



**St. Paul Hospital Millennium Medical College
Graduate Study Program**

**Utilization of the World
Health Organization Safety Checklist Compliance
at St. Paul Hospital Millennium Medical College and AABET
Hospital
, Addis Ababa Ethiopia, 2021**

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Addis Ababa, Ethiopia

August, 2021.



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Abstract

Introduction: Appropriate utilization and compliance of Surgical Safety Checklist reduces occurrence of perioperative surgical complications and improve patient outcomes.

However, data on compliance of surgical checklists are scarce in the study area. Therefore, the aim of this study was to evaluate compliance of checklist completion at SPHMMC.

Objectives: The objective of this study was to assess the compliance of the WHO surgical safety checklist at SPHMMC and AABET, Addis Ababa, Ethiopia, 2021.

Methodology: A prospective observational study was conducted among 451 patients who undergone elective and emergency surgery at SPHMMC and AABET hospital from June to July 2013. Compliance and completeness rate with implementation of Sign-in, Time-out, and Sign-out domains was computed with SPSS Version 23.

Results: A total of 451 operations were performed and checklists were utilized in 80.9 % (365/451) of operations. Among these, most checklists were employed at St. Paul Hospital (51.5 %), in patient who undergone elective surgery (67.1 %), the overall compliance and completeness rate were 80.9 and 9.31 % respectively. The most frequently missed checklist items were items from the sign out and the most frequently filled items were from Time out.

Conclusions and recommendations: Checklist was not used in all operations, among those who utilize the checklist in majority of the operations they were incomplete. The present study did not assess outcomes, but it is assumed that poor compliance puts patients at risk. The checklists were used more frequently during emergency patients who were operated in SPMCH.

Supplementary training and attention to actual checklist use would be indicated to ensure that this valuable tool could be used more routinely and improve communication. Conducting regular audit of checklist utilization is also recommended

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Chapter 1 Introduction

Background

Surgical service is one of the fundamental health care services given in the healthcare system. Over 234 million surgical operations are performed annually worldwide and complications are occurred in 3–16 % of surgical procedures. But it has been estimated that at least half of the complications that occur are avoidable (1). During the surgery and anesthesia services there are several complications including wrong-site operation, prolonged hospital stay, morbidity, and mortality, for prevention or reduction of surgery and anesthesia-related complications use of World Health Organization (WHO) surgical safety checklist is the main one.(2)

Addressing preventable harm from surgery is a less recognized global public health challenge, impacting the lives of millions of patients and their families.(3)Checklists are a simple and reproducible way to standardize selected aspects of patient care. The World Health Organization (WHO) surgical safety checklist is the most widely used surgical checklist, comprising 19 items in three domains.(4)

The WHO surgical safety checklist essentially identifies three distinct phases of an operation each corresponding to a specific period in the normal flow of work: before the induction of anesthesia, before the incision of the skin, before the patients leaves the operating facility. In each phase a ‘checklist coordinator ‘must confirm that the surgical team has completed the listed tasks before it proceeds with the procedure. Introduction of the checklist into a hospital is not sufficient to improve outcomes and compliance and understanding of the checklist may be a reason for the variation in the impact in surgical outcomes.(5)

Despite successful introduction of rules of asepsis, antisepsis, antibiotic treatment, medicine still fights with human errors in medicine. One of the crucial and sensitive to miscommunication are surgical situations, where plenty of multidisciplinary team members are involved in successful provision of the treatment. That is why starting from 2008 a useful tool supporting provision of safe surgery - Surgical Safety Checklist (SSC) - was introduced by World Health Organization.(6)

The importance of a strong safety culture that enhances patient safety initiatives has been reiterated for years in the healthcare system and the safety of surgical care therefore is a global concern. Evidence showed implementation of different effort modalities for an improved surgical outcome. Part of its efforts to improve patient safety, the World Health Organization launched Safe Surgery Saves Lives program in 2008. The aim was to harness political commitment and clinical will to address important patient safety issues, including inadequate anesthetic safety practice, avoidable surgical infection and poor communication among team members.(1)

Ethiopia, one of the developing countries with a population of 82.8 million, currently undergoing extensive development of healthcare services. Data on surgical outcomes is limited but published figures showed an all cause surgical mortality of 7 %. The Clinton Health Access Initiative (CHAI) and Yale Global Health Leadership Institute (GHLI) are working together with the Ethiopian Federal Ministry of Health to improve healthcare services across Ethiopia through the introduction of Ethiopian Hospital Reform Implementation Guidelines (EHRIG) in 2010. The WHO Surgical Safety Checklist is an important tool and its introduction to Ethiopian hospitals is an integral part of the EHRIG. While critics point out that checklists alone are not sufficient to improve patient safety, and must be accompanied by wider strategies for quality improvement, it is hoped that implementation of the checklist will reduce surgical mortality and morbidity. The benefits of the Checklist, however, depend upon the individual hospitals ability to implement it effectively.(1)

Statement of the Problem

Despite successful introduction of rules of asepsis, antisepsis, antibiotic treatment, medicine still fights with human errors in medicine. One of the crucial and sensitive to miscommunication are surgical situations, where plenty of multidisciplinary team members are involved in successful provision of the treatment. That is why starting from 2008 a useful tool supporting provision of safe surgery - Surgical Safety Checklist (SSC) - was introduced by World Health Organization.

Appropriate utilization and compliance of Surgical Safety Checklist reduces occurrence of perioperative surgical complications and improve patient outcomes.(5) However, data on compliance of surgical checklists are scarce in the study area. Therefore, the aim of this study was to evaluate compliance of checklist completion at SPHMMC, Addis Ababa. Ethiopia.

Rationale of the Study

The WHO Surgical Safety Checklist is an important tool. Despite the existing evidence for the use of the SSC, little is known about its real usage rate. To date, there are no reports in the medical literature on the usage rate of the SSC. Furthermore, usage habits of the SSC and reasons and circumstances of non-users of the SSC have not been explored. Knowledge of the usage rate SSC is essential for proper utilization.

This study will identify the gap; so that this finding will have contributed for policy makers and significant others to take possible to improve knowledge of the proper utilization of WHO surgical safety check list and may provide a base line for further study on implementation.

Chapter 2 Literature Review

This was a multicenter prospective study On 2015 by the American College of Surgeons, they conducted 565 and 309 observations of the time-out and sign-out, respectively. On average, two-thirds of the items were checked. Sign-out was not completed in 39% of cases, largely due to uncertainty about when to conduct it. Large variation in checklist use existed between hospitals, but not between surgical specialties or between elective and emergency procedures. Surgical safety checklist performance was better when surgeons led and when all team members were present and paused.(7)

A systematic review by international surgical journal identified 16 studies that observed the use of checklists in various surgical specialties; all surgical specialties (n-10), pediatric surgery (n-2), orthopedic surgery (n-2), otorhinolaryngology surgery (n-2).Surgical checklists have been shown to significantly improve patient outcomes subsequent to surgery, and therefore their use is being widely encouraged and accepted. Continual feedback could be given to maintain high checklist compliance, and thus high patient safety. The recent use of checklists in surgery has shown improvements in patient outcomes post-operatively. A review was conducted to establish the impact of the checklist on different surgical specialties. They found large variation in WHO checklist use in a representative sample of English ORs. (8)

In Australia on 2016 G.C systematic review, that was aimed to assess surgical safety checklist compliance and evaluate surgical team perceptions and attitudes, post-checklist implementation in the operating room was done and twenty-six studies, 13 assessing SSC compliance and 13 investigating surgical team perceptions of SSC, were evaluated studies showed a checklist initiation rate of .90%, but actual observed completion rate varied widely across studies. Sign out was the most poorly performed phase of the checklist (50%) with time out being the best. SSC compliance varies significantly across studies, being highly dependent on staff perceptions, training, and effective leadership. Surgical teams have positive perceptions.(9)

There was an observational study in a Swiss academic center on Adherence to the WHO surgical safety checklist, the checklist's application was evaluated in 104 on-site observations comprising of 72 Team Time Out (TTO) and 32 Team Sign out (TSO) sections. Adherence to the protocol ranged between 96 and 100% in TTO and 22% in TSO respectively. Lack of implementation of the TSO was mainly due to the absence of one of the key OR team members, who were busy with other tasks or no longer present in the operating room.(10)

A Large-scale Population-Based Difference-in-Differences Study was done in Italy on Effects on Clinical Outcomes of a 5-Year Surgical Safety Checklist Implementation Experience. They conducted a retrospective longitudinal study on 1 166 424 patients who underwent surgery in 48 public hospitals between 2006 and 2014. The adherence to the checklist was measured between 2011 and 2013 through a computerized database. Adherence to the checklist showed marked variations across hospitals (0%-93.3%). A pre/post analysis detected statistically significant differences between surgical interventions performed in hospitals with higher adherence to the checklist ($\geq 75\%$ of the surgeries) and those performed in other hospitals, as for the 30-days readmissions rate (odds ratio [OR]: 0.96; 95% confidence interval [CI]: 0.94-0.98) and LOS ≥ 8 days rate (OR: 0.88; 95% CI: 0.87-0.89). No association was observed with mortality outcomes. On the whole, the study attained mixed results. Although a protective effect of the surgical checklist use could not be proved over the first 5 years of this regional implementation experience, the research offers some methodological insights for practical use in the evaluation process of large-scale implementation projects.(11)

A descriptive study was conducted in university hospital in Thailand among 4,340 patients undergoing surgery in nine departments, the highest compliance rate (91.4%) during the sign-in period, however, only 19.4% of the surgical sites were marked. In the sign-out period, nurses correctly confirmed the name of the procedure orally in 99.5% of the cases. The surgeon, anesthetist, and nurse reviewed the key concerns for recovery and management of the patient at the rate of 85.1%.(12)

In single worldwide studies in beginning of implementation, SSC was proven to be effective in many both highland low income settings. The aim of our study was to review the effectiveness of the SSC based on the review of research in low- and middle income countries in years 2008-2017. Within 302 articles of PubMed Medline database, 12 articles were chosen for further analysis, with majority research held in Sub-Saharan Africa (42%), and Upper Middle Income Countries group (42%). The review proved the effectiveness of implementation of SSC in all income groups, especially in terms of reduction of surgical site infection, postoperative sepsis and improvement of communication in healthcare. Promising results of the few studies should encourage more research in this field, which may be difficult to conduct due to the lack of necessary resources in the LMIC.(6)

There was a survey of utilization of the WHO safe surgical checklist, which was done at the main referral hospitals in East Africa. Of the 85 anesthetists interviewed, only 25 % regularly used the WHO surgical checklist. None of the anesthetists in Mulago (Uganda) or Centre Hospitalo-Universitaire de Kamenge (Burundi) used the checklist, mainly because it was not available, in contrast with Muhimbili (Tanzania), Kenyatta (Kenya), and Centre Hospitalier Universitaire de Kigali (Rwanda), where 65 %, 19 % and 36 %, respectively, used the checklist.(13)

In another study conducted in Ethiopian Referral Hospital on Implementation of the WHO Surgical Safety Checklist compliance rates were 83% for general anesthetics at one month after implementation, with an overall compliance rate of 65% at eight months. There was a decrease in Checklist compliance over the period of the study to less than 20% by the end of the study period. The 'Sign out' section was reported as being the most difficult section of the Checklist to complete, and was missed completely in 21% of cases. The most commonly missed single item was the team introduction at the start of each case.(5)

Institutional based cross sectional study was conducted on utilization of WHO surgical safety check list in Ayder comprehensive specialized hospital Mekelle, Tigray, northern Ethiopia, on April 2017. A total of 132 operations were performed and checklists were utilized in 69.7% of cases and completeness rate were 2.2%. Time-out and sign-out Completeness rate were in 60.9%, 8.9% and 7.6% respectively.(1)

A prospective observational study was done in Gondar university hospital on Compliance with Surgical Safety Checklist completion. A total of 282 operations were performed and checklists were utilized in 39.7 % of cases. Among these, most checklists were employed during emergency procedures (61.6 %) that need general anesthesia (75.9 %) in department of surgery (58.9 %). The overall compliance and completeness rate were 39.7 and 63.4 % respectively. The sign-in, time-out and sign-out were missed in 30.5 %, 35.4 % and 45.7 % respectively.(1)

A retrospective study done at Bahir Dar City Administration Public Hospitals on utilization of a clinical checklist in the surgical operation in a resource limited setting. The data showed that of the patient's files only 85.1% had the Surgical Safety Checklist and the remaining 14.9% of operations had not used the Surgical Safety Checklist. Of the total 313 Surgical Safety Checklists patient's files used, only (32.6%) were complete (all items on the checklist had been 'ticked off') and 67.4% were partially complete (all items on the checklist had not been 'ticked off').(14)

According to a Three-Year Retrospective Study on the WHO Safety Checklist Compliance which was done in a Comprehensive Specialized Hospital in Debre Tabor, North Central Ethiopia. On a total of 3460 patient charts. The overall implementation of the WHO surgical safety checklist for surgical patients was found to be 82.1%. From the parts of the checklist, sign in, time out, and sign out were implemented in 85.1%, 43.9%, and 57.7%, respectively. The overall completeness of the checklist (all boxes ticked off) was 30.4%.(2)

Chapter 3: Objectives

General Objective:

- The objective of this study is to assess the compliance of the WHO surgical safety checklist at SPHMMC and AABET.

Specific objectives:

- To assess proper compliance rate of the sign in phase of the WHO surgical safety checklist at SPHMMC and AABET.
- To assess proper compliance rate of the time out phase of the WHO surgical safety checklist at SPHMMC and AABET.
- To assess proper compliance rate of the sign out phase of the WHO surgical safety checklist at SPHMMC and AABET.

Chapter 4: Methods

Study Setting:

St Paul's Hospital Millennium Medical College was established, first as a Hospital for the destitute in 1968 by the late Emperor Haile-Selassie, St. Paul's had been serving the needy for more than 5 decades now. In 2007, with the aim of providing better healthcare services to its patients and producing skilled healthcare professionals, it opened a Medical School with a unique integrated curriculum and admission criteria.

St Paul's Millennium Medical College or SPHMMC, as it is known today, was later established through a decree of the Council of Ministers Regulation No. 200/2011 in 2010GC. Although the establishment as a college entailed a marked reorganization of the structure, the values and the principles of the provision of care in St. Paul's are still preserved.

The college has more than 2800 clinical, academic and administrative and support staffs that provide medical specialty services to patients who are referred from all over the country, teaching medicine and nursing students and doing basic and applied researches. While the inpatient capacity is more than 700 beds, The College sees an average of 1200 emergency and outpatient clients daily.

As a college housing a referral tertiary level care hospital, SPHMMC runs a multitude of medical service provision operations. In addition to the major departments of Internal Medicine, Surgery, Obstetrics and Gynecology, Pediatrics, Emergency services; the college boasts clinical and non-clinical departments like Psychiatry, Ophthalmology, ENT, Dentistry & Maxillofacial surgery, Anesthesiology, Endoscopy, Pharmacy, etc. along with central diagnostic services of Radiology and Laboratory. With the ever-increasing demand for healthcare professionals, the academic wing is one of the other areas where SPHMMC stands out. Along with the special attention given to females and students from developing regions, the college follows a highly competitive performance-based recruitment policy and currently has a total of about 1828 students in undergraduate and graduate studies. The medical curriculum that's currently being provided at the college distinctly positions the student community at an advantage with an integrated modular and hybrid problem-based approach and support from an advanced e-library.

The integration of the medical services and the academic wing has led to a mutual evolvement in the provision of care as well as a time-to-time increase in the number of postgraduate programs in different disciplines. A special focus is given to ascertain quality and conformity to standards; and

marked improvements have been noted in regards to the provision of care given to patients and medical education to students.

The department of surgery was established in 1968 from the inauguration of the hospital and was serving as teaching and training center for postgraduate general surgery training as an affiliate of Tikur-Anbessa Hospital before starting its own post-graduate training program on 2005ec. Currently the department has general surgery, urology, plastic, and pediatrics surgery units under it. The department has 32 general surgeons, 4 renal transplant surgeons, 2 hepatobiliary and pancreatic surgeons, 3 vascular surgeons, and 5 urology surgeons. Currently the department is training a total of 81 residents in the 4-units under it and a total of 2 fellows.

Study Period: The study was conducted prospectively from June 1-June 30 2021.

Study Design: Institutional based cross sectional study.

Study Population: All major surgery cases which were performed with in the period of study at SPHMMC and AABET.

Inclusion criteria: All major surgeries cases which are performed with in the period of study are included.

Exclusion criteria:-If patient died on the table.

-If the surgery is cancelled, after taking the patient to the OR table.

Data Collection and Procedures:

This prospective observational study took place in the surgical department of SPPMCH and AABET, Addis Ababa, Ethiopia. From June 1 to June 30 2013 EC. The data collection procedure included individual structured interviews with selected local OR team members (Surgeons, scrub nurses, anesthetists and residents) regarding check- list Utilization, as well as on-site non-participant reports regarding the target checklist procedures. The interviews with OR team members were conducted by the researcher and included open-ended questions on what fosters and hinders OR professionals' adherence to the checklist. The on-site observations was performed by four trained OR nurses and supervised by two residents and the researcher.

Data Analysis Plan and Procedures:

Data were coded, cleaned, entered and analyzed using SPSS Version 23. Descriptive statistic was used to display checklist compliance and completeness. Categorical variables are presented as absolute and relative frequencies; for metric variables median and range (minimum, maximum) are given as none of these variables was normally distributed Then results will be summarized and presented by tables.

Operational Definitions:

Sign in: The first phase of WHO surgical safety check list that is implemented before induction of anesthesia, ideally with surgeon present, but not essential Verbally verify which is the all (7) components are full filled.

Time out: The second phase of WHO surgical safety checklist that is implemented after induction and before surgical incision, entire team which is the all (7) components are full filled.

Sign out: The third phase of WHO surgical safety check list that is implemented during or immediately after wound closure, before moving the patient out of the operating room, whilst surgeon still present which are the all (5) components are full filled.

Major surgery = is any invasive operative procedure in which a more extensive resection is performed.

Minor surgery = is defined as a set of procedures in which short surgical techniques are applied on superficial tissues, usually with local anesthesia and minimal complication.

Complete = if all item of the surgical safety checklist are ticked off.

Incomplete = if all items of the surgical safety checklist are not ticked off.

Safe surgery = is a multi-component program aimed at strengthening surgical services, improving systems and changing the way care is delivered.

Ethical Consideration:

Ethical clearance letter will be obtained from St. Paul's Hospital Millennium Medical College, surgical department and research directorate office before conducting the research. There will not be any patients' personal identifier included in the data collection form. We declare there is no conflict of interest.

Dissemination of Results:

The final report of this study will prepared both in soft and hard copies and will be submitted to in SPHMMC surgical department, research directorate offices and SPHMMC library. The result will also be disseminated to any concerned body who participate in the development of guideline. And will be disseminated by publishing it in peer reviewed journals.

Chapter 5: RESULT AND DISCUSSION

RESULT

A total of four hundred fifty one patient underwent surgical procedures in one month. The majority of patients were male 281 (62.3%) making Male to female ratio 1.6:1. The age of patients ranged from 5 days to 83 years with a mean of 35.6 years and the most common age group was age ranging from 21 to 40.

The majority of the patients were operated in SPMCH and most of them underwent emergency procedures.

Table 1. Socio-demographic characteristics of patients who underwent colostomy reversal in St. Paul hospital, Addis Ababa, Ethiopia.

Characteristics	Frequency	Percentage
Age		
<5	28	6.2
6-20	65	14.4
21-40	200	44.3
>41	158	35
Sex		
Male	281	62.3
Female	170	37.6
Hospital		
SPMMCH	230	50.9
AABET	221	49
Types of Surgery		
Emergency	176	39
Elective	275	60.9

Compliance of use and checklist completeness

During the study period, 451 operations were performed with spinal, general anesthesia and sedation. Checklist was used in 80.9 % (365/451) of operations; within used checklists only, 9.31 % (34/365) were complete and 90.6 % (331/365) were partially complete (i.e. all items of the checklist have not been ‘ticked off’). As a result, the overall compliance and completeness rate were 80.9 and 9.31 % respectively.

Most checklists were employed at St. Paul Hospital (51.5 %), in patient who undergone elective surgery (67.1 %).

Table 2 Surgical Safety Checklist utilization among operated surgical patients at SPMCH and AABET hospital,2013(N = 451)			
Variables	Use of Surgical Safety Checklist		
	Yes (n = 365)	No (n = 86)	Total operated(n = 451)
Types of surgery			
Emergency	120(32.8)	56(15.3)	176(39)
Elective	245(67.1)	29(7.9)	275(60.9)
Hospital			
SPMCH	188(51.5)	41(11.2)	230(50.1)
AABET	177(48.4)	44(12)	221(49)

Analysis of phases and individual items of the checklists

The analysis included 451 surgical procedures. Overall, 451 checklists were handed in and 9471 items were analyzed to find out which items were most commonly used/missed. The most frequently missed checklist items were items from the sign out.

Before induction (sign-in period)

In this period, 62.7%, the sign in verbally verifies each step, ask questions and checklist items are ticked off immediately after completing. Any patient concerns (e.g., risk of airway, risk of excessive bleeding, and increased risk of infection) are discussed by the team in 17.2% of the cases. In 65.2% of patients all Sign In steps are completed before proceeding to Time Out were insured. Only in 5.4% of patients it was verbally announced that Sign In is complete.

Before skin incision (time-out period)

In 89.5% of patients checklist coordinator verbally announced Time Out. The checklist coordinator verbally verified each step, asked questions and checklist items were ticked off immediately after completing in 80.9% of the cases. Only in 29% of the cases the surgical team paid attention and was focused during Time Out. Patient specific concerns during surgery (e.g., surgical difficulty) were discussed by the team in 67.3% of the cases. In 82.1 % of the cases, it was ensured that all Time Out steps were completed before proceeding to Sign Out and in 80.9% of cases, it was verbally announced that Time Out was completed.

Before patient left operating room (sign-out period)

Sign Out was not announced verbally in all cases, and in all cases the coordinator didn't verbally verified each step, ask questions and checklist items are ticked off immediately after completing the surgery. Surgical team didn't paid attention and was not focused during any Sign Out. Only in 9.31% of the cases Patient specific concerns for postoperative care were discussed by the team. In all cases, it was not ensured that all Sign Out steps were completed before leaving the operating room and it was not verbally announced Sign Out was completed.

Individual structured interviews with selected local OR team members

Twenty two experts from the OR were interviewed including nine surgeons, thirteen scrub nurses, three anesthetists, and seven residents.

Reasons for non-utilization of checklist surgical teams working in the hospitals were asked regarding whether they utilize/assist to utilize the checklist or not. They also asked about the barriers which affect the utilization and implementation process.

All of the surgeons agreed on the benefits of the checklist regarding reduction of mistakes and postoperative complications. Most of the surgeons lack the knowledge about the contents of the surgical safety checklist. The reason mostly mentioned for non-utilization were patient burden, lack of responsibility and the surgeon leaves the operating room before the surgery finished.

The scrub nurses also agreed on the benefit of implementing the checklist, they mentioned they are always the one who are responsible for implementing the checklist. The reasons mostly cited by the nurses were lack of insight and acceptance as to the meaning and purpose, Persons arriving too late” or that “people conversed during the Time Out”, “not all team mates will be available during sig out. “And also the lack of previous training and uncooperative surgical team.

The residents and the anesthetists also support the implementation of the check list. In addition to the previously mentioned reasons, they also stated that arriving of the nurses after the procedure started especially in emergency cases.

DISCUSSION

The implementation of a checklist is intended to improve the outcome of surgical care and thus the quality of care in general. However, its introduction and sustainability is always a big challenge. Of course, the translation of a new concept into practice usually follows theory of diffusion and innovation—acquire knowledge, persuaded by utility, make a decision to adopt, determine usefulness, and then decide to continue using the innovation to full effect.(1)

Time Out period was relatively administered in a higher rate (80.90 %), of which the greatest fulfillment was checklist coordinator verbally announced Time Out. These items are important in getting the attention of all the OR members. Moreover, Patient specific concerns during surgery was discussed in the majority of the cases which helps to anticipate complications and to be ready for the complications ahead and In contrast, in most cases the surgical team didn't paid attention and was focused during Time Out.

The overall implementation of the WHO surgical safety checklist for surgical patients was found to be 80.9% and the completeness of the checklist was 19.3%. This study was in line with a study done in Debre Tabor Comprehensive Specialized Hospitals and showed that the compliance of the surgical safety checklist was 82.1%.(2)

Our findings showed that higher implementation of the checklist in comparison to a study done in Ayder Comprehensive specialized hospital Mekelle study and they revealed that the implementation of the checklist was 69.7% with completeness of 2.2% and their reasons for low achievement were the checklists were not available, not clear and it was also too long. On the other hand, another study a prospective observational cohort study, systematic review and meta-analysis, which was done in London showed a higher percentage of implementation of the checklist, but their study was only on elective surgery. They reported a compliance of 89.8%.And a descriptive study was conducted in university hospital in Thailand and has higher compliance rate of (91.4%). (4, 5, 12).

From the checklist, components sign in and Time out relatively show the higher percentage and Sign out were the least implemented form the checklist. In one Prospective cross sectional study Sign-out was not completed in 39% of cases, largely due to uncertainty about when to conduct it. On the other hand, another study showed a lower implementation of the Time out and high implementation in Sign out component and it was associated with a lack of training and awareness on WHO surgical safety checklist.(7, 2)

Limitation of the study

This study has some limitations. It was conducted in only one setting and in a brief period of time which comprise of relatively small sample; therefore, the results might not be applicable to other settings throughout the country.

Conclusion and recommendations

Checklist was not used in all operations, among those who utilize the checklist in majority of the operations they were incomplete. As a result, the compliance rate was satisfactory but the overall completeness rate was suboptimal. The present study did not assess outcomes, but it is assumed that poor compliance puts patients at risk. The checklists were used more frequently during emergency patients who were operated in SPMCH. Sign- in and Time-out period were performed in satisfactory manner yet it was not performed with equal frequency in all aspects of the items. The Sign-out section was clearly seen as more difficult, and less important, to complete than other sections. The main reasons cited while utilizing the checklist were lack of previous training and uncooperative surgical teams. Regular and appropriate implementation of checklist is used as a tool for improving team communication; strengthening teamwork and improving patient safety. And all the team members should have responsibility and accountability for its implementation. On top that, to amplify consistency, the active team members should be motivated to utilize the checklist during their work practice regularly. Awareness creation should be in place especially for new nursing/anesthetic staffs because of high turnover. Moreover, conducting regular audit of checklist utilization.

Chapter 6: REFERENCE

1. Melekiet TB, Getahun GM. Compliance with Surgical Safety Checklist completion in the operating room of University of Gondar Hospital, Northwest Ethiopia. *BMC Research Notes*. 2015 Aug 19;8(1).
2. Tiruneh A, Yetneberk T. A Three-Year Retrospective Study of the World Health Organisation Safety Checklist Compliance in a Comprehensive Specialized Hospital in Debre Tabor, North Central Ethiopia. *Open Access Surgery* [Internet]. 2020 Dec;Volume 13:95–9. Available from: <https://www.dovepress.com/a-three-year-retrospective-study-of-the-world-health-organisation-safe-peer-reviewed-article-OAS>
3. Delisle M, Pradarelli JC, Panda N, Koritsanszky L, Sonnay Y, Lipsitz S, et al. Variation in global uptake of the Surgical Safety Checklist. *British Journal of Surgery*. 2020 Jan 1;107(2):e151–60.
4. Abbott TEF, Ahmad T, Phull MK, Fowler AJ, Hewson R, Biccadd BM, et al. The surgical safety checklist and patient outcomes after surgery: a prospective observational cohort study, systematic review and meta-analysis. *British Journal of Anaesthesia*. 2018 Jan 1;120(1):146–55.
5. Munusamy G, Gebremichael TB, Shanmugam R. UTILIZATION OF WHO SURGICAL SAFETY CHECK LIST IN AYDER COMPREHENSIVE SPECIALIZED HOSPITALMEKELLE, TIGIRAY, NORTHERN ETHIOPIA, 2017. 2019; Available from: <https://doi.org/10.24941/ijcr.35899.07.2019>
6. Gołębiowska M, Gołębiowska B, Chudzik R, Jarosz-Chudzik K, Jasiński M. Utilization of Surgical Safety Checklist in Low-and Middle Income Countries. Available from: www.worldscientificnews.com
7. Wangoo L, Ray RA, Ho YH. Compliance and surgical team perceptions of WHO surgical safety checklist; Systematic review. *International Surgery*. 2016 Jan 1;101(1):35–49.
8. Patel J, Ahmed K, Guru KA, Khan F, Marsh H, Shamim Khan M, et al. An overview of the use and implementation of checklists in surgical specialties - A systematic review. *International Journal of Surgery*. 2014 Dec 1;12(12):1317–23.
9. Bashford T, Reshamwalla S, McAuley J, Allen NH, McNatt Z, Gebremedhen YD. Implementation of the WHO Surgical Safety Checklist in an Ethiopian Referral Hospital. *Patient Safety in Surgery*. 2014 Mar 28;8(1).
10. Schwendimann R, Blatter C, Lüthy M, Mohr G, Girard T, Batzer S, et al. Adherence to the WHO surgical safety checklist: An observational study in a Swiss academic center. *Patient Safety in Surgery*. 2019 Mar 12;13(1).
11. Rodella S, Mall S, Marino M, Turci G, Gambale G, Montella MT, et al. Effects on Clinical Outcomes of a 5-Year Surgical Safety Checklist Implementation Experience: A Large-scale Population-Based Difference-in-Differences Study. *Health Services Insights*. 2018;11.

12. Kasatpibal N, Senaratana W, Chitreecheur J, Chotirosniramit N, Pakvipas P, Junthasopeepun P. Implementation of the world health organization surgical safety checklist at a university hospital in Thailand. *Surgical Infections*. 2012 Feb 1;13(1):50–6.
13. Epiu I, Bahe Tindimwebwa JV, Mijumbi C, Ndarugirire F, Twagirumugabe T, Lugazia ER, et al. Working towards safer surgery in Africa; A survey of utilization of the WHO safe surgical checklist at the main referral hospitals in East Africa. *BMC Anesthesiology*. 2016;16(1).
14. Semachew A, Afewerk S, Embiale N. Dataset on utilization of a clinical checklist in the surgical operation in a resource limited settings. *Data in Brief*. 2018 Dec 1;21:2562–6.
15. Melekie TB, Getahun GM. Compliance with Surgical Safety Checklist completion in the operating room of University of Gondar Hospital, Northwest Ethiopia. *BMC Research Notes*. 2015 Aug 19;8(1).
16. Tiruneh A, Yetneberk T. A Three-Year Retrospective Study of the World Health Organisation Safety Checklist Compliance in a Comprehensive Specialized Hospital in Debre Tabor, North Central Ethiopia. *Open Access Surgery*. 2020 Dec;Volume 13:95–9.

Annex 1 WHO Surgical Safety Checklist – Team Performance Tool

Performance Standard	Total Verification Criteria (n = 16)	YES	NO	Not Observed
Not Observed ☐ ☐ ☐ ☐ SSC – 1 Score: x/4 = ☐ ☐ ☐ ☐ ☐ ☐ SSC – 2 Score: x/6= ☐	Sign In (before anaesthesia procedure) Verification Criteria 1 - 4			
	1. Verbally verifies each step, ask questions and checklist items are ticked off immediately after completing	☐	☐	☐
	2. Any patient concerns (e.g., risk of airway, risk of excessive bleeding, increased risk of infection) are discussed by the team	☐	☐	☐
	3. Ensures all Sign In steps are completed before proceeding to Time Out	☐	☐	☐
	4. Verbally announces that Sign In is complete	☐	☐	☐
	SSC – 1 Score: x/4 =			

	Time Out (before skin incision) Verification Criteria 5 - 10			
	5. Checklist coordinator verbally announces Time Out	☐	☐	☐
	6. Verbally verifies each step, ask questions and checklist items are ticked off immediately after completing	☐	☐	☐
	7. Surgical team pays attention and is focused during Time Out	☐	☐	☐
	8. Patient specific concerns during surgery (e.g., surgical difficulty) are discussed by the team	☐	☐	☐
	9. Ensures all Sign In steps are completed before proceeding to Time Out	☐	☐	☐
	10. Verbally announces that Time Out is complete	☐	☐	☐
	SSC – 2 Score: x/6=			
	Sign Out (before the patient leaves the operating room) Verification Criteria 11 - 16			
	11. Checklist coordinator verbally announces Sign Out	☐	☐	☐

	12. Verbally verifies each step, ask questions and checklist items are ticked off immediately after completing	☐	☐	☐
	13. Surgical team pays attention and is focused during Time Out	☐	☐	☐
	14. Patient specific concerns for postoperative care are discussed by the team	☐	☐	☐
	15. Ensures all Sign In steps are completed before ending Time Out step	☐	☐	☐
	16. Verbally announces that Time Out is complete	☐	☐	☐
	SSC – 3 Score: x/6 =			
SSC – 3 Score: x/6 =				

Summary SSC Provider/Team Performance Score:

Performance Standard	Score (N and %)
SSC-1: Provider/Team performs appropriate Sign In	
SSC-2: Provider/Team performs appropriate Time Out	
SSC-3: Provider/Team performs appropriate Sign Out	
Total SSC Score = x/16	

WHO SSC Adherence is defined as a score of 100%

WHO SSC Adherence Rate
=

of SSCs correctly used/# of major surgeries observed

For example:

8 SSCs correctly used (SSC scores of 100% for all 8)/

10 major surgeries performed

WHO SSC Adherence Rate =
 $8/10 = 80\%$