ENSIGN GLOBAL COLLEGE

KPONG, EASTERN REGION, GHANA

FACULTY OF PUBLIC HEALTH

DEPARTMENT OF COMMUNITY HEALTH

UTILIZATION OF THE WHO SURGICAL SAFETY CHECKLIST BY SURGICAL PROFESSIONALS AT SELECTED HOSPITALS IN THE GREATER ACCRA REGION, GHANA

By

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APRIL, 2024

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A THESIS SUBMITTED TO THE DEPARTMENT OF COMMUNITY HEALTH, FACULTY OF PUBLIC HEALTH, ENSIGN GLOBAL COLLEGE IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF PUBLIC HEALTH DEGREE

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DECLARATION

I hereby declare that this submission is my work for the master's degree in public health and that, to the best of my knowledge, it does not contain any material previously published by any person or material accepted for the granting of any other degree from the college, except where proper attribution has been indicated in the text.

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DEDICATION

I dedicate this work to God Almighty for the strength and ability to produce this thesis. I am grateful to my wife Emelia Mensah and my daughters Yvonne, Lauretta and Michelle for their unflinching support and encouragement throughout the period. Finally, this work goes to my supervisor, Dr. Stephen Manortey, for his expert guide, support and guidance towards the successful completion of my project.

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DEFINITION OF TERMS

WHO Surgical Safety Checklist (WHO SSC): Standardized tools created to lower errors and enhance teamwork and communication among Surgical Professionals developed by the World Health Organization.

Surgical Professionals: it refers to doctors, anaesthetists and theatre nurses who operate at theatre suits of the hospitals where the study was undertaken.

ABBREVIATIONS/ACRONYMS

C.I	Confidence Intervals
GAR	Greater Accra Region
GARH	Greater Accra Regional Hospital
LCoGS	Lancet Commission of Global Surgery
OR	Odds Ratios
SCT	Social Cognitive Theory
SOTA	Surgical, obstetric, trauma, and anaesthesia
SSC	Surgical Safety Checklist
WHO	World Health Organization
WHO SSC	WHO Surgical Safety Checklist

ABSTRACT

Introduction: Even though there are enormous benefits associated with the use of the WHO Surgical Safety Checklist (WHO SSC) it's adoption and use in low-middle-income countries is only 20%. This study seeks to assess the factors that contribute to the utilization of the WHO SSC by surgical professionals at the Greater Accra Regional Hospital, Achimota Hospital, and Narh-Bita Hospital.

Methodology: A cross-sectional study was conducted among the Surgical Professionals. Data was collected using a self-administered questionnaire. The data was analyzed using a statistical software tool, STATA, version 18.0

Results: The study found that there was a high level of awareness of the WHO SSC among surgical personnel (100%). Also, 93.2% of surgical professionals knew the core objectives of the Checklist, 73.6% knew about the structure of the SSC, 86.4% knew that SSC is a collaborative effort and must involve all members of the surgical team, 97.7% had knowledge of the role of SCC to enhance the safety of patients and surgical outcomes and 77.7% of medical personnel showed a clear consensus on how to handle a situation where an item on the WHO SSC does not apply to a given surgical procedure.

Conclusion: Based on this, the study recommended that there should be continuous training on the importance and proper usage of WHO SSC. This will help to achieve the WHO SSC's goal of enhancing patient safety and surgical outcomes.

Keywords: Surgical Personnel, Check list, Safety, Awareness, Knowledge

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

With millions of surgical procedures conducted annually around the world, surgery is a crucial part of contemporary healthcare (Askarian et al. 2011). Even though surgical procedures have unquestionably improved patient outcomes and quality of life, they are not without danger. Patients who experience surgical errors, complications or adverse events may suffer life-changing repercussions such as extended hospital stays, higher healthcare costs or even death Forrester et al., (2018).

The World Health Organization (WHO) developed the Surgical Safety Checklist in response to the demand for improved patient safety in surgical settings (Weiser & Haynes 2018). The WHO Surgical Safety Checklist is a standardized tool created to lower errors and enhance teamwork and communication among surgical professionals (Mahajan 2011). Since its initial release in 2008, it has garnered general acceptance as an important tool for raising surgical safety (Weiser & Haynes 2018). Surgical teams follow the checklist, which is a straightforward yet comprehensive document, before, during, and after operation. It comprises crucial actions including establishing the surgical location, confirming the patient's identity and going through important details of the treatment (Treadwell et al., 2014). The checklist ensures that crucial safety procedures are constantly carried out and that all team members are on the same page by methodically taking care of these issues.

The adoption and effective application of the WHO Surgical Safety Checklist (WHO SSC) varies greatly between healthcare organizations and surgical teams, despite its ability to improve patient safety and reduce surgical complications (Conley et al., 2011). Its use may be influenced by a variety of circumstances, including institutional culture, the knowledge and attitudes of surgical staff, and logistical difficulties in the operating room. Regarding the

knowledge and utilization of the WHO Surgical Safety Checklist by Surgical Professionals, there have been several studies that demonstrate their (knowledge and utilization) importance. In the study by Ogunlusi et al., (2017), they found that while there was a high level of awareness of surgical safety checklists, the level of knowledge of the tool was low, as only a few surgical professionals correctly stated their main objective. Thus, this implied that its utilization was ineffective and poor. Further, in the study by Girma et al., (2022) on the utilization and completeness of surgical safety checklist, they found that the utilization of the checklist was high but the completeness was poor, implying low knowledge. In other words, the surgical professionals did not use the checklist effectively despite their high usage. The results of these studies demonstrate that even though there is ample evidence that points to the fact that effective utilization of the WHO Surgical Safety Checklist leads to improvement in surgical outcomes, this is only possible when there is adequate knowledge to back it up.

In Ghana, many healthcare professionals, especially surgical professionals, do not utilize the WHO Surgical Safety Checklist as much as they should. There could be various context-specific reasons for this (Bansah et al., 2023). This prompts the need to conduct this study to explore the reasons behind the utilization of the WHO Surgical Safety Checklist. Thus, using health facilities in the Greater Accra Region, the study examines the utilization of the WHO Surgical Safety Checklist by Surgical Professionals.

1.2 Problem Statement

According to Weiser et al. (2016), between 266.2 and 359.5 million procedures are performed annually. Based on this estimation, the number of people who undergo surgery each year is around 1 in 25, which is more than twice the number of babies born each year (PRB, 2016). In affluent countries, the mortality rate related to these surgical operations ranges between 0.4% and 0.8% and in developing countries, it is between 5% and 10% (Kable 2002; Ouro-Bang'naMaman 2005). This means that the death rates due to surgical

operations in developing countries, especially in sub-Saharan Africa, are high and bring into disrepute the level of safety within surgical settings.

In Ghana, even though there was a high uptake following the introduction of the WHO SSC at a teaching hospital (93%), its effective utilization was only 21% (Bansah et al., 2023) indication influence of systemic factors which influence the effective utilization of the WHO SSC and therefore compromising surgical safety. Further, there is a dearth of studies on the subject of utilization of the WHO Surgical Safety Checklist by Surgical Professionals within the Ghanaian context.

Thus, the problem to be addressed in this study is the limited utilization and effective use of surgical safety tools like the WHO Surgical Safety Checklist in healthcare settings in sub-Saharan Africa, particularly Ghana. Therefore, this research attempts to play a part in addressing these gaps using selected health facilities in the Greater Accra Region of Ghana.

1.3 Rationale of Study

Surgical procedures form part of medical interventions to improve patients' conditions. The healthcare system in Ghana is structured in such a way that more complex surgical procedures are carried out at higher levels of care like the regional and teaching hospitals while more simpler cases are done at the district health facilities and also the polyclinics.

Sometimes errors and complications accompany these procedures and this informed the development of basis the WHO Surgical Safety Checklist to prevent these complications and enhance patient safety (Santana et al., 2016). Conditions amenable to surgical, obstetric, trauma, and anaesthesia (SOTA) which is a vital component of the healthcare systems is a major contributor to death and disability in Ghana. The Lancet Commission of Global Surgery (LCoGS) recommends 5,000 surgical procedures per 100,000 population as a target to meet population surgical needs. In Ghana however, the surgical volume is 869 per 100,000 population which is far below the expected.

As efforts are being made to improve access to surgical care, efforts to improve safety and outcomes of the procedures have not received a commensurate attention. Thus, this is the basis for conducting the study examining the utilization of the WHO Surgical Safety Checklist by Surgical Professionals to inform policy for the improvement of patient safety.

1.4 Conceptual Framework

Figure 1: Conceptual framework (Author's construct 2023)

First, there is no cause-and-effect relationship in the topic of the knowledge and utilization of the WHO Surgical Safety Checklist by Surgical Professionals. However, it is worth mentioning that effective utilization of the WHO Surgical Safety Checklist depends on how well Surgical Personnel understand the tool's elements and specific elements and how they can be applied effectively which are the independent variables in the study. The effective implementation of the WHO Surgical Safety Checklist, which is the dependent variable, is the outcome that the study intends to measure or assess based on the level of awareness and knowledge possessed by the Surgical Professionals.

1.5 Research Questions

1. What is the level of utilization of the WHO Surgical Safety Checklist by doctors, anaesthetists and theatre nurses?
2. How well do doctors, anaesthetists and theatre nurses know and understand (knowledge) the specific elements and procedures of the WHO Surgical Safety Checklist?
3. What factors influence the use of the WHO Surgical Safety Checklist by doctors, anaesthetists and theatre nurses?

1.6 General Objective

The study aims to examine the knowledge and utilization of the WHO Surgical Safety Checklist by Surgical Professionals at selected hospitals in the Greater Accra Region of Ghana.

1.7 Specific Objectives

1. To assess the level of utilization of the WHO Surgical Safety Checklist by doctors, anaesthetists and theatre nurses.
2. To examine how well doctors, anaesthetists and theatre nurses know and understand (knowledge) the specific elements and procedures of the WHO Surgical Safety Checklist.
3. To evaluate the factors that influence the use of the WHO Surgical Safety Checklist by doctors, anaesthetists and theatre nurses.

1.8 Profile of Study Setting

Greater Accra Regional Hospital, Ridge, Accra

The Greater Accra Regional Hospital (GARH) is situated at North Ridge in the Osu-Klottey Sub-Metro of the Accra Metropolitan Area in the Greater Accra Region (GAR). It occupies a total land area of about 15.65 acres. As the Regional Hospital for the GAR, its catchment area is the whole of the region with an estimated population of over 4,671,363 (2016 projection based on the 2010 census by the Ghana Statistical Service). The immediate catchment area, however, includes the following suburbs: Ridge, Nima, Maamobi, Kanda, Accra New Town, Kotobabi, Osu, La, Adabraka, Achimota, Airport Residential Area and Central Accra.

Located at the heart of Accra city, the GARH started as a Hospital for European expatriates around 1928. It became a District Hospital after Ghana's independence in 1957 and was later designated as Ridge Regional Hospital in 1997 and now redeveloped and transformed into an ultra-modern 420-bed capacity hospital with the full complement of specialist services that reflect the current social aspirations of the rapidly growing capital city of Ghana.

Before the redevelopment of the Hospital, the larger proportion of the infrastructure and equipment in the Hospital dated back to the period 1911-1923. The physical structures of the Hospital were weak and required huge maintenance costs every year. Most of the clinical care equipment was over and the physical space to deliver health care services to clients remained a major challenge for the Hospital. The Hospital's bed compliments (192) at the time were overstretched culminating in congestion in all the clinical departments. The Hospital provided service to over 800 outpatients and 250 in-patients daily.

Narh-Bita Hospital, Tema

The Narh-Bita Hospital was established by Dr. Edward Atteh Narh (a Family Physician Consultant) and Mrs. Beatrice Afua Narh (a nurse by Profession) on the 1st of August 1979 to contribute to healthcare delivery to the surrounding community of Tema. The hospital started

from a two-bedroom facility with a staff strength of three; a medical officer, the nurse who also doubled as a dispenser and orderly. Over the years the hospital has grown into one of the largest private hospitals in Tema providing both general and specialist care to clients. It also has an operating theatre where various surgeries are performed on 24 24-hour basis. The hospital has also established a Nursing training school since July 2004 and a school for the training of Physician Assistants and Medical Laboratory Scientists.

Achimota Hospital, Accra

The Achimota Hospital's core mandate is to deliver curative, health promotion and preventive services in the Okaikoi North Municipality of Accra and Beyond. Its services range in complexity from secondary to tertiary-level care. The hospital also serves as one of the practical attachment sites for numerous schools within the country. It is thus committed to the creation of an enabling environment in which the prevention, and treatment of diseases run smoothly.

Its core services include surgical services, accident and emergency services, general outpatient services, antenatal services and obstetric and gynaecological services and it runs these services on a 24-hour basis.

1.9 Scope of Study

The scope of this study encompasses a comprehensive investigation into the knowledge and utilization of the WHO Surgical Safety Checklist by Surgical Professionals within selected hospitals in the Greater Accra Region, Ghana. Specifically, the research focuses on assessing the awareness levels, frequency of use, and perceived barriers to the effective implementation of the checklist among doctors, anaesthetists, and theatre nurses operating in the surgical units of these healthcare facilities. Again, the study is delimited to three major hospitals in the Greater Accra Region: The Greater Accra Regional Hospital, Achimota Hospital, and Narh-

Bita Hospital. These institutions were selected based on their significant roles in providing surgical care in the region and their potential variability in the adoption and utilization of the WHO Surgical Safety Checklist. By concentrating on these specific sites, the research aims to uncover insights that are both deep and broad enough to allow for an understanding of the checklist's impact on surgical safety within the context of Ghanaian healthcare settings. Also, this research is confined to examining the perspectives of full-time surgical personnel who are directly involved in patient care in the operating theatre. This includes surgeons, anaesthetists, and theatre nurses but excludes administrative staff, students, interns, and personnel not permanently employed at the hospitals during the study period.

1.10 Organization of Report

Six chapters are employed in this research to thoroughly investigate the knowledge and utilization of the WHO Surgical Safety Checklist by Surgical Professionals in selected hospitals in the Greater Accra Region, Ghana. The first chapter introduces the study, presenting its background, the statement of the problem, and the rationale. It also delineates the research objectives and questions, highlighting the significance of the study, its scope, and its limitations.

The second chapter conducts a comprehensive literature review. It begins with an introduction to the chapter, followed by an examination of relevant theories and models. This section delves into the WHO Surgical Safety Checklist, discussing its importance, implementation challenges, and impacts on patient safety and surgical outcomes. Key concepts are defined, and empirical studies are reviewed to establish a foundation for the study.

In the third chapter, the methodology employed for the research is outlined. This includes a description of the research methods and design, the study population, and the variables of

interest. The chapter details the sampling technique and size, data collection instruments, and the approach to data analysis. Ethical considerations and limitations of the study methodology are also discussed, as well as assumptions, ensuring the research adheres to the highest standards of academic integrity.

The fourth chapter presents the results of the study. Background information on the participants is summarized in one table, followed by an in-depth presentation of results based on the key study variables. This chapter aims to provide clear and concise findings to answer the research questions and meet the study's objectives.

The fifth chapter offers a comprehensive discussion based on the findings. The discussion links the research questions, objectives, key variables, the literature review, and the results, providing a critical analysis of the findings within the context of existing knowledge. The sixth chapter concludes with a summary of key findings and offers targeted recommendations for stakeholders, healthcare practitioners, and policy-makers interested in improving the utilization of the WHO Surgical Safety Checklist to enhance surgical safety and patient outcomes.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

Chapter two of the study serves as a crucial component, providing a comprehensive review of pertinent documents essential to understanding the context and framework of the current research. This is structured into other main sections. In the conceptual review, the study delves into the concept of, the World Health Organization Surgical Safety Checklist. The theoretical review explores existing theoretical frameworks relevant to the subject of investigation such as the Diffusion of Innovations Theory and Social Cognitive Theory. Also, the empirical review focuses on previous research studies and investigations that have generated empirical data related to the current study. Again, the study acknowledges the limitations of existing research and identifies gaps in the literature. Moreover, the chapter draws its information from different sources, including

books, journals, articles, and published thesis work.

2.2 Conceptual Review

This section of chapter two involves observing and analyzing already existing information on various concepts that form the study topic. The main concept for a review under this section includes the meaning of the World Health Organization Surgical Safety Checklist.

2.2.1 WHO Surgical Safety Checklist

The WHO Surgical Safety Checklist is a tool designed to improve communication and reduce the occurrence of errors and adverse events during surgical procedures (Woodman, 2018). It was introduced as part of the WHO's Safe Surgery Saves Lives initiative. The checklist is

intended to be used by surgical teams in operating rooms globally and aims to enhance patient safety by promoting a standardized and systematic approach to key safety measures (Munthali et al., 2022). Key principles of the surgical safety checklist include communication, teamwork, verification, prevention of adverse events and standardization (Woodman, 2018). The WHO Surgical Safety Checklist is designed to be used in three critical phases of surgery which are before induction of anaesthesia, before skin incision and upon completion of surgery.

'Sign-in' Component

The is the first phase of the surgical safety checklist which is done before induction of anaesthesia and is mainly concerned with identification of patients and procedures (Gong et al., 2021).

'Time-out Component

This second phase of the checklist is carried out just before skin incision involves the team's re-evaluation of the patient, procedure, risk and needed equipment. (Gong et al., 2021).

'Sign-out Component'

This third phase of the checklist occurs during or shortly after wound closure but before patient leaves the operating room. A summary of the surgery is given by the surgeon and instrument and gauze count is carried out to ensure accountability while safety concerns are also discussed together with concerns for recovery (Gong et al., 2021).

The WHO Surgical Safety Checklist has demonstrated positive effects on patient outcomes and safety. Studies (Bansah et al., 2023; Abdulkarim et al., 2020) have shown that its implementation is associated with a reduction in complications, morbidity, and mortality in

surgical patients. According to Ogunlusi et al., (2017), the implementation of the WHO Surgical Safety Checklist is associated with a reduction in surgical complications. The checklist helps identify potential issues before, during, and after surgery, leading to improved communication and a more systematic approach to addressing safety concerns. Again, the use of the WHO Surgical Safety Checklist is associated with a reduction in mortality rates following surgery (Olatosi et al., 2018). By systematically addressing critical safety steps, the checklist contributes to improved patient outcomes and survival.

The WHO Surgical Safety Checklist has been adopted globally and has shown positive impacts in diverse healthcare settings (Bansah et al., 2023; Abdulkarim et al., 2020). Its principles have been applied in various surgical specialties and across different countries and cultures, demonstrating its adaptability and effectiveness on a global scale. The checklist standardized key elements of the surgical process, ensuring that essential tasks are consistently performed. This standardization can lead to more predictable and reliable outcomes, reducing the variability in surgical care (Girma et al., 2022). The checklist is a dynamic tool, and its effectiveness relies on consistent and thorough implementation by the surgical team (Gong et al., 2021). The implementation of the checklist often requires a cultural shift within healthcare institutions, emphasizing the importance of safety and communication. This cultural change can lead to sustained improvements in surgical practices and patient outcomes.

2.3 Theoretical Review

This section presents a review of theories that provide contributing ideas to the analysis of the current study topic. Theories considered here include Diffusion of Innovation Theory and Social Cognitive Theory.

2.3.1 Diffusion of Innovation Theory

The diffusion of innovation theory was developed by sociologist Everett Rogers (Garcia-Aviles, 2020). The theory was first introduced in his book titled "Diffusion of Innovation," which was first published in 1962 and later updated in subsequent editions (Garcia-Aviles, 2020). The diffusion of innovation theory explains how innovations (new ideas, practices, or technologies) are spread and adopted within a social system. The theory categorizes individuals into innovators, early adopters, early majority, late majority, and laggards. Innovators are the first individuals to adopt an innovation. These individuals are risk-takers, venturesome and often high social status (Iqbal et al., 2021). Early adopters are often opinion leaders who adopt innovations early in the diffusion process (Iqbal et al., 2021). Early adopters have a high degree of social connectivity and are respected by their colleagues. The early majority also represents the average members of the social system (Frei-Landau et al., 2022). The early majority adopt innovations just before the average member of the system. The late majority forms individuals that adopt innovation after the average member of a social system. These people are typically skeptical and adopt due to social pressure. The laggards include individuals who are the last to adopt innovation (Iqbal et al.,2021). They are traditional, are often resistant to change and have low social status.

The diffusion of innovation theory has been widely applied in various fields, including marketing, public health, technology adoption, organizational change, and education (Frei-Landau et al., 2022). It provides a framework for understanding how new ideas or technologies gain acceptance and become integrated into different social systems. In the field of marketing and business, the theory is used to understand how new products are adopted by different consumer segments. Thus, the theory helps businesses to tailor their strategies based

on the characteristics of innovators, early adopters, early majority, late majority and laggards. Moreover, understanding the communication channels preferred by different adopter categories helps businesses tailor their marketing messages to effectively reach their target audience. In the technology sector, diffusion of innovation theory has been widely used to predict and manage the adoption of new technologies (Frei-Landau et al., 2022). This is crucial for companies introducing new software, digital platforms and hardware. Most organizations in the technology sector use the theory to manage the process of innovation by identifying potential barriers to adoption while developing strategies to overcome them. In healthcare, the diffusion of innovation theory is applied to understand how new medical treatments, procedures, or technologies are adopted by healthcare professionals and patients (Iqbal et al., 2021). It helps identify factors influencing the speed and extent of adoption in the healthcare industry. Public health initiatives, such as vaccination programs or health behaviour interventions, use diffusion of innovation theory to design effective campaigns that resonate with different segments of the population. In education, the theory is used by educators to implement new teaching methods, curriculum changes and technologies (Iqbal et al., 2021). The theory helps to understand the dynamics of adoption among teachers and learners.

However, critics argue that the theory assumes a homogeneous population, which may oversimplify the diversity of adopters within a social system (Call et al., 2022). The theory is often criticized for presenting a linear model of innovation adoption, suggesting a predictable and uniform process. In reality, the adoption process is more complex and may involve feedback loops, reversals, and interactions between different stages. Some critics also argue that the theory places too much emphasis on individual characteristics and overlooks the

influence of social and cultural factors in the adoption process (Call et al., 2022). Factors such as social networks, cultural values, and community dynamics may play a significant role in shaping adoption patterns.

Despite these criticisms, the diffusion of innovation theory remains a valuable framework for understanding and explaining the general patterns of innovation adoption (Garcia-Aviles, 2020). Applying the diffusion of innovation theory to the current study helps to examine where surgical personnel fall within this spectrum and can provide insights into the adoption and utilization of the checklist. Factors such as communication channels, leadership support, and the compatibility of the innovation with existing practices are key considerations.

2.3.2 Social Cognitive Theory

Social Cognitive Theory (SCT) was developed by Albert Bandura, a Canadian psychologist (Cervone et al., 2023). The theory has evolved, and Bandura's seminal work on SCT has been influential in the fields of psychology, education, and communication (Islam et al., 2023). SCT emphasizes reciprocal determinism, which means that behaviour, personal factors, and the environment interact and influence each other bidirectionally (Islam et al., 2023). Individuals are both influenced by their environment and play an active role in shaping their behaviour. Observational learning, also known as modelling or vicarious learning, is a central concept in SCT (Cervone et al., 2023). Individuals can learn by observing the actions and outcomes of others. The modelling process involves attention, retention, reproduction, and motivation. The theory also emphasizes self-efficacy which refers to an individual's belief in their ability to successfully execute a behaviour or achieve a particular goal (Schunk et al., 2020). Bandura posited that self-efficacy plays a crucial role in determining whether individuals engage in specific behaviours and how much effort they invest. Outcome

expectations are another key component of the theory which refers to an individual's anticipation of the consequences that may result from a particular behaviour (Schunk et al., 2020). Positive outcome expectations increase the likelihood of engaging in a behaviour, while negative expectations may act as deterrents.

SCT has been applied in educational settings to understand how students learn from observing teachers, peers, and educational materials (Cervone et al., 2023). The theory is used to design instructional strategies that enhance observational learning and self-efficacy. In health promotion, SCT is applied to understand factors influencing health behaviours. Interventions often focus on increasing self-efficacy, providing positive role models, and addressing outcome expectations to promote health-related behaviours (Islam et al., 2023). In psychology and therapy, SCT is used to explore the role of observational learning, self-efficacy, and self-regulation in shaping behaviour (Schunk et al., 2020). Therapeutic interventions may target these cognitive and behavioral processes. SCT is also relevant in the analysis of media effects, particularly in how individuals learn from characters in movies, television shows, or social media platforms. It has implications for understanding how media can shape behaviour and attitudes.

The Social Cognitive theory has been criticized for various reasons. Critics argue that SCT places too much emphasis on individual factors and may not adequately consider the influence of broader social structures, cultural contexts, and environmental determinants (Ying et al., 2023). The theory's comprehensive nature and multiple interacting factors can make it complex to apply and test empirically. Some critics also suggest that SCT may be seen as overly deterministic, implying that individuals are passive recipients of environmental influences rather than active agents shaping their experiences (Cervone et al., 2023).

Despite these criticisms, SCT has been widely influential and continues to provide valuable insights into understanding human behaviour, learning processes, and the influence of social environments. Researchers (Cervone et al., 2023; Islam et al., 2023; Ying et al., 2023) often adapt and integrate SCT principles into various domains to inform interventions and strategies for behaviour change. About the current study analysis, it can be said that individuals learn by observing others. In the context of the WHO Surgical Safety Checklist, Surgical Professionals may acquire knowledge and skills through observing colleagues who consistently use the checklist. Positive role modelling by influential team members can enhance the observational learning process. SCT emphasizes the importance of self-efficacy the belief in one's ability to perform a specific behaviour. Enhancing surgical personnel's self-efficacy in using the checklist involves providing training, resources, and feedback. Hands-on practice and successful experiences with checklist utilization can contribute to increased self-efficacy.

2.4 Theoretical and Empirical Implications of the Study

The study on the knowledge and utilization of the World Health Organization (WHO) Surgical Safety Checklist among Surgical Professionals has both theoretical and empirical implications. Understanding these implications is crucial for advancing the field of patient safety and improving surgical outcomes.

The theoretical framework of social cognitive theory helps to understand how individuals learn by observing others (Cervone et al., 2023). In the context of the current study topic, Surgical Professionals may acquire knowledge and use the WHO Surgical Safety Checklist by observing colleagues who consistently use the checklist. The observational learning process can be enhanced by positive role modelling which influences team members.

Diffusion of Innovation Theory on the other hand remains a valuable framework for understanding and explaining the general patterns of innovation adoption (Garcia-Aviles, 2020). Applying the diffusion of innovation theory to the current study helps to examine where surgical personnel fall within this spectrum and can provide insights into the adoption and utilization of the checklist. Factors such as communication channels, leadership support, and the compatibility of the innovation with existing practices are key considerations.

Empirical studies (Ilorah et al.,2024; Otobo et al., 2023; Bansah et al., 2023; Epiu et al., 2015; Sharma et al., 2020) of the current study help to assess the baseline knowledge levels of surgical personnel regarding the WHO Surgical Safety Checklist. This provides insights into the existing gaps in awareness and understanding, informing targeted educational interventions. Existing research (Woodman, 2018; Robertson-Smith, 2016; O'Connor et al., 2013; Munthali et al., 2022; Van Zyl et al., 2023) can empirically examine the actual utilization patterns of the checklist during surgical procedures. This involves observing adherence to checklist items, identifying deviations from the recommended protocols, and understanding the factors influencing compliance. Longitudinal research can track changes in knowledge and utilization over time. This allows for the assessment of the sustainability of interventions, the evolution of cultural norms, and the long-term impact on patient safety. Comparative research is achieved where empirical review helps to compare different strategies for implementing and promoting knowledge and utilization of the surgical checklist. This helps identify the most effective approaches for improving adherence among surgical personnel.

In summary, theoretical frameworks guide the conceptualization of research on the knowledge and utilization of the WHO Surgical Safety Checklist, while empirical studies

provide concrete evidence to inform interventions, policies, and practices. The synergy between theory and empirical research contributes to a comprehensive understanding of the complex factors influencing the adoption of safety protocols in surgical settings.

2.5 Empirical Review

This segment of the chapter provides a review of pertinent studies aligned with the research questions or objectives, specifically addressing the level of awareness about the existence of the WHO Surgical Safety Checklist, the knowledge of doctors, anaesthetists and theatre nurses on the specific elements and procedures of the WHO Surgical Safety Checklist and the factors that influence the use of the WHO Surgical Safety Checklist by doctors, anaesthetists and theatre nurses. These studies have been sourced from relevant books and online journals.

2.5.1 The level of awareness about the existence of the WHO Surgical Safety Checklist

First, Weiser and Haynes (2018) stated that the World Health Organization (WHO) brought about a tool known as the WHO Surgical Safety Checklist to bolster communication and safety during surgical procedures in the operating room. Similarly, Mahajan (2011) opined that this guarantees error-free and complications minimized during, before and after taking critical safety steps in the surgical room. Also, since the awareness of the WHO Surgical Safety Checklist has increased over the years, particularly within the medical and healthcare communities, many hospitals and surgical facilities around the world have adopted the use of the checklist as a standard practice (Conley, 2011). Again, there may still be variations in its adoption and implementation across different regions and healthcare settings although its awareness has increased. Hence, various scholars (Gong et al., 2021; Olatosi et al., 2018; Uprety et al., 2021; Urban et al., 2021; Rogers et al., 2020; Ogunlusi et al., 2017) have

assessed the level of awareness about the existence of the WHO Surgical Safety Checklist by theatre nurses, anaesthetists and doctors.

Moving on, Gong et al., (2021) conducted a study on the awareness of surgical team members toward the implementation of the surgical safety checklist in obstetrical and gynaecological operations in China. The study's findings indicated that surgeons exhibited a lower level of awareness compared to operating room nurses and anaesthetists although the general self-reported awareness of the checklist was high across all professional groups.

Similarly, in Nigeria, Olatosi et al., (2018) conducted a study on the use of the World Health Organization Surgical Safety Checklist by physician anaesthetists. The study looked at the level of awareness among anaesthetists about the existence of the World Health Organization Surgical Safety Checklist in teaching hospitals. Information for the study was obtained from 102 respondents using questionnaires and analysis performed using descriptive statistics and regression analysis. The research found a good awareness and application of the WHO Surgical Safety Checklist by physician anaesthetists. The study also identified that good awareness is associated with the "Sign-in" section required for the checklist.

Uprety et al., (2021) also examined the awareness of the Surgical Safety Checklist in a university teaching hospital in Nepal. This study employed a survey questionnaire to generate responses from 150 healthcare workers. Regression analysis and descriptive statistics were used to analyze the data collected. The findings showed that the majority (92.9%) of the respondents had good awareness of the use of the WHO Surgical Safety Checklist.

Again, Urban et al., (2021) conducted a study in five high-income countries which are New Zealand, the United Kingdom, Canada, Australia, and the United States on the attitudes of the health care professionals on the Surgical Safety Checklist. The study sought to assess the

level of awareness of the use of the Surgical Safety Checklist among anaesthetists, nurses and surgeons. The study collected information through an online questionnaire survey distributed to 2032 healthcare workers. The study utilized descriptive statistics for the analysis of the information obtained. Based on the study results, it was revealed that about half (50.3%) of respondents acknowledged the WHO Surgical Safety Checklist's role in improving patient safety although utilization was not actively participated by the surgical team members.

In South Australia, Rogers et al., (2020) conducted a study on engagement with perioperative nurses on the surgical safety checklist. The purpose of the study was to assess the level of awareness about the existence of the WHO Surgical Safety Checklist. The purposive sampling was used to select eight operating room nurses and data was obtained through semi-structured interviews and participant observations. From the results of the study, it was found that the perioperative nurses have a good awareness of the use of the surgical safety checklist in a tertiary teaching hospital.

Another study in Nigeria by Ogunlusi et al., (2017) examined the awareness of the use of surgical checklists among theatre users in Ekiti State. Information was generated from 70 healthcare workers including anaesthetists, surgeons and perioperative nurses. The study analyzed the data responses obtained using descriptive statistics. The results of the study showed a strong level of awareness regarding the surgical checklist among theatre users.

In a nutshell, these studies (Gong et al., 2021; Olatosi et al., 2018; Uprety et al., 2021; Urban et al., 2021; Rogers et al., 2020; Ogunlusi et al., 2017) showed that there was a good awareness about the existence of the World Health Organization Surgical Safety Checklist among doctors, anaesthetists, and theatre nurses.

2.5.2 Knowledge of WHO SSC among Surgical Professionals.

According to Weiser and Haynes (2018), the WHO Surgical Safety Checklist, established by the WHO, comprises specific elements and procedures that healthcare practitioners are required to adhere to. Consequently, Woodman (2018) opined that before the initiation of anaesthesia, before the commencement of skin incision, and before the patient departs from the operating room, the checklist is organized to be executed at these pivotal stages. Likewise, the knowledge of the specific elements and procedures has to do with the familiarity and understanding that doctors, theatre nurses and anaesthetists have concerning the particular details and steps outlined in the WHO Surgical Safety Checklist. Conley et al., (2011) also stated that the anaesthetists, doctors and theatre nurses are expected to be well-versed in the procedures and content specified in the checklist, which is designed to improve communication and safety in the operating room during surgical procedures. In this context, the knowledge involves being aware of the checklist's components and how to implement them effectively to improve the overall quality of surgical care and in line with this, various studies (Ilorah et al., 2024; Otobo et al., 2023; Bansah et al., 2023; Epiu et al., 2015; Sharma 2020).

The study by Ilorah et al., (2024) in South Africa assessed the knowledge, practices and attitudes of the WHO Surgical Safety Checklist in neurosurgery. In collecting data from the 91 neurosurgical theatre staff, the study used questionnaires and analysis done via inferential and descriptive techniques. The findings of the study showed that the surgical teams had adequate knowledge of the procedures and elements of the WHO Surgical Safety Checklist.

In the same way, Otobo et al., (2023) study in Nigeria conducted a study on the application and knowledge of the WHO Surgical Safety Checklist amongst clinical medical students in a

teaching hospital. The study found that 22.6% of the respondents had very good knowledge and 25.8% of respondents had good knowledge of the WHO Surgical Safety Checklist. The study also identified that the knowledge was obtained from extracurricular activities, class lectures and classrooms.

Furthermore, Bansah et al. (2023) study in Ghana examined the reported reasons for the utilization of the WHO's Surgical Safety Checklist among surgical providers at a tertiary hospital. The study looked at the knowledge of the surgical providers on the procedures and elements of the WHO Surgical Safety Checklist. The results of the study showed a high level of self-reported knowledge of the checklist among surgical professionals but its use was less optimal among them.

In North India, Sharma et al. (2020) studied the knowledge, practices and attitudes about the WHO Surgical Safety Checklist. This was a cross-sectional and descriptive study involving 104 respondents comprising theatre staff, surgeons and nurses. The study revealed that most (92.3%) of the respondents had good knowledge about the use of the surgical safety checklist.

Likewise, Epiu et al., (2015) conducted a study in five referral East African countries including Centre Hospitalier Universitaire de Kigali in Rwanda, Mulago in Uganda, Centre Hospitalo-Universitaire de Kamenge in Burundi, Muhimbili in Tanzania and Kenyatta in Kenya. The study found that 36% of respondents in Centre Hospitalier Universitaire de Kigali, Rwanda, 19% of respondents in Kenyatta, Kenya, 65% of respondents in Muhimbili, Tanzania while 25% of anaesthetists used the WHO Surgical Safety Checklist.

Overall, the studies cited (Ilorah et al., 2024; Otobo et al., 2023; Bansah et al., 2023; Epiu et al., 2015; Sharma et al. 2020) revealed that the anaesthetists, doctors and theatre nurses had

good knowledge of the specific elements and procedures of the WHO Surgical Safety Checklists.

2.5.3 Factors influencing the use of the WHO Surgical Safety Checklist.

To improve coordination and communication among surgical team members and enhance patient safety during surgical procedures, the WHO Surgical Safety Checklist is useful (Woodman, 2018). Hence, the adoption and effective use of the checklist can be influenced by various factors among anaesthetists, doctors, and theatre nurses. In this context, the factors that influence the use of the WHO Surgical Safety Checklist by these Surgical Professionals encompass the numerous elements that can influence how healthcare workers implement and the WHO Surgical Safety Checklist. These factors may include individual attitudes, time constraints, communication patterns, workload, organizational policies, training, and the general culture within a healthcare institution (Robertson-Smith, 2016). In other words, this may suggest that if anaesthetists, doctors, and theatre nurses are not adequately trained or face time constraints, it may influence their capability to effectively and consistently use the checklist during surgical procedures (O'Connor et al., 2013). In essence, the understanding of these factors is essential for better adherence to safety protocols and ultimately enhances patient safety and surgical outcomes.

A study by Gagliardi et al., (2014) in Canada examined the factors that influence adherence and outcomes associated with surgical safety checklists. The results of the study showed that lack of engagement and little support provided to organizations were the factors that influence adherence and outcomes associated with surgical safety checklists.

Another study in South Africa by Verwey and Gopalan (2018) studied the barriers to the use of the WHO Surgical Safety Checklist in theatres in Durban. Based on the analysis, it was

revealed that lack of buy-in from team members and time-related issues were the factors that influenced the use of the WHO Surgical Safety Checklist by surgeons, anaesthetists and nurses in Durban

In addition, Munthali et al., (2022) study in Zambia assessed the enablers and barriers to the utilization of the surgical safety checklist at a teaching university hospital. The findings indicated that lack of support for the surgical safety checklist among senior surgeons and poor teamwork, lack of training opportunities, negative attitudes towards it, lack of leadership, the hierarchical structure of surgical teams and the erratic availability of resources are the factors that influence the use of the WHO Surgical Safety Checklist by anaesthesia providers, nurses and doctors and supporting staff.

Finally, in Ghana Bansah et al. (2023) examined surgical provider-reported reasons for utilization of the World Health Organization's Surgical Safety Checklist at a tertiary hospital in Ghana. For the findings of the study it was revealed that time required to complete the checklist, poor communication between team members and confusion about who to coordinate the checklist process were the factors which accounted for the non-use of the WHO SSC at Korle-bu Teaching Hospital.

2.6 Limitations and Gaps in the Literature

The provided literature review offers significant insights into the awareness, knowledge, and factors influencing the use of the WHO Surgical Safety Checklist among healthcare professionals. However, there are some limitations and gaps in the literature that need to be considered. Firstly, regarding the limitations, some studies, particularly those conducted in specific regions or healthcare facilities, have relatively small sample sizes which may limit the statistical power and generalizability of the findings. Consequently, the current study

includes a sample size of 220 doctors, anaesthetists and theatre nurses from selected hospitals in the Greater Accra Region of Ghana. selected from the Greater Accra Regional Hospital.

Moving on to the gaps identified, the studies (Gong et at., 2021; Olatosi et al., 2018; Uprety et al., 2021; Urban et al., 2021) mentioned used different research tools for assessing knowledge, awareness, and utilization of the WHO Surgical Safety Checklist. As such, this inconsistency may hinder the ability to compare findings across studies and draw robust conclusions.

2.7 Conclusion

Chapter Two of the study presented a comprehensive review of the literature related to the World Health Organization Surgical Safety Checklist (WHO SSC). This comprises the conceptual review, theoretical review, theoretical and empirical implications of the study, empirical review, limitations and gaps in the literature and a conclusion. The conceptual review focused on the concept of, the WHO Surgical Safety Checklist by describing its purpose and principles as well as the three critical phases of the use of the checklist, which are before induction of anaesthesia, before skin incision, and throughout the procedure. It also emphasizes the checklist's positive impact on patient outcomes and safety, supported by various studies and at the same time highlights the checklist's global adoption and effectiveness in diverse healthcare settings.

Furthermore, the theoretical review section also discussed Everett Rogers' Diffusion of Innovation Theory as well as the Social Cognitive Theory by Albert Bandura while linking its relevance to the current study. The Diffusion of Innovation Theory categorizes individuals into innovators, early adopters, early majority, late majority, and laggards, discusses the theory's applications in various fields and its relevance to the study as well as acknowledges

criticisms but underscores the theory's continued value in understanding innovation adoption. The Social Cognitive Theory (SCT), emphasizes reciprocal determinism, observational learning, and self-efficacy, discusses applications of SCT in education, health promotion, psychology, and media analysis and presents criticisms but highlights the ongoing influence and adaptability of the theory. Concerning the theoretical and empirical implications of the study, the theoretical framework's role in understanding the adoption of the WHO Surgical Safety Checklist is discussed as well as emphasizing the importance of empirical studies in assessing baseline knowledge, utilization patterns, sustainability, and effectiveness of interventions was discussed.

Also, for the empirical review, these studies (Gong et al., 2021; Olatosi et al., 2018; Uprety et al., 2021; Urban et al., 2021; Rogers et al., 2020; Ogunlusi et al., 2017) assessed the level of awareness about the existence of the WHO Surgical Safety Checklist by theatre nurses, anaesthetists and doctors in different countries and highlights variations in awareness levels and the influence of professional roles. Likewise, studies (Ilorah et al., 2024; Otobo et al., 2023; Bansah et al., 2023; Epiu et al., 2015; Sharma et al., 2020) examined the knowledge of anaesthetists, doctors and theatre nurses regarding the specific elements and procedures of the checklist across different regions and shows variations in knowledge levels across different studies and regions. Similarly, the studies (Munthali et al., 2022; Van Zyl et al., 2023; Verwey & Gopalan et al., 2018; Russ et al., 2015; Sauls et al., 2019) cited on the factors that influence the use of the WHO Surgical Safety Checklist identified common factors such as absence of organizational or managerial support, training, teamwork and cultural considerations. Finally, the study highlighted limitations and gaps in the existing literature and suggested the need for further research.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study Methods and Design

This study was a quantitative and cross-sectional study using a self-administered questionnaire to gather data among doctors, anaesthetists, and theatre nurses at the Greater Accra Regional Hospital, Achimota Hospital, and Narh-Bita Hospital all located in the Greater Accra Region of Ghana. A quantitative research approach is explained as a research approach that involves the systematic empirical investigation of phenomena through the collection, interpretation and analysis of numerical data (Pilcher et al., 2023). The quantitative research approach relies on objective and standardized measures and as such, it was adopted to help estimate the level of knowledge and utilization of the WHO Surgical Safety Checklist by Surgical Professionals. A cross-sectional study is a type of observational research design that involves gathering data from a group of people at a specific point in time (Maier et al., 2023). It provides a snapshot of the study population at a specific point in time. The cross-sectional study was purposely adopted for the study to help examine the relationship between surgery personnel and the knowledge and utilization of the WHO Surgical Safety Checklist.

3.2 Data Collection Techniques and Tools

A printed structured questionnaire was used for data collection and three research assistants were employed and trained to facilitate data collection. Data was collected between January 2024 and February 2024. The questions were close-ended with options for participants to choose from. The questionnaire was used to determine the knowledge and utilization of the WHO Surgical Safety Checklist (WHO SSC) by Surgical Professionals. It is divided into four (4) sections labelled Section A, Section B, Section C and Section D. The first section is

labelled Section A and it describes socio-demographic characteristics like gender, age, educational status, profession, and marital status. The second section labelled Section B is made up of questions seeking to establish general information about the WHO SSC by Surgical Professionals. The third section is labelled Section C and contains questions about the barriers to the use of the WHO SSC and the fourth section labelled Section D contains questions about the knowledge of the structure and function of the WHO SSC.

3.3 Study Population

The study population refers to the entire group of people or entities that meet research criteria and form the subjects of the study (Shukla, 2020). The study population for this work comprised doctors, anaesthetists and theatre nurses working at the theatre suits of the Greater Accra Regional Hospital, Achimota Hospital and Narh-Bita Hospital.

3.3.1 Inclusion Criteria

Full-time doctors, anaesthetists and theatre nurses of the above-mentioned hospitals who are permanent staff and were at post at the time of the study.

3.3.2 Exclusion Criteria

Doctors who were house officers, anaesthesia interns, student nurses and nurses on rotation were excluded in the study as well as doctors, anaesthetists and theatre nurses who were on leave at the time of the study.

3.4 Study Variables

Table 1: *Variables for assessing the utilization of the WHO Surgical Safety Checklist in selected hospitals in the Greater Accra Region, Ghana.*

Variable Type	Variable Name	Description	Categories/Measurement
Independent (Demographic)	**Age**	Age of the surgical respondents	Continuous (may categorize for analysis if needed)
	Gender	Gender of the respondents	Male, Female
	Educational level	Highest educational attainment of the professional	Diploma, Bachelor's degree, Post-graduate degree
	Years of experience	Total years of working experience in the surgical field	Continuous (may categorize for analysis if needed)
	Professional role	Role within the surgical team	Surgeon, Anaesthetist, Theatre Nurse
	Surgical unit	The specific surgical department of personnel	General Surgery, Urology, Neurosurgery, Paediatric Surgery, Anaesthesia, Other (Specified)
	Years spent in studying	Duration of professional study	1 year, 2 years, 3 years, 4 years, 5 years and more
	Facility where you work	The hospital where the personnel are employed	Greater Accra Regional Hospital, Achimota Hospital, Narh-Bita Hospital
Independent (Awareness, Training and Knowledge)	**Awareness of the WHO SSC**	Whether the personnel are aware of the checklist	Yes, No (Dichotomous)
	Training on the use of the WHO SSC	Whether the personnel have received formal training on the checklist	Yes, No (Dichotomous)
	Knowledge of the WHO SSC	Personnel's understanding of the checklist content and procedures	High, Low (Responses merged where necessary)
Dependent	**Utilization of the WHO Surgical Safety Checklist**	Frequency and consistency of using the WHO SSC in surgical procedures	Utilized (Always/Mostly), Not Utilized (Sometimes/Rarely) (Dichotomous)

3.5 Sampling

Surgical Professionals play a key role in health delivery in the Ghana health sector providing surgical services to patients. These Professionals include surgeons, anaesthetists and operative nurses. The three health facilities were selected due to availability of functioning theatres and provision of a wide range of surgical services. The total reported number of surgical professionals as collected is 220.

A census was chosen as the most appropriate sampling technique due to the relatively small size of the target population making it manageable and feasible to include all individuals. This approach ensures completeness of data, reduces errors and biases and provides a good representation of the target population.

3.6 Pre-testing

The questionnaire for the study was pre-tested at the Tema General Hospital because it shares similar characteristics with the sites for the study in terms of the scope of surgeries carried out. The pre-test made it possible to test the participants' level of understanding and helped to further refine the questionnaire. Based on the responses which were received, a few questions were clarified and modified to ensure the reliability of the responses. Results from the pretesting were not included in the main study.

3.7 Data Handling

All data were confirmed for consistency, coded, and keyed into Microsoft Excel spreadsheet 2019. The principal investigator was in charge of data handling. Data collected with questionnaires were assessed for completeness and errors. All data sets and work done were sent to the investigator by email and kept on an external drive under data protection. All hard copies were retrieved and stored appropriately.

3.8 Data Analysis

Data retrieved was analyzed using a statistical software tool, STATA, version 18.0. Descriptive statistical analysis was carried out to obtain summary tables and graphs containing the demographic characteristics of the study participants. Results obtained were expressed as means, frequencies, percentages, and then graphs. Univariate, bivariate and multivariate logistic regression analysis was done to evaluate the factors that influence the use of the WHO SSC by doctors, anaesthetists and theatre nurses. These helped to compute the association between knowledge and utilization of WHO SSC in terms of odds ratio (OR). Odds ratios (ORs) were reported with their 95% confidence intervals (C. I) and the level of statistical significance was set at $p<0.05$ for all tests.

3.9 Ethical Consideration

Ethics are simply principles of right conduct and where the research involves the collection of data on individuals, privacy should be protected by ensuring confidentiality (Hunter, 2003). Ethical issues that were confronted were consent, confidentiality, and inconvenience on the part of the participant. Before the study began, ethical clearance was obtained from the Institutional Review Board of Ensign Global College. Additionally, administrative permission was sought from the Greater Accra Regional Hospital, Achimota Hospital and Narh-Bita Hospital. An informed consent was sought from individuals after explaining the purpose of the research before undertaking the exercise.

All data collected were treated confidentially, coded, and will be kept under lock and key for 5 years. Results were presented in a way that respects participant confidentiality, and none will be identifiable either in presentations or publications.

Participants were assured of the right to pull out of the research at any time without any consequences to them, their image, and their self-esteem.

3.10 Limitations of Study

The study on the utilization of the WHO Surgical Safety Checklist in the Greater Accra Region of Ghana faced some limitations that could impact the interpretation and generalization of the findings.

Firstly, the cross-sectional design of the research provided a snapshot at one point in time, which may not account for changes in practices or attitudes that could occur before or after the study period. It also limits the ability to establish causality between the variables studied. Secondly, the reliance on self-reported data poses a risk of response bias, as participants may provide socially desirable answers or may not have accurately recalled their use of the checklist. This can lead to an overestimation or underestimation of the checklist's utilization. Thirdly, the sample was restricted to three hospitals in the Greater Accra Region, which may not be representative of other regions in Ghana, thus limiting the generalizability of the results to other settings. Lastly, the dichotomization of the dependent variable and some independent variables, necessary for logistic regression, may result in a loss of data nuance and the potential for information to be oversimplified, affecting the complexity and richness of the findings.

Despite these limitations, the study provides valuable insights into the current status of the WHO Surgical Safety Checklist's adoption and use, offering a foundation for future research and potential interventions to enhance surgical safety practices.

3.11 Assumptions

The study operates under the assumption that surgical personnel, including surgeons, anaesthetists, and theatre nurses working within hospitals in the Greater Accra Region have a basic understanding and have been exposed to the WHO Surgical Safety Checklist, either

through formal training or workplace protocols. It is presumed that participants provided honest and accurate responses to the questionnaire, reflecting their true knowledge and utilization of the checklist. And that their participation was one of free will and not under coercion.

Another assumption is that the hospitals selected for the study are adequately equipped and follow standard operating procedures that could incorporate the use of the WHO Surgical Safety Checklist. It is also assumed that these hospitals have a culture that either encourages or mandates the use of safety checklists in surgical procedures, thereby influencing the participants' responses.

Furthermore, the study assumes that the time frame chosen for data collection is representative and sufficient to capture the routine practices of the Surgical Professionals without any unusual external factors, such as public health emergencies or institutional changes that could unduly influence the utilization of the checklist.

Lastly, the study assumes that the variables chosen for analysis, and the categorization of these variables, are suitable proxies for the constructs they are intended to measure and that the statistical methods applied are appropriate for concluding the data collected.

CHAPTER FOUR

4.0 RESULTS

4.1 Introduction

This chapter focuses on the results obtained related to the specific objectives of the study. Initially, the demographic results of the respondents are presented, providing a foundational understanding of the study population. This is followed by insights into the awareness levels regarding the WHO SSC, detailing the extent of its use among surgical personnel. Subsequently, the analysis explores training received on the WHO SSC, perceived knowledge of its application, and the actual understanding of its specific elements and procedures. Additionally, factors influencing the adoption and consistent use of the SSC are examined through statistical tests, offering a diverse view of the dynamics at play. The culmination of this chapter is a logistic regression analysis, identifying key predictors that significantly affect the frequency of WHO SSC usage, thus offering a comprehensive overview of the current state of WHO SSC implementation among the target demographic.

4.2 Demographic profile of respondents

Table 2 below provides a comprehensive view of the demographic and professional characteristics of the study participants, focusing on aspects such as age, sex, religion, educational level, surgical unit, type of surgical personnel, level of specialization, and years spent in studying. The distribution of age shows a concentration in the 39 years and below category, with 135 respondents (61.36 %) indicating that the majority of respondents fall within this mid-career age range, with an overall mean age of 37.8 years (SD=8.87). Regarding sex, females comprise the larger portion of the sample at 132 (60.0%), suggesting a significant female presence in the surgical workforce within the study population.

In terms of religion, a vast majority of 205 (93.2%) identify as Christian, followed by 15 (6.8%) who follow Islam, highlighting the predominance of Christianity among the respondents. Educational achievement among the participants varies, with the largest group holding a Bachelor's Degree, accounting for 125 (56.8%) of the total, suggesting a high level of formal education within this professional group.

The distribution across surgical units indicates that a majority work in General Surgery, making up 116 (52.7%) of respondents, underscoring the general surgery unit as a common area of service. When examining the type of surgical personnel, Theatre Nurses represent the most significant portion at 129 (58.6%), reflecting the critical role of nursing staff in surgical operations. Exploring the level of specialization, General Nurses form the largest category at 75 (34.1%), indicating a broad representation of nursing staff without specific surgical specialization. Lastly, regarding the years spent in studying, a substantial number of respondents, 60 (27.3%), have spent 2 years in their educational pursuits, pointing towards varied durations of professional training among the participants.

Table 2: *Demographic results of respondents*

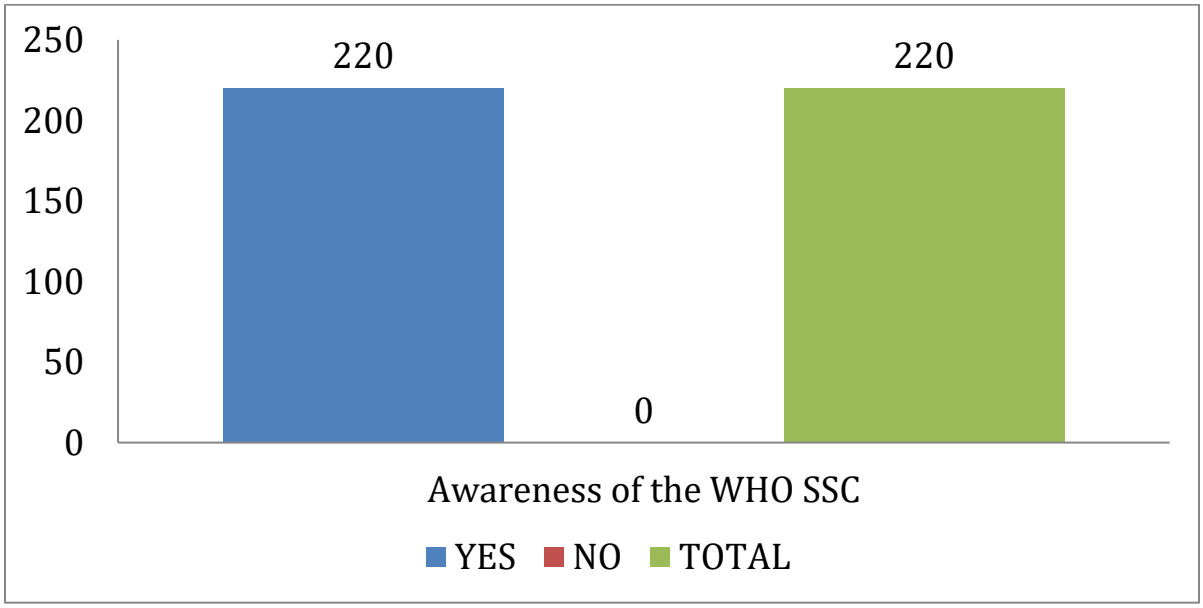
Variable	Categories	Frequency (n=220)	Percentage (%)	Mean (SD)
Age (in years)	$\leq 39\ years$	135	61.4	37.8(8.87)
	$\geq 40\ years$	85	38.6	
Sex	Male	88	40.0	
	Female	132	60.0	
Religion	Christianity	205	93.2	
	Islamic	15	6.8	
Educational level	Diploma	38	17.3	
	Bachelor's Degree	125	56.8	
	Postgraduate Degree	57	25.9	
Surgical unit	General Surgery	116	52.7	
	Paediatric Surgery	4	1.8	
	Anaesthesia	51	23.2	
	Others	49	22.3	
Type of surgical personnel	Surgeon	40	18.2	
	Anaesthetist	51	23.2	
	Theatre Nurse	129	58.6	
Level of specialization	Consultant	17	7.7	
	Specialist/Snr. Resident	22	10.0	
	Resident/Medical Officer	18	8.2	
	Peri-operative Nurse	59	26.8	
	General Nurse	75	34.1	
	Certified Registered Anaesthetist	29	13.2	
Years spent in specialization	1 year	9	4.1	
	2 years	60	27.3	
	3 years	56	25.5	
	4 years	45	20.5	
	5 years and more	50	22.7	

Source: *Field Data, 2024*

4.3 Awareness about the existence of the WHO SSC among Surgical Professionals.

Figure 2 below highlights the level of awareness regarding the WHO Surgical Safety Checklist (WHO SSC) among the study participants. The results are unequivocal: all respondents, totaling 220 (100%), are aware of the WHO SSC.

Figure 2 Awareness of the WHO SSC among Surgical Professionals

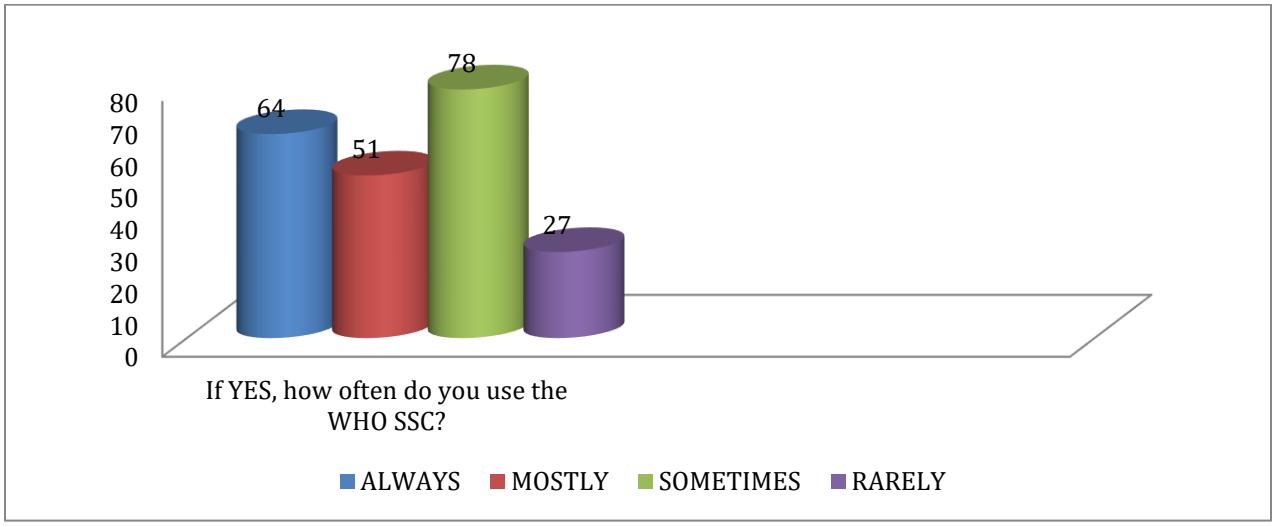


Source: *Field Data, 2024*

4.4 Frequency of use of WHO SSC by Surgical Professionals.

Figure 3 below presents the frequency of use of the WHO Surgical Safety Checklist (WHO SSC) among respondents who are already aware of its existence. The data shows a varied usage pattern among the 220 surgical personnel surveyed. A significant portion, 64 respondents (29.1%), reported using the SSC 'Always,' indicating a strong adherence to this safety protocol in their surgical practices. Another 51 respondents (23.2%) use the SSC 'Mostly,' suggesting a high but not consistent application of the checklist. The largest group, however, are those who use the SSC 'Sometimes,' comprising 78 respondents (35.5%). This indicates that while there is awareness and occasional use, there may be barriers to consistent application. Lastly, a smaller segment of 27 respondents (12.3%) admits to 'Rarely' using the SSC, highlighting challenges or resistance to integrating the checklist into everyday surgical routines.

Figure 3.: *Frequency of use of WHO SSC*

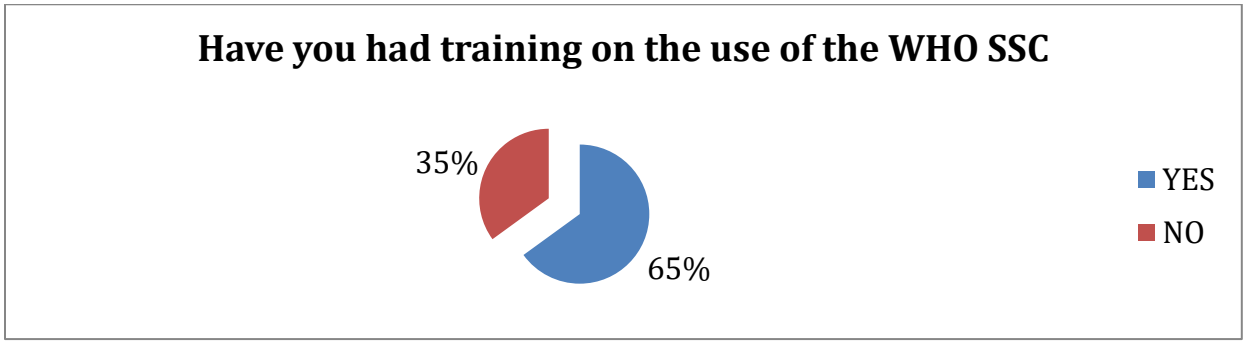


Source: *Field Data, 2024*

4.5 Training on the use of the WHO SSC

Figure 4 below presents data on the training experiences of the respondents regarding the use of the WHO Surgical Safety Checklist (SSC). Out of the 220 surveyed surgical personnel, 143 (65.0%) have received training on how to use the SSC, highlighting a significant proportion of the workforce is equipped with the knowledge and skills to implement the checklist effectively. Conversely, 77 respondents (35.0%) report not having received any training on the SSC, indicating a gap in training dissemination that could impact the consistent and correct use of the checklist in surgical settings.

Figure 4: *Training on the use of WHO SSC*

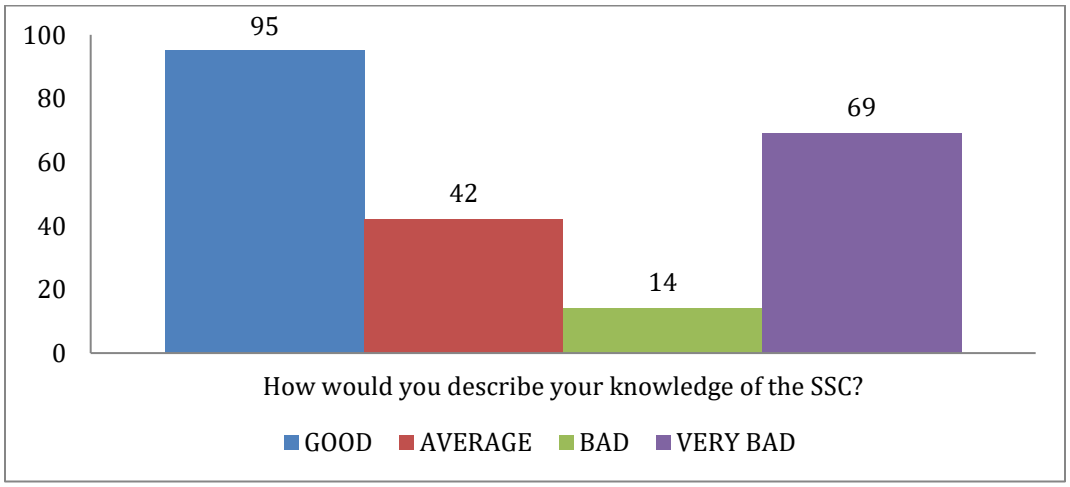


Source: *Field Data, 2024*

4.6 Self assessed knowledge of the WHO SSC

Figure 5 below explores the self-assessed knowledge levels regarding the WHO Surgical Safety Checklist (WHO SSC) among the respondents. A total of 220 Surgical Professionals participated in this assessment, revealing a spectrum of perceived understanding of the SSC. A notable 95 respondents (43.2%) rate their knowledge of the SSC as 'Good', indicating a confident understanding of the checklist and its application in surgical settings. This suggests that nearly half of the respondents feel adequately informed about the SSC, potentially facilitating its effective use. However, the distribution of perceived knowledge levels also points to areas of concern. Forty-two respondents (19.1%) consider their knowledge of the SSC to be 'Average', suggesting some familiarity with the checklist but possibly lacking depth in understanding or confidence in its application. A smaller fraction, 14 participants (6.4%), describe their knowledge as 'Bad', and notably, 69 respondents (31.4%) rate their knowledge as 'Very Bad'. These figures (‘Bad’ and ‘Very Bad’), totaling 37.8%, highlight a significant portion of the surgical personnel who perceive their understanding of the SSC as suboptimal, which could hinder the checklist's proper and consistent implementation.

Figure 5: *Perceived Knowledge of the Use of SSC*



Source: *Field Data, 2024*

4.7 Respondents' knowledge about the WHO SSC

Table 3 delves into the respondents' knowledge about the primary purpose, structure, and usage of the WHO SSC during operative sessions. The overwhelming majority, 205 out of 220 respondents (93.2%), recognize the checklist's core objectives as being to decrease errors and adverse events and to enhance teamwork and communication during surgical procedures.

Among the 220 surveyed individuals, a significant majority, 162 respondents (73.6%), correctly identified that the SSC contains three sections. However, there was a notable distribution of responses indicating some discrepancies in understanding the SSC's structure. Twenty-three respondents (10.5%) believed the SSC had two sections, while 26 (11.8%) thought it consisted of four sections. Additionally, 9 respondents (4.1%) were under the impression that the SSC included five sections. These variations from the correct answer suggested gaps in detailed knowledge about the checklist, even among those who were aware of its existence and purpose.

The responses revealed a spread of perceptions about the checklist's items. The most common response was that the WHO SSC contains nineteen items, with 78 respondents (35.5%) selecting this option, indicating a plurality were correctly informed or made an accurate guess regarding the checklist's content. However, there was significant variation in the responses. Seventy-two participants (32.7%) believed the SSC comprised fifteen items, while both the ten items and twenty-two items options were chosen by 35 respondents each (15.9%). This diversity in responses underscored a notable uncertainty or variability in the respondents' familiarity with the specific details of the SSC's content.

A significant majority, 190 out of 220 respondents (86.4%), indicated that the assessment should be a collaborative effort involving all members of the surgical team, but usually led by an operative nurse or anaesthetist. This response underscores a widespread understanding of the

checklist as a tool for enhancing teamwork and communication among surgical staff, rather than being the sole responsibility of a single professional role.

An overwhelming majority, 215 out of 220 participants (97.7%), recognized "Enhancing patient safety and surgical outcomes" as the principal objective of the SSC. This response indicates a strong and accurate understanding of the checklist's core purpose, which is to improve safety in surgical operations and ensure better outcomes for patients through systematic checks and balances.

The results showed a clear consensus on how to handle items which are not applicable to a particular surgical procedure with 171 out of 220 respondents (77.7%) indicating that the correct action is to mark the item as not applicable and document the reason for its inapplicability. This approach reflects a thorough and responsible engagement with the checklist, ensuring that every item is considered and accounted for, thereby maintaining the integrity of the safety protocol.

The respondents' perspectives on the appropriate response to discrepancies encountered during the checklist process of the WHO Surgical Safety Checklist (WHO SSC) indicated that the majority of participants, 145 out of 220 (65.9%), believe that surgical teams should resolve any discrepancies found during the checklist process before proceeding with the surgery. This approach underscores a proactive stance towards patient safety, emphasizing the importance of addressing and rectifying any identified issues immediately to prevent potential adverse events or errors during surgical procedures.

Table 3: *Knowledge level of specific elements and procedures of the WHO SSC*

Variable	Categories	Frequency (n=220)	Percentage (%)
What is the essence of the WHO SSC?	To decrease errors and adverse events, and increase teamwork and communication in surgery.	205	93.2
	To streamline surgical procedures for efficiency	10	4.5
	To document surgical outcomes	5	2.3
How many sections are in the WHO SSC?	Two	23	10.5
	Three	162	73.6
	Four	26	11.8
	Five	9	4.1
How many items are in the WHO SSC?	Ten	35	15.9
	Fifteen	72	32.7
	Nineteen	78	35.5
	Twenty-two	35	15.9
Who should lead in the assessment of various sections?	Only surgeons	13	5.9
	Only anaesthetists	4	1.8
	Only operative nurses	13	5.9
	All of the above, but usually led by an operative nurse or anaesthetist.	190	86.4
Which of the following is the primary goal of the WHO SSC?	Enhancing patient safety and surgical outcomes	215	97.7
	Decreasing the number of surgical procedures	5	2.3
What is the recommended action if a checklist item is not applicable?	Skip the item and proceed	21	9.5
	Mark the item as not applicable and document the reason	171	77.7
	Complete all items regardless of applicability	20	9.1
	Pause the surgery until all items are applicable	8	3.6
How should surgical teams address discrepancies found during the checklist process?	Resolve the discrepancies before proceeding	145	65.9
	Note discrepancies for post-surgery review	75	34.1

Source: *Field Data, 2024*

4.8 Bivariate analysis of selected variable on use of the WHO SSC.

Table 4 provides the results of the statistical test examining the level of association between selected variables on the use of the WHO Surgical Safety Checklist. Specifically, among respondents aged 39 years and below, 80 (69.6%) frequently used the SSC, whereas 55 (52.4%) did not frequently use it. For respondents aged 40 years and above, 35 (30.4%) frequently used the SSC compared to 50 (47.6%) who did not, with a Chi-Square value of 6.836 and a P-value of 0.009. This indicates a statistically significant association between the age group and the frequency of SSC usage.

In terms of sex, 54 male respondents (47.0%) frequently used the SSC, while 34 (32.4%) did not. Among female respondents, 61 (53.0%) frequently used the SSC compared to 71 (67.6%) who did not, yielding a Chi-Square value of 4.859 and a P-value of 0.028. This demonstrates a significant difference in SSC usage frequency between male and female surgical personnel, with females less likely to use it frequently.

The analysis also considered educational background, revealing no statistically significant difference (P-value of 0.111) in SSC usage among different educational levels, despite variations in the distribution of responses.

Years spent studying showed a notable impact on SSC usage, with a Chi-Square value of 8.113 and a P-value of 0.017. Specifically, respondents who had studied for less than 3 years and those who studied for 3 to 4 years displayed different patterns of SSC usage, indicating that the duration of professional education influences checklist use.

Training in the use of the SSC presented the most substantial impact on its frequency of usage, with a Chi-Square value of 39.647 and a P-value of less than 0.001. A notable 97 (84.3%) of

those trained in SSC usage frequently used the checklist, compared to only 18 (15.7%) among those not trained, highlighting the critical role of training in promoting SSC adoption.

Perceived knowledge of the SSC also significantly affected its use, with a Chi-Square value of 36.441 and a P-value of less than 0.001. Respondents rating their knowledge as 'Good' were more likely to frequently use the SSC, contrasting with those who perceived their knowledge as 'Average' or 'Bad'.

Table 4: *Test of association between selected variables on frequency of use of SSC*

Variable	Categories	Frequency of SSC Usage		χ^2 Test Stat	p-value
		Frequently Used	**Not Frequently Used**		
Age	39 years and below	80 (69.6%)	55 (52.4%)	6.8363	0.009*
	40 years and above	35 (30.4%)	50 (47.6%)		
Sex	Male	54 (47.0%)	34 (32.4%)	4.8585	0.028*
	Female	61 (53.0%)	71 (67.6%)		
Education	Diploma	14 (12.2%)	24 (22.9%)	4.3978	0.111
	Bachelor's	69 (60.0%)	56 (53.3%)		
	Postgraduate	32 (27.8%)	25 (23.8%)		
Years Studying	Less than 3 years	32 (27.8%)	37 (35.2%)	8.1127	0.017
	3 to 4 years	63 (54.8%)	38 (36.2%)		
	5 years and above	20 (17.4%)	30 (28.6%)		
Training in SSC	Yes	97 (84.3%)	46 (43.8%)	39.6474	<0.001*
	No	18 (15.7%)	59 (56.2%)		
Perceived Knowledge	Good	64 (55.7%)	31 (29.5%)	36.4408	<0.001*
	Average	5 (4.3%)	37 (35.2%)		
	Bad	46 (40.0%)	37 (35.2%)		

Source: *Field data, 2024* *Note: * signifies statistical significance at a threshold < 0.05*

4.9 Logistic regression

Table 5 presents the logistic regression output examining the factors influencing the use of the WHO Surgical Safety Checklist (WHO SSC) among Surgical Professionals, comparing those who frequently use the checklist versus those who do not.

For the age group, both the crude and adjusted odds ratios indicate that participants aged 40 years and above are significantly less likely to frequently use the SSC compared to those aged 39 years and below (Crude OR = 0.481, [CI=0.277-0.836], P-value=0.009; Adjusted OR = 0.136, [CI=0.047-0.389], P-value<0.001).

Regarding sex, the analysis reveals that females are less likely to frequently use the SSC compared to males (Crude OR = 0.540, [CI=0.312-0.936], P-value=0.028; Adjusted OR = 0.408, [CI=0.176-0.947], P-value=0.037). This finding underscores a significant gender difference in SSC usage patterns, pointing to potential areas for targeted interventions to increase checklist usage among female surgical personnel.

The years spent studying showed a differential impact on SSC usage. Those who studied for 5 years and above have significantly lower odds of frequent SSC usage compared to those with less than 3 years of study in the adjusted model (Adjusted OR = 0.335, [CI=0.110-1.017], P-value=0.054), indicating that longer educational periods might not correlate with higher adoption of the SSC. The results for 3 to 4 years of study showed a significantly higher odds of frequent SSC usage in the adjusted model.

Training on the SSC had a profound impact on its use. Those who had not received training on the SSC were significantly less likely to use it frequently (Crude OR = 0.145, [CI=0.077-0.273], P-value<0.001; Adjusted OR = 0.036, [CI=0.010-0.126], P-value<0.001), emphasizing the critical role of training in promoting SSC utilization.

The perceived knowledge of the SSC also influenced its frequent use. Those who considered their knowledge as 'Average' were less likely to use the SSC frequently compared to those with 'Good' knowledge in the crude analysis (Crude OR = 0.065, [CI=0.023-0.182], P-value<0.001). However, in the adjusted analysis, those with 'Bad' knowledge still had higher odds of frequent usage compared to the 'Average' knowledge group, (Adjusted OR = 0.286, [CI=0.111-0.739], P-value=0.010), highlighting the complex relationship between self-assessed knowledge and checklist use.

Table 5: *The logistic regression table on the factors that influence the use of the WHO Surgical Safety Checklist*

Variable	Categories	Unadjusted Model			Adjusted Model		
		OR	**p-value**	**(95% CI)**	**OR**	**p-value**	**(95% CI)**
Age	39 years and below	1	-	-	1	-	-
	40 years and above	0.481	0.009*	0.277- 0.836	0.136	<0.001*	0.047-0.389
Sex	Male	1	-	-	1	-	-
	Female	0.540	0.028*	0.312-0.936	0.408	0.037*	0.176-0.947
Education	Diploma	1	-	-	1	-	-
	Bachelor's	2.112	0.050	1.000-4.460	0.677	0.588	0.166-2.771
	Postgraduate	2.194	0.067	0.946-5.090	4.503	0.103	0.739-27.443
Years Studying	Less than 3 years	1	-	-	1	-	-
	3 to 4 years	1.917	0.040*	1.030-3.568	10.290	<0.001*	3.110-34.043
	5 years and above	0.771	0.489	0.370-1.612	0.335	0.054	0.110-1.017
Training in SSC	Yes	1	-	-	1	-	-
	No	0.145	<0.001*	0.077-0.273	0.036	<0.001*	0.010-0.126
Perceived Knowledge	Good	1	-	-	1	-	-
	Average	0.065	<0.001*	0.023-0.182	0.093	0.001*	0.023-0.371
	Bad	0.602	0.103	0.327-1.108	0.286	0.010*	0.111-0.739

Source: *Field data, 2024* *Note: * signifies statistical significance at a threshold < 0.05*

CHAPTER FIVE

5.0 DISCUSSIONS

5.1 Introduction

The chapter provides a detailed description, analysis, and interpretation of the current study findings by relating them to existing study findings and theoretical understandings.

5.2 Level of utilization of the WHO SSC by Surgical Professionals.

From the current study analysis, findings indicated that all the respondents (100%) were aware about existence of the WHO SSC. However, this high level of awareness did not reflect in the usage of it. Only about a third, 64 (29.1%) of respondents indicated that they used the checklist always. Also, 51(23.2%) of the respondents mostly used the WHO SSC, 78 (35.5%) indicated they sometimes used the WHO SSC and 27(12.3%) of the respondents indicated that they rarely used the WHO SSC. This highlights the possibility of challenges and resistance from various factors that affect the regular usage of the checklist. According to the study conducted by Gong et al., (2018), surgeons in China exhibited a lower level of awareness compared to operating room nurses and anaesthetists although the general self-reported awareness of the checklist was high across all professional groups. In another study conducted in New Zealand, the United Kingdom, Canada, Australia, and the United States by Urban et al., (2021), the result revealed that about half (50.3%) of respondents acknowledged the WHO Surgical Safety Checklist's role in improving patient safety although utilization was not actively participated by the surgical team members. This portrays some level of similarities in the findings obtained from the current study indicating that the inconsistency in the level of awareness on WHO SSC and its usage cuts across countries. This draws attention to the need for the WHO to strategize policies concerning the

implementation of the SSC to ensure effective adoption and implementation in various hospitals around the world.

In terms of the training experience of respondents on WHO SSC, the current study found a total of 143(65%) surgical professionals indicated that they have received training on the use of the WHO SSC while 77(35%) of the respondents indicated that they have not received any training on the checklist. In Zambia, Munthali et al., (2022) revealed that there is a lack of training on WHO SSC and this affects the effective usage of the SSC for surgery. This indicates an average and low level of training on WHO SSC in most parts of the world. There is therefore the need for more training to close the gap on education on the use of the WHO SSC. According to O'Connor et al., (2013), the absence of adequate training or time constraints may influence the capability of health workers to effectively and consistently use the checklist during surgical procedures.

Moreover, a total of 95 (43.2%) of the respondents rate their knowledge of WHO SSC as good, 42(19.1%) of the respondents reveal that their knowledge of the WHO SSC was average and 14(6.4%) of the respondents indicated that their knowledge on the WHO SSC was bad while 69(31.4%) of the respondent indicated that their knowledge on WHO SSC was very bad. The study by Ilorah et al., (2024) revealed that the surgical teams in South Africa had adequate knowledge of the procedures and elements of the WHO Surgical Safety Checklist. In another study by Otobo et al., (2023) in Nigeria, findings indicated that 22.6% of the respondents had very good knowledge and 25.8% of respondents had good knowledge of the WHO Surgical Safety Checklist. Despite the good level of perceived knowledge of the WHO SSC, the identified poor level of knowledge of the WHO SSC is seen as a key issue that can hinder the effective implementation of the checklist.

Overall, it can be said that most hospitals around the world have not fully achieved the purpose of creating awareness of the WHO SSC in terms of training and usage. Hence a need for a more strategic approach to the effective implementation of the WHO SSC in various hospitals around the world.

5.3 Knowledge of Surgical Professionals about the WHO Surgical Safety Checklist.

From the current study analysis, results revealed that the majority (93.2%) of the respondents rightly indicated that the core objective of the checklist was to decrease errors, reduce adverse events, and enhance communication and teamwork during surgical procedures. The study found strong familiarity with the WHO SSC's purpose and content among Surgical Professionals paralleling Bansah et al., (2023) and Sharma et al., (2020) in Ghana and North India respectively which reported high self-reported knowledge levels.

In addition, the current study found that the majority (73.6%) of the respondents correctly identified that the SSC contains three sections. However, some respondents indicated that SSC contains five sections while others revealed that the checklist contains two sections. These variations from the correct answer suggested gaps in detailed knowledge about the checklist, even among those who were aware of its existence and purpose.

Also, from the study findings, most of the respondents 78(35.5%) indicated that the SSC contains nineteen items, 72(32.7%) of the participants believed the SSC comprised fifteen items, while 35 (15.9%) of the respondents indicated both ten items and twenty-two items for SSC. This diversity in responses underscored a notable uncertainty or variability in the respondents' familiarity with the specific details of the SSC's content.

Moreover, for the majority of 190 (86.4%) of the respondents the assessment of the SSC is a collaborative effort and must involve all members of the surgical team but is usually led by an

anaesthetist or an operative nurse. This response underscores a widespread understanding of the checklist as a tool for enhancing teamwork and communication among surgical staff, rather than being the sole responsibility of a single professional role.

Further, a total of 215 (97.7%) of the participants indicated that the role of the SSC is to enhance the safety of patients and surgical outcomes. Other respondents indicated wrong roles of SSC such as decreasing the number of surgical procedures. This misperception is notably minor but underscores the necessity for periodic training and clarification regarding the SSC's aims and applications in clinical practice. The current research and others like Epiu et al., (2015) suggest room for improvement in comprehensive understanding and application regarding the SSC's aim.

Again, results from the current study indicated that the majority of the respondents showed a clear consensus on how to handle a situation where an item on the WHO SSC does not apply to a given surgical procedure. A total of 171(77.7%) of the respondents indicated the correct action to mark the item as not applicable and provide reasons for that. Other respondents indicated actions such as skipping the item and proceeding, completing all items regardless of applicability and surgery paused until all items on the checklist were applied.

5.4 The factors that influence the use of the WHO SSC by Surgical Professionals.

In discussing the findings from Table 5 regarding the logistic regression analysis on the factors influencing the use of the WHO Surgical Safety Checklist (WHO SSC), several critical insights emerge, reflecting on the dynamics of checklist adoption among Surgical Professionals.

Firstly, the data presents a significant age-related disparity in the frequency of SSC usage, with younger Professionals (aged 39 years and below) showing a higher propensity towards frequent

use compared to their older counterparts. This age group difference, particularly highlighted by the adjusted odds ratio (AOR) of 0.136 for those aged 40 years and above, suggests a generational shift in attitudes towards standardized safety protocols. The receptiveness of younger medical professionals to such measures could be attributed to recent educational curriculum that increasingly emphasize patient safety and quality improvement practices, including the SSC. This finding points to the potential for targeted interventions aimed at enhancing SSC adoption rates among older Surgical Professionals, possibly through continuing medical education or tailored training programs. These results are further supported by results from related studies. For instance, Gagliardi et al., (2014) found that the age of physicians was a factor that influences the adherence and outcomes associated with SSC. Robertson-Smith et al., (2016) also revealed that physician's age determines how SSC are adhered to. These results imply that younger medical professionals are more likely to adhere to the SSC compared to their older counterparts. This could be because the older medical professionals are of the perception of using experience and thus may be unwilling to adhere to the SSC. Consequently, over the years, younger medical professionals may accept this attitude from older medical professionals. This assertion is supported by the Social Cognitive Theory which emphasizes reciprocal determinism where individuals are known to be influenced by the environment they live in and this plays an active role in shaping their behaviour. The analysis also underscores a gender-based discrepancy in WHO SSC utilization, with females less likely to use the checklist frequently compared to males. This gender difference, evidenced by an AOR of 0.408 for females, may reflect broader issues related to workplace dynamics, including gender roles and expectations within surgical teams. Addressing this gap requires not only targeted educational interventions but also broader

efforts to foster a culture of equality and inclusivity within surgical departments, ensuring all team members, irrespective of gender, feel equally empowered to champion patient safety initiatives such as the WHO SSC. The result implies that females not adhering to surgical safety checklists may be due to gender roles and expectations within surgical teams. This is an indication that society's expectations of women affect adherence to surgical checklists. The results from Russ et al., (2015) study are in line with the results from the current study. The study found that female medical professionals are less likely to adhere to surgical safety checklists as compared to their male colleagues. This is because of social expectations of gender roles. Sauls et al., (2019) also found that culture was a factor that affected the implementation of SSC. This means that cultural beliefs and perceptions determine the adherence to surgical checklists among males and females. This is further explained by the Social Cognitive Theory which asserts that people learn by observing the actions and outcomes of others. In this context, it means that since society promotes gender roles even in the theatre, it is easier for females to adopt different attitudes towards the utilization of SSC.

Furthermore, the duration of education emerges as a determinant of SSC usage frequency, with those undergoing longer periods of study (5 years and above) less likely to frequently use the checklist. This somewhat counterintuitive finding, with an AOR of 0.335 for this group, may suggest that prolonged exposure to traditional medical training, which might not emphasize modern safety protocols to the same extent, could impact attitudes towards innovations like the SSC. Enhancing the integration of patient safety and quality improvement content, including the SSC, into all levels of medical and nursing education could mitigate this effect. This is also supported by results from related studies. For instance, Gagliardi et al., (2014) revealed that

training was an effective factor influencing the use of WHO SSC among health personnel. Similarly, Sauls et al., (2019) revealed that good knowledge of the WHO SSC through education influences adherence to the WHO SSC. The results are indications that when health professionals are educated, the adherence to SSC is high as compared to a low level of education or no education. Similar to education, the profound impact of SSC-specific training on usage frequency cannot be overstated, with untrained personnel significantly less likely to frequently use the checklist. This effect, demonstrated by an AOR of 0.036 for those without training, validates the crucial role of structured, comprehensive SSC training programs in promoting widespread and consistent checklist utilization.

Lastly, the relationship between perceived knowledge of the SSC and its use is notably complex. Those who considered their knowledge as 'Average' were less likely to use the SSC frequently compared to those with 'Good' knowledge in the crude analysis (Crude OR = 0.065). However, in the adjusted analysis, those with 'Bad' knowledge still had higher odds of frequent usage compared to the 'Average' knowledge group, (AOR = 0.286), highlighting the complex relationship between self-assessed knowledge and checklist use.

These results imply that education and training are significant factors that influence SSC usage. This means that there should be training and monitoring of training. This is further supported by Robertson-Smith et al., (2016), O'Connor et al., (2013), and Gagliardi et al., (2014) who found that training is a significant factor that influences the use of SSC. This is an indication that education and training can help health professionals effectively adhere to SSC which in the long run will improve the health outcomes of patients.

CHAPTER SIX

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter presents the conclusion of the study which includes a summary of the key findings from the data analyzed. The chapter further presents recommendations that are based on the findings from the study. The recommendations are presented under recommendations for stakeholders and interested parties as well as recommendations for future studies.

6.2 Conclusions

The study aimed to assess the utilization of the WHO SSC and factors that contribute to its usage by doctors, anaesthetists, and theatre nurses at Greater Accra Regional Hospital, Achimota Hospital, and Narh-Bita Hospital in the Greater Accra Region of Ghana, and its implication for the safety of surgical patients. From the analysis, the following recommendations are given.

The study concludes that even though there is a high level of awareness of the WHO SSC among surgical professionals (100%) and the understanding of its role as a tool for enhancing patient safety and surgical outcomes (97.7%) only about a third (29.1%) indicated their regular usage of it. Also, 65.0% of respondents have received training on how to use WHO SSC.

The study also concludes that 93.2% of surgical professionals had knowledge about the core objectives of the checklist to decrease errors and adverse events, enhance communication and teamwork during surgical procedures. Majority of respondents were also able to identify the three sections in the WHO SSC (73.6%). Furthermore, the study concludes that WHO SSC use is known to be a collaborative effort of all team members. However, the coordinator of the

procedure is usually the anaesthetist or operative nurse (86.4%). The study concludes that 77.7% of surgical personnel show a clear consensus on how to handle a situation where an item on the WHO SSC does not apply to a given surgical procedure.

Finally, the study concludes that there are factors that influence the use of the WHO SSC by doctors, anaesthetists and operative nurses. The factors include age group differences (AOR of 0.136), gender-based discrepancy in WHO SSC utilization (AOR of 0.408), and WHO SSC-specific training (AOR 0.036). Also, the study concludes that there is a relationship between duration of education and perceived knowledge of the WHO SSC and its use.

6.3 Recommendations

Based on the findings from the study, the following recommendations are given to stakeholders such as hospital managers and administrators, health professionals (doctors, anaesthetists and theatre nurses), Ghana Health Service and Regulatory bodies, professional associations and patients and patient advocacy groups. Recommendations are also given for future studies.

Recommendations for stakeholders

The following recommendations are given for stakeholders based on the findings from the study.

Hospital managers and administrators: The study recommends that resources should be allocated for comprehensive training programs on WHO SSC implementation. This will keep medical personnel abreast with current practices thus encouraging adherence. Also, there should be policies that make it mandatory for WHO SSC to be used in surgical procedures. Finally, it is recommended that a culture of accountability and compliance regarding WHO SSC usage should be encouraged.

Health professionals (doctors, anaesthetists and theatre nurses): The study recommends that there should be continuous training and education programs on the importance and proper usage of WHO SSC. This will keep surgical personnel up-to-date with WHO SSC usage. It is also recommended that there should be incentives for adherence to WHO SSC and this will encourage surgical personnel to use the checklist. Finally, there should be open communication channels that will help in addressing barriers or concerns to implementation. With this information, hospital managers can effectively address the challenges for a better working environment.

Ghana Health Service and Regulatory bodies: The study recommends that WHO SSC compliance should be included in health facility inspections and audits as this will promote adherence. Also, funds or grants should be provided to support WHO SSC implementation initiatives. Finally, there should be a monitoring team that monitors and reports on the adoption and effectiveness of use of WHO SSC in healthcare settings.

Professional Associations: The study recommends that WHO SSC training modules should be incorporated into continuing education programs toward the award for the Continuous Professional Development (CPD) credit. This will ensure continuous learning. There should also be integration of WHO SSC usage into accreditation standards for practitioners. Furthermore, there should be conferences and workshops that will help in sharing best practices and success stories of the adherence to WHO SSC.

Patients and patient advocacy groups: The study recommends that patients should be educated on WHO SSC and the role it plays in ensuring surgical safety. Also, patients should be

encouraged to inquire about the checklist usage before undergoing surgery. This will promote transparency and accountability in surgical practices.

Recommendations for future studies

For future studies, the following recommendations are given

i. The study recommends that future studies should consider conducting a longitudinal study. This will help in tracking the changes in awareness and adoption of WHO SSC over time thus identifying trends and patterns that can help in strategic decision making.

ii. The study also recommends that the scope of the study should be expanded to include multiple facilities across different geographical regions. This will help in capturing the variations in awareness and usage of WHO SSC.

Finally, the study recommends that future studies should consider using the qualitative approach that will call for the inclusion of key stakeholders such as policymakers and health administrators in the study. This will provide insights into the organizational factors that are influencing checklist usage in healthcare facilities.

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APPENDICES

Appendix A: Questionnaire

STUDY QUESTIONNAIRE

Title: ***Utilization of the WHO Surgical Safety Checklist by Surgical Professionals at selected Hospitals in Greater Accra Region, Ghana***

I kindly ask you to answer the following questions and statements regarding the use of the WHO Surgical Safety Checklist. By doing so you contribute to a better scientific understanding of the topic above and improvement in surgical safety. Information provided will be kept strictly confidential. Thank you.

Date of interview: …….

SECTION A: DEMOGRAPHIC CHARACTERISTICS		
1.	Age in years	
2.	Sex	01. Male ( ) 02. Female (
3.	Religion	01. Christianity ( ) 02. Islamic ( ) 03. Traditional ( ) 04. Other (please specify)
4.	Educational level	01. Diploma ( ) . Bachelor's degree ( ) . Post-graduate degree ( )

5.	Surgical Unit	. General Surgery ( ) . Urology ( ) . Neurosurgery ( ) . Paediatric Surgery ( ) . Anaesthesia ( ) Other (please specify) ……...
6.	Surgical Team (if applicable for surgeons)	Please state: ……
7.	Type of Surgical Professional	01. Surgeon ( ) 02. Anaesthetist ( ) 03. Theatre Nurse ( )
8.	Level of Specialization	01. Consultant ( ) 02. Specialist/Snr. Resident ( ) 03. Resident/Medical Officer ( ) 04. Peri-operative nurse ( ) 05. General nurse ( )
9.	Years spent studying and working at the hospital	……..

10.	Satisfied with current profession	.01 Very unsatisfied ( ) 02. unsatisfied ( ) 03. Neither ( ) 04. satisfied ( ) 05. Very satisfied ( )

SECTION B: GENERAL INFORMATION ON THE WHO SSC

11.	Are you aware of the WHO SSC?	. Yes ( ) 02. No ( )
12.	Do you use the WHO SSC?	. Yes ( ) 02. No ( )
13.	If YES, how often do you use the WHO SSC?	. Always ( ) 02. Mostly ( ) . Sometimes ( ) 04. Rarely ( )
14.	Have you had training on the use of the WHO SSC?	. Yes ( ) 02. No ( )
15.	How would you describe your knowledge of the WHO SSC?	. Very good ( ) 02. Good ( ) . Average ( ) 04. Bad ( ) . Very bad ( )

SECTION C: BARRIERS TO THE USE OF WHO SSC

The under-listed factors do not allow you to effectively use the WHO SSC (kindly tick)

		Strongly disagree	**disagree**	**Can't tell**	**Agree**	**Strongly agree**
16.	The SSC takes too long to complete					
17.	The SSC duplicates with other existing checks					

18.	There is poor communication between the anaesthetist and the surgeon					
19.	It is unnecessary to use an WHO SSC					
20.	The WHO SSC is a waste of time					
		Strongly disagree	**disagree**	**Can't tell**	**Agree**	**Strongly agree**
21.	The WHO SSC is difficult to incorporate into my perioperative routine					
22.	The WHO SSC does not cover all risks e.g. skin preparation and postoperative pain prevention					
23.	It is difficult to find a ordinator for the checklist					
24.	Do you know whose responsibility it is to initiate the checklist					
25.	Staff needs to be trained in using the checklist					
26.	Team members' attitude towards the questions on the checklist are not encouraging					

27.	Surgical personnel (surgeons) support the use of the checklist					
28.	Anaesthetic personnel support the use of the checklist					
29.	Nursing personnel support the use of the checklist					
30.	Management supports the use of the checklist					

SECTION D: KNOWLEDGE ABOUT THE WHO SURGICAL SAFETY CHECKLIST

31. What is the essence of the WHO Surgical Safety Checklist?
    1. To decrease errors and adverse events, and increase teamwork and communication in surgery.
    2. To streamline surgical procedures for efficiency.
    3. To document surgical outcomes.
    4. To train new surgical staff.
32. How many sections are in the WHO SSC?
    1. Two
    2. Three
    3. Four
    4. Five
33. How many items are in the WHO SSC?
    1. Ten (10)
    2. Fifteen (15)
    3. Nineteen (19)
    4. Twenty-two (22)
34. At what periods during surgery are the various sections conducted?
    1. Sign-in: before the patient enters the operating theatre; Time-out: just after anaesthesia induction; Sign-out: immediately after surgery completion.
    2. Sign-in: before induction of anaesthesia; Time-out: before skin incision; Sign-out: before the patient leaves the operating room.

3. Sign-in: at the time of patient admission; Time-out: at the start of surgery; Sign-out: after patient recovery.
4. Sign-in: during pre-operative assessment; Time-out: during the surgery; Sign-out: during post-operative care.

35. Who should lead in the assessment of the various sections? *Choose the most appropriate*
    1. Only Surgeon
    2. Only Anaesthetist
    3. Only Operative Nurse
    4. All of the above, but usually led by an operative nurse or anaesthetist.

36. Which of the following is a primary goal of the WHO SSC?
    1. Reducing the duration of surgeries
    2. Increasing surgical team members
    3. Enhancing patient safety and surgical outcomes
    4. Decreasing the number of surgical procedures
37. What is the recommended action if a checklist item is not applicable?
    1. Skip the item and proceed
    2. Mark the item as not applicable and document the reason
    3. Complete all items regardless of applicability
    4. Pause the surgery until all items are applicable
38. How should surgical teams address discrepancies found during the checklist process?
    1. Continue with the surgery as planned
    2. Resolve the discrepancies before proceeding
    3. Note discrepancies for post-surgery review
    4. Only the surgeon decides if action is needed

THANK YOU

Appendix B: Informed Consent

TITLE OF STUDY

Utilization of the WHO Surgical Safety Checklist by Surgical Professionals at selected hospitals in the Greater Accra Region, Ghana

PRINCIPAL INVESTIGATOR

ANDREWS K. MENSAH

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PURPOSE OF STUDY

You are being asked to take part in a research study. Before you decide to participate in this study, you must understand why the research is being done and what it will involve. Please read the following information carefully. Please ask the researcher if there is anything that is not clear or if you need more information.

The purpose of this study is to determine the level of knowledge of the WHO Surgical Safety Checklist and the factors that influence the utilization of the checklist by Surgical Professionals of the Greater Accra Regional Hospital, Achimota Hospital and Narh-Bita Hospital.

STUDY PROCEDURES

The study will employ a self – self-administered questionnaire. Each questionnaire will take an average of 10 minutes to complete.

BENEFITS

There will be no direct benefit to you for your participation in this study in the short term. However, in the long term, I hope that the information obtained from this study will help shape policy relating to the appropriate utilization of WHO SSC and improve surgical outcomes. It will also help measure the level of knowledge and extent of utilization of the WHO SSC at the said facilities.

CONFIDENTIALITY

Every effort will be made by the researcher to preserve confidentiality including the following:

- Assigning code names/numbers for participants that will be used on all research notes and documents
- Keeping notes and any other identifying participant information in a locked file cabinet in the personal possession of the researcher.

Participants' data will be kept confidential except in cases where the researcher is legally obligated to report specific incidents. These incidents include, but not be limited to, incidents of abuse and suicide risk.

CONTACT INFORMATION

If you have questions at any time about this study, you may contact the researcher whose contact email address is provided on the first page. If you have questions regarding your rights as a research participant, or if problems arise that you do not feel you can discuss with the Primary

Investigator, please contact Dr Steve Manortey at *steve.manortey@ensign.edu.gh* and on mobile number +233 24 885 5374

VOLUNTARY PARTICIPATION

Your participation in this study is voluntary. It is up to you to decide whether or not to take part in this study. If you decide to take part in this study, you will be asked to sign a consent form. After you sign the consent form, you are still free to withdraw at any time and without giving reasons. Withdrawing from this study will not affect the relationship you have, if any, with the researcher. If you withdraw from the study before data collection is completed, your data will be returned to you or destroyed.

Appendix C: Consent Form

I have read and understand the provided information and have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reasons and without cost. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

Participant's signature _____ Date _____

Investigator's signature _____ Date _____