



**St. Paul's Hospital Millennium Medical
College
Post-graduate Study Program
Department of Emergency and Critical Care Medicine**

Assessment of Knowledge, attitude, and practice of Advanced Trauma Life Support (ATLS) among residents At Addis Ababa Burn, Emergency and Trauma (AaBET) hospital, Addis Ababa, Ethiopia in 2023.

By: Dr. Tolossa Tesfaye
Emergency and Critical Care Medicine final year resident,
Saint Paul's Hospital Millennium Medical College

A research thesis submitted to department of Emergency and Critical Care Medicine, in partial fulfillment of specialty in Emergency and Critical Care Medicine.

December, 2023
Addis Ababa, Ethiopia



**St. Paul's Hospital Millennium Medical College Post-graduate
Study Program Department of Emergency and Critical care
medicine**

A cross-sectional study on knowledge, attitude, and practice of
Advanced Trauma Life Support (ATLS) among residents at Addis
Ababa Burn, Emergency and Trauma (AaBET) hospital

By: Dr. Tolossa Tesfaye
Emergency and Critical Care Medicine final year resident,
Saint Paul's Hospital Millennium Medical College

Advisors:
Dr. Rakeb Mulugeta
Assistant Professor of Emergency and Critical Care Medicine Saint Paul's
Hospital Millennium Medical College
Dr. Biniam Bahta
Assistant Professor of Emergency and Critical Care Medicine Saint Paul's
Hospital Millennium Medical College

December, 2023
Addis Ababa, Ethiopia

Academic research thesis submission guide

Table 1: Academic research thesis submission guide

Name of investigator	Dr. Tolossa Tesfaye
The full title of the research project	Assessment of knowledge, attitude, and practice of Advanced Trauma Life Support (ATLS) among residents at Addis Ababa Burn, Emergency and Trauma (AaBET) hospital
Duration of the project	July 30, 2023, G.C to November 30, 2023, G.C.
Study Area	Addis Ababa Burn, Emergency and Trauma(AaBET) hospital
Total Cost of the Project	28,770.ETB
Source(s) of Funding	Saint Paul's Hospital Millennium Medical College
Address of investigator	Cell Phone: <u>+251916423283</u>
	Fax:
	P.O.Box:
	Email: <u>titotesfaye70@gmail.com</u>
Name and address of Advisor(s)	Dr.Rakeb Mulugeta Mobile: +2519..... Dr. Biniam Bahtha Mobile: +2519.....

Abstract

Introduction: Traumas, resulting from diverse causes such as road traffic accidents, falls, burns, poisoning, wars, and acts of violence, pose significant public health challenges. Advanced Trauma Life Support (ATLS) protocol is a crucial training framework designed to equip caregivers with emergency knowledge for managing acute trauma victims.

Objective: The study aims to evaluate the knowledge, attitude, and practice of residents towards ATLS at Addis Ababa Burn, Emergency, and Trauma Center (AaBET hospital) between July 30, 2023, and November 30, 2023.

Methods: A cross-sectional study included 103 residents from four departments at Saint Paul Hospital Millennium Medical College trauma center, utilizing systematic sampling. Data collected through a structured questionnaire, were analyzed using SPSS version 25.0. Variables with $P < 0.05$ were considered statistically significant.

Results: Majority (62.14%) of the 103 participants were aged 26-30, with a mean age of 30.29 ± 2.34 SD; 76.7% were male. A significant portion (76.70%) had not undergone ATLS training. The study revealed that 84.47% possessed good to very good knowledge, 50.5% had a positive attitude, and 67.96% demonstrated adequate practice. Associations were found between knowledge and attitude ($P = 0.005$, OR: 3.548 [95%CI; 1.455-8.656]), knowledge and practice ($P < 0.001$, OR: 9.903 [95%CI; 3.833-25.586]), knowledge and residency program ($P < 0.001$, OR: 0.426 [95%CI; 0.282-0.644]), and knowledge and year of residency ($P < 0.001$, OR: 0.921 [95%CI; 0.885-0.960]).

Conclusion: The research showed that residents at AaBET hospital offering trauma care have adequate knowledge and majority of residents had a favorable opinion of ATLS, despite the fact that most of them did not take any formal training and certification on ATLS.

Keywords: knowledge, attitude, practice, residents

Acknowledgments

First of all, I would like to thank SPHMMC department of Emergency Medicine and Critical Care for giving this opportunity to do my research thesis.

My deepest gratitude and special thanks goes to Dr Rakeb Mulugeta for her advice, suggestions and comments that helped me to complete my research thesis.

Secondly I would like to express my heartfelt gratitude to Dr Biniam Bahtha for his guidance and support on establishment of my thesis.

Acronyms and Abbreviations

ATLS - Advanced Trauma Life Support

AA –Addis Ababa

AaBET - Addis Ababa Burn, Emergency and Trauma hospital

SPHMMC - Saint Paul Hospital Millennium Medical College

ED - Emergency Department

ETB-Ethiopian birr

SPSS - Statistical Package for Social Science

ABCDE - Airway, Breathing, Circulation, Disability, Exposure

CI- Confidence Interval

G.C-Gregorian Calendar

OD –Odd Ratio

SPHMMC – Saint Paul’s Hospital Millennium Medical College

WHO-World Health Organization

Table of contents

<i>Academic research thesis submission guide.....</i>	<i>I</i>
<i>Abstract.....</i>	<i>II</i>
<i>Acknowledgments.....</i>	<i>III</i>
<i>Acronyms and Abbreviations</i>	<i>IV</i>
<i>1. Introduction</i>	<i>1</i>
<i>1.1. Background</i>	<i>1</i>
<i>1.2. Statement of the Problem</i>	<i>2</i>
<i>1.3. The rationale of the study.....</i>	<i>3</i>
<i>2. Literature Review.....</i>	<i>4</i>
<i>3. Objectives</i>	<i>7</i>
<i>3.1. General Objective:</i>	<i>7</i>
<i>3.2. Specific objectives.....</i>	<i>7</i>
<i>4. Methods</i>	<i>8</i>
<i>4.1. Study Setting.....</i>	<i>8</i>
<i>4.2. Study Period.....</i>	<i>8</i>
<i>4.3. Study Design.....</i>	<i>8</i>
<i>4.4. Population.....</i>	<i>9</i>
<i>4.4.1. Source Population</i>	<i>9</i>
<i>4.5. Eligibility criteria</i>	<i>10</i>
<i>4.5.1. Inclusion criteria</i>	<i>10</i>
<i>4.5.2. Exclusion criteria</i>	<i>10</i>
<i>4.6. Sample Size.....</i>	<i>10</i>
<i>4.7. Sampling Procedures.....</i>	<i>12</i>
<i>4.8. Variables</i>	<i>12</i>
<i>4.8.1. Dependent variable.....</i>	<i>12</i>

4.8.2. Independent variables.....	12
4.9. Data Collection and Procedures.....	12
4.10. Data Processing and Analysis.....	13
4.11. Operational definitions.....	13
5. Results.....	15
5.1. Socio-demographic characteristics of participants.....	15
5.2. The level of knowledge, attitude and practice of the participants.....	17
5.3. Response of participants on knowledge of ATLS questions.....	17
5.4. Response of participants on Attitude towards ATLS questions.....	18
5.5. Response of participants on practices towards ATLS questions.....	19
5.6. Level of knowledge towards ATLS as assessed towards attitude of participants	20
5.9. Practice assessment with residence program and year of residency.....	23
6. Discussion.....	25
8. Conclusion.....	26
9. Strength and limitation of the study	27
9.1. Strength of the study	27
9.2. Limitations of the study.....	27
10. Recommendations	28
11. References.....	29
12. Assurance of Principal Investigator.....	31
Approval of the Primary Advisor	32
Approval of the Advisor.....	32
13. Annexes.....	33
13.1. Questionnaires.....	33

List of tables

<i>Table 1: Academic research thesis submission guide.....</i>	<i>I</i>
<i>Table 2: Socio-demographic characteristics of residents at SPHMMC, AaBET Hospital, Addis Ababa, Ethiopia, 2023(n=103).....</i>	<i>16</i>
<i>Table 3: The level of knowledge, attitude and practice of the participants at SPHMMC, AaBET Hospital, Addis Ababa, Ethiopia, 2023(n=103).</i>	<i>17</i>
<i>Table 4: Response of participants on knowledge of ATLS among residents at SPHMMC, AaBET Hospital, Addis Ababa, Ethiopia, 2023(n=103).</i>	<i>18</i>
<i>Table 5: Response of participants on knowledge of ATLS among residents at SPHMMC, AaBET Hospital, Addis Ababa, Ethiopia, 2023(n=103).</i>	<i>18</i>
<i>Table 6: Response of participants on practice of ATLS among residents at SPHMMC, AaBET Hospital, Addis Ababa, Ethiopia, 2023(n=103).</i>	<i>20</i>
<i>Table 7: Knowledge assessment with residence program and year of residency among residents at SPHMMC, AaBET Hospital, Addis Ababa, Ethiopia, 2023(n=103).</i>	<i>22</i>
<i>Table 8: Practice assessment with residence program among residents at SPHMMC, AaBET Hospital, Addis Ababa, Ethiopia, 2023(n=103).</i>	<i>23</i>

List of figures

<i>Figure 1: Age category of resident at SPHMMC, AaBET Hospital, Addis Ababa, Ethiopia, 2023(n=103).</i>	15
<i>Figure 2: Residency program with year of residency among residents at SPHMMC, AaBET Hospital, Addis Ababa, Ethiopia, 2023(n=103).</i>	16
<i>Figure 3: Level of knowledge towards ATLS as assessed towards attitude among residents at SPHMMC, AaBET Hospital, Addis Ababa, Ethiopia, 2023(n=103).</i>	21
<i>Figure 4: Level of knowledge towards ATLS as assessed towards practice among residents at SPHMMC, AaBET Hospital, Addis Ababa, Ethiopia, 2023(n=103).</i>	22

1. Introduction

1.1. Background

Traumas result most commonly from road traffic accidents, falls, drowning, burns, poisoning, wars, and acts of violence against oneself or others. Among these, the top 3 trauma-related causes of death are road traffic injuries, homicide, and suicide. According to most current WHO reports traumas/injuries take the lives of 4.4 million people around the world each year which means more than nine people die every minute from injuries or violence and it constitutes nearly 9% of all deaths [1].

Advanced trauma life support (ATLS) is a protocol prepared to provide coordinated training and prepare caregivers with adequate emergency knowledge for the management of acute trauma victims. It has been witnessed how the coordinated efforts of well-trained providers improved survival of the seriously injured trauma victims. It was devised in 1976 and was adopted by the American College of Surgeons Committee on Trauma in 1980. It is now widely accepted as the standard protocol for the initial assessment and treatment of acute trauma victims [2].

ATLS is based on the idea that the greatest threat to life should be treated first because appropriate and timely care could significantly improve the outcome of injured patients and the lack of a definitive diagnosis should never prevent the application of an indicated treatment and a detailed history is not mandatory to begin the evaluation and treatment of a patient with acute injuries [2, 3].

Trauma centers were not established separately before the half of the 20th century because injuries were thought to be unpredictable instead of something that could be anticipated and included treatment plans to care for injuries. The establishment of organized trauma systems in developed countries has resulted in significant improvements; decreasing death rates for all treated trauma patients by 15–20% and especially lowering mortality from medically preventable causes by more than 50% [2].

Ethiopia is Africa's second most populous sub-Saharan country with an estimated population of around 120 million. The Addis Ababa Burn, emergency, and trauma center (AaBET Hospital) an affiliate of SPHMMC, which has approximately 20 - 30,000 emergency visits annually and has specialty training programs such as Emergency Medicine and Critical Care, Orthopedics and traumatology, Neurosurgery and Plastic and Reconstructive surgery [4].

1.2. Statement of the Problem

The Advanced Trauma Life Support (ATLS) Program was developed to teach doctors a safe, reliable method to assess and initially manage trauma patients.

Minimizing the effects of catastrophic injuries, such as long-term morbidity or mortality can be achieved by promptly and effectively administering acute trauma care. The prevention of fatalities, the reduction of short- and long-term disability and aid in coping with the effects of the injury on one's life can all be achieved by providing victims of injuries with high-quality support and care services.

So, the knowledge and practice of ATLS among residents practicing at a trauma center are mandatory for minimizing the occurrence of long-term morbidity or mortality. The question remains, do all residents practicing at trauma centers have the standard ATLS knowledge, attitude, and practice required for acute trauma care?

As a resident practicing at a trauma center, it is required to have a better understanding and knowledge of advanced trauma care and to have a skillful approach toward trauma patients among all residents practicing at AaBET hospital but trauma care is a rapidly advancing subject that needs an up to date knowledge with different updated recommendations. This could impose a major challenge to the residents regardless of their specialty program.

The aim of this study was to evaluate the knowledge of trauma management protocols, practices based on such knowledge in the management of trauma patients, and attitudes towards acquiring this knowledge among residents practicing at AaBET hospital.

1.3. The rationale of the study

This study was conducted to investigate the level of knowledge, attitude, and practice gap among residents on Advanced Trauma Life Support(ATLS) protocol at Addis Ababa Burn, emergency, and trauma center (AaBET hospital). Identifying the gap in knowledge, attitude, and practice on ATLS and listing the main cause of this gap which have importance for different health officials, and policymakers, and for the Ministry of Health to take corrective action to fill the gap by different methods. In addition to this, it has an advantage for health professionals“ to know their gap from the required standards level. The study may impose to get training on ATLS before being assigned to the emergency unit and even may lead to including ATLS as part of formal education in the curriculum.

The thesis emphasizes the importance of assessing the knowledge, attitude, and practice of ATLS among residents. By evaluating their familiarity with the protocol, the study aims to identify areas for improvement in trauma care and enhance patient outcomes. This research contributes to the existing literature on ATLS implementation in developing countries.

2. Literature Review

Globally traumas result in deaths of 14,000 and 16,000 each day, which accounts for 5 million annual deaths, equating to 9% of the worldwide burden of mortality. Road traffic injuries are the major trauma-related cause with a worldwide estimate of 1.2 million deaths each year and as many as 50 million injuries. Low-income and middle-income countries account for about 85% of the deaths and 90% of the annual disability-adjusted life years (DALYs) lost because of road traffic injury [1, 8].

According to WHO research, Africa has the highest global rate of traffic fatalities. There are 26.6 road injury fatalities for every 100,000 people, which is roughly three times more than in Europe. Central Africa has the poorest statistics. [9]

According to a study conducted in Ethiopia in the year 2019, Road traffic injury was one of the main reasons for trauma-related hospital admissions. This study found that road traffic injury among trauma victims in Ethiopian hospitals had a pooled prevalence of 31.5%. [10]

The advanced trauma life support (ATLS) manual was prepared in 1976 and was approved by The American College of Surgeons Committee as a continuing medical education program course in 1979. The main goal of ATLS is to provide care within the "golden hour," when quick assessment, resuscitation, and often surgical intervention greatly increase survival and reduce associated morbidity [2, 11].

Clinicians should treat injured patients by rapidly evaluating injuries and starting life-saving treatments simultaneously. A structured approach that can be easily and efficiently used is necessary since timing is essential [2].

The “initial assessment,” includes the following elements [2]:

- ✧ Preparation
- ✧ Triage
- ✧ Primary survey (ABCDEs) with immediate resuscitation of patients with life-threatening injuries
- ✧ Adjuncts to the primary survey and resuscitation
- ✧ Consideration of the need for patient transfer
- ✧ Secondary survey (head-to-toe evaluation and patient history)
- ✧ Adjuncts to the secondary survey
- ✧ Continued post-resuscitation monitoring and reevaluation

✧ Definitive care

The primary survey, which is conducted in a structured and systematic manner, is the foundation for the initial evaluation of the trauma patient [2, 12]. The sequential management priority of the primary survey uses a mnemonic **ABCDE** for **A**irway, **B**reathing, **C**irculation, **D**isability and **E**xposure (undress), and **E**nvironment (temperature control) which should be repeated frequently and whenever a patient's status changes [2, 11, 12].

Studies conducted on the educational and clinical impact of ATLS show that training significantly increases knowledge of trauma management, improves practical skills, organization of trauma management, and identification of management priorities [3, 13, 14].

A cohort study from the ATLS India program which aimed to measure the benefits of ATLS training in knowledge, skills, attitude, and their attrition over ten years showed improvement in knowledge in 98.3% of participants, psychomotor skills in 95.7% of participants, organizational skills improvements in 96.9%, improved overall trauma management in 98.7% and self-confidence 91%[15].

Studies conducted in low and middle-income countries to assess the effectiveness of trauma training as an alternative to standard ATLS courses showed effectiveness concerning knowledge gained and lower cost needed as compared to ATLS, but the impact on patient outcome was not demonstrated [16].

According to a retrospective study on adult trauma patients treated at a Level I Canadian trauma center, there was compliance rate to ATLS protocol was 81.8% for the primary survey and 75% for the secondary survey [17]. This study showed that trauma team leader presence during resuscitation was associated with improved adherence to ATLS protocols [17].

In another retrospective study conducted in France to evaluate adherence to evidence-based clinical management guidelines in patients with bleeding trauma, adherence to protocols has a substantial impact on trauma outcome and is linked to survival [18]. This study also discovered that initial resuscitation, stopping subsequent bleeding, and assessing rapid control of bleeding had only moderate compliance with the guidelines [18].

A systematic review published by the European Journal of Trauma and Emergency Surgery to evaluate the effects of the application of a checklist during in-hospital resuscitation of trauma patients on adherence to the ATLS guidelines, trauma team performance, and patient-related outcomes

showed improvements regarding adherence to ATLS guidelines and work-flow during resuscitation[19]. According to this review using a checklist might also decrease the mortality rate among patients who have suffered severe injuries [19]. According to a cross-sectional study done among interns at Addis Ababa University, St. Paul Millennium Medical College, and Arsi University College of Health Sciences in Ethiopia, the institution offering the ATLS course has better interns with knowledge than the other institutions [20]. According to this study, most interns had a positive attitude to ATLS. Very few see ATLS as solely a mandate or career advantage while most of them believe it saves lives and truly benefits patients [20]. Another cross-sectional study conducted among non-specialist doctors involved in trauma care in Nigeria to determine the level of knowledge of the advanced trauma life support protocol indicated that there is a poor knowledge of ATLS among non-specialist doctors involved in trauma care although most of them rated their knowledge of ATLS higher than the level of knowledge they demonstrated [21]. This study also found that senior residents who have received formal ATLS training displayed excellent knowledge [21].

3. Objectives

3.1. General Objective:

To assess the knowledge, attitude, and practice of Residents towards Advanced Trauma Life Support(ATLS) protocol Addis Ababa Burn, emergency, and trauma center (AaBET hospital) from July30, 2023, G.C to November 30, 2023 G.C.

3.2. Specific objectives

- ✧ To assess the knowledge of Residents about the ATLS protocol from July30, 2023, G.C to November 30, 2023 G.C.
- ✧ To assess the practice of Residents toward ATLS protocol from July30, 2023, G.C to November 30, 2023 G.C.
- ✧ To assess the attitude of residents toward ATLS from July30, 2023, G.C to November 30, 2023 G.C.
- ✧ To identify the level of ATLS training among residents working at Addis Ababa Burn, emergency, and trauma center (AaBET hospital) from July30, 2023, G.C to November 30, 2023 G.C.
- ✧ To compare the knowledge, attitude and practice of ATLS among residents of different departments and years of residency from July30, 2023, G.C to November 30, 2023 G.C.

4. Methods

4.1. Study Setting

This study was conducted at SPHMMC, AaBET hospital . St. Paul's millennium medical college which is located in the capital city of Ethiopia was established through a decree of the Council of Ministers in 2010, although the medical school opened in 2007 and the hospital was established in 1968 by the late Emperor Haile Selassie. It is governed by a board under the Federal Ministry of Health. The college-initiated Ethiopia's first integrated modular and hybrid problem-based curriculum for its undergraduate medical education and diversifying postgraduate programs. The college has more than 2800 clinical, academic and administrative, and supporting staff that provides medical specialty services to patients who are referred from all over the country.

AaBET Hospital (Addis Ababa Burn, emergency and trauma center) is a part of St. Paul millennium medical college; it is the first trauma center; founded in Ethiopia 9 years back. It has an Emergency department, ICU, departments of Orthopedic and Traumatology, Neurosurgery, General surgery, and Plastic surgery. At full capacity, it serves as 250 beds patient load equivalent. The emergency department has a Red zone with 5 beds, an Orange zone with 12 beds, and Yellow Green zone with 40 beds. The ICU has a total of 11 beds. Both the Emergency and ICU are run by Emergency and Critical care specialists.

This research focuses on residents working at AaBET hospital in Ethiopia. This hospital serves as the study setting due to its significance as the country's first trauma center. By targeting residents from multiple specialties, such as Emergency and Critical Care Medicine, Neurosurgery, Orthopedics and Traumatology, and Plastic and Reconstructive Surgery, the study provides a comprehensive understanding of ATLS implementation across different departments.

4.2. Study Period

The study was conducted starting from July 30, 2023, G.C to November 30, 2023 G.C.

4.3. Study Design

A single-centered descriptive cross-sectional study was conducted among four Department residents (Emergency and critical care medicine, Neurosurgical, Orthopedic and Traumatology, and Plastic and Reconstructive surgical) working and practicing in Saint Paul Hospital Millennium Medical College at the trauma center.

The thesis employs a cross-sectional study design, which allows for the collection of data at a specific point in time. This design is appropriate for assessing the knowledge, attitude, and practice of residents at a particular trauma center. However, it's worth noting that cross-sectional studies present limitations in establishing causality or capturing longitudinal changes.

4.4. Population

4.4.1. Source Population

All residents who are involved at various residency programs in Saint Paul Hospital Millennium Medical College.

4.4.2. Study Population

The whole residents who are training at various levels of residency training in four departments (emergency medicine and critical care, neurosurgical, orthopedic and Traumatology, and plastic surgery) in Saint Paul Hospital Millennium Medical College trauma center (AaBET hospital).

4.4.3. Sampling Population

Residents who are currently practicing at various levels of residency training in the four departments in Saint Paul Hospital Millennium Medical College trauma center (AaBET hospital) and fulfill the inclusion criteria.

4.5. Eligibility criteria

4.5.1. Inclusion criteria

All residents at various levels of residency training in four departments (emergency medicine and critical care, neurosurgical, orthopedic and Traumatology, and plastic surgery) at AaBET hospital from June 11/2023- July 8/2023

4.5.2. Exclusion criteria

- ✧ Residents who are not available during study period due to (month-off, rotation to other hospital, maternity leave, and sick leave)
- ✧ Residents who come from other hospitals for attachment
- ✧ Residents who are not willing or unable to participate for different reasons

4.6. Sample Size

Taking the population proportion of doctors among no specialist doctors involved in trauma care in Enugu, Nigeria, is reported to have demonstrated a knowledge rate to be 33.8%.

$$n = \frac{z^2 p(1 - p)}{e^2}$$

n = the required sample size

p = proportion of doctors among non-specialists in Nigeria who have demonstrated knowledge was reported to be – 33.8%

$Z_{\alpha/2}$ = the critical value at 95% confidence level = 1.96 e = precision (margin of error) = 5%

Accordingly, the minimum sample size would

$$n = \frac{1.96^2 0.338(1 - 0.338)}{0.05^2}$$

$$n = \frac{1.96^2 0.338(0.662)}{0.05^2}$$

$$n = 344$$

Using the correction formula to estimate the final sample size (nf) from a finite target,

Population (N): Thus

$$N = \frac{344}{1 + 344/140} = 100$$

Therefore, the minimum calculated sample size, by adding 10% of the calculated sample size for the contingency that might happen due to incomplete reports, the final sample size became 110.

4.7. Sampling Procedures

The sample was allocated proportionally to four departments (Emergency and critical care medicine, neurosurgery, orthopedic and traumatology, and plastic and reconstructive surgery) in Saint Paul Hospital Millennium Medical College at the trauma center who is working training in their respective level of residency and will be collected with a systematic random sampling technique.

Due to small total number of residents in the three departments (neurosurgery, orthopedic and traumatology, and plastic and reconstructive surgery), we decided to include all residents from this departments who were available at AaBET hospital during the specified study period.

4.8. Variables

4.8.1. Dependent variable

- ✧ Knowledge, attitude and practices residents towards ATLS

4.8.2. Independent variables

- ✧ Socio-demographic characteristics
- ✧ Residency program
- ✧ Year of residency
- ✧ Training of ATLS Course
- ✧ The importance of ATLS for their career

4.9. Data Collection and Procedures

Data were collected from each respondent who fulfills the inclusion criteria, using structured questionnaire checklists prepared in the English language. The questionnaire was prepared by reviewing different literature and undertaking modifications for the population being studied. It was modified further after a pre-test and before the data collection, then will be followed and reviewed during data collection completeness was checked by the Principal Investigator. The purpose and significance of the study was explained to the data collectors by the principal investigator before the research begins and the collection was carried out by formatted self-administered questionnaire. However, the residents were informed about the anonymous evaluation of their data and they will be informed that by submitting the questionnaire, they are considered to have agreed to participate in the study. Participation in the study is completely voluntary.

4.10. Data Processing and Analysis

Data entering, coding, and cleaning was performed using Epi-info version 7.0 and statistical analysis was done by using SPSS (Statistical Package for Social Science) version 26. Frequency and cross-tabulation were used to check for missed values and variables. The Socio-demographic of the responders was computed by using descriptive statistics such as mean, percentage, frequencies, and standard deviation. Multiple linear regression was used to determine associations between independent and dependent variables. Those variables with a p-value of ≤ 0.05 were taken to a logistic regression model. Finally, the study findings is presented using diagrams, tables, and figures.

4.11. Operational definitions

Trauma:- physical damage to a human being caused by intolerable transfer of energy, it is may be mechanical, thermal, electrical, chemical, or radiation energy or by the sudden absence of heat or oxygen

Resident: a medical graduate engaged in specialized practice under supervision in a hospital.

Knowledge: - is a familiarity, awareness, or understanding of trauma victim handling, such as facts, information, descriptions, or skills, which is acquired through experience or education by perceiving, discovering, or learning as measured by knowledge questionnaire.

Practice:- is a skill to manage and provide a trauma handling at health centers, but the required care can be done by having all the mandatory knowledge apart from the skill to provide the necessity trauma care for the injured patient.

The knowledge and practice level of the participant was measured as:

- ✧ **Very good** = participant who scored $> 75\%$
- ✧ **Good** = participant who scored between 50% to 75%
- ✧ **Poor** = participant who scored between 25% to $<50\%$
- ✧ **Very poor** = participant who scored $< 25\%$

4.12. Ethical Consideration

Ethical clearance and approval was obtained from St Paul Hospital Millennium medical College Ethics Committee. The data from the responders' records were handled with strong confidentiality. Owing to the cross-sectional study design, the requirement for informed consent was waived.

4.13. Dissemination of Results

The result of this study will be presented for partial fulfillment of the residency program. The manuscript will also be sent to journals for possible publication and presentations (conferences, workshops).

5. Results

5.1. Socio-demographic characteristics of participants

In this study, 103 residents have participated with a 100% response rate. Majorities 64(62.14%) of the participants' ages ranged from 26-30 years followed by 31-35 years 37(25.92%) and the mean age of participants' was 30.29 ± 2.34 SD. (figure) Three-fourth (79) of the participants were male. (Table)

A large proportion of the study participants 79 (76.70%) did not take any training regarding ATLS.

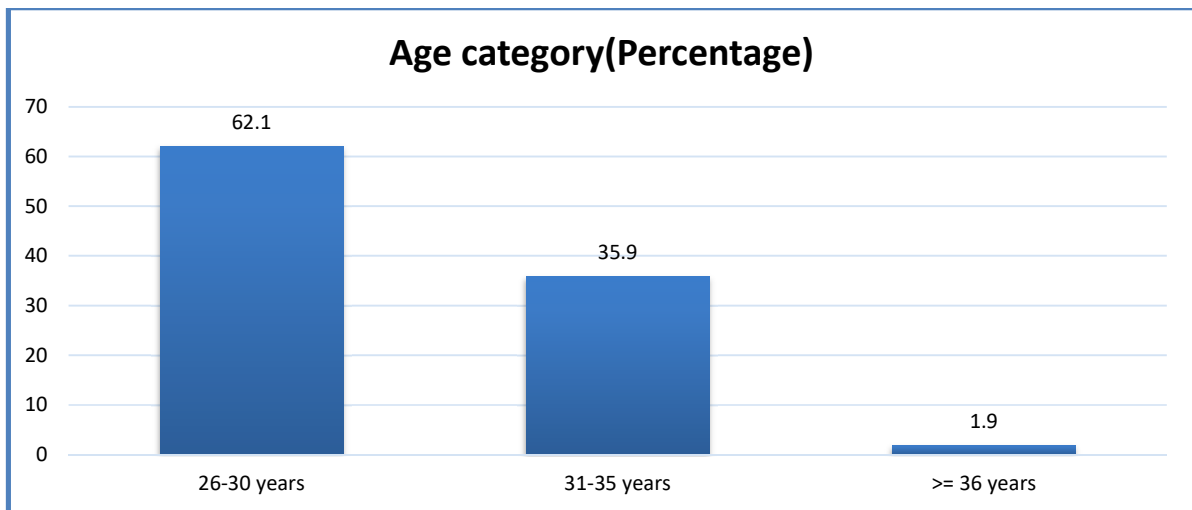


Figure 1: Age category of resident at SPHMMC, AaBET Hospital, Addis Ababa, Ethiopia, 2023(n=103).

Table 2: Socio-demographic characteristics of residents at SPHMMC, AaBET Hospital, Addis Ababa, Ethiopia, 2023(n=103).

Variables	Category	Frequency	Percentage (%)
Age	26-30 years	64	62.14
	31-35 years	37	35.92
	≥ 36 years	2	1.94
Sex	Male	79	76.70
	Female	24	23.30
Residency program	EMCC	49	47.57
	Neurosurgery	15	14.56
	Ortho and traumatology	27	26.21
	Plastic and reconstructive surgery	12	11.65
Total years of experience	< 2 years	8	7.77
	2-4 years	50	48.54
	years	40	38.83
	>6 years	5	4.85
Year of residence	First year	29	28.16
	Second Year	30	29.13
	Third Year	27	26.21
	Fourth Year	14	13.59
	Fifth Year	3	2.91

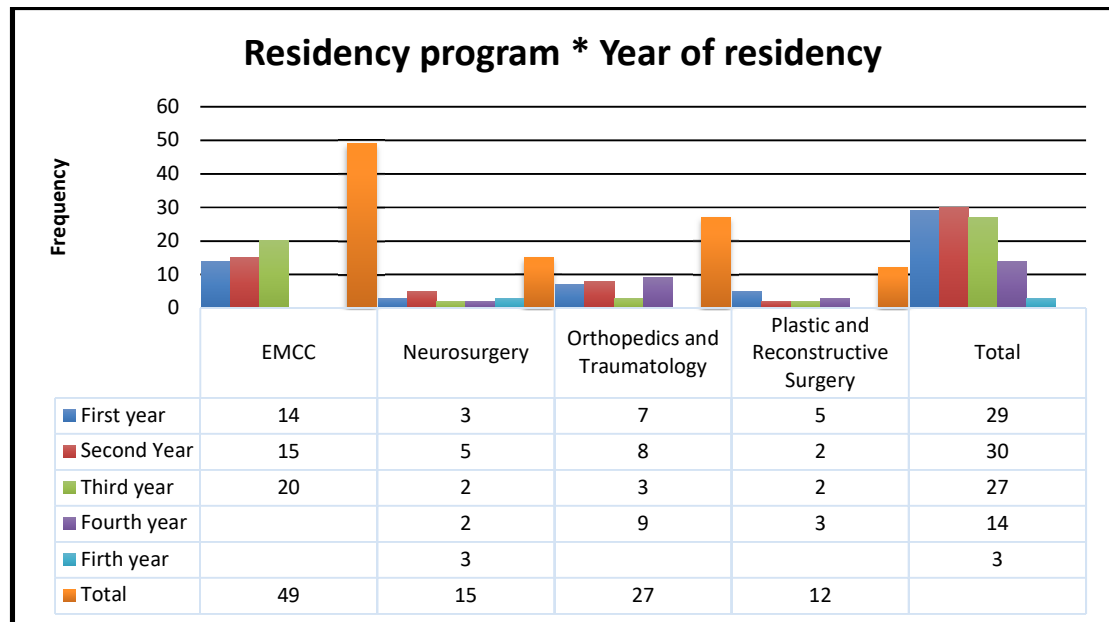


Figure 2: Residency program with year of residency among residents at SPHMMC, AaBET Hospital, Addis Ababa, Ethiopia, 2023(n=103).

5.2. The level of knowledge, attitude and practice of the participants

Among 103 residents who participate in this study vast majority of them (87, 84.47%) had good and very good knowledge whereas only (16, 15.53%) demonstrated poor knowledge and none of them had very poor knowledge towards ATLS. Almost half of the study participants' (52, 50.5%) showed positive attitude towards ATLS. Three-fourth of the study participants (70, 67.96%) had adequate (very good and good) practice level while only one participant showed very poor practice on ATLS.

Table 3: The level of knowledge, attitude and practice of the participants at SPHMMC, AaBET Hospital, Addis Ababa, Ethiopia, 2023(n=103).

Variables	Category	Frequency	Percentage (%)
Level of knowledge towards ATLS	Very Good	64	62.1
	Good	23	22.3
	Poor	16	15.5
	Very poor	0	0
Level of Attitude towards ATLS	Positive	52	50.5
	Negative	51	49.5
Level of Practices towards ATLS	Very Good	44	42.7
	Good	26	25.2
	Poor	32	31.1
	Very poor	1	1

5.3. Response of participants on knowledge of ATLS questions

Participants' basic knowledge on ATLS was assessed based on knowledge assessment questions prepared from ATLS course manual and previous studies. The vast majority of participants (93, 89.9%) have correctly answered primary and secondary survey assessment knowledge questions. The participants' knowledge on primary survey components (ABCDE) was assessed separately. Accordingly, 91.26%, 77.18%, 72.4%, 69.9% of participants provided correct answers for airway, breathing, circulation, and disability assessment questions respectively.

About (97, 94.17 %) of study participants gave correct answers on the knowledge assessment of ATLS

which emphasized rapid trauma assessment method in ATLS – the primary survey (ABCDE approach). Almost three-fourth (75, 72.82%) of participants correctly answered the knowledge question on ATLS's concept of the "Golden Hour," for optimal care of a trauma patient. About half of participants (50, 48.54%) gave correct answers for burn surface area calculation question on an adult patient who had partial thickness burn.

Table 4: Response of participants on knowledge of ATLS among residents at SPHMMC, AaBET Hospital, Addis Ababa, Ethiopia, 2023(n=103).

Questions on Knowledge of ATLS	Question category	Correct answer (n)	Percentage (%)
Rapid trauma assessment method in ATLS – primary survey (ABCDE assessment)	Primary survey	97	94.17
The "Golden Hour" for optimal care after a trauma:		75	72.82
Definitive airway technique in a trauma patient:	A- Airway	94	91.26
Initial management of patient with an open pneumothorax:	B- Breathing	70	67.96
Patient from fire place with inhalational injury and respiratory failure:		89	86.41
Preferred method for controlling external hemorrhage in an injured extremity:	C- Circulation	76	73.79
The recommended initial fluid for resuscitation in hemorrhagic shock:		74	71.84
Preferred site for intraosseous access on a pediatric patients:		82	79.61
Concerning intraosseous infusion in child:		62	60.19
The best guide for adequate fluid resuscitation of the burn patient is:	D- Disability	79	76.70
Care for a patient with suspected cervical spine injury:		72	69.90
Burn surface area calculation in an adult patient who had partial thickness burn:	E- Exposure	50	48.54
Aim of the secondary survey assessment in ATLS:	Secondary survey	87	84.47
Acronym "AMPLE" in ATLS history taking:		94	91.26
Highest priority in a mass casualty situation:	Disaster	77	74.76

5.4. Response of participants on Attitude towards ATLS questions

Almost all (97, 94.17 %) of participants have agreed or strongly agreed that knowledge of trauma care could be useful for them. On the other hand, about one third (36, 34.9%) of the study participants had disagreed or strongly disagreed on the importance of ATLS training for doctors whose intended specialty does not involve regular management of trauma patients. The vast majority (94, 91.3%) of study participants have agreed or strongly agreed that there is a need for formal training in ATLS in the residency curriculum.

Table 5: Response of participants on knowledge of ATLS among residents at SPHMMC, AaBET

Hospital, Addis Ababa, Ethiopia, 2023(n=103).

Attitude questions	Strongly agree		Agree		Neutral		Very much disagree	
	n	%	n	%	n	%	n	%
Knowledge of trauma care could be useful to you	69	66.99	28	27.18	5	4.85	1	0.97
ATLS course training is essential for practicing your proposed specialty	69	66.99	28	27.18	4	3.88	2	1.94
ATLS course provide the basic knowledge necessary to resuscitate and stabilize patients according to priority	64	62.14	35	33.98	3	2.91	1	0.97
ATLS training helps to determine whether a patient's needs exceed the resources of a facility and/or the capability of a provider	25	24.27	52	50.49	20	19.42	5	4.85
ATLS training for doctors whose intended specialty does not involve regular management of trauma patients	29	28.16	38	36.89	20	19.42	16	15.53
ATLS training and certificate has a major advantage for advancement of your career	51	49.51	42	40.78	8	7.77	2	1.94
There is a need for formal training in ATLS in the residency curriculum	54	52.43	40	38.83	6	5.83	3	2.91

5.5. Response of participants on practices towards ATLS questions

Most participants (83, 80.58%) had practice of the concepts and principles of the primary and secondary survey during the initial assessment of a trauma patient. Regarding residents practice of essential procedures in the past one year almost all of them (93.2% and 96.12%) performed an IV access and hemorrhage control procedures while only 10(9.7%) of participants have performed cricothyroidotomy procedure. About three fourth (77, 75.2%) of residents were confident of their ability to provide initial trauma care and triaging of trauma victims in mass casualty situations. (Table 6)

Table 6: Response of participants on practice of ATLS among residents at SPHMMC, AaBET Hospital, Addis Ababa, Ethiopia, 2023(n=103).

Practices questions		Response			
		Yes		No	
		n	%	n	%
Practice of the concepts and principles of the primary and secondary survey during the initial assessment of a trauma patient		83	80.58	20	19.42
Application of primary and secondary managements necessary for the emergency management of acute life-threatening conditions in a timely manner		74	71.84	29	28.16
Procedures performed in the past one year	Airway opening maneuvers(ChinLift, Jaw-Thrust)	84	81.55	19	18.45
	Nasopharyngeal Airway, Oropharyngeal Airway, Laryngeal Mask Airway	76	73.79	27	26.21
	Orotracheal intubation	63	61.17	40	38.83
	Cricothyroidotomy	10	9.71	93	90.29
	IV access	96	93.20	7	6.80
	Intraosseous access	34	33.01	69	66.99
	Hemorrhage control	99	96.12	4	3.88
	Pleural decompression via needle or finger	58	56.31	45	43.69
	chest tube insertion	62	60.19	41	39.81
	Ultrasound (FAST)	53	51.46	50	48.54
	Spine immobilization	79	76.70	24	23.30
	Fracture Reduction and splinting	72	69.90	31	30.10
Confident of your ability to provide initial trauma care		87	84.47	16	15.53
Confident of your ability to triage victims of trauma in mass casualties		68	66.02	35	33.98
Formal training on ATLS previously		24	23.30	79	76.70

5.6. Level of knowledge towards ATLS as assessed towards attitude of participants

From our study participants, about 38(36.9%) of them had very good knowledge of ATLS with positive attitude and 26(25.2%) of them had negative attitude with very good knowledge towards ATLS. On the other hand only 3 participants with positive attitude had a poor knowledge towards ATLS. This was significant with P-value = 0.005 and OR: 3.548 [95%CI; 1.455- 8.656]

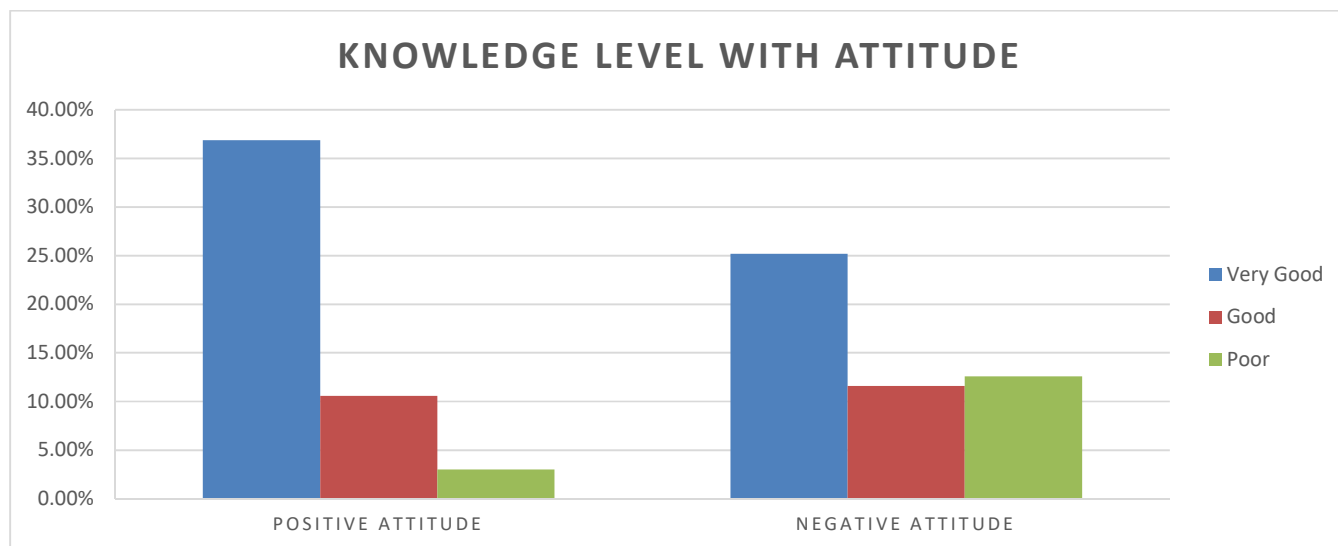


Figure 3: Level of knowledge towards ATLS as assessed towards attitude among residents at SPHMMC, AaBET Hospital, Addis Ababa, Ethiopia, 2023(n=103).

5.7. Level of knowledge towards ATLS as assessed towards practice of participants

From 70 study participants with adequate practice of ATLS, about 54(84.38%) have very good knowledge towards ATLS which was significant with p-value <0.001 and AOR: 9.903 [95%CI; 3.833- 25.586]

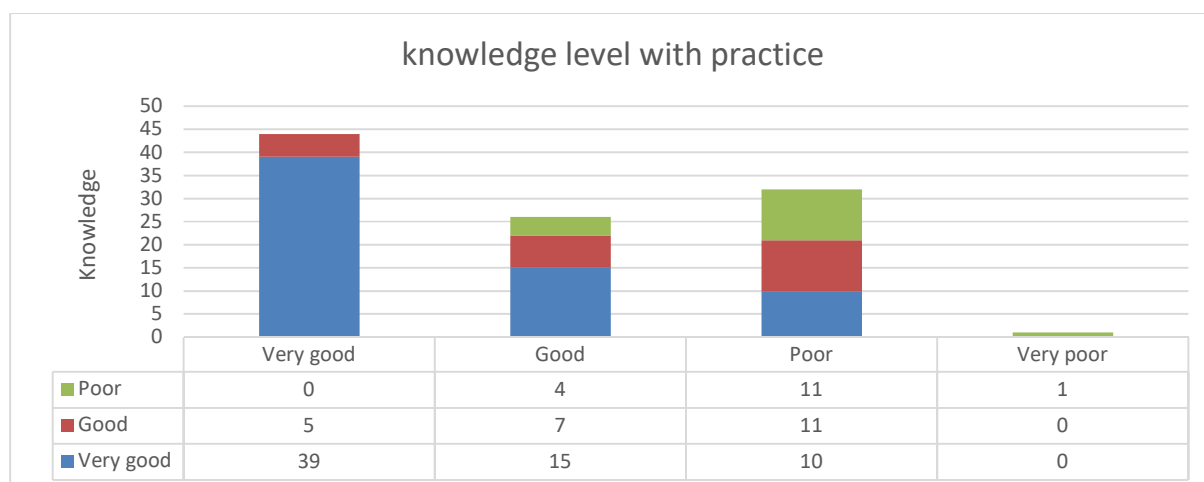


Figure 4: Level of knowledge towards ATLS as assessed towards practice among residents at SPHMMC, AaBET Hospital, Addis Ababa, Ethiopia, 2023(n=103).

5.8. Knowledge assessment with residency program and year of residency

Almost 90% of Emergency and critical care medicine residents had a very good knowledge towards ATLS. As compared to other residency programs Emergency and critical care medicine residents demonstrated better knowledge on ATLS which was significant with p-value <0.001 and AOR: 0.426 [95%CI; 0.282- 0.644].

There were also significant association of the knowledge level with year of residency with p-value< 0.001 and AOR: 0.921 [95%CI; 0.885- 0.960]. (Table 7)

Table 7: Knowledge assessment with residence program and year of residency among residents at SPHMMC, AaBET Hospital, Addis Ababa, Ethiopia, 2023(n=103).

Residency program	Year of residency	Knowledge category						Total
		Very good		Good		Poor		
		n	Percentage (%)	n	Percentage (%)	n	Percentage (%)	
Emergency medicine and critical care	1st year	12	85.7%	1	7.1%	1	7.1%	14
	2nd year	14	93.3%	1	6.7%	0	0.0%	15
	3rd year	18	90.0%	2	10.0%	0	0.0%	20
Neurosurgery	1st year	0	0.0%	3	100%	0	0.0%	3
	2nd year	0	0.0%	2	40.0%	3	60.0%	5
	3rd year	0	0.0%	1	50.0%	1	50.0%	2
	4th year	0	0.0%	2	100%	0	0.0%	2
	5th year	2	66.7%	1	33.3%	0	0.0%	3
	1st year	4	57.1%	0	0.0%	3	42.9%	7

Orthopedics and Traumatology	2nd year	4	50.0%	2	25.0%	2	25.0%	8
	3rd year	1	33.3%	2	66.7%	0	0.0%	3
	4th year	5	55.6%	3	33.3%	1	11.1%	9
Plastic and Reconstructive Surgery	1st year	1	20.0%	1	20.0%	3	60.0%	5
	2nd year	0	0.0%	1	50.0%	1	50.0%	2
	3rd year	0	0.0%	1	50.0%	1	50.0%	2
	4th year	3	100%	0	0.0%	0	0.0%	3
Total		64	62.1%	23	22.3%	16	15.5%	103

5.9. Practice assessment with residence program and year of residency

All 49 residents from Emergency and critical care medicine had an adequate practice towards ATLS, among which most of them 41 (83.7%) were found to have a very good practice level. Almost all 2nd year 14 (93.3%) Emergency and critical care medicine residents had a very good practice while only one resident had a good practice towards ATLS. Among participants from Neurosurgery department, there was a 46.6% of good practice and 53.4% of inadequate practice of ATLS. Amongst all participants of this study only one resident from Orthopedics and Traumatology department demonstrated a very poor practice towards ATLS.(table 8)

Practice level with the residency program regression analysis was found significant with p value <0.001 AOR: 0.127 [95%CI; 0.064- 0.254].

Regression analysis on practice level of each year of residency with their respective residency programs also showed significant association with a p value of <0.001 AOR: 0.814 [95%CI; 0.760- 0.872].

Table 8: Practice assessment with residence program among residents at SPHMMC, AaBET Hospital, Addis Ababa, Ethiopia, 2023(n=103).

Department	Year of residency	Practice level			
		Very Good	Good	Poor	Very Poor
		N (%)	N (%)	N (%)	N (%)
Emergency medicine and critical care	1st year	10 (71.4)	4 (28.6)	0 (0.0)	0 (0.0)
	2nd year	14 (93.3)	1 (6.7)	0 (0.0)	0 (0.0)
	3rd year	17 (85.0)	3 (15.0)	0 (0.0)	0 (0.0)
	Total	41 (83.7)	8 (16.3)	0 (0.0)	0 (0.0)
Neurosurgery	1st year	0 (0.0)	2 (66.7)	1 (33.3)	0 (0.0)
	2nd year	0 (0.0)	2 (40.0)	3 (60.0)	0 (0.0)

	3rd year	0 (0.0)	0 (0.0)	2 (100.0)	0 (0.0)
	4th year	0 (0.0)	0 (0.0)	2 (100.0)	0 (0.0)
	5th year	0 (0.0)	3 (0.0)	0 (0.0)	0(0.0)
	Total	0 (0.0)	7 (46.6)	8 (53.4)	0 (0.0)
Orthopedics and Traumatology	1st year	0 (0.0)	1 (14.3)	6 (85.7)	0 (0.0)
	2nd year	1 (12.5)	2 (25.0)	4 (50.0)	1(12.5)
	3rd year	0 (0.0)	1 (33.3)	2 (66.7)	0 (0.0)
	4th year	1 (11.1)	5 (55.6)	3 (33.3)	0 (0.0)
	Total	2 (7.4)	9 (33.3)	15 (55.6)	1 (3.7)
Plastic Reconstructive Surgery	1st year	0 (0.0)	1 (20.0)	4 (80.0)	0 (0.0)
	2nd year	1 (50.0)	1 (50.0)	0 (0.0)	0 (0.0)
	3rd year	0 (0.0)	1 (50.0)	1 (50.0)	0 (0.0)
	4th year	0 (0.0)	1 (33.3)	2 (66.7)	0 (0.0)
	Total	1 (8.3)	4 (33.3)	7 (58.3)	0 (0.0)
Total		44 (42.7)	26 25.2)	32 (31.1)	1 (1.0)

6. Discussion

The theoretical knowledge and practical skills of ATLS are the basic determining factors of a successful patient's lifesaving technique and are of utmost importance. Attitude plays a great role, especially for starting the ATLS procedure.

According to this study, the level of knowledge is significantly associated with the participants' level of practice and attitude. Similarly, the level of knowledge is also affected by the residency program and year of residency with statistically significant association between those.

In this study, 80.58% of participants had the practice of the concepts and principles of the primary and secondary survey during the initial assessment of a trauma patient. This was consistent with a retrospective study on adult trauma patients treated at a Level I Canadian trauma center, where there was compliance to ATLS protocol of 81.8% for the primary survey and 75% for the secondary survey.

On the contrary to a cross-sectional study conducted among non-specialist doctors involved in trauma care in Nigeria where there is a poor knowledge of ATLS among non-specialist doctors involved in trauma care, our study showed vast majority of participants (87, 84.47%) had good and very good knowledge whereas only (16, 15.53%) demonstrated poor knowledge and none of them had very poor knowledge towards ATLS.

Numerous studies have demonstrated that ATLS training improves trainees' skills, but it is more challenging to demonstrate a positive impact on trauma effects (4, 7, 9). However, 97.09 % of the residents who took part in the study believe that ATLS saves lives.

Although this research shows an overwhelmingly positive view towards ATLS, almost all, 97(94.17 %) of participants were think that, they were agree and strongly agree on knowledge of trauma care could be useful for them. It is important to take into account the response rate and the possibility that many of the nonresponses were interns who had not taken ATLS courses or made up a more unfavorable group. The present findings are consistent with earlier studies conducted by Bruce Cambell and colleagues at the Royal Devon and Exeter Hospitals in the United Kingdom.

8. Conclusion

The research showed that residents at AaBET hospital offering trauma care have adequate knowledge. Because medical professionals who do not understand the need of treating injured patients first will have poor patient outcomes, more training is necessary to raise the level of ATLS understanding in this group.

In particular, if they will be providing care for trauma victims, resident ought to receive ATLS training either before to employment or as early in their career as feasible. Among Residents who treat trauma, this will raise awareness and lessen anxiety. In order to lower costs and make the trainings more accessible to interested parties, the regional health bureaus that employ the doctors might set up the programmers.

Our study demonstrates that the majority of residents had a favorable opinion of ATLS. Few see ATLS mainly as a mandate or career advantage, and most think it saves lives and offers patients real, useful benefits.

The study's findings indicated several significant associations, highlighting the interplay between various factors. Notably, a significant association was observed between knowledge and attitude (P-value = 0.005, OR: 3.548 [95%CI; 1.455-8.656]), emphasizing the link between understanding and positive perceptions. Additionally, a robust connection between knowledge and practice was established (P-value < 0.001, OR: 9.903 [95%CI; 3.833-25.586]), underlining the importance of translating knowledge into effective clinical application.

Furthermore, the study identified a significant association between knowledge assessment and residency program (P-value < 0.001, OR: 0.426 [95%CI; 0.282-0.644]), emphasizing the role of the training program in shaping residents' knowledge. Lastly, a significant association between knowledge level and the year of residency (P-value < 0.001, OR: 0.921 [95%CI; 0.885-0.960]) highlighted the impact of experience and progression within the residency program on the understanding of ATLS.

9. Strength and limitation of the study

9.1. Strength of the study

- ✧ Including all resident programs and year of residence at the trauma center

9.2. Limitations of the study

- ✧ Inadequate representation of residents other than ECCM department due to their small total number
- ✧ Unavailability of previous similar research on the topic over the country
- ✧ The sampling method

10.Recommendations

We recommend conducting more research using this as a starting point at the nation's medical school. Additionally, we recommend the ministry of health residency matching program to give training and certification on ATLS for residents assigned at trauma centers before being recruited to practice and treat trauma patients.

We also recommend the medical schools to include formal ATLS training in the residency teaching curriculum.

11.References

1. https://cdn.who.int/media/docs/default-source/gho-documents/world-health-statistic-reports/worldhealthstatistics_2022.pdf.
2. LifeSupport, A.C.o.S.C.o.T.A.T. and f. Doctors, *Advanced Trauma Life Support: ATLS: Student Course Manual*. American College of Surgeons. Chicago IL, 2018. **Tenth ed.**
3. Jayaraman, S. and D. Sethi, *Advanced trauma life support training for hospital staff*. Cochrane Database of Systematic Reviews, 2009(2).
4. Zewdie, A., *Assessment of Trauma Care in Tertiary Center, Addis Ababa Ethiopia: An Observational Study*. EC Emergency Medicine and Critical Care, 2020. **4**: p. 01-08.
5. Peden, M., *World Report on Road Traffic Injury Prevention*. 2004.
6. Organization, W.H., *Atlas of African health statistics 2022: health situation analysis of the WHO African Region*. 2022: World Health Organization. Regional Office for Africa.
7. Endalamaw, A., et al., *The burden of road traffic injury among trauma patients in Ethiopia: A systematic review and meta-analysis*. Afr J Emerg Med, 2019. **9**(Suppl): p. S3-s8.
8. James, D. and A.M. Pennardt, *Trauma Care Principles*. 2022: StatPearls Publishing, Treasure Island (FL).
11. van Olden, G.D., et al., *Clinical impact of advanced trauma life support*. The American Journal of emergency medicine, 2004. **22**(7): p. 522-525.
14. Tsang, B., et al., *Compliance to advanced trauma life support protocols in adult trauma patients in the acute setting*. World Journal of Emergency Surgery, 2013. **8**(1): p. 1-7.
15. Godier, A., et al., *Compliance with evidence-based clinical management guidelines in bleeding trauma patients*. BJA: British Journal of Anaesthesia, 2016. **117**(5): p. 592-600.
16. Van Maarseveen, O.E., et al., *Effects of the application of a checklist during trauma resuscitations on ATLS adherence, team performance, and patient-related outcomes: a systematic review*. European Journal of Trauma and

Emergency Surgery, 2020. 46: p. 65-72.

17. *Feleke, Y., Assessment of Knowledge and Attitude of ATLS among Interns of Three Different Medical Schools of Ethiopia. AAU, 2019.*
18. *Amaraegbulam, P. and O. Nwankwo, The level of knowledge of the advanced trauma life support protocol among nonspecialist doctors involved in trauma care in Enugu metropolis. Nigerian Journal of clinical practice, 2013. 16(1): p. 67-70.*

12.Assurance of Principal Investigator

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

Name of the student: _____

Signature: _____

Date: _____

Approval of the Primary Advisor

Name of the primary advisor: _____

Signature: _____

Date: _____

Approval of the Advisor

Name of the primary advisor: _____

Signature: _____

Date: _____

13. Annexes

13.1. Questionnaires

PART I: Socio-demographic characteristics

1. Age (years).....
2. Sex
 - A. Male
 - B. Female
3. Residency program
 - A. Emergency medicine and critical care
 - B. Neurosurgery
 - C. Orthopedics and Traumatology
 - D. Plastic and Reconstructive Surgery
4. Year of residency.....
5. Total Work Experience before residency
 - A. 6 month- 2 years
 - B. 2-4 years
 - C. 4-6years
 - D. other (specify).....

PART II: Questions to assess the knowledge

1. ATLS emphasizes the use of a rapid trauma assessment known as:
 - A. ABCDE (Airway, Breathing, Circulation, Disability, Exposure)
 - B. AVPU (Alert, Voice, Pain, Unresponsive)
 - C. FAST (Focused Assessment with Sonography for Trauma)
 - D. Glasgow Coma Scale (GCS)
2. ATLS promotes the concept of the "Golden Hour," which refers to:

- A. Time spent by a patient in the emergency department
 - B. The first hour after a trauma, during which optimal care should be provided
 - C. The time taken to transport a patient from the trauma scene to the hospital
 - D. The time during which surgical intervention should occur after a trauma
3. In a patient with suspected cervical spine injury, which method should be employed to open the airway while minimizing movement of the neck?
- A. Jaw thrust maneuver
 - B. Chin lift maneuver
 - C. Head tilt maneuver
 - D. Stabilize and immobilize the neck first, then perform a chin lift maneuver
4. What is the preferred technique for establishing a definitive airway in a trauma patient who cannot protect their own airway?
- A. Endotracheal intubation
 - B. Bag-mask ventilation
 - C. Nasopharyngeal airway insertion
 - D. Surgical cricothyroidotomy
5. The most important, immediate step in the management of an open pneumothorax is:
- A. 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
6. A patient from a fire has severe respiratory distress, a hoarse voice, soot around the mouth and nares, respiratory rate of 32/minute and stridor. Which of these is the best intervention for this patient?
- A. Intubation
 - B. Fluid resuscitation
 - C. Ventilation by mouth to mask
 - D. Nebulized bronchodilator treatment
7. What is the preferred method for controlling external hemorrhage in an injured extremity?

- A. Application of a tourniquet.
 - B. Direct pressure.
 - C. Elevation of the limb.
 - D. Administration of hemostatic agents.
8. What is the recommended initial fluid resuscitation in hemorrhagic shock according to ATLS?
- A. Colloids.
 - B. Crystalloids.
 - C. Blood products.
 - D. Combination of colloids and crystalloids.
9. Which of these is the preferred site for intraosseous access on a pediatric patient?
- A. Distal femur
 - B. Proximal tibia
 - C. Distal humerus
 - D. Proximal radius
10. Which one of the following statements concerning intraosseous infusion in children is TRUE?
- A. Only crystalloid solutions may be safely infused through the needle.
 - B. Aspiration of bone marrow confirms appropriate positioning of the needle.
 - C. Intraosseous infusion may be utilized indefinitely in the management of injured children.
 - D. Swelling in the soft tissue around the intraosseous site is not a reason to discontinue infusion.
11. The best guide for adequate fluid resuscitation of the burn patient is
- A. Adequate urinary output.
 - B. Reversal of systemic acidosis
 - C. Normalization of the heart rate
 - D. Four ml/kg/percent body burn/24 hours
12. An adult patient has partial thickness burns of the chest, abdomen, perineum and the entire

anterior surface of both legs. Using the Rule of Nines, how much of total body surface area has been burned?

- A. 19%
- B. 28%
- C. 37%
- D. 55%

13. Which of the following statements is true about the secondary survey in ATLS?

- A. It focuses on immediate life-threatening injuries only
- B. It involves a detailed head-to-toe examination of the patient
- C. It is not necessary if the primary survey is conducted properly
- D. It is performed before the primary survey

14. What does the acronym "AMPLE" represent in ATLS history taking?

- A. Allergies, Medications, Previous surgeries, Last oral intake, Events leading to injury
- B. Assessment, Medications, Physical examination, Last oral intake, Events leading to injury
- C. Allergies, Medications, Physical examination, Last oral intake, Events leading to injury
- D. Assessment, Medications, Previous surgeries, Last oral intake, Events leading to injury

15. Which patient is the highest priority in a mass casualty situation?

- A. Severe head injury with agonal respiration
- B. Cardiac arrest
- C. 96% 3rd degree burns
- D. Blunt chest trauma with deviated tracheal and hypotension.

PART III: Questions to assess the attitude of enrolled resident's

Attitude variables	very much disagree	Disagree	Neutral	Agree	Very much Agree
Do you think knowledge of trauma care could be useful to you?					
Do you believe that ATLS course training is essential for practicing your proposed specialty.					
Does ATLS course provide the basic knowledge necessary to resuscitate and stabilize patients according to priority?					
Do you believe ATLS training helps to determine whether a patient's needs exceed the resources of a facility and/or the capability of a provider?					
Do you suggest ATLS training for doctors whose intended specialty does not involve regular management of trauma patients?					
Do you agree that ATLS training and certificate has a major advantage for advancement of your career?					
Do you think there is a need for formal training in ATLS in the residency curriculum?					

PART IV: Questions to assess the practice of enrolled resident's

Variables		Response	
		Yes	No
Do you demonstrate the concepts and principles of the primary and secondary survey during the initial assessment of a trauma patient?			
Do you apply primary and secondary managements necessary for the emergency management of acute life-threatening conditions in a timely manner?			
In the past one year, have you performed the following procedures on actual patient or simulation? (if yes, <i>Please specify the number</i>)	Airway opening maneuvers(Chin-Lift, Jaw-Thrust)		
	Airway device insertion (Nasopharyngeal Airway, Oropharyngeal Airway, Laryngeal Mask Airway)		
	Orotacheal intubation		
	Cricothyroidotomy		
	Vascular access		
	Intraosseous access		
	Hemorrhage control		
	Pleural decompression via needle or finger		
	chest tube insertion		
	Ultrasound (FAST)		
	Spine immobilization		
	Fracture Reduction and splinting		
Are you confident of your ability to provide initial trauma care?			
Are you confident of your ability to triage victims of trauma in mass casualties?			
Have you taken any formal training on ATLS previously?			
If No to question number 6, are there any factors that deter you from training on ATLS? Mark all that is relevant A. No formal training in the residency curriculum B. Not enough training centers C. Expensive course D. Doing a course does not change the outcome of the patient E. Any other please specify: _____.			

