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**EXAMINING LEVEL OF AWARENESS AND COMPLIANCE WITH THE
WORLD HEALTH ORGANIZATION SAFETY CHECKLIST AMONG
KENYAN ANESTHESIOLOGISTS**



**A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENT FOR THE AWARD OF DEGREE OF MASTER OF
BUSINESS ADMINISTRATION IN HEALTHCARE MANAGEMENT AT
STRATHMORE UNIVERSITY BUSINESS SCHOOL, NAIROBI, KENYA.**

NOVEMBER 2021

DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the dissertation contains no material previously published or written by another person except where due reference is made in the thesis itself.

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Date: 11th November 2021

APPROVAL

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Date: 11th November 2021

ABSTRACT

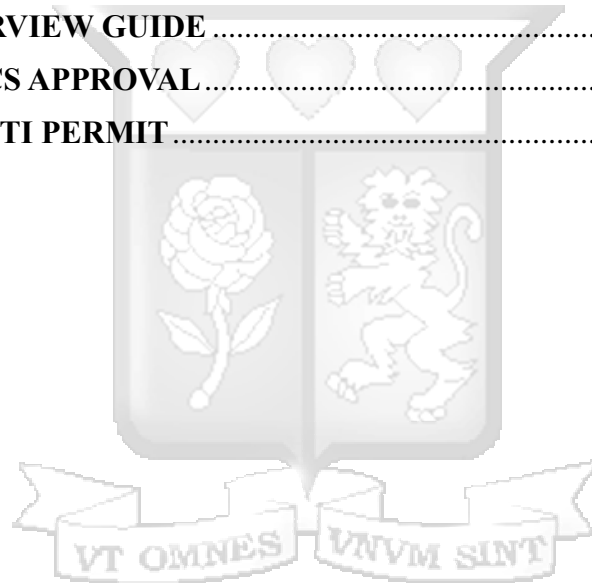
Patient safety is a fundamental right and is of great value among patients undergoing medical procedures that involve the administration of anesthesia due to the risks and high potential for complications. Statistics show that the global rate of adverse patient outcomes (mortality and complications) remain high, particularly in low- and middle-income countries. While factors such as low numbers of medical specialists contribute, there is growing evidence linking adverse outcomes to poor compliance to safety checklists and guidelines in surgery, including the World Health Organization Safe Surgery Checklist. This study assessed and explored compliance to safety checklists by medical specialists in order to inform policy and practice on how compliance can be improved for better outcomes. The study employed a mixed method approach to assess factors that influence compliance to the components of WHO surgical safety checklist among anesthesiologists and explore underlying reasons. Both quantitative and qualitative data were collected using questionnaires and interviews. Findings showed an understanding and good knowledge about all the components of the WHO safety checklist among the practitioners. Many agreed that the safety checklist is central to improving the safety in the operating room and in the surgical procedures. In terms of compliance, not all aspects of the checklist were adhered to by the practitioners. Participants only agreed to adhere to some of the aspects of the WHO safety checklist. The level of compliance with the WHO checklist strongly dependent on the level of knowledge among the respondents regarding the presence of these WHO safety checklist ($p=0.000$, $B=0.821$); high levels of knowledge correlated to high levels of compliance. There are significant discordances between knowledge and compliance of the WHO surgical safety checklist. Recommendations for improving compliance to the WHO safety checklist have been provided.

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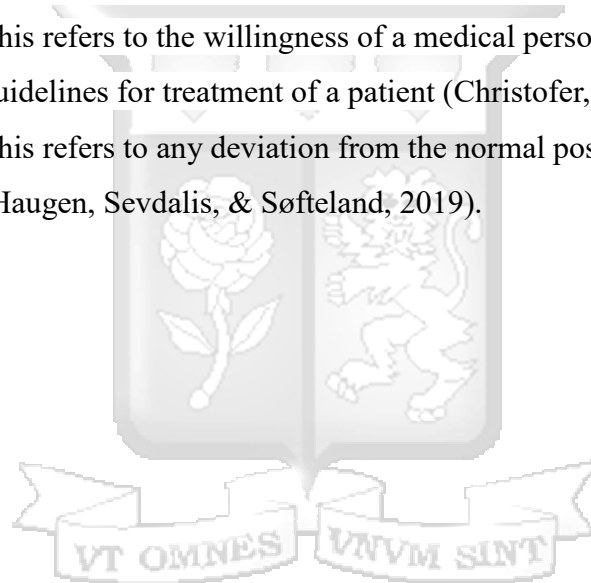
ABBREVIATION AND ACRONYMS

KSA	Kenya Society of Anesthesiologists
LMICs	Low- and middle-income countries
SPSS	Statistical Package for the Social Sciences
WHO	World Health Organization



OPERATIONAL DEFINITION OF TERMS

- Anesthesia** This refers to a treatment using drugs called anesthetics. These drugs keep you from feeling pain during medical procedures. Anesthesiologists are medical doctors who administer anesthesia and manage pain. Some anesthesia numbs a small area of the body (Gelb et al, 2018).
- Checklist** This refers to a list of guidelines that medical personnel needs to follow, information that they want to find out, and things that they should not forget (Cadman, 2018).
- Compliance** This refers to the willingness of a medical personnel to follow a set of guidelines for treatment of a patient (Christofer, et al., 2013).
- Surgical complications** This refers to any deviation from the normal post-operative course (Haugen, Sevdalis, & Søfteland, 2019).



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CHAPTER 1

INTRODUCTION

1.1 Chapter Introduction

This introductory chapter provides a framework upon which the study was based. It provides a detailed background information about the study as informed by current research in the subject area. The chapter also documents the research problem, the value of the research and the research objectives that were examined.

1.2 Background

There is increased global recognition of the importance of patient safety in healthcare, with a recent global study indicating that nearly six million lives are lost annually due to poor quality (Kruk, *et al*, 2018). Patient safety involves the processes and procedures undertaken to lower or prevent adverse outcomes or injuries when patients are receiving health care (Naderi, *et al*, 2019). Patients undergoing surgery are vulnerable to adverse outcomes, as various things could go wrong during the procedure. The nature of surgical procedure, pain and stress inflicted on the patient require the induction and maintenance of anesthesia on patients undergoing surgery. Drugs that induce anesthesia are administered on patients before surgical procedures to relieve anxiety (anxiolytics), provide analgesia and amnesia. The induction of anesthesia on patients during surgery has been associated with an increased risk of adverse outcomes and injuries (Wacker & Staender, 2014). While anesthesia practitioners are expected to follow appropriate standards such as the WHO safety checklist when handling patients, it remains uncertain whether these professional comply and follow these standards; this puts patient safety at great risk.

Anesthesia practitioners responsible for the induction and maintenance of anesthesia in patients have an important role in determining pre-operative patient safety. Despite the institutionalization of anaesthesiology, the rate of post-operative death and complications remains high (Schlack & Boermeester, 2010). The World Health Organization (WHO) estimates a 0.5% post-operative mortality rate globally, while close to 7 million surgery patients suffer major complications each year (Gelb, *et*

al., 2018). The global cases of post-operative injury reduced from 10 million (Naderi, *et al.*, 2019) to the current 7 million people between 2010 and 2020, representing a small reduction in the last decade. In Africa, the rate of post-operative death is higher than in the global cases. A recent study reported the rate of post-operative mortality to range from 3-29% (Ekenze, *et al.*, 2010). Could such adverse outcomes be minimized if anesthesia practitioners follow protocols for maintaining patient safety? This is a central question that this study tried to answer.

The African continent is home to the most significant burden of people living with surgery associated disabilities, with roughly 38 out of every 1,000 surgery patients having complications (Friedrich, 2018). The region also has the highest burden of people with surgical complications. A cross-sectional survey in several countries, including Sierra Leone and Rwanda, found that one quarter of patients had developed surgical complications (Groen, *et al.*, 2012; Gupta, *et al.*, 2015). The high prevalence of post-operative death and complications in African countries has been associated with the shortage of specialized surgeons and anesthesiologists. In a study conducted in Uganda, 2% of the patients who underwent surgery died from various complications. On further analysis, the lack of adequate surgeons and slow implementation of the WHO checklist was implicated in the high rate of post-operative mortality (Hewitt-Smith *et al.*, 2018). Adherence to the WHO safety checklist may improve the manner in which safety of patients is improved at the personal level. The fact that the safety checklist elaborates on mechanisms to improve patient safety, compliance may help reduce adverse effects such as complications and deaths.

According to the Kenya Society of Anesthesiologists (KSA), Kenya had 201 certified anesthesiologists in 2021, a relatively low number compared to the number of surgeries reported annually. The post-operative death rate stood at 3.6% in 2020 (Newton, *et al.*, 2019). Evidence shows that the use of the surgical safety checklist can help reduce surgical complications and deaths among anesthesia patients (Newton, *et al.*, 2019). The ability of such positive results to be replicated in the Kenya context can significantly benefit patients. Anesthesiologists are particularly essential in ensuring the safety of patients during anesthesia and after the surgical procedure; thus, the use of the WHO safety checklist can potentially reduce the cases of adverse outcomes (Schlack & Boermeester, 2010). Yet we know that even where numbers are relatively good, low compliance to standards will still cause adverse outcomes.

This study assessed the level of compliance to safe anesthesia practices based on adherence to the WHO Surgical Safety Checklist.

1.3 Problem statement

The high rate of adverse health outcomes among patients undergoing anesthesia and surgery has resulted in mortality and surgery-associated complications. The rate of perioperative deaths in Kenya is estimated to be 3.6% of the surgery cases (Newton, *et al.*, 2019). The difficulties arising from surgical procedures are preventable with the proper application of the WHO recommendations especially related safety (Weiser, & Haynes, 2018). The WHO developed a framework for the improvement of safe surgical teams by recommending safe anesthesia practices as defined by the WHO checklist. Many resource-constrained countries do not adequately comply with the WHO surgical safety checklist resulting to adverse outcomes (Vivekanantham *et al.*, 2014). Patient safety significantly depends on the decisions and actions taken by the anesthesiologists as well as the surgeons before and during the surgery as the adverse outcomes may be irreversible. This underscores the need for healthcare systems to invest in improving patient safety during anesthesia and the entire surgical procedure (Naderi, *et al.*, 2019). One of the ways this goal can be achieved is by improving compliance to WHO safety checklist.

Available evidence suggests that full implementation of the Checklist could reduce surgical complications by up to four percentage points (from 11 to 7%) and lower mortality from 1.5 to 0.8% globally (Weiser, & Haynes, 2018). Yet, despite the evidence, anecdotal evidence from most low- and middle-income countries still report low checklist use. Globally, complexity of modern medicine has resulted in increased harm to patients, with evidence suggesting that roughly 10% of hospitalized patients are harmed (Fisher, *et al.*, 2017). Yet most adverse outcomes can be prevented using checklists and guidelines. The WHO strongly recommends the use of a surgical safety checklist in surgery, emphasizing the need for this to be familiar and adaptable to the local users. The clinical settings that have implemented the patient's safety guidelines have shown reductions in morbidity and mortality (Vimlati *et al.*, 2009). The WHO surgical safety checklists are aimed at improving safety in both anesthesia and surgery (Merry *et al.*, 2010).

The surgical safety checklist is aimed at reducing adverse outcomes by emphasizing compliance to evidence-based processes and systems, underscoring the value of practices such as teamwork,

consistency of care and adequate communication. The limited evidence from Kenya shows that the commonest causes of adverse surgical outcomes include poor surgical techniques, post-operation bleeding and infections (McFadden *et al*, 2011). Elderly patients are more likely to undergo surgical procedures, yet they are the group most vulnerable to complications and infections. And with the emergence of the Covid-19 disease, health systems are likely to face even more complications, requiring specialized medical and surgical interventions. These factors underscore the importance of generating evidence on how surgery and other medical procedures can be made safer and more effective through better compliance to checklists. Furthermore, it is important to establish whether the practitioners are aware of the checklist and whether they comply to the checklist. This study assessed the level of awareness of the components of the WHO surgical safety checklist among the anesthesia practitioners in Kenya, and examine compliance in the Kenyan context.

1.4 Research Objectives

1.4.1. General objective

To examine the level awareness and compliance to the WHO surgical safety checklist among anesthesiologists practicing in Kenya.

1.4.2. Specific objectives

- i. To examine the awareness of the components of WHO surgical safety checklist among anesthesiologists practicing in Kenya
- ii. To examine the level of compliance to the WHO surgical safety checklist among anaesthesiologists in Kenyan hospitals.
- iii. To assess the patterns of association between compliance to the WHO safe surgical checklist and knowledge and selected anaesthesiologists' characteristics
- iv. To examine reasons underlying discordances (if any) between the knowledge and compliance to the WHO surgical safety checklist

1.5 Research Questions

- i. How knowledgeable are the anesthesiologists practicing in Kenya with regards to the components of WHO surgical safety checklist?

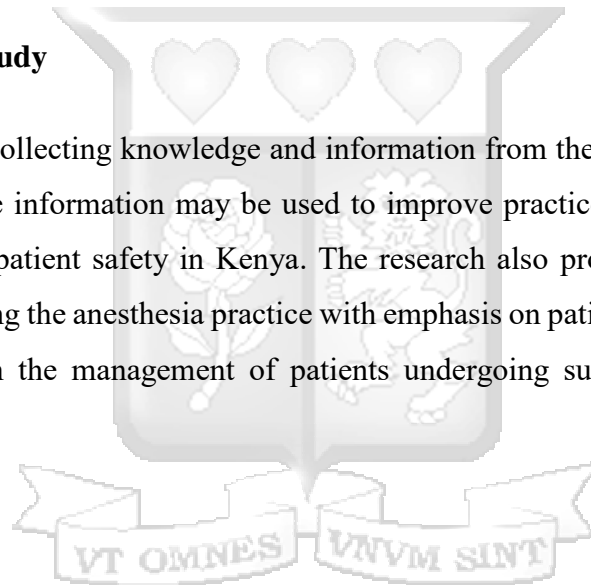
- ii. What is the level of compliance to the WHO surgical safety checklist among anesthesiologists in Kenyan hospitals?
- iii. What is the difference between knowledge and compliance to the WHO safe surgical checklist among selected anesthesiologists' characteristics?
- iv. What are the reasons underlying discordances (if any) between the knowledge and compliance to the WHO surgical safety checklist?

1.6 Scope of the study

The study was conducted in Kenyan Hospitals. The study relied on administering questionnaires and interviewing Kenyan anesthesiologists. The study was limited to the number of health practitioners in the anesthesia sub-sector who were available for the research study.

1.7 Justification of the study

This study was useful in collecting knowledge and information from the anesthesiologists concerning the safety of patients. The information may be used to improve practices as well as inform decision making when enhancing patient safety in Kenya. The research also provided recommendations that may be critical in enhancing the anesthesia practice with emphasis on patient's safety. The findings will play an important role in the management of patients undergoing surgical procedures in Kenyan hospitals.



CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This section provides a review of past studies that guides this research. It includes the theoretical literature that has been used to explain compliance to standards, and an empirical review section that looks at some of the studies on compliance to health standards. The chapter finishes by presenting a conceptual framework to guide the study.

2.2 Theoretical Review

Given the importance of surgical safety checklist in reducing adverse outcomes, a variety of theoretical models have been used by researchers to explain compliance to standards. This study looks at two opposing, but potentially useful models proposed in past research. The first one – the Rationalist Compliance Model - links compliance to direct reward or punishment, while the second one – the Normative Compliance Model - examines compliance from the perspective of cooperation and associated components such as professionalism. The two streams of thought are discussed below in more detail.

2.2.1. Rationalist Compliance Model

The nature of compliance can be understood by examining compliance based on the Rationalist/ Normative Compliance model which groups compliance on two bases; rationalist and normative (Malloy, 2003). The Rationalist Compliance Model links compliance to direct reward or punishment. From the rationalist perspective, the extent to which an individual will exercise compliance is dependent on the measure of potential benefits and costs associated with the decision to comply or fail to comply. According to Wu et al (2015), rationalist compliance is focused on making the decision based on rational thinking where benefits and costs of the decision are weighted. Based on this approach, actors tend to choose their decision based on rationality among different alternatives that may be available. According to Kraus & Coleman (1987), incentives or non-incentives will play significant

roles in altering the calculations of a particular actor regarding compliance. A major approach that is used to enhance compliance based on the rationalist approach is enforcement, based on a command-control mechanism is used; wanted behaviors are encouraged by the use of rewards while unwanted behaviors are deterred by the means of punishments. The role of rationale in making decision has been supported by scholars in different sectors such as Uzonwanne (2016) and Alvino and Franco (2017). This perspective can explain the decision made by anesthesiologists to adhere to professional standards for safety such as the WHO Safety checklist. In the rationalist perspective, the rewards act as additional means for stimulating compliance since they can successfully alter the cost-benefit dimensions to the actor's advantage. As highlighted by Feldman (2011), decision making may be driven by reason; this approach can be used to explain the decision to comply with regulations of policies in an organization. Therefore, if through rational thinking, an anesthesiologist views patient safety as more beneficial than costly, they will likely adhere to the protocols for safety.

2.2.2. Normative Compliance Model

Unlike the Rationalist Compliance Model that links compliance to some form of reward or punishment, the Normative Compliance Model examines compliance from the perspective of cooperation and associated components such as professionalism. According to Chayes & Chayes (1993), the normative perspective views compliance as a product of cooperation and assistance which are core to stimulating compliance in the working environment. Based on this perspective, actions are viewed as identities, roles, obligations and appropriate considerations. Fairness and legitimate actions are core to complying with a particular set of behaviors or actions. How an individual views a particular action as either appropriate, fair, obligatory or legitimate will determine the extent to which that particular individual will comply with these actions (Chayes & Chayes, 1993). The normative perspective broadens the scope of examining compliance by eliminating the strong reliance on cost benefit analysis of actions. The normative perspective is very applicable in the healthcare sector where elements such as identity, roles and obligations are core to the values of the sector. Feldman (2011) viewed this perspective of decision making as “Morality-oriented” whereby the inherent motivator for a decision relies on societal norms. In the context of the healthcare sector, these ‘norms’ are related to values of the healthcare professions. According to Hashmi et al. (2016) noted that the normative requirements for regulatory compliance relate to adherence to norms informed by these regulations. In the context of anesthetic

practitioners, these norms include maintaining patient safety. Therefore, they may be driven by the need to follow a norm or moral which is to keep people safe.

Healthcare professionals such as anesthesiologists have duties, obligations and roles to ensure the safety of their patients at all times. In addition, these healthcare professionals are bound by principles of fairness, justice, legitimacy and considerations of appropriate especially when dealing with their clients or patients (Merry *et al*, 2010). As a result, it is expected that these elements determine the extent at which these professionals will deal with various issues in the healthcare sector including ensuring that high quality care and safety is provided to the patients. In complying with the duties or standards of practice, healthcare professionals are not expected to compare the costs and benefits of their actions. Rather, they should comply with the belief that it is the right thing to do based on the need to remain professional. Through cooperation and assistance, healthcare professionals such as anesthesiologists should comply with the safety rules when handling patients; this is the basis for normative approach to compliance.

2.2.3. Use of theory in the study

The two theories are of great value in this study. Through a survey approach informed by the theories, it was possible to examine compliance adherence and factors that motivate or encourage compliance to the guidelines by Kenyan anesthesiologists. Using the rationalist view, the study examined whether the professionals' compliance behavior is driven by a need to accrue certain benefits or avoid sanctions (Feldman, 2011). Put in another way, the study established whether compliance is dependent on some kind of cost-benefit consideration (Uzonwanne, 2016; Alvino and Franco, 2017). Exploring applicability of the rationalist view informed policy on whether introducing rewards and/or punishment can encourage compliance to the safety protocols among the anesthesiologists.

On the other hand, the normative perspective posits that compliance is driven by the need to be appropriate, legitimate, fair, professional, or valuable to the patient and institution. The normative perspective is based on norms or morals (Hatcher et al., 2000; Hashmi et al., 2016). Under this view, anesthesiologists are expected to comply to the safety checklist simply because it is the right thing to do as professionals, and because it the fair, appropriate and legitimate thing to do. Building on the two opposing views, the study sought to establish whether the professionals' view of the standards: whether

they see the checklist as a fixed rule for the profession to follow, or whether they see it as a valuable tool that allows them to practice in their profession capacity.

2.3 Empirical Literature

This section of the literature review seeks to understand compliance levels of Kenyan Anesthesiologists to international standards through examining past empirical evidence. First, awareness of components of the WHO patient safety checklist is examined (2.4.1); then compliance to the WHO surgical safety checklist discussed (2.4.2). Sections 2.4.3, 2.4.4, and 2.4.5 discuss the role of communication in ensuring patient safety, the role of clinical team work, and working environment; and the value of patient engagement respectively.

2.3.1 Awareness of the components of WHO anesthesia patient safety checklist

A patient safety checklist is defined as making a list of actions that need to be performed in a clinical environment in algorithmic form (Haugen, *et al.*, 2019). Patient safety checklists aim to ensure that no step can be ignored. It is necessary for anesthesiologists to become aware of components of the surgical safety checklist since it has a sound basis of human factors that facilitate and play a major role in achieving patient safety.

The key to the successful implementation of the safety checklist is to maximize the safety culture in units where checklists are used, engaging leadership in coming up with the checklist and enlighten the public on the importance of maintaining the same. WHO surgical safety checklist includes patient identification, the safety checks prior to induction of anesthesia, incision site identification, planned operation, anticipated critical events, emergency plans, past medical history of the patient, timing of the procedure, treatment plan necessary for the care after the operation, whether sterility is performed, whether there are issues with the instruments, whether there is essential imaging, induction events, fluids, records that need to be reviewed and transfer care (Haugen, *et al.*, 2019). The checklist consists of lists that were created to promote safer use and administration of anesthesia thereby reducing the surgical site infections as well as improving the teamwork and communication in the operating room. According to Lydia & Romie (2019), most healthcare facilities comply with the above stipulated

guidelines by about 70%. This means that hospitals across the world, especially in developed economies, are more compliant compared to those in emerging economies (Lydia & Ronnie, 2019).

The experts have divided the checklist into three sections: sign in section that is done before the induction of anesthesia; time out stage that is done after the induction of anesthesia right before the skin incision, and lastly sign out which is after the patient leaves the operation room (Merry *et al*, 2010). Before the induction of anesthesia, the health care professionals need to complete safety checklists for check in. Such include confirmation of site, identity, consent and procedure. The site should be marked, anesthesia checklist completed, the pulse oximeter examined on the patients and confirmed to be functioning (Lydia & Ronnie, 2019). There is also the need to determine whether the patients exhibit a known allergy, difficulty in accessing the airway, have an aspiration risk or have a risk of blood loss.

Before skin incision, the following safety checklist needs to be taken in consideration: introduction of all the team members by their names, the anaesthesia provider needs to confirm verbally the name of the patient, the site and the procedure. Any critical events that are anticipated should also be mentioned (Newton, *et al.*, 2019). These include the unexpected steps, duration of operation, as well as the anticipated blood loss. The anesthesia team need to review whether there are specific patients' concerns while the nursing team need to review the sterility of the procedure as well as the equipment concerns. There is need for confirmation whether antibiotic prophylaxis has been administered within the last one hour. Essential imaging also needs to be displayed.

When the patients' sign out, the nurse in charge needs to verbally confirm with the team to indicate the name of the procedure that was used, the name of the instruments, sutures and swabs used (Lydia & Ronnie, 2019). The equipment that is supposed to be used, equipment problems that need to be addressed and review of the key concerns so as to ensure that the surgical procedure proceeds smoothly with the right tools and equipment.

Compliance with a checklist can reduce the number of communication failures that are found in the theatres as well as the number of complications that are most likely obtained from the surgery. Compliance has the likelihood of reducing the risk of wrong-site surgical operations. The use of the WHO surgical safety checklist has the likelihood of developing a safety attitude among the personnel (Christofer, *et al.*, 2013).

WHO surgical safety checklist is mandated to improve the safety of the patients (Newton, *et al.*, 2019). The various checklists are essential; however, the compliance to these checklists has not been investigated. This study addressed compliance to the checklist and assessing the frequency of the deviations as well as the factors that may contribute towards these deviations.

2.3.2. Awareness of WHO Anesthesia Patient Safety Checklist and Rate of Compliance

Awareness of components of WHO surgical safety checklist is necessary for both the health professionals and the patients. The use of safety checklists and compliance in medicine has increased since the establishment of WHO. Well established WHO checklist compliance rate is necessary to have a strong influence on the patients' safety culture as indicated by many health professionals (Thomassen, *et al.*, 2014). Arguably, the WHO acts as a watchdog, protecting the interests of patients by stipulating the different guidelines (Allegranzi *et al.*, 2018; Cadman, 2018). Patient safety is considered a priority before delivery of services on the said individuals.

Studies have shown that there is an increase in the quality and safety of healthcare after the implementation of safety checklists (Newton, *et al.*, 2019). Health professionals should be aware of the components of the WHO safety checklist so that they can implement the checklists. There are process-related measures of safety that include changes in leadership, communication, coordination, mental models, and situational awareness, which are the human factors relevant for the safety of the patients and thus can improve the medical management. Alidina *et al.* (2019) suggested that being aware of the checklist and knowing the relevance and impact such compliance has on the wellbeing of patients increases the interest healthcare facilities have towards maintaining the WHO guidelines. For instance, leadership in facilities acts as an inspiration to engage in the expected requirements with the patient safety being a priority. Communication is also crucial as it ensures information between the different stakeholders in a healthcare facility as they work towards implementing the WHO checklist guidelines.

Kenya is considered to be a developing nation and ranked as a middle- and low-income country. Implementation of WHO checklist standards are structured with the intention of strengthening the anesthesia practices in all countries, irrespective of their economic situation (Haugen *et al.*, 2019). Hence, it is the responsibility of each nation to incorporate relevant leadership and teamwork requirements in place in all healthcare facilities, implement viable infrastructure intended to improve

the quality of anesthesia practices in the region both in the short-term and in the long-term (Tan *et al.*, 2021). Adhering to safety precautions is relevant as it prevents sepsis of infections that may arise or complications that may eventually lead to death.

The rate of perioperative deaths in Kenya is estimated to be 3.6 % of the surgery cases (Newton, *et al.*, 2019). The difficulties arising from surgical procedures are preventable with the proper application of the WHO recommendations (Weiser, & Haynes, 2018). Safe anesthesia involves safety while inducing anesthesia during surgery. Kenya is yet to meet WHO recommendations particularly in meeting the number of anesthesiologists, currently, Kenya has only 201 anesthesiologists, a number which falls below the WHO recommendation.

2.3.3 Role of Communication in Ensuring Safety of the Patients

Wang *et al.* (2018) indicate that nurses and physicians require constant communication so as to effectively manage the patients. Communication is required throughout the continuum of care so as to achieve effective and optimal outcome for the patients (Wang, *et al.*, 2018). Health care professionals require effective communication in order to achieve accurate as well as effective communication in the healthcare system. It is worthy to note that there is need to improve communication among the teams in the health care services to achieve better results. According to Mujumdar & Santos (2014), teamwork and communication are seen as big challenges to the incidences that relate to the safety of the patients. Breakdown in communication is a critical factor in contributing to inadequate performance at the work place. According to Waari *et al.* (2018) open communication opens channels for information to flow both upwards and downwards. This means the management of healthcare facilities will pass information to the junior staff with ease and get feedback whenever they need about potential challenges the employees may be facing when implementing the WHO guidelines. Such will then be resolved within a short-time with the patient safety being considered a priority.

Grouse (2014) indicates that patients' partnership with the professionals in the health care services is essential since it helps in giving the best care to the affected patients. Commitment towards patients' partnership enhances the quality of health care that the patients receive. Patients and the health care professionals need to team up in enhancing the safety in health care. The health care team need to work hand in hand with patients as well as with their families in order to achieve better results. Through

effective collaboration between the two systems, there will be safer health care systems and patients will have better health care experiences and positive health outcomes. Ahmed *et al.* (2020) and Park *et al.* (2018) agree that communication is one of the most important factors that contribute to the probability of healthcare facilities implementing the WHO checklist. Staff will inform the management team on whether the environment is conducive or convenient enough to allow or support the implementation of WHO guidelines. The presence of the current global pandemic Covid-19 should not be a limit to the adherence of WHO suggestions to protect the interests of patients (Ahmed *et al.*, 2020). Hospitals that had managed to implement the precautions as stipulated by WHO an easy time managing patients placed in care units that needed them to be placed anesthesia.

Chigome *et al.* (2020) stated that shortages in staff in healthcare facilities may be one of the contributing factors to lack of effective communication since there is no enough persons that would implement the WHO checklist. Communication is important as it allows physicians and nurses to combine their efforts, knowledge, and experience when taking care of patients. OnyambuMasese *et al.* (2016) affirms the need of communication through a case study conducted in Kenya's Thika Level 5 Hospital, a facility in the country that implements and makes use of stipulated guidelines from Service Charters developed by the government. The success of implementing such a local charter is a clear indicator that the WHO checklist may be realistic since the service providers are aware of what is required of them.

2.3.4 Role of the Clinical Team and Work Environment in Healthcare

Madhusmita *et al.*, (2014) did a study on the extent that teamwork among the employee's affects the overall satisfaction level as well as the performance. It was established that inadequate team work as well as lack of satisfaction at the work place contribute towards low performance hence the organization needs to develop strategies that are significant in improving the bond that exist between the staff at the organization. The findings established that senior employees are more satisfied with high levels of bonding than the junior employees.

Shooshtarian *et al.*, (2013) mentioned that good teamwork is significant in achieving high level of satisfaction at the work place. Further, the findings revealed that satisfied employees will have a sense of belonging which creates a sense of having value and being part of the organization. This initiative is significant in improving creativity amongst employees as they come up with ways in which they need

to perform their tasks. Employees should feel part of the team that works towards improving the performance of the employees.

According to Kossaify *et al.* (2017) and Pitkänen *et al.* (2018) the clinical team in a healthcare facility are the implementers of the action plan from the strategic team. The top management plans and makes all major decisions and leaves the actualization to the clinical team who are in direct contact with the patients. The clinical team understand and have knowledge of the specific areas that should be rectified to improve patient safety during the administration of anesthesia. The clinical team openly communicate with each other as they inform the management of areas that have been implemented and those that would be impossible, based on the available resources. The work environment in healthcare facilities cannot be functional without the input of clinical staff who deliver their services to the patients.

Teams comprise of individuals with different capabilities, strengths, and opinions, who when they come together, brainstorm and bring creative and innovative ideas that will transform the healthcare environment both in the short-term and in the long-term (Kilpatrick *et al.*, 2020). Multidimensional teams (MDTs) in healthcare facilities must provide their input as they work together to achieve the organizational goals and objectives. Lavelle *et al.* (2019) stipulated that the clinical teams are important in hospitals since each individual gives their input during the decision-making process, with ideas that are relevant based on the situation at hand.

2.3.5 Patients' Engagement in the Healthcare System

In order to ensure that there is effective compliance, WHO recommends that there is need for patient's engagement in their health care. Lavelle *et al.* (2019) claimed that patients' engagement has the potential to improve the health outcome of the patients. It enhances satisfaction with the care that one receives and effective health care service delivery. Patients are able to be engaged in designing as well as improving the health care services through involvement in activities that include filling in sample surveys about the care experiences as well as the serving as advisors or members of the governance team. According to WHO, patients' engagement is useful as a form of participatory approach in facilitating the decision-making process and aligning choices and priorities to the sustainability of the health care. Patients' engagement has benefits such as enhancing the responsiveness of the health care

system to meet the needs of the patients, making the health care system to be more open and transparent hence improve the process of decision making (Liang *et al.*, 2016).

According to Tzeng & Marcus Pierson (2017), engaging patients and informing them of the kind of services they will get is crucial as it allows them to be psychologically prepared for the anesthetic administration that will be given to them. It opens a communication process that allows the patients to inform the medical practitioners of what they feel or think, which means their satisfaction and safety is prioritized at all times. At the end of a procedure, patients can give their feedback, with areas they point as weaknesses being used as a point of reference to make changes in the healthcare system.

Liang *et al.* (2016) indicate that patients' engagement in their health care is pivotal in the new development. Patients as well as family engagement has influence on the policy formulation process as well as the delivery of the healthcare systems from the clinical stages all the way to the boardroom. Patients' engagement contributes towards efficient delivery of the health care systems by lowering the costs of health care, improving the outcomes of health care as well as influencing the outcomes of health care. Further, the findings indicated that failure to engage the patients has the effects of social exclusion as well as silencing the voice of the patients. The health care organizations thus are tasked with the role of engaging in strategies that are useful in improving the health care services.

2.4 Conceptual Framework

The conceptual framework for the study is illustrated in Figure 1. It indicates that patient outcomes are dependent on the extent at which the healthcare professionals (anesthesiologists) adhere to the safety protocols in the process of conducting surgeries. It is expected that the more the anesthesiologists adhere to safety protocols, the higher the chances of good patient outcomes. This relationship is supported by either the rationalist model, or the normative model, or possibly, a combination of the two. In that regard, the conceptual framework can be seen as predicting alternative pathways through which surgery outcomes can be achieved. Higher rate of compliance to the checklists indicates a lower morbidity and mortality rates hence high health performance in administration of anesthesia (Rydenfält, *et al.*, 2013).

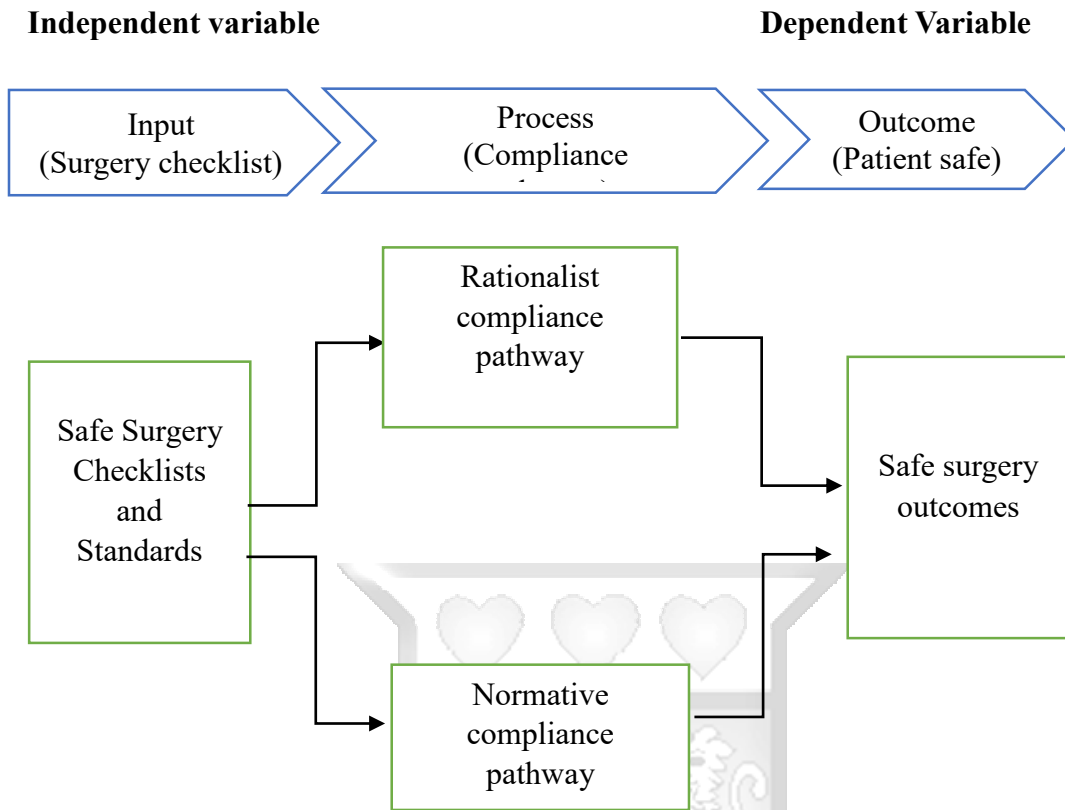


Figure 1: Conceptual Framework

2.5 Summary of Literature Review

Liang *et al.* (2016) focused on the patient's engagement in the hospitals. A descriptive analysis was used in the analysis. It was found out that family and patient's engagement are able to influence the clinical decision-making process and the policy making process as well as delivery of the healthcare services. It was necessary for the health care professionals to focus more on the delivery of the health care to improve the quality of health care. In the current study, there is need for awareness of the safety checklists which is facilitated by effective engagements.

Wang *et al.* (2017) did a study on invention to improve communication between nurses and physicians in the intensive care unit. The importance of communication was highlighted on the methodology. The findings established that effective communication among the health professionals result in improved health care services. Communication at the work place goes hand in hand with the awareness and compliance of the safety checklists and compliance. Mujumdar & Santos (2014), did a study on team

work and communication approach to patient safety. Correlation analysis was used to determine the relationship between teamwork and incidences at the hospitals. The study found that teamwork is essential in improved surgeries at the hospitals. The safety checklists considered the working relationship among the nurses, the surgeons and anesthesiologists in the theatre.



CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents a blueprint on how the research questions were answered. It covers the research design, setting, target population, sample size and sampling, data collection methods and data analysis procedures.

3.2 Research design

This study used a mixed method approach to assess factors that influence compliance to the components of WHO safety checklist among anesthesiologists and explore underlying reasons. According to Dunning *et al.* (2008), a mixed method approach is a research procedure that uses both qualitative and quantitative methods in a single study to understand the research problem. Mixed method approach was appropriate for this study since it is useful in understanding the contradictions between the qualitative and quantitative findings while generating richer information from both approaches. According to O'Cathain *et al.* (2007), the justification for mixed methods research include increased comprehensiveness, increased confidence in the results, and facilitating one approach by guiding the analysis of the other. Further, mixed method helped in understanding the point of view of the participants in a deeper manner. The mixed method allowed a deeper understanding of the views of the anesthesiologists by collecting data using more than one approach. A quantitative approach was used to answer questions posed under specific objectives one to three, while the qualitative component was used to answer the 'why' question under objective four.

3.3 Population

The target population consisted of anesthesiologists in Kenya, who are distributed in the various public and private hospitals in Kenya. According to Kenya Society of Anesthesiologists, Kenya has 201 anesthesiologists and this informed the study population.

3.4 Sample size and sampling

The determination of the sample size was based on the formula developed by Cochran (1977). For finite population, the formula is:

$$n = \frac{P(1-P)Z^2 N}{(N-1)E^2 + P(1-P)Z^2} \quad \text{Equation (1)}$$

Where n is the sample size, N is the population of anesthesiologists in Kenya, Z is the critical value that is 1.96 achieved at a confidence level of 0.05 in each tail, $p(1-p)$ is the estimate of the variance, $N-1$ is the degree of freedom, q is $1-p$, and e is the acceptable error or the level of precision which is 0.01. A level of 0.01 was used since it uses a combination of both qualitative and quantitative data.

$$n = \frac{0.05(0.05)1.96^2 \times 201}{(201)0.01^2 + 0.05(0.05)1.96^2} = 65 \text{ respondents.}$$

The sample size consisted 65 anesthesiologists.

The study used a systematic random sampling technique so as to get the sample size. A list of anesthesiologists in the Kenya was obtained from the Kenya Society of Anesthesiologists (KSA). The list was arranged in alphabetical manner using the anesthesiologist's first name. The population of interest was 201 anesthesiologists while the required sample was 65 anesthesiologists. Using the systematic sampling formula for interval which divides the population by the required sample, the interval for selection was 3. This approach was preferred because it was relatively simple, and, worked well in cases where the listing of participants in the sampling frame didn't carry any inherent bias. In this case, it was unlikely that the participants' first name had any systematic error associated. Participants refusing to consent to participate were replaced by the next name down the list. The sample of 65 anesthesiologists was used for the quantitative aspects of the research (objectives 1-3), with the fourth objective being answered through the qualitative approach.

3.5 Data collection

A mixed methods approach was used, with data being collected using two approaches: a questionnaire survey and in-depth interviews.

The survey data addressed the first three objectives. The questionnaire was structured into three sections: a general information section (for instance, demographic characteristics); a knowledge/awareness section to gauge the knowledge levels of the anaesthesiologists on the safe surgery checklist; and a compliance section to ask questions about compliance levels. Questionnaires were appropriate for this study since they provided a relatively cheap, quick and efficient way of obtaining information. With the prevailing epidemic, online questionnaires using Google forms were used to collect the data. The use of online questionnaires was vital due to the government protocols on Covid 19. The questionnaires also helped in collecting both qualitative and quantitative data since there were both open and close ended questions.

An interview topic guide was developed based on the theoretical models proposed in Chapter two to address objective four. Questions explored the two compliance pathways, seeking to understand what motivates compliance among anesthesiologists and how this can be improved for higher impact or patient outcomes following surgery. Interviews were conducted online so as to gain more information on the topic of the study. Interviews were appropriate since they provided a better method of collecting qualitative data.

3.6 Validity and Reliability of the Research Instrument

3.6.1 Pre-test

A pre-test was carried out before the actual interview so as to test the validity of the instrument. 10% of the respondents (6 respondents) were used during pre-testing. The data collection instrument were also pre-tested for consistency, timing, accuracy and reliability. Pre-test was done among anesthesiologists who would not be included in the final study.

3.6.2 Validity and Reliability of Research Tools

The content validity was ascertained by performing a pre-test to standardize the data collection tool. The questionnaire was then validated by the university supervisor before data is collected. Furthermore, the reliability of the questionnaire was established through a test-retest technique whereby the instrument was administered twice to the same group of participants during the pilot study. There was

be a time lapse between the first and the second test. Cronbach alpha was used to test the reliability of the data collected.

The quality of data was ascertained through checking for missing values after the data is entered in the SPSS software. Further, the data was cleaned before any analysis was made. With regards to the qualitative data the credibility, dependability, confirmability and transferability of the data was checked with the researcher together with the supervisor before the analysis is done.

3.7 Data analysis

The data from the survey was analyzed quantitatively. The questionnaire was coded before entering the data into SPSS version 25 for analysis. The data analysis involved descriptive and analytical statistics as well as qualitative analysis. On the other hand, the qualitative data obtained from the interviews were analysed using NVIVO.

Descriptive statistics were used to evaluate the rate of compliance to the WHO surgical safety checklists among anaesthesiologists in the Kenyan hospitals. A Likert scale was used where interviewees were asked to rate compliance among the anesthesiologists. Some of the data that was captured including: site marked, anesthesia checklist completed, examining the pulse oximeter on the patients and functionality, whether the patient exhibits a known allergy, difficulty in airway breathing or aspiration risk and risk blood loss.

For objective three, regression methods were used to assess for patterns of association between selected covariates and level of compliance. Analyses included checking for the possible effect of age, level of training/experience and knowledge.

The data from the interviews were analyzed using thematic analysis. The simple codes generated from each interview were used for generating major themes. Trends, patterns and commonalties among the themes formed the basis for analysis. The thematic analysis was informed by the rationalist/normative model proposed in chapter 2.

3.8 Ethical Consideration

The respondents were assured that their responses would be strictly confidential and were used for the purposes of this research only. The researcher also took personal responsibility for the conduct and consequences of the research by adhering to the ethical standards of research. Approval for this research was collected from the Research Ethics Review Committee, Strathmore Business School and NACOSTI.



CHAPTER 4

ANALYSIS AND PRESENTATION OF FINDINGS

4.1 Introduction

The focus of this dissertation chapter is to present the main findings drawn from the analysis of the collected data. The descriptive statistics are first presented which is used to provide a general overview of the data. The second phase of the chapter presents data on the main research objectives that were used for the research.

4.2 Response rate

Sixty-five questionnaires were administered to the respondents. Out of this number, 60 questionnaires were successfully filled. Therefore, the research study generated a response rate of 92.31% which was ideal for drawing conclusions for the research study's objectives. The response rate for the research study is summarized in Figure 2.

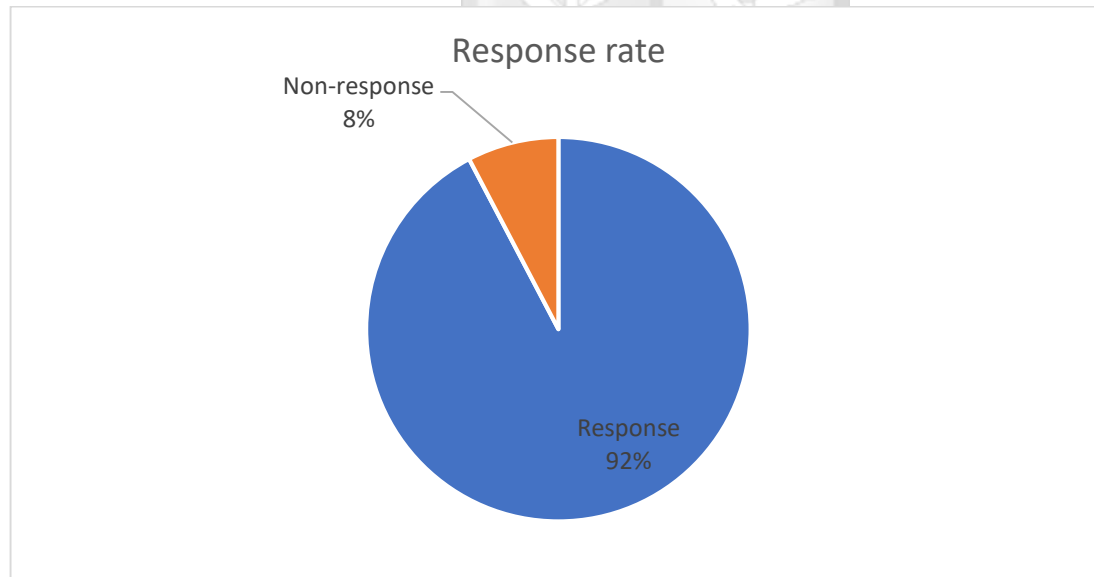


Figure 2 Response rate (Source: Research data, 2021)

4.3 Descriptive statistics

Appropriate descriptive statistics were generated from the data and summarized in Table 1. The data is summarized as percentages and frequencies based on the nature of the variables.

Table 1. Respondents' demographic characteristics

Baseline Variables	Categories	Frequency (n=65)	Percentage
Gender	Female	29	44.6%
	Male	36	55.4%
Age of the respondents	31-40 years	35	53.8%
	41-50 years	21	32.3%
	51-60 years	5	7.7%
	Over 60 years	4	6.2%
Years of experience	0-3 years	12	18.5%
	4-6 years	12	18.5%
	7-9 years	13	20.0%
	10 years and above	28	43.1%
Position held	Management	23	35.4%
	Non-management	42	64.6%
Duty station	Level 3	1	1.5%
	Level 4	9	13.8%
	Level 5	17	26.2%
	Level 6	38	58.5%

Among the most important demographic characteristics of the participants that were captured in this research study included gender, age, years of experiences, position held and the duty station upon which the respondents work. With regards to gender, it was evident that majority of the respondents (55.4%) were male while the remaining 44.6% were female.

Majority of the participants are aged between 31 and 40 years of age which accounted for 53.8% of the participants. Participants aged 41-50 years old accounted for 32.3% of the research participants while those aged 51-60 years old accounted for 7.7% of the respondents. Only a small proportion of the participants (6.2%) were aged over 60 years of age.

In terms of the years of experience working at their respective positions, 43.1% of the participants had worked for more than 10 years. Another 20% has worked for 7-9 years while another 18.5% had worked for 4-6 years (Table 4.1). It was also clear that only 18.5% of the participants has worked for between

0-3 years. Therefore, a large number of the respondents had significant experience working in the anesthesiology sector.

The participants also worked in different job positions in their respective organizations as illustrated in Table 4.1. It is evident from the findings that 64.6% of the respondents had worked in non-management positions while 35.4% of the participants had been working in management positions.

The duty station of the respondents also varied and this could determine differences in roles and responsibilities of the participants in their organizations. It was clear from the findings that 58.5% of the participants worked in Level 6 stations while another 26.2% of the employees worked in Level 5 stations, The remaining 13.8% and 1.5% worked in Level 4 and Level 3 stations respectively.

4.4 Findings on objectives

The general finding on each objective were computed and summarized into means and standard deviations are presented in this section of the dissertation.

4.4.1 Knowledge on the components of WHO surgical safety checklist among anesthesiologists practicing in Kenya

An importance element of this research study was to examine the extent at which the anesthesiologists were aware of the WHO safety checklist that is central to their line of work especially in facilitating patient safety and quality of care. In attempts to examine the level of awareness with the WHO checklist, the respondents were presented with 8 statements that examined their knowledge on the components of the WHO safety checklist as summarized in Table 2. The criterion for interpretation of the means was as follows; 0 – 1.49 = Strongly disagree; 1.50 – 2.49 = disagree; 2.50 -3.49 = neither agree nor disagree; 3.50 – 4.49 = agree and 4.50 – 5.00 = strongly agree.

Table 2: Knowledge on components of the WHO surgical safety checklist

	Mean	Std Dev
Use of the WHO surgical safety checklist decreases errors and adverse events, and increases teamwork and communication in surgery.	4.88	.331

There is significant reduction in surgery/anaesthesia-related morbidity and mortality with the routine use of the WHO surgical safety checklist.	4.77	.527
Successful implementation of the WHO safety surgical checklist involves a multidisciplinary approach, extensive education and training, local adaptation, active leadership and identification of champions.	4.87	.333
The checklist is always easy to use	4.23	.965
The checklist has improved operating room safety	4.70	.609
The WHO safety checklist has helped to develop a safety culture in surgical teams	4.72	.573
The checklist helped prevent errors in the operating room	4.69	.639
Briefing of personnel before a surgical procedure is important for patient safety	4.92	.269

Majority of the respondents strongly agreed that the use of the WHO surgical safety checklist decreases errors and adverse events, and increases teamwork and communication in surgery ($M = 4.88$, $SD = 0.331$), and that there is significant reduction in surgery/anaesthesia-related morbidity and mortality with the routine use of the WHO surgical safety checklist ($M = 4.77$, $SD = 0.527$). The results also showed that majority of the respondents strongly agreed that the successful implementation of the WHO safety surgical checklist involves a multidisciplinary approach, extensive education and training, local adaptation, active leadership and identification of champions ($M = 4.87$, $SD = 0.333$).

The majority of the respondents strongly agreed that the checklist is always easy to use ($M = 4.23$, $SD = 0.965$) has improved the operation room safety ($M = 4.70$, $SD = 0.609$), has helped develop a culture of safety in the surgical teams ($M = 4.72$, $SD = 0.573$) and has helped prevent errors in the operating room ($M = 4.69$, $SD = 0.639$). Most of the participants also agreed that briefing of personnel before a surgical procedure was central to improving patient safety ($M = 4.92$, $SD = 0.269$).

In general, the findings from the questionnaire showed a strong agreement among the participants regarding all the components of the WHO safety checklist. There was a strong agreement among the respondents that the different components or elements of the safety checklist are central to improving the safety in the operating room and in the surgical procedures. Therefore, there was general awareness among the participants regarding the different components of the WHO surgical safety checklist and its value in the operating room.

4.4.2 Level of compliance to the WHO surgical safety checklist among anaesthesiologists in Kenyan hospitals.

The other important aspect of the research study was to examine the level of compliance among the respondents with the WHO surgical checklist. A summary of the level of compliance with the WHO surgical checklist by the respondents is shown in Table 3

Table 3. Level of compliance to the WHO surgical safety checklist

	Mean	Std Dev
The WHO surgical safety checklist is adopted for use at my hospital.	4.23	.862
The surgical, anaesthesia and nursing teams are fully trained on the use of the WHO surgical safety checklist.	3.51	1.174
The WHO surgical safety checklist is fully implemented at my hospital.	3.29	1.182
The department of anaesthesiology senior management have supported the implementation of the WHO safety checklist.	4.20	1.003
The checklist has helped prevent errors in the operating room.	4.34	.840
Communication has been improved through use of the WHO surgical safety checklist.	4.20	.939
Compliance of WHO safety checklist has improved patient outcomes through its adoption in the preoperative, intraoperative and post-operative environment.	4.15	.939
Compliance of WHO safety checklist brings no extra value to existing safety procedures already in place in my hospital/clinic before its implementation.	1.92	1.291

The criterion for interpretation of the means was as follows; 0 – 1.49 = Strongly disagree; 1.50 – 2.49 = disagree; 2.50 -3.49 = neither agree nor disagree; 3.50 – 4.49 = agree and 4.50 – 5.00 = strongly agree

The majority of the respondents agreed that the WHO surgical safety checklist is adopted by the hospital facility where they work (M = 4.23, Sd = 0.862), the implementation of the WHO safety checklist is strongly supported by the senior management at the organization (M = 4.20, SD = 1.003), and the use of the checklist was crucial in reducing errors in the operating room (M = 4.34, Sd = 0.84).

It was also clear that there is a significant number of the participants agreed that the surgical, anesthesia and nursing teams are fully trained on the use of the WHO surgical safety checklist (M = 3.51, SD = 1.174) and Compliance of WHO safety checklist has improved patient outcomes through its adoption

in the preoperative, intraoperative and post-operative environment ($M = 4.15$, $SD = 0.939$). However, area of compliance, the participants were not sure which is a negative attribute of compliance.

In terms of compliance, not all aspects of the checklist were adhered to by the practitioners. They only agreed to adhering to some of the aspects of the WHO safety checklist. A portion of the anesthesiologists who participated in the research study as well as their respective institutions comply with the WHO safety checklist standards. Such levels of compliance, based on the responses has been a major drive of improvements in patient outcomes and reduction in possible errors in the operation room. However, the participants were not sure of their compliance with other aspects of the WHO safety standards.

4.4.3 Association between compliance to the WHO safety surgical checklist and knowledge and selected anaesthesiologists' characteristics

It was hypothesized that the level of compliance with the WHO safety checklist will strong depend on the knowledge of the anesthesiologists about these safety measures and other demographic factors such as age and working experience. A multiple regression was therefore conducted to determine the presence and significance of such a relationship. A summary regression coefficients table illustrating these relationships is shown in Table 4.

Table 4: Summary regression coefficients for compliance to WHO checklist and independent factors (knowledge, age and experience)

Coefficients	B	t	Sig
(Constant)	-.666	-.570	.571
Level of knowledge	.821	3.707	.000
Age	.269	2.069	.043
Experience	-.068	-.743	.461

R squared = 0.212

Even though the regression model generated had a low predicting power (21.2%) the results clearly showed that there was a strong positive and significant relationship between compliance with the WHO safety checklist and knowledge of its existence. Specifically, the level of compliance with the WHO

checklist strongly dependent on the level of knowledge among the respondents regarding the presence of these WHO safety checklist.

4.4.4 Reasons underlying discordances between the knowledge and compliance to the WHO surgical safety checklist

According to the interviews conducted on the selected individuals, there was evidence that a gap exists between knowledge and compliance to the WHO surgical safety checklist. While the research participants were well informed about the presence and importance of the WHO safety checklist, its full implementation in the operating rooms remained a challenge. With regards to the reasons explaining the discordances between knowledge and compliance of the WHO surgical safety checklist the, the reasons were divided into the following themes;

4.4.4.1 Implementation challenges in ORs

There were issues related to the actual implementation of the WHO checklist in the primary care or acute settings. Many of the issues raised relate to poor communication or coordination among members of the OR, laxity among the nurses and staff, inconsistencies, poor reporting and lack of seriousness among staff. The following are some of the direct quotes from the interview scripts;

“WHO safety check list should be fully implemented in ALL theatres...Some surgeons don't support use of the surgical safety checklist: the nursing and anesthesia teams have thus taken lead...Matters of drug errors are rarely reported as concerns (look alike and sound alike drugs).”

“The check list is a useful tool.”

“In addition to the above it would be good to write important issues about the surgery on the board in theatre and review it whilst in surgery. Some nurses take it as a document just to be read.”

“The checklist is sometimes taken for granted and not filled in real-time. Hence loses purpose”

“Implementation is not consistent. In the teams where the checklist is used, the teams work better together, are better prepared for each patient and have fewer delays and frustrations.”

“WHO surgical checklist is a gem in theater usage as far as patient safety is concerned.”

“Its use is haphazardly done. The nurse communicates to individuals no teamwork.”

4.4.4.2 Leadership and advocacy

The other central issue that may explain gaps in knowledge and implementation of WHO safety checklist relates to leadership and advocacy. Based on the comments from the interviews, there poor leadership and advocacy efforts from the senior personnel at the organization and this negatively affect compliance rates. Some of the comments include;

“Advocacy of WHO surgical safety checklist is needed and should be ongoing.”

“There is need to keep staff reminded that the details in the checklist are not just routine but inform the patient safety measures needed for good outcomes.”

“There is need to keep staff reminded that the details in the checklist are not just routine but inform the patient safety measures needed for good outcomes.”

4.4.4.3 Organizational and logistical factors

Organizational and logistical factors is the other broad category of factor that may explain why compliance levels are not at par with the level of knowledge among the staff regarding the WHO safety checklist. These factors may include inadequate frameworks for supporting adherence to the WHO safety checklist in the workforce. Some of the comment include;

“Institution must allow safe innovative adaptation of the WHO SSCL suited for different theatres. Single documents not suitable for all.”

“Many factors impact in the outcomes of patients in my setting that are not necessarily eliminated by adherence to WHO checklist.”

“Work still needs to be done for the safety checklist to be adopted in the remote setting anesthesia especially radiology and endoscopy.”

“The safe to speak culture should be engrained by management to enable the perioperative team enforce the checklist as a routine.”

It would be important for these factors to be compared with information from other scholarly works and this will be done in the discussion section of the dissertation.

CHAPTER 5

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter discusses the main research findings from the study in attempts to generate meaning and interpret the findings in relation to the research questions. The chapter also compares the finding with works by other scholars in the subject area of interest. The chapter will finalize by concluding and providing recommendations for practice and further research.

5.2 Discussion

5.2.1 Knowledge on the components of WHO surgical safety checklist among anesthesiologists practicing in Kenya

The findings showed a strong agreement among the participants regarding their knowledge of all the components of the WHO safety checklist. In addition, there was a strong agreement among the respondents that the different components or elements of the safety checklist are central to improving the safety in the operating room and in the surgical procedures. These findings suggest the importance of practitioners to have knowledge and understanding of the WHO safety checklist requirements

The findings show that knowledge and implementation of WHO safety checklist improves patient safety which is the main reason for complying to this checklist. The conclusions that anesthesiologists have knowledge on the WHO surgical safety checklist supports works by other scholars who also agree that many of these professionals understand the need to use the WHO safety checklist. For instance, Sharma et al (2020) acknowledged the fact that many healthcare professionals in a healthcare setting have knowledge on the WHO safety checklist. In another study, Hurtado et al (2012) provide another perspective whereby they examined acceptance of the WHO safety checklist. Both studies, however, showed that that knowledge of the WHO safety checklist is present among anesthesiologists. However, whether this can be linked to compliance was not captured in the two studies, and this was the focus of this research study which sought to fill this gap. Similar to the results from our study, Weber-Sánchez et al. (2018) also showed that the knowledge of the WHO safety checklist may be important in

improving safety during delivery of care. Many of the benefits of the WHO safety checklist have been reported by other scholars such as Cullati et al (2014) who noted that compliance to the WHO safety checklist especially among surgeons and anesthesiologists improve safety and quality of care in the primary care setting. Therefore, it was critical to examine whether knowledge about WHO safety checklist was related to compliance.

5.2.2 Level of compliance to the WHO surgical safety checklist among anesthesiologists in Kenyan hospitals.

In terms of compliance, not all aspects of the checklist were adhered to by the practitioners. They only agreed to adhering to some of the aspects of the WHO safety checklist. A portion of the anesthesiologists who participated in the research study as well as their respective institutions comply with the WHO safety checklist standards. Such levels of compliance, based on the responses has been a major drive of improvements in patient outcomes and reduction in possible errors in the operation room. However, the participants were not sure of their compliance with other aspects of the WHO safety standards. The varying level of compliance with the WHO safety checklist was also reported in other studies. According to Melekie and Getahun (2015) compliance varied significant depending on the sector of the operating room with more adherence being recorded in rooms requiring general anesthesia. The study cited lack of appropriate training and lack of cooperation among surgical staff as main reasons for non-compliance. In another study by Schwendimann et al (2019), issues with compliance were also noted with the authors citing individual, procedural and contextual factor as main challenges facing compliance. These findings conform with results from our study which showed inconsistencies in compliance. Whether this was related to knowledge of WHO safety checklist was explored in our study.

Based on the rationalist compliance model people make decisions based on rational thinking which mainly categorizes decisions as either good or bad; a cost benefit analysis helps inform these decisions (Wu et al., 2015). Through viewing decisions, actions and behaviours as rational, critical thinking based on the analysis of the decision determines whether the decision will be made or not. By viewing the importance of adhering to the WHO safety checklist rules based on a cost-benefit analysis, anaesthesia practitioner may choose to comply to these standards or not. Normative decision making model is based on societal norms or morals (Feldman, 2011). Therefore, a decision will be based on the extent to which

an individual seeks to abide by the societal rules considered norms. For anesthesiologists, norms such as morality and justice inform current practice where the professionals seek to adhere to the rules that govern their practice

5.2.3 Association between compliance to the WHO safety surgical checklist and knowledge and selected anesthesiologists' characteristics

Specifically, the level of compliance with the WHO checklist strongly dependent on the level of knowledge among the respondents regarding the presence of these WHO safety checklist. These findings mean that the knowledge on WHO safety checklist will only be valuable is the anesthesiologists can comply to the guidelines. According to White et al (2020), the knowledge of WHO safety checklist can only be important is it can be transformed into action. While many research studies reviewed in this research have examined issues related to compliance including Rydenfalt et al (2013), few have linked compliance with prior knowledge. This is a possible gap in research in this subject area that our research study has filled

5.2.4 Reasons underlying discordances between the knowledge and compliance to the WHO surgical safety checklist

The main factors explaining the discordances between knowledge and compliance of the WHO surgical safety checklist include; implementation challenges in ORs (resistance, poor communication, laxity among the nurses and staff, inconsistencies, poor reporting and lack of seriousness among staff), leadership and advocacy (poor leadership and advocacy) and organizational and logistical factors (inadequate frameworks WHO safety checklist compliance). Most of the findings from this study support works by other scholars in the subject area. For the WHO checklist to make a difference in the healthcare sector, there has to be acceptance among the anesthesiologists working in surgical area (Wæhle et al., 2020). From the organizational perspective, the creation of an important culture of safety especially in the operating room may improve compliance to WHO safety checklist among professionals working in the surgical setting. These findings were also reported by Haugen et al (2013). Therefore, there is a need for interventions to be implemented to close the gap between WHO safety checklist knowledge and its implementation in the surgical environment.

5.3 Conclusion

It can be concluded from the study that there is an understanding and good knowledge about all the components of the WHO safety checklist among the practitioners. In fact, many agreed that these components or elements of the safety checklist are central to improving the safety in the operating room and in the surgical procedures. Therefore, there was general awareness and knowledge among the participants regarding the different components of the WHO surgical safety checklist and its value in the operating room.

In terms of compliance, not all aspects of the checklist were adhered to by the practitioners. They only agreed to adhering to some of the aspects of the WHO safety checklist. A portion of the anesthesiologists who participated in the research study as well as their respective institutions comply with the WHO safety checklist standards. Such levels of compliance, based on the responses has been a major drive of improvements in patient outcomes and reduction in possible errors in the operation room. However, the participants were not sure of their compliance with other aspects of the WHO safety standards. The level of compliance with the WHO checklist strongly dependent on the level of knowledge among the respondents regarding the presence of these WHO safety checklist; high levels of knowledge correlated to high levels of compliance.

The main factors explaining the discordances between knowledge and compliance of the WHO surgical safety checklist include; implementation challenges in ORs (resistance, poor communication, laxity among the nurses and staff, inconsistencies, poor reporting and lack of seriousness among staff), leadership and advocacy (poor leadership and advocacy) and organizational and logistical factors (inadequate frameworks WHO safety checklist compliance). Most of the findings from this study support works by other scholars in the subject area.

5.4 Recommendations

The recommendations proposed from this research relate to bridging the gap between knowledge of the WHO surgical safety checklist and the actual compliance to the checklist among the practitioners. The results showed that the level of knowledge on the WHO safety checklist is very high among the respondents. However, the compliance levels were much lower. Therefore, there were discordances

between knowledge or the WHO checklist and actual compliance of the checklist among staff. The following recommendations may help improve compliance with the WHO safety checklist;

- i. Organizations need to identify ways to address challenges present in the OR with regards to adherence to the WHO safety checklist. Specifically, measures must be out in place to ensure that these protocols are followed and implemented in all theaters including allocating personnel to check and ensure the WHO safety checklist is implemented.
- ii. Increased education and awareness among surgeons, nurses and the anesthesiologists working in the operating room is needed to improve compliance and reduce resistance to the use of these measures.
- iii. Importance of the safety checklist need to be emphasized more among the health and anesthesia teams through development and implementation of a culture of safety within the organization as a whole.
- iv. Individuals in leadership and senior management positions need to take the lead in advocating for all personnel to adhere to measures aimed at maintaining safety of the patients including implementation of the WHO safety checklist.
- v. At the organizational level, appropriate frameworks for supporting safety in the operating rooms and surgical department need to be developed and implemented as needed. When organizational leadership enforce policies to improve safety, chances are high that these measures will improve overall safety compliance including compliance to WHO safety checklist by the OR staff.

5.5 Limitations

One of the limitations of this research study is that it has explained the disconnection between knowledge and compliance of the WHO safety checklist very broadly despite this being a very crucial element of the subject area. Therefore, it becomes very challenging for the information from the study to be used to make appropriate corrections that would improve compliance to the WHO safety standards in relation to the level of knowledge among the practitioners. The broad categorization in this component of the research could have emerged for several reasons. The interviews were conducted on a very small sample size; therefore, a wide range of reasons were generated that were dissimilar to each other. Perhaps a larger sample size for interviews would have provide better results.

An important factor that can be regarded as a limitation of this study is that it did not examine how the knowledge and adherence of WHO safety checklist may directly impact patients. This aspect is regarded as a limitation of this study especially because the final desired outcomes of adhering to the WHO safety checklist is to improve patient outcomes. While benefits of compliance to WHO safety checklist have been highlighted in parts of this dissertation, narrowing down to the specific benefits on patients including how the WHO compliance can improve patient safety and other outcomes could provide more evidence-based information that would support practice in this area. Perhaps, this is a major gap in this research study that can be filled through further research. The gap might not have been handled for logistic reasons since this was not part of the scope for this research study.

5.6 Suggestions for further research

A potential area for further research based on the weaknesses of this research study is for researchers to examine the specific factors responsible for the disconnection between the level of knowledge on WHO safety standards and the level of compliance to these standards among the practitioners. While it was clear that such a gap existed, this study only categorized the factors on a broader sense. Further research may be conducted on a larger sample size and go into more in-depth and specific factors responsible for the disconnection between knowledge and compliance.

A potential gap in the study that can be filled by further research is the connection between WHO safety checklist knowledge and compliance, and patient outcomes such as safety and quality of care. While this research has shown that WHO safety checklist knowledge and compliance are related, it has not linked this connection to important patient outcomes such as safety, quality of care and wellbeing. Perhaps other future studies may continue the discourse along these lines.

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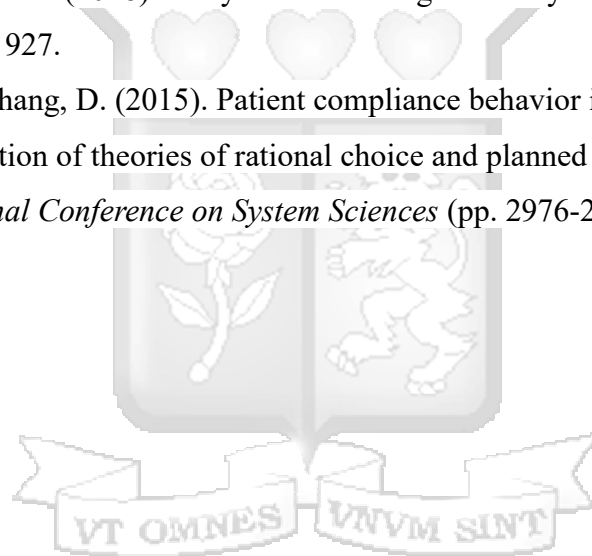
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APPENDIX I: PARTICIPANT INFORMATION AND CONSENT FORM

TOPIC: AWARENESS AND COMPLIANCE WITH THE WORLD HEALTH ORGANIZATION'S SAFETY CHECKLIST AMONG KENYAN ANESTHESIOLOGISTS

SECTION 1: INFORMATION SHEET

Investigator: Muthoni Ntonjira

Institutional affiliation: Strathmore Business School (SBS)

SECTION 2: INFORMATION SHEET–THE STUDY

2.1: Why is this study being carried out?

The purpose of this study is to assess the factors affecting patient safety in anesthesia in Kenya with focus on awareness and compliance to the WHO surgical safety checklist among Kenyan anaesthesiologists.

2.2: Do I have to take part?

No. Taking part in this study is entirely optional and the decision rests only with you. If you decide to take part, you will be asked to complete a questionnaire to get information on the factors affecting patient safety in anesthesia in Kenya with focus on awareness and compliance to the WHO surgical safety checklist among Kenyan anaesthesiologists. If you are not able to answer all the questions successfully the first time, you may be asked to sit through another informational session after which you may be asked to answer the questions a second time. You are free to decline to take part in the study at any time without giving any reasons.

: Who is eligible to take part in this study?

- Kenyan anesthesiologists

2.3: Who is not eligible to take part in this study?

- Non- anesthesiologists

2.4: What will be taking part in this study involve for me?

You will be approached by a research assistant and requested to take part in the study. If you are satisfied that you fully understand the goals behind this study, you will be asked to sign the informed consent form (this form) and then taken through a questionnaire to complete.

2.5: Are there any risks or dangers in taking part in this study?

There are no risks in taking part in this study. All the information you provide will be treated as confidential and will not be used in any way without your express permission.

2.6: Are there any benefits of taking part in this study?

The information will be used to improve the safety of patients during surgery.

2.7: What will happen to me if I refuse to take part in this study?

Participation in this study is entirely voluntary. Even if you decide to take part at first but later change your mind, you are free to withdraw at any time without explanation.

2.8: Who will have access to my information during this research?

All research records will be stored in securely locked cabinets. That information may be transcribed into our database but this will be sufficiently encrypted and password protected. Only the people who are closely concerned with this study will have access to your information. All your information will be kept confidential.

2.9: Who can I contact in case I have further questions?

You can contact me, **Muthoni Ntonjira**, at SBS, or by e-mail (jane.ntonjira@strathmore.edu), or by phone (+254 722 389501). You can also contact my supervisor, **Dr. Francis Wafula**, at the Strathmore Business School, Nairobi, or by e-mail (fwafula@strathmore.edu) or by phone (+254 722 679467)

If you want to ask someone independent anything about this research, please contact:

The Secretary–Strathmore University Institutional Ethics Review Board, P. O. BOX 59857, 00200, Nairobi, email ethicsreview@strathmore.edu Tel number: +254 703 034 375

I, _____, have had the study explained to me. I have understood all that I have read and have had explained to me and had my questions answered satisfactorily. I understand that I can change my mind at any stage.

Please tick the boxes that apply to you;

Participation in the research study

I AGREE to take part in this research

I DON'T AGREE to take part in this research

Storage of information on the completed questionnaire

I AGREE to have my completed questionnaire stored for future data analysis

I DON'T AGREE to have my completed questionnaire stored for future data analysis

Participant's Signature:

Date: _____/_____/_____

DD / MM / YEAR

Participant's Name:

Time: _____/_____

(Please print name)

HR / MN

I, _____ (Name of person taking consent) certify that I have followed the SOP for this study and have explained the study information to the study participant named above, and that s/he has understood the nature and the purpose of the study and consents to the participation in the study. S/he has been given opportunity to ask questions which have been answered satisfactorily.

Investigator's Signature:

Date: _____/_____/_____

DD / MM / YEAR

Investigator's Name:

Time: _____/_____

(Please print name)

HR / MN

APPENDIX II: QUESTIONNAIRE

INTRODUCTORY LETTER

My name is Dr. Muthoni Ntonjira, a student at Strathmore Business School. As part of my master's degree in Business Administration in Healthcare Management, I am carrying out a study on factors affecting patient safety in anesthesia in Kenya.

The purpose of this study is to assess the factors affecting patient safety in anesthesia in Kenya with focus on awareness and compliance to the WHO surgical safety checklist among Kenyan anaesthesiologists.

I humbly ask for your support as a randomly selected participant for this study. Your contributions in this regard are of utmost importance. All your information will be handled with confidentiality. For privacy purpose, use of names will be avoided, so **do not** write your name anywhere in this questionnaire. Thank you for your contribution.

SECTION A: GENERAL INFORMATION

1. What is your age (please tick your age category)
21-30 years
31-40 years
41-50 years
51-60 years
Over 60 years
2. What is your gender?
Male
Female
3. What is your level of work experience as an anesthesiologist?
0 to 3 years
4 to 6 years
7 to 9 years
10 years and above
4. What position do you hold in your organization?

Management

Non-Management

5. What level of hospital do you work at?

Level 3

Level 4

Level 5

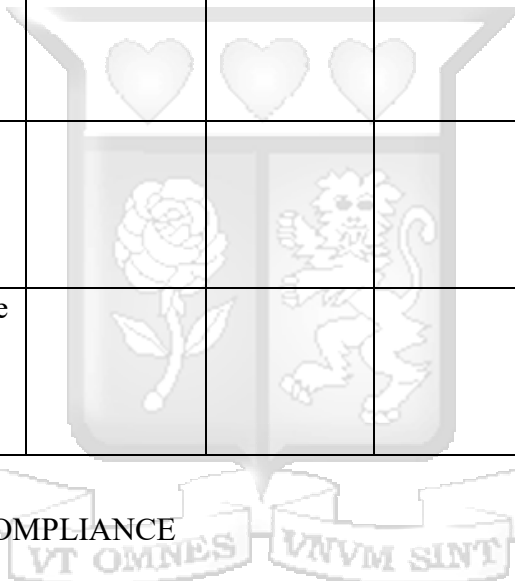
Level 6

SECTION B: LEVEL OF KNOWLEDGE

Please tick as appropriate

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Use of the WHO surgical safety checklist decreases errors and adverse events, and increases teamwork and communication in surgery.					
There is significant reduction in surgery/anaesthesia-related morbidity and mortality with the routine use of the WHO surgical safety checklist.					
Successful implementation of the WHO safety surgical checklist involves a multidisciplinary approach, extensive education and					

training, local adaptation, active leadership and identification of champions.					
The checklist is always easy to use					
The checklist have improved operating room safety					
The WHO safety checklist have helped to develop a safety culture in surgical teams					
The checklist helped prevent errors in the operating room					
Briefing of personnel before a surgical procedure is important for patient safety					

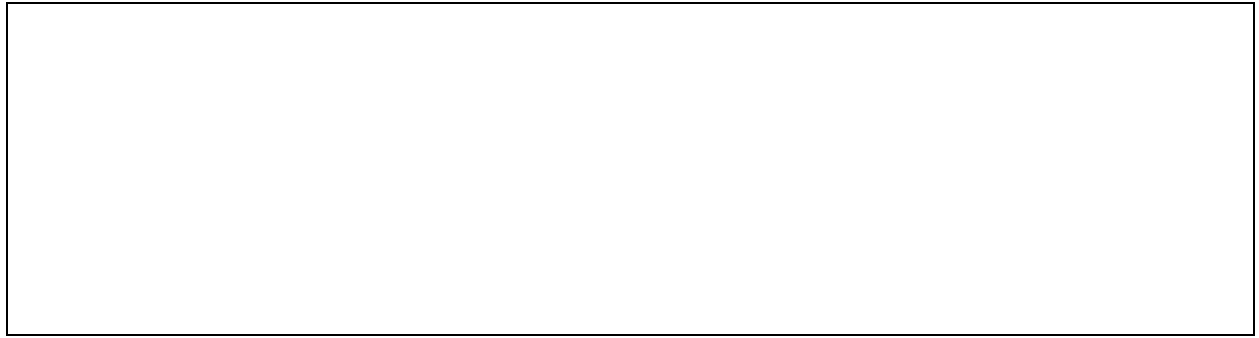


SECTION C: LEVEL OF COMPLIANCE

Please tick as appropriate

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
The WHO surgical safety checklist is adopted for use at my hospital.					
The surgical, anaesthesia and nursing teams are fully trained on the use of the WHO surgical safety checklist.					

The WHO surgical safety checklist is fully implemented at my hospital.					
The department of anaesthesiology senior management have supported the implementation of the WHO safety checklist.					
The checklist has helped prevent errors in the operating room.					
Communication has been improved through use of the WHO surgical safety checklist.					
Compliance of WHO safety checklist has improved patient outcomes through its adoption in the preoperative, intraoperative and post-operative environment.					
Compliance of WHO safety checklist brings no extra value to existing safety procedures already in place in my hospital/clinic before its implementation.					
Any other comments;					



Thank you for your co-operation



APPENDIX III: INTERVIEW GUIDE

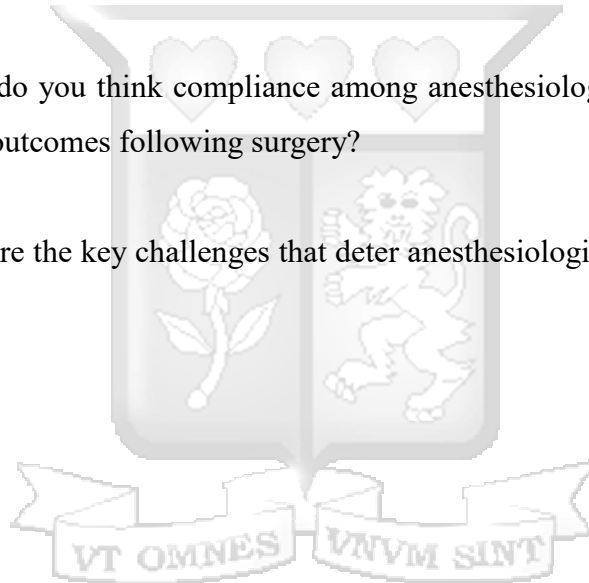
Date of Interview _____

Name of Interviewer _____

In-depth Interview Topic Guide

Guiding questions

1. In your own view, what do you think motivates compliance among anesthesiologists? Probe for ways in which anesthesiologists comply with the safety guidelines.
2. In your opinion, how do you think compliance among anesthesiologists can be improved for higher impact or patient outcomes following surgery?
3. In your opinion what are the key challenges that deter anesthesiologists from complying to the safety checklist?



APPENDIX IV: ETHICS APPROVAL



17th August 2021

Dr Ntonjira Jane,
jane.ntonjira@strathmore.edu

Dear Dr Ntojira,

RE: Awareness and Compliance with the World Health Organization's Safety Checklist among Kenyan Anesthesiologists


This is to inform you that SU-IERC has reviewed and **approved** your above **SU- master's** research proposal. Your application reference number is **SU-IERC1135/21**. The approval period is **17th August 2021 to 16th August 2022**.

This approval is subject to compliance with the following requirements:

- i. Only approved documents including (informed consents, study instruments, MTA) will be used
- ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-IERC.
- iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-IERC within 48 hours of notification
- iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-IERC within 48 hours
- v. Clearance for export of biological specimens must be obtained from relevant institutions.
- vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
- vii. Submission of an executive summary report within 90 days upon completion of the study to SU-IERC.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) <https://research-portal.nacosti.go.ke/> and also obtain other clearances needed.

Yours sincerely,


for: Dr Virginia Gichuru,
Secretary; SU-IERC

Cc: Prof Fred Were,
Chairperson; SU-IERC



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