



**ADHERENCE TO THE SURGICAL SAFETY CHECKLIST AMONG SURGICAL
TEAM AT SELECTED DISTRICT HOSPITAL'S KIGALI, RWANDA**

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Year: 2019

DECLARATION

I declare that this dissertation work entitled ” Adherence to the surgical safety checklist among surgical team members at district hospitals, Rwanda ” has never been presented elsewhere in other universities.

Also, I do declare that a complete list of references is provided indicating all the sources of information quoted or cited.

Josine` UMUHOZA

DEDICATION

I dedicate this research to Almighty God, my beloved parent, family and fellow classmates for their kind collaboration to handle and accomplish this work.

ACKNOWLEDGEMENT

First of all, the praise is to the Almighty God, for having given me life, the resources and strength to go through my dissertation, without his guidance nothing could have been possible. Secondly, I am deeply indebted by my supervisors Dr. Liliane OMONDI (PhD) and Mr. RYAMUKURU David who despite their tight schedules and heavy workloads accepted to guide and assists me to do this study; I do appreciate their uncomplaining efforts and encouraging statements.

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Thank you all and may God reward you abundantly!

ABSTRACT

Background:

World Health Organization's (WHO) patient safety program, 'Safe Surgery Saves Lives' developed a surgical safety checklist (SSC) as a way of improving the safety of surgical care around the world.

The aim of this 'surgical safety checklist' was to give surgical teams a simple, efficient set of priority checks to improve effective teamwork and communication and encourage active consideration of patient safety for every operation performed.

WHO also wanted to ensure consistency in patient safety during surgery and introduce a culture that values patient safety.

Objective: The main of this study was to assess the adherence to the surgical safety checklist among surgical team at selected at district hospitals, Kigali.

Methodology: The cross-sectional descriptive study was conducted.

A census sampling method was applied in this study, with a sample of 100 surgical team members (nurses, anesthetists, midwives and surgeons). The self-adapted questionnaire from WHO's surgical safety checklist was used as a data collection tool, the data was analyzed by SPSS, 22.

Results: It was found that the regular use of SSC was at 100 %, however its completeness of all items was at 49.4 %.

The main factors were the uncooperativeness of surgical team while filling the checklist, heavy workload and lack of previous training.

The study showed that more than half of the physicians were not consistently cooperative about the use of checklist.

Conclusions: The adherence of surgical team to SSC in selected district hospital, Kigali was found to be high; however the completeness of all items still has a gap.

The factors hindering its use were the heavy workload, uncooperative team members like some surgeon who consider the surgical safety checklist as wasting the time.

The health policy makers should take measures to increase awareness on the importance of use of SSC so its full use would be increased as well.

The administration of health institution should support the use of surgical safety checklist; more over the team work should be enhanced for effective use of surgical safety checklist.

Key words: Adherence, surgical safety checklist, patient safety

TABLE OF CONTENTS

DECLARATION	i
DEDICATION	ii
ACKNOWLEDGEMENT	iii
ABSTRACT	iv
TABLE OF CONTENTS.....	vi
LIST OF ACRONYMS AND ABBREVIATIONS	ix
LIST OF TABLES	x
LIST OF FIGURES AND GRAPHS	xi
LIST OF ANNEXES	xii
CHAPTER ONE: INTRODUCTION.....	1
1.1 INTRODUCTION.....	1
1.2 BACKGROUND.....	1
1.3 STATEMENT OF THE PROBLEM	3
1.4. THE AIM OF THE STUDY	4
1.5. RESEARCH OBJECTIVES	4
1.6. RESEARCH QUESTIONS.....	4
1.7. SIGNIFICANCE OF THE STUDY.....	4
1.7.1. To the researcher	4
1.7.2. To the education	4
1.7.3. To the practice	5
1.8. DEFINITION OF THE CONCEPTS.....	5
1.9. STRUCTURE/ORGANIZATION OF THE STUDY	6
1.10. CONCLUSION OF CHAPTER ONE.....	6

CHAPTER TWO: LITERATURE REVIEW	7
2.1 INTRODUCTION.....	7
2.2. THEORETICAL LITERATURE.....	7
2.2.1 Stages of surgical safety checklist.....	7
2.2.2 Rationale of surgical safety checklist.....	8
2.2.3. Implementation of surgical safety checklist.....	8
2.2.4. Benefit of surgical safety checklist.....	9
2.3. EMPIRICAL LITERATURE.....	10
2.3.1. Adherence the use of surgical safety checklist.....	10
2.3.2. Factors influencing the use of safe surgical checklist.....	11
2.4 CRITICAL REVIEW AND RESEARCH GAP IDENTIFICATION	12
2.5 CONCEPTUAL FRAMEWORK	12
CHAPTER THREE: RESEARCH METHODOLOGY	16
3.1. INTRODUCTION.....	16
3.2. STUDY DESIGN.....	16
3. 3. RESEARCH APPROACH.....	16
3.4. RESEARCH SETTING	16
3.5. STUDY POPULATION	17
3.6. SAMPLING	17
3.6.1. Sample size.....	17
3.6.2. Sampling strategy	17
3.7. VALIDITY AND RELIABILITY OF RESEARCH INSTRUMENTS	18
3.7. 1. Data collection tool.....	18
3.7.2 Content validity	19
3.8. DATA COLLECTION.....	19

3.9. DATA ANALYSIS	20
3.10. ETHICAL CONSIDERATIONS	20
3.11. DATA MANAGEMENT	21
3.12. DATA DISSEMINATION	21
3. 13. PROBLEMS AND LIMITATIONS OF THE STUDY	21
3.14. CONCLUSION OF CHAPTER THREE.....	21
CHAPTER FOUR: RESULTS	22
4.1. INTRODUCTION.....	22
4.2. DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS	22
4.3. PRESENTATION OF FINDINGS	24
4.3.1. Profile of observed participants.....	24
4.3.2. Adherence to the surgical safety checklist	25
4.3.5 Challenges to the adherence to the SSC	28
4.3.6 Factors influencing the adherence to the surgical safety checklist.....	29
CHAPTER FIVE: DISCUSSION.....	32
5.1. ADHERENCE TO THE SURGICAL SAFETY CHECKLIST	32
5.2. FACTORS INFLUENCING THE ADHERENCE TO THE SURGICAL SAFETY CHECKLIST.....	33
CHAPTER SIX: CONCLUSIONS AND RECOMMANDATIONS	35
6. 1. INTRODUCTION.....	35
6.2. CONCLUSION	35
6.3. RECOMMANDATIONS.....	35
REFERENCES	37
APPENDICES	42

LIST OF ACRONYMS AND ABBREVIATIONS

IRB: Institutional Review Board

OR: Operating Room

SPSS: Statistic Package of Social Sciences

SSC: Surgical Safety Checklist

UK: United Kingdom

USA: United States of America

UR/CMHS: University of Rwanda/ College of Medicine and Health Science

WHO: World Health Organization

LIST OF TABLES

Table 1. Content validity of data collection tool.....	19
Table 2. Socio-demographic variables.....	23
Table 3. Profile of observed participants	24
Table 4. Presentation of results according to missing items on the SSC	25
Table 5. Challenges to the adherence to the surgical safety checklist	28
Table 6. Factors influencing the adherence to the sign in.....	29
Table 7. Factors influencing the adherence to the time out	30
Table 8. Factors influencing the adherence to the sign out.....	31

LIST OF FIGURES AND GRAPHS

Figure 1. Surgical Safety Checklist	7
Figure 2. Interaction model of client health behavior (IMCHB) a model for advanced practice nurses done by (Mathews, Secrest and Muirhead,2008)	14
Figure 3. Conceptual framework adopted from interaction model of client health behavior (IMCHB) for done by (Mathews, Secrest and Muirhead, 2008) and WHO checklist.....	15
Graphic 1.Distribution of the findings according to the incompleteness of the main periods of the surgical safety checklist	27

LIST OF ANNEXES

ANNEXE 1. AUTHORIZATION LETTERS	i
ANNEXE 2. RESEARCH INSTRUMENTS	v
ANNEXE 3. CONSENT FORM	vi
ANNEXE 4. QUESTIONNAIRE	viii

CHAPTER ONE: INTRODUCTION

1.1 INTRODUCTION

This chapter involves: the background of the study, problem statement, and the aim of the study, research objectives, research questions, significance of the study, definition of concepts, structure/organization of the study, and conclusion to the chapter one.

1.2 BACKGROUND

Surgical service is one of the essential health care services given in the healthcare institution. Worldwide over 234 million of surgical operations are performed annually, among them 3–16 % are associated complications. Surgical complications are a major cause of morbidity and mortality and also pose a major financial burden to patients and providers. But it has been estimated that at least half of the complications that occur are avoidable (Melekie,T, Getahun,G ,2015).

In 2008 the World Health Organization (WHO) patient safety program “Safe Surgery Saves Lives” developed a surgical safety checklist (SSC of improving) as a way the safety of surgical care around the world (Epiu, I, et al,2016).

The aim of this ‘surgical safety checklist’ was to give surgical teams a simple, efficient set of priority checks to improve effective teamwork and communication and encourage active consideration of patient safety for every operation performed and prevent some avoidable surgical complications (WHO, 2010).

Even if it is not easy to eliminate human error entirely, a study done at University of Gondar, Ethiopia found that surgical deaths were reduced by approximately one-half and surgical complications were reduced by more than one-third when the surgical safety checklist was started to be implemented (Melekie,T, Getahun, G ,2015).

Study conducted by WHO indifferent countries including Canada, India, Jordan, New Zealand, Philippines, Tanzania, England, and the United States found that SSC decreased mortality and complications by 48% and 37%, respectively (Wangoo,L, et al,,2016).

Despite initial results demonstrating that properly implemented surgical checklists can make a considerable dissimilarity to patient safety; however, implementation has not been straight forward (Vries ,D,et al., 2008). The none adherence to surgical safety checklist have many causes include inconsistent leadership, lack of flexibility, and teamwork requirements (Vries, D,et al.2008).

The study done in East African countries including Rwanda ,Burundi,Congo ,Tanzania, Kenya and Uganda found that among 85 anesthetists interviewed, only 25 % regularly used the WHO surgical checklist but in Mulago (Uganda) or Centre Hospitalo-Universitaire de Kamenge (Burundi) none use SSC because they did, not have this tool, in contrast with Muhimbili (Tanzania), Kenyatta (Kenya), and Centre Hospitalier Universitaire de Kigali (Rwanda), where 65 %, 19 % and 36 %, respectively, used the checklist(Epiu, I, et al,2016). The East African Community is made up of low and middle-income countries with limited resources for anaesthesia, including shortages of trained human resources, consumables, and equipment (Epiu & al., 2010). It also lacks well enforced standard operating procedures, guidelines and appropriate infrastructure for safe anaesthesia (Epiu & al., 2010).

The adherence to the WHO Surgical Safety Checklist, if enforced, is likely to have a greater impact on outcomes in this sub-region than in developed countries (Epiu & al., 2010).

Particularly, Rwanda with population 11 million has 44 hospitals and 124 operating rooms (1-2 operating rooms per 100 000 persons (Petroze , et al., 2012).

However there is scarcity of data about the use of this surgical safety checklist, therefore the present study is anticipated to assess the adherence to the surgical safety checklist among surgical team members at district hospitals, Kigali.

1.3 STATEMENT OF THE PROBLEM

Worldwide over 234 million of surgical operations are performed annually, among them 3–16 % are associated complications. Surgical complications are a major cause of morbidity and mortality and also pose a major financial burden to patients and providers (Melekie,T, Getahun,G ,.2015).

WHO developed a SSC as result to minimize mortality and different complications related to surgeries by increasing effective teamwork, communication and encourage active consideration of patient safety for every operation performed (WHO, 2010).

However different study found that the adherence rate to the SSC are still low in developed and developing countries as reported by Mazieroa in study done in Brazil found that the biggest problems related to adherence to the checklist were during the stages prior to induction of anesthesia and prior to the surgical incision; 40% of the team was absent at the time of checking the items, and in more than 70% of the cases the required pause to check the items was not observed but in England, the senior physicians have great involvedness in adhering to the checklist, which negatively reflects on the rest of the team (Mazieroa, E, C, S et al,2015).

The study done in East African countries including Rwanda ,Burundi,Congo ,Tanzania,Kenya and Uganda found that among 85 anaesthetists interviewed, only 25 % regularly used the WHO surgical checklist but in Mulago (Uganda) or Centre Hospitalo-Universitaire de Kamenge (Burundi)none use SSC because they did, not have this tool, in contrast with Muhimbili (Tanzania), Kenyatta (Kenya), and Centre Hospitalier Universitaire de Kigali (Rwanda), where 65 %, 19 % and 36 %, respectively, adhere to the surgical safety checklist(Epiu, I, et al,2016).

This is likely to increase the perioperative medical errors like wrong surgical site, wrong patient and forgetting some items inside patient's body during surgeries (Cristina et al., 2015).

A researcher experience that in some referral hospital surgical team start surgery without conducting SSC, say that” it's wasting time “;and wondering to know if in District hospitals

the surgical team conduct a SSC before surgery, however there is a scarcity of data about the adherence to the surgical safety checklist in Rwanda , therefore the present study is anticipated to assess the adherence to the surgical safety checklist and associated factors among surgical team members at district hospitals, Kigali.

1.4. THE AIM OF THE STUDY

The aim of this study was to assess adherence and factors influencing the adherence to surgical safety checklist at district hospitals, Rwanda.

1.5. RESEARCH OBJECTIVES

1. To determine the level of adherence to the surgical safety at selected district hospitals, Rwanda.
2. To identify the factors influencing the adherence to the surgical safety checklists at selected district hospital, Rwanda.

1.6. RESEARCH QUESTIONS

1. What is the level of adherence to the surgical safety at selected district hospitals, Rwanda?
2. What are factors influencing the adherence to the surgical safety checklists at selected district hospital, Rwanda?

1.7. SIGNIFICANCE OF THE STUDY

This study will be significant in three major areas:

1.7.1. To the researcher

The result of the study hopefully made some contribution by adding to the current literature, the academicians and other interested scholars for research related issues. In addition to other similar conducted researches, it served as a resource of future research.

1.7.2. To the education

The research would provide much data on the use of surgical safety checklist and will anticipate supplementing to the existing knowledge and triggering further research on use of surgical safety checklist.

1.7.3. To the practice

This study would serve as reference for policy makers to establish policies, plans, procedures, laws and regulations toward use of SSC which will be implemented by Health planners in Rwanda.

1.8. DEFINITION OF THE CONCEPTS

Adherence:

Adherence to treatment describes the degree to which patient or a physician follows correctly the medical procedure regimen, weather it is pharmacological, exercise and dietary In this study, the adherence means the degree to which the surgical team members abide to the use of surgical safety checklist (Randa, et al., 2014).

Surgical safety checklist:

It is a simple checklist developed by the World Health Organization which reduces surgical morbidity and mortality and sentinel events. In this study, the surgical safety checklist is a tool used in medical services with aim to improve the safety of surgery by reducing perioperative incidents (WHO, 2010).

Patient safety:

Patient safety is the cornerstone of high-quality health care. Much of the work defining patient safety and practices that prevent harm have focused on negative outcomes of care, such as mortality and morbidity. In the present study, the patient safety imply the use of surgical safety checklist to prevent perioperative errors(WHO, 2010).

Operating theatre:

A room, or suite of rooms, designed for the safe performance of surgical operations (Melekie,T, Getahun,G ,.2015).

Major surgery:

Any surgery within or upon the contents of the abdominal, pelvic ,cranial or thoracic cavities; or which, given the locality, condition of patient, level of difficulty or length of time to perform, constitutes a hazard to life or function of an organ or tissue (Cristina et al., 2015).

Major surgery usually requires general anesthesia, a period of hospitalization of varying length (often a week) and may be performed by a general board-certified-surgeon in a secondary care hospital, or by a surgical subspecialist in a tertiary care hospital (Epiu et al., 2010).

1.9. STRUCTURE/ORGANIZATION OF THE STUDY

This study was organized into two main parts is made of title page, dedication, abstract, dedication, acknowledgement, table of contents, list of tables and list of acronyms and abbreviations.

The second part is made of six chapters, the chapter one that includes the introduction, background, problem statement, aims of the study, research questions, significance of the study, definition of concepts, structure/organization of the study and conclusion to chapter one.

Chapter two is the literature review that made of theoretical literature, empirical literature, critical review, research gap identification and conceptual framework. Chapter three is the methodology that includes, research design, research approach, research setting, population, sampling, data collection data analysis methods, ethical considerations, data management, data dissemination, limitations and challenges to study and conclusion to chapter three.

Chapter four presented the findings of this study, chapter five and six were made of discussions and conclusions and recommendations respectively.

1.10. CONCLUSION OF CHAPTER ONE

The chapter one has presented the background, problem statement, purpose of the study, research objectives and questions, definitions and significance of the study. The next chapter presented the literature.

CHAPTER TWO: LITERATURE REVIEW

2.1 INTRODUCTION

The chapter two presented the existing literature about adherence and factors influencing the use of surgical safety checklist. It is made of theoretical and empirical literature review. In addition to that, this chapter contains the critical review and research gap identification, theory on stress, conceptual framework and conclusion to chapter two.

2.2. THEORETICAL LITERATURE

2.2.1 Stages of surgical safety checklist

The surgical safety checklist provided by the World Health Organization is made up of three main stages namely: the period before the induction of anaesthesia, the period before the incision and the period before the patient leaves the operating room. The checklist focused on all activities that are carried out in operating room references.

World Health Organization	SURGICAL SAFETY CHECKLIST (FIRST EDITION)		
Before induction of anaesthesia	Before skin incision	Before patient leaves operating room	
SIGN IN	TIME OUT	SIGN OUT	
<input type="checkbox"/> PATIENT HAS CONFIRMED • IDENTITY • SITE • PROCEDURE • CONSENT	<input type="checkbox"/> CONFIRM ALL TEAM MEMBERS HAVE INTRODUCED THEMSELVES BY NAME AND ROLE	NURSE VERBALLY CONFIRMS WITH THE TEAM:	
<input type="checkbox"/> SITE MARKED/NOT APPLICABLE	<input type="checkbox"/> SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE VERBALLY CONFIRM • PATIENT • SITE • PROCEDURE	<input type="checkbox"/> THE NAME OF THE PROCEDURE RECORDED	
<input type="checkbox"/> ANAESTHESIA SAFETY CHECK COMPLETED	ANTICIPATED CRITICAL EVENTS	<input type="checkbox"/> THAT INSTRUMENT, SPONGE AND NEEDLE COUNTS ARE CORRECT (OR NOT APPLICABLE)	
<input type="checkbox"/> PULSE OXIMETER ON PATIENT AND FUNCTIONING	<input type="checkbox"/> SURGEON REVIEWS: WHAT ARE THE CRITICAL OR UNEXPECTED STEPS, OPERATIVE DURATION, ANTICIPATED BLOOD LOSS?	<input type="checkbox"/> HOW THE SPECIMEN IS LABELLED (INCLUDING PATIENT NAME)	
DOES PATIENT HAVE A:	<input type="checkbox"/> ANAESTHESIA TEAM REVIEWS: ARE THERE ANY PATIENT-SPECIFIC CONCERNS?	<input type="checkbox"/> WHETHER THERE ARE ANY EQUIPMENT PROBLEMS TO BE ADDRESSED	
KNOWN ALLERGY?	<input type="checkbox"/> NURSING TEAM REVIEWS: HAS STERILITY (INCLUDING INDICATOR RESULTS) BEEN CONFIRMED? ARE THERE EQUIPMENT ISSUES OR ANY CONCERNS?	<input type="checkbox"/> SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE REVIEW THE KEY CONCERNS FOR RECOVERY AND MANAGEMENT OF THIS PATIENT	
<input type="checkbox"/> NO	<input type="checkbox"/> HAS ANTIBIOTIC PROPHYLAXIS BEEN GIVEN WITHIN THE LAST 60 MINUTES?		
<input type="checkbox"/> YES	<input type="checkbox"/> YES		
DIFFICULT AIRWAY/ASPIRATION RISK?	<input type="checkbox"/> NOT APPLICABLE		
<input type="checkbox"/> NO	<input type="checkbox"/> IS ESSENTIAL IMAGING DISPLAYED?		
<input type="checkbox"/> YES, AND EQUIPMENT/ASSISTANCE AVAILABLE	<input type="checkbox"/> YES		
RISK OF >500ML BLOOD LOSS (7ML/KG IN CHILDREN)?	<input type="checkbox"/> NOT APPLICABLE		
<input type="checkbox"/> NO			
<input type="checkbox"/> YES, AND ADEQUATE INTRAVENOUS ACCESS AND FLUIDS PLANNED			

THIS CHECKLIST IS NOT INTENDED TO BE COMPREHENSIVE. ADDITIONS AND MODIFICATIONS TO FIT LOCAL PRACTICE ARE ENCOURAGED.

Figure 1. Surgical Safety Checklist (WHO, 2008)

2.2.2 Rationale of surgical safety checklist

As the worldwide incidences of traumatic injuries, cancers and cardiovascular disease continue to raise, and require surgical intervention, in the under-equipped hospitals, patients are likely to risk for complications, even death (Weiser et al., 2010). For instance, the WHO have estimated that 234 million operations are performed annually around the globe where over 74,000 patient records found a median incidence of in-hospital adverse events was rated at 9.2% with approximately half of those events being operation or drug-related, and 43% deemed preventable (Melekie,T, Getahun,G ,.2015).

Before the introduction and implementation of surgical safety checklist, the lives of millions of around the world were in danger, in United States of America, between 1995 and 2006, the Joint Commission for Accreditation of Health Organizations found that just over 13% of reported adverse events were due to wrong-site surgery (WHO, 2011).

An analysis of 126 cases of wrong-site or wrong-patient surgery in 2005 revealed that 76% were performed on the wrong site, 13% on the wrong patient and 11% involved the wrong procedure (Troxel et al., 2004).

The Surgical Safety Checklist played a big role in saving millions of people in Uganda 2006 by prevention of medical error, however the challenges still surfacing due to the shortage of anesthesia providers, and other surgical team members (Epiu et al., 2010).

Even routine surgery requires the complex coordination of surgeons, anesthesia providers, nurses, and support staff to provide timely and effective care; heightened patient acuity and time pressure increases the potential for critical errors and omissions in established standards of care (Weiser et al., 2010).

2.2.3. Implementation of surgical safety checklist

The surgical safety checklist was introduced in 2008 by the World Health Organization (WHO) and it was applied to all surgical teams to be used for every patient undergoing a surgical procedure.

This tool has been implemented around the world, and encourages dialogue within multidisciplinary teams and the use of routine safety checks to minimize harm to our patients and it was aimed at reducing the morbidity rate and mortality rate for those who could undergo medical operations(Woodman, 2016).

In the framework of implementing successfully a protocol, it is prominent to have people who are compliant with the procedure;(Fourcade et al 2012) showed that though there was an overall positive perception of the surgical safety checklist, some key team members limited its successful implementation.

Anesthesiologists and nurses were largely supportive of surgical checklists and believed that these protocols were instrumental in increasing team communication and morale; however some surgeons were not enthusiastic about the implementation of surgical checklists in the operating room (Helmiö& al., 2012).

Different studies around world showed the importance of adhering to surgical safety checklist where patient's complications decreased from 11.9%to 2.72%, surgical site marking increased from 69.9% pre-checklist to 97.8% (Helmiö et al., 2012).

These are indicators showing that the adherence to surgical safety checklist saved lives and prevent errors as affirmed by another study where 76.0% of physicians who attended the meeting on Surgery in Geneva agreed that the checklist improved operating room safety and 68.0% assumed that it helped to prevent errors(Cullati et al., 2012). However, in hospitals which have inadequate medical facilities and competent staff are likely to experience complications during surgical operations which culminate to deaths so the leaders should make more efforts to provide training to improve surgical safety practices by implementing the surgical safety checklist (Conley et al., 2011).

2.2.4. Benefit of surgical safety checklist

A study done by Faiz et al. (2008) has found that the morbidity and mortality are the outcome measures that have been traditionally used to measure the effectiveness of surgical care and patient safety.

This means that the outcomes of surgical safety checklist get useful when they reflect all facets of surgical operations.

They are useful when outcomes themselves are of interest and reflect all facets of surgical care collectively; including differences in technology and patient variables. They can also be used to identify areas of need and resource utilization at a national or regional level.

The goal of the health care profession should continue to be improved on the advances that have been made in implementing surgical checklists and preventing wrong-site surgery and other medical errors (Ragusa et al., 2016).

An initial assessment of the current patient safety guide- lines is necessary to remedy issues within the system even though errors are inevitable in the health care profession, but by identifying causes and developing plans to minimize or eliminate them can help establish an effective system that ensures patient safety (WHO, 2011).

2.3. EMPIRICAL LITERATURE

2.3.1. Adherence the use of surgical safety checklist

The surgical safety checklist was introduced by the World Alliance for Patient Safety in collaboration with WHO in 2004, with the aim of reducing the medical errors like wrong surgical site or wrong patients, in a study conducted by Melekie and Getahun 2015 showing that the adherence to the surgical safety checklist was 100% cases but the completeness was only observed in 63.6% three years after introduction.

In other study done in Brazil, the surgical safety checklist still under used, particularly in developing countries, in this study it has found that the adherence to was at 80% of all surgical cases(Cristina et al., 2015).

The adherence to the use of safety surgical checklist showed positive impact in high income and low and middle income countries as the complication rates decreased from 18.4% over at 11.7 % after the checklist has been introduced in different countries of the world, as results, the death rates dropped from 3.7% to 1.4% following checklist introduction and compliance with its use (Weiser et al., 2010).

A study done in Norway a study showed that the surgical safety checklist adherence improved surgical safety from 77% to 85% (Haugen et al., 2013). Among other factors which contributed to compliance improvement are adequate staffing and equipment which are the most prominent contributing factors, as the research found that they are positively and significantly correlated with the proper use of safe surgical checklist (Haugen et al., 2013).

The results of the study evaluation of the adherence to the safe surgery checklist at the public university hospital in Sao Paulo revealed that after 5 years of implementation and a second reformulation of the checklist shows that the implementation of protocols related to surgical safety checklist has improved the patient safety (Galbiatti P, et al., 2015).

In East Africa, Uganda was not left behind in implementing safe surgery checklist, Data from the pilot project revealed an estimated surgical volume at Mbarara Regional Referral Hospital of 8515 operations per year, perioperative mortality rate at this hospital was found to be 2.4% overall and 4.6% for non-obstetrical operations (Cullati et al., 2012)..

Using retrospective analysis of surgical records it is obvious that the introduction of safe surgical checklist from 2010 and 2012 decreased mortality significantly (Cullati et al, 2012)

2.3.2. Factors influencing the use of safe surgical checklist

There is a common dilemma among healthcare staff where checklists actually work or only add to the amount of paperwork, the role of checklists in error mitigation is well proven and established in high risk (Hales and Pronovost 2006) and there is growing evidence of its effectiveness in health care. The compliance with the safe surgical checklist was productive in reducing errors which affected lives of patients but it cannot be confirmed that compliance is full because it requires a number of factors, Vats et al (2010) identified barriers and challenges to implementation of the checklist namely.

The East African Community is made up of low and middle-income countries with limited resources for anaesthesia, including shortages of trained human resources, consumables, and equipment (Epiu & al., 2010). It also lacks well enforced standard operating procedures, guidelines and appropriate infrastructure for safe anaesthesia (Epiu et al., 2010).

The adherence to the WHO Surgical Safety Checklist, if enforced, is likely to have a greater impact on outcomes in this sub-region than in developed countries (Epiu et al., 2010).

Those factors include unfamiliarity with the checklist and embarrassment about its use; the hierarchal style in the operating room, which was particularly an issue when the nurse in charge of running the checklist was timid and/or the surgeon or anesthesiologist was unsupportive; problems with timing of the time-out portion because certain processes, such as identifying the patient, were difficult to perform after the patient had been draped; duplication or repetition of items on the checklist, which was sometimes considered “wasting

time”; and inclusion of items on the checklist that were not relevant to certain surgical specialties in an effort to make the list all-inclusive(Cristina et al., 2015).

2.4 CRITICAL REVIEW AND RESEARCH GAP IDENTIFICATION

Most of the articles reviewed in the literature showed how the adherence to safe surgical checklist contributed to the decrease of errors during surgical operations and this reduce the rate of morbidity and mortality. They focused on the implementation of policies related to adherence to surgical safety checklist and how it contributed to the decrease of complications and deaths (Galbiatti et al., 2015).

However, these did not assess the level of adherence to the use of surgical safety checklist and explore the barriers to the use of surgical safety checklist in low income countries like Rwanda.

Therefore, there is need to assess the adherence and factors influencing to the use of surgical safety checklist among the surgical team in district hospitals, Kigali, Rwanda.

2.5 CONCEPTUAL FRAMEWORK

Conceptual framework is a system of concepts, assumptions, expectations, beliefs, and theories that support and explain the study (Nicholas 2013,p2).

Original Theoretical Framework

In this study the original Theoretical conceptual framework used, was from interaction model of client health behavior (IMCHB) a model for advanced practice nurses done by (Mathews, Secrest and Muirhead, 2008).

This model was adopted because it has all variables to base on assessing the level of adherence to the SSC in order to maintain patient safety program “Safe Surgery Saves Lives” developed a surgical safety checklist (SSC of improving) as a way the safety of surgical care around the world (Epiu, I, et al,2016).

The original theoretical framework has 3 categories (Client singularity, Client-professional interaction and health outcome).

The first category is client singularity, which emphasizes the unique and holistic components of a patient ,in this study this term explain that SSC has to be conducted to every patient as unique before surgery.

Client–professional interaction: the surgical safety checklist improves team communication. Instead of a one-way direction from client to professional to health care outcomes suggests a reciprocal engagement between client singularity, interaction, and health outcome, (Mathews, Secrest and Muirhead, 2008). The IMCHB is similar as in this study adherence to SSC among surgical team and associated factors. Use of SSC involves relationship between health care providers and patients themselves (El-nasser *et al.*, 2013).

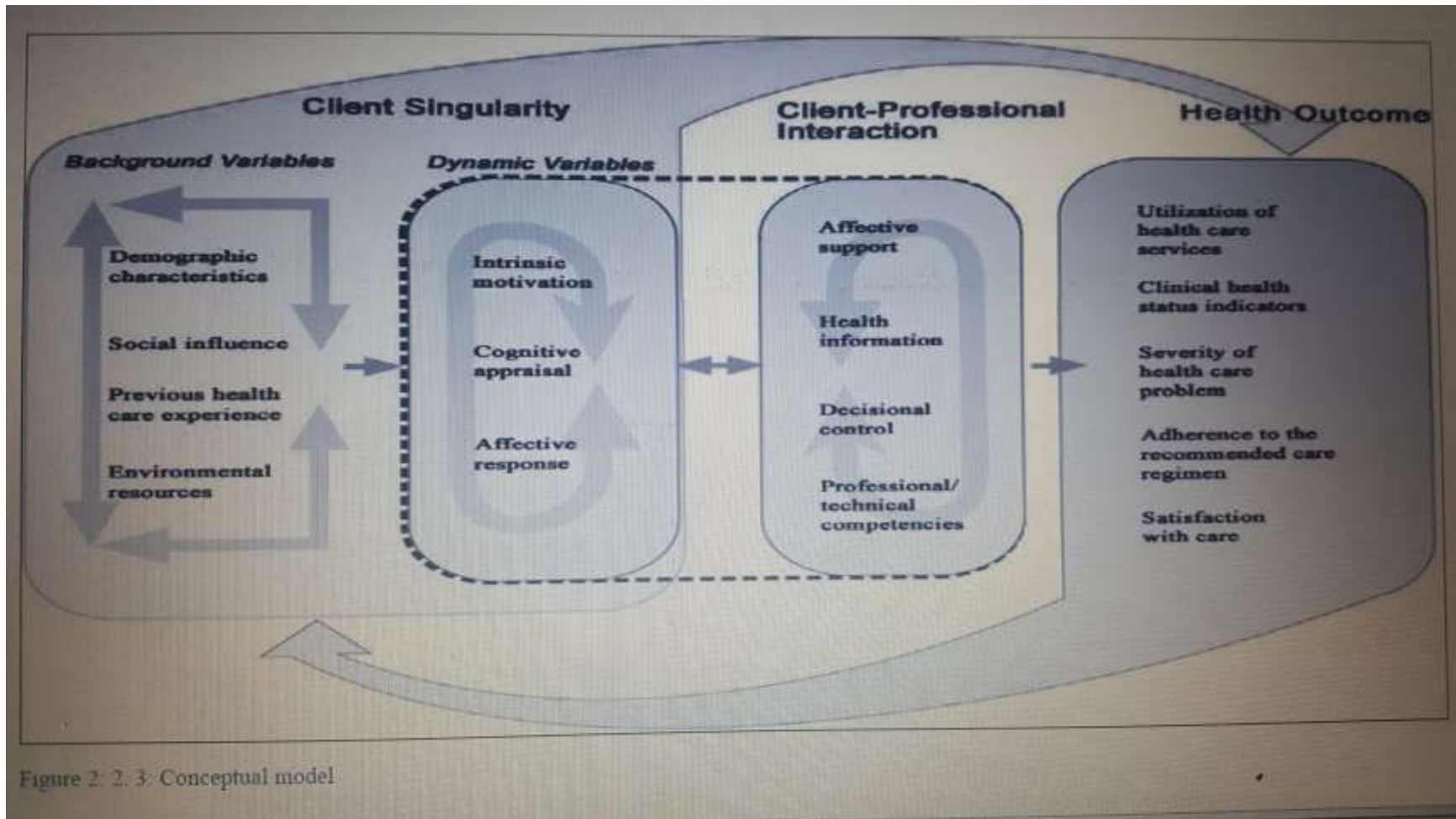


Figure 2. 2. 3: Conceptual model

Figure 2. Interaction model of client health behavior (IMCHB) a model for advanced practice nurses done by (Mathews, Secrest and Muirhead,2008)

The present conceptual framework was made by a researcher; in this study the conceptual framework presents the relationship between several concepts, and variables.

These concepts and variables include the factors that influence the adherence to surgical safety checklist among the surgical team members. In turn the non adherence to the surgical safety checklist may lead to perioperative incidents (medical errors) that can causes different postoperative complications; yet, the preoperative incidents (medical errors) and the possible complications will not be addressed in this study.

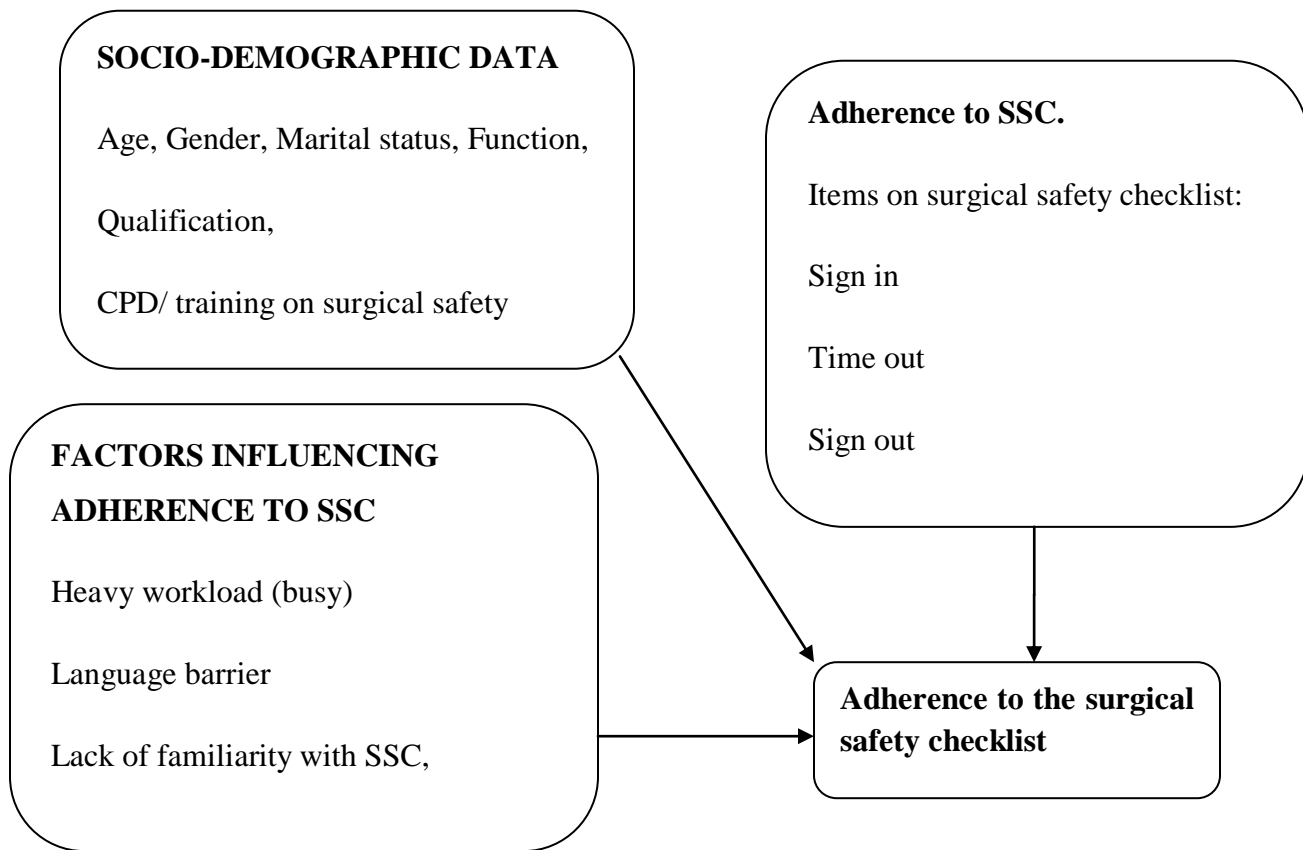


Figure 3. Conceptual framework adopted from interaction model of client health behavior (IMCHB) for done by (Mathews, Secret and Muirhead, 2008) and WHO checklist.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1. INTRODUCTION

The chapter three is the research methodology; it presents the process and methods that was used to conduct this research.

It includes a study design, research approach, study population, sample size and sampling methods, data collection methods and procedures, data analysis, study limitation and challenges, and ethical consideration

3.2. STUDY DESIGN

The present study is cross-sectional using quantitative approach to meet the objectives of the study. Quantitative research is the numerical representation and manipulation of observations for the purpose of describing and explaining the phenomena that those observations reflect (Polit and Beck, 2008). The present study is to assess the adherence to the surgical safety checklist among surgical team at selected at district hospitals, Kigali population and described the phenomenon as reported by the respondents themselves in point of time.

3.3. RESEARCH APPROACH

The quantitative non-experimental approach was applied to the present research. The quantitative is a study that involves the statistical measurement (numbers) or numerical analysis of data.

3.4. RESEARCH SETTING

This research was conducted at three district hospitals in Kigali city, namely Kibagabaga, Muhima and Masaka district hospitals.

KIBAGABAGA hospital is located at Kimironko sector, Gasabo district, MUHIMA hospital at Muhima sector, Nyarugenge district and MASAKA hospital at Masaka sector, Kicukiro district all those hospital are public hospitals for Kigali city under control of Ministry of health.

3.5. STUDY POPULATION

The target population of this study was made of all surgical team members (Nurses, midwives, anesthetists and surgeons) working in operating theatre of Kibagabaga, Muhima, and Masaka district hospital.

Based on information from unit managers of operating theatre of Kibagabaga, Muhima, and Masaka district hospital, the number of theatre team are 31 at Muhima hospital, 33 at Kibagabaga hospital and 27 at Masaka hospital. Therefore the study population was 91 surgical team members (participants).

3.6. SAMPLING

3.6.1. Sample size

The sample size was made all surgical team members (nurses, midwives, anesthetists and surgeons working at Kibagabaga, Masaka and Muhima district hospitals) fulfilling the inclusion criteria thus the sample was equal to 91 population.

3.6.2. Sampling strategy

A census sampling method (complete enumeration) was applied in this study, a census sampling method is a sampling method that involves every unit or everyone in the study population included in sample. The whole study population constitutes the study sample.

The rationale for choosing this method is because the operating team members were too few to random selection in selected district hospital.

3.6.2.1. Inclusion criteria

The inclusion criteria were all surgical team members (nurses, midwives, anesthetists and surgeons) working in operating theatre at Muhima, Kibagabaga and Masaka hospital with working experience above six months and those who accepted to sign consent form.

3.6.2.2. Exclusion criteria

The exclusion criteria were made of all surgical team members (nurses, midwives, anesthetists and surgeons) who were in leave and those who were not consent for

participation, those who were absent and those with below six months of working experience.

3.7. VALIDITY AND RELIABILITY OF RESEARCH INSTRUMENTS

3.7. 1. Data collection tool

To achieve the study's objectives, the study questionnaire was constructed to collect data about the adherence and the factors influencing the use of surgical safety checklist at selected district hospital among surgical team including (nurses, midwives, anesthetists and surgeons). The data collection tool was made up self-developed questionnaire and adopted questionnaires from similarly study done by (Stéphane et al., 2012).

The final data collection tool was made of three sections, the first was made of socio-demographic data, and the second was made of surgical safety checklist (sign in, time out and sign out), the third section is made of the factors that influence the adherence to the use of surgical safety checklists among the surgical team members.

An observation checklist was used to evaluate the participant's level of adherence toward SSC at selected district hospital and Liker scale scored on 4point was used to assess the factors influencing the adherence to surgical safety checklist among surgical team. 1: not agree, 2: neutral, 3: agree and 4: strongly agree.

Validity and Reliability of data collection tool

The validity of the instrument is the extent to which the instruments measure what is supposed to measure (Polit et al., 2010).

To ensure validity of the self-developed data collection tool, the pilot study was applied to evaluate the reliability and validity. The objective of the pilot study was to: (1) Detect possible technical challenges in data collection procedures including instructions and time limits and (2) to identify unclear or ambiguous items in a questionnaire. The tool was valid because it was revised with experts and the researcher adopt the tool from a trusted article regarding adherence to surgical safety checklist.

It was conducted on to 1/10 of sample size (9 participants) from study settings, The participants of the pilot study were observed and interviewed by the researcher, so the tool

was found to be usable, applicable and reliable on 9 participants, the collected data was analyzed, and then the reliability coefficient was 0.83 (Cronbach alpha) and was reported before its use for the large scale of the study sample.

3.7.2 Content validity

Table 1. Content validity of data collection tool

Objectives	Items on the conceptual framework	Items on the questionnaire
To determine the adherence to the use of surgical safety checklists at tree district hospital, Kigali.	Items on surgical safety checklist: Sign in Time out Sign out	Items on surgical safety checklist: Sign in Time out Sign out
To identify the factors that influencing the use of surgical safety checklists at district hospital, Kigali.	<u>Factors influencing the use of SSC</u> Heavy workload Language barrier Lack of familiarity with SSC, Lack of support from administration Lack of time Poor team communication	Section III, Question Number 1, 2, 3 , 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14,15,16,17 and 18.

3.8. DATA COLLECTION

After getting approval from IRB/CMHS, the researcher applied for permission to conduct research from Muhima, Kibagabaga and Masaka hospital ethical committees. Once permission obtained, the researcher met the unit managers of the theatre to introduce himself and explain the study purpose and ask permission and appointments to meet the surgical team members (nurses midwives, anesthetists and surgeons).

After explanation of the study purpose and request the surgical team members (nurses midwives, anesthetists and surgeons) to participate to the study, the consents signed the consent form thereafter the researcher.

As the researcher was an expert in peri-operative nursing, she has entered the operating room to observe the really situation about the use of surgical safety checklist, after operation the researcher completed the data collection tool, at the end of day the researcher interviewed the participants to complete the remaining part of a data collection tool.

3.9. DATA ANALYSIS

Data were captured and analyzed using SPSS 22. Descriptive statistics (frequency, percentages, mean and standard deviation) were computed and summarized in the form of tables and graphs. Then inferential statistics was also applied to answer the research objectives.

3.10. ETHICAL CONSIDERATIONS

The researcher will apply for ethical clearance from IRB/CMHS and permission to conduct the research from Muhima, Kibagabaga and Masaka hospital ethical committees. To ensure anonymity, confidentiality and also participant's right, the codes was used on questionnaires. The participants were guaranteed the right to refuse the participation and to withdraw from the study at any stage without any negative consequences, therefore participation was totally voluntary.

The researcher approached and informed the participants about the potential risks and how they will be mitigated. For example, this study involved the interruption of routine activities to participate to interview, so the interview and completion of questionnaire was done during free time. Of course the comfort of their leisure time was disrupted but the benefit of the provided research information would balance or even outweigh the sacrifice of participants. Then the participants were requested freely to sign the informed consent form in the language of choice as the documents wherein English and French.

3.11. DATA MANAGEMENT

The soft copies were stored on external disk, kept confidential and were used for the purpose of research.

3.12. DATA DISSEMINATION

The results of this study would be published in order to be accessible to the user as needed and the researcher would provide the feedback to the study settings

3. 13. PROBLEMS AND LIMITATIONS OF THE STUDY

In this study some problems might be encountered for instance delay to get permission to collect data from study settings. This was anticipated by ending the research report as early as possible and gets enough time to wait for permission.

The participants might not be willing to participate in this research as the surgical team members might be busy with heavy workload, so the collection tool was very specific and simplified to minimize the time for observation and interview at about ten minutes.

Other anticipated challenge was the possible changes of routine use of surgical safety checklist because of knowing that the observation is in process, this was anticipated by signing the consent forms before the observation done latter without knowing that the observation is ongoing.

3.14. CONCLUSION OF CHAPTER THREE

The chapter three has described the research procedure and instruments that was applied by researcher to answer the research questions.

CHAPTER FOUR: RESULTS

4.1. INTRODUCTION

This chapter presents the findings of this study; the results are presented according to the research objectives. The results are presented in tables which are preceded by a short summary of the contents within table.

The aim of the study was to assess the adherence to the surgical safety checklist and the influencing factors at selected district hospitals, Kigali, Rwanda.

The study was intended to determine the adherence to the surgical safety checklist and to identify the factors influencing the adherence of surgical safety checklist at district hospitals, Kigali, Rwanda.

4.2. DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

The distribution of the findings according to demographic characteristics was presented in the table 2 shows data according to the age of participants, the majority was aged between 30-39 with 56.3% followed by those in 20-29 categories with 26.3%.

According to gender the majority of participants was females n=45(56.25 %) and the males were n=35 (43.75%) as shown in table.

According to their profession selection of the participants, the majority of questionnaires were completed by the nursing group n=35 (43,75%), followed by the anesthetists n=20 (25%).

And also shows the respondents with 2-5 years' experience n=43 (53.7%) is the largest, followed by those with more to 5 years n=29 (36.3%), then 1 year or less n= 8 (10.0%).

The number five in the table below shows only 61.3% of participants received training on SSC while 38.8% were not trained.

Then number 6. Shows a large number of participants hold an Advanced diploma (53.8), followed by with a bachelor's degree.

Table 2. Socio-demographic variables

Variables		N	%
1. Age	20-29	21	80.0
	30-39	45	16.0
	40-49	14	2.0
Total		80	100
2. Sex	Male	35	43.8
	Female	45	56.3
Total		80	100
3. Profession	Nurses	35	43.8
	Midwives	10	12.5
	Anesthetists	20	25.0
	physicians	15	18.8
Total		80	100
4.Experience	Less or equal 1year	8	10.0
	2-5years	43	53.8
	More than 5years	29	36.3
Total		80	100
5. training on SSC	Yes	49	61.2
	No	31	38.8
Total		80	100
6.Education	A2	8	10.0
	A1	43	53.8
	Bachelor's	27	33.75
	Master's	2	2.5
Total		80	100

4.3. PRESENTATION OF FINDINGS

4.3.1. Profile of observed participants

The table 3 displays the characteristics of every surgical operation observed. It is clear that the majority (71.3%) cases were performed under spinal anesthesia while 78.8% were elective cases. Most (81.3%) cases were performed during day time whereas 81.1% were obstetric surgeries mainly caesarean sections.

Table 3. Profile of observed participants

Variable		Frequency	Percent
Type of Anesthesia	SA	57	71.3
	GA	22	27.5
Status of surgery	Emergent	17	21.3
	Elective	63	78.8
Time of operation	Day	65	81.3
	Night	15	18.8
Type of surgery	General	14	17.5
	Obstetric	65	81.3

4.3.2. Adherence to the surgical safety checklist

The table 4 depicts the missed items on every checklist. Overall, 80 checklists were handed in and 2000 items were analyzed to find out which items were most commonly used (full adherence) or missed (incompleteness).

From these check items evaluated, a half, 50.6 % (1013/2000) were not well completed, meaning that only 49.4% of observed participants use the surgical safety checklist correctly while 50.6% use it incorrectly.

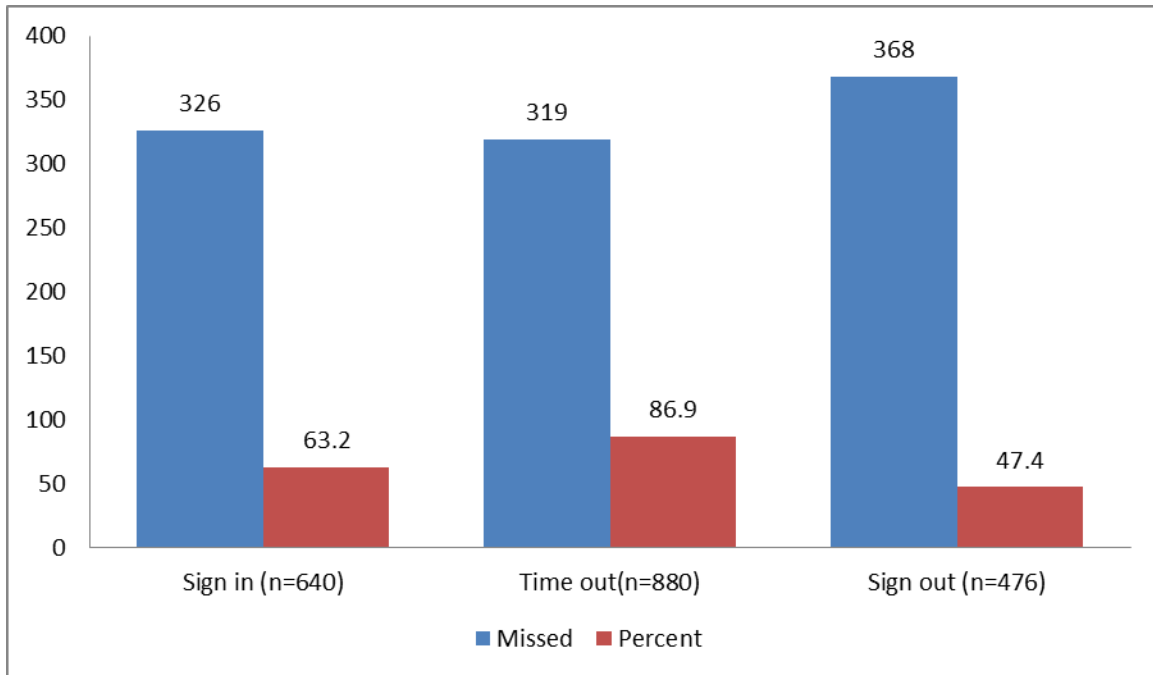
The most frequently missed checklist items were item 23 (74 times), 24 (73 times) and 25 (70 times) that state “surgeon, anesthesia professional and nurse review the key concerns for recovery and management of this patient”, Specimen labeled correctly” and whether the assigned person put his/her Name and signature or not respectively.

Table 4. Presentation of results according to missing items on the SSC

Item no	Checklist item	Not checked	Percent
Sign in			
1	Has the patient confirmed his/her identity, site, procedure and consent?	29	2.9
2	Is the site marked?	57	5.6
3	Are the anesthesia equipment and medication checks complete?	39	3.8
4	Pulse oximetry is attached and functional	39	3.8
5	Does the patient have a known allergy?	39	3.8
6	Does the patient have a difficult airway or Aspiration risk?	42	4.1
7	Is risk of blood loss >500 ml and require blood?	40	3.9
8	Does the assigned person put his/her Name and signature?	41	4.0
Time out			

9	Confirm all team members have introduced themselves by name and role	33	3.3
10	Confirm the patient's name, procedure and site of incision	26	2.6
11	Has antibiotic prophylaxis been given within The last 60 min?	24	2.4
	Anticipated critical events to surgeon:		
12	What are the critical or non-routine steps	25	2.5
13	How long will the operation take?	25	2.5
14	Is the anticipated blood loss > 500 mls?	25	2.5
	Anticipated critical events to anesthetist:		
15	Are there any patient-specific concerns?	32	3.2
	Anticipated critical events to nursing team:		
16	Sterility confirmed	38	3.8
17	Are there equipment issue or any concern	33	3.3
18	Is essential imaging displayed	30	3.0
19	Does the assigned person put his/her name and signature?	28	2.8
	Sign out		
20	Nurse verbally confirms name of procedure	61	6.0
21	Completion of instrument, sponge, needle and suture counts	19	1.9
22	Are there any equipment problems to be addressed?	71	7.0
23	What are the key concerns for recovery and management of this patient?	74	7.3
24	Specimen labeled correctly	73	7.2
25	Does the assigned person put his/her Name and signature?	70	6.9
	TOTAL	1013	100

The graphic 1 illustrates the level of incompleteness of the main steps of the SSC. The sign-in, time-out and sign-out were missed in 63.2 % (326/640), 86.9% (319/880) and 47.4 % (368/476) respectively.



Graphic 1. Distribution of the findings according to the incompleteness of the main periods of the surgical safety checklist

4.3.5 Challenges to the adherence to the SSC

The following table 5 indicates the barriers to adherence to SSC use. A large number (76.3%) strongly agree that administration issues were a barrier to the adherence.

Other participants also strongly believe that shortage of staff, timidity and lack of good communication are barriers to adherence with 66.3%, 62.5% and 57.5% respectively. Other findings are summarized in the table below.

Table 5. Challenges to the adherence to the surgical safety checklist

Statement	Strongly Disagree	Disagree	Agree	Strongly agree
Administrative issues	3 (3.8)	3 (3.8)	13 (16.3)	61 (76.3)
Lack of training	2 (2.5)	21 (26.3)	32 (40)	25(30)
Commitment of staff to duty	3 (3.8)	7 (8.8)	40 (50)	30 (37.5)
Absence of SSC	11 (13.8)	12(15.0)	47 (58.8)	10 (12.5)
Lack of management commitment	9 (11.3)	17 (21.3)	36 (45)	18 (22.5)
Lack of incentives	10 (12.5)	5 (6.3)	45 (56.3)	20 (25.0)
Lack of interest	6 (7.5)	19 (23.8)	26 (32.5)	29 (36.3)
Shortage of manpower	7 (8.8)	4 (5.0)	16 (20.0)	53 (66.3)
Lack of team spirit	3 (3.8)	7 (8.8)	40 (50)	30 (37.5)
Timidity	7 (8.8)	1 (1.3)	22 (27.5)	50 (62.5)
Time consuming	23 (28.8)	18 (22.5)	6 (7.5)	33 (41.3)
Use of SSC not important	16 (20.0)	18 (22.5)	28 (35.0)	18 (22.5)
Lack of good communication	6 (7.5)	6 (7.5)	22 (27.5)	46 (57.5)

4.3.6 Factors influencing the adherence to the surgical safety checklist

The table 6 depicts the factors influencing the compliance to the sign in period. It is clear that only the status of the surgery is significantly associated with the adherence to sign in with a P value <0.05. There is less likelihood for the SSC to be adhered to in case of emergencies.

Table 6. Factors influencing the adherence to the sign in

Variable		Sign in		Chi ²	P-value
		Completed	Not completed		
Type of Anesthesia	Spinal	22	37	1.25	0.19
	General	5	16		
Status of surgery	Emergent	10	7	6.07	0.01*
	Elective	17	46		
Time of operation	Daytime	21	44	0.32	0.38
	Night shift	6	9		
Training on SSC	Yes	18	31	0.50	0.32
	No	9	22		

The table 7 depicts the factors influencing the compliance to the time out period. It is clear that neither the type of an aesthesia, status of the surgery, time of operation nor training on SSC are statistically associated with the completeness or not of the SSC during the time out period.

Table 7. Factors influencing the adherence to the time out

Variable	Time out		Chi ²	P-value	
	Completed	Not completed			
Type of Anaesthesia	Spinal	33	26	2.67	0.08
	General	16	5		
Status of surgery	Emergent	10	7	0.05	0.51
	Elective	39	24		
Time of operation	Daytime	41	24	0.48	0.33
	Night shift	8	7		
Training on SSC	Yes	34	15	3.52	0.051
	No	15	16		

The table 8 depicts the factors influencing the compliance to the sign out. Again, it is clear that neither the type of anesthesia, status of the surgery, time of operation nor training on SSC are statistically associated with the completeness or not of the SSC during the sign out period.

Table 8. Factors influencing the adherence to the sign out

Variable		Sign out		Chi ²	P-value
		Completed	Not completed		
Type of Anaesthesia	Spinal	1	58	0.59	0.45
	General	1	20		
Status of surgery	Emergent	0	17	0.55	0.61
	Elective	2	61		
Time of operation	Daytime	1	64	1.31	0.34
	Night shift	1	14		
Training on SSC	Yes	0	49	3.24	0.14
	No	2	29		

CHAPTER FIVE: DISCUSSION

5.1. ADHERENCE TO THE SURGICAL SAFETY CHECKLIST

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 are 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 (Hedden and Gabrieli, 2004).

In this observational study we have found, although the hospital reported 100 % utilization of the checklist in the operation room, the adherence greatly varies with a completeness of items (49.4 %). However this figure is quite lower compared to the findings of the study conducted by (Melekie and Getahun 2015) showing that the instrument was used in 100% cases but the completeness was only observed in 63.6% three years after introduction.

Sign-in period was relatively administered in a lower rate (33.8 %), of which show the lack of fulfilment of anaesthetic equipment and medication checking. These findings are contrary to those found in the study conducted by (Melekie and Getahun 2015) showing a sign in completeness rate of 69.5%. The findings of this study are quite warring because these items are important in preventing the most common errors that causes serious harm to the patient (WHO, 2009).

Moreover, functional pulse oximetry was attached in the majority of the cases which helps to detect desaturation at the early stage. In contrast, items of aspiration risk, anticipation of a difficult airway, allergic history and estimated blood loss were found unchecked in most cases, all of them could lead to loss of life (Kasatpibal et al., 2012).

Surgical team communication is one of the key intentions of the WHO Surgical Safety Checklist (Lingard et al., 2005). In Time-out period, surgical teams are expected to introduce each other by name and functional role. Nevertheless, the findings of this study showed that only 48.8 % of team members were introduced themselves by names and roles. The result is similar with study conducted in Thailand in which majority of the surgical team failed to introduce their name and functional role to others (Lingard et al., 2004).

The reason might be explained by surgical teams were communicated and introduced themselves for a long period of time in their practical place. Moreover, people often introduce each other only during the first contact. In this respect, many studies depicted that serious complications could occur when there are unsuccessful communication and cooperation among the surgical team members (Mishra et al., 2008).

In this study finding, Sign-out period was poorly performed (2.5 %) compared with other sections. This is consistent with experience from the Ethiopian, UK and Thailand hospitals (Lingard et al., 2004; Conley et al., 2011).

The potential causes for this period could be tightly preoccupied surgical teams (nursing teams with final instrument count, processing and preparation for the next case, surgical and anaesthetic teams with patient extubation, oxygen preparation in recovery room, procedure note writing and patient transfer) during that procedure.

5.2. FACTORS INFLUENCING THE ADHERENCE TO THE SURGICAL SAFETY CHECKLIST

The factors that influence the use of surgical safety checklist, particularly the period of signing out which was found to poorly adhered was the tight preoccupation of the surgical teams (nursing teams with final instrument count, processing and preparation for the next case, surgical and anaesthetic teams with patient extubation, oxygen preparation in recovery room, procedure note writing and patient transfer) during that procedure so the operating team members were found to not adhere to the surgical safety checklist because of busy workload.

Communication errors are the most common cause of adverse events in healthcare, for instance, information does not reach the right person, or is inaccurate, or issues remain unresolved until they become critical. In the operating theatre, this leads to mistakes, inefficient use of resources, wasted equipment, frustration, poor morale and delays (Randa, et al, 2014). .

This problem was in line with current study finding, as the main reason cited was uncooperativeness of surgical team while filling the checklist and lack of previous training, both of them are sources of communication error.

Literature indicates that over time, compliance of surgical staff is good but needs follow up and sustained education sessions including meetings to review and address the barriers in a comprehensive way , this highlights the importance of involvement of administration to the use of surgical safety checklist (Hancorn and Blair, 2010; Haynes et al., 2011).

The importance of local champions was highlighted and effective implementation was seen when senior clinicians showed good leadership skills, demonstrated how to use the checklist, and explained why it was necessary (Carthey et al., 2003).

But this study showed that more than half of the physicians were not consistently used the checklist.

This may have impact on patient outcome and not being exemplary for other staffs. It appears that it is not only the technical skill, but also the behavioural patterns and non-technical skills of the physician/surgeon (leadership, teamwork, problem-solving, decision-making & situation awareness), that affect surgical outcomes (Carthey et al., 2003; McCulloch et al., 2009).

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1. INTRODUCTION

Chapter six is made of conclusions that are drawn from the findings of this study, and the recommendations to the health policy makers, the administration of the district hospitals, health care providers and to the health researchers

6.2. CONCLUSION

The rate of adherence to surgical safety checklist was found to be high, however the completeness of items is questionable, (about the half of SSC) were not well completed.

The reported reason was the heavy workload, as many patients were waiting for surgery so many surgical team members reported not to have enough time to complete the full surgical safety checklist. Furthermore the participant revealed that the uncooperative team members was other factor that hinder the use of surgical safety checklist, for instance some of them consider the use of surgical safety checklist as wasting time, this was explained by the fact that when the seniors like surgeons, other physicians and leaders highlight the full application of the surgical safety checklist, it's use increases considerably as reported in different literature.

As reported by this study, the systematic application of surgical safety checklist does not only imply the technical skill, but also the behavioural patterns and non-technical skills of the physician/surgeon (leadership, teamwork, problem-solving, decision-making & situation awareness), that affect surgical outcomes.

6.3. RECOMMENDATIONS

According to the findings of the present study on adherence to the surgical safety checklist at Districts Hospital, Kigali, Rwanda, the recommendations are presented as follows:

To the ministry of health: to take measures to increase awareness on the importance of use of surgical safety checklist to reduce preoperative and other medical errors, the awareness can be increased by planning for training/ symposium/seminars/ workshops/ on the use of surgical safety checklist. To plan for continuing evaluation and monitoring on how the surgical safety checklist is applied in order find out the challenges that may hinder its use.

To the administration of University Teaching Hospitals: to plan the time table of mentorship to the district hospitals about adherence to surgical safety checklist.

To the study settings (selected District hospital Kigali): to take measures that every required health personal, particularly the surgical team members understand and support the use of surgical safety checklist, furthermore, the personal should be enough to have sufficient time to complete the surgical safety checklist, moreover all necessary equipments (hard copies of SSC) and other necessities to apply the surgical safety checklist. To plan for continuing evaluation and monitoring on how the surgical safety checklist is applied in order find out the challenges that may hinder its use.

To the healthcare professionals: To promote team work/good communication/ mutual collaboration/ inter-professional relationships to enhance the use surgical safety checklist.

To be aware that the use of surgical safety checklist is important for the patient safety

To the researchers: Additional research is needed to find and test the best interventions that can be applied to increase the application of the surgical safety checklist to minimize peri-operative and other medical errors.

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APPENDICES

ANNEXE 1. AUTHORIZATION LETTERS



UNIVERSITY OF
RWANDA

COLLEGE OF MEDICINE AND HEALTH SCIENCES

CMHS INSTITUTIONAL REVIEW BOARD (IRB)

Kigali, 14/01/2019
Ref: CMHS/IRB/059/2019

UMUHOZA Josiane
School of Nursing and Midwifery, CMHS, UR


Dear UMUHOZA Josiane

RE: ETHICAL CLEARANCE

Reference is made to your application for ethical clearance for the study entitled "*Adherence to Surgical Safety Checklist among Surgical Team Members at District Hospitals in Kigali City.*"

Having reviewed your protocol and found it satisfying the ethical requirements, your study is hereby granted ethical clearance. The ethical clearance is valid for one year starting from the date it is issued and shall be renewed on request. You will be required to submit the progress report and any major changes made in the proposal during the implementation stage. In addition, at the end, the IRB shall need to be given the final report of your study.

We wish you success in this important study.



Professor Jean Bosco GAHSTU
Chairperson Institutional Review Board,
College of Medicine and Health Sciences, UR

Cc:

- Principal College of Medicine and Health Sciences, UR
- University Director of Research and Postgraduate studies, UR

REPUBLIC OF RWANDA

16/04/2019

REF 360/MSK/DH/2019



KIGALI CITY
DISTRICT KICUKIRO
HOPITAL MASAKA
B.P 3472 KIGALI
E-mail: masaka.hospital@moh.gov.rw

To: Madam UMUHOZA Josine

Re: PERMISSION TO CONDUCT DATA COLLECTION

Dear Madam,

Reference made by decision of Director General of Masaka district hospital on your research proposal entitled "*adherence to surgical safety checklist among surgical team members at district hospitals in Rwanda*" The management of Masaka District Hospital is pleased to inform you that, you have authorization to conduct a study in our hospital.

Sincerely

Dr. Marcel UWIZEYE
Director General Masaka Hospital



KIGALI CITY
NYARUGENGE DISTRICT
MUHIMA HOSPITAL
P.O. BOX 2456 KIGALI
Tél. /Fax : +252 50 37 7
E-mail : muhima.hospital@moh.gov.rw

UMUHOZA Josine

Re: Your request for conducting a research and data collection

Dear Josine,

Reference made to your letter received on April 4th 2019 requesting to conduct a research and data collection at Muhima District Hospital for your research project entitled: *Adherence to surgical safety checklist among surgical team members at District hospital in Kigali*.

I would like to inform you that your request is approved and at the end the administration of Muhima hospital shall need to be given the final report of your study.

Yours sincerely,

MANIRAGUHA YEZE Aimée Victoire

Chief Ethic Committee



Cc:

- Clinical Director
- Director of Nursing

On 2nd April 2019
UMUHOZA Josine
School of Nursing and Midwifery
College of Medicine and Health Sciences
University of Rwanda

Accord



REC'D AL KIBAGABAGA
04/04/2019
N° 467
A baler par

To The Director General of KIBAGABAGA district hospital

RE: Request to carry out research and data collection at KIBAGABAGA district hospital.

Dear Sir,

I am UMUHOZA Josine a student in Masters in Nursing Science, perioperative track at the college of Medicine and Health Sciences. As a prerequisite to complete masters' degree, I am supposed to carry out research and my study is entitled "ADHERENCE TO SURGICAL SAFETY CHECKLIST AMONG SUGICAL TEAM MEMBERS AT DISTRICT HOSPITALS IN KIGALI"

I have submitted the requirements to the CMHS institutional Review board and an Ethical Clearance Letter has been granted to me Ref: CMHS/1RB/083/2019 dated 21/02/2019. The tool to be used and the ethical standards to be followed have been accepted. It is against this recommendation letter that I seek authorisation to carry out research and collect data at your district hospital. Kindly find attached the letter from CMHS institutional Review Board.


I hope my request will be put under your kind consideration.

Sincerely yours,


UMUHOZA Josine
Masters in Nursing Science perioperative track
School of Nursing and Midwifery,
College of medicine and health sciences
University of Rwanda
Tel: +250788631855
Email: umuhoza2004@gmail.com

ANNEXE 2. RESEARCH INSTRUMENTS

2.1. SURGICAL SAFETY CHECKLIST

 SURGICAL SAFETY CHECKLIST (FIRST EDITION)		
Before induction of anaesthesia	Before skin incision	Before patient leaves operating room
SIGN IN <input type="checkbox"/> PATIENT HAS CONFIRMED • IDENTITY • SITE • PROCEDURE • CONSENT <hr/> <input type="checkbox"/> SITE MARKED/NOT APPLICABLE <hr/> <input type="checkbox"/> ANAESTHESIA SAFETY CHECK COMPLETED <hr/> <input type="checkbox"/> PULSE OXIMETER ON PATIENT AND FUNCTIONING <hr/> DOES PATIENT HAVE A: KNOWN ALLERGY? <input type="checkbox"/> NO <input type="checkbox"/> YES <hr/> DIFFICULT AIRWAY/ASPIRATION RISK? <input type="checkbox"/> NO <input type="checkbox"/> YES, AND EQUIPMENT/ASSISTANCE AVAILABLE <hr/> RISK OF >500ML BLOOD LOSS (7ML/KG IN CHILDREN)? <input type="checkbox"/> NO <input type="checkbox"/> YES, AND ADEQUATE INTRAVENOUS ACCESS AND FLUIDS PLANNED	TIME OUT <input type="checkbox"/> CONFIRM ALL TEAM MEMBERS HAVE INTRODUCED THEMSELVES BY NAME AND ROLE <hr/> <input type="checkbox"/> SURGEON, ANAESTHESIA PROFESSIONAL, AND NURSE VERBALLY CONFIRM • PATIENT • SITE • PROCEDURE <hr/> ANTICIPATED CRITICAL EVENTS <input type="checkbox"/> SURGEON REVIEWS: WHAT ARE THE CRITICAL OR UNEXPECTED STEPS, OPERATIVE DURATION, ANTICIPATED BLOOD LOSS? <hr/> <input type="checkbox"/> ANAESTHESIA TEAM REVIEWS: ARE THERE ANY PATIENT-SPECIFIC CONCERNS? <hr/> <input type="checkbox"/> NURSING TEAM REVIEWS: HAS STERILITY (INCLUDING INDICATOR RESULTS) BEEN CONFIRMED? ARE THERE EQUIPMENT ISSUES OR ANY CONCERNS? <hr/> HAS ANTIBIOTIC PROPHYLAXIS BEEN GIVEN WITHIN THE LAST 60 MINUTES? <input type="checkbox"/> YES <input type="checkbox"/> NOT APPLICABLE <hr/> IS ESSENTIAL IMAGING DISPLAYED? <input type="checkbox"/> YES <input type="checkbox"/> NOT APPLICABLE	SIGN OUT NURSE VERBALLY CONFIRMS WITH THE TEAM: <input type="checkbox"/> THE NAME OF THE PROCEDURE RECORDED <input type="checkbox"/> THAT INSTRUMENT, SPONGE AND NEEDLE COUNTS ARE CORRECT (OR NOT APPLICABLE) <input type="checkbox"/> HOW THE SPECIMEN IS LABELLED (INCLUDING PATIENT NAME) <input type="checkbox"/> WHETHER THERE ARE ANY EQUIPMENT PROBLEMS TO BE ADDRESSED <hr/> <input type="checkbox"/> SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE REVIEW THE KEY CONCERNS FOR RECOVERY AND MANAGEMENT OF THIS PATIENT
THIS CHECKLIST IS NOT INTENDED TO BE COMPREHENSIVE. ADDITIONS AND MODIFICATIONS TO FIT LOCAL PRACTICE ARE ENCOURAGED.		

ANNEXE 3. CONSENT FORM

Chairperson of the CMHS IRB (0788 490 522)

Deputy Chairperson (0783 340 040)

Number: ... /2019

My name is Josine UMUHOZA, In order to improve In order to improve the quality of care provided to the patients perioperatively, a Master student from the University of Rwanda, College of Medicine and Health Sciences, Master’s program, is conducting a research on the adherence to the use of surgical safety checklist among the surgical team members at four district hospitals, Kigali, Rwanda.

The main of this study is to assess the adherence to the use of surgical safety checklist among the surgical team members at four district hospitals, Kigali, Rwanda.

For this purpose, I humbly request you to participate in this study by completing this questionnaire which will take about 10 minutes.

All of the answers you give will be confidential and will not be shared with anyone other than the researchers

You have right to participate in the study or not and you have right to withdraw at any stage.

Do you have any questions/ clarifications?

I thank you in advance for your kind and precious participation

I agree to participate in the research: Yes No

Signature of participant:..... date:.....

Data collection tool was adapted from WHO surgical safety checklist, free to use

The image shows the WHO Surgical Safety Checklist (First Edition) with three columns: 'Before induction of anaesthesia', 'Before skin incision', and 'Before patient leaves operating room'. Each column has a title and a list of items to be checked. The 'SIGN IN' column includes items like patient identity confirmation and anaesthesia safety checks. The 'TIME OUT' column includes items like team introductions and reviews of critical events and antibiotic prophylaxis. The 'SIGN OUT' column includes items like team verbal confirmation and instrument counts. A disclaimer at the bottom states: 'THIS CHECKLIST IS NOT INTENDED TO BE COMPREHENSIVE. ADDITIONS AND MODIFICATIONS TO FIT LOCAL PRACTICE ARE ENCOURAGED.'

Available on: <https://www.who.int/patientsafety/safesurgery/checklist/en/>

In addition items for factors influencing the adherence to surgical safety checklist were borrowed from article free for use, available on:

https://www.hugge.ch/sites/interhug/files/structures/qualite_des_soins/documents/2010meetings_checklistsurveys.pdf

ANNEXE 4. QUESTIONNAIRE

I. SECTION I: OBSERVATION SHEET

A. Addition information on observation sheet

1. Type of Anesthesia: General Spinal

2. State of Surgery: Emergency Elective

3. Time of operation: Day Night

B. The surgical safety checklist

Item no	Checklist item	Checked	Missing
Sign in			
1	Has the patient confirmed his/her identity, site, procedure		
To identify the	Is the site marked?		
3	Are the anesthesia equipment and medication checks		
4	Pulse oximetry is attached and functional		
5	Does the patient have a known allergy?		
6	Does the patient have a difficult airway or aspiration risk?		
7	Is risk of blood loss >500 ml and require blood?		
8	Does the assigned person put his/her name and signature?		
Time out			
9	Confirm all team members have introduced themselves by		
10	Confirm the patient's name, procedure and site of		
11	Has antibiotic prophylaxis been given within the last 60		
Anticipated critical events to surgeon:			
12	What are the critical or non-routine steps		
13	How long will the operation take?		
14	Is the anticipated blood loss > 500 mls?		
Anticipated critical events to anaesthetist:			
15	Are there any patient-specific concerns?		
Anticipated critical events to nursing team:			
16	Sterility confirmed		
17	Are there equipment issue or any concern		
18	Is essential imaging displayed		
19	Does the assigned person put his/her name and signature?		
Sign out			
20	Nurse verbally confirms name of procedure		
21	Completion of instrument, sponge, needle and suture		
22	Are there any equipment problems to be addressed?		
23	What are the key concerns for recovery and management		
24	Specimen labelled correctly		
25	Does the assigned person put his/her Name and		

SECTION II: QUESTIONNAIRE

II. A. Socio-demographic variables of surgical team members

1. Age (year)
2. Gender: Male Female
3. Marital status: Married Single Divorced
4. Profession: Nurse Midwife Anesthetist Physician
6. Experience (in years): ≤ 1 year $2 \leq \text{years} < 5$ ≥ 5 years
7. Training on surgical safety checklist: Yes No
8. Level of education: A2 A M Ph.D

II. B. FACTORS INFLUENCING THE ADHERENCE

Instructions: Answer the questions below by encircling the number that corresponds to how you agree of the following barriers to the use of surgical safety checklist.

1-strongly disagree-2-disagree, 3-Agree, 4-Strongly agree

1. Administrative bottleneck/bureaucracy: 1 2 3 4
2. Lack of training: 1 2 3 4
3. Commitment of staff to duty: 1 2 3 4
4. Co-operation among staff: 1 2 3 4
5. Inadequate supply of consumable instruments/other: 1 2 3 4
6. equipment/facilities: 1 2 3 4
7. Inadequate time to carry out the checklist: 1 2 3 4
8. Lack of commitment from the Management: 1 2 3 4
9. Lack of incentive among theatre workers: 1 2 3 4
10. Lack of interest/will/attitude of health worker: 1 2 3 4
11. Shortage/lack of manpower: 1 2 3 4
12. Lack of team spirit: 1 2 3 4

13. Language of the checklist is not clear: 1 2 3 4
14. Timidity/fear of public for reading the surgical safety checklist: 1 2 3 4
15. Use of surgical safety checklist is time consuming: 1 2 3 4
16. Difficult to use surgical safety checklist in emergency cases: 1 2 3 4
17. The use of safety checklist is not important to me: 1 2 3 4
18. Uncooperative surgical teams: 1 2 3 4
19. Lack of good communication: 1 2 3 4