



HARAMAYA UNIVERSITY
COLLEGE OF HEALTH AND MEDICAL SCIENCES
SCHOOL OF MEDICINE

Knowledge, Attitude and Utilization of the WHO Surgical Safety Checklist and Factors Associated with Utilization Among Surgical Health Professionals Team in Two Public Hospitals of Harar, Eastern Ethiopia.

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Haramaya University, Harar, Ethiopia

Knowledge, Attitude and Utilization of the WHO Surgical Safety Checklist and Factors Associated with Utilization Among Surgical Health Professionals Team in Two Public Hospitals of Harar, Eastern Ethiopia.

A THESIS SUBMITTED TO THE DEPARTMENT OF ANESTHESIOLOGY, CRITICAL CARE AND PAIN MEDICINE, SCHOOL OF GRADUATE STUDIES, HARAMAYA UNIVERSITY

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE SPECIALITY CERTIFICATE IN ANESTHESIOLOGY, CRITICAL CARE AND PAIN MEDICINE

College: Health and Medical Science

School: Medicine

Department: Anesthesiology, Critical Care and Pain Medicine

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December 2025 G.C

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APPROVAL SHEET
HARAMAYA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

I hereby certify that I have read and evaluated this thesis entitled “knowledge, attitude and utilization of the who surgical safety checklist and associated factors among surgical health professionals team in public hospitals of harar, eastern ethiopia, 2025.”. Prepared under my guidance by Dr. Masresha. I recommend that it can be submitted as fulfilling the thesis requirement.

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As a member of the board of examiners of the Open thesis defense examination, I certify that I have read and evaluated the thesis prepared by Dr. Masresha and examined the candidate. I recommend that the thesis should be accepted as fulfilling the thesis requirement for the speciality certificate in anesthesiology, critical care and pain medicine.

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BIOGRAPHICAL SKETCH

My name is Dr. Masresha Yohannes. I was born in Hawassa, Ethiopia. I have completed my elementary and secondary education at Adventist primary, st' Daniel comboni secondary and preparatory schools from 2003–2011. In 2012, I have joined Hawassa University College of health and medical science and graduated in 2020. After graduation, I was employed and have served at Wolkite University Specialized Hospital and Kebado Primary Hospital, until January 2023.

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Acronyms and Abbreviations

ACCPM:	Anesthesiology, Critical Care and Pain Medicine
AOR:	Adjusted Odds Ratio
ASA:	American Society of Anesthesiology
BMI:	Body Mass Index
CI:	Confidence Interval
COR:	Crude Odds Ratio
HFCSUH:	Hiwot Fana Comprehensive Specialized University Hospital
IHREC:	Institutional Health Research Ethical Review Committee
KAP:	Knowledge, Attitude and Practice
LMICs:	Low and Midle Income Countries
OR:	Odds Ratio
SSC:	Surgical Safety Checklist
WHO:	World Health Organization

Abstract

Background: The World Health Organization Surgical Safety Checklist is an evidence based instrument designed to decrease surgical errors and enhance patient outcomes. Despite its proven value, its use remains inconsistent in many settings, including low resource hospitals. Limited evidence exists on the knowledge, attitude, and utilization of the checklist among surgical teams in public hospitals of Harar, Eastern Ethiopia.

Objective: To assess the knowledge, attitude, and utilization of the WHO Surgical Safety Checklist and identify associated factors among surgical health professionals working in public hospitals of Harar, Eastern Ethiopia.

Methods: An institution based cross sectional study was conducted among 170 surgical health professionals selected using simple random sampling. Knowledge, attitude, and practice levels were described using frequency and percentage. Multivariable logistic regression was used to identify independent predictors of consistent checklist utilization. Adjusted odds ratios with 95 percent confidence intervals were reported, and statistical significance was declared at $p < 0.05$.

Results: Most participants demonstrated strong knowledge 78% (CI:0.71-0.83) of the checklist's key components, and the majority held a positive attitude 65% (CI:0.57-0.72) toward its usefulness and relevance to patient safety. However, utilization was lower 47% (CI:0.4-0.55), particularly for steps such as team introductions and postoperative planning. Nurses were more likely to use the checklist consistently than physicians (AOR 4.38, 95% CI 1.90 to 10.09). Staff working in OBGYN or orthopedic units had lower odds of consistent use compared with those in general surgery (AOR 0.48, 95% CI 0.24 to 0.96).

Conclusion: Although surgical staff demonstrated high knowledge and favorable attitudes toward the WHO Surgical Safety Checklist, actual adherence to checklist steps was inconsistent. Profession and working unit were key determinants of checklist utilization. Targeted interventions focusing on training, surgical team engagement, and unit specific implementation strategies may improve consistent use of the checklist.

Keywords: knowledge, attitude, utilization, WHO Surgical Safety Checklist, associated factors, Harar, Eastern Ethiopia.

1. Introduction

1.1. Background

For more than a century, surgery has been a vital part of medical care all throughout the world. The burden of surgical intervention on public health systems will only increase as the prevalence of cardiovascular disease, cancer, and severe injuries rises (Shrime, M.G., et al. 2015). Surgery is frequently the sole treatment that can lessen impairments and lower the chance of dying from common illnesses. Millions of individuals receive surgery each year, and it is estimated that 13% of all disability-adjusted life years worldwide are caused by surgical procedures (Ferrari., et al. 2021).

Patient safety is at the center of every surgical procedure. The patient's wellbeing must be closely monitored during the entire surgical operation due to the intricacy of the treatments and the risks involved. Surgical safety encompasses protocols and guidelines from pre-operative planning to post-operative care in order to minimize risks and guarantee optimal outcomes during surgical procedures (Hussain, A.K., et al. 2023).

Preoperative safety precautions are intended to improve the patient's condition, reduce risks, and guarantee that the surgical team is ready. These strategies come under the headings of anesthesia planning, infection control, risk assessment, patient identification, and team communication (Rothrock, J.C., et al. 2022). Patient verification, surgical site marking, and informed consent are all important processes (Sheedy, C. and Richard, S., 2020). Risk assessment entails examining medical history, comorbidities, medications, and airway evaluation, with appropriate laboratory testing and imaging if necessary (Sameed, M., et al. 2021).

Intraoperative surgical safety emphasizes sterility, patient monitoring, protocol adherence, and efficient communication (Chellam Singh, B. and Arulappan, J., 2023). While difficult airway planning, neuromuscular blockade monitoring, and fluid management are anesthetic safety precautions, continuous ASA-standard monitoring aids in the detection of hemodynamic instability (Law, J.A., et al. 2021). Sterile procedures, good hand hygiene, and antibiotic redosing when needed are all part of strict infection control (Joseph, M.P.S., et al. 2022).

Postoperative surgical safety emphasizes patient monitoring, complication prevention, pain treatment, and efficient handover (Rose, M., 2016). Continuous monitoring of the airway, oxygenation, hemodynamics, and neurological condition during the immediate postoperative phase aids in the early detection of problems such as hypoxia and bleeding (Plante, A., Ro, E. and Rowbottom, J.R., 2012).

The World Health Organization (WHO) Surgical Safety Checklist (SSC) is a straightforward yet effective tool that is intended to encourage cooperation, communication, and adherence to crucial safety procedures during three crucial stages of surgery: before anesthesia is induced (Sign In), before skin incision (Time Out), and before exiting the operating theater (Sign Out). In order to minimize avoidable mistakes and guarantee that surgical teams operate in a coordinated, safety-conscious manner, the checklist addresses crucial safety precautions such as patient identification, site marking, allergy confirmation, and tool counts. (WHO, 2009).

Despite its well-documented benefits, the implementation of the WHO SSC remains inconsistent, especially in resource-constrained environments (Mensah, A.K., 2024). In many low-resource hospitals, including those in Ethiopia, checklist use is often incomplete or superficial, with surgical teams bypassing certain elements or viewing the checklist as a mere formality (Bashford, T., et al. 2014). The reasons for this are multifaceted, involving knowledge gaps, attitude barriers, logistical constraints, and institutional challenges. These challenges may be even more pronounced due to staffing shortages, heavy surgical caseloads, and limited access to regular training on checklist use (Barimani, B., et al. 2022).

1.2. Statement of the problem

An estimated 4.2 million deaths worldwide are attributed to surgical complications each year, making surgical safety a significant public health concern (Weiser., et al. 2016). Compared to high-income nations, surgical mortality rates are considerably greater in low and middle income countries like Ethiopia, where up to 10% of surgery patients experience potentially fatal complications (Endeshaw, A.S., 2023).

Although a number of factors, such as resource limitations, delayed presentations, and infrastructural issues, contribute to these poor results, avoidable intraoperative errors are a major component (Batchelder, A.J., 2022).

A crucial instrument for lowering intraoperative mistakes is the WHO SSC. Not everyone implements the WHO SSC successfully, despite the fact that it has been widely acknowledged as a global standard to lower surgical risks (Waehle, H.V., 2020). For example, although awareness of the checklist is reasonably high in Ethiopia, practical adherence to it is limited. Only 35% of surgical staff regularly used the checklist when doing procedures, despite the fact that 80% of them were aware of it (Girma, T., et al., 2022).

The level of knowledge, attitude, and degree of checklist adherence and associated factors among the surgical and anesthesia teams involved in surgical procedures in public hospitals in Harar town, eastern Ethiopia, has not been studied. There is lack of evidence based information on the Knowledge, attitude and utilization of the WHO Surgical Checklist and its associated factors among the Surgical health professionals team in Public Hospitals of Harar town, Eastern Ethiopia.

This study will try to stablish the level of existing knowledge, attitude and utilization of the WHO SSC and factors associated with it in the study area.

1.3. Significance of the study

The study's findings will help determine the current level of practice, attitude, and knowledge of the surgical and anesthetic teams in Harar town with reference to the WHO SSC. This result will help in developing an intervention strategy to increase the level of adherence to the WHO SSC in all surgical procedures by identifying the obstacles to its implementation.

It also can be used as an input by the HFCSH and Jugal General Hospital and the Hararie regional health bureau at large and related stakeholders in planning for the prevention of unsafe surgery.

This study will benefit the surgeons and the anesthesia providers who are practicing in the study area by alarming them about the magnitude of the problem and making them pay due attention to it so that they can improve their over all surgical outcomes.

The finding of this research can help other researchers who are interested in writing about related topics in this study area.

At last but not least, this study will help me in fulfilling the partial requirement for my speciality training in anesthesiology, critical care and pain medicine.

1.4. Objectives

1.4.1. General objective

- To assess Knowledge, Attitude and Utilization of the WHO Surgical Safety Checklist and Associated Factors Among Surgical Health Professionals Team in Public Hospitals of Harar, Eastern Ethiopia, from September 1 to October 30, 2025.

1.4.2. Specific objectives

- To assess the level of knowledge towards the WHO SSC Among Surgical Health Professionals Team in Public Hospitals of Harar, Eastern Ethiopia, from September 1 to October 30, 2025.
- To assess the the level of attitude of surgical health professional team towards the WHO Surgical Safety Checklist Utilization in public hospitals of Harar, Eastern Ethiopia, from September 1 to October 30, 2025.
- To measure the extent of utilization of the WHO Surgical Safety Checklist Among Surgical Health Professionals Team in Public Hospitals of Harar, Eastern Ethiopia from September 1 to October 30, 2025.
- To assess factors associated with the WHO SSC Utilization Among Surgical Health Professionals Team in Public Hospitals of Harar, Eastern Ethiopia, from September 1 to October 30, 2025.

2. Literature Review

The literature on knowledge, attitude, and practice as well as the variables affecting the usage of the WHO SCC will be reviewed in this part.

2.1. Knowledge towards the WHO SSC Among Surgical Health Professionals Team

A key factor affecting the WHO Surgical Safety Checklist's successful application in clinical practice is familiarity with it. Existing literatures on the level of surgical team members' knowledge about the WHO SSC is examined as follows.

An online poll of various health care workers operating in surgery theatres in Austria found that self-reported subjective knowledge about the SSC was equally high across all professional categories. 82.5% (132/160) of the participants stated that their knowledge is very good or quite good (Sendlhofer, G., et al. 2015).

Another cross-sectional survey of 127 healthcare professionals working in the operating theatre at the Tribhuvan University Teaching Hospital in Kathmandu, Nepal, found that 118 (92.9%) of the participants were aware of the WHO SSC (Uprety, A., et al. 2021).

A study conducted in north India among 122 professionals, including surgeons and anesthesia providers, revealed that the majority of volunteers, 52 (54.17%), had good knowledge of SSC, 35 (36.83%) had average knowledge, and 9 (9.3%) had poor knowledge of SSC (Sharma, P., et al. 2020).

A cross-sectional survey of 220 health professionals practicing in eastern Ghana indicated that surgical workers were highly aware of the WHO SSC (100%). Furthermore, 93.2% of surgical professionals understood the Checklist's core objectives, 73.6% understood the structure of the SSC, 86.4% understood that the SSC is a collaborative effort involving all members of the surgical team, and 97.7% understood the role of SCC in improving patient safety and surgical outcomes (Mensah, A.K., 2024).

2.2. Attitude of Surgical Health Professional Team Towards the WHO SSC Utilization

The regular and successful application of the WHO Surgical Safety Checklist (SSC) in clinical settings is greatly influenced by attitudes about it. Adherence can be improved by positive attitudes, such as a strong conviction in its advantages and a dedication to patient safety, but its use may be hampered by skepticism, reluctance to change, or feelings of increased workload. The opinions of the surgical team regarding the SSC are examined in this section.

In a one-month long global survey of WHO SSC usage and opinions posted on the Facebook and Twitter pages of a not-for-profit surgical news website, 4181 (66.7%) respondents thought the WHO SSC was useful and 4031 (64.3%) thought it prevented mistakes, but 765 (12.2%) thought it caused delays and 389 (6.2%) did not believe it worked (Vohra, R.S., et al. 2015).

A systematic review of studies conducted in 17 countries on four common elements comprising the core issues that the WHO-SSC developers believed the checklist addressed was adopted. In this review, they found that a self-perceived benefit of 70% in any of these categories was significant enough to indicate a positive effect (Wangoo, L., Ray, R.A. and Ho, Y.H., 2016).

In a study of surgeons and operating room staff in 138 hospitals in China, just 12.7% said that the checklist took too long to complete. 78.8% agreed it was 'simple to use'. A large majority agreed that the checklist significantly enhanced operating room safety and communication (90.4 and 85.6%, respectively), and 89.5% believed it prevented errors. Only 3.4% of respondents disagreed that they would want the checklist to be utilized if they were being operated (Tan, J., et al. 2021).

A study conducted in north India among 122 professionals, including surgeons and anesthesia providers, showed that the majority (88%) of members wanted the checklist to be used for all surgical procedures, and 78% expected it to promote communication and collaboration among operating room staff. Only nearly one-fifth (18%) of the personnel thought they could operate efficiently without the checklist. 12% said it would cause staff aggravation, 16% thought the procedure would be time-consuming, and 25% considered it would not add any value to the

existing safety culture. The majority of participants (76%) stated that the checklist is simple to use and is not just another tick-box (Sharma, P., Tripathi, V. and Gupta, U., 2020).

2.3. Utilization of the WHO SSC Among Surgical Health Professionals Team

How well the WHO SSC is incorporated into regular surgical procedures is reflected in its practice. Consistent adherence to checklist rules is necessary for effective implementation, in addition to knowledge and a positive attitude. The amount of SSC use in clinical practice and surgical team adherence are examined in this section.

A global survey of WHO SSC utilization and opinions made on social media pages found that 57.5% of respondents used the WHO SSC perioperatively (Vohra, R.S., et al. 2015). In Austria, 305 operations were observed during two tests, with the SSC being employed in 77.1% of all operations in test run 1 and 99.2% in test run 2. Within the used SSCs, the completion rates were 36.3% in test run 1 and 1.6% in test run 2. Following the rollout, three unannounced audits revealed that the SSC was used in 95.3%, 91.9%, and 89.9% of cases, respectively. Within utilized SSCs, completion rates fell from 81.7% to 60.6% and 53.2% (Sendlhofer, G., et al. 2015).

In a cross-sectional study of 127 healthcare workers at Tribhuvan University Teaching Hospital in Kathmandu, Nepal, 106 (89.8%) reported that it is not commonly utilized in the operating theatre (Uprety, A., et al. 2021). In a study of surgeons and operating room staff in 138 hospitals in China overall WHO SSC compliance was 79.8% (Tan, J., et al. 2021).

According to a prospective observational countrywide deployment of the WHO Surgical Safety Checklist in Cameroon, checklist utilization was 56%. Patient identification was verified 91% of the time, with a 79% risk rating for problematic intubation and an 88% risk assessment for blood loss. 93% used pulse oximetry, 95% treated with antibiotics, and 89% counted surgically (White, M.C., et al. 2020).

A cross-sectional study of 220 health professionals practicing in eastern Ghana revealed that a considerable proportion (29.1%) of respondents acknowledged using the SSC Always. Another

23.2% of respondents utilize the SSC Mostly while the largest group (35.5%) uses the SSC Sometimes (Mensah, A.K., 2024).

An observational research conducted in an Ethiopian referral hospital found that checklist compliance rates for general anaesthetics were 83% one month after installation, with an overall compliance rate of 65% eight months later. Checklist compliance decreased throughout the study, reaching fewer than 20% by the conclusion. The 'Sign out' element was identified as the most hardest section of the Checklist to complete, and it was totally overlooked in 21% of cases (Bashford, T., et al. 2014).

In a teaching hospital in Ethiopia, a clinical perspective study was done, and a total of 100 operations were observed in the main operation theatres of their surgical safety before induction of anaesthesia, before surgical incision, and before any team member leave the operation room. From those 100 surgical procedures, patients' identity, procedure, and informed consent, anaesthesia machine checking, and medication preparations were performed completely with a 100% compliance. (Merish, A.T., et al. 2021).

2.4. Factors Associated with the WHO SSC Utilization Among Surgical Health Professionals Team

There are several elements that impact the way in which healthcare providers use the WHO Surgical Safety Checklist in clinical practice. In order to remove obstacles, increase compliance, and eventually improve surgical safety and patient outcomes, it is imperative to acknowledge these aspects. The following section examines the bodies of existing information on this particular point in two categories namely sociodemographic and profession related factors.

2.4.1. Sociodemographic Factors

A cross-sectional study of 220 health professionals practicing in eastern Ghana, age was presented as one important factor. The study showed that individuals over 40 years of age are substantially less likely than those under 39 to utilize the SSC on a regular basis AOR = 0.136, [CI=0.047-0.389] (Mensah, A.K., 2024).

Gender was identified as a factor in a couple of studies. One such finding is a global survey of WHO SSC utilization and opinions made on social media pages which found out that Women

are more likely to use the checklist as compared to male counter parts (61.3% vs. 56.4% males, $p = 0.001$) (Vohra, R.S., et al. 2015). This was also the case in above mentioned Ghanaian study that came up with the fact that compared to men, women are less likely to utilize the SSC regularly AOR = 0.408, [CI=0.176-0.947] (Mensah, A.K., 2024).

According to the above mentioned global survey of WHO SSC utilization level of income was identified to have association with checklist utilization. This study found that in LMICs, respondents used the WHO SSC at a lower rate than in high-income countries (43.5% vs. 83.5%, $p < 0.001$), (Tan, J., et al. 2021).

2.4.2. Profession and Cognitive Related Factors

According to a global survey of WHO SSC utilization and opinions made on social media pages found that consultant surgeons (59.6% vs. 53.2% interns, $p < 0.001$), and those working in university hospitals (61.4% vs. 53.7% non-university hospitals, $p < 0.001$) were more likely to employ the SSC. Believing the SSC was useful, did not work, or caused delays was independently linked with respondents' reported usage of the SSC (OR 1.22 95% CI 1.07e1.39; OR 0.47 95% CI 0.36e0.60; OR 0.64 95% CI 0.53e0.77, respectively) (Vohra, R.S., et al. 2015).

In a cross-sectional study of 127 healthcare workers at Tribhuvan University Teaching Hospital in Kathmandu, Nepal, the most common obstacles to using the checklist were a lack of proper training (72, 67.9%), staff resistance to using the checklist (54, 50.9%), and insufficient experience (42, 39.7%) (Tan, J., et al. 2021).

A study done in north India among 122 professionals, including surgeons and anesthetic doctors, identified the following challenges to SCC utilization, along with their frequencies. Lack of awareness or knowledge 16%, lack of manpower 14%, Lack of good communication 13%, Staff commitment to duty 12%, Management commitment 12%, Staff cooperation 11%, insufficient supply of consumable instruments/other equipment/facilities 11%, lack of interest/will/attitude of health worker 11%, lack of team spirit 11%, lack of incentive among theatre workers 10%, administrative bottleneck/bureaucracy 10%, insufficient time to complete the checklist 8%, and corruption 7% (Sharma, P., Tripathi, V. and Gupta, U., 2020).

A cross-sectional study of 220 health professionals practicing in eastern Ghana, showed that the odds of frequent SSC use are considerably lower for those who studied for at least five years

than for those who studied for less than three years AOR = 0.335, [CI=0.110-1.017]. The likelihood of using the SSC regularly was considerably lower among those who had not received training on it (AOR = 0.036, [CI=0.010-0.126]). Individuals with 'Average' knowledge were less likely to use the SSC than those with 'Good' knowledge COR = 0.065, [CI=0.023-0.182]. But when compared to the 'Average' knowledge group, bad knowledge still had a higher chance of being used frequently AOR = 0.286 [CI = 0.111-0.739] (Mensah, A.K., 2024).

2.5. Conceptual Framework

The below figure shows the relationship among the dependent and the independent variables. It was developed by the principal investigator after reviewing various literatures.

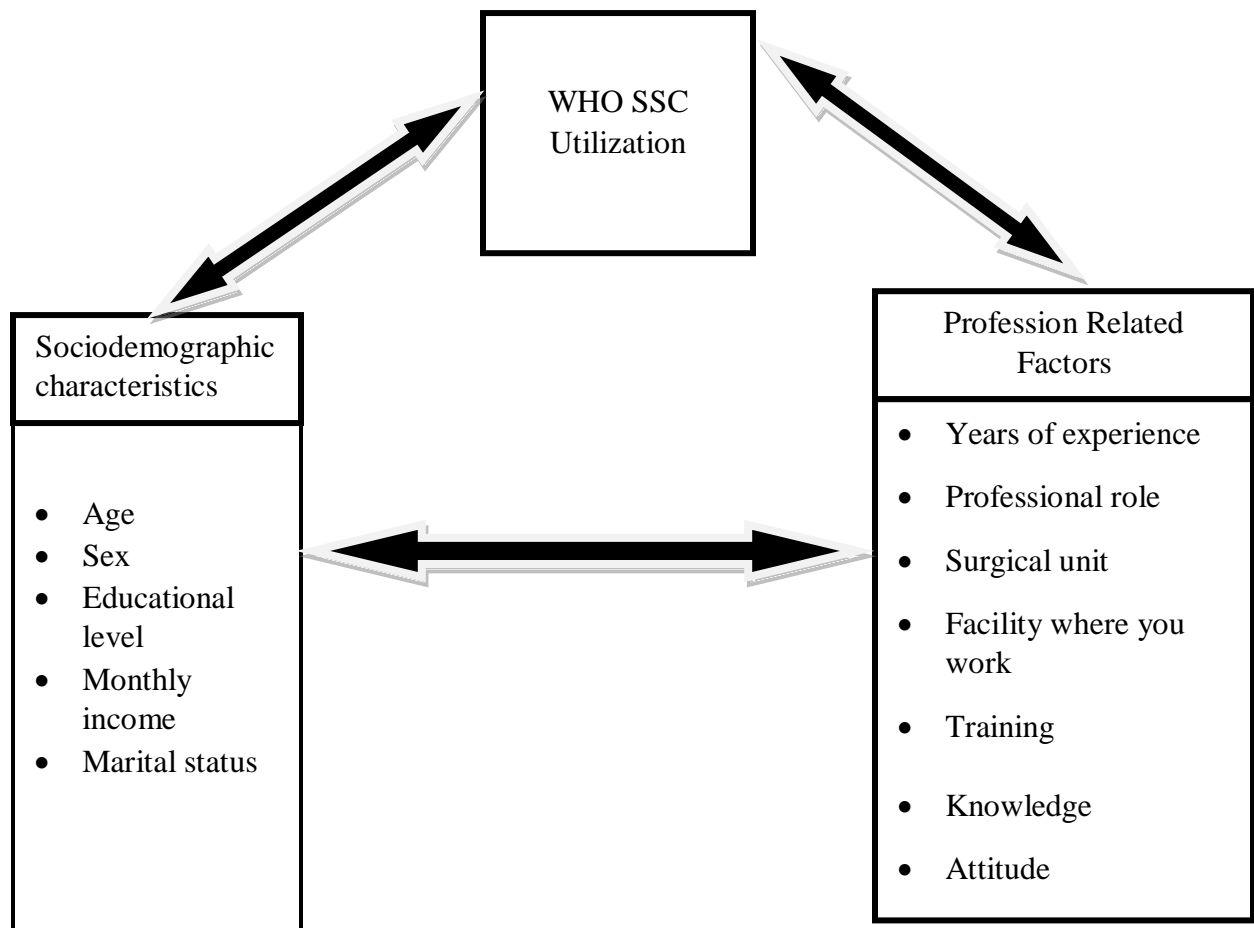


Figure 1. Conceptual framework showing Factors Associated with the WHO SSC Utilization Among Surgical Health Professionals Teams in Public Hospitals of Harar, Eastern Ethiopia, 2025.

3. Methods and Materials

3.1. Study Area and Period

The study was conducted in the two public hospitals of Harar town. Namely Hiwot Fana Comprehensive Specialized Hospital and Jugal general hospital. Harar is located in Harari region, about 526 Km away from Addis Ababa the capital city of Ethiopia. There are seven hospitals in the city; these are a teaching, a regional, a police, a defence force and two private hospitals. In addition, there are eight health centers, 31 private clinics, 26 health posts and one regional laboratory.

Hiwot Fana Comprehensive Specialised Hospital and Jugal hospital are serving as a referral hospital for most of eastern part of the country. The hospitals provide various surgical services namely general surgery, pediatric surgery, neurosurgery, urologic surgery, ENT, maxillo-facial, gynecological, orthopedic, plastic and selected laparoscopic surgeries.

This study was conducted among Surgical Health Professionals Team working in the two hospitals from September 1 to October 30, 2025.

3.2. Study design

Institution based cross sectional study design was used.

3.3. Population

3.3.1. Source population

All surgical and anesthesia personnel working in the two hospitals.

3.3.2. Study population

All surgical and anesthesia personnel working in the two hospitals during the study period.

3.4. Eligibility criteria

3.4.1. Inclusion criteria

All surgical and anesthesia personnel who are working for at least 6 months in the two hospitals.

3.4.2. Exclusion criteria

- Doctors, anaesthetists and theatre nurses who are on leave at the time of the study will be excluded.

3.5. Sample size determination

The sample size for KAP was calculated by using the formula for single population proportion.

$$n = (Z_{\alpha/2})^2 P(1-P) / d^2$$

Where n is the sample size required; d, margin of error of 5% (d = 0.05); Z, the degree of accuracy required at 95% confidence level = 1.96; and since there is no locally available published study taking P=50% for 1st, 2nd and 3rd objectives. Replacing in the formula $n = (Z_{\alpha/2})^2 P(1-P) / d^2$, we get 384.

The sample size for factors associated with checklist utilization (**Specific Objective 4th**) was calculated using OpenEpi as it is depicted in the table below as well.

Table 1. Shows sample size calculation for Factors Associated with utilization of WHO SSC Among Surgical Health Professionals Teams in Public Hospitals of Harar, Eastern Ethiopia, 2025.

Variables	Assumptions	Sample size	References
Age	AOR = 0.136 Percent of control exposed = 48 Power = 80% Ratio 1:1	58	(Mensah, A.K., 2024)
Knowledge	AOR = 0.286 Percent of control exposed = 54 Power = 80% Ratio 1:1	112	

The first objectives yield the highest sample size of 384. Adding 10% for possible non response we get a final sample size of 424.

3.6. Sampling procedure and sampling technique

A total of 550 surgical health professionals from two public hospitals, Hiwot Fana Comprehensive Specialized Hospital ($N_1 = 400$) and Jugal General Hospital ($N_2 = 150$) comprises the source population. Applying simple random sampling proportionally to each hospital we get 308 samples from Hiwot Fana and 116 from Jugal. Adding this together gives us a final sample size of 424 participants.

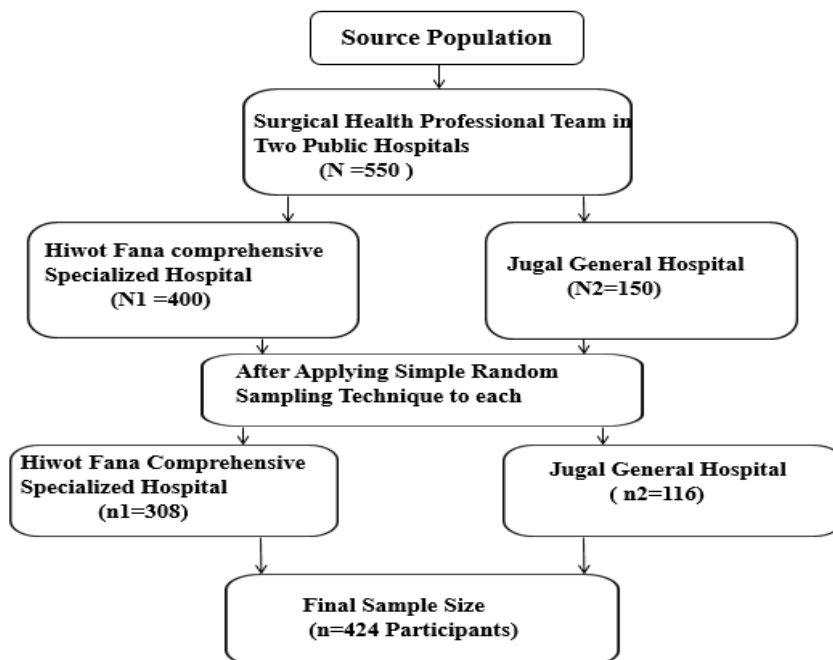


Figure 2. Schematic diagram of Sampling procedure and sampling technique

3.7. Data collection method

3.7.1. Data collection instruments

A structured, self administered questionnaire was developed after thorough review of relevant literature. The questionnaire was organized into five parts. Part one assessed sociodemographic characteristics, including age, sex, monthly income, and marital status. Part two focused on

profession related factors. Part three contained items designed to assess participants' level of knowledge regarding the WHO Surgical Safety Checklist. Part four evaluated participants' attitudes toward the WHO Surgical Safety Checklist. Part five included questions related to checklist utilization.

3.7.2. Data collectors and supervisors

One BSc nurse from the surgical ward was used as a data collector. The data collector's role included distributing the kobo tool box link to eligible participants, guide participants who need support, ensure consent and that correct participant is filling the form and report daily collection status. One supervisor was assigned to supervise the data collection. The supervisor had responsibilities like tracking real time responses from the linked google sheet, check for inconsistencies, verify sample coverage, etc.

3.7.3. Data collection procedure

A structured, self-administered questionnaire was developed using Google Forms to assess the knowledge, attitude, utilization and factors associated with utilization of the WHO Surgical Safety Checklist among surgical health professional team members. Data collection took place from September 1 to October 30, 2025. To enhance response rates, the principal investigator announced the survey in advance, allocated a two month data collection period, and sent periodic reminders to participants.

3.8. Study variables

3.8.1. Dependent variables

- Knowledge
- Attitude
- WHO SSC Utilization

3.8.2. Independent variables

- **Sociodemographic characteristics**
 - Age
 - Sex
 - Educational level
 - Monthly income

- Marital status

➤ **Professional Factors**

- Years of experience
- Professional role
- Surgical unit
- Facility where you work
- Training
- Knowledge
- Attitude

3.9. Operational definition

Knowledge:

- **Adequate Knowledge:** number of participants who correctly answer Seven or more out of Nine questions on WHO SSC, including its components, advantages, and its use in surgical settings, they are deemed to have adequate knowledge (Yosef, T., 2023).
- **Inadequate Knowledge:** number of participants who correctly answer <7 of the knowledge-related questions on the WHO SSC, they are said to have inadequate knowledge (Yosef, T., 2023).

Attitude:

- **Positive Attitude:** Number of participants who score at least Six out of Seven questions on the attitude assessment scale will be considered to have a positive attitude (Shamil, M., Legese, N. and Tadiwos, Y., 2021).
- **Negative Attitude:** Number of participants who score <6 questions on the attitude assessment scale will be considered to have a negative attitude (Shamil, M., Legese, N. and Tadiwos, Y., 2021).
- **Utilization:** Number (%) of participants who have reported on using the WHO SSC in all surgical procedures and completing all three phases in accordance with WHO recommendations then is considered to have utilized (WHO. 2008).

3.10. Data quality control

A pretest was conducted on randomly selected (5% of the calculated sample size) surgical and anesthesia personnels who are working at Haramaya General hospital, a week before the actual data collection. Then, adjustments was made on the tool for final data collection. Each questionnaire was checked for completeness, clarity, consistency, and accuracy by the PI. Data cross check and data cleanup was done before analysis.

3.11. Methods of analysis

The study participants was categorized as having adequate/inadequate knowledge, positive/negative attitude and utilization(utilized/not utilized). The independent variables were categorized based on respective standards; after categorization is completed, each variables were checked for missed values and normality test was performed. The data was entered in to STATA software version 17 for additional data cleaning and analysis. Descriptive statistics such as mean, frequency, percentage and other measures were used to describe the independent variables. No multi-collinearity was seen (mean VIF =1.2). A multivariable logistic regression analysis Was employed and crude and adjusted odds ratio with 95% confidence intervals estimate of the association between independent variables and dependent variable was reported. Factors with a p-value ≤ 0.2 in the bivariable models were candidate for the multivariable model. Factors with $P < 0.05$ in the multivariable model were considered statistically significant and independent predictors for outcome variable. The model's fitness was evaluated based on Hosmer and Lemeshow's goodness-of-fit statistics and it was demed fit with a p value of 0.4615.

3.12. Ethical considerations

Ethical clearance was obtained from the Institutional Health Research Ethics review Committee (IHREC) of Haramaya University, College of Health and Medical Science via an approval letter written with reference No IHRERC/157/2025. After explaining the aim and the benefit of the study, informed, voluntary written and signed consent was obtained from the participants and from the medical directors of the two hospitals. All the information retrieved is kept in a way that

it could not interfere in personal confidentiality. Confidentiality of the information was maintained by omitting participants' names and personal identification.

3.13. Plan for dissemination of study result

The finding of the study will be submitted to the school of medicine, school of graduate studies of College of Health and Medical Sciences Haramaya University. The copy of the research will be given to the hospitals as well. Upon approval, this study will be made available to the HU, CHMS, school of graduate studies library. There is also a plan for publication in a peer-reviewed reputable journal to keep the information as widely available as possible.

4. RESULTS

4.1. Socio Demographic Characteristics Participants

A total of 170 health professionals were included in the study. This makes a response rate of 40.1%. The median age of participants was 32 years \pm 7 IQR. Nearly three-fourth of the participants, 128 (75.29%), were males (Table 2).

Table 2. Socio demographic characteristics of Surgical Health Professionals Team in Public Hospitals of Harar, Eastern Ethiopia, 2025 (N=170).

Variables	Categories	Frequency (%)
Age	≤ 32 years	98 (57.6)
	>32 years	72 (42.4)
Sex	Female	42 (24.7)
	Male	128 (75.3)
Marital status	Unmarried	79 (46.5)
	Married	91 (53.5)
Educational status	Undergraduate	97 (57.1)
	Postgraduate	73 (42.9)
Monthly income	≥10,000	122 (71.8)
	<10,000	48 (28.2)

4.2. Profession Related Characteristics of participants

Most of the participants had five or fewer years of work experience, accounting for 110 (64.7%). Nearly all were working in a teaching hospital, 158 (92.9%). General surgery was the most common working unit, with 97 participants (57.1%), while 73 (42.9%) were from OBGYN or orthopedic units. Physicians made up the majority of the surgical team, 122 (71.8%), compared with 48 nurses (28.2%).

Table 3. Profession Related Characteristics of Surgical Health Professionals Team in Public Hospitals of Harar, Eastern Ethiopia, 2025 (N=170).

Variables	Categories	Frequency (%)
Work experience	≤5Yrs	110 (64.7)
	>5Yrs	60 (35.3)

Facility type	General Hospital	12 (7.1)
	Teaching Hospital	158 (92.9)
Surgical unit	General surgery	97 (57.1)
	OBGY/ORTHO	73 (42.9)
Professional role	Physicians	122 (71.8)
	Nurse	48 (28.2)
Training on WHO SSC	Yes	104 (61.2)
	No	66 (38.8)

4.3. Descriptive Analysis of Knowledge of Participants on WHO SSC

The overall knowledge level of participants toward the WHO Surgical Safety Checklist is shown in the figure below (Figure 3). A large majority demonstrated adequate knowledge, 132 (78%, CI:0.71-0.83), while a smaller proportion (22%), fell into the inadequate knowledge category, reflecting the generally strong understanding observed in the detailed knowledge items.. The majority of the participants demonstrated good awareness across most checklist components. For example, 151 (88.8%) correctly identified that the SSC includes confirming patient identity, procedure, and surgical site, and the same proportion recognized the importance of checking allergies, airway risks, and anticipated blood loss. Equipment readiness was acknowledged by 145 (85.3%), and 162 (95.3%) understood that instrument and sponge counts must be verified (Table 4).

Table 4. Descriptive Analysis of Knowledge on WHO SSC Among Surgical Health Professionals Team in Public Hospitals of Harar, Eastern Ethiopia, 2025 (N=170).

No.	Knowledge Items	Responses (frequency/%)	
		Yes	No
1.	Does the checklist include steps before anesthesia, before incision, and before patient leaves OR?	141 (82.9)	29 (17.1)

2.	Does the checklist include confirming patient identity, procedure, and surgical site?	151 (88.8)	19 (11.2)
3.	Is equipment readiness (e.g., anesthesia machine, pulse oximeter) checked in the SSC?	145 (85.3)	25 (14.7)
4.	Does the checklist include allergy check, airway risk, and anticipated blood loss?	151 (88.8)	19 (11.2)
5.	Are team members required to introduce themselves before starting surgery?	144 (84.7)	26 (15.3)
6.	Does the checklist include timing of antibiotic prophylaxis?	149 (87.7)	21 (12.3)
7.	Is it mandatory to verify instrument, sponge, and needle counts before closure?	162 (95.3)	8 (4.7)
8.	Are all members (nurse, anesthetist, and surgeon) expected to participate in the checklist process?	149 (87.7)	21 (12.3)
9.	Does the checklist include discussion of key postoperative recovery concerns?	137 (80.6)	33 (19.4)

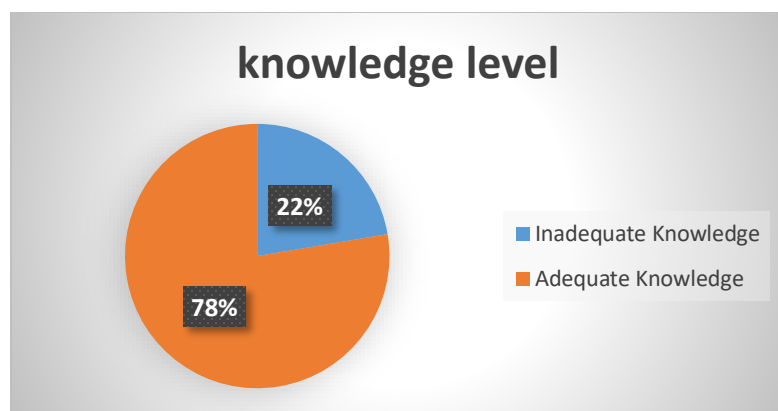


Figure 3. Knowledge level towards the WHO SSC Among Surgical Health Professionals Team in Public Hospitals of Harar, Eastern Ethiopia, 2025 (N=170).

4.4. Descriptive Analysis of Attitude of Participants on WHO SSC

Most respondents expressed positive attitudes. For instance, 147 (86.5%) agreed or strongly agreed that the checklist improves patient safety, and 136 (80%) felt it enhances communication

among the surgical team. Similarly, 142 (83.7%) considered the checklist feasible in their setting. A large proportion, 149 (87.6%), supported making the checklist mandatory for all surgeries. However, confidence in applying the checklist was lower, with only 30 (17.7%) feeling strongly confident.

Table 5. Descriptive Analysis of Attitude on WHO SSC Among Surgical Health Professionals Team in Public Hospitals of Harar, Eastern Ethiopia, 2025 (N=170).

No.	Attitude Items	Responses (frequency/%)				
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	I believe the surgical safety checklist improves patient safety outcomes.	3 (1.76)	1 (0.59)	19 (11.18)	62 (36.47)	85 (50)
2.	The checklist promotes effective communication among surgical team members.	1 (0.59)	11 (6.47)	22 (12.94)	66 (38.82)	70 (41.18)
3.	The checklist is feasible and practical in my current surgical setting.	3 (1.76)	4 (2.35)	21 (12.35)	67 (39.41)	75 (44.12)
4.	I feel confident and skilled in using the checklist.	83 (48.82)	34 (20.00)	23 (13.53)	25 (14.71)	5 (2.94)
5.	The checklist unnecessarily delays surgical procedures. *(reverse scored)*	6 (3.53)	12 (7.06)	19 (11.18)	65 (38.24)	68 (40.00)
6.	The checklist should be mandatory for all surgeries including emergencies.	4 (2.35)	1 (0.59)	16 (9.41)	72 (42.35)	77 (45.29)
7.	All team members should be held accountable for completing the checklist.	6 (3.53)	1 (0.59)	13 (7.65)	68 (40.00)	82 (48.24)

The overall attitude levels of the participants is shown in figure 4. Most surgical team members, 110 (65%, CI:0.57-0.72), demonstrated a positive attitude toward the WHO Surgical Safety Checklist, with fewer participants showing neutral or negative attitudes.

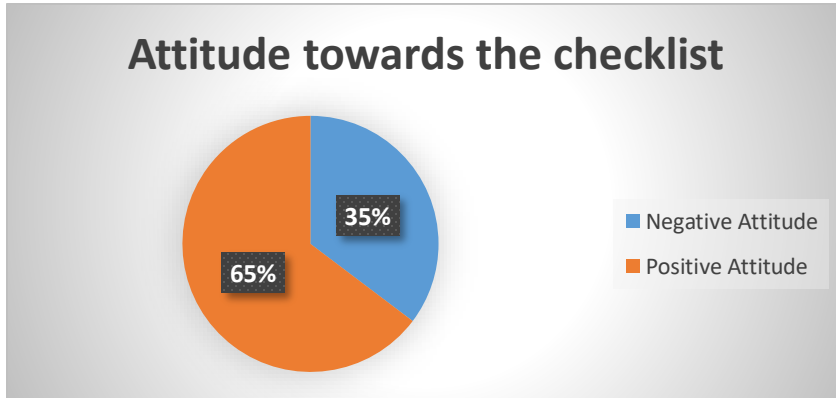


Figure 4. Attitude towards the WHO SSC Among Surgical Health Professionals Team in Public Hospitals of Harar, Eastern Ethiopia, 2025 (N=170).

4.5. Descriptive Analysis of Level of Utilization of WHO SSC

The overall WHO SSC utilization level was 80 (47%, CI:0.4-0.55) (figure 5). Several critical steps were consistently performed by a majority of participants. For example, verifying patient identity before anesthesia was always done by 131 (78%), and confirming equipment readiness was reported by 132 (79.5%). Antibiotic timing checks were consistently performed by 132 (78.6%), and anticipated critical events were discussed by 137 (81.6%). However, some steps showed weaker adherence. Team introductions were always practiced by only 79 (47.6%), and postoperative planning discussions were consistently performed by 102 (61.1%). Instrument and sponge counts had the lowest consistent participation, with only 61 (58.1%) reporting they always engaged in this step.

Table 6. Descriptive Analysis on Utilization of the WHO SSC Among Surgical Health Professionals Team in Public Hospitals of Harar, Eastern Ethiopia, 2025 (N=170).

No.	Practice Items	Utilization (frequency/%)
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		Always	Sometimes	Rarely	Never
1.	I participate in checking patient identity, procedure, and consent before anesthesia.	131 (77.98)	28 (16.67)	7 (4.17)	2 (0.12)
2.	I confirm equipment readiness before surgery starts.	132 (79.52)	23 (13.86)	8 (4.82)	3 (1.81)
3.	I ensure team members introduce themselves by name and role.	79 (47.59)	60 (36.14)	19 (11.45)	8 (4.82)
4.	I take part in verifying antibiotic prophylaxis timing.	132 (78.57)	26 (15.48)	8 (4.76)	2 (1.19)
5.	I discuss anticipated critical events and risks with the team.	137 (81.55)	21 (12.50)	8 (4.76)	2 (1.19)
6.	I confirm the checklist steps are completed before the patient leaves the OR.	115 (68.86)	35 (20.96)	12 (7.19)	8 (2.99)
7.	I actively engage in postoperative planning discussions as per checklist	102 (61.08)	43 (25.75)	14 (8.38)	8 (4.79)
8.	I ensure instrument and sponge counts are verified and documented.	61 (58.10)	22 (20.95)	17 (6.19)	5 (4.76)

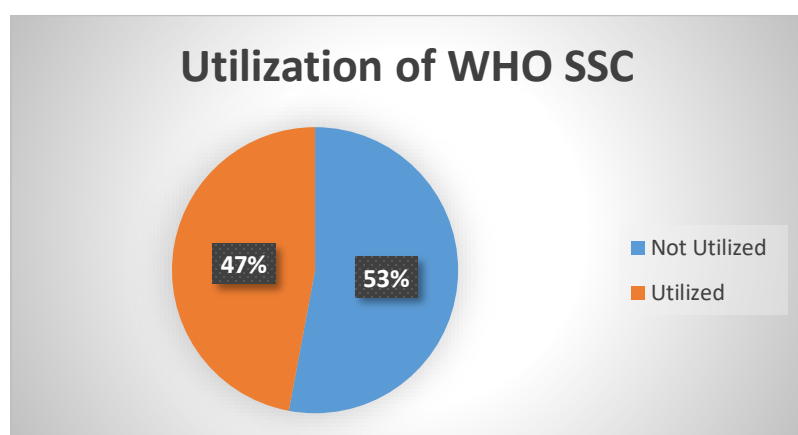


Figure 5. Status of Utilization of the WHO SSC Among Surgical Health Professionals Team in Public Hospitals of Harar, Eastern Ethiopia, 2025 (N=170).

4.6. Bivariate analysis of Factors Associated with Utilization of WHO SSC Among Surgical Health Team Professionals in Public Hoapitals, Harar, Easternn Ethiopia, 2025, (n=170, P<0.2).

All independent variables, age, sex, educational level, monthly income, marital status, years of experience, professional role, surgical unit, facility where you work, training, knowledge level, and attitude level, were included in the bivariate analysis and those with a p-value of less than 0.2 in the bivariable logistic regression were included in the multivariable model. These included sex, marital status, surgical unit, educational status, profession, monthly income, and attitude towards the checklist.

Table 7. Factors Associated with Utilization of the WHO SSC Among Surgical Health Professionals Team in Public Hospitals of Harar, Eastern Ethiopia, 2025 (N=170 and P<0.2)

Factors	Categories	Utilization of WHO SCC		COR (95%CI)	P value
		Utilized (%)	Not utilized (%)		
Age	≤32 years	43 (43.88)	55 (56.12)	1	
	>32 years	37 (51.39)	35 (48.61)	1.35 (0.73-2.49)	0.333
Sex	Female	28 (66.67)	14 (33.33)	1	
	Male	52 (40.62)	76 (59.38)	0.34 (0.16-0.71)	0.004*
Marital status	Unmarried	32 (40.50)	47 (59.50)	1	
	Married	48 (52.75)	43 (47.25)	1.64 (0.89-3.02)	0.112*
Educational status	Undergrad	41 (42.27)	56 (57.73)	1	
	Postgrad	39 (53.42)	34 (46.58)	1.57 (0.85-2.89)	0.150*
Monthly income	≥10,000	50 (40.98)	72 (59.02)	1	

	<10,000	30 (62.50)	18 (37.50)	2.4 (1.21- 4.77)	0.012*
Profession	Physicians	44 (36.07)	78 (63.93)	1	
	Nurses	36 (75)	12 (25)	5.32 (2.51-11.27)	0.001*
Surgical unit	General surgery	51 (52.58)	46 (47.42)	1	
	OBGY/ORTHO	29 (39.73)	44 (60.27)	0.59 (0.32-1.10)	0.038
Experience	≤5 Years	48 (43.64)	62 (56.36)	1	
	>5 Years	32 (53.33)	28 (46.67)	1.48 (0.78-2.78)	0.227
Facility (Hospital)	Teaching	74 (46.68)	84 (53.32)	1	
	General	6 (50.00)	6 (50.00)	1.14 (0.35-3.67)	0.832
Training	No	27 (40.91)	39 (59.09)	1	
	Yes	53 (50.96)	51 (49.04)	1.50 (0.80-2.8)	0.202
Knowledge	Inadequate	16 (42.10)	22 (57.90)	1	
	Adequate	64 (48.48)	68 (51.52)	1.29 (0.62-2.68)	0.488
Attitude	Negative	33 (55.00)	27 (45.00)	1	
	Positive	47 (42.73)	63 (57.27)	0.61 (0.32-1.15)	0.127*

Note *p value <0.2 COR= crude odds ratio

4.7. Multivariate analysis of Factors Associated with Utilization of WHO SSC Among Surgical Health Team Professionals in Public Hoapitals, Harar, Easternn Ethiopia, 2025, (n=170, P<0.05).

Profession was a strong predictor. Nurses had more than four times higher odds of Utilizing WHO Surgical Safety Checklist compared with physicians (AOR 4.38, 95% CI 1.90 - 10.09, p = 0.001). Surgical unit was also significant. Staff working in OBGYN or orthopedic units had lower odds of Utilizing WHO Surgical Safety Checklist compared with those in general surgery (AOR 0.48, 95% CI 0.24 - 0.96, p = 0.038).

Table 8. Multivariable analysis of Factors Associated with Utilization of the WHO SSC Among Surgical Health Professionals Team in Public Hospitals of Harar, Eastern Ethiopia, 2025 (N=170 and P<0.05)

Factors	Categories	Utilization		AOR (95%CI)	P value
		Utilized (%)	Not utilized (%)		
Sex	Female	28 (66.67)	14 (33.33)	1	
	Male	52 (40.62)	76 (59.38)	0.63 (0.26-1.52)	0.305
Marital status	Unmarried	32 (40.50)	47 (59.50)	1	
	Married	48 (52.75)	43 (47.25)	1.07 (0.48-2.34)	0.875
Educational status	Undergrad	41 (42.27)	56 (57.73)	1	
	Postgrad	39 (53.42)	34 (46.58)	1.58 (0.85-2.89)	0.150
Monthly income	>=10,000	50 (40.98)	72 (59.02)	1	
	<10,000	30 (62.50)	18 (37.50)	1.17 (0.50-2.72)	0.722
Profession	Physicians	44 (36.07)	78 (63.93)	1	

	Nurses	36 (75)	12 (25)	4.38 (1.90-10.09)	0.001*
Surgical unit	General surgery	51 (52.58)	46 (47.42)	1	
	OBGY/ORTHO	29 (39.73)	44 (60.27)	0.48 (0.24-0.96)	0.038*
Attitude	Negative	33 (55.00)	27 (45.00)	1	
	Positive	47 (42.73)	63 (57.27)	0.66 (0.33-1.32)	0.239

5. DISCUSSION

This study assessed the knowledge, attitude, and practice of the WHO Surgical Safety Checklist among surgical health professionals in public hospitals of Harar, as well as the factors associated with its consistent utilization. Overall, the findings show that participants demonstrated high knowledge 78% (CI:0.71-0.83) and a generally positive attitude 65% (CI:0.57-0.72) toward the checklist, yet checklist utilization was suboptimal 47% (CI:0.4-0.55) and varied across specific steps. Profession and working unit emerged as the key independent predictors of consistent checklist use.

In the present study, most surgical team members showed strong knowledge across almost all components of the WHO SSC. More than four fifths of participants correctly recognized the purpose and structure of the checklist, and critical elements such as confirming patient identity,

checking allergies and airway risk, verifying antibiotic timing, and ensuring instrument counts were well understood.

This high knowledge level aligns with findings from previous studies. In Austria, 82.5% of respondents rated their knowledge as very good or quite good (Sendlhofer, G., et al. 2015). Similarly, 92.9% of surgical staff in Nepal were aware of the WHO SSC (Uprety, A., et al. 2021). Studies from India and Ghana also reported high awareness and understanding of the checklist, including 54.17% demonstrating good knowledge in India (Sharma, P., et al. 2020) and up to 100 percent awareness in eastern Ghana (Mensah, A.K., 2024).

The consistently high levels of knowledge across settings, including ours, may reflect the global dissemination of the WHO SSC and the universal recognition of its role in improving surgical safety.

Participants in our study exhibited predominantly positive attitudes toward the checklist. Most believed that the SSC improves patient safety, enhances communication, and should be mandatory for surgeries. However, confidence in using the checklist was low among a substantial number of respondents.

Similar trends have been observed globally. In an international survey, 66.7% believed the SSC was useful and 64.3% believed it prevented mistakes, although 12.2% thought it caused delays (Vohra, R.S., et al. 2015). In China, 90.4% felt it enhanced safety and 85.6% believed it improved communication (Tan, J., et al. 2021). A systematic review also reported strong global perceptions of its benefits (Wangoo, L., et al., 2016). North Indian staff similarly supported checklist use and linked it with improved teamwork (Sharma, P., et.al., 2020).

The consistency of these findings suggests that attitudes are generally favorable across diverse settings, yet positive attitudes alone may not guarantee adherence without adequate training and supportive systems.

Although knowledge and attitudes were strong, consistent utilization of the checklist was relatively low in our setting. Key safety steps such as patient identity verification, equipment readiness checks, and antibiotic timing were commonly practiced; however, other steps, especially team introductions and postoperative planning, showed lower adherence. Only a proportion of participants reported consistent practice overall.

This finding is consistent with global evidence indicating a persistent gap between knowledge and Utilization. For instance, only 57.5% of respondents in a global survey reported using the SSC perioperatively (Vohra, R.S., et al. 2015). Observational audits in Austria demonstrated fluctuating utilization and declining completion rates over time despite initial high compliance (Sendlhofer, G., et al. 2015). In Nepal, as many as 89.8 percent of staff reported that the SSC was not consistently used (Uprety, A., et al. 2021). In Cameroon, utilization was 56 percent (White, M.C., et al. 2020), while Ghana reported that only 29.1 percent always used the checklist (Mensah, A.K., 2024).

Similarly, Ethiopian studies have shown variable adherence, with compliance falling sharply over time and certain checklist components consistently neglected (Bashford, T., et al. 2014; Mersh, A.T., et al. 2021). These patterns mirror our findings and emphasize that the presence of the checklist in a facility does not translate into consistent practice.

In multivariable analysis, two variables were independently and significantly associated with consistent utilization of WHO SSC in our study.

Nurses had significantly higher odds of consistent WHO Surgical Safety checklist utilization compared with physicians. This contrasts with a global survey where consultant surgeons were more likely to use the SSC (Vohra, R.S., et al. 2015). The discrepancy may be due to contextual differences in workflow patterns, the distribution of responsibilities, and the degree of engagement expected from nurses versus physicians during checklist completion. Nurses may also adhere more readily because many SSC tasks fall within their daily routines.

Participants working in OBGYN or orthopedic units showed lower odds of consistent utilization than those in general surgery. Differences in workload, case urgency, staffing patterns, and team dynamics may contribute to this gap. Previous studies also highlighted the role of institutional environment, with those working in university hospitals being more likely to use the SSC (Vohra, R.S., et al. 2015).

5.1. STRENGTH AND LIMITATION OF THE STUDY

5.1.1. STRENGTH OF THE STUDY

The study used a probability based sampling method, improving the representativeness of surgical health professionals in public hospitals of Harar. Standardized and pretested data collection tools enhanced the reliability of measurements. Multivariable logistic regression allowed identification of independent predictors while controlling for confounders.

5.1.2. LIMITATIONS OF THE STUDY

The cross sectional design prevents establishing causality between associated factors and checklist utilization. Self reported practice may be subject to social desirability and recall bias, potentially overestimating adherence. Direct observational verification of checklist use was not performed, which may have strengthened the assessment of practice.

6. CONCLUSION AND RECOMMENDATION

6.1. CONCLUSION

This study found that surgical health professionals in public hospitals of Harar possess strong knowledge of the WHO Surgical Safety Checklist and generally hold positive attitudes toward its importance in improving patient safety. However, consistent utilization of the checklist remains suboptimal, with notable gaps in steps that require team coordination, such as introductions and postoperative planning. Profession and working unit were the only significant predictors of consistent Utilization, with nurses demonstrating higher adherence than physicians, and staff in OBGYN and orthopedic units showing lower adherence than those in general surgery. These findings highlight the persistent gap between awareness, attitude and utilization, underscoring the need for tailored interventions to strengthen checklist use across surgical teams.

6.1.2. RECOMMENDATION

For Hospital Administrators

Strengthen institutional support for checklist implementation through regular monitoring, mentorship, and reinforcement of accountability. Ensure adequate staffing and workflow organization to allow uninterrupted completion of checklist steps. Integrate checklist utilization into routine audit and feedback mechanisms.

For Surgical Department Leadership

Provide structured and recurrent training on the WHO Surgical Safety Checklist, prioritizing units with lower adherence. Encourage multidisciplinary briefings and debriefings to improve teamwork and communication. Promote shared ownership of the checklist among surgeons, anesthetists, and nurses to reduce reliance on a single personnel.

For Future Research

Conduct observational studies to complement self reported data and better understand specific barriers during real time surgical workflow.

7. References

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8. Annexes

8.1. Information Sheet and Informed voluntary Consent form for Head of Hospital

My name is Dr. Masresha Yohannes. I am the principal investigator of the study to be conducted in Hiwot Fana comprehensive specialized University hospital and Jugal general hospital. I am studying Anesthesiology, Critical Care and Pain Medicine at Haramaya University, College of Health and Medical Science. I kindly request you to lend me your attention to explain about this study.

The Study Title: The study title is “Knowledge, Attitude and Utilization of the WHO Surgical Safety Checklist and Associated Factors Among Surgical Health Professionals Team in Public Hospitals of Harar, Eastern Ethiopia, 2025.”

The purpose/Aim of the Study: The purpose of this study is to establish a local hospital based information on the KAP of the WHO SSC and Factors Associated with its practice Among Public Hospitals of Harar, Eastern Ethiopia, 2025. The finding of this study will provide up-to-date information to the Public Hospitals in Harar in order to plan appropriate intervention program to improve the utilization of the WHO surgical safety checklist. Also will serve as entry point for future studies. Moreover, the main aim of this study is to write a thesis as a partial fulfillment of my training in anesthesiology, Critical Care and pain medicine.

Procedure and Duration: the surgical and anesthesia personnels will be asked to fill out a set of self administered questions. There are 37 questions to answer and the time required is approximately about 20 minutes.

Risk and Benefit: The risk of participating in this study is very minimal which is taking few minutes from their time. The investigator will not pay any direct cash for study participants for participating in this study.

Confidentiality: Participant’s information will be confidential. The finding of the study will be general and will not reflect anything about particular individual information. The questionnaire will be coded with a unique identification number to exclude showing names. No reference will be made in oral or written reports that could link participants in the study.

Rights: Participation for this study is fully voluntary. The participants have the right to declare to participate or not in this study. If they decide to participate, they have the right to withdraw from the study at any time and this will not label them for any loss of benefits which they otherwise are entitled. They do not have to answer any question that they do not want to answer.

Contact Address: If you have any questions or inquiries about the study any time you can contact the principal investigator by using his mobile phone number: **0916627247 or 0906664890 / Dr. Masresha Yohannes and/or E-mail: masre.shonde@gmail.com** or the Institutional Health Research Ethics Review Committee of the College of Health and Medical Sciences using their office phone number: +251-254-662-011 or P.O.Box: 235, Harar, Ethiopia.

Declaration of Informed Voluntary Consent

I have read the information sheet. I have clearly understood the purpose of the study, the procedure, the risk and benefit of the study, and issues of confidentiality. The contact address was given to me for any queries. I have been given the opportunity to ask questions about things that have been unclear. I understand that participant has the right to withdraw from the study at any time or not to answer any question that they do not want and also I was informed that i have a full right to permit or not for this research to be done or not in this hospital. Therefore, I declare my voluntary on behalf of the Hospital Management to allow this study to be conducted in our Hospital with my signature.

Name of the hospital Manager: _____Signature:_____Date:
____/____/2025

Name of the Principal Investigator: Dr. Masresha Yohanne Signature: _____Date:
__/__/2025

8.2. Participant Information Sheet and Voluntary Consent Form

My name is _____. I am working as a data collector for the study being conducted in this hospital by Dr. Masresha Yohanne (ACCPM resident), who is studying his Anesthesiology, Critical Care and Pain Medicine at Haramaya University, College of Health and Medical Science. I kindly request you to give me your attention to explain about the study and being selected as the study participant.

The study title: The study title is “Knowledge, Attitude and Utilization of the WHO Surgical Safety Checklist and Associated Factors Among Surgical Health Professionals Team in Public Hospitals of Harar, Eastern Ethiopia, 2025.”

Purpose of the study: The purpose of this study is to establish a local hospital based information on the KAP of the WHO SSC Among health professionals in Public Hospitals of Harar, Eastern Ethiopia, 2025. The finding of this study will provide up-to-date information to the Public Hospitals in Harar in order to plan appropriate intervention program to improve the utilization of the WHO surgical safety checklist. Also will serve as entry point for future studies. Moreover, the main aim of this study is to write a thesis as a partial fulfillment of my training in anesthesiology, Critical Care and pain medicine.

Procedure and Duration: You will be asked to fill out a set of questions. There are 36 questions to answer and the time required is approximately about 20 minutes.

Risk and benefits: The risk of participating in this study is very minimal, which is only taking few minutes from your time. There would not be any direct payment for participating in this study. But the findings of this study may reveal important information for the hospitals and other health offices to fill the gaps identified through this study.

Confidentiality: The information you provide in the questionnaire will be confidential. There will be no information that will identify you in particular. The findings of the study will be general for the study participants in general and will not reflect anything about particular individuals. The questionnaire will be coded to exclude showing names. No reference will be made in oral or written reports that could link participants to the study.

Rights: Participation for this study is fully voluntary. You have the right to declare to participate or not in the study. If you decide to participate, you have the right to withdraw from the study at any time and this will not label you for any loss of benefits which you otherwise are entitled. You do not have to answer any question that you do not want to answer.

Contact address: If you have any questions about the study, the procedure or anything else related to the study, please contact through the following address:

Mobile phone of Principal investigator **0916627247 or 0906664890 / Dr. Masresha Yohannes and/or E-mail: masre.shonde@gmail.com** And/or Institutional research ethics review committee (IHRERC) Haramaya University: Office phone: +251-254-662-011: P.O.BOX: 235, Harar.

Declaration of informed voluntary consent:

I have read the participant information sheet. I have clearly understood the purpose of the research, the procedures, the risks and benefits, issues of confidentiality, the rights of participating and contact address for any queries. I have been given the opportunity to ask questions for things that may have been unclear. I was informed that I have the right to stop the study at any time or not to answer any question that I do not want. Therefore, I declare my voluntary consent to participate in this study with my initials (signature) as indicated below.

Name of the participant: _____ Signature: _____ Date: ____/____/2023

Name of the data collector: -----Signature: -----Date: -----/-----/2023

N.B: This is to be signed face to face in the presence of data collector.

Thank you for your cooperation!

8.3. Data Collection Tool

Part 1: Socio-demographic characteristics

N_o	Variables	Response and codes
101.	Age	_____ (in years)
102.	Sex	01. Male 02. Female
103.	Marital status	01. Single 02. Married 03. Divorced 04. Widowed
104.	Monthly income	01. <5000 02. 5000–10,000

		03. 10,001–15,000 04. >15,000
105.	Educational level	01. Diploma 02. BSc 03. MSc 04. Other: (specify)_____

Part 2: Profession-Related Factors

No.	Factors	Response and codes
201.	Professional role	01. Surgeon 02. Anesthetist 03. Anesthesiologist 04. Residents 05. Nurse 06. Physiotherapist 07. Dietitian 08. Other (specify) _____
202.	Years of clinical experience	01. <2 02. 2–5 03. 6–10 04. >10
203.	Surgical unit	01. General 02. Colorectal 03. OB-Gyn 04. Orthopedic 05. ENT 06. Other: (specify)_____
204.	Facility where you work	01. HFCSH 02. Gugal generl hospital
205.	Training in WHO SSC.	01. Yes 02. No

Part 3: Knowledge of the WHO Surgical Safety Checklist

No.	Items	Responses and codes
301.	Have you received training or orientation on the WHO surgical safety checklist?	01. Yes 02. No
302.	Does the checklist include steps before anesthesia, before incision, and before patient leaves OR?	01. Yes 02. No 03. Not sure
303.	Does the checklist include confirming patient identity, procedure, and surgical site?	01. Yes 02. No 03. Not sure
304.	Is equipment readiness (e.g., anesthesia machine, pulse oximeter) checked in the SSC?	01. Yes 02. No 03. Not sure
305.	Does the checklist include allergy check, airway risk, and anticipated blood loss?	01. Yes 02. No 03. Not sure
306.	Are team members required to introduce themselves before starting surgery?	01. Yes 02. No 03. Not sure
307.	Does the checklist include timing of antibiotic prophylaxis?	01. Yes 02. No 03. Not sure
308.	Is it mandatory to verify instrument, sponge, and needle counts before closure?	01. Yes 02. No 03. Not sure
309.	Are all members (nurse, anesthetist, surgeon) expected to participate in the checklist process?	01. Yes 02. No 03. Not sure
310.	Does the checklist include discussion of key postoperative recovery concerns?	01. Yes 02. No 03. Not sure

Part 4: Attitude Toward Surgical Safety Checklist

No.	Items	Responses and codes
401.	I believe the surgical safety checklist improves patient safety outcomes.	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree

402.	The checklist promotes effective communication among surgical team members.	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree
403.	The checklist is feasible and practical in my current surgical setting.	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree
404.	I feel confident and skilled in using the checklist.	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree
405.	The checklist unnecessarily delays surgical procedures. *(reverse scored)*	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree
406.	The checklist should be mandatory for all surgeries including emergencies.	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree
407.	All team members should be held accountable for completing the checklist.	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neutral <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree




Part 5: Utilization of the Surgical Safety Checklist (please answer this part only if applicable for you)


No.	Items	Responses and codes
501.	I participate in checking patient identity, procedure, and consent before anesthesia.	<input type="checkbox"/> Always <input type="checkbox"/> Sometimes <input type="checkbox"/> Rarely <input type="checkbox"/> Never
502.	I confirm equipment readiness before surgery starts.	<input type="checkbox"/> Always <input type="checkbox"/> Sometimes <input type="checkbox"/> Rarely <input type="checkbox"/> Never
503.	I ensure team members introduce themselves by name and role.	<input type="checkbox"/> Always <input type="checkbox"/> Sometimes <input type="checkbox"/> Rarely <input type="checkbox"/> Never
504.	I take part in verifying antibiotic prophylaxis timing.	<input type="checkbox"/> Always <input type="checkbox"/> Sometimes <input type="checkbox"/> Rarely <input type="checkbox"/> Never
505.	I discuss anticipated critical events and risks with the team.	<input type="checkbox"/> Always <input type="checkbox"/> Sometimes <input type="checkbox"/> Rarely <input type="checkbox"/> Never

506.	I confirm the checklist steps are completed before the patient leaves the OR.	<input type="checkbox"/> Always <input type="checkbox"/> Sometimes <input type="checkbox"/> Rarely <input type="checkbox"/> Never
507.	I actively engage in postoperative planning discussions as per checklist	<input type="checkbox"/> Always <input type="checkbox"/> Sometimes <input type="checkbox"/> Rarely <input type="checkbox"/> Never
508.	I ensure instrument and sponge counts are verified and documented.	<input type="checkbox"/> Always <input type="checkbox"/> Sometimes <input type="checkbox"/> Rarely <input type="checkbox"/> Never

8.4. Curriculum Vitae of Principal Investigator

Masresha Yohannes

 Harar, Ethiopia |  +251 916627247 |  masre.shonde@gmail.com

 Instagram: @masre.shonde

Date of Birth: 29 November 1993 | Place of Birth: Hawassa, Ethiopia

Nationality: Ethiopian | Passport No.: EP6430940

[Profile](#)

A dedicated and compassionate medical professional with over three years of experience as a general practitioner and currently pursuing residency training in Anesthesiology. Committed to delivering patient-centered care, with strong clinical, interpersonal, and communication skills. Proficient in English and Amharic, with advanced capabilities in documentation and clinical systems.

Work Experience

Wolkite University Specialized Hospital – Wolkite, Ethiopia

General Practitioner | 19 May 2020 – 8 December 2020

- Managed patients in outpatient departments (OPD) and inpatient wards.
- Conducted daily rounds, performed clinical assessments, and developed care plans.

Kebado Primary Hospital – Dara Kebado, Ethiopia

General Practitioner | 8 May 2021 – 5 January 2023

- Provided general medical care in OPD and ward settings.
- Participated in ward rotations, supervised junior staff, and ensured continuity of care.

Education & Training

Doctor of Medicine (MD)

Hawassa University, School of Medicine – Hawassa, Ethiopia

23 December 2012 – 9 February 2020 | www.hu.edu.et

Anesthesiology Residency (Ongoing)

Haramaya University – Harar, Ethiopia

23 February 2023 – Present | www.haramaya.edu.et

Certificates

- COVID-19 Infection Prevention and Control (IPC) Training

Ethiopian Federal Ministry of Health – Addis Ababa, Ethiopia

- COVID-19 Clinical Management Training

Ethiopian Federal Ministry of Health – Addis Ababa, Ethiopia

Languages

Amharic (Native)

English

Skills

- Clinical decision-making and patient management
- Microsoft Office Suite (Word, Excel, PowerPoint)
- Remote communication platforms (Zoom, Skype)
- Social media and professional communication (Twitter, Instagram)

Hobbies & Interests

- Watching sports
- Participating in sporting activities