

**ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCES
DEPARTMENT OF EMERGENCY MEDICINE**



**KNOWLEDGE REGARDING ADVANCED TRAUMA LIFE SUPPORT
AMONG NURSES WORKING AT ADULT EMERGENCY
DEPARTMENT AT ALERT CENTER AND TIKUR ANBESSA
SPECIALIZED HOSPITAL, ADDIS ABABA, ETHIOPIA, 2021.**

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

JUNE 2021,

ADDIS ABABA, ETHIOPIA

KNOWLEDGE REGARDING ATLS AMONG NURSES WORKING AT
ADULT EMERGENCY DEPARTMENT AT ALERT AND TASH, ADDIS
ABABA, ETHIOPIA, 2021.

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DECLARATION

I, Wondosen declare that this thesis is my original work and has not been presented for any degree in any other University. It is presenting for the partial fulfillment for the degree of Master in Emergency Medicine and Critical Care Nursing. All sources of materials used for this thesis work and all people and institutions who gave support during this thesis work are fully acknowledged. The board of examiner approved this thesis by Wondosen zewde to partial fulfillment of the requirement for the degree of Master of Science in Emergency medicine and critical care nursing.

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LIST OF ABBREVIATIONS AND ACRONYMS

ABCDE- airway, breathing, circulation, disability, exposure

ACLS- advanced cardiac life support

ALERT- All African Leprosy Tuberculosis Rehabilitation and Training Center

ATLS - advanced traumatic life support

BLS- Basic life support

BSc - Bachelor of Science

ED- emergency department

EM- emergency medicine

MSc-masters of science

SPSS - Statistical Package for Social Science

TASH– Tikur Anbessa Specialized Hospital

UK - United Kingdom

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ABSTRACT

Background: Trauma is a major cause of mortality and disability in developed as well as developing countries. The ATLS knowledge helps to implement a methodological approach to the trauma patients in the emergency room which aims for rapid and accurate assessment. Trauma management can be improved by implementing ATLS properly. However, for the knowledge of the investigator, there is a limitation of a study conducted in Ethiopia.

Objective: To assess the knowledge of nurses on ATLS working in the adult emergency department of TASH and ALERT, Addis Ababa, Ethiopia, 2021.

Methods: A descriptive cross-sectional study design was used and data were collected using a structured and self-administering questionnaire. The study population was all nurses working within the adult emergency department of the ALERT and TASH. Participants were selected by convenience sampling technique. The collected data were checked for its completeness by data collectors and PI before entering into the software for analysis. Data were entered using the epi-data v 4.6.0, and analyzed using SPSS v26. Binary logistic regression was performed to see the association between the independent and dependent variables. A P-value of less than 0.05 is considered statistically significant.

Result: One hundred nurses participated in the study. The majority of them were between the ages of 25 and 29 years, 59% with mean age of 29.5 ± 5.4 . There were equal numbers of both sexes out of totally participated subjects, but the most participants were from TASH (56%) while the rest were from ALERT. Educational and the training status of the nurses are identified as the factors affecting the knowledge level of the respondents (AOR=12.3, P=0.022 and AOR=2.47, P=0.001) respectively'. From study participants, only 45% of the nurses have good knowledge of ATLS.

Conclusion and recommendation: in conclusion, there is a significant gap of knowledge towards ATLS in these selected hospitals. . A lack of ATLS expertise among emergency department staff nurses could potentially harm patient outcomes in trauma cases. Therefore ALERT and TASH nurses should get training on ATLS & improve their educational status.

Keywords: ATLS, knowledge, Nurses, ED

CHAPTER ONE

1. INTRODUCTION

1.1 Background

Advanced Trauma Life Support (ATLS) is a systematic and concise system for treating trauma patients created by the American College of Surgeons Committee on Trauma. It was first used in the United States and internationally in 1980 to teach how to treat wounded patients safely and efficiently (1).

Trauma is a chief cause of mortality and disability in developed as well as developing countries(2,3). As the calculation of the Global Burden of disease analysis, injury accounts for 10percent of the global population (3). Nearly 90% of global injury-related fatalities occur in low and middle-income nations and the rate of trauma is expected to rise by 2030(3). With high qualifications in advanced trauma management and rapid assistance, it is possible to rise the survival rate and lower the risk of sequels(3).

ATLS was made by the injury committee of the American College of Specialists and was, to begin with, received within the joined together states and overseas in 1980 after the most noticeably awful injury mischance happened due to a pilot mishap, which caused a stretch on wellbeing experts to exclude conceivable results and at this time made a difference learners with a secure and compelling framework for early administration of harmed patients (3). It also advises how to coordinate the inter-hospital transfer of a patient and ensure that optimal care is given in the process. ATLS course was initiated in 1988 in the United Kingdom and is generally recognized as the gold standard for acute trauma management practice(4).

The goal of the ATLS course is to provide a safe method for severe trauma management and to set standards for the resuscitation of trauma victims(5). One of ATLS's initial objectives is to include realistic training with hands-on trauma recovery strategies in a way similar to those used in the well-established ACLS course(5).ATLS is a method to establish priorities in emergency trauma care. There are three underlying premises; 1- Treat the extreme threat to life first, 2- indicated treatment must be applied even when a definitive diagnosis is not yet established and 3- adelay to detailed history is not necessary to start evaluation and treatment. Therefore, the assessment of a traumatic patient is classified into a primary and a secondary survey. In the

primary survey, life-threatening injuries are evaluated and treated at the same time, while all other injuries are assessed in the secondary survey(6).

According to a study in Australia, nurses have knowledge gaps about trauma management, especially when patients suffer from traumatic brain injury, and the majority of knowledge gaps were discovered as evidence-practice gaps in the emergency trauma department evidenced by about 82 percent of patients admitted to the trauma ward with moderate or serious traumatic brain injury reported hyperthermia, despite a low percentage of nursing management on hyperthermia and nursing procedures that were not evidence-based(7).

As morbidity and mortality from road injuries result from Global Burden of disease reports on trauma assessment, improvements of patients in case fatality rates can be affected by two overall processes. First, infrastructure changes, driving laws such as seatbelt laws, and improvements in vehicle safety may have contributed to a decline in severity over time in the forms of injury suffered in road accidents. The second possible factor that could lead to improvements in case fatality is improvements in access to medical care following a road injury. For example, adding ambulance services, building trauma centers, and ensuring access to emergency medical care in all populations is likely to be beneficial in terms of improving survival for road injury cases, which has been shown in locations that advance trauma systems(8).

Advances in trauma care over the previous more than three decades have led to improved imaging and diagnostic technologies being more readily available to global populations, and research in trauma resuscitation has led to a better understanding of the pathology that can occur in a road injury, though post-incident care in road injuries remains an ongoing area of research(8).

Trauma is the fifth leading cause of death in mainland China, with 700,000 people dying each year due to their emergency medical trauma program is not ideal because only the emergency medical service system is responsible for trauma treatment. Providing high-quality trauma care includes specialists with extensive expertise in trauma management systematic patient care for trauma patients according to protocols for prompt and proper trauma care could help improve the quality of trauma cares and thus save the lives of trauma patients(9). Trauma patients experience significantly lower mortality or morbidity when treated at a specialized

trauma Centre equipped with well-trained trauma health professionals and trauma nursing that emerging specialty distinct from emergency nursing while there are several emergency nursing courses available in higher education institutes that involve ATLS(10).

Injury-related deaths have a significant impact on families and communities around the world, according to a study conducted in Addis Ababa to determine the proportion and types of injury deaths in Addis Ababa, as well as the distribution of different socio-demographic characteristics(11). Ethiopia is among the countries that injury deaths have a significant impact especially road traffic accident which needs best ATLS intervention witnessed that deaths resulting from injuries are substantial health challenges in Addis Ababa(11).

As an observational study done on Addis Ababa Ethiopia states, there is no organized training on ATLS because of the cost and non-availability in the country which is similar to other studies. But there are different short-term courses given to the staff established by the Ministry of Health. The hospital provided emergency and critical care, neurosurgical, orthopedic, general surgery, plastic and reconstructive surgery, physiotherapy services for trauma patients. Besides the study revealed a lack of communication from pre-hospital care, lack of sustainable trauma registry, and trauma quality improvement project in the hospital is still a huge challenge(12).

1.2 Statement of the problem

Advanced Trauma Life Support is a training program established by the American College of Surgeons for medical professionals to treat acute trauma cases. The premise of the ATLS program is to treat the extreme threat to life first which account 50% of all in hospital trauma death but when comes to the real environment of working some health care workers lack this decision due to lack of training. It also argues that the limitation of a conclusive diagnosis and a clear history does not prevent the implementation of appropriate care for a life-threatening injury, with the most time-critical procedures being carried out as soon as possible (13). For this study, the investigator couldn't find the exact white literature which was previously done to assess the knowledge level of those nurses in the local area.

In the trimodal distribution of death, 50% of patients are dying due to loss of adequate implementation of ATLS which can be reduced by early hospital resuscitation and competent definitive care which can potentially affect the third peak of death(14).

A study carried out in Addis Ababa, at Burn Emergency Trauma Hospital on Trauma Care Evaluation in Tertiary Center notes that there is still no better human capital and infrastructure that is proportional to the number of trauma patients that leads to inadequate ATLS intervention and trauma quality improvement project in the hospital(12).

ATLS has become the foundation of care for injured patients by teaching a common language and a common approach. To deliver timely organized and actual care to the patient, emergency nurses who are competent and efficient are needed. To enable that there is a need to distribute the system that allows timely managing of critically ill patients and lessening the occurrence of preventable morbidities and mortalities. To the knowledge of the investigator, there is a limitation of research done to assess the knowledge of nurses regarding ATLS who are working at those two different federal hospitals in Ethiopia. Therefore this study will help to identify the knowledge gap of nurses who are working at those selected hospitals in the adult emergency departments.

1.3 Significance of the study

The heterogeneous nature of the injury patterns and demographics of trauma patients, and the heterogeneity in hospital admission management systems and procedures, are likely to have confounding effects on results that it would be difficult to determine the impact of ATLS training in isolation. Advocates of ATLS training point out that the primary goal of the course is to enhance information related to trauma care to bring immediate patient change(15). In the emergency department, standard treatment increases the outcomes of trauma patients.

During this time, the ATLS procedure plays a critical role in the care of patients who are admitted to the hospital as a result of an accident/injury. For the knowledge of the investigator, the results of a study on ATLS knowledge among emergency department nurses in Ethiopia have not yet been released.

As a result, the findings of this study are useful to health planners/policymakers, such as those in charge of trauma care in emergency departments, and will also allow those bodies to devise better programs to resolve the identified issues. Second, this research will contribute to me in completing a partial fulfillment of my master's degree in emergency and critical care nursing. Lastly, this paper will be used as important literature for future researchers who want to undertake a similar study.

CHAPTER TWO

LITERATURE REVIEW

Trauma is known as a surgical condition and accounts for 12% of the worldwide overall burden of illness(2). Implementation of the ATLS software has greatly improved the outcome of trauma patients(16). The aim is a rapid and accurate assessment of the patient's physiological status and further management based on these parameters. Additional training on BCLS, ATLS, and ACLS programs trains both physicians and paramedics on goals in the treatment of the wounded, and with social changes and technological advances, trauma incidents, such as motor vehicle accidents and terrorist attacks, are becoming more severe(9,17).

Knowledgeable trauma providers are critical for reducing deficiencies during trauma care(18). Trauma care training for specific trauma providers can improve the general principles and practices used in trauma care significantly(17). Different types of trauma care courses are available in the United States for people of various educational backgrounds; among these, medical and paramedical students can take an ATLS course or a trauma assessment and management course to learn ATLS related principles during their clinical training year(9).

The management of cases presenting with acute life-threatening traumatic injuries is often difficult and causes anxiety, even for the most experienced clinicians. The American College of Surgeons designed the advanced trauma life support course to address this issue and provide practitioners with a simple, repeatable, and effective way to managing these cases(4). A trauma management system based on ATLS training and the development of the trauma team concept has apparent benefits for patient survival by following its steps(4). Those steps are as follows as key treatment objectives:-A. airway assessment with cervical spine control, B. breathing (delivery of oxygen through an appropriate source), C. circulation and hemorrhage control, D. assessment of disability (brief neurological assessment), and E. log roll.

Training in ATLS has been shown to make a difference in cervical spine injury treatment and it has also been suggested that a trauma management system based on ATLS training and the improvement of the concept of the trauma team has clear advantages for patient survival(19).

Transforming Emergency Care documents in the United Kingdom (UK) expected a shift in the role of the emergency department nurse that would minimize patient waiting times and decrease patient concerns(20). The value of inter-professional cooperation will also increase as the role of the emergency nurse diversifies and expands, and when seeking approval for role expansions in nursing(20)(21).

According to a study conducted on the Chinese mainland, trauma care providers' level of trauma expertise is linked to their department, professional status, and previous involvement in related academic training. Individuals' trauma awareness can be improved by trauma care experience and involvement in academic lectures and training programs, such as China trauma care training (7).

The study conducted in Australia on Thai Hospital trauma nurses shows that the knowledge of nurses towards traumatic brain injury is 82% which shows still gap towards trauma management(7)

The study conducted in India shows that ATLS preparation has a positive impact on the score obtained in the trauma management quiz, and thus recommends that ATLS be included in emergency department medical officer training(ED)(3).The impact of training courses developed by the American College of Surgeons in Trauma Assessment and Management was evaluated for senior medical students before and after the course, as shown by research in Iran hospital, which showed that training programs had a positive impact on their expertise, skills and clinical judgment(1,13).

More than 50 countries have adopted the Advanced Trauma Life Support curriculum, which teaches a comprehensive approach to initial trauma patient assessment and care(22). Getting ATLS nurses helps to identify the pattern of serious injuries and to evaluate the predictors of hospital mortality of patients admitted to the emergency department(23).

Individual clinicians can increase their performance by exposing themselves to emergencies through training and incorporating teamwork, communication, and crisis resource management principles into current critical care courses. In emergencies, improved preparation and coordination can encourage clearer thinking, so that information can be converted into meaningful action and better patient outcomes(24).

The prospective cohort study conducted in Saudi Arabia, at King Abdulaziz University, Jeddah on final year senior medical students revealed from 136 participants, the mean scores for trauma-related knowledge were 68.4% (standard deviation 15.63%) and 45.4% (SD 19.52%), respectively(25).

According to research conducted in Nigeria, additional training programs in BTLS, ATLS, and ACLS prepare both physicians and nurses for goals in the treatment of the injured evaluated at the ATLS stages and the components of the primary survey(26). In developing countries, including Ethiopia, trauma is one of the leading causes of mortality. The first caregivers to treat trauma patients are nonspecialist physicians and nurses, but most of them in Nigeria lack extra experience in trauma care, including ATLS training(2,2,26).

Advanced life support courses in Africa states that one-quarter of emergency care clinicians lack access to advanced life support courses in 23 African nations. Most clinicians agree that advanced life support courses have importance in their clinical environments, but most African emergency care clinicians do not have access to them. The development of such a course and its related guidance could alleviate the current constraints of low-resource ALS courses(27).

According to a report conducted in Sub-Saharan Africa, Africa has the world's highest mortality rates associated with road traffic. Despite this, structured trauma management training is not commonly adopted in these countries, and 10 consecutive Primary Trauma Care (PTC) courses are being provided in seven countries in East and Central Africa to enhance health care providers' knowledge of trauma care. A multiple-choice questionnaire rating of eight clinical scenarios was used to test candidate knowledge and clinical trust in trauma management by conducting descriptive statistical analysis. Overall, the mean MCQ score was 70%, indicating a disparity in trauma care instruction training. Therefore front-line health staffs have to improve their knowledge and confidence in trauma management, irrespective of their job roles (28).

The study conducted on medical interns in three Ethiopian teaching hospitals states that there is a strong statistical association between knowledge and working area with a p-value = 0.003. So most interns regard ATLS favorably and assume that it saves lives and provides patients with real practical value. Therefore, because health care professionals from various departments use common language these days, nurses need to know ATLS(29).

The conceptual structure of this study is focused on the synthesis and incorporation of numerous literature reviews that will be carried out in the emergency department region. Advanced trauma life support knowledge in an ED was defined as the ability of nurses working in the emergency department to intervene and use their decision-making capabilities to save more patients who are sustained to trauma(13,30–32).

A study done in Kenya Nairobi revealed that from nurses who are working in the emergency and accident department some of them have not any training regarding trauma life support which accounts for 25% of 68 nurses working in the emergency department with the different educational level that has negative impacts towards decision making when giving care(33).

CONCEPTUAL FRAMEWORK

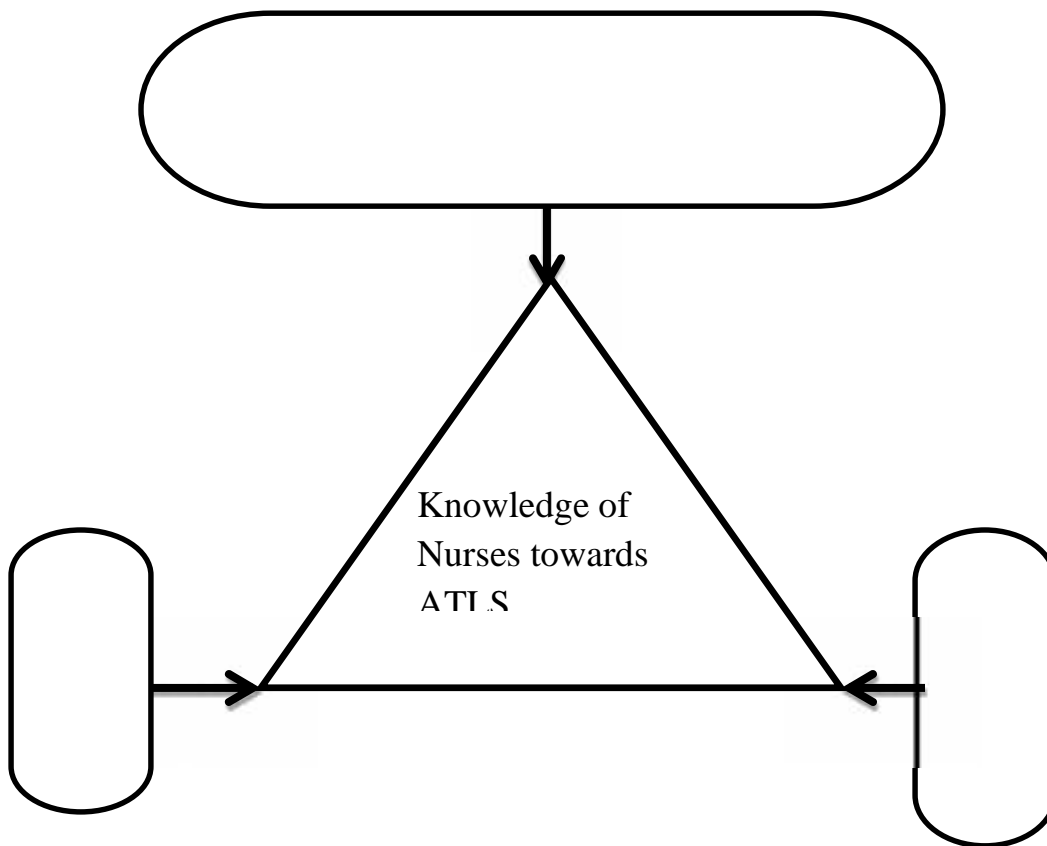


Figure 1:-Conceptual framework related to ATLS among nurses working in the emergency department of ALERT and TASH, from March 1 to 10/2021, Addis Ababa, Ethiopia, 2021.

CHAPTER THREE

OBJECTIVES

3.1 General objective

- ❖ To assess the knowledge of Nurses on ATLS Working at the Adult Emergency Department of TASH and ALERT, Addis Ababa, Ethiopia, 2021.

3.2 Specific objective

- ❖ To assess the knowledge of adult emergency department working nurses towards ATLS.
- ❖ To assess factors affecting knowledge of nurses towards ATLS.

CHAPTER FOUR

METHODS AND MATERIALS

4.1 Study Area and period

The study was conducted in Addis Ababa city at two selected federal hospitals which are Tikur Anbessa Specialized Hospital and ALERT hospital on the nurses who were working at the adult emergency department found around Lideta kifleketema and kolfe keranio respectively. There were 58 and 48 nurses who were working at the department which was a total of 106 but during the actual data collection period, only 100 of them were existed due to different reasons. The data collection was carried from March 1- 10/2021.

4.2 Study Design

A hospital-based cross-sectional survey was used to assess the knowledge of nurses towards ATLS.

4.3 Population

4.3.1 Source population

All nurses who were working in selected hospitals during the study period were the source population.

4.3.2 Study population

Nurses allocated to the adult emergency department by hospital administrators or nursing directors during the data collection were employed as the study population.

4.4. Eligibility criteria

4.4.1 Inclusion criteria

All nurses who were employed with having at least six months of experience and were working in the adult emergency departments of those selected federal hospitals of Addis Ababa, who were available at the time of data collection and willing to participate in this study.

4.4.2 Exclusion criteria

Those nurses, who were unable to participate in the data collection because they were not available at the time, nurses who have less than six months duration after employment, and students who were on practical attachment in the emergency department of those selected hospitals were not included in the research.

4.5 Sampling technique

Using a convenience sampling technique both TASH and ALERT hospitals' adult emergency department working nurses were selected by the investigator for study subjects because on this day those hospitals are serving trauma patients daily more likely.

4.6 Study variables

4.6.1 Dependent Variables

Knowledge of nurses towards ATLS

4.6.2 Independent variables

age, sex, educational status, workplace, and training status.

4.7 Data collection Instrument

Standardized questionnaire was adapted from different literature which consists of parts of socio-demography and knowledge(29)(22). The knowledge part was obtained from the ATLS. It consists of 20 multiple choice questions that assess their knowledge of different factors of ATLS and was graded out of 20 by a self-administering questionnaire which was forwarded to nurses who were working at the adult emergency department.

4.8 Data collection Method and Collectors

Before the date of data collection, the data collectors were trained for 3 days on the goal of the study, its importance, and faithfulness. Data were collected from nurses who were working in the ED using an English version structured questionnaire by self-administering. Finally, the principal investigator has monitored the overall quality of data collection.

4.9 Data Quality control

The questionnaire was checked for its clarity, understandability, completeness, reliability, consistency, and pattern of response. Different difficulties that occurred during data collection were explained and discussed with the respondents as much as possible.

In addition to this, a pre-test was done at AaBET hospital emergency department working nurses on five percent of the target groups on February 25, 2021, before the application of full-scale research to check the tools to be used and so that, 100% response rate was obtained.

4.10 Data Processing and analysis

After the data collection, it was checked for its completeness and consistency before inserting it into software by the principal investigator. To explain the knowledge level of the study population regarding ATLS, first, the questionnaire was coded and inserted to Epi-data version 4.6.0, after completing the insertion exported to SPSS version 26 software. Finally, the mean, bivariate, and multivariable logistic regression, frequency tables, charts, summary statistics, and narratives were entertained to present the results. The descriptive statistical method used to illustrate variables and chi-square test was employed to determine the relationship of different factors with dependent variables and a P-value of 0.05 is taken as a significant.

4.11 Ethical Consideration

The proposal document was revised and permitted by the research advisors before the study was undertaken. Formal written permission / ethical clearance for all possible supports was written from Addis Ababa University to ALERT and TASH hospital offices (File No_:-EM/SM 1992, 2021). Following the receipt of permission, each respondent was asked for verbal consent, and cultural and religious norms and values were observed throughout the study. After a full explanation about the objective of the study, consent was obtained from the study subjects. The respondents were told as having the right to respond or refuse to take part in the research. Privacy during data collection and confidentiality of the collected data was ensured.

4.12 Operational Definitions

Knowledge: -the theoretical understanding of advanced trauma life support by adult emergency department working nurses.

The assessment grading was considered below and above the mean values from given 20 multiple-choice questions or items.

Poor knowledge: - nurses who scored less than the mean value which was calculated by SPSS from 20 items by computing from responded or after compiled (7.29) from the given 20 knowledge questions.

Good knowledge –Nurses who received a score more than or equal to the mean (7.29) on the 20 knowledge questions.

4.13 Dissemination

The findings of the study would submit and presented to the Addis Ababa University department of emergency medicine as partial fulfillment of a master's degree in emergency medicine and critical care nursing and also to those of selected hospitals.

The findings are expected to present in different seminars, meetings, and workshops, as well as further effort, will make to publish the findings in a national and international peer-reviewed journal. For additional scholars and readers, hard and soft copies will be available at the AAU library.

CHAPTER FIVE

RESULT

A total of 100 study participants were included with a response rate of 94% with a 6% non-response rate. This has occurred due to six nurses were not participating because four nurses were on annual leave while two of them were on maternal leave (100/106).

5.1 Socio-demography and working environment of the respondents

The majority of the respondents were between the ages of 25 and 29 years 59(59%) followed by 30-34 years 32 (32%) with the (mean=29.5±5.4 SD and concerning sex, 50% of them were males. For those of participants, 56% of them were working in TASH while the rest were working at ALERT hospital.(Table 1)

Table 1:- The study participants' characteristics at TASH and ALERT from March 1 to 10/2021, Addis Ababa, Ethiopia, 2021

Character	Category	Frequency	Percentage
Age	25-29	59	59%
	30-35	32	32%
	36-39	9	9%
	Total	100	100
Sex	Male	50	50
	Female	50	50
	Total	100	100
Working place	ALERT	44	44
	TASH	56	56
	Total	100	100

Among the study participants, 37% had training on emergency and trauma care while the rest (63%) hadn't any history of training relating to emergency and trauma care. More than three fourth of the participants were general BSc nurses (79%) followed by a master's in emergency and critical care nursing 9(9%) while the rest were BSc in emergency and critical care nursing and diploma nurse (7% and 5%) respectively.(Table 2)

Table 2:- The educational and training status of the ED nurses working in both hospitals, at TASH and ALERT from March 1 to 10/2021, Addis Ababa, Ethiopia, 2021

Educational level or status of respondents		
Variable	Number	Percent
Diploma	5	5
General BSc	79	79
BSc in ECCN	7	7
MSc	9	9
Total	100	100

Training status of the participants/having training		
	Number	Percent
Yes	37	37
No	63	63
Total	100	100

5.2 Knowledge of adult emergency department working nurses towards ATLS.

The mean knowledge of the nurses was computed to classify them as having good or poor knowledge (mean=7.29, ± 2.9 SD). Of those respondents, 45 (45%) of them have responded to the mean value and above which was called as having a good knowledge towards ATLS while the rest (55 %) were with poor knowledge. (Table 3)

Table 3: The level of knowledge of nurses towards ATLS with the place where they are working at TASH, and ALERT from March 1 to 10/2021, Addis Ababa, Ethiopia, 2021

Knowledge level of respondents'/nurses'					
Place	No	Poor knowledge		Good knowledge	
		No_	%	No_	%
TASH	56	29	29	27	27
ALERT	44	26	26	18	18
Total	100	55	55%	45	45%

This study finding shows less than half of the nurses have good knowledge towards ATLS among nurses who were working in the adult emergency department of those two hospitals. (Figure 3)

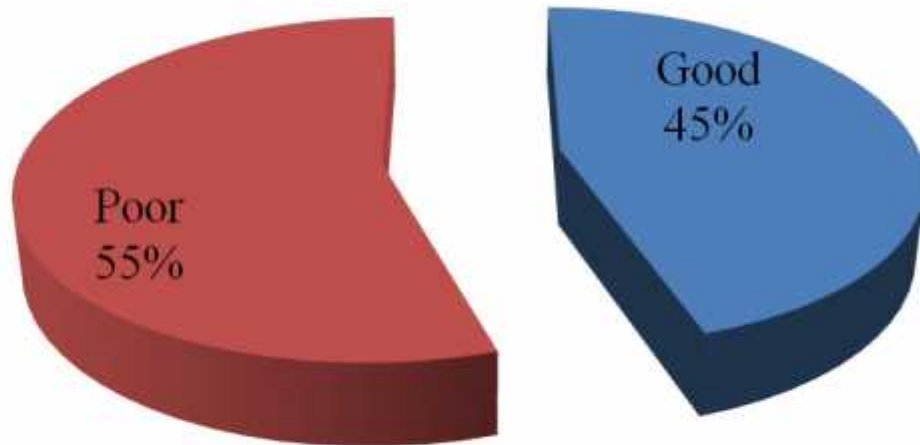


Figure 2:-shows distributions of knowledge of respondents towards ATLS among selected hospitals, from March 1 to 10/2021, Addis Ababa, Ethiopia, 2021.

As shown below (Figure 2), from the whole respondents, 20 %(1/5) diploma nurses, 43.04% (34/79) general BSC nurse, 42.86%(3/7) BSC in emergency and critical care nurse and 77.8%(7/9) masters in EMCCN had good knowledge.

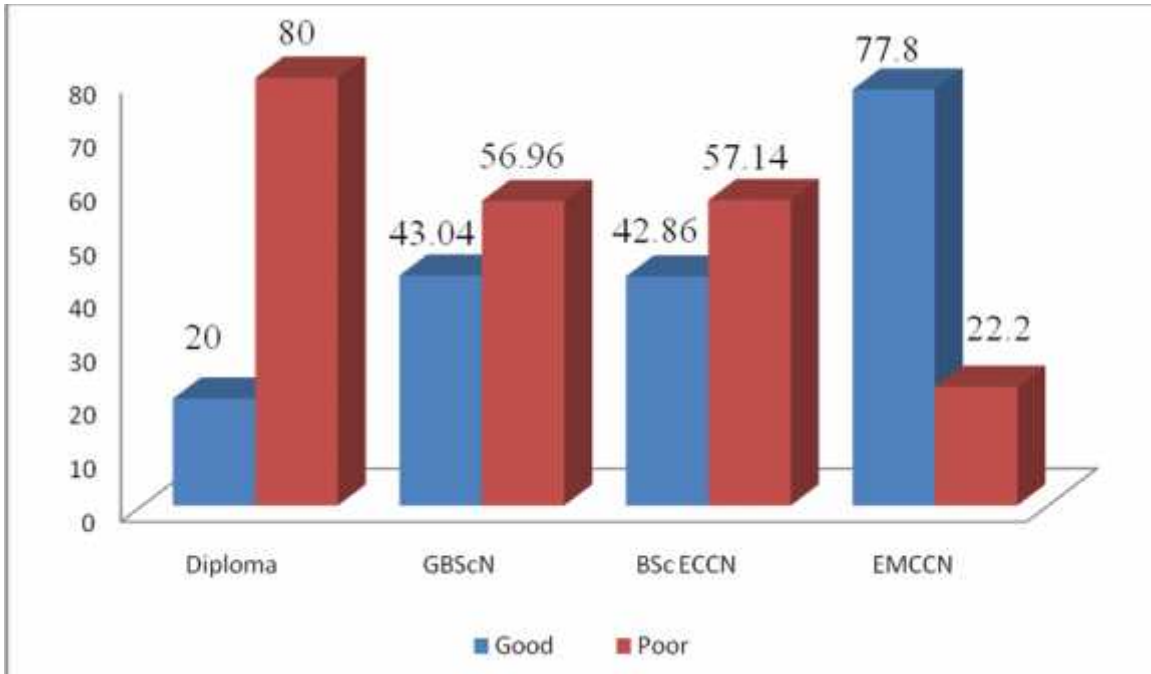


Figure 3:- shows that distributions of knowledge of respondents with educational level among selected hospitals, from March 1 to 10/2021, Addis Ababa, Ethiopia, 2021

5.3 Factors Affecting Knowledge of Nurses towards ATLS

This study shows, on Multivariable logistic regression, there is a strong statistical association between knowledge towards ATLS and educational status of the nurses with $\{(p=0.022, (AOR=12.3(5.81-28.88)95\%CI)\}$ (Table 4).

Table 4:-Bivariate and multivariate logistic regression of nurses' knowledge towards ATLS at TASH and ALERT hospitals from March 1 to 10/2021, Addis Ababa, Ethiopia, 2021

Variables	Category	Good knowledge	Poor knowledge	P-value	COR, 95% CI	AOR, 95% CI	P-value
Age	25-29	30(66.67%)	29(52.72%)	0.302	1.0		
	30-34	11(24.44%)	21(38.18%)		2.15 (0.51-9.03)		
	35-39	4(8.89%)	5(9.09%)		0.62 (0.22-1.78)		
Sex	Male	23(51.1%)	27(49.1%)	0.649	1.0		
	Female	22(48.9%)	28(50.9%)		0.81(0.33-1.99)		
Working place	ALERT	18(40%)	26(47.3%)	0.509	0.74(.30-1.83)		
	TASH	27(60%)	29(52.7%)		1.0		
Having training on job site	Yes	21(46.7%)	16(29.1%)	0.114*	2.08(.84-5.18)	2.47(1.01-4.07)	0.001
	No	24(53.3%)	39(70.9%)		1.0	1.0	
Education level/status	Diploma	1(2.2%)	4(7.3%)	0.022*	1.0	1.00	
	General BSC	34(75.6%)	45(81.8%)		1.016(0.11-9.73)	1.34(1.08-10.03)	0.012
	BSC in ECCN	3(6.7%)	4(7.3%)		1.600(0.10-4.70)	1.78(1.11-8.14)	
	MSc in EMCCN	7(15.6%)	2(3.6%)		14.00(1.44-20.59)	12.31(5.81-28.88)	

Note: * predictors having p-value <0.05 in multivariate logistic regression
AOR; adjusted odds ratio, CI; confidence interval COR; crude odd ratio

The following table (Table 5) shows the overall questionnaire with the corresponding answer which the participants responded for each questionnaires out of hundred respondents.

Table 5:- participants' response for the given questionnaires for the knowledge level towards ATLS at TASH and ALERT hospitals from March 1 to 10/2021, Addis Ababa, Ethiopia, 2021

S.no_	Questions forwarded	Response		
		Yes	No	Total
1	What is the most important initial step in head-injured patient?	6	94	100
2	Before an IV for fluid resuscitation, what is your first priority?	20	80	100
3	When casualties become hypothermic secondary to blood loss, changes occur in their blood that will prevent it from:	38	62	100
4	Why we insert the needle over the top of the rib?	39	61	100
5	Why we don't insert NG tube for poly-trauma patients?	30	70	100
6	What is the first maneuver to improve oxygenation after chest injury?	49	51	100
7	Most, immediate step in the management of an open pneumothorax	32	68	100
8	Hemorrhage of 20% of the patient's blood volume is associated with....	37	63	100
9	A young male in a MVA is brought to the emergency department with BP 84/60, P 123, and GCS 10. The patient moans when his pelvis is palpated. After initiating fluid resuscitation, the next step in management is.....	58	42	100
10	What is Slick's maneuver?	30	70	100
11	34-year-old man has a gunshot wound to the right groin area with uncontrolled arterial bleeding with direct pressure. The patient appears confused, diaphoretic and has weak peripheral pulses. What is the appropriate fluid resuscitation for this patient?	32	68	100
12	Which one is the most common cause of preventable trauma death?	23	77	100
13	Where is an acceptable location to needle when decompressing a tension pneumothorax for the adult patient?	28	72	100
14	Before passage of a urinary catheter in a man with trauma, what is essential important checkup?	58	42	100
15	What is the correct duration to perform endotracheal intubation?	26	74	100
16	20-year-old woman, at 32 weeks, is stabbed in the upper right chest. In the ED, her BP is 80/60 mmHg. She is gasping for breath, extremely anxious, and yelling for help. Breath sounds are diminished in the right chest. Which one is the most appropriate first step to help your patient?	41	59	100
17	What is the most important, immediate step in the management of an open pneumothorax is	54	46	100
18	What is the preferred site for intra-osseous access on a pediatric patient?	44	56	100
19	When would one be most suspicious for a tension pneumothorax?	45	55	100
20	Which patient is the highest priority in a mass casualty situation?	46	54	100

CHAPTER SIX

DISCUSSION

The finding of this study shows, majority of the study subjects' age was 25-29 with the mean age of 29.5 years. Regarding the sex of the respondents, half of them were male while the rest female. The highest numbers of the nurses in this study were from Tikur Anbessa specialized hospital, and the rest were from ALERT hospital.

From hundred nurses who participated in this study, most of them have no training related to emergency and trauma care on job site which accounts for 63%, while the rest (37%) only have training which was regarding emergency and trauma care. From those nurses, the ones who had training experience are two times more knowledgeable than those nurses who have no training related to emergency and trauma care $\{(p=0.001, (AOR =2.47(1.01-4.07)95\% CI)\}$. This shows us having training on emergency and trauma care is significantly associated with knowledge towards advanced trauma life support.

A study done in Kenya Nairobi revealed that from nurses who were working in the emergency and accident department one fourth of them have not any training regarding trauma life support (25%) (32) Which is inconsistent with this study (63%). This may be related to the difference in sample size.

The study conducted in ten sub-Saharan and central Africa staff nurses shows the overall mean score of their knowledge level was 70% which has a big difference with this study finding (27). The difference might be due to the different conducting are and different area study population.

The bulk of the nurses in this study, 86%, had a bachelor's degree (79 general BSc nurse and 7 BSC in emergency and critical care nursing). The educational status of the respondents was significantly associated with their knowledge level towards advanced trauma life support. This finding shows that as the educational level of the nurses upgraded their knowledge level was also increased. This study shows us being a master in emergency and critical care makes twelve times more knowledgeable than the BSc nurses $\{(p=0.022, (AOR=12.31(5.81-28.88) 95\% CI)\}$.

This study finding's mean score is different from the research conducted in King Abdulaziz University, Jeddah (the overall mean score of the respondents towards trauma management was 68.4%) (24). This difference regarding the mean score of the respondents might be due to different study designs and specialty differences.

Regarding the knowledge level of the respondents, most of the nurses working in both hospitals in emergency departments had poor knowledge regarding ATLS which accounts for 55% while the rest had good knowledge (45%). Comparing the knowledge level of both hospitals, the nurses who were working at TASH are more knowledgeable than ALERT hospital's nurses (27% vs 18% respectively).

According to a study finding in Australia Thai hospital trauma nurses, to assess knowledge of traumatic brain injury, about 82% of them are knowledgeable towards trauma management(7) which is inconsistent with this study. So the study subjects of this research are poorly knowledgeable than Australia's. This difference might be due to the difference in the objective, or having the training towards trauma management.

The factor like that of sex and working place were less likely associated with the knowledge of the nurses towards ATLS. A study was conducted on medical interns of three Ethiopian hospitals; there was a strong association between knowledge and their internship attachment area which is different from this finding(29). This discrepancy might be due to professional differences.

For this study, the knowledge level of the nurses who are working in adult emergency departments of ALERT and TASH hospitals, in Addis Ababa is affected by their training and educational status.

6.1 Strength and Limitation of the Study

6.1.1 Strength of the study

The strength of this study was its effort to generalize the factors of knowledge regarding advanced trauma life support on nurses.

6.1.2 Limitations of the study

The limitation of this study was looking only at emergency room nurses.

CHAPTER SEVEN

CONCLUSION AND RECOMMENDATION

7.1 Conclusions

In conclusion, this finding identified that the nurses who are working in Addis Ababa, both ALERT and TASH hospitals, majority of them had poor knowledge which could affect the management outcome of the patients' once sustained to trauma. From this study, the training and educational status of the nurses had an association with the knowledge level towards advanced trauma life support.

7.2 Recommendations

Grounded in the outcomes of this study, the following recommendations have been made:

To Ministry of Higher Education:-

- ✓ To give concern for nursing students to have enough knowledge towards trauma life support minimally giving as an introduction because after graduation most of them can assign different trauma caring institutions.

To the hospitals:-

- ✓ The hospital administrative bodies for both hospitals should give more emphasis on improving nursing knowledge towards trauma management for nurses who are working in adult emergency departments because their knowledge level is so poor.
- ✓ ALERT and TASH administrative bodies should prepare an onsite ATLS training program for their nurses who are working in the ED.
- ✓ The emergency department should cover the nursing activities with those of nurses having an emergency profession because they are relatively knowledgeable than the others for trauma management.

To researchers: -

- ✓ Further research should be conducted with different study design and with more number of study populations to investigate the knowledge level of the nurses who are working in different hospitals and should give training on ATLS.

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ANNEX I

QUESTIONNAIRE

Good morning, good afternoon, good evening? My name is Wondosen zewde. I came from Addis Ababa University College of health sciences department of emergency medicine and critical care. I am here to assemble facts from you on *the assessment of knowledge regarding advanced trauma life support among nurses working in the adult emergency department* which helps to find the gap and need to improve for the future. I would like to ask you about your knowledge of trauma management. Your name will not be written wherever in this paper. There is no risk associated with joining this study. Participation in this study or refusal to participate will not affect your knowledge to serve your clients/patients. The questionnaire takes about 15-20 minutes to complete. Participation in this survey is voluntary and you can choose not to answer any personal questions or the entire questions. But I kindly request your willingness to participate in the survey to meet the goals and benefit for the future generation. Are you willing to participate in this survey?

A. Yes - go to next/ proceed

B. No –Thank you!

Socio-demographic characteristics of nurses enrolled to study

1. Age (in years) _____
2. Sex:- A, male B, Female
3. Which hospital are you working at now? A. TASH B, ALERT
4. Have you ever take training in emergency and trauma care?
 - a. A.Yes b. No
5. What is your educational level?
 - a. Diploma nurse
 - b. General BSc nurse
 - c. BSc in ECCN
 - d. MSc

Questions to assess the knowledge of the participants

- 1) In managing the head-injured patient, the most important initial step is to
 - a. secure the airway
 - b. obtain c-spine film
 - c. support the circulation
 - d. determine the GCS score
- 2) Before you attempt to start an IV for fluid resuscitation, your priority should be to:
 - a. Stop the bleeding
 - b. Prepare fluid
 - c. Sterilize the IV site
 - d. Ensure adequate blood pressure
- 3) When casualties become hypothermic secondary to blood loss, changes occur in their blood that will prevent it from:
 - a. Clotting
 - b. Fighting infections
 - c. Carrying oxygen
 - d. Carrying nutrients
- 4) When performing a needle chest decompression, we insert the needle over the top of the rib to avoid damage to the _____, which runs along the bottom of the rib
 - a. Cartilage bridge
 - b. Intercostal muscle
 - c. Neurovascular bundle
 - d. Parietal pleura
- 5) In a case of polytrauma, a nasogastric tube shouldn't be inserted when there is
 - a. Broken teeth
 - b. Fracture of the mandible
 - c. Blunt injury to the abdomen
 - d. Basal skull fracture
- 6) The first maneuver to improve oxygenation after chest injury is
 - a. Intubate the patient.
 - b. Assess arterial blood gases.

- c. Administer supplemental oxygen.
 - d. Ascertain the need for a chest tube.
- 7) The most important, immediate step in the management of an open pneumothorax is
- a. The operation to close the wound.
 - b. Placing a chest tube through the chest wound.
 - c. Placement of an occlusive dressing over the wound.
 - d. Initiation of two, large-caliber IVs with Ringer's Lactate.
- 8) Hemorrhage of 20% of the patient's blood volume is associated usually with
- a. Oliguria.
 - b. Confusion.
 - c. Hypotension.
 - d. Tachycardia.
- 9) A healthy young male in a motor vehicle crash is brought to the emergency department with a blood pressure of 84/60, pulse 123, GCS 10. The patient moans when his pelvis is palpated. After initiating fluid resuscitation, the next step in management is:
- a. Placement of a pelvic binder
 - b. Transfer to a trauma center
 - c. Pelvic x-ray
 - d. Insert urinary catheter
- 10) What is Slick's maneuver?
- a. A method allowing the rescuer to hold a mask on the face with both hands
 - b. A system used to calculate the minute volume
 - c. Another name for Mallampati
 - d. Posteriorly directed pressure applied to the cricoid cartilage
- 11) A 34-year-old man has a gunshot wound to the right groin area. Arterial bleeding, which cannot be controlled with direct pressure, is coming from the wound. The patient appears confused, diaphoretic, and has weak peripheral pulses. What is the appropriate fluid resuscitation for this patient?
- a. Intravenous fluid at a "Keep Open" rate
 - b. Apply a hemostatic agent and gain intravenous access given enough fluid to maintain peripheral pulses
 - c. Intravenous fluid at a Wide Open rate; give at least two liters, then reassess the patient
 - d. No intravenous access should be established in this situation

- 12) Among the following, what is the most common cause of preventable trauma death in the injured adult patient?
- Airway obstruction
 - Cardiac tamponade
 - Hemorrhagic shock
 - Spinal injury
- 13) Which of the following is an acceptable location to insert a needle when decompressing a tension pneumothorax for the adult patient?
- Directly under the bottom of the second rib, the midclavicular line
 - Directly under the fifth rib, the anterior axillary line
 - Directly over the top of the fourth rib, the midaxillary line
 - Directly over the top of the third rib, the midclavicular line
- 14) Before passage of a urinary catheter in a man with trauma, it is essential to
- Examine the abdomen.
 - Determine pelvic stability.
 - Examine the rectum and
 - perineum.
 - Know the history and
 - mechanism of injury.
- 15) When performed correctly, endotracheal intubation
- Reduces the risk of aspiration.
 - Should be performed before defibrillation.
 - Should be accomplished in 40 seconds or less.
 - Can only be used in spontaneously breathing patients.
- 16) A 20-year-old woman, at 32 weeks gestation, is stabbed in the upper right chest. In the emergency department, her blood pressure is 80/60 mm Hg. She is gasping for breath, extremely anxious, and yelling for help. Breath sounds are diminished in the right chest. Which one of the following is the most appropriate first step to help your patient?
- Perform tracheal intubation.
 - Initiate 2, large-caliber IV lines and crystalloid infusion.
 - Performs needle decompression of the right chest.
 - Inserts an oropharyngeal airway.
- 17) The most important, immediate step in the management of an open pneumothorax is
- Endotracheal intubation.
 - An operation to close the wound.

C. Placing a chest tube through the wound.

D. D. placement of an occlusive dressing over the wound

18) Which of these is the preferred site for intra-osseous access on a pediatric patient?

a. Distal femur

c. Distal humerus

b. Proximal tibia

d. Proximal radius

19) When would one be most suspicious for a tension pneumothorax?

a. O₂ Sat =95

c. Tracheal Deviation is noted

b. Coughing is uncontrolled

d. Weaning is unsuccessful

20) Which patient is the highest priority in a mass casualty situation?

a. Severe head injury with agonal respirations

b. Cardiac arrest

c. 96% 3rd-degree burns

d. Blunt chest trauma with deviated tracheal and hypotension

Correct answers

1. A

8. D

15. C

2. C

9. A

16. C

3. C

10. D

17. B

4. B

11. D

18. B

5. D

12. C

19. C

6. C

13. A

20. D

7. C

14. B

ANNEX II

RESEARCH TOOL GRANT

In addition to a phone call, permission from a local country person (Dr. Yohannes Feleke, MD, Assistant professor of Emergency Medicine and Critical Care with cell phone +251947811405) to share the tool email conversation has been made with different researchers who was a volunteer. The following conversation shows the dialogue made with Dr. Robert Douglas (Australian, emergency surgery specialist, research consultant).

