES DEPARTMENT OF EMERGENCY MEDICINE AND CRITICAL CARE IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF SCIENCE IN EMERGENCY MEDICINE AND CRITICAL CARE NURSING.

**JUNE, 2019.
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**ASSESSMENT OF KNOWLEDGE, PRACTICE AND ITS ASSOCIATED
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AND EMERGENCY RESPONSE AND RESCUE AUTHORITY OF ADDIS
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I, the undersigned MSc student, declare that I have submitted my original work on a title assessment of knowledge, practice and associated factors towards basic life support among nurses working in pre-hospital setting of fire and emergency response and rescue authority of Addis Ababa, Ethiopia, 2019 for the examination.

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By my signature below, I declare and affirm that this thesis is my own work. I have followed all ethical principles of scholarship in the preparation, data collection, data analysis and completion of this thesis. All scholarly matter that is included in the thesis has been given recognition through citation. I affirm that I have cited and referenced all sources used in this document. Every effort has been made to avoid plagiarism in the preparation of this thesis.

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List of Abbreviations and Acronyms

AAFEPR:	Addis Ababa Fire and Emergency Prevention and Rescue Authority
AHA	American Heart Association
ALS:	Advanced Life Support
BLS:	Basic Life Support
C-SPINE:	Cervical Spine
EMS:	Emergency Medical Service System
EMTs:	Emergency Medical Technicians
FBAO	Foreign Body Airway Obstruction
FEPR:	Fire and Emergency Prevention Response Authority
PHA	Prehospital Ambulance
PHEM:	Pre-Hospital Emergency Medical Service
OHCA	Out-of-Hospital Cardiac Arrest
SCA	Sudden Cardiac Arrest

ABSTRACT

Back ground: Pre-hospital emergency care is the emergency care delivered to a patient before transfer to a hospital or proper healthcare facility. Basic Life Support is refers to the care healthcare providers and public safety professionals provide to patients who are experiencing respiratory and cardiac arrest or airway obstruction.

Objective: To assess knowledge and practice towards basic life support and its' associated factors among nurses practicing in ambulance at fire and emergency prevention and rescue authority of pre hospital care setting in Addis Ababa, Ethiopia, from March to April 20, 2019.

Methods: Institutional based a cross sectional survey with complete enumeration of all respondents was conducted on participants from fire and emergency prevention and rescue authority during the study period from March to April 20, 2019. Self-administered questioners were used to collect data from respondents and then it was presented by descriptive data presentation methods for descriptive variable. Binary and multiple logistic Regression analysis we used to show effect of independent variable on dependent variable. Data quality was controlled by pre-testing the tools and providing training the data collectors

Result: About 129 respondents were studied in this study with the response rate of 95%. Of them more than half 76(58.9%) were female. According to this study the overall BLS knowledge and practice skills were found inadequate. More than half of the participants 68 (52.7%) and 73(56.6%) had poor BLS knowledge and practice level respectively. Educational status, previous clinical exposures and involvement in resuscitation were showed significant association with BLS knowledge and practice on both binary and multiple logistic regressions.

Conclusion and recommendation: since the result of this study revealed that overall BLS knowledge and practice skills were found inadequate which were not enough to provide these crucial lifesaving procedures through sound BLS. In-service education and repetitive hand on practice about basic life support maneuvers for nurses must be considered to improve their basic life support knowledge and practice.

Key words: basic life support, ambulance nurses, knowledge, and practice

1. INTRODUCTION

1.1. Background

Pre-hospital emergency care is the emergency care delivered to a patient before transfer to a hospital or proper healthcare facility. It is lifesaving medical approach during transportation for critically ill patients. Safe, high quality outcomes for patients in prehospital care setting depends upon the most appropriately trained person(s) with the necessary equipment attending the emergency incident within an acceptable time frame(1,2).

Basic life support (BLS) is the preservation or restoration of life by the establishment and maintenance of airway, breathing, circulation and related emergency cares(3). It consists of a range of non-invasive procedures and external applications with the available materials found at hand for maintaining respiratory and circulatory function by means of chest compressions (CPR), using an automated external defibrillator (AED) and relieving an obstructed airway for patients of all ages (4). It is universally accepted that proper airway management is of high priority in the victim of major trauma and outcome of cardiac arrest directly influenced by performing quality CPR(5,6).

In our country nurses who work in ambulance provide care for any patients in pre hospital setting even irrespective of their age, severity of illness and emergent medical and traumatic conditions. They might be the first health care provider to see cases of cardiac arrest secondary to a wide variety of medical and traumatic conditions at out of hospital setting. Due to this, they are expected to have skill and knowledge for saving life in life threatening emergency condition at prehospital care setting. Therefore their knowledge and practice are vital to perform in need BLS in emergency situations either in hospital or outside hospital settings especially inside ambulance rather than not delivering care to perform(5-7)

1.2. Statement of the Problem

Ambulance health care providers shall assume the existence of serious, potentially life threatening conditions and expected to perform the primary survey by noting the patient's general appearance, assessing airway patency with ensuring manual C-spine protection, breathing, circulation with expose obvious or suspected external hemorrhage and injury sites and level of consciousness and identifying critical findings(8–10).

Basic life support (BLS) is a set of emergency procedures useful to a patient which is the initial step to prompt recognition and provide emergency support for ventilation and circulation in case of respiratory or cardiac arrest(8). Timely provision of BLS/CPR can protect a priceless life. It includes recognition of signs of sudden cardiac arrest (SCA), heart attack, and foreign-body airway obstruction (FBAO), performing CPR and defibrillation with an automated external defibrillator (AED)(3).

However, globally nurses' knowledge and practice towards basic life support in pre hospital care setting in cases of traumatic emergencies or critical medical illness is not adequate. Majority of the study on assessment of nurses' knowledge and practice towards BLS/CPR showed that more than the average respondents were failed looking for scene safety, activating EMS response in case of cardiac arrest, opening the airway of the injured victim with appropriate maneuver, differentiate the difference to adult verses infant foreign body removal technique during choking, explain quality CPR (in location, depth and number compression) and delivering defibrillator(6, 11–14)

Ambulances service in prehospital setting of Africa faced big challenge due to given the large regional burden of disease associated with delayed and inappropriate transfer of patients from lesser to more specialized healthcare facilities(15). This was evidenced as in sab Saharan Africa there were 11.2/1000 inhabitants sustained sudden cardiac death per year. Out-of-hospital cardiac arrest (OHCA) occurred more than average victims from the total recorded sudden cardiac death and Witness cardiac arrest was reported in 86.2% cases, but only 7.4% of victims experienced cardiopulmonary resuscitation attempts(16). For opening the airway of the injured victim, only 40% of them responded jaw thrust with immobilization of the cervical spine, whereas 57% pointed out head tilt-chin lift maneuver which should be avoided in assumed victims with C-spine injury(14).

In Ethiopia BLS knowledge and practice of nurses practicing in ambulance of pre hospital setting is not adequate. This argument is supported by different literatures as; Less than one fifth of patients had got some kind of care before they arrive to definitive care due to lack of knowledge, or fear of procedure and fear of medico-legal case and other reasons like to deliver the victim as fast as possible. Similarly more than half of the patients did not get any kind of pre-hospital care before reaching to health facility as the result of poor knowledge(17). Additionally, other study support that more than half of the respondents did not receive at least one of the necessary basic prehospital medical cares and one fourth of patient assessed en route ambulance care lost their consciousness but only 10.7% oral airway was applied, only 36.7% among patients having bleeding but about half of them were tried to stop bleeding and out of trauma patients only 12.1% of patients were applied with C-collar(18).

People who had pre-hospital care were less likely to develop severe and lethal complication injury (17) but however when pre hospital transportation is poor or absent, deaths that could have been prevented even by inexpensive procedures occur (3).Due to this, if ambulance health care providers (nurses working in ambulance) should expected in identifying problems, such as absent/inadequate airway, breathing or circulation at scene and en route, they are expected to perform skillful interventions of BLS to preserve life or limb and must have knowledge and technical skill to perform these crucial procedures(8–10).

Therefore this paper tried to assess basic life support knowledge and practice and its determinant factors among nurses who were working in ambulance at Addis Ababa Fire and Emergency Prevention and Rescue Authority.

1.3. Significance of the Study

Pre hospital ambulance care is the main important gate to start saving life of a patient on the way before reaching at hospital. However, Ethiopia has numerous problem related to pre hospital care system especially on ambulance service delivery and little recognition given to ambulance health care providers.

Using appropriate BLS on time to life threatening conditions, like traumatic injury or non-traumatic acute emergency medical complication from chronic illness, deaths that could have been occur would be prevented by inexpensive procedures. This is achieved only if BLS is done by individual who has basic knowledge and skill about BLS when and how to do it.

Therefore, this study was dig out gap on ambulance nurses' knowledge and skill towards BLS and tried to show solutions/directions to address gaps and identify factors in order give sound BLS cares by nurses working in ambulance during transportation. In addition to this the study was used as base line data for further research, for policy makers and for other stake holders.

2. LITERATURE REVIEW

Basic life support (BLS) is a set of emergency procedures useful to a patient in order to preserve or restore life by the establishment and maintenance of airway, breathing and circulation and related emergency care. It encompasses a number of techniques like cardiopulmonary resuscitation (CPR), shocking, controlling active bleeding and first aid treatments to sustain patient's life, and using automatic external defibrillator (AED), until advance life support team arrives or the person reaches hospital(1,3,8). Cardiopulmonary resuscitation (CPR) is the combination of chest compressions and airway ventilation to maintain effective basic life support(3).

Effective basic life support delivery may increase the likelihood of successful defibrillation; helps maintain myocardial and cerebral oxygenation until reversible causes can be diagnosed and treated and advanced life support clinicians and equipment are available(3,19).

Early initiation of BLS has been shown to increase the probability of survival for a person having cardiac arrest. To increase the odds of surviving a cardiac event, the rescuer should follow the steps in the adult, children and infant in chain of survival(20). Therefore, all clinicians, are expected to be trained and proficient in basic life support delivery

2.1. Knowledge towards Basic Life Support

Study done in Sri Lanka indicated that The knowledge score was inadequate (<50 %) among 12.7 % of the sample(21). Similarly, Indian study on the basis of knowledge score, it was noted that forty two percent of the study individuals (42%) has knowledge score above 50(22). Another Survey conducted in south Africa revealed that poor knowledge in the sample population with correct answers to 80% of the clinical resuscitation questions were given by 11% of respondents and only (8.2%) answered the clinical defibrillation question correctly(13).

According to Observational study done in Nepal showed that only 40% know about recommended maneuver for opening the airway of the injured victim and jaw thrust with immobilization of the cervical spine whereas 57% pointed out head tilt-chin lift maneuver which should be avoided in suspected victims with C-spine injury(8). But however, study in Saudi Arabia showed that the majority of study participants had knowledge about the spinal immobilization in trauma patients (94.7%), recognition of cardiopulmonary resuscitation

(82.5%), and the steps of the cardiopulmonary resuscitation (47.4%)(8) and 65% of respondents could recognize "no signs of life"(8).

Another Study done in Saudi Arabiya with Cross-section design showed only 52% respondents were aware about the correct location of the chest compressions for BLS/CPR and About more than 80% them recognize the need of spinal immobilization, and also only 33% knew how to open airway in case of an accident or trauma(23). Additionally, the Nepal study indicated that about 73% of the responders failed to select mouth to mouth and nose technique as the rescue breathing for infants. Similarly, Study one in Ethiopia with cross sectional design showed about 79.8% of respondents had identified cardiac and respiratory arrests were the major indication of CPR. But about 15.2% of them identified apparent sudden death as an indication of CPR(24).

Study done in Nepal indicates that about 67% respondents were unable to identify the chest compression to ventilation ratio in infants and children, nevertheless 50% of them knew that the depth of chest compression in an infant is one third of the chest. Likewise, wrong answers to the questions concerning adult and pediatric choking were found (81%, 74% respectively) (8). Saudi Arabia cross sectional study revealed that as to questions on chest compression in adults; nearly half of the participants could identify that the right location of the hands for chest compression is the center of the chest between two nipples, the compression rate is 100/min, and the chest compression to ventilation ratio is 30:2. (8).

2.2. Practice towards Basic Life Support

Basic life support is a skill that is fundamentally based on practice(7). The airway management is of paramount importance in patients with traumatic brain injury, cervical spine lesions, chest trauma and for any patient with Glasgow comma scale <8 for those to open the airway by jaw thrust maneuvers(18).

Study done in India with the cross sectional method indicated that about 51% of the study participants have not performed CPR voluntarily(25). Similarly, other two more Indian study with the same study design showed that almost one fourth of participants (23.2%) practiced CPR And about 83.38% of the participants have not performed CPR voluntarily(26,27).

Study done in turkey by cross-section design showed that for five patients with cardiac arrest two had cardiopulmonary resuscitation (CPR), one was intubated, one received adrenaline(1). Similarly Ethiopian study indicated circulation was assessed for 61.7% patients among them 10.8% were cardiac arrest initially, for 67.5% of patients were CPR done but no AED(18). According to cross sectional study done India, the majority of the participants are not hesitant to

perform even mouth to mouth breathing(26). For choking management Study in India showed that about one third of participants (36.8%) saved a choked victim(27).

According to the study done in Addis Ababa with cross sectional design from total assessed level of consciousness 23.3% patients were lost their consciousness out of them oral airway were applied only for 10.7% patients(18). During the prehospital care of trauma victims, as much as 66%-85% of preventable deaths occur by airway obstruction; Circulation assessed for patients; CPR was done for 75% patients who had cardiac arrest(18). Another Ethiopian study showed that out of 34.2% trauma patients 12.1% patients were applied C-collar but majority 87.9% patients weren't(18)And also from the turkey study for needed spinal immobilization, 57.5% had spinal board and Cervical collar usage was 65(1). And also according to another cross sectional study also done in Addis Ababa showed over all 57.7% patients did not receive at least one of the necessary basic prehospital medical cares.

2.3. Factors Affecting Knowledge and Practice of Basic Life Support

Different study on the basic life support indicated that the following factors strongly affect knowledge and practice by health care providers during life threatening conditions. Lack of confidence, lack of skills and knowledge, fear of causing harm to the person during performing the resuscitation were the common reasons for nurses' reluctance(28). Nurses must improve BLS skill with training programs and fulfill their roles effectively during the implementation of BLS(7).

Lack of previous training of BLS has strong association with knowledge and practice of basic life support. To prove this argument according to cross sectional Study done in turkey support that there was a statistically significant difference between nurses had previously undergone BLS training and the difference between their pre- and post-test results ($p < 0.05$)(7). Another study conducted in India shows that 67% perceived that lack of training for the lack of knowledge is the main responsible factor reasons. It was found that those who had scored above fifty percent had some prior training in BLS (74.1%). All this was found to be statistically significant with p-value less than 0.005(22). Correspondingly, studies done in Nepal with the cross sectional indicate that CPR training significantly influenced the BLS knowledge of the participants. Those who had received some CPR training within 5 years obtained the highest mean score of 8.62 ± 2.49 , whereas those who had training > 5 years back and without training obtained mean score of 5.54 ± 2.38 and 6.1 ± 2.29 respectively. This later important observation must be noted and

is of great clinical significance(9). study done in India revealed that an untrained participants have scored poorly as compared to trained participants in theoretical knowledge and practice of BLS (24.36 % and 53.45% versus 9.25 % and 24.07%) respectively(26). South African study also indicated that among the categorical factors that influenced skill were: the most recent type of CPR training ($p = 0.02$)(29). Furthermore study done in Ethiopia 98.7% of students were revealed that lack of training as major factors affecting practice of CPR (24).

Lack of exposure is significantly associated with practice of basic life support. This is evidenced as study in India showed that Poor exposure of dental students to the training and emergencies is the prime factor behind their less knowledge as compared to medical students(30). A cross sectional study conducted in Ethiopia revealed that Lack of exposure is significantly associated with practice of BLS/CPR as p value is less than 0.05(24).

Lack of confidence is another factor which affects the practice of basic life support. Nearly 84% participants state that lack of confidence is one factor affecting practice of CPR(22). According to berlin descriptive statistics on the first survey showed the highest frequencies for extremely confident were on recognizing unresponsiveness (46.8%) and absence of breathing or abnormal breathing (42.6%); the areas with the lowest frequencies of extremely confident were AED pad placement (23.4%) and AED operation (17.0%)(10).study in Sri Lank showed that only 32.1 % of participants were confident in saving a life with their knowledge(21). Indian cross sectional study showed that 8.7% expressed reluctance in performing CPR in hospital because of lack of confidence(12).

According to study done in Nepal, the prior CPR clinical exposure influence the retention of knowledge and has significance association. This evidenced by those who were involved in resuscitation frequently had a higher median score of 8 in comparison to those who were seldom involved or not involved at all ($P < 0.001$)(9).

South African study with analytical study design revealed that categorical factors that influenced knowledge were: the sector of employment ($p < 0.001$), the place of training ($p = 0.001$), and The categorical factors that influenced skill were: the most recent type of CPR training ($p = 0.02$) as well as the type of guidelines participants were trained according to ($p = 0.01$)(29).

2.4. Conceptual Frame Work

Factor affecting the knowledge and practice BLS from the previous similar study is used to conceptualize the whole research process and to help for development of tools. Generally, the factors affecting knowledge and practice towards BLS are as socio-demographic related factors, individual behavioral related factors and organizational related factors.

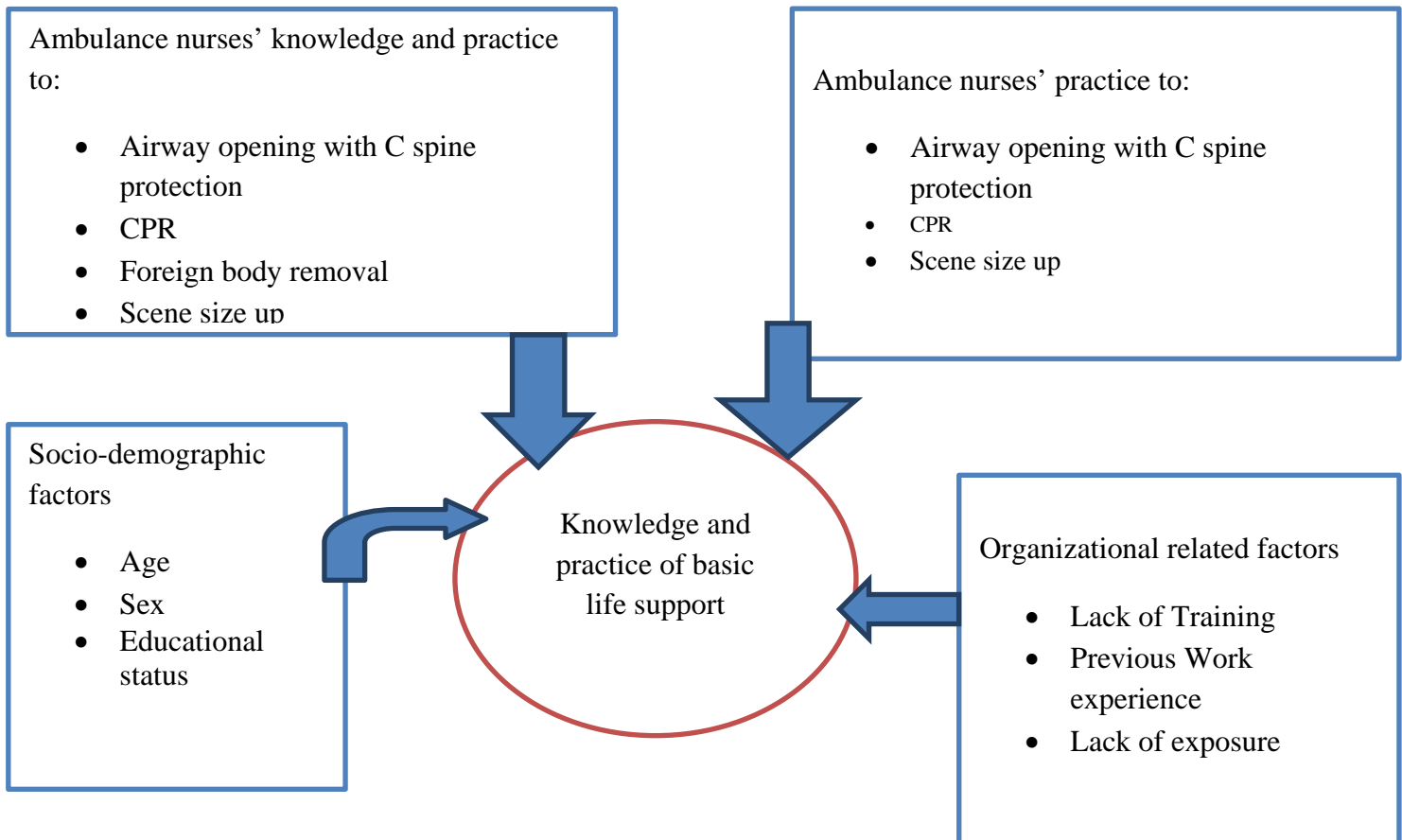


Figure 1; conceptual frame work on assessment of knowledge and practice towards basic life support and factors affecting its delivery among nurses working at fire and emergency response authority in Addis Ababa, Ethiopia, 2019.

3. OBJECTIVES

3.1. General Objective

- To assess knowledge and practice towards basic life support and its associated factors among nurses working in ambulance at fire and emergency prevention and rescue authority of Addis Ababa, Ethiopia from March to April 20, 2019 GC.

3.2. Specific Objectives

- To assess the knowledge of nurses working in ambulance towards basic life support at fire and emergency prevention authority.
- To assess the practice of nurses working in ambulance to towards basic life support at fire and emergency prevention authority.
- To identify factors affecting basic life support knowledge and practice among nurses working in ambulance at fire and emergency response authority.

4. METHODS AND MATERIALS

4.1. Study Area and Study Period

The study was conducted in prehospital setting of fire and emergency prevention and rescue authority in Addis Ababa which is the only governmental institution where prehospital care delivery given for Addis Ababa community. Addis Ababa is the capital city of Ethiopia, the seat for Africa union, United Nations economic commission for Africa (ECA) and hosts the various other continental and international organizations. Addis Ababa is therefore often referred as political capital of Africa for its historical, diplomatic and political significance for the continent with an attitude of 2300 m above sea level. This city is divided into 10 sub cities and 99 woredas. According to 2007 census the city has a population of 3,475,952 inhabitants.

There are three major organizations which give pre-hospital ambulance service. These are Fire and Emergency prevention and rescue Authority, which is governmental and this governmental organization organized by having 8 branches such as Addis ketema, Akaki kality, Arada, Bole, Gulale, Kirkose, Kolfe keranio, Nifase silke, and yeka city under the control of both Arada and bole site with 33 ambulances but 13 are functional. The health care providers working in this ambulance are all nurse; Addis Ababa Red Cross Society (non-governmental); and Tebita private ambulances and this organization has one dispatch center with 11 ambulances.

The study was conducted from March 10 to end May 15 2019.

4.2. Study Design

- An institutional based a cross sectional survey was employed to assess knowledge and practice and there determinant factors towards basic life support among nurses practicing in ambulance at FEPPRA.

4.3. Populations

4.3.1.1. Source Study and population

- All nurses who were working in ambulance who provide ambulance health care at pre hospital care setting in Addis Ababa city.

4.3.1.2. Study subjects and study units

All nurses who were working at pre hospital setting of Fire and Emergency prevention and Response Authority who provide pre hospital ambulance service to trauma emergency and non-traumatic emergency condition and fulfill eligibility criteria.

4.4. Eligibility Criteria

4.4.1.1. Inclusion criteria

All licensed ambulance nurses who are working at fire and emergency response authority which provide pre hospital service were included in the study

4.4.1.2. Exclusion criteria

All ambulance health care providers who did not have license and serve as volunteers, nurses those who were on annual leave and on sick leave.

4.5. Sample Size Determination and Sampling Procedure

Using single population proportion formula by considering p-value 50%, CI 95% and 5% degree of precision can be given as:

$$n = \frac{(Z_{1-\alpha/2})^2 \times p \times (1-p)}{d^2},$$

n=384 which is more than half of the total respondents found at fire and emergency prevention and rescue authority.

There are 140 nurses currently found on work in fire and emergency prevention and rescue authority organization of Addis Ababa city administration. These respondents are organized in three shifts duty of 18 nurses in each sub city or branch branches. Therefore complete census used from fire and emergency authority organization

4.6. Variables

4.6.1.1. Dependent variable

- Ambulance nurses' knowledge and practice towards BLS

4.6.1.2. Independent variables

- Socio-demographic related factors: - age, sex, educational status, religion etc.

- Organizational related factors:-lack of training, previous work experience, previous exposure etc.

4.7. Data Collection Methods

Data was collected by trained data collectors by using closed ended questionnaires which is adopted from AHA 2015 guideline. Then the questioners were modified to local context.

4.8. Data Collection Procedure and Tools

Structured self-administered questionnaires were used to collect data from respondents in order to assess their knowledge and practice level towards BLS. This questioner had three parts. The first part of the questioner contains 14 questions which were assessing the socio-demographic factors of the respondents. The second part of the questionnaire contains 16 MCQs that was used to assess the levels of knowledge towards BLS, and the third part the questioner also contains 13 MCQs and 3 correct/incorrect practice assessing questions and 1 question which used to assess obstacle to practice of BLS. The data was collected by trained data collectors' from each branches of AAFEPPRA.

4.9. Data Quality Management

4.9.1. Data quality control

A pretest was done on five percent of the total respondents at Ethiopian Red Cross society who were not included in the study. Then ambiguous and unsuitable questions were modified after the pretest was conducted. In addition to the pretest, the data collectors trained for completeness of response to questionnaires before collecting the respondents. The principal investigatory also continuously follow data collection and check the data for completeness clarity and collected filled questioner.

4.10. Data Processing and Analysis

Data was checked for completeness, inconsistencies, cleaned, coded. Then collected data was enter into Epi-Data version 4.4.2.1 and then exported to SPSS with latest version 21 for statistical analysis.

Descriptive statistics such as percent, pie chart, graphs, proportion, and ratio were used to summarize the data. And also, binary and multiple logistic regression analysis used to show relationship between dependent and independent variables.

4.11. Operational Definitions

Basic life support (BLS): is a set of emergency procedures applied to a patient, it comprises a number of techniques like cardiopulmonary resuscitation (CPR), shocking, and first aid treatments to sustain patient's life until advance medical facility arrives or the person reaches hospital.

Leveling knowledge status of respondents: The knowledge assessing part of questioner has 16 MCQ questions which were used for assessing the knowledge of BLS among participants. Each correct answer was scored 1 and each incorrect answer was coded as 0. According to this scoring those who score less than 8 (less than 50% of 16 question items) were considered to have poor BLS knowledge and those who got score equal or above 8 were considered to have good knowledge on BLS even though it was against AHA certification cut off point (85%) so as considering socio-demographic variation of the study area.

Leveling Practice status of respondents: The practice assessing part of questioner also has 16 questions which were used for assessing the practice of BLS among participants. Each correct answer was scored 1 and each incorrect answer was coded as 0. According to this scoring those who score less than 8 (less than 50% of 16 question items) were considered to have poor BLS practice and those who got score equal or above 8 were considered to have good practice on BLS even though it was against AHA certification cut off point (85%) so as considering socio-demographic variation of the study area.

4.12. Ethical Consideration

Ethical clearance was secured from Research Ethics Committee (REC) of the Emergency Medicine Department as mandated by Addis Ababa University. This ethical clearance letter was submitted to head office of prehospital care department at AAFEPPRA. Then letter of permission was obtained from head office of AAFEPPRA and then after this letter was also submitted to each branch of AAFEPPRA before actual data collection began.

The objectives of the study and its procedures were clearly mentioned for the study participants initially. Then informed consent was obtained from all study participants prior to proceeding data collection. Finally, each respondent was asked to check whether information provided on the purpose of the study has been adequately understood or not. Confidentiality of the information obtained from each participant was maintained

4.13. Dissemination of Results

The final report of this study would be submitted to emergency medicine department, Addis Ababa University, fire and emergency rescue ambulance and others stake holder organizations. Efforts would be made to present in scientific conferences and publish on national journals.

5. RESULT

5.1. Socio-demographic characteristics of nurses who were working in ambulance at Fire and Emergence prevention and rescue Authority.

Totally 140 nurses who were working in ambulance were required for this study form all branches of AAFEPRRA. However, about 133 respondents with the response rate of 95% replied for the survey. Finally about 129 respondents were used for analysis to this survey because of four respondents were excluded from the study as a result of incomplete response.

As indicated below in the table1, of 129 respondents more than two-third of them 76(58.9%) were female. The mean age of the participants was 26.78 with standard deviation of (SD=2.70). About more than half of them 87 (67.4%) were diploma holders and 75(58.9) were orthodox religion followers. When looking at their work experience about two-third 85(65.9%) of the respondents had experience of between 1 to 5 years. About 20 (15.5%) of them had previous work experience at health center/hospital. Finally, nearly half 63(48.8%) of the respondents were previously observed cardiac arrest patients resuscitation with the frequency interval of between 1-5 times and about 54(41.9%) out of total participants previously engaged in critically ill patients resuscitation.

Table 1; Socio demographic characteristics of Nurses at Fire and Emergency Response and Rescue Authority of Addis Ababa, Addis Ababa, Ethiopia, May 2019. (N=129)

Variable		Frequency	Percentage
		N =129	100%
Sex	Male	53	41.1
	Female	76	58.9
Age	20-24 years	37	20.9
	26-29 years	67	51.9
	>30 years	25	28.7
Religion	Orthodox	75	58.1
	Muslim	19	14.7
	Protestant	35	27.1
Training of BLS	Yes	Before graduation	8(7.4%)
		After graduation	81(92.6%)
	No	40	31
Year of experience In prehospital care	<1 year	20	15.5
	1-5 years	85	65.9
	>5 years	24	18.6
Work experience at health center or hospital	Yes	20	15.5
	No	109	84.5
Exposure to cardiac arrest	Never	16	12.4

patients	1-5 times	63	48.8
	>5 times	50	38.8
Current work station by kifle ketema	Addis ketema	17	13.2
	Arada kifle ketema	16	12.4
	Akaki kifle ketema	16	12.4
	Bole kifle	15	11.6
	Gulele kifle	16	12.4
	Kirkos kifle	14	10.9
	Kolfe keranio	19	14.7
	Nifas silk	16	12.4

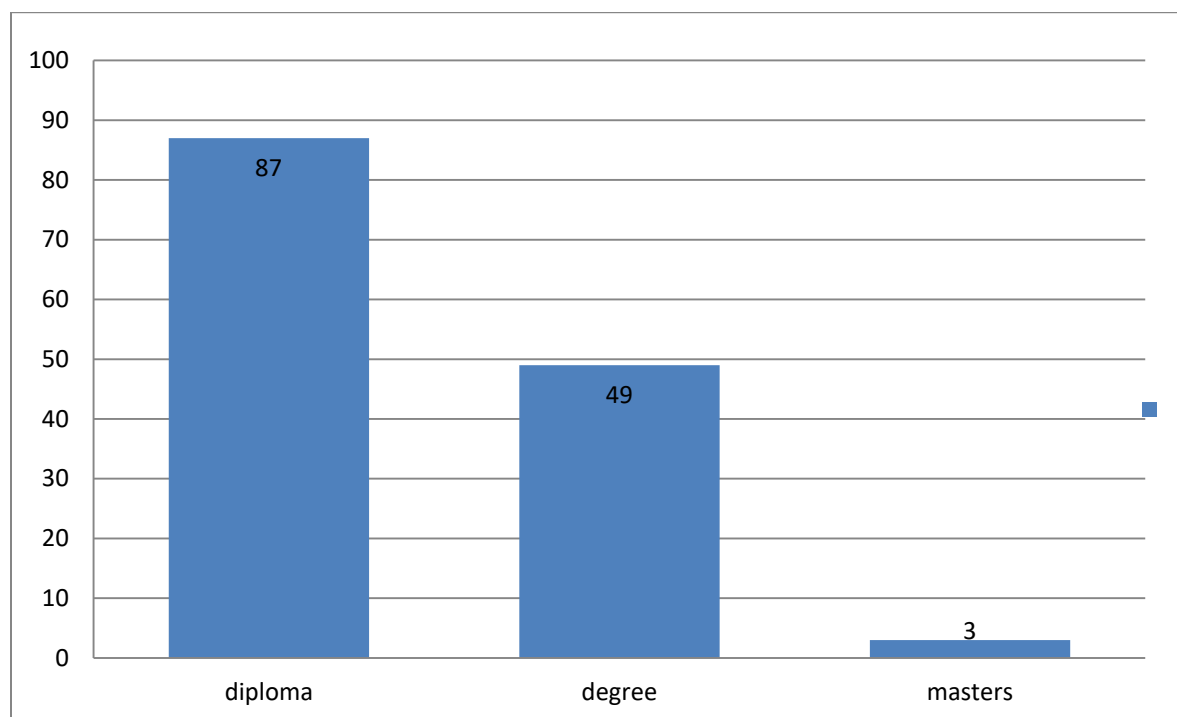


Figure 2. The educational status in nursing of participants working in ambulance of prehospital ambulance care of AAFEPR, Addis Ababa, Ethiopia 201

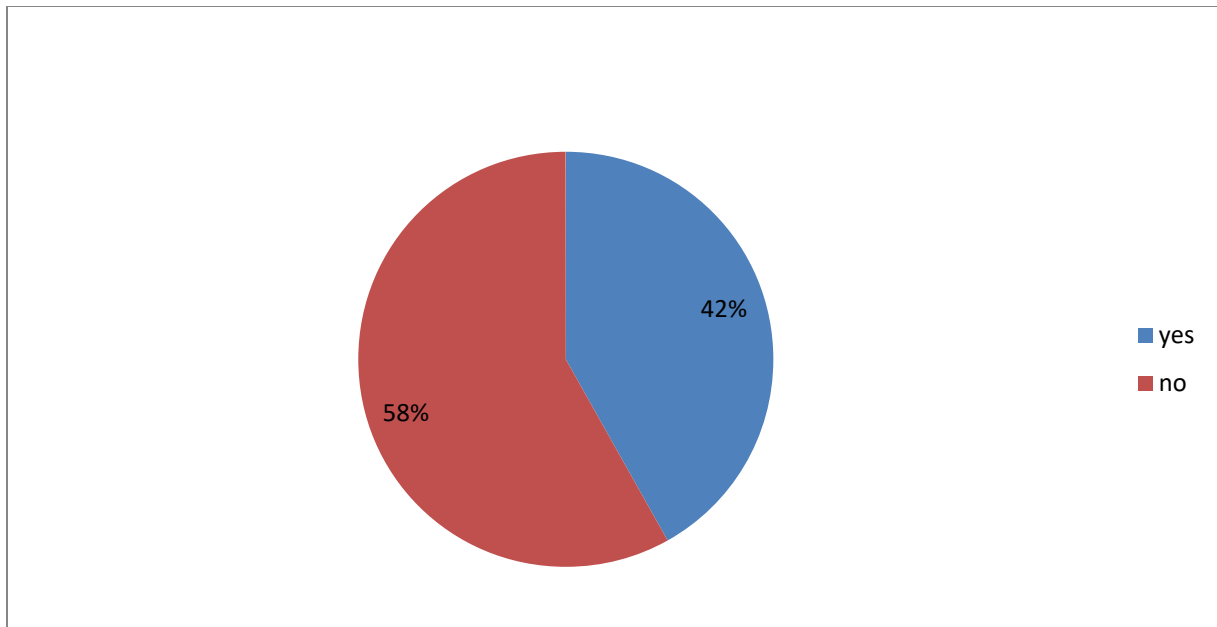


Figure 3. The Proportions of nurses' who previously engaged in patient resuscitation at Fire and Emergency Response and Rescue Authority of Addis Ababa, Ethiopia, May 2019. (N=129)

5.2. Knowledge of nurses working in ambulance towards basic life support at all branches of Fire and Emergency Prevention and Rescue Authority.

As indicated in figure 2, more than half of the participants 68 (52.7%) had poor knowledge regarding basic life support with the mean score of 7.73 (which is from the total 16 scores), standard deviation of 1.87 out of BLS knowledge levels. The minimum and maximum score responded among total percipients were 4 and 12 respectively out of 16 BLS knowledge assessment questions.

As shown in table 2, from the total respondents about 98(76%) replied the correct response to the question "What does the abbreviation BLS stands for?" and it is followed by the question "What is the basic concept of BLS?" which was correctly answered by 80(62%) respondents. On the other hand about 45(34.9%) of respondents only gave the correct response to the question "What does abbreviation AED stands for?" from those knowledge assessing questions.

Table 2; Responses of Nurses who were working in prehospital ambulance care for 16 BLS knowledge questions at all branches of AAFEPR, Addis Ababa, Ethiopia, May 2019.(N=129)

Knowledge assessment questions	Incorrect responses		Correct responses	
	Freq.	%	Freq.	%
1. What does the abbreviation BLS stand for?	31	24	98	76
2. What is the basic concept of BLS?	49	38	80	62
3. If you find someone unresponsive in the middle of the road, what will be your first response? (Note: You are alone there)	55	42.6	74	57.4
4. If you confirm somebody is not responding to you even after shaking and shouting at him, what will be your immediate action?	83	67.3	46	35.7
5. Where is the exact location for chest compression?	70	54.3	59	45.7
6. What is the location for chest compression in infants?	78	60.5	51	39.5
7. How do you give rescue breathing in infants?	80	62.0	49	38.0
8. What is recommended a ventilation rate of breaths per minute for adults?	64	49.9	65	50.1
9. What is depth of compression in adults during CPR?	80	62	49	38
10. What is depth of compression in Children during CPR?	76	58.9	53	41.1
11. What is depth of compression in neonates during CPR?	80	62.0	49	38.0
12. The rate of chest compression in adult and Children during CPR	54	41.9	75	50.1
13. What does abbreviation AED stands for?	84	65.1	45	34.9
14. What does abbreviation EMS stands for?	58	43.4	73	56.6
15. If you and your friend are having food in a canteen and suddenly your friend starts expressing symptoms of choking but responsive, what will be your first response?	70	54.3	59	45.7
16. If you observe infant in chocking but responsive, what will be your action/s? (More one response is possible)	62	48.1	67	51.9

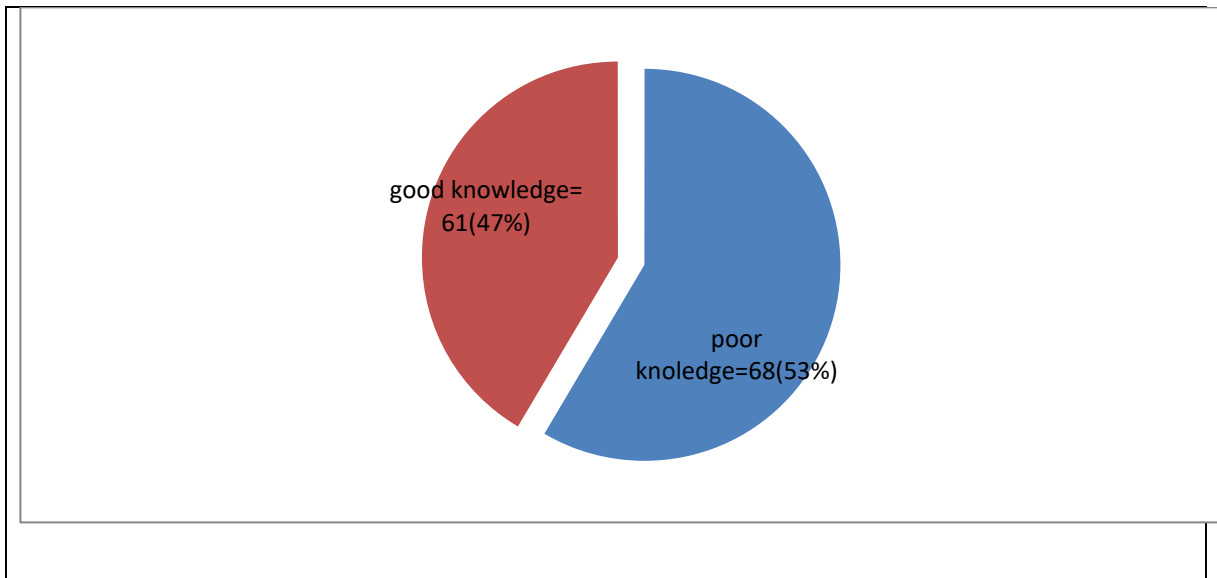


Figure 4: BLS Knowledge status of the Nurses working in ambulance of Fire and Emergency Prevention and Rescue Authority, Addis Ababa, Ethiopia 2019.(N=129)

5.3. Practice of nurses working in ambulance towards basic life support at all branches of Fire Emergency Prevention and Rescue Authority.

According to figures 3 shown below, of 129 participants more than half of respondents 73(56.6%) had poor practice towards BLS with mean score of 7.39(is out of 16 practice assessing questions) (46.19% out of 100%), standard deviation 1.8, variance 3.25, and minimum and maximum score of 4 and 7 respectively. About 75(58.1) respondents replied that they were not involved in any patient resuscitation (BLS). However the majority of the respondents 113(87.59%) revealed that they had the opportunity to observe critical ill patients during resuscitations. Looking at their training status, more than two-third (2/3) of the respondents 89(69%) were reported that they took training towards basic life support at least once either before graduation or in service training after graduation. only 20(15.5%) of them had previous work experience either at hospital or health center.

As indicated in the table 3 below, about 88(68.8%) of study participants were correctly responded the inquiry “Where should you attempt to perform a pulse check in adult?” which is followed by the question “Starting chest compressions within 10 seconds of recognition of cardiac arrest must be considered during CPR.” and The compression to ventilation ratio for the lone rescuer giving CPR to victims of any age were given the correct response by about 79(61%) and 77(59.7%) of the study participants respectively. On the other side, only 43(33.3%) of the study participants gave correct response to the method how to open the airway of infant.

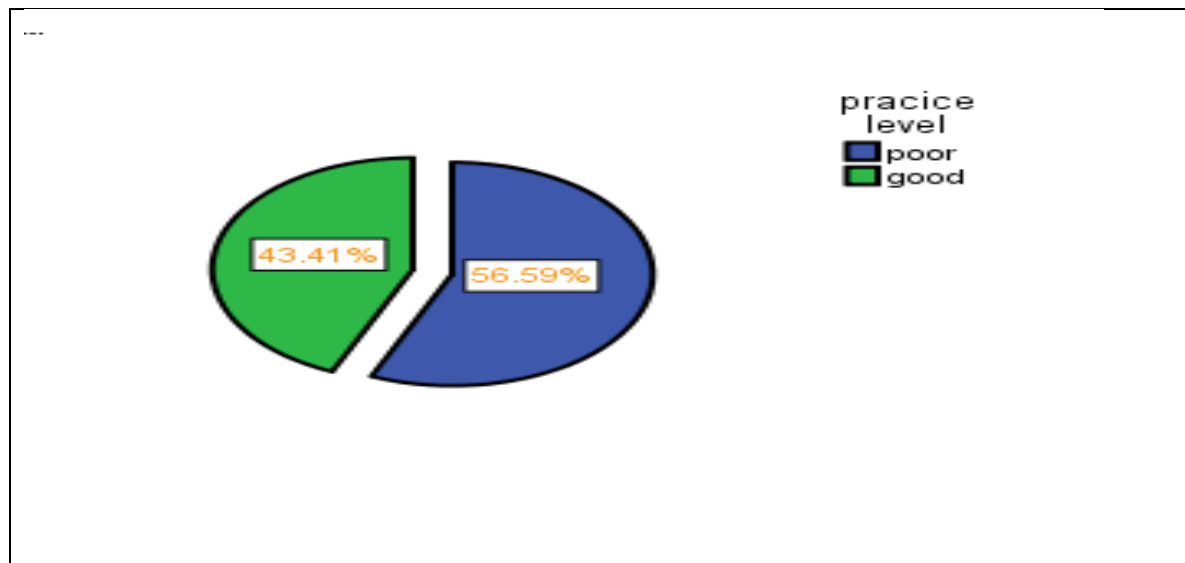


Figure 5 BLS practice level of nurses working in prehospital ambulance care of Fire and Emergency Prevention and Rescue Authority, Addis Ababa, Ethiopia 2019.(N=129)

Table 3; Responses of Nurses who were working in prehospital ambulance care for 16 BLS practice questions at all branches of AAFEPR, Addis Ababa, Ethiopia, May 2019.(N=129)

No.	Questions	Incorrect responses		Correct responses	
		Freq	%	Freq.	%
1	Correct maneuver to opening the airway of the injured victim?	66	51.2	63	48.8
2	The Chain survival in adult Include?	85	65.9	44	34.1
3	How often should rescuers switch roles when performing 2-rescuer CPR?	63	48.8	66	51.2
4	The initial Basic Life Support steps for adults are:	77	59.7	52	40.3
5	Where should you attempt to perform a pulse check in adult?	41	31.2	88	68.8
6	The compression to ventilation ratio for the lone rescuer giving CPR to victims of ANY age is	52	40.3	77	59.7
7	The proper steps for operating an AED are:	74	57.4	55	42.6
8	The Sign/s of severe airway obstruction?	75	58.1	54	41.9
9	In an adult with an advanced airway in place during 2-rescuer CPR, how often breaths should be administered?	83	64.3	46	36.7
10	If you what to open the airway of infant, which position is appropriate?	86	66.7	43	33.3
11	Starting chest compressions within 10 seconds of recognition of cardiac arrest is considered in CPR	50	38.8	79	61.1
12	Push hard, push fast is considered during quality CPR	74	57.4	55	42.6
13	Minimize interruptions is considered as quality CPR	81	62.8	48	37.2
14	The critical characteristics of high-quality CPR include which of the following?	72	55.8	57	44.2
15	The Correct steps in management chocking of infant but responsive?	62	48.1	67	51.9
16	Correct method in management of chocking for responsive adult?	70	54.3	59	45.7

5.4. Factors associated with basic life support knowledge among nurses who were working in ambulance at Fire Emergency Prevention Rescue Authority.

Socio-demographic factors such as Sex, Age, educational status, year of previous work experience on prehospital ambulance care and hospital or health center, frequency of exposure to cardiac arrest (critically ill patients) and involvement to critical patient resuscitation of respondents were analyzed by binary logistic regression in order to predict crude odds ratio with the BLS Knowledge initially. From this binary logistic regression analysis; except sex of the respondents all variables were found to be significantly associated with the BLS Knowledge. Whereas, in the multivariate binary logistic regression analysis, only educational status, previously engaged critical ill patient's resuscitation and previous exposure to cardiac arrest were the variables which significantly associated with the knowledge of BLS at p-value of less than 0.05.

Table 4 below indicates that those nurses who had degree and above were 2.26 times more likely to be knowledgeable as compared to diploma[AOR=2.26, 95%CI (1.04-6.57)]. Those nurses who were previously performed resuscitation were 11 times more likely to be knowledgeable as compared to those nurses who didn't resuscitated any patient before[AOR=11, 95% CI (4-31.55)]. Those nurses who were previously had more than 5 times exposures to cardiac arrest patient were 6.99 times more likely to be knowledgeable as compared to nurses who were not exposed to any cardiac arrest patient resuscitation[AOR=6.99,95%CI(1.52-32.00)].

Table 4; Bivariate and Multivariate analysis of factors affecting the knowledge of nurses working in ambulance towards basic life support at AAFEPR, Addis Ababa, Ethiopia, May,2019.(N=129)

		Knowledge		OR (CI =95%)			
		good	Poor	Crude(CI)	P-Value	Adjusted	P-value
Sex	Male	28	25	1			
	Female	33	43	.602(.297-1.22)	.178		
Age in year	20-24	9	28	1		1	
	25-29	34	43	3.21(1.31-7.81)*	0.010	2.60(.86-79)	
	>30	18	7	8 (2.53-25.31)*	0.002	2.46(.54-11.32)	
Educational status	Diploma	31	56	1		1	
	Degree and above	30	12	4.51(2.02-10.05)*	.000	2.62(1.04-6.57)*	.040
Year of experience	<1 year	6	14	1		1	
	1-5 years	42	39	1.63(.57-4.67)	.359	.7(.19-2.55)	
	>5 years	13	15	11.67(2.77-49.13)*	.001	3.22(.60-17.28)	
Work experience at HC/hospital	Yes	14	6	.325(.116-.909)*	.032		
	No	47	62	1			
Training	Yes	50	39	.296(.132-.665)*	.003	.72(.39-3.85)	
	No	11	29	1		1	
Exposure to cardiac arrest patients	Never	3	13	1		1	
	1-5 times	21	42	2.16(.556-8.44)	.265	1.68(.38-7.3)	
	>5 times	37	13	12.33(3.03-50.28)*	.000	6.99(1.52-32.00)*	.012
Engaged in patient resuscitation	Yes	45	9	18 (7.46-45.5)*		11(4.9-31.55)*	.000
	No	16	59	1			

* indicates the significant association on at p-value less than 0.05.

5.5. Factors associated with practice of basic life support among nurses who were working in ambulance at Fire and Emergency Prevention and Rescue Authority.

According to result of this study shown in table 5 below, nurses' age group, education status, previous year of work experience PHA care and work experience at hospital (health center), previous exposure to cardiac arrest patients (critically ill patients) and engagement in resuscitation of critical ill patients of the respondents were factors associated with the BLS practice from socio-demographic variable by bivariate logistic regression analysis with the reference p-value of less than .05. In addition lack of updated protocols, lack of confidence and unwilling to perform the BLS procedure and knowledge level on BLS were showed significant association with the BLS practice on binary logistic regression again as compared p-value less than 0.05.

However those nurses engaged in patient resuscitation and their knowledge level from socio-demographic factors as well as lack of updated protocols on BLS, lack of confidence and unwilling to perform the BLS procedures from obstacles of their BLS practice were factors showed significant association with BLS practice at reference p-value less than 0.05 on multiple logistic regressions.

Therefore this study revealed that knowledgeable nurses were 8.33 times more likely to perform BLS practice as compared to those with in adequate knowledge [AOR=8.33, 95%CI (2.82-24.57)]. Nurses' who previously had not engaged in critical ill patient resuscitation were 68.7% less likely to practice BLS skills than those who involved in any patient resuscitation [AOR=0.313, 95% CL (.10-.797)]. Furthermore According to nurses who replied for barriers regarding BLS practice; as nurses who were confident in performing BLS were 3.69 times more likely to practice BLS skills than those who were not confident to practice BLS skill [AOR=3.96,95%CI(1.76-8.9)]. As they were willing to practice BLS skill had 3.82 times more likely to perform BLS skill than those nurses who were unwilling to practice BLS skill [AOR=3.82, 95 % (1.68-8.71)]. As they Had updated protocol on BLS were 2.49 times more likely to practice BLS skill as compared to those nurses who were not had updated protocol on BLS practice [AOR=2.49, 95%(1.07-5.82)].

To summarize, the result of this study revealed that educational status, previous exposure to cardiac arrest and performing resuscitation and knowledge level were found significantly associated with BLS practices. This result also indicated that willingness and level confidence to perform BLS maneuvers and availability updated protocols were found significant association

with BLS practice on both bivariate and multivariate logistic regression with p-value less than 0.05

Table 05; Bivariate and Multivariate analysis of factors affecting the practice of nurses who working in ambulance towards basic life support at all branches of AAFEPR, Addis Ababa, Ethiopia, May,2019.(N=129)

Variable		Practice		Crude(CI)	OR (CI =95%)		P-value
		Poor	Good		P-Value	Adjusted	
Sex	Male	24	29	1			
	Female	49	27	.46(.22-.933)*	.032		
Age group	20-24	26	11	1			
	25-29	38	29	1.80(.77-4.24)			
	>30	9	16	4.2(1.43-12.36)*	0.009		
Educational status	diploma	56	31	1			
	Degree and above	17	25	2.65(1.25-5.66)*	.011		
Year of experience	<1 year	13	7	1			
	1-5 years	53	32	1.12(.40-3.10)	.82		
	> 5 years	7	17	4.51(1.26-16.09)*	.02		
Work experience at HC/hospital	Yes	6	14	.27(.096-.753)*	.012		
	No	67	42	1			
Training	Yes	43	46	.312(.312-..713)*	.006		
	No	30	10	1			
Exposure to cardiac arrest patients	Never	13	3	1			
	1-5 times	43	20	2.01(.52-7.87)			
	>5 times	17	33	8.42(2.10-33.60)*	.006		
Engaged in patient resuscitation	Yes	14	40	.095(.042-.216)*	0.000	.313(.10-.797)*	.045
	No	59	16	1		1	
Knowledge level	Good	15	46	17.787(7.31-43.26)*	.000	8.33(2.82-24.57)*	.000
	Poor	58	10	1		1	

* indicates significance at p-value less than 0.05

Table 5; Bivariate and Multivariate analysis of perceived obstacles affecting the practice of nurses who working in ambulance towards basic life support at all branches of AAFEPR, Addis Ababa, Ethiopia, May,2019 (N=129)

Variable		Practice		Crude(CI)	p-value	OR(CI)		p-value
		Poor	Good			Adjusted		
Medico legal	Yes	50	37	1.1 (.53-2.34)				
	No	30	19					
Work load	Yes	32	24	1.04(.51-2.13)				
	No	41	32					
Being confident	Yes	49	20	3.67(1.76-7.64)*	0.001	3.96(1.76-8.90)*	0.001	
	No	24	36					
willing to do the procedures	Yes	53	21	4.4(2.09-9.31)*	0.000	3.82(1.68-8.71)*	0.001	
	No	20	35					
Presence update protocol	Yes	56	28	3.29(1.44-6.52)*	0.002	2.49(1.07-5.82)*	0.024	

* indicates significance association at P-value less 0.05

6. DISCUSSION

BLS is an essential medical procedure which is critically vital for individuals who face sudden cardiopulmonary arrest secondary to cardiac and respiratory, choking and drowning. Hence BLS knowledge and skill is extremely important to prevent and maintain the life of suddenly collapsed patient. So that nurses should become knowledgeable and skillful in delivering quality BLS(2). However the finding of this study indicates that the BLS knowledge and practice of nurses working in ambulance of prehospital setting was inadequate.

According to result of this study about 47.3% of respondents had good knowledge regarding basic life support with the mean score of (46.19%) 7.73(is out of 16). The finding of this study is lower than study done in Botswana (48.7%)(31), India (53.45%)(22) and Palestine (56.7%)(32). The possible explanation might be due to all studies done among nurses' who work in hospitals where they get better exposure than those participants who were included in study. But it is better than study done at Amahara regional referral hospitals (38.6%)(33), Sri Lanka 12.7%(21) and another Indian study (42%)(22). The possible reason for this might be due the leveling system of Sri Lanka's and Indian studies used polychotomus category system however this study used dichotomous. Whereas the respondents of this study had better access to resuscitation training than respondents of Amahara regional state study.

Immediate activation of EMS, providing quality CPR and early defibrillation is key for delivering sound BLS to arrested patients resuscitation(14). For providing quality CPR, AHA's 2015 guide line recommended that Compression depth of at least 2-2 ^{1/2} inches for adults/children and minimize interruptions with compression rate at least 100-120 per minute. But the result of this study indicated that only 38% of the respondents responded correctly "What is depth of compression in adults during CPR?" This is lower than study done in Indian study(44.5%)(34).Regarding the question about Activating EMS only 35.7% of the respondents responded the correct response. This finding is lower than study carried out in South Africa (47.0%)(35), Indian study (56%)(22). The possible explanation for this might be the respondents were not updated themselves routinely with updated BLS protocols.

The finding of this study revealed that the participants had inadequate BLS practice level even though basic life support is a skill that is fundamentally based on practice(7). The result of this study showed that about 43.4% of the respondents had good practice towards BLS practice. As compared to others, this study is better than study done in Ethiopia (Amahara region state)(32%), (Batswana study (18%) and South Africa (11%). The reason for this discrepancy might be due to respondents of this study had better opportunity of BLS training as compared to study done at Amahara regional state where as south African study used cut off point 85% in level practice. But the Botswana study used observation based skill assessment on BLS maneuvers.

In Airway intervention of all traumatic victim consideration should be given for C spine injury and apply jaw thrust maneuver to opening the airway of the injured victim (19). However, according to this study only 48.8% replied about the inquiry “Correct maneuver to opening the airway of the injured victim?” This finding is better than study done Nepal (40%)(12). The possible explanation for this might be in Nepal’s study the study participants were students who exposed less for BLS of trauma patients. However, study in Saudi Arabia(94.7%) showed much better than this study (8). The reason for this might be in Saudi Arabia registered nurses should have license on BLS before practicing it and advancements of trauma life support create better opportunity for their exposure and to perform hand on practices.

Characteristics of high quality CPR are minimum interruptions, starting within 10 seconds of cardiac arrest and to push hard and fast rate(19). However the finding of this study revealed that only 41% respondents responded the correct response concerning high quality CPR. This is less than study done Ethiopia (64.5%)(36) and in India (72.7%)(22)). But the result of this study higher than study done at Amahara regional state (average percentage of each components of quality CPR)(38.5%)(33). The variation for this might be due to the Ethiopian study done on anesthetists who had more exposure to cardiac arrest patients and the Indian study carried out on the respondents who work at tertiary care hospital where they had more exposure and hand on practice of BLS procedures. Whereas for study done in Amahara regional state respondents had less opportunity to BLS training than the respondents of this study.

According to America Red Cross society, using an AED promptly greatly increases the patient’s likelihoods of survival and a patient’s chance for survival is reduced by 7 to 10 percent for every minute late in performing CPR and defibrillation (37). However the result of this study showed that only 45(34.9%) of participants responded the correct response to what AED stands. This

finding is lower than Indian (57.6%)(34) and Saudi Arabia study (41.6%) (27). The reason for this might be better access of AED in advanced countries. Additionally according to this study's result About 55(42.6%) of participants gave correct response to proper steps for operating AED. This finding is better than study done in south Africa(8.2%)(13). The explanation to this might be the better access of training given to participants of this study.

Choking is preventable cause of cardiac arrest. The correct response for a choking victim depends on knowledge and skilled of rescuer to airway obstruction(14). According to the finding of this study only 59(45.5%) and 67(51.9%) of participants give correct responses to adult and infants choking management respectively. This finding is better than study done in Nepal(19% and 26%)(9). This variation might be respondents of Nepal's study were medical students who had less exposure to choking. However the finding of this is in line with study done in Saudi Arabia(45.5%)(27).

There is an assumption that nurses who become proficient in BLS knowledge would be able to respond immediately and appropriately for victims who need an emergency resuscitation(2). This study also agrees the above assumption, as the educational status of nurses and their knowledge levels was found to be significantly associated. This supports study done in Amahara regional state(33) and Palestine(32). Additionally this study agrees on Nurses' previously resuscitation practice and their knowledge level was found to be statistically associated. This opinion is inconsistent with study done in Germany(10). The finding of this study indicated that exposure to cardiac arrest resuscitation showed significant association with both BLS practice and knowledge level. This is supported by Ethiopian (24) and Indian study(30).

Nurses who were willing to practice and confident in performing BLS, the availability of updated protocol on BLS were found to be statistically significant association with BLS practice. This assumption is in line with studies done in Ethiopia (38), Saudi Arabia(27) and Berlin Germany(10).

7. CONCLUSION AND ECOMMENDATIONS

7.1. Conclusion

The ability to respond quickly and effectively to life threatening emergencies like cardiopulmonary arrest and shocking rests on health care team being knowledgeable and competent in emergency lifesaving procedure of BLS(39). It remains a critical factor in determining outcomes of sudden cardiopulmonary arrest. However, according to the finding of this study more than half of the participants had poor BLS knowledge and practice level which were not enough to provide this crucial lifesaving procedures. Educational status, previous clinical exposures and involvement in resuscitation positively influence BLS knowledge and practical. Therefore it is important to have an in-service education and repetitive hand on practice and simulation about basic life support maneuvers for nurses to improve their knowledge as well as their skills of providing basic life support.

7.2. Recommendations

For Nurses:-

- To update themselves according to updated BLS protocols.
- To engage in patients resuscitation and enhance their practical knowledge and put their knowledge into practice.
- To avoid unwillingness and lack confidence by exposing themselves to vital BLS maneuvers.

For Department Of Emergency Medicine

- To provide continues refreshment training through simulation focused training
- To prepare protocols on how to preform sound BLS maneuvers and provide continues updates to nurses working in ambulance of prehospital setting.

For AAFEPR

- To facilitate provision of in-service training and simulation on BLS maneuvers.
- To facilitate and create opportunity for in-service educational developments of the workers.
- To create helpful environments to collaboration with organizations like hospital where the nurses get enough exposure.

For Ministry Of Health

- Since effective prehospital care increase patients' outcome at hospital, ministry health should give more attention to prehospital human power development and strength prehospital emergency system.

8. LIMITATIONS OF THIS STUDY

- The limitation of this is the use of only a questionnaire which serves as an indicator of purely theoretical knowledge. On the contrary, practical performance needs both theoretical knowledge as well as psychomotor skills.
- The attitude aspect of respondents towards BLS is not include in this study even though it very important for exercising it.
- This study done on focusing only at governmental prehospital care setting.
- Since the study design of this study is cross section which does not show the cause and effect association between dependent and independent variables.

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8. ANNEXS

Annex 1- Participant Information Sheet and informed Voluntary Consent Form

Dear respondent my name is _____. I am working as data collector for the study being conducted in this facility by Tamrat Alate, who is studying for his Master degree at Addis Ababa University, College of Health Science, and Department of Emergency Medicine.

I am interviewing your organization nurses about their knowledge and practice towards basic life support and its associated factors in order to generate information necessary to dig out perceived gap and to show solution regarding to it, and other researchers to draw base line finding for further investigation in the area. To attain this objective, your cooperation to be honest and genuine participant by responding to the question prepared is very important and highly appreciated.

I will proceed to the interview after you understand the following points

Objective – The objective of this study is to assess knowledge and practice towards basic life support and factors associated with its delivery among ambulance nurses practicing at fire and emergence responses authority Addis Ababa.

Benefit: The study may have no direct benefit for the participants. But the information generated from the study help to out gap on ambulance nurses' knowledge and skill towards BLS and will try to show solutions/directions to address gaps and identify factors in order give sound BLS cares by ambulance nurses during transportation. Moreover, it is used as base line data for further investigation. Indeed, it will help the researcher to write up his thesis for partial fulfillment of Master of Science degree.

Harm: The participants do not have any harm by participating to the study or for not participating to the study, except taking few minute from your time. There wouldn't be any direct payment for participating in this study.

Procedures and duration: Participants are interviewed once and the interview may take from 30-40 minutes. So, I kindly request you to spare me this time for the interview.

Alternatives to participation: You do not have to take part in this research if you do not wish to do so, and refusing to participate will not affect you and your family. If you have question that is

unclear you have a right to ask for clarification. If you have also a question that you don't want to answer you can skip it. You may stop participating in the research at any time.

Confidentiality: Your answers are completely confidential. Your name will never be used in connection with any information you tell us. The questionnaire will be coded to exclude showing names. All information given by you will be kept confidential.

Informed consent: I have read this form or it has been read to me in the language that I understand. I understand all conditions stated above. Therefore, I am willing to participate in this study.

If there is any questions or enquires any time about the study or the procedures, please contact:

Name of Principal investigator: Tamrat Alate

Address: Tell +251916343891

E-mail: tamratalate91@gmail.com

Name of interviewer _____

Signature _____

Result of interview:

1. Completed
2. Refused
3. Partially completed

Checked by:

Supervisor Name-----signature-----Date-----

Annex-2-Information Sheet and Informed Voluntary Consent Form for Heads of fire and emergency response authority

Preamble: My name is Tamrat Alate, MSc student at Addis Ababa University. I am here to conduct the study in your organization. I will conduct a study under Addis Ababa University, college of health sciences for partial fulfillment of Master of Science in Emergency Medicine and Critical Care. The study will have a paramount importance to assess knowledge and practice and associated factors towards basic life support among ambulance nurses working at your organization. So, I kindly request your permission to do the study on nursing staffs of your organization.

Study title: assessment of knowledge, practice and associated factors towards basic life support among ambulance nurses working at fire and emergency response authority of Addis Ababa, Ethiopia

Objective: The objective of this study is to assess knowledge and practice towards basic life support and factors associated with its delivery among ambulance nurses practicing at fire and emergency responses authority Addis Ababa.

Benefit: The study may have no direct benefit for the participants. But the information generated from the study help to out gap on ambulance nurses' knowledge and skill towards BLS and will try to show solutions/directions to address gaps and identify factors in order give sound BLS cares by ambulance nurses during transportation. Moreover, it is used as base line data for further investigation. Indeed, it will help the researcher to write up his thesis for partial fulfillment of Master of Science degree

Harm: The study has no harm to the institution and to the participant. The participants do not have any harm by participating to the study or for not participating to the study, except taking few minute from his/her time.

Procedures and duration: The study will be conducted among all ambulance nurses working at fire and emergency response authority from January to May 2019 GC. Written informed consent will be taken from each study participant. Then the questioner will be administered to the respondents.

Confidentiality

The information gathered from participants will be confidential. The finding of this study will be general for the study community and will not reflect anything particular of individual persons. The questionnaire will be coded to exclude showing names. No reference will be made in oral or written reports that could link participants to the research.

Rights

Participation in this study is voluntary basis. Considering the importance of the research to your hospital you are free to decide on it. If any violation of rules and conduct is seen throughout the study, your institution has full right to withdraw the study at any time.

If there are any questions or enquires any time about the study or the procedures, please contact:

Principal investigator

Name: **Tamrat Alate**

Tel: 0916343891

E- mail: tamratalate91@gmail.com

Sign _____

Name of FERA _____

Head of the FERA: _____

Tel: _____

E-mail: _____

Sign: _____

Annex-3- English Version Questionnaire

Addis Ababa University

College of Health Sciences

Department of Emergency Medicine

Preamble

Dear respondent! The purpose of this questionnaire is to collect data about assessment of knowledge and practice towards basic life support and factors associated with its delivery. Questions included in this questionnaire enable investigator to get information relating to the knowledge and practice towards basic life support and factors associated with its delivery. Information you give will serve only this stated academic purpose and confidentiality will also be strictly kept. Your genuine response to the questions is very important in achieving goal of the study. Thus, I warmly ask your cooperation and willing for on this questionnaire honestly.

Would you be willing to participate? A. Yes, B. No

If you are willing to response, please give the responses in the following pages.

General instruction: For close ended questions choose the appropriate response that reflect answer and encircle the code immediately answers box. For open ended question, give response accordingly.

Segment 1: Certification

Name of data collector: _____

Signature: _____

Date western (D-M-Y): _____

Field Supervisors Name: _____

Signature: _____

Part one: socio-demographic variables

Question no.	Question	Answer options	Answer Code	Skip
Q 101	Sex	Male	1	
		Female	2	
Q 102	Age in year			
Q 102	Religion	Orthodox	1	
		Muslim	2	
		Protestant	3	
		Catholic	4	
		Other, specify	5	
Q 103	Education level in nursing	Diploma	1	
		Degree	2	
		MSc and above	3	
		Others, specify		
Q 104	Do you have Work experience on prehospital ambulance care?	Yes		If answer the Q no 105
		No		
Q105	How long did you have work experience on prehospital ambulance care?	_____		
Q106	Did you have work experience in nursing at hospital/health centre?	Yes		If yes specify _____
		No		
		No	2	
Q107	Did you have training about basic life support (Resuscitation)?	Yes	1	If yes give answer to Q110
		No	2	
Q109	When did you take training about basic life support?	Before graduation	1	If your response is while working give response to Q110
		While working after graduation	2	
Q110	When did you take your last basic life support training?	_____		
Q111	Did you ever seen cardiac arrest patient?	Yes	1	If yes give response to Q112 and Q113
		No	2	
Q112	How many times you exposed to cardiac arrest patient?	_____times		
Q113	Did you ever involved in any patient resuscitation during your nursing experience?	Yes	1	If yes give response to Q116
		No	2	
Q114	Write your current work station	_____		

Part two: Knowledge assessment questions

No.	Questions	Answer options	Answer code	Skip
201	What does the abbreviation BLS stand for?	Best Life Support	1	
		Basic Lung Support	2	
		Basic Life Support	3	
		Basic Life Services	4	
202	Basic concept of BLS	Recognizing and treating life threatening condition	1	
		Taking complete history	2	
		Coming to definitive diagnosis problem	3	
203	If you find someone unresponsive in the middle of the road, what will be your first response? (Note: You are alone there)	Open airway	1	
		Start chest compression	2	
		Look for safety	3	
		Give two breathings	4	
204	If you confirm somebody is not responding to you even after shaking and shouting at him, what will be your immediate action?	Start CPR	1	
		Activate EMS	2	
		Put him in recovery position	3	
		Observe	4	
205	Where is the exact location for chest compression?	Left side of the chest	1	
		Right side of the chest	2	
		Centre of the chest on lower half of breast bone	3	
		Xiphisternum	4	
206	What is the location for chest compression in infants?	At the inter mammary line	1	
		One finger breadth below the nipple line	2	
		One finger breadth above the nipple line	3	

		At Xiphisternum	4	
207	How do you give rescue breathing in infants?	Mouth-to-mouth with nose pinched	1	
		Mouth-to-mouth and nose	2	
		Mouth-to-nose only	3	
		Mouth-to-mouth without nose pinched	4	
208	What is recommended a ventilation rate of breaths per minute for adults?	10-12 breath per minute	1	
		20-30 breath per minute	2	
		1-10 breath per minute	3	
209	What is depth of compression in adults during CPR?	At least 2 inches	1	
		2½ – 3 inches	2	
		1 – 1½ inches	3	
		1½ inch	4	
210	What is depth of compression in Children during CPR	2 inches	1	
		2 - 2½ inches	2	
		1 - 1½ inches	3	
		½ – 1 inch	4	
211	What is depth of compression in neonates during CPR	1½ – 2 inches	1	
		2- 2½	2	
		1 inch	3	
		approximately 1½ inch	4	
212	The rate of chest compression in adult and Children during CPR	Below 100 / min	1	
		approximately 100 / min	2	
		80 / min	3	
		100-120 / min	4	
213	What does abbreviation AED stands	Automated External Defibrillator	1	

	for?	Automated Electrical Defibrillator	2	
		Advanced Electrical Defibrillator	3	
		Advanced External Defibrillator	4	
214	What does abbreviation EMS stands for?	Effective Medical Services	1	
		Emergency Management Services	2	
		Emergency Medical Services	3	
		External Medical Support	4	
215	If you and your friend are having food in a canteen and suddenly your friend starts expressing symptoms of choking but responsive, what will be your first response?	Give abdominal thrusts	1	
		Give chest compression	2	
		Confirm foreign body aspiration by talking to him	3	
		Give back blows	4	
216	If you observe infant in choking but responsive, what will be your action/s?	Give Back blow	1	
		Give abdominal thrusts	2	
		Give chest thrusts	3	

Part three: practice assessment questions

Question No.	Questions	Answers	Code	Skip
301	Which appropriate maneuver to opening the airway of the injured victim	Head tilt chin lift	1	
		Jaw thrust	2	
		Head tilt	3	
302	Which of the following is included in the 5 links in the adult Chain/s? (more than one response is possible)	Early CPR	1	
		Immediate activation of EMS	2	
		Scene size up	3	
		Rapid defibrillation	4	
303	How often should rescuers switch roles when performing 2-rescuer	After each cycle	1	
		After 2 cycles	2	

	CPR?	After 5 cycles	3	
		After 10 cycles	4	
304	The initial Basic Life Support steps for adults are:	Assess the victim, give 2 rescue breaths, defibrillate, start CPR	1	
		Assess the victim, activate EMS & get AED, check pulse, start CPR	2	
		Check pulse, give rescue breaths, assess the victim, defibrillate	3	
		Assess the victim, start CPR, give 2 rescue breaths, defibrillate	4	
305	Where should you attempt to perform a pulse check in adult?	Carotid	1	
		Brachial	2	
		Ulnar	3	
		Temporal	4	
306	The compression to ventilation ratio for the lone rescuer giving CPR to victims of ANY age is:	15:1	1	
		15:2	2	
		30:1	3	
		30:2	4	
307	The proper steps for operating an AED are:	On the AED, attach electrode pads, shock the patient, analyse the rhythm	1	
		On the AED, attach electrode pads, analyse the rhythm, clear the patient, deliver shock	2	
		Attach electrode pads, check pulse, shock patient, analyse rhythm	3	
		Check pulse, attach electrode pads, analyse rhythm, shock patient	4	
308	Which one of the following Sign/s of severe airway obstruction?(More than one answer is possible)	Poor air exchange	1	
		High-pitched noise while inhaling	2	
		Unable to cry	3	
		May wheeze between coughs	4	

309	In an adult with an advanced airway in place during 2-rescuer CPR, how often breaths should be administered?	Every 5 seconds	1	
		Every 5-6 seconds	2	
		Every 6-8 seconds	3	
		Every 10-12 seconds	4	
310	If you want to open the airway of infant, which position is appropriate?	Neutral position	1	
		Head tilt	2	
		Jaw thrust	3	
311	The critical characteristics of high-quality CPR include which of the following? (More than answer is possible)	Starting chest compressions within 10 seconds of recognition of cardiac arrest	1	
		Push hard, push fast	2	
		Minimize interruptions	3	
312	The first step in airway management steps is to:	Perform the head tilt/chin lift	1	
		Open the mouth and turn the head slightly downwards, to allow for drainage by gravity	2	
		Inspect the patient's airway for any foreign material and remove if confident	3	
		Deliver 2 rescue breaths	4	
313	Which one is the Correct steps in management choking of infant but responsive?	Give 5 back blows then give 5 chest thrusts	1	
		Give 5 back blows then give 5 abdominal thrusts	2	
314	Which one is correct method in management of choking in adult and responsive	Give abdominal thrust	1	
		Give chest thrust	2	
		Give cardiopulmonary resuscitation	3	
315	Which one following is the obstacle to you to practice basic life support? (more than one answer is possible)	Medico legal issues	1	
		Work load	2	
		Not being confident to the procedures	3	
		Unwilling to do the procedure	4	
		Absence of protocol	5	

