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Assessment of knowledge, attitude and practice towards advanced trauma life support approach among emergency care providers in tertiary hospitals of Bahir Dar city, Ethiopia

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BAHIR DAR UNIVERSITY

COLLEGE OF MEDICINE AND HEALTH SCIENCE

DEPARTMENT OF EMERGENCY AND CRITICAL CARE MEDICINE.

Assessment of knowledge, attitude and practice towards advanced trauma life support approach among emergency care providers in tertiary hospitals of Bahir Dar city, Ethiopia

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TITLE	ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICE TOWARDS ADVANCED TRAUMA LIFE SUPPORT APPROACH AMONG EMERGENCY CARE PROVIDERS IN TERTIARY HOSPITALS OF BAHIR DAR CITY, ETHIOPIA
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Abstract

Background: The Advanced Trauma Life Support (ATLS) protocol is a globally recognized system aimed at improving the care of trauma patients by ensuring timely and effective interventions for their stabilization. Despite generally positive attitudes among healthcare workers, evidence from African studies shows significant gaps in ATLS knowledge and practice. Only small percent of emergency care providers in Bahir dar take formal ATLS training but it is incorporated in trauma teaching books.

Objective: This study aims to assess the knowledge, attitudes, and practices of emergency care providers regarding the ATLS approach in tertiary hospitals of Bahir Dar City, Ethiopia, September 2025 to February 2026.

Methods: Institutional based analytical cross-sectional study was conducted Qamong healthcare workers who were working in Tibebe Gion Comprehensive specialized hospital and Felege Hiwot Comprehensive Specialized Hospital Bahir Dar, Ethiopia. Total sample size was 202. Stratified systemic sampling technique was employed. A structured self-administered questionnaire was used for data collection. The data were collected using kobo collect and analyzed with statistical package for social science version 27. Logistic regression analysis was used to differentiate the effects of each independent variable on the dependent variable.

Results: Among 190 study participants with 94.1 % response rate most (118) (62.1 %) had poor knowledge towards ATLS. More than half (102) (46.3 %) had negative attitude and (110) (57.9 %) had poor practice. Being a senior or resident (AOR 0.05(0.01,0.256) $p<0.01$), having > 5 years' experience, seeing more than 6 patient per week, age between 20-30 and ATLS training (AOR 0.352(0.131,0.95) $p=0.039$) increased odds of having good knowledge. In addition, having advanced trauma life support training contributes to positive attitude. Having good knowledge and positive attitude contributes to better practice.

Conclusion: The important determinant was ATLS training, as trained and young providers showed significantly better knowledge. The absence of training in ATLS was the main determinants of poor knowledge, and poor knowledge combined with a negative attitude was associated with poor practice.

Keywords: advanced trauma life support, knowledge, attitude, practice, trauma, Bahir Dar

Acronyms

TGCSH	Tibebe Gion Comprehensive Specialized Hospital
FHCSH	Felege Hiwot Comprehensive Specialized Hospital
HUSCH	Hawassa university Comprehensive Specialized Hospital
LMIC	low- and middle-income countries
AAU	Addis Ababa University
ATLS	Advanced Traumatic Life Support
ED	Emergency Department
EM	Emergency Medicine
EMD	Emergency medicine department
SPSS	Statistical Package for Social Science
TASH	Tikur Anbessa Specialized Hospital
SPHMMC	Saint Paul hospital millennium medical college
xABCDE Exposure	Exsanguinating hemorrhage, Airway, Breathing, Circulation, Disability,
UK	United Kingdom
ETAC	Emergency Trauma Assessment and Care
RTI	Road Traffic Injury
TM	Trade Mark
EMT	Emergency medical technicians
ECCM	Emergency and critical care medicine

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1. Background

1.1 Introduction

Injury is a major public health problem worldwide, causing substantial premature death and serious nonfatal consequences that may lead to permanent impairment (1). Injury consequences extend beyond health to have a significant macroeconomic impact. In 2019, injuries, such as road traffic crashes, unintentional injuries, self-harm, and interpersonal violence caused 4.3 million deaths globally, accounting for 10% of the total deaths and over 40 million years lived with disability (YLDs)(2). While injury affects all ages, youths, and young adults are particularly vulnerable. Moreover, the injury burden is disproportionately high in low- and middle-income countries (LMICs). According to the 2019 Global Burden of Diseases, Injuries, and Risk Factors (GBD) study there are significant regional variations in the global incidence of injuries. Over 90% of injuries that occur globally take place in LMICs, where there are inadequate safety precautions and medical services available (1, 2).

A trauma systemic review on prevalence of trauma in Ethiopia was conducted in 2019 E.C. Among the injured participants most of cases were living in Addis Ababa followed by Gondar and Jimma. Severe road traffic accident, occupational injury, and surgical patients were among the major risk factors of trauma. The mortality rate of the trauma case fatality was reached about 4%.(3) In Ethiopia pooled prevalence of RTI among trauma patients in Ethiopian hospitals was 31.5%. This finding was comparable with a prevalence report in sub-Saharan Africa (32%) and low- and middle-income countries (13% to 31%)(4).

Advanced trauma life support (ATLS) is a protocol for management of acute trauma victims. It was first initiated in 1976 by an American Orthopedic surgeon, James Styner and in 1980 it was accepted by the American College of Surgeons Committee on Trauma. It is now widely accepted as the standard protocol for initial assessment and treatment of acute trauma victims(5, 6).

The program has grown each year in the number of courses and participants. As of 2018 the course has trained more than 1.5 million participants in more than 75,000 courses around the world. Currently, an average of 50,000 clinicians are trained each year in over 3,000 courses. The greatest growth in recent years has been in the international community, and this group currently represents more than half of all ATLS activity(5).

In December 2017, Hawassa University was chosen as the pilot site for the ACS Surgical Training Collaborative, a joint initiative between the ACS, the College of Surgeons of East, Central and Southern Africa (COSECSA), and 13 US-based institutions that have surgical faculty engaged in global health. The inaugural ATLS course was successfully launched in February 2023(7).

ATLS training significantly improves trauma management outcomes, reduces preventable mortality, and enhances clinical decision-making in emergency settings. These findings support the continued expansion of ATLS training programs, especially in resource-constrained regions, and emphasize the importance of structured refresher courses to maintain trauma care efficiency(8). Trauma life support training programs are associated with reduced mortality in trauma patients, but the evidence is observational(9).

Education of advanced trauma life support principles, with the ATLS™ Course in a current leading forefront, has changed how the trained physician thinks and perceives initial evaluation of the traumatized patient, and has been met by enthusiasm in most instances. However, recognition of perceived shortcomings such as the utility and recommendations for diagnostic imaging, high costs, low compliance (even among general surgeons in the US), and critique of the predomination of "North-American principles" and the organization's rigidity on change has spurred discussion on the value of ATLS, in particular outside the US and even the development of a European alternative course(10).

Trauma training for front-line providers is a critical component of injury mitigation and trauma systems strengthening. ATLS has become the global “gold standard” for trauma evaluation, but that its utility in a low-resource setting coupled with the financial and logistical challenges of implementing the course has limited its reach(11). ATLS program significantly improved trauma patient outcome in a developing country, thus supporting the concept of international promulgation of this program for physicians(12).

1.2 Statement of the problem

Trauma is a leading cause of death and disability worldwide, particularly in low- and middle-income countries (LMICs), where the incidence of traumatic injuries often outpaces healthcare resources and preparedness(13). By 2030, road traffic crashes are predicted to become the fifth leading cause of death worldwide. (14, 15) Trauma remains the leading cause of death among children and adults under the age of 46 years, accounting for nearly half of all deaths in these age groups.

Despite generally positive attitudes among healthcare workers, evidence from African studies shows significant gaps in ATLS knowledge and practice. In a study of house officers in Sudan, it was found that while over 90% of participants acknowledged the importance of ATLS and thought it should be mandatory, their general understanding of ATLS principles was inadequate, and less than half had received formal ATLS training. This disparity reveals a crucial gap between optimistic viewpoints and real readiness to effectively manage trauma patients(16).

Doctors who completed ATLS course or a shorter version of it were more efficient in managing simulated trauma cases and Studies show that teaching advanced trauma life support course to medical students results in significantly improve in knowledge and skill(17, 18).

Without proper ATLS training, healthcare providers may struggle to manage trauma cases effectively, leading to higher mortality rates. Lacking knowledge and practice in ATLS may also result in incorrect assessment, increasing severity of injuries and complicating the recovery process(5).

In Ethiopia, particularly in tertiary hospitals of Bahir Dar City, there is limited research on the knowledge, attitudes, and practices of emergency care providers regarding the ATLS approach. Despite the Residency programs, there is a significant gap in the proper and consistent application of ATLS guidelines within emergency departments.

This study assessed the knowledge, attitudes, and practices of emergency care providers regarding the ATLS approach in Tertiary hospitals of Bahir Dar City. The goal was to identify any deficiencies in their understanding or implementation of trauma care standards. Recognizing gaps in knowledge, attitudes, and practices provide insights into potential barriers to effective

trauma care and help guide the development of targeted interventions, such as annual ATLS training and resource allocation, to improve trauma patient outcomes in the region.

1.3 Significance of the study

This study was significant for several reasons, particularly in the context of trauma care in Ethiopia and other resource-limited settings. The findings of this study provide valuable insights into the level of knowledge, attitude, and practice regarding the Advanced Trauma Life Support (ATLS) approach and associated factors among emergency care Provider in tertiary hospitals of Bahir Dar city. It also helps in preparing training courses and allocating budgets in human resource development. It also helps in Guiding Policy about Trauma and ATLS Training Initiatives

In conclusion, this study was significant because it tried to address a major gap in trauma care and provides useful insights that can help improve trauma care which directly benefiting both healthcare providers and patients. These Research also provides reference for future Researchers and policy makers.

2. Literature review

2.1 ATLS Course History

The ATLS course was established after a tragic plane crash in 1976, which devastated an entire family. The pilot, an orthopedic surgeon named James Styner, was seriously injured while his wife was killed and three of his children sustained critical injuries. He was horrified at the treatment his family received at a local hospital in rural Nebraska and decided that the established system for managing the severely injured was wrong. A group of local surgeons and physicians, the Lincoln Medical Education Foundation, together with the University of Nebraska founded local courses aiming at teaching advanced trauma life support skills(19).

A new approach to providing care for individuals who suffer major life-threatening injury premiered in 1978, the year of the first ATLS course. This prototype ATLS course was field-tested in conjunction with the Southeast Nebraska Emergency Medical Services. One year later, the ACS COT, recognizing trauma as a surgical disease, enthusiastically adopted the course under the imprimatur of the College and incorporated it as an educational program(5).

ATLS was based on the assumption that appropriate and timely care could significantly improve the outcome of injured patients. The original intent of the ATLS Program was to train doctors who do not manage major trauma on a daily basis, and the primary audience for the course has not changed. However, today the ATLS method is accepted as a standard for the “first hour” of trauma care by many who provide care for the injured, whether the patient is treated in an isolated rural area or a state-of-the-art trauma center(5).

The concept behind the ATLS course has always been straightforward. Traditionally, the method used to treat injured patients in medical schools mirrored that for patients with an undiagnosed medical condition. This involved taking a comprehensive medical history, including past medical issues, conducting a physical examination from head to toe, developing a differential diagnosis, and compiling a list of additional tests to confirm the diagnosis. While this method was suitable for managing conditions like diabetes mellitus and various acute surgical illnesses, it fell short for patients facing life-threatening injuries. Consequently, a change in approach was necessary(5).

Three underlying concepts of the ATLS Program were initially difficult to accept:

1. Treat the greatest threat to life first.
2. Never allow the lack of definitive diagnosis to impede the application of an indicated treatment.
3. A detailed history is not essential to begin the evaluation of a patient with acute injuries.

The result was the development of the ABCDE approach to evaluating and treating injured patients. These concepts also align with the observation that the care of injured patients in many circumstances is a team effort that allows medical personnel with special skills and expertise to provide care simultaneously with surgical leadership of the process(5).

Thus, the mnemonic xABCDE defines the specific, ordered evaluations and interventions that should be followed in all injured patients:

Exsanguinating Hemorrhage

Airway with restriction of cervical spine motion

Breathing

Circulation, stop the bleeding

Disability or neurologic status

Exposure (undress) and Environment (temperature control)

The ATLS course emphasizes the rapid initial assessment and primary treatment of injured patients, starting at the time of injury and continuing through initial assessment, lifesaving intervention, reevaluation, stabilization, and, when needed, transfer to a trauma center. The course consists of pre-course and post-course tests, core content, interactive discussions, scenario-driven skill stations, lectures, interactive case presentations, discussions, development of lifesaving skills, practical laboratory experiences, and a final performance proficiency evaluation. Upon completing the course, participants should feel confident in implementing the skills taught in the ATLS course(5).

In Ethiopia 3 years back Eight emergency and critical care specialists, four orthopedic surgeons, 14 general surgeons, one colorectal surgeon, and one plastic surgeon attended the inaugural ATLS Provider Courses. In this group, 28 participants passed the course, 16 were identified as

having instructor potential, eight completed the ATLS instructor course, and four were certified as ATLS instructors(20). The first Ethiopian ATLS Training center is in HUSCH and still continued to be the only one(20).

2.2 Knowledge and Practice

Lacking knowledge and practice in ATLS may result in incorrect assessment, increasing severity of injuries and complicating the recovery process. The appropriate practice of ATLS is essential for enhancing the survival and outcomes of trauma patients and maintaining the resilience of communities in the face of traumatic events(5, 16).

If properly implemented, trauma systems can reduce mortality of severe trauma patients by at least 15%(21). Training physicians to manage multiple trauma patients is an essential part of developing proper trauma systems. The primary endpoint of any clinical educational activity is its impact on improving health care(6, 21). Medical staff who have either undertaken the full ATLS course or an abbreviated form of the course were more effective in their management of the simulated trauma cases(18). It is highly recommended that ATLS courses should be taught for all doctors who are involved in the management of multiple trauma patients(22).

Knowledge and practical skills gained by ATLS participants decline over time if these skills are not utilized. This supports the need for re-certification. They are of the opinion that ATLS re-certification should be under taken every four years so as to update candidates with recent advances in trauma management. Trauma management continuously changes depending on new scientific evidence that leads to modification of recommendations and guidelines(23, 24). There is some evidence that educational initiatives improve knowledge of hospital staff of available emergency interventions(25). Basic training in medical schools is not enough and does not prepare clinicians adequately for emergencies(26).

A survey was conducted to determine differences in perspective towards Advanced Trauma Life Support (ATLS) between emergency medicine (EM) physicians and other specialties (OS), assess its value in the management of acute trauma, and identify areas in the course which could be revised or updated. The survey was devised and completed by physicians after ATLS. Of 26 course participants, there were 11 EM physicians (42%), four family practitioners (15%), four surgeons (15%), four internists (15%), two pediatricians (8%), and one anesthesiologist (4%).

Both groups found ATLS useful and relevant. Proposed changes from the EM perspective include shortening ATLS to one day and increased use of EM instructors(27).

ATLS® is a mandatory joint interoperability standard for military physicians and it is also an Army Individual Critical Task Lists for many areas of concentration (AOC)/military occupational specialty (MOS). Only counting completion of this course as one ICTL is a missed opportunity for the time spent by Army medical providers and limits the exposure of ATLS® to select AOCs/MOSs. or mandate(28).

ATLS India surveyed 2,500 randomly selected providers trained during a decade for efficacy and use of ATLS in their clinical practice Cognitive, psychomotor, organizational, and affective impact of ATLS is overwhelmingly positive in the Indian scenario. Until formal trauma systems are established, ATLS remains the best hope for critically injured patients in resource-constrained settings(29). ATLS training significantly reduced 30-day mortality in severely injured patients, demonstrating its effectiveness even in resource-limited settings(30).

A study done in Africa on the level of knowledge of the Advanced Trauma Life Support protocol among non-specialist doctors involved in trauma care showed a deficiency in knowledge of ATLS among non-specialist doctors engaged in trauma care in Enugu, Nigeria. They recommended that ATLS training should be adopted by hospitals involved in doctors training and ATLS certification ought to be a prerequisite to employing surgical residents(31, 32) Continuous medical staff education with effective methods is essential for improving the qualification of medical personnel(33).

A study done in Kenya showed Nearly half of the participants had poor knowledge of Advanced Trauma Life Support (ATLS) principles, and 62.4% failed to implement these protocols in practice, indicating a significant gap in trauma care proficiency. Since skills were found to significantly decline within six months to two years after training, this deficiency is primarily attributable to a lack of structured training and a natural decline in competency over time. It's interesting to note that there is an inverse relationship between age and expertise; younger practitioners are typically more familiar with the protocols, while older professionals exhibit a decline in knowledge, probably as a result of long-term skill deterioration in the absence of frequent reinforcement(31).

In Ethiopia Cross-sectional study method was conducted in interns of selected medical schools: Addis Ababa University, St. Paul millennium medical college and Arsi University College of health sciences. The study demonstrated interns who are from the institutions who is providing ATLS has better knowledge to that of other institution who does not provide that. Further trainings are therefore required to improve the level of knowledge of ATLS in this group as medical personnel who do not appreciate the priorities in treatment of the injured will have poor patient outcome. (6).

2.3 Attitude towards ATLS

Attitude toward Advanced Trauma Life Support (ATLS) among house officers in Khartoum state hospitals was positive. The majority of participants perceived ATLS as an essential and valuable component of trauma care, with 91% indicating that the course should be compulsory for doctors. In addition, most respondents believed that ATLS should be recommended for both junior and senior physicians, reflecting broad acceptance of its relevance across professional levels. Even for doctors whose specialties do not routinely involve trauma management, two-thirds of participants considered ATLS essential, while others still acknowledged its added value(16).

In a study held in UK which was completed by trainees in accident and emergency (A & E) (26), anesthetic (82), general surgical (26), orthopedic (42) and other (5) posts in different hospitals (response rate 66%).Of the trainees, 78% had done an ATLS course and, of these, 83% considered ATLS a 'Major advantage' or 'essential' for practicing their proposed specialty - 100% for A & E,94% for orthopedics, 92% for general surgery, and 75% for anesthetics.. Over 90% had positive attitudes towards ATLS, and 74% selected 'genuine improvement of management of trauma patients' as the most important reason for doing the course: 93% thought ATLS saved lives. This survey has shown that most trainees view ATLS positively. They believe that it provides genuine practical benefit for patients, and very few regard ATLS primarily as a career advantage(34).

In study done in Kenya nearly all respondents agreed that ATLS knowledge is essential for managing trauma patients, with a large majority strongly supporting the view that ATLS certification should be mandatory for staff working in Accident and Emergency departments. Most participants also believed that ATLS training improves teamwork, clinical confidence, and

overall effectiveness in the trauma setting, and almost nine out of ten reported that ATLS knowledge had directly benefited patient care in their own experience(31).

In Ethiopia despite positive perception, attitudes toward ATLS may still be influenced by access to training, professional role, and prior exposure to trauma care. Some participants express frustrations related to the rigid structure of the course, cost, or limited availability, particularly in resource-constrained settings. Overall, a positive attitude toward ATLS reflects strong acceptance of its principles and pointed the importance of expanding training opportunities and integrating ATLS concepts into undergraduate and postgraduate medical education(6).

2.4 Factors associated with knowledge, attitude and practice of ATLS

Attendance of formal ATLS training emerged as the strongest determinant of good knowledge and practice. In the Sudanese study among house officers, participants who had completed ATLS training demonstrated significantly better self-assessed competence across all core trauma care domains, including airway management, shock resuscitation, neurological assessment, and adherence to the ABCD approach. In contrast, lack of training was strongly linked to poor knowledge despite generally positive attitudes toward ATLS. Common barriers to training included limited course availability, high cost, and busy work schedules, which directly affected knowledge acquisition and skill development(16).

In addition to formal training, workplace-related and experiential factors were important in shaping ATLS practice. Regular work in emergency departments, frequent exposure to trauma cases, and the presence of seniors with good teaching skills were significantly associated with better ATLS practice, particularly among those who had already received ATLS training. Trauma exposure alone, however, was insufficient to improve competence in untrained providers, suggesting that experience must be reinforced by standardized protocols and education. Supportive institutional environments—such as availability of equipment, organized trauma teams, and ongoing refresher workshops—were also perceived as critical enablers of effective ATLS implementation(16, 31).

3. Conceptual framework

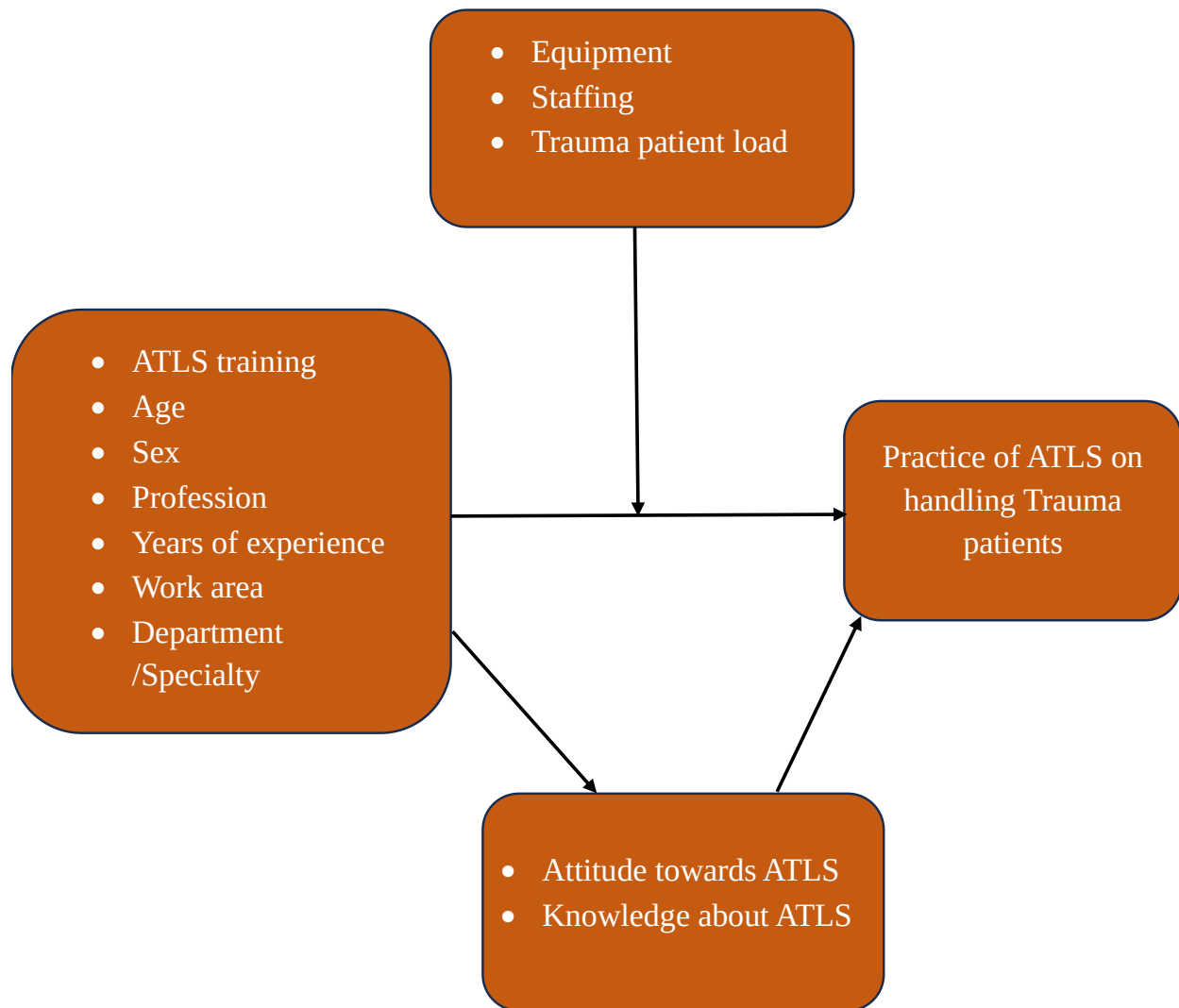


Figure 1 conceptual framework adapted from Guantai NK. Knowledge, Attitude and Practice of Advanced Trauma Life Support Principles Among Health Care Workers in Accident and Emergency Departments in Nairobi, Kenya: A Multi-center Study: University of Nairobi; 2023.

4. Objectives

4.1 General objective

To assess the level of knowledge, attitude, and practice regarding the Advanced Trauma Life Support (ATLS) approach and its associated factors among emergency care providers in tertiary hospitals of Bahr Dar city, Ethiopia, September 2025 to February 2026.

4.2 Specific objective

1. To assess the level of knowledge of emergency care providers about the principles and protocols of the ATLS approach among emergency care providers in tertiary hospitals of Bahr Dar city Ethiopia, September 2025 to February 2026.
2. To assess the attitude of emergency care providers in applying ATLS principles during the management of trauma patients among emergency care providers in tertiary hospitals of Bahr Dar city, Ethiopia, September 2025 to February 2026.
3. To investigate practice levels regarding ATLS among different emergency care providers in tertiary hospitals of Bahr Dar city, Ethiopia, September 2025 to February 2026.
4. To identify factors associated with knowledge attitude and practice of ATLS trauma approach among emergency care providers in tertiary hospitals of Bahr Dar city Ethiopia, September 2025 to February 2026.

5. Methods

5.1 Study Design

The study was institutional based analytical cross-sectional study conducted among emergency care providers to assess knowledge, attitude, and practice (KAP) and associated factors toward Advanced Trauma Life Support (ATLS) trauma approach in 2026.

5.2 Study setting

Bahir Dar City is the capital city of Amhara National Regional State. Bahir Dar City is located on the southern beach of Lake Tana, the source of the Blue Nile (Abay). Bahir Dar City is one of the 10 most beautiful cities in Africa. There are two big tertiary hospitals serving the community. These are Tibebe Gion Specialized Comprehensive Hospital and Felege Hiwot Specialized Comprehensive Hospital(35).

Tibebe Gion Specialized Comprehensive Hospital is a prominent healthcare facility located in Bahir Dar 10 km away from the city. It serves as a critical provider of medical services to the local population and surrounding areas. Emergency department has triage, red, orange and yellow green area. ED is multidisciplinary area Consisting of EMTS, nurses, medical interns, ECCM, surgical, ENT, internal medicine, anesthesia and orthopedic residents and seniors. Daily patient flow is 30 patient per day(36).

Felege Hiwot Specialized Comprehensive Hospital is Another big hospital serving a lot of patients annually. It is located in the city. ED is multidisciplinary but no residents. Daily patient flow is around 50 patients daily. 15 percent of the patients are trauma cases.(37)

Profession	TGSCH	FHSCH
Nurse	28	44
GP	0	12
Resident	104	4
Seniors	38	8
EMT	6	8
Interns	96	4

Table 1 ED staffs in TGSCH and FHSCH(36, 37)

5.3 Study period

The study was conducted among emergency care providers in Tertiary hospitals of Bahir Dar city from September 1 2025 to January 30 2026.

5.4 Source Population

Health care providers involved in Emergency care in Tertiary Hospitals of Bahir Dar

5.5 Study population

Emergency care providers of TGSCCH and FHSCCH which includes nurses, EMTs, interns, GPs, residents and seniors (EMCC, ACCPM, General Surgery, ENT, Orthopedics)

5.6 Inclusion and Exclusion criteria

5.6.1 Inclusion criteria

All emergency care providers which were involved directly in the management of trauma patients and gave consent

5.6.2 Exclusion criteria

Emergency care providers who were on leave

5.7 Study Variables

5.7.1 Dependent variable

- Level of knowledge of ATLS
- Practice on handling Trauma patients
- Attitude on ATLS principles

5.7.2 Independent variables

- Age
- Gender
- ATLS training
- Work Area
- Profession

- Department/Specialty
- Trauma patient load
- Levels of experience
- Staffing
- Equipment (collar, large bore IV, hard board)

5.8 Operational Definitions

The variables were operationalized based on the previous study on the knowledge, attitude and practice(35, 38)

1. Knowledge – is arranged of information and understanding stored in memory concerning ATLS

Good Knowledge – those who scored above 50% or or more of the knowledge questions correctly.

Poor knowledge = those who scored below 50% of knowledge questions.

2. Attitude - it is a positive or a negative view the way Emergency care think about ATLS

Positive - those who scored above mean

Negative – those who scored below mean

3. Practice: the act of practicing ATLS approach in Trauma patients

Good practice – those who scored above mean

Poor practice – those who scored below mean

5.9 Sample size

The actual sample size for the study was calculated using the single population proportion formula

$$n = [(z\alpha/2)^2 p(1-p)]/d^2$$

Where,

n=sample size,

$z\alpha/2$ =95% confidence level,

p=the proportion of knowledge Attitude and Practice of healthcare workers toward ATLS (50%) was used (no similar study in Ethiopia)

d=margin of error (0.05)

Calculated sample size for infinity population was 384 but to correct sample size for this study we used Finite Population Correction (FPC) formula for finite population

Number of health professional which are directly involved in Trauma in both Hospital are expected to be 352.

$$n_f = n_0 / (1 + (n_0 - 1)/N) = 384 / (1 + (384 - 1)/352) = 384 / 2.09 = 184$$

where n_f - the corrected sample size for the finite population

n_0 - the sample size for infinite population

N - the total number of the population

Adding 10 % non-response rate which is 18 minimum sample size determined will be 202

5.10 Sampling technique

This study employed a stratified systematic random sampling method to select 202 participants from a total population of 352 healthcare professionals across two institutional strata (TGSCH, N=272 and FHSCH, N=80). Proportional allocation yielded samples of 156 from TGSCH and 46 from FHSCH, with further allocation to six professional categories within each stratum. For systematic selection, a sampling interval (k-value) was calculated and k was 2. Final sample size was 190 respondents with 94.1% response rate.

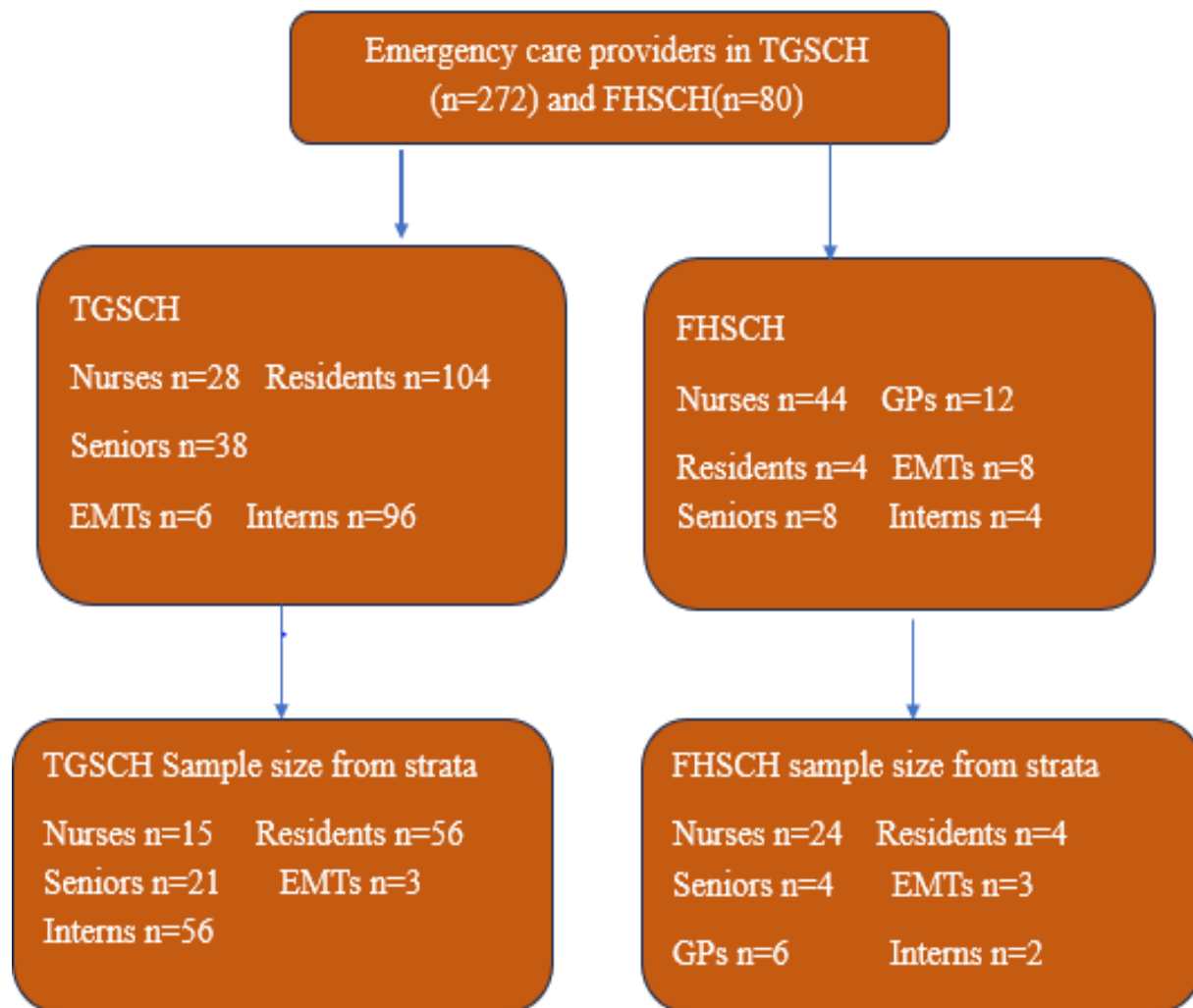


Figure 2 Sampling techniques and sample size from each stratum at TGSCH and FHSCH

5.11 Data collection

5.11.1 Data collection instrument and procedures

The data was collected using English version of structured, pre-tested and self-administered closed-ended questionnaires adapted from reviewing different related literatures considering the objectives of the study(6, 31).The questionnaires consists of four parts 10 sociodemographic, 10 knowledge, 10 attitude and 10 practice questions. Data was collected from online and offline electronic system called kobo toolbox (Harvard Humanitarian Initiative, 2023). Two interns were trained for 2 days on data collection and collected data using online and offline links and also using kobo android application. Reliability of the questions were checked using Cronbach's alpha. It was 0.769 for knowledge questions, 0.818 for practice and 0.74 for attitude questions. Cumulatively it was 0.853 which has good internal consistency.

5.11.2 Data quality control

All the collected data was organized and analyzed by the principal investigator. It was daily monitored through kobo website for progress and incompleteness. Pretesting of the questionnaire was done in 5% of the sample size before the actual data Collection take place and corrections on the instruments were made accordingly.

5.11.3 Data analysis

Data were exported to SPSS version 27 and assessed for completeness and subsequently variables were coded. The study population characteristics variables were analyzed using descriptive parameters including mean, frequency and proportion and results are displayed with tables and graphs. Model fitness for analysis was done using Hosmer-Lemeshow test and it was fit for all 3 dependent variables. Multicollinearity among the independent variables was assessed using Variance Inflation Factor (VIF). All VIF values were found to be less than 5. Variables that fit for model were analyzed using binary logistic regression. The association of independent and dependent variables was analyzed using bi-variable and multiple variable forms of logistic regression model. Variables with p-value of < 0.25 on bi-variant regression were considered as having association and further analyzed with multiple variable logistic regression models. The presence of statistically significant association described with P-value of 0.05 with 95% CI. The strength of association is assessed using crude and adjusted odds ratio with their respective 95% CI.

5.12 Ethical considerations

The study was conducted after ethical clearance was obtained from the ethical Institutional Review Board (IRB) of the Bahir Dar university college of health science IRB protocol number is 5060/2025. Then, data was collected after getting an official letter of permission from the IRB office. Verbal consent from Emergency care providers was obtained and the objective of the study was explained to them. And questionnaires didn't have any personal identifiers and Data collected from the study was stored in a file and didn't get revealed to a third party.

6.Results

6.1 Sociodemographic Characteristics

The study involved 190 Emergency care Providers. Among 190 participants, 72.1% were male and 56.3% were aged 31–50 years. Of the participants, slightly more than half (53.7%) had fewer than five years of job experience. 26.3% had received ATLS instruction. Seniors and residents made up the largest group (41.6%), followed by interns and general practitioners (32.6%) and nurses and emergency medical technicians (25.8%). Most (58.9%) emergency care providers primary work area is ED.

Table 2 Sociodemographic characteristics

Variable	Category	n	%
Age (years)	20–30	83	43.7
	31–50	107	56.3
Sex	Female	53	27.9
	Male	137	72.1
Work Experience	< 5 years	102	53.7
	≥ 5 years	88	46.3
Department	Emergency Medicine	79	41.6
	Anesthesia	15	7.9
	Surgical (General surgery, orthopedics, ENT)	96	50.5
ATLS Training Status	Untrained	140	73.7
	Trained	50	26.3
Primary Work Area	Emergency Department	112	58.9
	ICU or OR	78	41.1
Trauma Patient per Week	1–5 patients	89	46.8
	≥ 6 patients	101	53.2
Professional Category	Seniors & Residents	79	41.6
	Interns & General Practitioners	62	32.6
	Nurses & EMTs	49	25.8

ATLS Advanced Trauma Life support

6.2 Knowledge of Emergency care providers towards ATLS

Among the 190 Emergency care providers surveyed, the majority (62.1%) demonstrated poor knowledge, while more than one-third (37.9%) demonstrated good knowledge regarding ATLS trauma approach assessed in this study.

A high percentage of participants correctly identified the initial priority in managing a critically injured trauma patient, 71.6%, and the minimum Glasgow Coma Scale score indicating severe head injury, 71.1%. Similarly, 70.0% of respondents correctly answered the question about the immediate life-saving intervention for tension pneumothorax, and 68.4% correctly identified the meaning of the “E” component in the ABCDE primary survey. Knowledge of the secondary survey components was relatively better. Eighty percent of participants correctly identified the AMPLE history mnemonic. Additionally, 61.1% identified the appropriate initial intervention for cardiac tamponade when immediate surgical intervention was not available.

However, only 34.5% of participants correctly identified the most sensitive indicator of hypovolemic shock, and 50.0% accurately identified a non-definitive airway technique according to ATLS guidelines. Slightly more than half, 54.2%, correctly identified the most important initial parameter when assessing disability during the primary survey. The lowest score was found on identifying the most sensitive indicator of hypovolemic shock in a trauma patient. (see table 3).

6.3 Attitude of emergency care providers towards ATLS

Out of the 190 study participants, more than half demonstrated a positive attitude toward ATLS principles. 102 participants (53.7%) were classified as having a positive attitude, while 88 participants (46.3%) exhibited a negative attitude.

Nearly all participants agreed or strongly agreed that ATLS principles are essential for effective trauma management (97.9%) and that adherence to ATLS protocols improves patient outcomes (95.8%). Similarly, 69.5% agreed or strongly agreed that importance of teamwork in the successful application of ATLS principles.

More than 87.9% of participants reported confidence in their ability to manage critically injured trauma patients using ATLS guidelines. In addition, 95.8% believed that all healthcare professionals involved in trauma care should be ATLS certified, and 60.5% agreed or strongly

Table 3 Knowledge level of emergency care providers towards ATLS trauma approach in Tertiary hospitals of Bahir Dar city, Bahir Dar, Ethiopia, February 2026

no	Questions	Knowledge level of Emergency care providers (with correct answer)
1	According to ATLS principles, what is the initial priority in the management of a critically injured trauma patient?	136(71.6%)
2	Which of the following is the most sensitive indicator of hypovolemic shock in a trauma patient?	66(34.5%)
3	What is the recommended initial fluid resuscitation for an adult trauma patient in hemorrhagic shock?	113(59.5%)
4	In a patient with suspected tension pneumothorax, what is the immediate life-saving intervention?	133(70%)
5	The "E" in the primary survey (ABCDE) stands for:	130(68.4%)
6	Which of the following is not a definitive airway technique according to ATLS guidelines?	95(50%)
7	What is the minimum Glasgow Coma Scale (GCS) score indicating a severe head injury?	135(71.1%)
8	During the secondary survey, what does the "AMPLE" history mnemonic stand for?	152(80%)
9	A patient presents with signs of cardiac tamponade after blunt chest trauma. What is the most appropriate initial intervention if immediate surgical intervention is not available?	116(61.1%)
10	When assessing for disability (D) in the primary survey, what is the most important initial assessment parameter?	103(54.2%)

agreed that ATLS provides a clear and systematic approach to trauma patient assessment and management.

Regarding training and professional development, most respondents (82.1%) agreed or strongly agreed that regular ATLS recertification is necessary to maintain trauma management skills. However, motivation to update trauma care knowledge and skills showed a lower level of agreement, with 44.2% agreeing or strongly agreeing and nearly half (49.5%) reporting a neutral response.

Attitude related to institutional and system support revealed there is gap. A substantial proportion of participants (89.0%) agreed or strongly agreed that lack of resources, including equipment and staffing, is a major barrier to implementing ATLS principles in their practice setting. Furthermore, only 24.2% agreed or strongly agreed that their institution adequately supports continuous medical education in trauma care, while 73.6% disagreed or remained neutral. (see table 4)

Table 4 Attitude of emergency care providers towards ATLS in Bahir Dar city, Bahir Dar, Ethiopia, February 2026

Attitude Questions		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. ATLS principles are essential for effective management of trauma patients.	n	0	2	2	100	86
	f	0.00%	1.10%	1.10%	52.60%	45.30%
2. Regular ATLS recertification is necessary for maintaining trauma management skills.	n	0	2	32	54	102
	f	0.00%	1.10%	16.80%	28.40%	53.70%
3. I feel confident in my ability to manage a critically injured trauma patient using ATLS guidelines.	n	0	3	20	100	67
	f	0.00%	1.60%	10.50%	52.60%	35.30%
4. Teamwork is crucial for successful application of ATLS principles in a trauma setting.	n	0	3	55	107	25
	f	0.00%	1.60%	28.90%	56.30%	13.20%
5. Adherence to ATLS protocols improves patient outcomes in trauma cases.	n	0	1	7	81	101
	f	0.00%	0.50%	3.70%	42.60%	53.20%
6. Lack of resources (e.g., equipment, staff) is a major barrier to implementing ATLS principles in my practice setting.	n	0	1	20	91	78
	f	0.00%	0.50%	10.50%	47.90%	41.10%
7. I believe that all healthcare professionals involved in trauma care should be ATLS certified.	n	0	2	6	97	85
	f	0.00%	1.10%	3.20%	51.10%	44.70%
8. ATLS provides a clear and systematic approach to trauma patient assessment and management.	n	0	7	68	79	36
	f	0.00%	3.70%	35.80%	41.60%	18.90%
9. I am motivated to update my knowledge and skills in trauma care regularly.	n	1	11	94	65	19
	f	0.50%	5.80%	49.50%	34.20%	10.00%
10. My institution adequately supports continuous medical education in trauma care.	n	4	70	70	41	5
	f	2.10%	36.80%	36.80%	21.60%	2.60%

6.4 Practice of Emergency care providers towards ATLS

Among the 190 respondents, 110 (57.9%) had poor ATLS practice, whereas 80 (42.1%) had good practice.

A large majority of participants reported that they often or always followed the ABCDE approach during the primary survey for trauma patients (87.4%). Most respondents indicated that they often or always considered life-threatening chest injuries early in the Primary survey of trauma patients (86.8%) and around two third accurately estimated blood loss and initiated appropriate fluid resuscitation according to ATLS guidelines (74.2%).

Regular documentation of trauma assessments and interventions was commonly reported, with 83.1% of participants stating that they often or always documented care in accordance with institutional protocols. In addition, 84.7% reported that they often or always escalated care or transferred patients to a higher level of care when necessary.

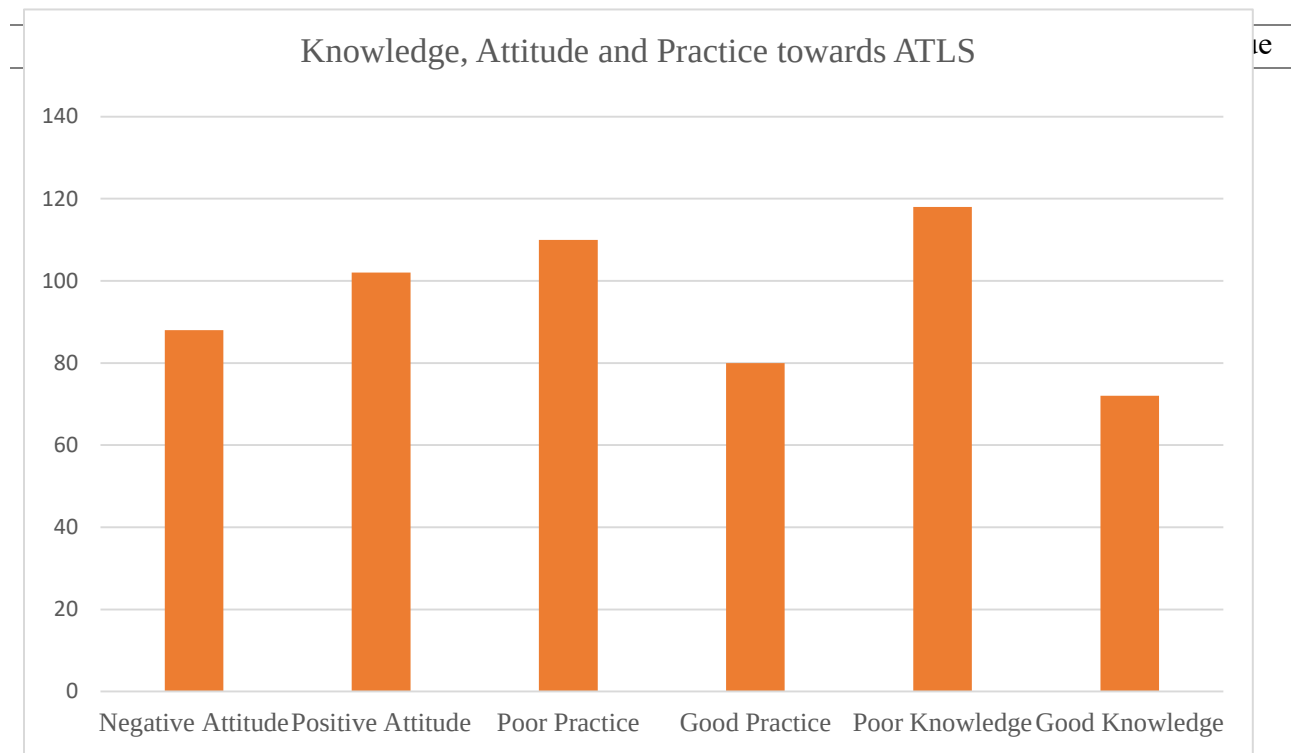
Moderate levels of adherence were observed for other practices. Approximately 51.6% of participants reported that they often or always maintained cervical spine immobilization until clearance, while 51.6% indicated that they often or always performed a comprehensive secondary survey, including AMPLE history and head-to-toe examination. Regular reassessment of vital signs and neurological status was less consistent, with 31.1% reporting that they often performed this activity, and nearly half (48.4%) indicating that they did so sometimes.

Team-based practices of ATLS was low. While 31.6% of respondents reported often involving other team members in the management of complex trauma cases, more than half (56.3%) indicated that this occurred only sometimes. Participation in trauma case debriefings or reviews was comparatively low, with only 28.4% reporting often or always engaging in such activities, while 67.4% reported rarely or sometimes participating. (see table 5)

Table 5 Practice of emergency care providers towards ATLS trauma approach in tertiary hospitals of Bahir Dar, Ethiopia, February 2026

Practice questions		1 = Never	2 = Rarely	3 = Sometimes	4 = Often	5 = Always
1. I systematically follow the ABCDE approach (Primary Survey) for every trauma patient.	n	1	2	21	109	57
	%	0.50%	1.10%	11.10%	57.40%	30.00%
2. I ensure cervical spine immobilization is maintained until cleared in all appropriate trauma patients.	n	1	13	89	42	45
	%	0.50%	6.80%	46.80%	22.10%	23.70%
3. I regularly reassess vital signs and neurological status of trauma patients after initial interventions.	n	2	37	92	59	0
	%	1.10%	19.50%	48.40%	31.10%	0.00%
4. I accurately estimate blood loss and initiate appropriate fluid resuscitation based on ATLS guidelines.	n	1	7	41	99	42
	%	0.50%	3.70%	21.60%	52.10%	22.10%
5. I consider and rule out life-threatening chest injuries (e.g., tension pneumothorax, massive hemothorax) early in the assessment.	n	2	2	21	85	80
	%	1.10%	1.10%	11.10%	44.70%	42.10%
6. I perform a thorough secondary survey, including an AMPLE history and head-to-toe examination.	n	2	12	78	56	42
	%	1.10%	6.30%	41.10%	29.50%	22.10%
7. I involve other team members (e.g., nurses, surgeons, radiologists) promptly in the management of complex trauma cases.	n	6	17	107	60	0
	%	3.20%	8.90%	56.30%	31.60%	0.00%
8. I document my trauma patient assessments and interventions thoroughly and according to institutional protocols.	n	1	7	24	96	62
	%	0.50%	3.70%	12.60%	50.50%	32.60%
9. I escalate care to a higher level or transfer patients when necessary, following established protocols.	n	2	1	26	87	74
	%	1.10%	0.50%	13.70%	45.80%	38.90%
10. I participate in debriefings or reviews of trauma cases to identify areas for improvement	n	8	65	63	34	20
	%	4.20%	34.20%	33.20%	17.90%	10.50%

Figure 3 Knowledge, Attitude and Practice towards ATLS trauma approach among emergency care providers of Bahir Dar city tertiary hospital, Bahir Dar, Ethiopia January 2026



6.5 Factors associated with knowledge of ATLS among emergency care providers

In the multivariable logistic regression analysis age, work experience, ATLS training status, patient load, and profession were associated with the level of ATLS knowledge among emergency care providers.

Participants aged 20–30 years had significantly higher odds of good ATLS knowledge compared with those aged 31–50 years (AOR = 4.25; 95% CI: 1.02–17.70; $p = 0.047$). Emergency care providers with more than five years of work experience were significantly have higher odds of good knowledge compared with those with less than five years of experience (AOR = 0.29; 95% CI: 0.09–0.92; $p = 0.035$).

Participants who were untrained in ATLS had significantly lower odds of having good knowledge compared with those who had received ATLS training (AOR = 0.35; 95% CI: 0.13–0.95; $p = 0.039$).

		Poor	Good			
Age	20 - 30 years	59	24	0.5(0.272,0.919)	4.249(1.02,17.701)	0.047*
	31 - 50 years	59	48	1	1	
Sex	Female	45	8	0.203(0.089,0.462)	0.761(0.257,2.25)	0.621
	Male	73	64	1	1	
Experience variable	<5 years	69	33	0.601(0.333,1.085)	0.286(0.089,0.917)	0.035*
	>5 years	49	39	1	1	
Attitude						
Department practicing	Emergency Medicine	61	18	0.349(0.18,0.676)	0.698(0.203,2.406)	0.569
	Anesthesia	5	10	2.364(0.751,7.436)	1.574(0.376,6.596)	0.535
	Surgical	52	44	1	1	
ATLS training	Untrained	99	41	0.254(0.129,0.5)	0.352(0.131,0.95)	0.039*
	Trained	19	31	1	1	
Primary Work Area	ED	78	34	0.459(0.252,0.836)	2.748(0.745,10.134)	0.129
	Other	40	38	1	1	
Patient per week	1-5 patient/wk.	65	24	0.408(0.222,0.75)	0.351(0.144,0.857)	0.021*
	>6 patient/wk.	53	48	1	1	
Equipment Availability	Unavailable	69	50	1.614(0.867,3.003)	0.994(0.405,2.44)	0.989
	Available	49	22	1	1	
Profession	Seniors and Residents	23	56	1	1	
	Inters and GPs	49	13	0.109(0.05,0.238)	0.05(0.01,0.256)	<0.01**
	Nurses and EMTs	46	3	0.027(0.008,0.095)	0.01(0.001,0.075)	<0.01**

Table 6 Factor associated with knowledge of emergency care providers towards ATLS in tertiary hospitals of Bahir Dar, Ethiopia, February 2026

Those managing more than six trauma patients per week had significantly higher odds of good knowledge compared with those managing 1–5 patients per week (AOR = 0.35; 95% CI: 0.14–0.86; p = 0.021). Profession was strongly associated with knowledge level. Compared with senior physicians and residents, interns and general practitioners had significantly lower odds of good knowledge (AOR = 0.05; 95% CI: 0.01–0.26; p < 0.01). Similarly, nurses and emergency medical technicians had markedly lower odds of good knowledge which was very significant (AOR = 0.01; 95% CI: 0.001–0.08; p < 0.01). (see table 5)

		Negati ve	Posi tive			
Sex	Female	29	24	0.626(0.331,1.185)	0.925(0.413,2.07)	0.849
	Male	59	78			
Experience	<5 years	41	61	1.706(0.958,3.035)	1.445(0.606,3.443)	0.406
	>5 years	47	41			
ATLS training	Untrained	85	55	0.041(0.012,0.139)	0.053(0.015,0.187)	<0.01 **
	Trained	3	47			
Primary	ED	46	66	1.674(0.934,2.999)	2.059(0.874,4.853)	0.099
Work Area	Other	42	36			
Equipment	Unavailable	48	71	1.909(1.053,3.461)	1.017(0.514,2.01)	0.962
Availability	Available	40	31			
Profession	Seniors and Residents	31	48	0.837(0.426,1.645)	0.467(0.152,1.434)	0.184
	Inters and GPs	27	35	0.409(0.197,0.85)	0.488(0.166,1.436)	0.193
	Nurses and EMTs	30	19			

Table 7 Factor associated with emergency care providers attitude towards ATLS in Bahir Dar City tertiary hospitals, Bahir Dar, Ethiopia, February 2026

6.6 Factors Associated with Attitude of emergency care providers towards ATLS

During Binary logistic regression Sex, ATLS training, experience, equipment availability, profession and primary work area were analyzed separately then entered to multivariate analysis. Only one independent variable was found statistically significant association with attitude. Participants who had not received ATLS training were 95% less likely to have a positive attitude compared with trained participants (AOR = 0.053; 95% CI: 0.015–0.187; $p < 0.01$). (see table 6)

6.7 Factor associated with emergency care provider practice of ATLS

During binary logistic regression sex, Experience of health professionals, ATLS training status, Availability of Equipment, Professional role, Attitude and Knowledge towards ATLS were analyzed separately which was found to be significant and entered to multivariate analysis. Attitude and knowledge were found to be significantly associated with practice of ATLS among emergency care providers.

In the multivariable logistic regression analysis, knowledge level and attitude were independently associated with ATLS practice. Participants with poor knowledge had significantly lower odds of good ATLS practice compared with those who had good knowledge (AOR = 0.433; 95% CI: 0.191–0.981; $p = 0.045$). Similarly, participants with a negative attitude toward ATLS were 54 % less likely to demonstrate good practice compared with those with a positive attitude (AOR = 0.459; 95% CI: 0.221–0.956; $p = 0.038$). (see table 7)

Table 8 Factor associated with practice of ATLS among emergency care providers of Bahir Dar city tertiary hospitals, Bahir Dar, Ethiopia, February 2026

		Practice		COR 95% C.I.	AOR 95% C.I.	p-value
		Poor	Good			
Knowledge	Poor	83	35	0.253(0.136,0.47)	0.433(0.191,0.981)	0.045*
	Good	27	45			
Attitude	Negative	66	22	0.253(0.136,0.471)	0.459(0.221,0.956)	0.038*
	Positive	44	58			

7. Discussion

This study assessed knowledge attitude and practice of ATLS trauma approach among emergency care providers in Bahir Dar tertiary hospitals. The study found significant gap in three

domains which is 62.1% had poor knowledge, 46.3% had a negative attitude and 57.9% had poor ATLS practice. The study emphasizes the need for expanded ATLS training access across professional categories, regular refresher programs to decrease knowledge decay among experienced providers, and organizational support systems that allows protocol adherence despite clinical pressures.

This study showed 62.1 % poor knowledge in the emergency care providers about ATLS practices. These findings were supported by a study done in Kenya that shows health care providers Working in Emergency and acute trauma has 50 % poor knowledge(31). The higher rate of poor knowledge can be explained due to less ATLS training only 26 % trained in our study and less concern for trauma patients in recent years. In study done in intern doctors of Ethiopia they have 58.5 % poor knowledge which is similar to our study(6).

In the multivariable logistic regression analysis of these study age, work experience, ATLS training status, patient load, and profession were associated with the level of ATLS knowledge among emergency care providers. Participants aged 20–30 years had significantly 4.25 times high likely to have good ATLS knowledge compared with those aged 31–50 years which is supported by previous Kenyan study after they have done ANOVA test between age and knowledge(31). This is because Compared to their older counterparts, younger professionals (aged 20-30) benefit from more recent medical education where ATLS principles are thoroughly integrated into curriculum and they are chronologically closer to academics which decreases knowledge decay.

Finding from a Sudanese study shows 91% believe ATLS should be compulsory, 85% recommend it for all doctors, 57.8% report substantial post-training improvement which strongly reinforce our study(16). In our study Participants who were untrained in ATLS had significantly lower odds of having good knowledge compared with those who had received ATLS training (65 %). This is explained by low ATLS trained professional (26 %) and minimal support from the institution on improving CME which in our study only 24.2% agreed or strongly agreed that their institution adequately supports continuous medical education in trauma care.

Other finding in our study is professional disparities which compared to seniors and resident nurses and interns have less likely to have good knowledge 95 % and 99 % respectively. Which is confirmed by Kenyan study doctor vs nurse 64.5 % vs 42.3% level of knowledge with strongly significant on ANOVA test(31).

There is a disparity in ATLS knowledge Age and experience on our study which is explained by most experienced emergency care providers (60 %) and 63.3 % of them are aged between 31- 50 years are nurses which in our study has poor knowledge which is also associated with high rate of knowledge decay. Another result was those who manage >6 trauma cases per week had 65% higher odds of having good knowledge when compared to those with lower volumes. Healthcare providers who manage more than six trauma cases per week are repeatedly exposed to the ATLS primary and secondary survey principles, which augment theoretical knowledge through hands-on practice. Frequent involvement in trauma resuscitation increases experiential learning, improves recall of critical steps (airway, breathing, circulation, disability, exposure), and improves clinical reasoning under pressure.(23)

This study indicated that positive attitude was 53.7 % but nearly all participants agreed or strongly agreed that ATLS principles are essential for effective trauma management (97.9%) and that adherence to ATLS protocols improves patient outcomes (95.8%) which compared to studies done in Kenya and Sudan was lower 100 % and 91 % respectively(16, 31).

The study also assessed practice level of emergency care providers towards ATLS which 42.1 % has good practice compared to study done in Kenya it is high but it is difficult and impossible to measure true practice by using self-administered questionnaires because of social desirability bias(31). In our study health workers who lack knowledge have 57% less odds of having good practice, while those who possess a negative attitude had 54% less odds of having good practice. This important discovery revealed the role of the sequential competency approach in ATLS protocol implementation, in which both knowledge and attitude are equally important in ensuring the quality of clinical practice. It also confirms that both cognitive understanding and attitude are equally important and non-substitutive in ensuring the quality of clinical practice. In India Lack of trained staff (64.1%) and attitude issues (48.1%) were the major drawbacks in implementing ATLS at the workplace(29).

8. Strength of the study

The strengths of this study lie in the fact that the two major tertiary hospitals were involved and the high response rate (94.1%) make the results more representative and reliable. The structured questionnaire was also pre-tested and based on other validated questionnaires to ensure the quality of the data and its consistency with other studies. Moreover, the results of this study are valid and not based on descriptive results alone; the multivariable logistic regression was also carried out to determine the independent predictors of good knowledge, positive attitude, and good practice.

9. Limitation of the study

- The cross-sectional design of the study makes it difficult to establish causality between associated factors and knowledge, attitude, and practice toward ATLS.
- The assessment of practice was not conducted through a direct observation approach, which might make it difficult to accurately measure real-time practice with ATLS guidelines.
- Resources, and support systems were not fully explored, which might have affected the participants' responses and ATLS implementation.

10. Conclusion

The results of this particular study revealed that there was a knowledge gap, attitude, and practice of ATLS trauma care among emergency care providers in tertiary hospitals in Bahir Dar. More than half of the participants have poor knowledge (62.1%) and poor practice (57.9%) of ATLS trauma care. Nearly half of the participants have a negative attitude toward ATLS trauma care. Although most of the participants have positive attitude of the importance of ATLS trauma care and its impact on improving trauma patient outcomes, there was a clear discrepancy between perceptions and implementation of ATLS trauma care.

This study also shows younger age and ATLS trained participants have better knowledge levels of ATLS trauma care. In addition, no formal training in ATLS trauma care, professional category differences, low trauma patient exposure, and knowledge decay among work experience providers are all major contributors to low knowledge levels of ATLS trauma care. Furthermore, poor knowledge levels and negative attitude have strong associations with poor practice levels of ATLS trauma care.

11. Recommendations

- For Ministry of health, CPD directors and NGOs
 - ATLS training should be expanded and made available to all categories of emergency care practitioners, with a special concern on nurses, interns and EMTs.
 - Regular refresher training and CPD programs should be encouraged and incorporated into the system to reduce knowledge decay among experienced practitioners.
- For hospital administrations and Medical Director
 - The administration of hospitals should provide system-level support for ATLS implementation by ensuring the availability of standardized ATLS protocols and essential equipment for trauma care
 - Supervisory and mentoring support should also be encouraged to bridge the gap between knowledge and practice competence among practitioners.
- Finally, future research studies should consider the use of longitudinal research designs and objective practice competence measures such as direct observation or clinical audits to assess the actual implementation of ATLS and its outcomes on patient care and outcomes.

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13. Annexes

13.1 Annex 1: Information Sheet and Consent form

This study aims to assess the level of knowledge, attitude, and practice regarding the Advanced Trauma Life Support (ATLS) approach among emergency care providers

Good morning/good afternoon.

Hello! My name is _____. I am here today to collect data on the level of knowledge, attitude, and practice regarding the Advanced Trauma Life Support (ATLS) approach among emergency care providers in Tibebe Ghion Specialized Hospital and Felege Hiwot Specialized Comprehensive Hospital. The study is being conducted by Dr Yohannes Erkie from Bahir Dar university Emergency and Critical care medicine, post graduate program. This study aims to assess the level of knowledge, attitude, and practice regarding the Advanced Trauma Life Support (ATLS) approach among emergency care providers. You are being asked to take part in this study and to respond genuinely. Your cooperation and willingness are greatly helpful to conduct this research. Your name will not be written in this form and will never be used in connection with any information. You tell us & this questioner may take a maximum of 20 minutes to complete.

There is no possible risk associated with participating in this study except the time spent for completing the questionnaire. Your participation is voluntary and you are not obligated to answer any question you do not wish to answer. If you feel discomfort with the question, it is your right to drop it any time you want.

If you have questions regarding this study or would like to be informed of the results after its completion, please feel free to contact the principal investigator.

Principal investigator:

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13.2 Annex 2 Questionnaire

Advanced Trauma Life Support (ATLS) Knowledge, Attitude, and Practice (KAP) Questionnaire

This questionnaire aims to assess the knowledge, attitudes, and practices regarding Advanced Trauma Life Support (ATLS) among healthcare professionals. Your honest responses are valuable for this research. Answer all questions to the best of your ability.

Part 1: Demographic and general Information

1. Age: _____ years
2. Gender:
 - Male
 - Female
3. Profession/Role: (e.g., Senior, Nurse, EMT, Resident, Intern, GPs)
4. Years of Clinical Experience:
 - <1 year
 - 1–5 years
 - 6–10 years
 - 10 years
5. Department/Specialty: (e.g., Emergency Medicine, General Surgery, ACCPM, ENT, Orthopedics)
6. Have you ever attended an ATLS course?
 - Yes
 - No
7. If yes to Q6, when was your last ATLS course completion/recertification?
 - Within the last 2 years
 - 2–4 years ago
 - 4 years ago
 - Never certified, but attended lectures/training sessions/Simulation

8. Where do you primarily practice.....ED/ICU/OR
9. On average, how many trauma patients do you manage per week?
- 0–2
 - 3–5
 - 6–10
 - 10
10. Is there staff shortage that interfere with proper trauma resuscitation?
- ☐ Yes ☐ No
11. Is equipment available to perform ATLS principles in your unit?
- ☐ Yes ☐ No

Part 2: Knowledge Questions

1. According to ATLS principles, what is the initial priority in the management of a critically injured trauma patient?
 - a) Establishing intravenous access
 - b) Controlling external hemorrhage
 - c) Airway maintenance with cervical spine protection
 - d) Performing a FAST exam
 - e) Obtaining a detailed patient history
2. Which of the following is the most sensitive indicator of hypovolemic shock in a trauma patient?
 - a) Blood pressure
 - b) Heart rate
 - c) Urine output
 - d) Capillary refill time
 - e) Mental status
3. What is the recommended initial fluid resuscitation for an adult trauma patient in hemorrhagic shock?
 - a) 500 mL of 5% Dextrose in Water
 - b) 500ml to 1 liter of crystalloid
 - c) 250 mL of colloid
 - d) 2 units of packed red blood cells
 - e) 50 mL of hypertonic saline
4. In a patient with suspected tension pneumothorax, what is the immediate life-saving intervention?
 - a) Chest tube insertion

- b) Needle decompression
 - c) Endotracheal intubation
 - d) Oxygen via non-rebreather mask
 - e) Surgical exploration
5. The "E" in the primary survey (ABCDE) stands for:
- a) Environment/Exposure
 - b) Extremities
 - c) Electrocardiogram
 - d) Emergency
 - e) Evaluate
6. Which of the following is **not** a definitive airway technique according to ATLS guidelines?
- a) Orotracheal intubation
 - b) Nasotracheal intubation
 - c) Cricothyroidotomy
 - d) Laryngeal mask airway (LMA)
 - e) Tracheostomy
7. What is the minimum Glasgow Coma Scale (GCS) score indicating a severe head injury?
- a) <8
 - b) <10
 - c) <13
 - D) <11
8. During the secondary survey, what does the "AMPLE" history mnemonic stand for?
- a) Allergies, Medications, Past medical history, Last meal, Events leading to injury
 - b) Airway, Medications, Pain, Level of consciousness, Extremities
 - c) Age, Mechanism of injury, Pain, Labs, Examinations
 - d) Air, Muscle, Pressure, Light, Environment
 - e) None of the above
9. A patient presents with signs of cardiac tamponade after blunt chest trauma. What is the most appropriate initial intervention if immediate surgical intervention is not available?
- a) Thoracotomy
 - b) Pericardiocentesis
 - c) Chest tube insertion
 - d) Fluid resuscitation
 - e) Administration of inotropes

10. When assessing for disability (D) in the primary survey, what is the most important initial assessment parameter?
- a) Pupil size and reactivity
 - b) Motor strength in all four limbs
 - c) Glasgow Coma Scale (GCS) score
 - d) Cranial nerve examination
 - e) Sensory level

Part 3: Attitude Questions

(Please indicate your level of agreement with the following statements using a Likert scale:

1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree)

	1 = Strongly Disagree	2 = Disagree	3 = Neutral	4 = Agree	5 = Strongly Agree
1. ATLS principles are essential for effective management of trauma patients.					
2. Regular ATLS recertification is necessary for maintaining trauma management skills.					
3. I feel confident in my ability to manage a critically injured trauma patient using ATLS guidelines.					
4. Teamwork is crucial for successful application of ATLS principles in a trauma setting.					
5. Adherence to ATLS protocols improves patient outcomes in trauma cases.					
6. Lack of resources (e.g., equipment, staff) is a major barrier to implementing ATLS principles in my practice setting.					
7. I believe that all healthcare professionals involved in trauma care should be ATLS certified.					

8. ATLS provides a clear and systematic approach to trauma patient assessment and management.					
9. I am motivated to update my knowledge and skills in trauma care regularly.					
10. My institution adequately supports continuous medical education in trauma care.					

Part 4: Practice Questions

(Please indicate how often you perform the following actions when managing a trauma patient:
1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Always)

	1 = Never	2 = Rarely	3 = Sometimes	4 = Often	5 = Always
1. I systematically follow the ABCDE approach (Primary Survey) for every trauma patient.					
2. I ensure cervical spine immobilization is maintained until cleared in all appropriate trauma patients.					
3. I regularly reassess vital signs and neurological status of trauma patients after initial interventions.					
4. I accurately estimate blood loss and initiate appropriate fluid resuscitation based on ATLS guidelines.					
5. I consider and rule out life-threatening chest injuries (e.g., tension pneumothorax,					

massive hemothorax) early in the assessment.					
6. I perform a thorough secondary survey, including an AMPLE history and head-to-toe examination.					
7. I involve other team members (e.g., nurses, surgeons, radiologists) promptly in the management of complex trauma cases.					
8. I document my trauma patient assessments and interventions thoroughly and according to institutional protocols.					
9. I escalate care to a higher level or transfer patients when necessary, following established protocols.					
10. I participate in debriefings or reviews of trauma cases to identify areas for improvement					

13.3 Declaration form

Declaration

I, the under signed, declared that this is my original work, has never been presented in this or any other University, and that all the resources and materials used for the research, have been fully acknowledged.

Principal investigator

Name: Dr Yohannes Erkie

Signature: _____

Date: _____

Advisors

Name: Dr Tilahun Chekol

Signature: _____

Date: _____

Name: Dr Semahagn Abebaw

Signature: _____

Date: _____



Name: Mrs. Bethelhem Belete

Signature: _____

Date: _____