

**SCHOOL OF PUBLIC HEALTH  
COLLEGE OF HEALTH SCIENCES  
UNIVERSITY OF GHANA**



**PROCESS EVALUATION OF INFECTION PREVENTION AND CONTROL POLICIES  
AT THE GREATER ACCRA REGIONAL HOSPITAL**

**BY**

**VANESSA OPOKU - DARKO**

**(10935628)**

**THIS DISSERTATION IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON  
IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MSC  
IN PUBLIC HEALTH MONITORING AND EVALUATION DEGREE.**

**INTEGRI PROCEDAMUS**

**APRIL, 2023**

## DECLARATION

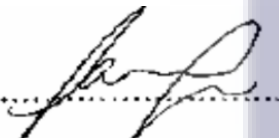
I declare that except for other people's work, which I have duly acknowledged, this thesis is the result of my own original research conducted under the supervision of Prof. Paulina Tindana. I further declare that this dissertation, either in whole or in part, has not been submitted elsewhere for another degree.



21<sup>st</sup> April, 2023

.....  
Vanessa Opoku – Darko  
(10935628)

.....  
Date



.....  
Prof. Paulina Tindana  
(Supervisor)

20<sup>th</sup> April, 2023

.....  
Date



## DEDICATION

I dedicate this work to God Almighty who gave me the grace to complete this work successfully.

I also dedicate it to my grandmother Nana Ama Agyemang and to my parents Mr & Mrs Kuffour.



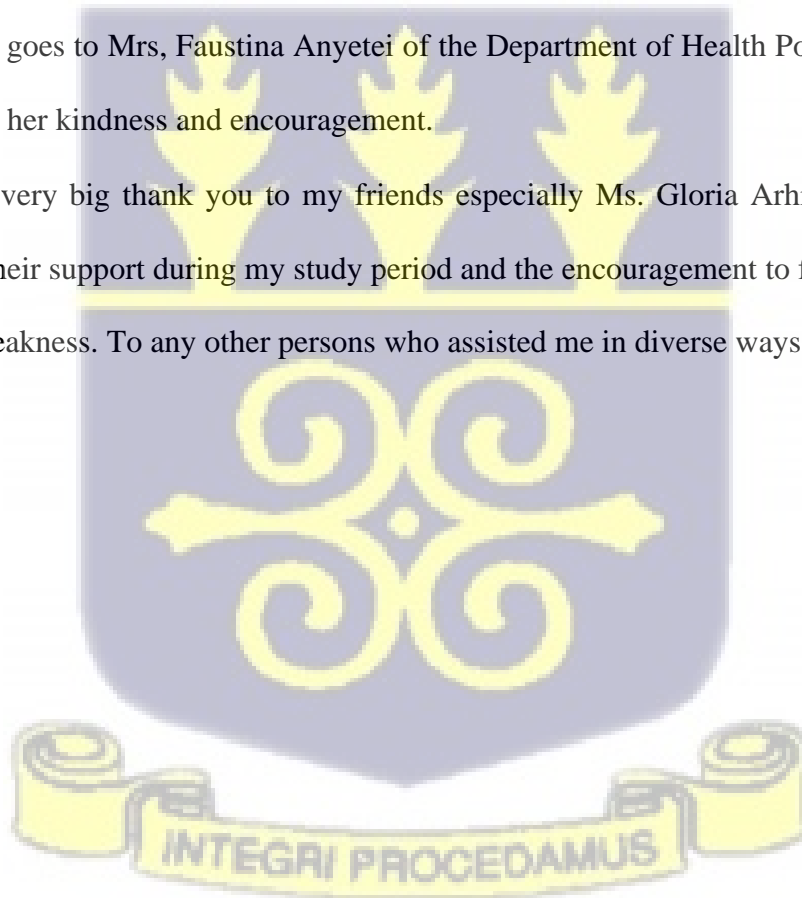
## ACKNOWLEDGEMENT

I thank the Almighty God for His protection and guidance which has seen me through this phase and many other phases of my life. I express my sincere appreciation and gratitude to my supervisor, Prof. Paulina Tindana of the Department of Health Policy Planning and Management, School of Public Health, University of Ghana for her guidance and encouragement in carrying out this dissertation. You always made time for me during the research. I am most grateful.

Special thanks to the staff of the Surgical Department of the Greater Accra Regional Hospital for participating in the study and providing me all the needed support for the research. I am most grateful for the inputs that made it possible for me to complete my work.

My appreciation goes to Mrs, Faustina Anyetei of the Department of Health Policy Planning and Management for her kindness and encouragement.

Finally, I say a very big thank you to my friends especially Ms. Gloria Arhin and Ms. Judith Attakumah for their support during my study period and the encouragement to finish my research in my time of weakness. To any other persons who assisted me in diverse ways, I say thank you.



## ABSTRACT

**Background:** Healthcare Associated Infection (HCAI) is a public health problem affecting hospitalized patients and healthcare workers, as they increase cost, morbidity, mortality and antibiotic resistance and the likelihood of being exposed to infections. The Center for Disease Control considers HCAs as one of the commonest complications of health care management and admonishes the formulation and implementation of guidelines to prevent or control HCAs in health facilities. However, there is limited evidence of how infection prevention control policies are implemented in healthcare facilities in Ghana.

**Objectives:** This aim of the study was to evaluate the implementation of infection prevention and control guidelines at the Greater Accra Regional Hospital (GARH). Specifically, the study assessed the knowledge of healthcare workers on infection prevention control policies, the various types of HCAs; the risk factors associated with surgical site infections on patients; and the implementation of the guidelines employed to control and prevent surgical site infections in the hospital.

**Methods:** This was an exploratory qualitative study involving in-depth interviews and observations. Twenty-five interviews were conducted with participants purposively selected because of their experience of either providing care (15 health workers) or receiving care (10 patients) at the Greater Accra Regional Hospital. A checklist was used to interview participant. Data were analyzed using thematic content analysis.

**Results:** The study found that majority (90%) of the respondents were knowledgeable about Health Care Associated Infections and familiar with the recommendations in the Infections Prevention and Control guidelines at the hospital. On the control of infections, all participants agreed that transmission of hospital acquired infections can be prevented through personal hygiene

and adhering to protocols. Most participants reported that surgical site infections are the most common HCAI at the GARH, particularly in the operating theatre, and that staff members working in the emergency wards are particularly vulnerable due to the nature of their jobs. **Conclusion:** Almost all the respondents reported having good knowledge on the IPC policies at the GARH. Compliance of healthcare professionals is essential to achieve universal, quality, and safe healthcare and a safe working environment.

**Key words:** healthcare professionals, infection prevention, knowledge, compliance, Ghana



**Table of Contents**

DECLARATION .....	i
DEDICATION .....	ii
ACKNOWLEDGEMENT .....	iii
ABSTRACT.....	iv
LIST OF TABLES .....	x
LIST OF FIGURES .....	xi
LIST OF ABBREVIATIONS.....	xii
CHAPTER ONE.....	1
1.0 Introduction.....	1
1.1 Background of the study .....	1
1.2 Problem Statement.....	4
1.3 Research Questions.....	6
1.4 Study Goals and Objectives.....	6
1.4.1 General Objective.....	6
1.4.2 Specific Objectives .....	7
1.5 Justification of the study.....	8
1.6. Outline of thesis.....	8
CHAPTER TWO .....	10
LITERATURE REVIEW .....	10
2.0 Introduction.....	10
2.1 Definition on Key Concepts.....	10
2.1.1 Health Care Associated Infections.....	10
2.2 Types of Health Care Associated Infections.....	13
2.2.1 Pneumonia.....	13
2.2.2 Bloodstream Infections .....	14
2.2.3 Urinary Tract Infection .....	14
2.2.4 Surgical Site Infections (SSIs).....	15
2.3 Risk Factors of Surgical Site Infections.....	16
2.3.1 Patient Associated Risk Factors for SSI .....	16
2.3.2 Surgical type Operative factors of SSI.....	18

2.3.3 Environmental Risk Factors.....	20
2.4 Control and Preventive Guidelines on Surgical Site Infections.....	21
CHAPTER THREE .....	25
METHODS .....	25
3.0 Introduction.....	25
3.1 Study Design.....	25
3.2 Study Population.....	26
3.3 Study Setting.....	26
3.4 Inclusion Criteria .....	29
3.5 Exclusion Criteria .....	29
3.6 Study Variables.....	29
3.7 Sampling Approach .....	29
3.8 Data Collection Tool.....	30
3.9 Data Collection .....	31
3.9 Data Analysis and Reporting .....	32
3.10 Organization of Themes.....	33
3.11 Data Quality Control.....	35
3.12 Ethical Considerations .....	35
CHAPTER FOUR.....	37
MONITORING AND EVALUATION ISSUES OF THE STUDY.....	37
4.1 Description of Guidelines for Healthcare Associated Infections.....	37
4.1.1 Pre-operative Guidelines.....	37
4.1.2 Intra-operative Guidelines .....	37
4.1.3 Post-operative Guidelines .....	38
4.2 Type of Evaluation.....	38
4.3 Study Frameworks .....	38
4.3.1 Conceptual Framework.....	38
4.3.2 Logic Model.....	42
4.4 Definition of Indicators.....	44
CHAPTER FIVE .....	45
RESULTS .....	45

5.0 Introduction.....	45
5.1 Socio-Demographic Characteristics.....	45
5.2 Knowledge and perceptions of healthcare associated infections (HCAIs).....	48
5.2.1 Respondents’ understanding of Healthcare Associated Infections (HCAIs).....	49
5.3.2 Familiar with Hospital Acquired Infection Prevention Guidelines .....	49
5.3.3 Following Protocols and Guidelines .....	50
5.3.4 Adherence to IPC policies .....	53
5.4 Knowledge, Types and Perceptions of Healthcare Associated Infections (HCAIs).....	54
5.5 Following Protocols and Guidelines.....	56
5.6 Operation Room Checklist for IPC.....	59
5.6 Mode of Transmission .....	61
5.6.1 Infection Prevention and Control.....	62
CHAPTER SIX.....	63
DISCUSSION.....	63
6.0 Introduction.....	63
6.1 Knowledge and perceptions of Healthcare Associated Infections (HCAIs).....	63
6.2 Types of HCAIs at the Greater Accra Regional Hospital (GARH).....	65
6.3 Factors associated with Surgical Site Infections on patients in the Greater Accra Regional Hospital? .....	65
6.4 Control and Prevention of HCAIs in the Greater Accra Regional Hospital. ....	67
CHAPTER SEVEN .....	70
CONCLUSION AND RECOMMENDATIONS .....	70
7.0 Introduction.....	70
7.1 Conclusion .....	70
7.2 Recommendations.....	71
7.2.1 Greater Accra Regional Hospital.....	71
7.2.2 Ministry of Health (MOH).....	72
7.2.3. Recommendation for Future Study.....	72
REFERENCES .....	73
APPENDIX I: PARTICIPANT INFORMATION SHEET (HEALTHCARE WORKERS)...	76
APPENDIX II: INFORMATION SHEET (PATIENTS).....	80

APPENDIX III: CONSENT FORM (PATIENTS) .....	84
APPENDIX IV: INFORMATION SHEET (HEALTHCARE WORKERS) .....	86
APPENDIX V: CONSENT FORM (HEALTHCARE WORKERS) PROJECT TITLE: EVALUATION OF HEALTHCARE ASSOCIATED INFECTION AT GREATER ACCRA REGIONAL HOSPITAL.....	90
DATA COLLECTION TOOLS .....	92
APPENDIX V: SEMI-STRUCTURED INTERVIEW TRANSCRIPT (PATIENTS) .....	92
APPENDIX VI: SEMI-STRUCTURED INTERVIEW TRANSCRIPT (HEALTHCARE WORKERS).....	96
APPENDIX VII: ETHICS CLEARANCE .....	101



**LIST OF TABLES**

Table 3.1: Organization of Major themes and Sub-themes ..... 34

Table 4.1: Performance Indicators of the Study ..... 44

Table 5.1: Demographic characteristics of study population (n = 25)..... 47

Table 5.2: Respondents’ response on availability of IPC materials ..... 52

Table 5.3: Healthcare workers’ response on availability of IPC materials and infection  
preventions..... 58

Table 5.4: Operation room checklist variables and their response ..... 60



**LIST OF FIGURES**

Figure 1: Map of Korle Klorley Municipality Showing the Greater Accra Regional Hospital.... 28

Figure 2: Conceptual Framework ..... 41

Figure 3: Logic Model ..... 43



### LIST OF ABBREVIATIONS

<b>CDC</b>	-	Centers for Disease Control
<b>GHS</b>	-	Ghana Health Service
<b>GARH</b>	-	Greater Accra Regional Hospital
<b>HAI</b>	-	Hospital Acquired Infections
<b>HCAIs</b>	-	Healthcare/Hospital Associated Infections
<b>HCW</b>	-	Health Care Worker
<b>HIV</b>	-	Human Immunodeficiency Virus
<b>ICU</b>	-	Intensive Care Unit
<b>IPC</b>	-	Infection Prevention and Control
<b>KAP</b>	-	Knowledge, Attitude and Practices
<b>MOH</b>	-	Ministry of Health
<b>PPE</b>	-	Personal Protective Equipment
<b>SSI</b>	-	Surgical Site Infection
<b>VAP</b>	-	Ventilator-Associated Pneumonia
<b>WHO</b>	-	World Health Organization



## CHAPTER ONE

### 1.0 Introduction

The utilization of infection prevention and control (IPC) measures is essential in healthcare institutions to curtail the incidence and impact of microbial infections on patients, resulting in improved patient outcomes. This study sought to evaluate the implementation of policies and practices to prevent and control Healthcare-Associated Infections at the Greater Accra Regional Hospital (formerly known as Ridge Hospital). The context of the study, statement of the problem, the objectives of the study, and justification are described in this chapter.

### 1.1 Background of the study

Health facilities, especially referral institutions have instituted guidelines to control the spread of infections within the facility environment. These guidelines are to protect both staff and patients who access the facilities from Healthcare Associated Infections (HCAIs). Lemass et al (2013) explains HCAIs as infections acquired as a result of healthcare interventions. These infections could lead to protracted hospitalization, long term disability, and even death. According to WHO (2021), HCAIs are endemic in referral facilities, where numerous cases of patients, both critical and non-critical are received more frequently. The CDC (2019) identifies HCAIs as one of the commonest complications of health care management and admonishes the formulation and implementation of guidelines to prevent or control HCAIs in health facilities.

The infection prevention and control (IPC) policy was developed in Ghana in order to direct healthcare workers' actions in order to prevent and control the spread of infections within healthcare settings and to address the issue of healthcare-associated infections, which are brought on by inadequate IPC measures being observed during the provision of healthcare.

The Greater Accra Regional Hospital (GARH) formerly known as Ridge Hospital, has 420 beds. It can be located in the heart of Accra. It has departments like those for imaging, maternity care, emergency and burns treatment, and the national intensive care unit, among others. (Mary et al, 2021). Within its catchment region, the GARH offers referral services to 111 hospitals, 299 clinics, 101 maternity homes, 32 health centers, and 707 CHPS facilities. (Enoch et al. 2023). The entire region, with an estimated population of around 4,671,363 (2016 projection based on 2010 census by the Ghana Statistical Service), is within its catchment area as the Regional Hospital for the GAR. The suburbs Ridge, Nima, Maamobi, Kanda, Accra New Town, Kotobabi, Osu, La, Adabraka, Achimota, Airport Residential Area, and Central Accra are all within the immediate catchment area, though.

The Greater Accra Regional hospital is a prominent tertiary health facility serving a large and diverse population in Ghana. This hospital like others across the country faces challenges of preventing and controlling HCAs. A Research conducted at the Ridge Hospital in Ghana found that health personnel had a moderate level of IPC knowledge and compliance, and it recommended greater efforts to raise these levels (Hayeh, 2012). Data from Ghana Health service DHIMS 2 indicate an increase in surgical site infections from 0.4471 to 2.2083 in 2020. Less money is spent on healthcare globally thanks to IPC's advantages in patient happiness and quality health service. Every nation is required to comply with IPC norms to at least a 70% level (WHO, 2002). However, there are no up-to-date statistics on compliance levels in Ghana. In addition, a monitoring survey carried out by the Institutional Care Division (ICD) of GHS in a few chosen hospitals in the Greater Accra Region (GAR) revealed a compliance percentage of 43% and 18% at Ridge Hospital (GHS, 2011). Hayeh and Esena in 2013 explored infection inhibition and management practices among health staff at” Ridge Regional Hospital in Accra (Ghana)”. The research revealed that

understanding of IPC amongst health staff was little above half of the respondents (51%), convenience and access to IPC materials was (58%). However, overall obedience to IPC guidelines was revealed to be 54% (Hayeh & Kwasi Esena, 2013). These numbers need to be looked at because they fall below the threshold of 70% as required by the World Health Organization (Hayeh, 2013).

Enemark estimates a high prevalence of illnesses linked to healthcare in Ghana, but the issue received little attention since it was frequently overlooked as a concern connected to the healthcare environment (Enemark, 2018). Some anecdotal evidence also revealed a high prevalence of healthcare-associated illnesses in Ghana, such as a news item on Joy FM (a radio station in Ghana) about a man who lost two newborn babies as a result of infections in a hospital. (Myjoyonline, 2017).

A report by WHO (2011) indicates a prevalence of health care associated infections in developing countries to be 15.5%. The CDC (2019) identifies five major sources of HCAs including the use of catheter (drainage tube) or ventilator (breathing tube), injections, surgery, facility, or equipment not disinfected and disease that transmits rapidly between healthcare staff and patient or patient to patient. Studies conducted by Nachman et al (2020) and corroborated by WHO (2021) revealed surgical site infections as the dominant and common HCAs, with a percentage of 38.6, bloodstream infections of (19.5%), Urinary tract Infections (UTIs) (18.5%), respiratory tract infections (16.3) and device associated infections (7.1%).

HCAI's affect both patients and healthcare workers. These infections may either show immediately or be incubated during admission and only show after discharge. They also include occupational infections among facility staff (Malangu, 2012).

The study encompasses the adoption of process evaluation to evaluate infection prevention and control guidelines in the Greater Accra Regional Hospital. In evaluating HCAs guidelines, it is prudent to assess the causes, reduction, control, and prevention strategies enshrined and geared towards HCAs management. The aim of the study was to assess how Infection Prevention Control (IPC) guidelines are being implemented to at the Greater Accra Regional Hospital, the challenges encountered and to identify key recommendations to reduce healthcare associated infections at the hospital.

## **1.2 Problem Statement**

Essentially, no health facility is immune to infection. This assertion is in consonance with studies conducted by Lemass et.al (2013) which concluded that any interaction in a critical space, like a health facility, should include a risk assessment for potential infection transmission. HCAs are infections acquired in healthcare facilities that pose a major risk to patient safety, leading to serious illness, prolonged hospital stays, disability, and even death (WHO, 2021). They can affect patients during or after their hospital stay, as well as healthcare workers (WHO, 2011). As such, it is crucial to implement effective infection prevention and control measures to reduce the risk of HCAs and maintain public confidence in healthcare facilities (WHO, 2021).

According to the United States Centre for Disease Control (CDC) (2019), though significant progress has been made in preventing some healthcare-associated infection types, there is much more work to be done. On any given day, about one in 31 hospital patients has at least one healthcare-associated infection. The WHO (2021) states that the incidence of health care-associated infections (HCAI) is not acceptable for low- and middle-income countries because HCAI poses a serious risk to patient safety and the standard of treatment. However, according to

the WHO, 15 patients in low- and middle-income countries will contract at least one HCAI during their hospital stay for every 100 patients in acute-care hospitals.

The estimated prevalence of healthcare-associated infections in Ghana is high, but the problem is rarely noticed due to the complexity in diagnosing these infections. At the RIDGE hospital, there is moderate to low knowledge of infection prevention and control (IPC) among health workers. Compliance with IPC is also moderate, and as a result, contributes to the prevalence of HCAI at the hospital (Kondor, 2018).

Labi et al. (2019) conducted a study in selected referral health facilities in Accra and found an overall prevalence of 8.2% for healthcare-associated infections (HCAIs), with surgical site infections being the most common (32.6%). The study also found that HCAIs accounted for an additional cost of US\$1985 per patient and estimated an annual cost of US\$700,000 to the hospital and almost US\$900,000 to the broader society (Labi et al., 2019)

Data from the Ghana health service DHIMS 2 indicate an increase in surgical site infection rate from 0.4471 to 2.2083 in 2020 and 2022 respectively in the greater Accra regional hospital (RIDGE)

Tertiary and secondary healthcare institutions as preventive and control mechanisms have instituted stringent monitoring and evaluation modules to mitigate or lessen the rate of infections. The WHO posits that the most effective control and prevention mechanism is hand hygiene. In the wake of the novel corona virus (COVID 19), hand hygiene and social distancing has been the most effective measure to curb the spread. Isolation centres have been established globally to admit and treat patients with this highly communicable disease. Within the Accra metropolis, isolation centres have been set up in selected secondary and tertiary institutions, aside newly built isolation

centre to help curb this menace. The settings and the nature of work of healthcare workers increases their risk acquiring HCAI such as COVID-19 (Verbeek et al. 2020, Nachman et al. 2020).

Adherence to infection prevention and control measures remains the best weapon to protect healthcare workers from these infections (Casella, 2020). Notwithstanding all these strides, HCAIs pose major financial and health burdens on both patients and health care staff. This underscored the need to undertake this study to adequately assess how these preventive monitoring and evaluation mechanisms has facilitated healthcare infection prevention and control in Ghana, with Greater Accra Regional hospital as the focal point of study.

### 1.3 Research Questions

1. What level of knowledge and comprehension among healthcare workers regarding infection prevention and control practices?
2. What are the various types of HCAIs in the Greater Accra Regional Hospital.?
3. What are the risk factors associated with surgical site infections on patients in the Greater Accra Regional Hospital?
4. What are the guidelines employed to control and prevent surgical site infections in the Greater Accra Regional Hospital?

### 1.4 Study Goals and Objectives

#### 1.4.1 General Objective

The study sought to evaluate the implementation of policies and measures in the prevention and control of healthcare infections in referral facilities, using the Greater Accra Regional Hospital as the case study.

#### 1.4.2 Specific Objectives

1. To assess Healthcare Workers' Understanding of Infection Prevention and Control Measures in greater Accra regional hospital
2. To examine the various types of HCAIs in the Greater Accra Regional Hospital.
3. To identify the risk factors associated with surgical site infections on patients in the Greater Accra Regional Hospital.
4. To evaluate the Implementation of Surgical Site Infection (SSI) Prevention Guidelines in the Greater Accra Regional Hospital.



### **1.5 Justification of the study**

Effective infection prevention and control strategies require reliable measures, mechanisms and policies in our referral facilities, and this is currently lacking in most hospitals in Ghana (Kondor, 2018). The study was to evaluate the various types, guidelines and risk factors associated with HealthCare Associated Infections (HCAIs) in referral hospitals in Ghana with Greater Accra Regional Hospital as our case study. Healthcare-associated infections (HCAI) are considered one of the most common adverse events in health care service provision. To prevent the occurrence of HCAIs, it is important to implement several prevention strategies. The WHO (2021) indicates that the prevalence and types of HCAI varies among countries with lower rates observed in developed countries. The high rate of HCAI in developing countries is attributed to inadequate infection control practices owing to the lack of infection control policy and guidelines, and the dearth of infection control health professionals. It is based on these reasons that this study was carried out. The planned research will hasten the understanding of HCAIs and other health-related issues. A deeper grasp of the facts and new research opportunities will be made possible by the study, allowing for more suitable action. Since COVID-19 was not the only pandemic to affect humans, the study intends to spark interest in HCAIs and aid in the development of appropriate measures and policies for times like these. The findings from this study would provide basis for further research. Also, the result will help develop new ideas in planning and developing related educational programs.

### **1.6. Outline of thesis**

This thesis is structured into seven (7) main chapters. This first chapter presented background information on infection prevention control policies the problem statement, research questions and research objectives as well as the justification for the study. The next chapter, Chapter two presents

a synthesis of current literature on the topic. Chapter three describes the study design, study location, population and study methods. Chapter four focuses on the monitoring and evaluation issues of the study. Chapter five presents the key results of the research. Chapter six discusses the results of the study in relation to existing literature and finally, Chapter seven presents the main conclusions of the study and key recommendations.



## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Introduction

This chapter comprises theoretical and evidential review of studies related to the study topic. Literature review is undertaken in this study to unearth suitable concepts and theories that may be useful to enhance the study design, data collection, analysis, and presentation of findings. According to Mouton (2001), review of literature is essential to research as it explains what has been studied previously or verified with emphasis on a research purpose. The current study was to evaluate the guidelines employed in the prevention and control of surgical site infections (Are HCAs the same as SSIs?) in the hospital with the greater Accra regional hospital, ridge as the study infrastructure. The literature review is divided into subtopics to cover the types and causes of surgical site infections, prevention guidelines and control measures, and the general effects of surgical site infections on staff and patients.

#### 2.1 Definition on Key Concepts

Definitions of salient concepts underpinning surgical site infections as a pertinent HCAI is discussed to appreciate the causes, types and its impact on staff and patients.

##### 2.1.1 Health Care Associated Infections

The WHO (2016) also refers to HCAs as a nosocomial or hospital infection and explains it is an infection which ensues in a patient while receiving care in a hospital or any health condition, which incidentally was not existing or nurturing at the time of admission. Fundamentally, HCAs may also occur or appear after patient discharge. The WHO (2021) reports that hundreds of millions of people globally get HCAs annually. The infections are substantial enough to prolong hospital

stays, persistent resistance to antibiotics, rise in costs to patients and facilities, and death. Common HCAs may include surgical site infections, pneumonia, bloodstream infections, urinary tract infections, and wound infections (Brenner & Nercelles (2016). Patients, staff, and visitors are seriously at risk from healthcare-associated infections. They can result in high morbidity for those who contract them as well as substantial expenses for the NHS. As a result, the NHS has made infection prevention and control a top focus. Infections acquired while receiving healthcare are included because of receiving care or encountering a health or social care facility. Also, because of community healthcare services outside a healthcare setting (for example, in the community) and brought in by patients, staff or visitors and transmitted to others (for example, norovirus).

According to Alhassan (2020), “Infections contracted while undergoing treatment for another ailment are known as healthcare-associated infections (HCAs). Hospitals, ambulatory surgical centers, end-stage renal disease institutions, and long-term care facilities are just a few of the healthcare settings where HCAs can occur. HCAs can be brought on by bacteria, fungi, viruses, or other, less frequent pathogens.” HCAs can have significant financial, emotional and medical consequences including mortalities. Research had shown that U.S. healthcare system spends billions of dollars each year to manage these infections, which cause thousands of deaths (Alhassan, 2020, Magill, S.S. et al. 2018).

HCAs are predominantly associated with patients in the hospital as they may be at higher risk due to the existence of other ailments, reduced immunity and antibiotics usage. Moreover, they may also have intrusive devices such as ventilators to aid in their breathing and catheters to assist in the passing of urine WHO 2016). In addition, patients are also at risk in the event they undertake procedures which are fertile attractions for infections to be established, such as surgery. Again, CARPHA (2015) asserts that patients admitted into intensive care are primarily at higher risk,

including early and newborn babies of acquiring HCAs due to the likelihood of being admitted for longer periods, antibiotics use and the frequent monitoring of their conditions. In the event of a HCAI, WHO (2016) recommends the following preventive and curative practices such as quarantine in a room to prevent the spread of infection, healthcare workers are advised to wear disposable Personal Protective Equipment (PPEs) when attending to an HCAI patient, also its prudent to provide extra care to a HCAI patient since they will need additional care, contingent on the type and severity of the infection developed as well as sensitization of patients on how to prevent the spread of infection to others they come into contact with.

Healthcare-associated infections (HCAs) are the most common negative effects of healthcare globally, endangering both patients' and healthcare workers' health (HCWs). According to Rothe C, et al 2013, HCAs are widespread in sub-Saharan Africa, with surgical site being the dominant focus of infection. In resource - poor countries, a stretched-thin health personnel, and a high incidence of community-acquired infections, the effects of HCAI are felt most strongly. In developing countries, the magnitude of the problem remains underestimated or even unknown largely because HAI diagnosis is complex and surveillance activities to guide interventions require expertise and resources (Allegranzi B, 2008). Behagwa et al. (2022), report that transmission of HCAs is based on attitudinal and behavioural practices by healthcare workers [Bejamin E et al, 2011]. The emergence of some diseases of public health importance such as Ebola virus disease and COVID-19 provides the need to improve IPC to have a resilient health systems. (Behagwa et al., 2022). A systematic review reported the burden of HCAs in Tanzania to be 14.8%, which is much higher than in developed countries [Hussein K, et al, 2022]. Approximately 1 in 7 patients in South African hospitals are at high risk of acquiring a Healthcare-Associated Infection (HCAI), with respiratory and urinary tract infections being the most common. In Ghana, it is estimated that

152,000 out of 20.7 million people suffer from HCAs, yet little has been done by authorities to address the issue. A study shows that fomites in a regional hospital in Ghana are contaminated with pathogenic bacteria, posing a risk for HCAI transmission (Duse A, et al., 2006).

## **2.2 Types of Health Care Associated Infections**

HCAIs is one of the utmost common complications of managing healthcare (CDC, 2019). The CDC identifies surgical site infections, pneumonia, bloodstream infections and urinary tract infections as the commonest types of HCAs.

### **2.2.1 Pneumonia**

Pneumonia is a type of HCAI with ventilator associated disorder that develops as a lung infection on a patient on a ventilator machine (CDC, 2019). The ventilator provides oxygen to the patient to aid breathing and comfort. Oxygen is given to a patient by placing a tube on the mouth, nose or any other possible opening. In the event germs or microorganisms access the tube, the patient may suffer some infection especially if the germs get to the lungs of the patient (CDC, 2019). Also, Ventilator Associated Pneumonia (VAP) develops within 48 hours or longer after the process of a mechanical ventilation is administered via tracheostomy (Amanullah, 2015). Studies by Klompas & Ansari (2020) revealed that VAP is associated with prolonged hospital admission and significant costs (What does significant costs mean?). Their studies further revealed United States hospitals reported VAP rates of 1.2 events per 1000 ventilator days in medical intensive care units, whilst 2.5 per 1000 ventilator days in surgical intensive care units. According to Bellingan & Al-khafaji (2006), VAP also prolongs hospital stays and tends to be an independent determinant of mortality of critically ill patients. Treatment pivots on designating an effective antibiotic from the inception and early discontinuing of antibiotics that are no longer required (Bellingan & Al-khafaji 2006).

### **2.2.2 Bloodstream Infections**

Research undertaken by Kallen & Patel (2007) indicates that bloodstream infection occurs when there is evidence of bacteria in the blood of a patient. The study further revealed that if the infection is transmitted directly into the bloodstream via catheter or an IV line, it can be described as primary bloodstream infection. Accordingly, it can be described as secondary if the infection is transmitted from other parts of the body, such as from a surgical wound or urinary tract. According to WHO (2016), bloodstream infections of HCAs can be associated with both increased use of antibiotics and the risk of adverse outcomes. In effect, WHO (2016) recommends that clinical practice should be geared towards improving blood culture methods to reduce detection of adulterated pathogens and ensure paid clinical site cultures are executed along with all blood cultures to better comprehend the epidemiology and likely repercussions of primary and secondary discordant health care associated bloodstream infections.

### **2.2.3 Urinary Tract Infection**

According to Kompas & Ansari (2020), UTI as an HCAI occurs when bacteria invade the urinary system, such as the bladder, kidney, ureter or the urethra, and symptoms of infection are manifested. The CDC (2019) also asserts that UTIs are the most common type of HCAs in Europe. The center further asserts that among UTIs acquired in a health facility, approximately 75% are related with the use of urinary catheter, which is a tube inserted into the bladder via the urethra to drain urine. WHO (2016) indicates that between 20 to 35% of admitted patients receive urinary catheters whilst on admission. The most significant risk factor for developing catheter related UTI is the prolonged use of a catheter (WHO, 2016). Consequently, catheters should simply be used for the suitable indications and should be meticulously removed immediately they are no longer in need.

#### 2.2.4 Surgical Site Infections (SSIs)

This type of infection occurs after surgery in the part of the human body where the surgery procedure was done (CDC, 2019). Surgical site infections can occasionally be superficial infections involving the skin only. However, it has the tendency to be more severe and can involve tissues beneath the skin, organs or inserted material. According to the WHO (2016), surgical site infections are HCAs that occur within 30 days after a surgical procedure and involves the skin and subcutaneous tissue of the opening and the deep soft issue of the opening or any part of the anatomy other than the opening that was created or manipulated during a surgical procedure.

Seidelman & Anderson (2021) contends that SSIs are the leading cause of HCAs. This contention was corroborated by Nachman et al. (2020) which revealed surgical site infections as the dominant and common HCAs, with a percentage of 38.6, bloodstream infections of (19.5%), Urinary tract Infections (UTIs) (18.5%), respiratory tract infections (16.3) and device associated infections (7.1%). According to the WHO (2016), SSIs have generally low risk, (low risk of what?) they are still common in the United States due to the volume of surgical procedures performed annually. In 2014, the WHO (2016) reports of 17.2 million hospital visits with invasive and therapeutic surgeries. Further, Seidelman & Anderson (2021) concluded that SSIs occur in 1 to 10% of patients that undergo surgery. Seidelman & Anderson (2021) further suggested that SSIs are more common in low- and middle-income countries, with an occurrence rate of 1% to 30% of surgical procedures performed. Studies conducted by the CDC (2019) revealed that SSI numbers have been declining in the United States. The survey conducted in 148 health facilities revealed a rate of decrease from 0.98 per 100 surgical procedures in 2014 to 0.57 per 100 surgical procedures undertaken in 2018. Likewise, publicly reported rates of SSI following surgical procedures like abdominal hysterectomy and colon surgery decreased approximately 12% in 2017 compared to the national

standard reported in 2016, although the reduction is statistically insignificant. Nonetheless, decreases in surgical site infections have been modest compared to decreases observed in other types of HCAs, thus bloodstream infections, UTIs and pneumonia. WHO (2016) systematic reviews on SSIs in low- and middle-income countries revealed an incidence of 11.9 per 100 surgical patients undergoing surgical procedures. The review further revealed that SSI was the most frequently reported HCAI in low- and middle-income countries. Further, the level of risk was significantly higher than in advanced countries.

### **2.3 Risk Factors of Surgical Site Infections**

SSIs are potential complications associated with any type of surgical procedure. According to Nachman et al (2020), SSIs are one of the most preventable HCAs, but they still represent a substantial burden in terms of patient indisposition and mortality, and further costs to the health systems and service payers globally. According to Hassan et al. (2020), recognized risk factors of SSIs include prolonged hospital stays, obesity, duration and complexity of a surgical procedure, patient co-morbidities and higher wound contamination classification. The International Federation of Infection Control (IFIC, 2016) categorized risk factors of SSIs into three key elements, thus patient associated risk factors, types of surgical procedure risk factors and operating room/theater environment risk factors aligned with an increased risk of surgical site infections.

#### **2.3.1 Patient Associated Risk Factors for SSI**

Key risk factors for Surgical Site Infections (SSI) include existing infection, low serum albumin, older age, obesity, smoking, diabetes, vascular disease, prolonged procedures, inadequate surgical scrub or antiseptic preparation, trauma, shock, blood transfusion, hypothermia, hypoxia, and hyperglycemia. Multiple patient-related, surgery-related, and physiological factors contribute to the heightened risk of SSI.

**Diabetes:** According to Brenner & Nercelles (2016), there exists a positive correlation between increased glucose levels ( $>190$  mg/dl or  $170$  mg/dl in cardiac surgery procedure) in the perioperative period and the risk of SSI. Good glycaemia control and steady glucose concentration is therefore vital. Also, Diabetes and Risk of Surgical Site Infection, a study by Martin E et al, 2016, the results support the consideration of diabetes as an independent risk factor for SSIs for multiple surgical procedure types. Numerous prior research has shown, and this study verified the involvement of diabetes mellitus in the development of SSI after orthopedic procedures (Olsen et al, 2008). It is discovered that preoperative FBG  $> 125$  mg/dL or postoperative random  $> 200$  mg/dL high serum glucose levels were both independent risk factors for SSI after orthopedic spinal procedures. Hyperglycemia was defined as a preoperative FBG  $>140$  mg/dL by (Hikata et al., 2014), and they discovered that diabetic individuals who had it had a 3.1-fold higher risk of developing SSI after foot and ankle surgery. In both diabetic and non-diabetic patients, the CDC guideline advocated perioperative glycaemia management and the use of a random blood glucose target level of fewer than  $200$  mg/dL.

**Smoking:** Nicotine has the likelihood to delay wound healing. IFIC (1016) asserted that cigarette or tobacco inhalation increases SSI due to nicotine. In effect, the cessation of nicotine intake or smoking is significant to reduce the risk of SSI before the commencement of elective surgical procedures is prudent. Numerous studies have documented how smoking has a negative impact on the emergence of SSI after orthopaedic procedures. In research by Singh et al. (2011) included 33336 individuals undergoing elective total knee or total hip arthroplasty, it was discovered that current smoking raised the incidence of SSI by 1.41 times when compared to never smokers. In an analysis of 3836 instances with TKA, Crowe et al. (2015) discovered that smoking was independently linked to a 3.1-fold higher risk of SSI, which is similar with our finding (OR, 4.2;

95% CI, 2.0-6.4). On the other hand, we should really acknowledge that there is a chance that the smoking status can be changed to prevent SSIs. Therefore, it is recommended that smokers who are undergoing elective spinal or arthroplasty surgery should cease smoking for at least 4 weeks to have a favorable surgical condition.

**Obesity:** An average Body Mass Index (BMI) of greater than 40 has been related to surgical site infections, especially after elective procedures such as orthopedic implant surgery, cesarean section and cardiac procedures.

**Co-existing remote:** Studies have revealed that active infection, particularly associated with the skin and respiratory tract organ, has the potential to increase surgical site infection risks in all types of surgical procedures.

**Establishment with microorganisms:** Nasal carriage of bacteria *S. aureus* is a risk factor of surgical site infections. In cardiac and orthopedic surgical procedures, studies from IFIC (2016) support the screening and decolonization before the commencement of the surgical procedure, especially where the health facility has record of high rates of surgical site infections caused by the causative agent *S. aureus*.

**Length of pre-operative stay:** Prolonged pre-operative admission has been significantly associated with increased risk to surgical site infections, undoubtedly because it has the likelihood of an indicator of severe or critical underlying condition or illness.

### 2.3.2 Surgical type Operative factors of SSI

**Pre-operative Shaving:** Pre-operative shaving of the surgical site is related with considerably higher surgical site infection risk than using depilatory agents or no hair abstraction. Clipping hair

instantaneously before surgical procedure lessens the risk. Nonetheless, the risk from either clipping or shaving proliferates when it is done the night before surgery. The use of depilatories is better; nonetheless it can cause hypersensitivity. Studies by Brenner & Nercelles (2016) establish that any removal of hair is associated with increased surgical site infection rates and recommends that hair should not be removed at any cause, unless critical to the procedure. Strong evidence indicates that preoperative scalp shaving before cranial surgeries has no benefit against postoperative wound infection and, paradoxically, may increase infection rates. This conclusion comes from a systematic review of articles related to preoperative scalp shaving before cranial surgeries and the implications for postoperative wound infections. Many authors suggested that cranial procedures be performed without shaving because hair removal neither benefits the surgery itself nor lowers the risk of wound infection but has significant cosmetic value for the patient (Sebastian S, 2012).

**Infected Surgical Personnel:** Surgical personnel with skin infections such as psoriasis, microorganisms such as staphylococci, have been associated with the outbreak of surgical site infections. In effect, Health facilities should omit infected personnel from all surgical procedures/activities.

**Duration of Surgical Procedure:** Studies by IFIC (2016) and corroborated by Brenner & Nercelles (2016) have established that prolonged operations are linked with an increased risk of surgical site infections. Thus, time with accuracy should be encouraged and kept at the minimum.

**Foreign material within in the surgical enclave:** Any foreign material may promote inflammation and act as a point of entry for microorganisms. Drains used to evacuate postoperative

hematomas or serious fluids in the post-operative period increase incisional surgical site infection risk.

**Surgical procedure:** Breaks in aseptic methods, such as use of shared syringes or contamination of arterial fluids or equipment, have been linked with surgical site infection. However, good surgical procedure, thus effective homeostasis, meticulous handling of tissues and extrication of devitalized tissues, decreases the risk of surgical site infections. The risk of surgical site infections is sturdily linked with the experience of surgical players. Health institutions should opt for experienced surgeons to tackle complex procedures and monitor surgical technique as well.

### 2.3.3 Environmental Risk Factors

**Theatre Ventilation:** According to WHO (2016), a surgical theatre should be at convenient pressure comparative to adjacent spaces and supplied with sufficient filtered air to provide at least 25% air changes hourly. Consumption of ultra clean air in the prevention of surgical site infections is well proven. The infectious count in the theater air is directly proportionate to the sum of people and their movement, hence imperative for movement to be controlled and numbers kept at minimum.

**Ineffectual sterilization of surgical instruments:** Sterilization of instruments is a pertinent aspect of aseptic method which must be performed with the use of validated techniques. Poor sterilization has been linked to a surge in surgical site infection rates and outbreaks.

WHO (2016) posits that the use of flash sterilization technique is recommended and performed only in emergency scenarios. There are concerns with non-availability of protective packaging, likelihood for contamination of processed items in the process of transportation and a strain in

monitoring cycle limits, thus time, temperature and pressure. Essentially, flash sterilization is highly discouraged and for use in procedures associated with implants or invasive instruments.

**Contamination from Surgeons and team (Surgical gloves and apron):** Barrier clothing are significant to surgical procedures purposely to minimize exposure of a patient's wound to the skin, slimy tissues and hair of the surgical team. Again, it also safeguards the surgical team from contact to a patient's fluid. Masks can prevent infection of patients with respiratory pathogens. Further, surgical caps reduce infection of the surgical space by microorganisms from the scalp and hair. Footwear should be bound, and this secures the team from inadvertently dropped sharps and other infectious items; nonetheless, open foot wears are highly discouraged to be worn. In the event there is a risk of discharge of blood or other high risk body fluids, it is always imperative for the wearing of surgical waterproof boots.

Sterile gloves reduce transmission of germs from the hands of the surgical team to patients, prevent infection of team members to patients and prevent the contamination of team members from patients' blood and body fluids. Wearing an additional pair of gloves might provide extra protection though.

#### **2.4 Control and Preventive Guidelines on Surgical Site Infections**

The Miller-Keane medical dictionary explains Preoperative care as preparing patients physically and psychologically for surgery, addressing their anxieties and fears. Medications and treatments are administered as ordered, and efforts are made to optimize the patient's health before surgery. Intraoperative care involves monitoring vital signs, administering medications and fluids, ensuring sterile techniques, and maintaining patient safety and comfort during surgery. Goals of intraoperative care include maintaining homeostasis, preventing cross-infection, securing the

patient on the operating table, and preventing complications such as hematomas. Globally, the WHO (2014) developed a handbook for the formulation of guidelines for all HCAs. The handbook served as a resource for the formulation of facility specific guidelines to minimize HCAs. The following guidelines currently exist to prevent and control SSIs (WHO, 2016, ECDE, 2016).

*a. Pre-operative guidelines*

WHO (2016); Aikins et al. (2016) & Beldi et al. (2010) made the following recommendations to inform surgical site infection guidelines such as detect and treat all contaminations before elective surgical procedures, keep good control of diabetes, maintain pre-operative hospital stay to a minimum, and do not take away hair pre-operatively except the hair within the incision site will obstruct the procedure. However, if considered vital, remove hair instantaneously before the commencement of the procedure using a non-invasive technique. This may be done via clipper. Advisedly, the use of razors is considered inappropriate.

Also, use an antibacterial for skin preparation. In the event no contraindication occurs, use alcohol having pre-operative skin preparatory agents together with chlorhexidine. Alcohol is contraindicated for definite actions; these include actions in which the preparatory agent may pool or not dry creating a fire risk or actions involving cornea or ear.

Moreover, implement a pre-operative surgical scrub within 2 to 4 minutes using a suitable antiseptic. A surgical scrub can be performed using water-less products, such as alcohol-based hand rubs in the absence of visibly dirty hands. Do not use brush. Remove debris underneath the fingernails using the nail cleaner before the first procedure in the morning.

Exclude personnel who exhibit symptoms of a communicable infection via surgical activities. Staff with draining skin lacerations must be excluded until the infection is entirely resolved. Administer prophylactic antibiotics in tandem to local policy. Intensify dosing of prophylactic antimicrobial agent for suddenly overweight patients or when the procedure exceeds three hours. Halt agents use 24 hours after the procedure.

Cogitate on screening and decolonization of the carriers of *S. aureus* bacteria for high-risk events, for instance orthopedic and cardiothoracic events if the surgical site infection proportions for this germ are high and not measured by regular infection deterrence measures.

Examine the level of knowledge and experience essential for surgeons executing intricate surgeries. Advocate smoking cessation 30 days prior to the conduction of an elective surgical procedure.

**b. Intra-operative Guidelines**

WHO (2016); Aikins et al. (2016) & Beldi et al. (2010) again concluded that some guidelines are implemented to curb surgical site infections in the intraoperative stage. That is, the use of a surgical checklist to ensure compliance with best practices. The adoption of WHO checklist is highly recommended as it has been associated with less surgical complications arising from surgical site infections, Limiting the length of the procedure to the minimum, sterilize all surgical apparatuses with certified methods. The use of flash sterilization regularly is discouraged. According to CDC (2019), the wearing of sterile gloves, water resistance surgical gowns and curtains. Maintain positive pressure aeration in the surgical theatre in terms of corridors and adjacent locations.

The closure of operating rooms except in need for passage of instruments, staff, and patients. The restriction of entry to the surgical theatre to personnel only and their movement should be controlled. Also, imperatively stick to the principles of asepsis whilst performing health

interventions and invasive procedures in surgical theatres and the handling of tissue should be meticulous, observe effective homeostasis, reduce devitalized tissue and external bodies, such as sutures and charred tissues, and remove dead space at the surgical site.

It is prudent to keep body temperature of the patient between 36°C and 37°C in the course of surgical procedure in patients with an anesthesia duration of at least an hour.

Lastly, avoid the use of artificial fingernails in the period of surgical procedures.

*c. Post-operative Guidelines*

WHO (2016); Aikins et al. (2016) & Beldi et al. (2010) suggested the following guidelines to be followed in the post-operative stage to prevent and control surgical site infections:

1. The touching of surgical wounds is prohibited, unless needful. In such an event, the wearing of sterile gloves should not be compromised.
2. Undertake daily review the need to continue the use of drains and exclude or discard when no longer essential.
3. It is also imperative, according to WHO (2016); Aikins et al. (2016) & Beldi et al. (2010) to institute a workable surveillance system for surgical site infections using standard descriptions and risk categorizations. Again, the performance of post-discharge reconnaissance for ambulatory surgical procedure or short stay patients.



## CHAPTER THREE

### METHODS

#### 3.0 Introduction

This chapter describes how the study was conducted and the methods used to collect and analyze the data. The overall aim of this methods chapter is to provide an overview on the methods employed so that a judgment can be made as to how appropriate they are and how valid the data that has been generated is. Qualitative research methods were used for this study. This is because the nature of the study involved detailed investigation of contextual conditions which required physical engagement and interaction with participants. The chapter further states the choice of the research design and the strategies it adopted in answering the research questions. It comprises a discussion of the research design, the study population, the sample size and sampling technique, research instruments, data collection procedure and methods employed in data analysis. Furthermore, the details of field work that was carried out at the Greater Accra Regional Hospital provides insights into the data collection process and the challenges encountered. Also, this chapter explains how data was analyzed to generate research findings as well as ethical concerns that guided the study.

#### 3.1 Study Design

The design for the study was an exploratory qualitative research design. “One of the greatest strengths of the qualitative approach is the richness and depth of explorations and descriptions” (Myers, 2008). With a qualitative research design, the researcher is part of the study itself and must be flexible enough to follow up on observed leads and take on-the-spot decisions. A case study, which is an example of qualitative design was used because it helps to gain more insights and probe deeply into the issues under consideration (Cohen and Manion, 1994). This is because

qualitative research tries to study, understand, and interpret things in their natural environments (Denzin & Lincoln, 2011, p.3). Case studies aim to analyze specific issues within the boundaries of a specific environment, situation, or organization. This approach was selected because the study organization's activities are continuous processes and therefore was "bounded or described within certain parameters, such as specific place and time" (Cresswell, 2013). According to Stake (1995), case studies are useful when the researcher wishes to understand an issue, a problem or something that is of concern. This approach is appropriate for the study because it helped the researcher to clearly understand the respondent's needs as well as their concerns from their points of view. The goal of this study was to evaluate measures, mechanisms and policies that play in the prevention and control on infections in referral facilities, with the Greater Accra Regional Hospital as the case study.

### **3.2 Study Population**

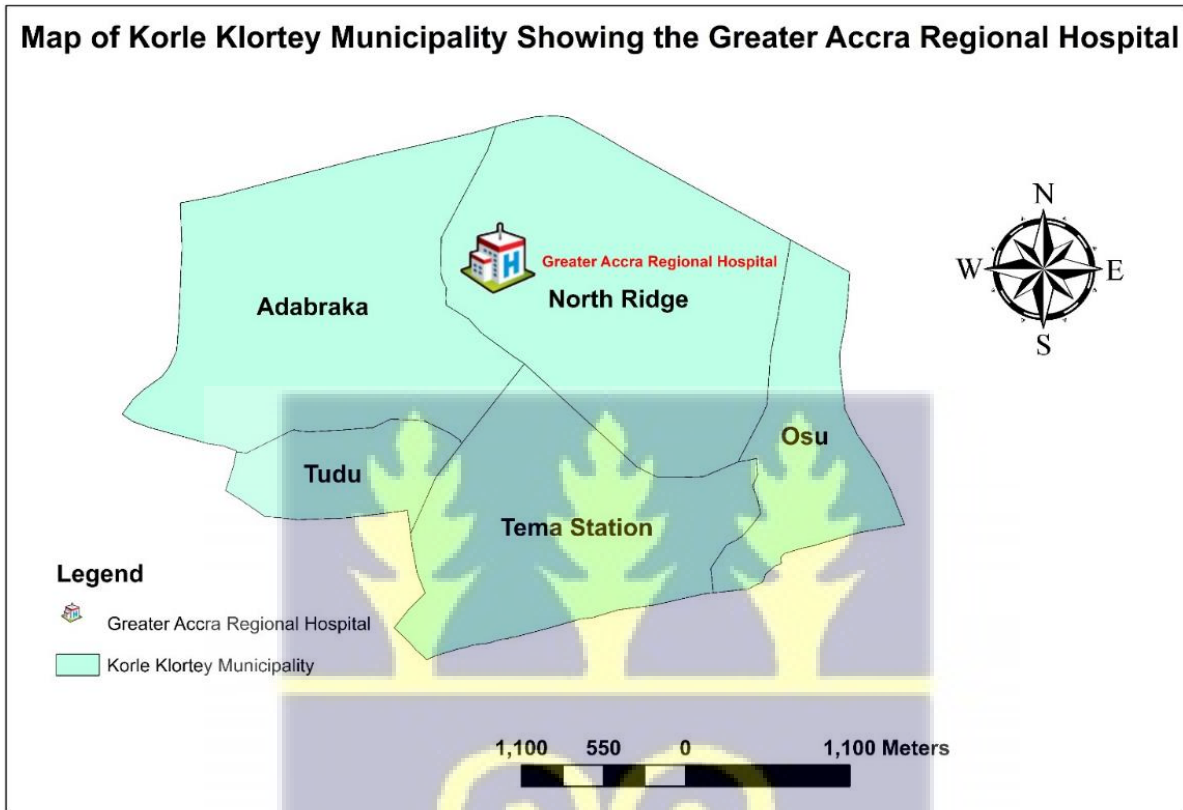
According to Kusi (2012), a population is a group of individuals or people who have similar traits and are the subject of the study. The scope of the research was limited to the staff and patients of the Greater Accra Regional Hospital, a referral hospital that serves the people of Accra and beyond. The study population were patients, doctors, nurses, anesthetics and orderlies. The healthcare workers (i.e., doctors, nurses, anesthetics, and orderlies) who were on duty in the various wards of the hospital at the time of the study were interviewed. Study participants were recruited by purposive sampling. The survey's results aided in the analysis and generalization of the data.

### **3.3 Study Setting**

The Greater Accra Regional Hospital (formally the Ridge Hospital) is a major regional hospital located in Accra, Ghana. The Ridge Hospital was built in 1929 to provide healthcare for British nationals during the colonial era. The hospital is currently a 600-bed facility and more than 12

surgical theatres totaling 465,560 SF. The 307,000 SF facility contains approximately 400 beds and enhanced medical specialists, maternity, day-care, day surgery, NICU, HDU, Administration, Laboratory and ICU's. The GARH has among others, a comprehensive diagnostic and treatment block with a 24-hour surgery department, delivering unit, accident and emergency unit, pharmacy, a logistic building, a 42-accommodation facility for staff, a school of Anaesthesia, a new mortuary and a good road network. Other components of the hospital project include an Administration and Support Services Wing comprising Catering, Stores, Transport, Laundry, Maintenance, Medical Gas Systems, and a Waste Treatment Plant. In addition, some of the building's electricity supply is provided by solar power, enabling it to meet environmental standards. All these are complemented with two standby generators with a combined capacity of 5600 KVA. Also, a capacity building that will house the Out-Patient Services, Catheterization Laboratory (or Cath Lab), Fertility Centre, Specialized Medical Diagnostic Services, Public Cafeteria, Mini Mart, Auditorium, Dental, Ophthalmology, Ear Nose Throat (ENT), Physiotherapy, Psychiatry and Public Health Services. The Hospital, one of the leading referral facilities in the capital. The hospital is situated within the Accra metropolis, within the Central Business District (CBD). The hospital has carved a niche for itself as one of the highly regarded and diligent health facilities in the country. The hospital, which has undergone major rehabilitation works to be one of the prominent referral facilities in the country undertakes major surgical and other intensive care remedies to the public. It occupies a total land area of about 15.65 acres. As the Regional Hospital for the GARH, its catchment area is the whole of the Greater Accra Region, with an estimated population of over 6,455,692 Population (2021) census by the Ghana Statistical Service, GSS). 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. It has a school which trains various disciplines in the health sector, to facilitate the provision of quality health care to the citizenry.



**Figure 1: Map of Korle Klorley Municipality Showing the Greater Accra Regional Hospital**

*Source: Author's construct, September, 2023*



### 3.4 Inclusion Criteria

- Adult males and females within age range of 18 and above who had experienced surgical site infection at the Greater Accra Regional Hospital.
- Healthcare providers (Doctors, Nurses, Anesthetics', and Orderlies) working in the surgical department of the Greater Accra Regional Hospital

### 3.5 Exclusion Criteria

- Critically ill patients who were seen in the surgical units.
- Those who declined to participate in this study.

### 3.6 Study Variables

The variables in this study were dependent variable (prevention of healthcare associated infection) and independent variables (knowledge of IPC, attitude towards IPC and availability and accessibility of materials for IPC practice and compliance with Infection Prevention and Control (IPC) practices by healthcare workers in the surgical department of Greater Accra Regional Hospital).

### 3.7 Sampling Approach

To ensure accurate and reliable information on evaluating the guidelines on infection prevention and control of HCAs in the hospital, the study used purposive sampling technique to select fifteen patients to constitute the study sample. Through the assistance of unit head and health staff at the time of visit were selected from theatre (4 staff) and the surgical ward (6 staff) because they directly work on patients with SSIs. The staff at the two units were approached to participate in the study, informed consent forms were administered to staff who agreed to participate in the study. Semi-structured IDIs were conducted with staff who signed the information.

Eligible patients were individuals with a documented and confirmed history of a healthcare-associated infection. They were identified by reviewing their medical records that is, patient folder with the support of the ward in-charge. Purposive sampling, also as judgmental or convenient sampling, is a non-probability sampling technique where the researcher selects units to be sampled based on his own existing knowledge, or his professional judgment. This sample was used because the respondents selected had the desirable characteristics as well as the information needed for the study. McMillan (1996) supports this idea by stating that the sample chosen should possess the needed characteristics for research to be conducted.

The researcher obtained a letter of introduction from the department and assured respondents of confidentiality and anonymity. Data collection was done using a semi-structured interview guide, and the rationale for the study was explained to gain respondents' support. Purposive sampling was used based on the researcher's judgment to select a representative sample. English, Twi, and Ga were used as languages for investigation, assuming they are widely spoken by patients at the Greater Accra Regional Hospital.

### **3. 8 Data Collection Tool**

The study used a semi-structured interview guide with open ended questions to engage selected participants in in-depth interviews. The interview guide was developed with guidance from the outcome of the literature search and the study's objectives. In addition, the interview guide, which included the study's research questions, covered all the study's significant topics. The interview guide was divided into two sections: Section A and section B. Section A covered the demographic information of respondents. Section B of the data collection instrument covered the steps and procedures that leads to their infections as well as their knowledge, attitude, compliance level, availability and accessibility of IPCs materials. The third section of the interview guide focused

on healthcare providers' attitudes towards IPC based on CDC, WHO and MOH Ghana guidelines on infection and control. During each interview portion, the researcher took notes to record additional occurrences, such as participant reactions to some of the questions in the field.

### **3.9 Data Collection**

The interviews took place in a variety of places that were convenient for the participants. The researcher explained the study's goal to the participants and handed them an information sheet with extensive information about the whole investigation. The researcher then explained the processes to the participants and dispelled any doubts they may have about the study. Persons who demonstrated interest and willingness to participate in the study were interviewed.

Each interview lasted between 30 and 60 minutes on average and was conducted in the patient's preferred language. The interview began with substantial and probing questions from the researcher. This provided enough foundation for the participants to make extensive and persuasive replies.

Other follow-up questions aimed to elicit further information about the participants' experiences were asked. All audio recordings of interviews, permission forms, field notes, and transcribed texts were password-protected to increase the security of the data acquired. Separate files were supplied for each participant, with each file simply including the answers to the key questions, consent forms, and biographic data. Interviews that have been transcribed were kept ensuring that it is available when needed. All other files containing written data collection information were classified as confidential and kept in a locked drawer accessible only to the researcher and her supervisor.

The data collection took two weeks due to the delay and busy schedules of the staff and patients. All the responses retrieved from the respondents were used for the analysis.

### **3.9 Data Analysis and Reporting**

The interviews were audio-recorded with the participants' consent and transcribed into word files afterwards for analyses.

Various strategies were used in managing the data and data cleaning. The demographic characteristics including sex, age, gender and occupational category and educational data collected from respondents during interview were coded, edited, and entered in qualitative analysis software (QSR) NVIVO version 12 to aid data analysis. The data were analyzed using thematic content analysis. Participants responded to interview questions and probing questions in their local language and therefore the data were transcribed based on the defined thematic areas. Individual files were given pseudonyms to enable the identification of replies from various participants. To build an understanding, the transcribed material was reviewed again, and codes were formed from comparable concepts and connected to pre-set themes established concerning the structures of the conceptual framework to guarantee the correctness of the transcriptions and to allow the researcher to identify places that needed more elaboration, the audio was played numerous times and compared to verbatim transcriptions. The qualitative data were grouped under each theme and were analyzed by drawing inferences from existing literature and complementing the data with direct quotation and stories narrated by the sampled respondents. The major findings were summarized in line with the objectives of the study for generalization to support existing literature or otherwise.

### 3.10 Organization of Themes

Four (4) major themes emerged after a thematic content analysis was performed. These major themes namely: Knowledge and perceptions of HCAIs, Operation Room Checklist for IPC, and measures and control by the facility to control healthcare associated infections. Additionally, sixteen (16) sub-themes were obtained from the analysis. The categorization of each of the sub-theme under the major themes is presented in table 4.2.



**Table 3.1: Organization of Major themes and Sub-themes**

MAJOR THEMES	SUB-THEMES
Knowledge (what healthcare workers/patients know and do regarding HCAs).	What are HCAs Types of HCAs Familiar with infection measures How HCAs can be transmitted Adherence to hygiene Following protocols and guidelines
Self-regulations (to control one's own process by applying a set of mechanisms such as personal hygiene, self-monitoring, goal setting, self-instruction, preventive measures)	Problem-solving skills Risk of acquiring HCAs Healthy coping skills How transmission of HCAs can be prevented
Operation Room Checklist for IPC	Availability of IPC materials or service Personal protective equipment for use Hygiene
Measures, control, policies and guidelines by the facility to control healthcare associated infections	Policies and measures Guidelines employed to control and prevent SSIs Health professional support Organizational support

*Source: Fieldwork, February, 2023*

### **3.11 Data Quality Control**

Training of data collection officers were done prior to the collection of data to ensure their understanding of the data collection tools. They were trained on how to ensure privacy and confidentiality, how to obtain the informed consent of participants, and how to properly record and document the process of data collection to avoid missing or incomplete data. The data collected in the field underwent thorough verification to ensure that all the necessary information was accurately captured and recorded. To maintain data security, the information was entered into a personal computer protected by a password.

### **3.12 Ethical Considerations**

An official ethical clearance and permission for this work was sought from the Ghana Health Service Ethics (include approval number here). Again, an official introductory letter of the researcher and purpose of the study sought from the Department of Health Policy, Planning and Management of the University of Ghana, Legon which was duly granted. During data collection, informed consent was sought from sampled participants. The researcher explained in detail the purpose of the study to the respondent and further gave opportunity for clarity and questioning. The researcher indicated to respondents their free will to participate in the study or not, the liberty to opt out of the interview at any point in time, free will not to respond to questions which the respondent was not comfortable with and right of the respondent to request that their responses should not be included in the study. Again, the data analysis will be presented in aggregated response, and nobody can use a respondents view against him or her in future. The researcher further indicated that a third party will not have access to data without the permission of the respondent. Finally, the researcher indicated to participants that their decision not to take part in the study will not have implications on them in future if some interventions or benefits comes out

of the study findings. Each respondent was made to tick 'Yes' or 'No' on the consent form to take part or opt out of the study respectively.



## CHAPTER FOUR

### MONITORING AND EVALUATION ISSUES OF THE STUDY

#### 4.1 Description of Guidelines for Healthcare Associated Infections

The WHO (2014) has developed a manual for defining guidelines for all HCAs in the world. The manual serves as a resource for the formulation of specific guidelines for facilities to minimize HCAI. According to Seidelman & Anderson (2021), Surgical Site Infections (SSIs) are the leading cause of HCAs. Currently, there are guidelines on pre-operative, intra-operative and post-operative procedures to prevent and control SSIs (WHO, 2016, ECDE, 2016).

##### 4.1.1 Pre-operative Guidelines

The WHO and other organizations have made some recommendations for preventing SSIs. Among them are the detection and treatment of all infections prior to surgery, the control of diabetes, reducing the stay in the hospital prior to surgery, and avoiding the removal of pre-operative hair. For skin preparation, an antibacterial should be applied, and an antiseptic should be used for a surgical pre-scrub. Surgery should not be performed by personnel who has symptoms of a communicable infection. Antibiotics for prevention should be administered in accordance with local regulations. For high-risk surgeries, screening and decolonizing carriers of *S. aureus* bacteria may be considered, and surgeons should have the necessary training and expertise for difficult procedures. Additionally, it's important to promote quitting smoking 30 days before surgery.

##### 4.1.2 Intra-operative Guidelines

Several recommendations have been made to prevent surgical site infections during the intraoperative period. One of these is the use of a surgical checklist to ensure adherence to best practices, with the use of the WHO checklist being strongly advocated. It is crucial to keep procedures brief and to sanitize all surgical tools with approved techniques, avoiding flash sterilization. Positive pressure ventilation should be used, and all personnel in the operating room

should wear sterile gloves and water-resistant gowns. During medical interventions and invasive procedures, there should be a restriction on people's movement within the theatre and aseptic standards should be followed. During the procedure, the patient's body temperature should be maintained between 36°C and 37°C, and the usage of artificial fingernails should be avoided.

#### **4.1.3 Post-operative Guidelines**

Guidelines to prevent and control surgical site infections in the post-operative stage include avoiding touching surgical wounds unless necessary, donning sterile gloves in such circumstances, assessing the need for drains daily, and putting in place a surveillance system for surgical site infections with standardized definitions and risk categorizations. Patients undergoing ambulatory surgery or staying for a brief period should also undergo post-discharge surveillance. To lower the risk of surgical site infections, these guidelines are meant to ensure good wound treatment and surveillance.

#### **4.2 Type of Evaluation**

The study includes the application of process evaluation to assess infection prevention and control guidelines in the Greater Accra Regional Hospital. It aims to standardize the use of these guidelines to determine whether implemented policies and procedures defined and adopted are being followed as well as to assess whether systems are being managed as intended.

#### **4.3 Study Frameworks**

The conceptual framework and the logic model are the frameworks used in this study to illustrate the relationship between the variables in the study, and how the various activities affect each other.

##### **4.3.1 Conceptual Framework**

The conceptual framework of the study depicts the various components of the study, thus surgical site infection prevention and control. Patient associated risk factors, surgical associated risk factors

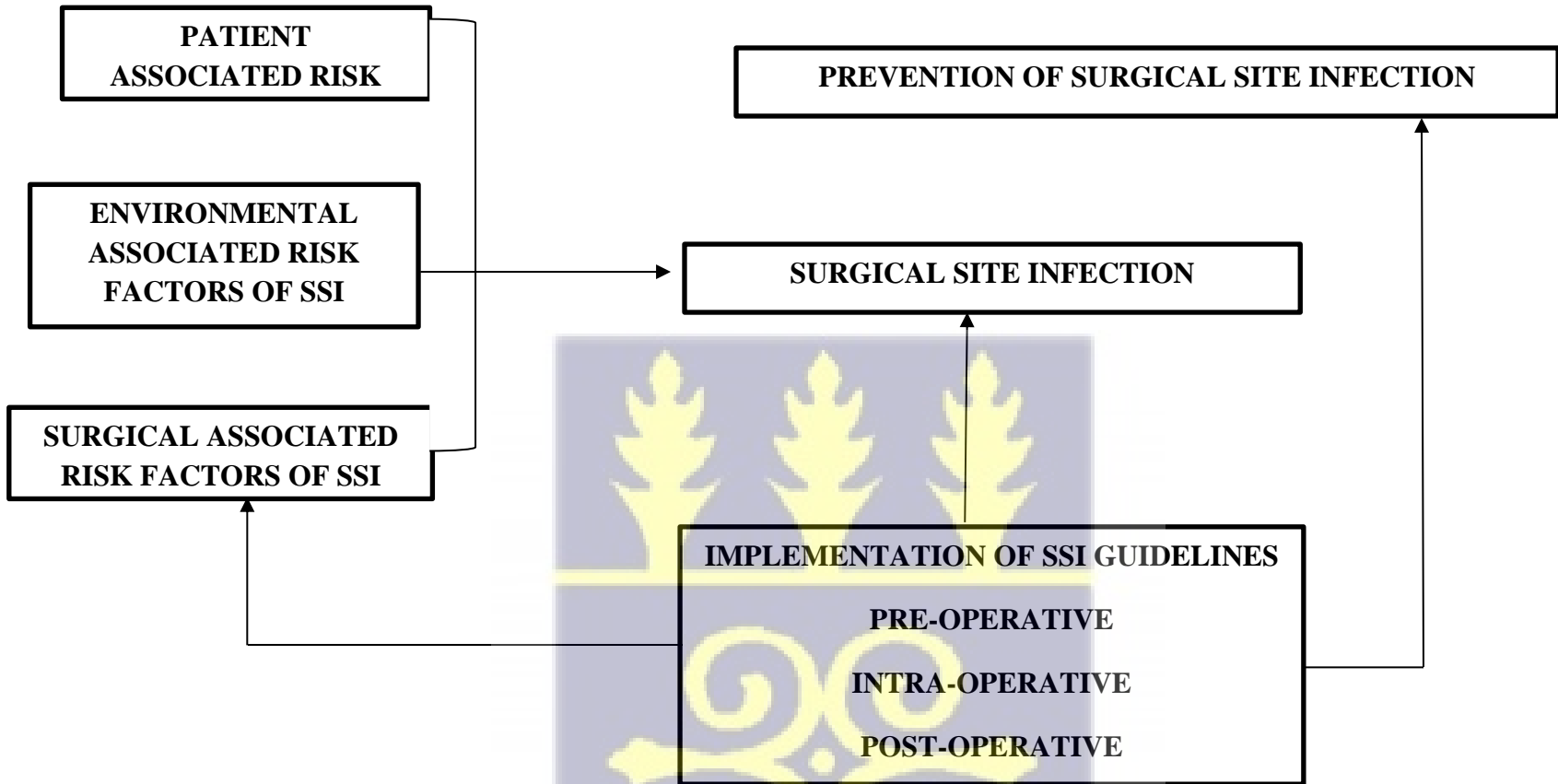
and environmental risk factors are the major causes of surgical site infection (SSI). These three main causative factors are linked as the major causes of surgical site infection due to the absence of pre-operative, intra-operative and post-operative guidelines.

Despite advancements in preventive measures, SSIs remain among the most frequent adverse events that affect hospitalized patients undergoing surgery or in outpatient surgical procedures (Dellinger, 2012). Surgical site infections (SSIs), which affect up to one-third of patients who undergo surgery in low- and middle-income countries and are the second-most prevalent infection linked with healthcare in Europe and the USA, are avoidable and epidemiologically significant. Preventative actions must be taken before to, during, and following surgery (WHO, 2016; CDC, 2017). Following surgery, surgical site infections (SSIs) are infections of the surgical site incision, organ, or space. Only the skin and subcutaneous tissues are affected by superficial (incisional) infections, whereas deep (organ or space) infections affect at least the muscle and fascial layers. Both the patient's own normal flora and environmental flora, such as the members of the surgical team, have the potential to infect an incision. Based on how much the surgical incision was exposed to bacterial contamination, the classification system for surgical wounds was developed. For clean procedures, preoperative skin decontamination is crucial to preventing wound infection. It is advised to take a shower with either basic soap or antibacterial before operation. Since there is evidence that patients who do not have their hair removed may have even lower rates of surgical site infections (SSIs), hair removal at the surgical site is generally avoided. If it is essential, however, it must be done using clippers, ideally before to surgery (Allegranzi B, et al 2016).

The most frequent complication in postoperative surgical patients is SSI, which is linked to high mortality rates, severe morbidity, and financial strain on both national budgets and individual patients (U.S Department of Health & Human Services, 2108). Infections that develop up to 30 to

90 days following surgery in patients receiving an organ, a group of cells, or a device are known as SSIs and can affect both the incisional site and deeper tissues nearby (Centres for Disease Control and Prevention, 2018).





**Figure 2: Conceptual Framework**

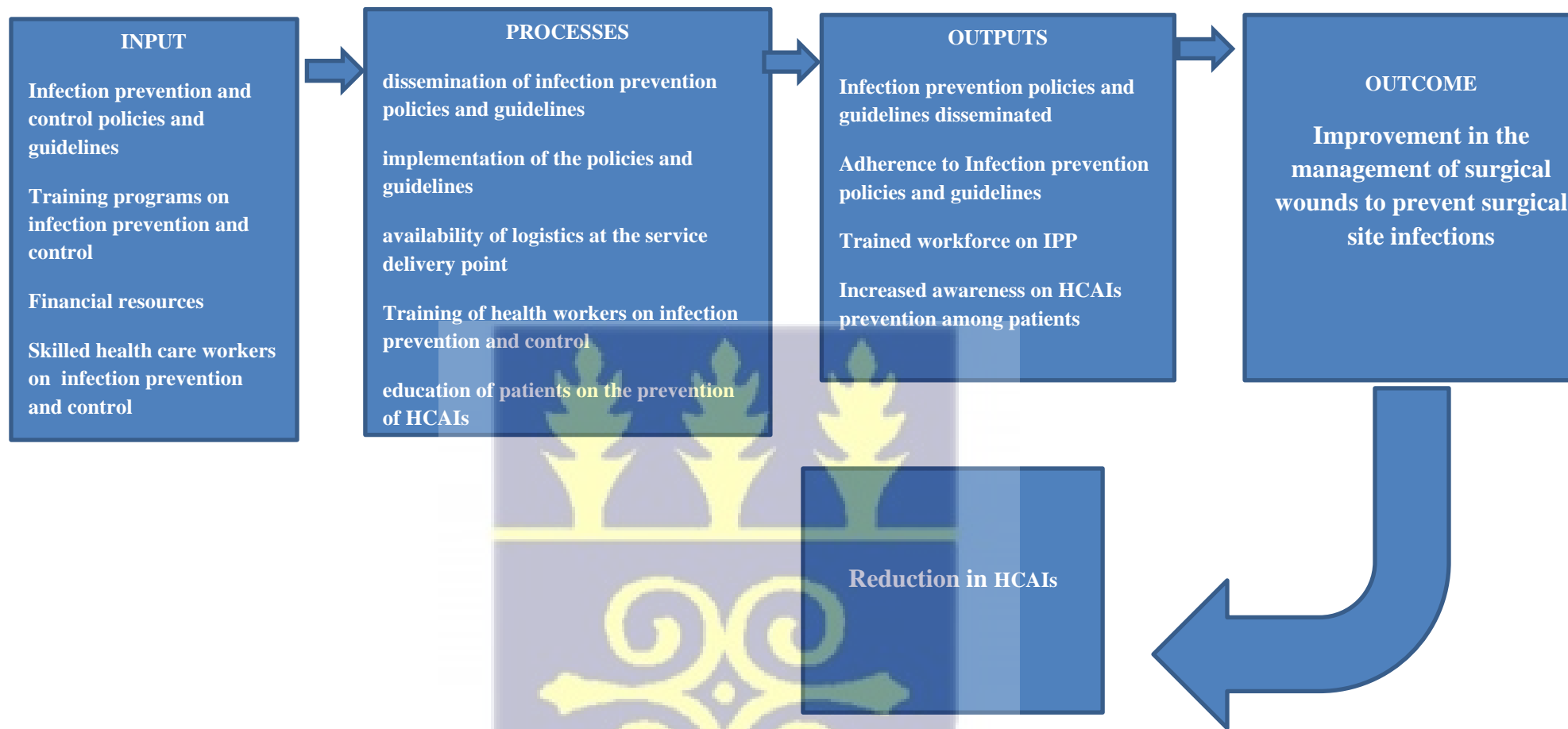
*Source: Author's construct, September, 2023.*



#### 4.3.2 Logic Model

The logic model is a visual representation that outlines the inputs, activities, output and outcomes and impact of a program or interventions. This model provides a structured representation of factors, Processes and outcomes related to the prevention of SSIs. Prevention of SSIs requires a multidisciplinary approach. Healthcare workers, Patients and governments at large. It requires the availability of input such as policies and guidelines, Skilled workforce, funding etc. to aid in the training of personnel, dissemination of policies and guidelines at the service to delivery point and ensuring health workers and patients compliance to these policies by periodically training the health workers and education of patients on measures to prevent these infections with the aim of preventing surgical site Infections.





**Figure 3: Logic Model**

*Source: Author's construct, September, 2023*



#### 4.4 Definition of Indicators

**Table 4.1: Performance Indicators of the Study**

<b>Performance Indicators</b>	<b>Definition of Indicators</b>	<b>Data Source</b>
Types of HCAIs identified during the study	The different types of HCAIs identified during the study	Semi-structure interviews
Percentage of study participants that had HCAIs.	$\frac{\text{Number of participants who had HCAIs}}{\text{Total number of participants interviewed}}$	Semi-structure interviews
Risk factors identified through the study	The number of risk factors of HCAIs identified through the study	Semi-structure interviews
Surgical site infections rate of Greater Accra Regional Hospital	$\frac{\text{Number of surgical site infections reported}}{\text{Total number of surgeries}}$	Facility annual report
HCAIs prevention and control guidelines identified during the study	The number of HCAIs prevention and control guidelines identified during the study	Semi-structure interviews
HCWs adherence to the guidelines employed to control and prevent surgical site infections	$\frac{\text{Number of HCWs who adhere to guideline}}{\text{Total number of HCWs interviewed}}$	Semi-structure interviews

*Source: Author's construct, February, 2023*



## CHAPTER FIVE

### RESULTS

#### 5.0 Introduction

The study's focus was about healthcare facility associated infections acquired during healthcare delivery from patient or healthcare staff or through contaminated equipment's, instruments, hands, bed linen or air droplets. Infection Prevention and Control (IPC) practices are basic requirements for all health facilities to reduce the morbidity and mortality associated with microbial agents and hence excellent patient outcome. Participants' experiences and feedback added insight to the research questions posed in this study. By listening to and analyzing the experiences of these patients, valuable information was obtained and grouped into three broad themes; knowledge and perceptions of Healthcare Associated Infections (HCAs) in general, respondents' response to the availability of IPC materials or services, and the measures put in place by the hospital management to control healthcare associated infections. These themes and sub-themes are documented in the study with supporting evidence through verbatim quotes from respondents, together with subject codes serving as identifying markers.

#### 5.1 Socio-Demographic Characteristics

The total study population consisted of 25 respondents, all of whom were selected from the Greater Accra Regional Hospital. This group comprised 15 adult patients who had experienced surgical site infections at the hospital, as well as 10 healthcare providers, including doctors, nurses, anesthetists, and orderlies, who worked in the surgical department. Out of the 25 respondents, 11 were male, and 14 were female, showing a slightly higher representation of females in the study. The age distribution among the participants varied, with the majority falling within the age range of 25 to 30 years. The second most represented age group consisted of respondents above 30 years.

The smallest age group in the study was individuals between 18 and 24 years. In terms of marital status, the majority of the participants were married, while the remaining were single. Participants had diverse educational backgrounds. Some had completed senior high school, while others had received at least basic education. The majority had completed tertiary education with diploma and degree certifications. The participants' current occupations or employment varied, and they included medical doctors, nurses, teachers, entrepreneurs, fashion designers, students, and others. Out of the 10 healthcare providers in the study, the majority worked for 6 to 8 hours daily, while the remaining group worked for 9 to 12 hours daily. In terms of years of service at the hospital, most had served for 5 to 10 years, while a smaller group had worked for more than 10 years.



**Table 5.1: Demographic characteristics of study population (n = 25)**

<b>Variable</b>	<b>Frequency N</b>	<b>Percentage %</b>
<b>Gender</b>		
Male	11	44
Female	14	56
<b>Age/Years</b>		
18 - 24	2	8
25 - 30	18	72
Above 30	5	20
<b>Marital Status</b>		
Single	8	32
Married	17	68
<b>Level Of Education</b>		
Primary/JHS	3	12
SHS	5	20
TERTIARY	17	68
<b>Job Category</b>		
Nurse	3	12
Medical Doctor	3	12
Anaesthetist	2	8
Lab Technician	2	8
Teacher	2	8
Students	3	12
Entrepreneur	4	16
Hairdresser/Fashion Designer	3	12
Trader	3	12
<b>Work Experience</b>		
Below 5 Years	2	20
5 - 10 Years	2	20
More Than 10 Years	6	60
<b>Hours Of Work Daily</b>		
6 - 8hrs	8	80
9 -12 Hrs	2	20

*Source: Fieldwork, February, 2023*

## 5.2 Knowledge and perceptions of healthcare associated infections (HCAIs)

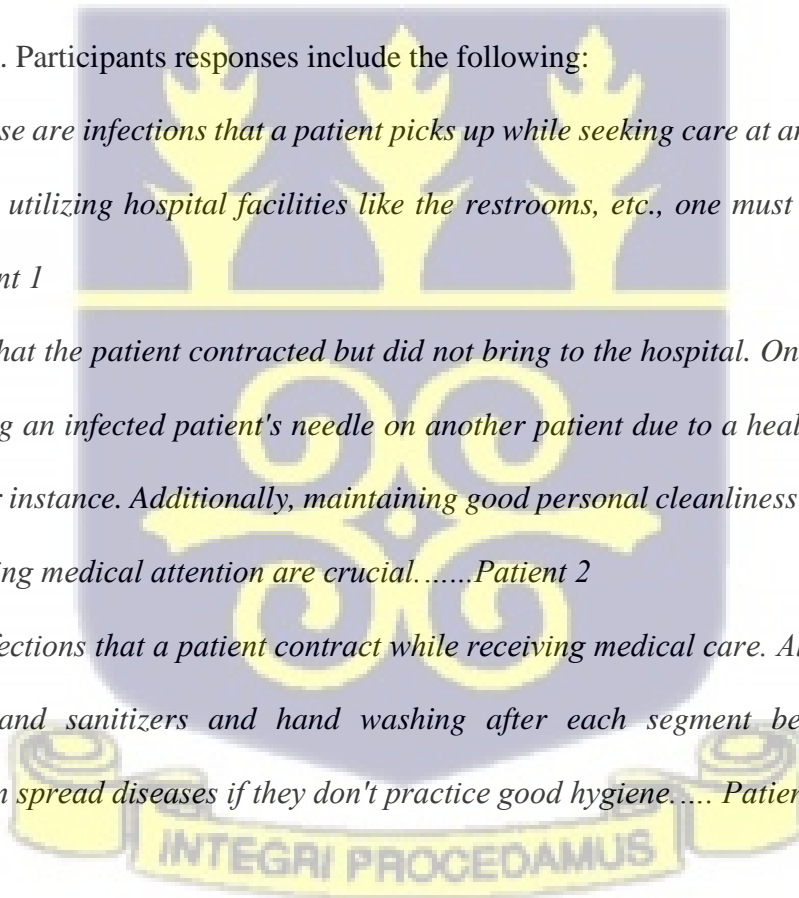
The first major theme that emanated from the analysis of the transcribed data was knowledge and adherence to the IPC guidelines. This theme first of all explored participants' knowledge of healthcare associated infections (HCAIs) and its associated self-care practices like protocols and guidelines. The theme also provides knowledge on the types of HCAIs among the study participants.

The participants exhibited their knowledge mostly based on their experience and education provided to them by their health care professionals when they visit them with such conditions. Several others also learned from the experiences of their relatives who had experienced such infections before. Participants responses include the following:

*... in essence, these are infections that a patient picks up while seeking care at any clinical facility. Therefore, while utilizing hospital facilities like the restrooms, etc., one must exercise personal hygiene.... Patient 1*

*.....Infection that the patient contracted but did not bring to the hospital. One may contract an infection by using an infected patient's needle on another patient due to a health care provider's forgetfulness, for instance. Additionally, maintaining good personal cleanliness and using caution whenever receiving medical attention are crucial. ....Patient 2*

*.....They are infections that a patient contract while receiving medical care. All I am aware of is the usage of hand sanitizers and hand washing after each segment because healthcare professionals can spread diseases if they don't practice good hygiene. .... Patient 3*



### 5.2.1 Respondents' understanding of Healthcare Associated Infections (HCAIs)

Participants (patients) were asked about their understanding and definitions of HCAIs, and it was stated as infections acquired at the hospital. All participants identified the hospital as a place where infections are acquired. This was followed by infection transmitted by medical equipment such as syringes, needles, catheters, stethoscope, and thermometers, A majority of the respondents said they knew how to prevent and control hospital acquired infections; however, they are familiar with healthcare acquired infections prevention guidelines. On the control of infections, all patients (n=15) agreed that transmission of hospital acquired infections can be prevented through personal hygiene. We found that participants who knew how to wash their hands properly according to the guidelines also had more knowledge for hospital-acquired infections.

Some of the participants shared their knowledge on HCAIs:

*...what I knew about HCAIs is "infections you didn't bring from the house but came to get at the hospital while going through treatment"..... Patient 1*

*...I can get it through "infected patients and tools that healthcare workers used. Also, contaminated hands of staff during normal clinical activities and can then be transferred to other patients" .... Patient 3*

### 5.3.2 Familiar with Hospital Acquired Infection Prevention Guidelines

The study respondents (patients and healthcare workers) were asked about their awareness and familiarity with hospital acquired infection prevention guidelines, Mparticipants reported that the knowledge they have about (HCAIs) is mainly infections acquired at the hospital and personal hygiene is the only prevention measures they are aware of. Generally, the majority of the participants practice personal hygiene, importantly hand washing after every section at every unit. Furthermore, almost all of the patients reported using water with soap as a method of hand hygiene whenever they visit the hospital, and this is the easiest and accessible prevention method. Also, all

the participants (patients) agreed that infections can be transmitted by medical equipment such as syringes, needles, catheters, stethoscope thermometers etc.

Participants responses include the following:

*...she knew it was “practicing of personal hygiene and their risk of acquiring HCAs is very high. Also, HCAs can be transmitted through medical instrument ” ... Patient 4*

*...one thing I am very particular about is “whenever I visit the hospitals washrooms, I make sure I used tissue to clean the toilet sit after which I wash my hands with soap. Also, I sanitized my hand after every surface I touch and when am totally done, I wash my hands with soap and water before I leave the facility” ..... Patient 1*

*...I can get it through “infected patients and tools that healthcare workers used. That is contaminated hands of staff during normal clinical activities and can then be transferred to other patients” .... Patient 6*

It is found out that all staffs and patients should be considered potentially infectious regardless of their diagnosis. All the participants/patient indicated “that everybody is a suspect and can be a carrier of an infection”. (include source of this quote and also include some quotes from the healthcare workers as well.)

### **5.3.3 Following Protocols and Guidelines**

Patients’ response to the availability of Infection Prevention Control (IPC) materials or services. The study inquired about the facility's availability of Infection Prevention Control (IPC) resources or services. Under this checklist, 6 items were examined with regards to the availability of IPC materials. Levels of availability of IPC materials were investigated. The IPC material was either always available or sometimes available or not available.

According to all participants (patients), safety boxes for disposal of used syringes and needles were always available as well as detergents for decontamination of used instruments. Hand

washing items especially water and soap were always available but the least available IPC material according to the patients was hand sanitizers which was not available to patients. Also, there are personal protective equipment's for use on the ward but they are not always available. In response to questions on what PPE the hospital provides for usage during procedures, it was discovered that the facility provides masks, aprons, lab coats, safety boots, and goggles to patients for used at the ward. According to the participants, the majority of the either actually rarely utilize or occasionally use personal protection equipment. According to the patients, there is no instruction or training provided for patients on infection control measures outside of their own personal hygiene, which they practice whenever they visit the hospital, regarding in-service training/workshops connected to infection prevention and control. **Table 3:**



**Table 5.2: Respondents’ response on availability of IPC materials**

IPC Materials	Response	Frequency (n)	Percentages (%)
Hand washing materials e.g water and soap	Not always available	0	0
	Sometimes available	0	0
	Always available	15	100
Hand sanitizers	Not always available	7	47
	Sometimes available	8	53
	Always available	0	0
Personal protective equipment’s for use on the ward	Not always available	0	0
	Sometimes available	4	27
	Always available	11	73
How often do you use the personal protective equipment	Always	4	27
	Occasionally	6	40
	Rarely	3	20
	Not at all	2	13
Safety boxes for disposal of used syringes and needles	Not always available	0	0
	Sometimes available	0	0
	Always available	15	100

*Source: Fieldwork, February, 2023*



#### 5.3.4 Adherence to IPC policies

Five items of standard precaution were used in observing healthcare worker compliance to IPC. These standard precautions were: hand hygiene, wearing of gloves, wearing of facemask, use of apron or gown and sharps management. Each standard precaution item had questions which were all positively worded of which 'Yes' meaning wearing of gloves, wearing of facemask, use of apron or gown etc were in section while 'No' scores were no wearing of gloves, facemasks, use of aprons or gown etc. Respondents' response to hand hygiene practice shows that hand hygiene after patient contacts was reported hundred percent for all respondents and this practice is in line with recommendation from World Health Organisation (WHO) which are before touching a patient, after body fluid exposure or risk, after touching a patient, before clean/aseptic procedures and after touching patient surroundings. Meanwhile only few (n=5) of the patient agreed to hand hygiene before patient contact, this is not good compared to hundred percent hand hygiene after patient contact. Otherwise, more than half of the respondents' do not wash their hands before taking care of patients, this is out of line with WHO recommendation on hygiene. Hand hygiene before glove use recorded 'Yes' for 4 patients of the total responses, this is low and a poor practice. Meanwhile hand hygiene practice after wearing gloves was well practice by most of the respondents and this is higher. In this current study at the Ridge Hospital, all the respondents' said hand washing items such as water and soap were always available. This is very good since hand hygiene compliance will be positive relatively to the availability of IPC materials.

The participants' experiences showed that most of them (healthcare workers) do follow the hand hygiene practice.

*“...healthcare workers mostly washed their hands after touching a patients but not before touching a patients. They do wash their hands after body fluid exposure, also after coming in contact with contaminated equipment”..... Patient 2*

*“... they follow almost all the hand hygiene protocols such as washing of hand before and after touching a patient, also after wearing a glove or coming into contact with contaminated equipment or surfaces”..... Patient 3*

#### **5.4 Knowledge, Types and Perceptions of Healthcare Associated Infections (HCAIs)**

This study assessed the knowledge and practices of healthcare professionals regarding hospital-acquired infections in surgical clinics and to investigate the factors influencing their compliance with guidelines.

These are infections acquired at the hospital. A patient might come with an infirmity or condition, but healthcare associated infections are infections that a patient picked from the facility (HCW 1). The majority (n = 10) of the respondents identified the hospital as a source of nosocomial infection. It was said that nosocomial infection can be transmitted by medical equipment such as syringes, needles, catheters, stethoscope, and thermometers, etc. In this study, all the respondents (staffs) identified the hospital as the main source of nosocomial infection. They all agreed that staff and patients should be considered potentially infectious regardless of their diagnosis and knew how to prevent and control hospital-acquired infections. All health workers interviewed (n= 10, 100%) said they knew how to prevent and control hospital acquired infections and were familiar with health acquired infections prevention guidelines. According to the study, the healthcare workers were aware of the World Health Organisation (WHO) “five moments of hand hygiene which are before touching a patient, after body fluid exposure or risk, after touching a patient, before clean/aseptic procedures and after touching patient surroundings. Majority (n= 6) agreed that there

is an infection control team, but they were not active until the COVID-19 pandemic era. The COVID-19 became the eye opener because they did not have the idea with regards to presence or absence of an infection control team in the hospital even though it exists.

Some of the participants shared their knowledge and perceptions about HCAs:

*.....the commonest one as far as theatre is concern is ‘surgical site infections. The most vulnerable staffs are those working at the emergency wards because of the nature of their work, people turn to forget about the basic infection controls’.....* **Healthcare worker 1**

Another participant also said:

*....commonest one, we can have ‘UTI, by passing catheter, pneumonia. During the time of COVID we could see there was an increase in the number, because there is a focus on infections. Those vulnerable will be basically patients but if you don’t adhere to the rules and practices in the hospital such as not following the hygienic instructions’.....* **Healthcare worker 2**

*.....the common types of HCAs are ‘needle prick, blood splash. There is no increase in a number of cases. The most vulnerable are patient with underlining conditions like cancer, HIV/AIDS, Hepatitis B and emergency staffs are most vulnerable because there is no time for laboratory investigation’.....* **Healthcare worker 3**

Other participants reported that *.....‘HCAs are infections healthcare workers are likely to transmit to patients. There is no increase in a number of cases, unlike COVID where there are awareness, testing etc. The common types that reported are bloodstream infections and wound infections. The vulnerable are the aged and those with chronic diseases’.....* **Healthcare worker**

**4**

*.....for those vulnerable are ‘the patients, health staffs and patients relatives. The common types of HCAs in terms of specific examples by way of etiology are Pseudomonas aeruginosa like cocus*

*infections but if it is by way of the symptoms affected by surgical site infections, they are pneumonia, respiratory tract infections. For an increase in a particular cases, not that am aware of”.....**Healthcare worker 5***

*.....when I think about healthcare associated infections, am thinking “about nosocomial infections, that is infections you get whiles seeking for treatment at the hospital or at the ward whiles on admission. In regards to surgical site infections, we try as much as possible to prevent them and there are no increase in a particular infections at the ward. We also try to maintain aseptic conditions”..... **Healthcare worker 6***

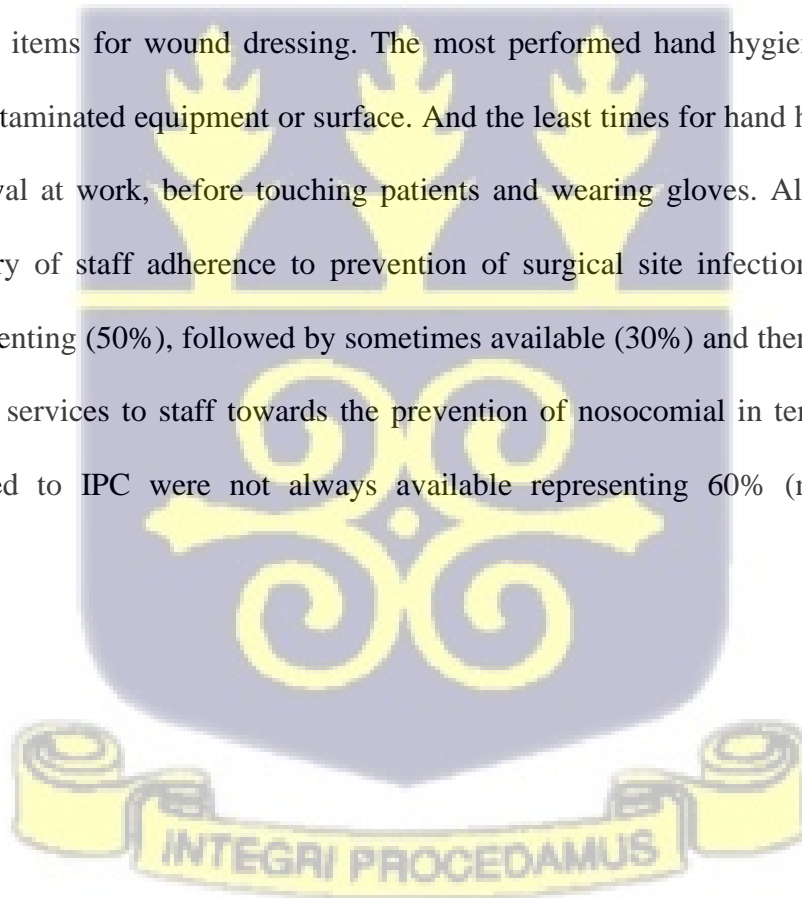
### **5.5 Following Protocols and Guidelines**

To prevent nosocomial infection, it is very important to know the mode of transmission. There are various modes of transmission and some of them are direct contact, indirect contact, airborne, droplets, and common vehicle etc. This can be transmitted through direct contact with infected person skin or through contaminated surfaces such as door handles, towels, benches and taps. Healthcare workers’ confirmed the availability of Infection Prevention Control (IPC) materials or services. Thus, the availability of such materials or services at the facility.

All the health workers interviewed stated that they were trained in disease transmission and control during their professional training and were given clear work procedures and guidelines in their job category. Moreover, all interviewed staffs (n=10) know how to prevent and control hospital acquired infections. The health workers strongly believed that policies and procedures for infection control should be adhered to at all times. The study shows that it is the responsibility of both health workers and patients to comply with the hospital acquired infection guidelines, that is the workload does not affect their ability to apply infection prevention guidelines. According to the staffs, following the prevention guidelines will reduce rates of hospital acquired infections. Furthermore,

50% of respondents agreed that the hospitals do not regularly organize in-service workshops or training sessions on infection prevention and control.

With regards to the availability of IPC materials. The IPC material was either always available or sometimes available or always available. According to the healthcare workers, (n= 10) safety boxes for disposal of used syringes and needles were always available as well as detergents for decontamination of used instruments. On hand washing materials such as water and soap almost all the respondents indicated they were always available whereas hand sanitizers were not always available according to most of the total respondents. Also, there are personal protective equipment's for use on the ward e.g boots, goggles, gloves, aprons etc., they were always available including sterile items for wound dressing. The most performed hand hygiene time was after contact with contaminated equipment or surface. And the least times for hand hygiene was: hand hygiene on arrival at work, before touching patients and wearing gloves. Also, availability of hospital monitor of staff adherence to prevention of surgical site infection was not always available, representing (50%), followed by sometimes available (30%) and then always available (20%). Hospital services to staff towards the prevention of nosocomial in terms of training or workshop related to IPC were not always available representing 60% (n=6) of the total respondents.



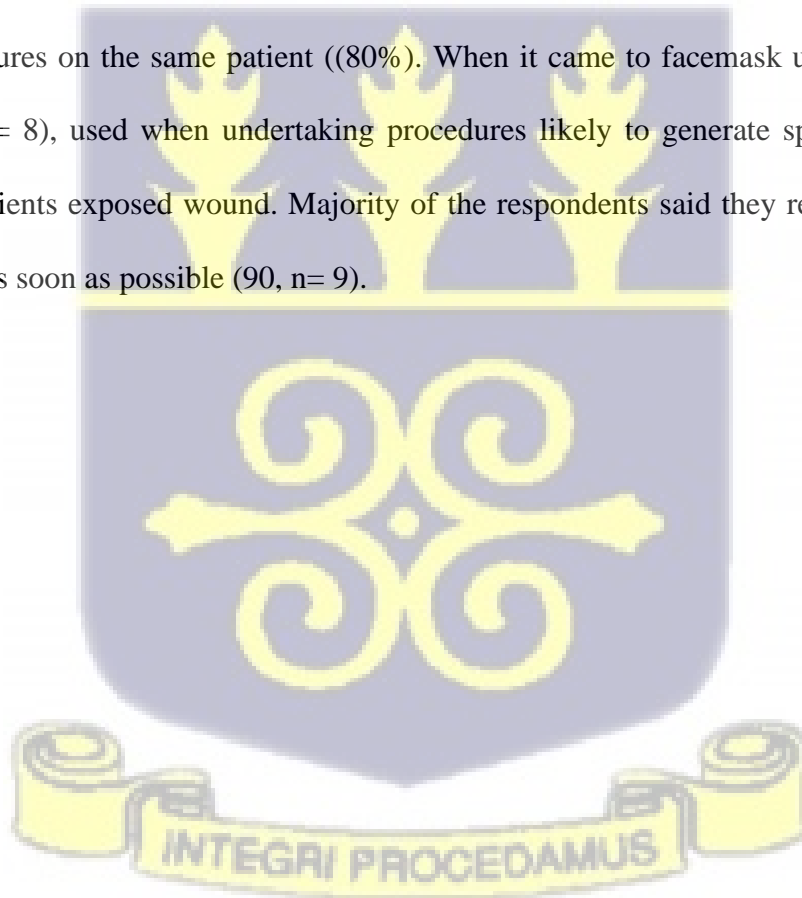
**Table 5.3: Healthcare workers’ response on availability of IPC materials and infection preventions**

IPC Materials	Response	Frequency (n)	Percentages (%)
Hand washing materials e.g water and soap	Not always available	0	0
	Sometimes available	0	0
	Always available	10	100
Hand sanitizers	Not always available	7	70
	Sometimes available	2	20
	Always available	1	10
Sterile items for wound dressing	Not always available	0	0
	Sometimes available	0	0
	Always available	10	100
Personal protective equipment’s for use on the ward	Not always available		
	Sometimes available	10	100
How often do you use the personal protective equipment	Always	10	100
	Occasionally	0	0
	Not at all	0	0
Safety boxes for disposal of used syringes and needles	Not always available	0	0
	Sometimes available	0	0
	Always available	10	100
Detergents for decontamination of used instruments	Not always available	0	0
	Sometimes available	0	0
	Always available	10	100
In-service training/workshop related to infection prevention measures	Not always available		50
	Sometimes available	4	40
	Always available	1	10
Hospital monitoring of staffs adherence	Not always available	5	50
	Sometimes available	3	30
	Always available	2	20

Source: Fieldwork, February, 2023

## 5.6 Operation Room Checklist for IPC

Five items of standard precaution were used in observing healthcare worker compliance to IPC. These standard precautions were: hand hygiene, wearing of gloves, wearing of facemask, use of apron or gown and sharps management. From the responses, there was 100 percent availability of sterile items for wound dressing (e.g., gloves, gauze, lotion, etc.) and safety boxes for sharps disposal items. Healthcare professionals' response to hand hygiene practice shows that hand hygiene after patient contacts was reported hundred percent for all respondents. With regards to gloves use, the most situations when the glove is used are changing gloves between patients' contacts (100%, n= 10) and the least situations when gloves are used is changing gloves between different procedures on the same patient ((80%). When it came to facemask use, facemask was mostly (80%, n= 8), used when undertaking procedures likely to generate splashes as well as dealing with patients exposed wound. Majority of the respondents said they remove soiled /wet gown or apron as soon as possible (90, n= 9).



**Table 5.4: Operation room checklist variables and their response**

Variable	Response	
	No	Yes
Operation Room items	No	Yes
All areas & surfaces are clean dry & dust free	0	10
Scrub facilities are available & well located	0	10
Mask is worn throughout the operation	2	8
Remove soiled /wet gown or apron as soon as possible	1	9
Pre-operative hair removal; if needed is to be done in the least possible skin area; as close as possible from operating time (not more than 2 hours).	0	10
Pre-operative skin antiseptics is achieved by the use of the proper antiseptic and being left over the skin for spontaneous drying.	0	10
Dirty instruments and waste are properly handled and transported	0	10
Only the required surgical team is present in the operating room during the procedure.	6	4
The team does not remove surgical attire until the wound has been dressed and the risk of contact with bloody drapes had been eliminated	4	6
Surgical attire is taken off; gloves are the first to be taken off; hands and forearms are washed	2	8

*Source: Fieldwork, February, 2023*



## 5.6 Mode of Transmission

Knowledge on the mode of transmission is crucial to the prevention of HCAs. Some common modes of transmission of HCAs includes airborne, contact with contaminated surfaces, droplet among others. HCAs are infections that occur during the process of care that were not present or incubating at the time of admission. Microorganisms are found in many places, including air, soil, water, and our bodies. According to the first participants....

*.....nosocomial infections can be transmitted by “medical equipment because if patients A who has a viral disease like HIV or Hepatitis B and was injected whereas same needle is used to injects patients B, then you will be transmitting a disease to patients B. Also, when you catheterised a patient you are supposed to take care of the catheter and we call that catheter care, if you don’t care for the catheter the patients may get UTI through the catheter. Recommendations such as easy access to the washing area, instrument, the theatre zones could also help implementing surgical site infections”..... **Healthcare worker 1***

*.....“Vulnerable patients, such as those in intensive care units and those with invasive devices, are at a higher risk of developing an HCAI. Some of them are helpful, but others can be harmful and cause infections”.....**Healthcare worker 5***

This was evidenced in the statement by **Healthcare worker 2:**

*.....surgical site infection measures instituted in this facility: 1. “Those coming for surgery are giving antibiotics of fluxes especially the cesarean section skin is prepared by using antiseptics solution and if we are suppose to do shaving, we shave them close to the time of the procedure, so that cut through razors will not develop infections. And also strict handwashing protocols are adhered to, we sterilized all our instruments that we use. Also as far as anesthesia is concerned*

*face masks and other things used are also decontaminated immediately to prevent transmission to the next person”.....*

### **5.6.1 Infection Prevention and Control**

Infection prevention & control is vital in healthcare to reduce infections, ensure quality care & promote patient safety. Through the use of infection prevention practices in healthcare settings, there have been several attempts throughout the years to guarantee a secure environment for effective and efficient healthcare delivery at the Greater Accra Regional Hospital (Ridge).

Some participants shared the following views:

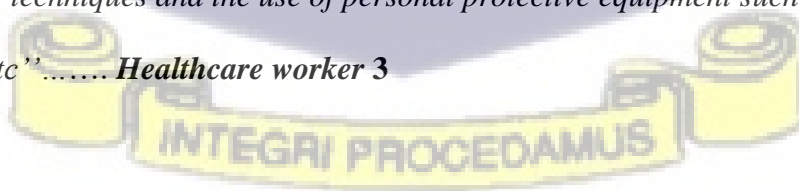
*.....Some of these initiatives resulted in “the creation of guidelines, procedure manuals, and other associated training materials and programs in all aspects of our healthcare facilities. Hand hygiene is not limited to healthcare providers alone but patients and all hospital visitors”.....*

#### **Healthcare worker 4**

Other respondents stated that they adopted certain positive lifestyles based on their knowledge of the HCAs. This mostly had to do with hand hygiene and education

*.....Hand hygiene can be done with “alcohol-based formulation or with water and soap. Infection prevention and control education and training should be directed towards all categories of healthcare staffs. All healthcare workers must have adequate knowledge with regards to the mode of infection transmission and various ways of breaking infection circle including knowledge on hand washing techniques and the use of personal protective equipment such as gloves, gowns, mask, goggles, etc”.....*

#### **Healthcare worker 3**



## CHAPTER SIX

### DISCUSSION

#### 6.0 Introduction

This chapter contains a discussion of the study results in relation to existing literature. In this study, the knowledge, and practices of healthcare professionals regarding Healthcare-Associated Infections (HCAIs) acquired in surgical wards at the Greater Accra Regional Hospital (RIDGE) were investigated. It involves a comparison of the results with other studies. The study sought to evaluate the implementation of policies and measures in the prevention and control of healthcare infections Greater Accra Regional Hospital. The themes include demographic characteristic of respondents, knowledge of respondents on Infection Prevention Control (IPC), respondents' attitude towards IPC, availability of materials for IPC compliance, compliance of respondents towards IPC and observational studies for IPC compliance at the surgical wards.

#### 6.1 Knowledge and perceptions of Healthcare Associated Infections (HCAIs)

The first major theme that emanated from the analysis of the transcribed data was knowledge and adherence to guidelines. This theme first explored participants' knowledge of healthcare associated infections (HCAIs) and its associated self-care practices like protocols and guidelines. The study shows that all patients were aware and knew very well that (HCAIs) are infections acquired at the hospital and are familiar with prevention guidelines. Majority (80%) of the respondents said they knew how to prevent and control hospital acquired infections. On the control of infections, all patients (n=15) agreed that transmission of hospital acquired infections can be prevented through personal hygiene. The participants exhibited their knowledge mostly based on their experience and education provided to them by their health care professionals when they visit

them with such conditions. Several others also learned from the experiences of their relatives who had had such infections before. They also agreed that all staffs and patients should be considered potentially infectious regardless of their diagnosis and knew how to prevent and control hospital-acquired infections.

According to the healthcare workers, HCAs are infections acquired at the hospital, a patient did not bring, a patient might come with an infirmity or condition, but healthcare associated infections are infections that a patient picked from the facility. All the participants (staffs; n=10) identified HCAs as a hospital infection. The WHO (2016) also refers to HCAs as a nosocomial or hospital infection and explains it is an infection which ensues in a patient in the course of receiving care in a hospital or any health condition, which incidentally was not existing or nurturing at the time of admission. It was said that nosocomial infection can be transmitted by medical equipment such as syringes, needles, catheters, stethoscope, and thermometers, etc. In this study, all the respondents (staffs) identified the hospital as the main source of nosocomial infection. The study also shows that the patients have a fair knowledge about HCAs as infections that a patient picks up while seeking care at any clinical facility, which indicates that both healthcare workers and patients had some knowledge about HCAs. These findings are consistent with other studies Chan et al., 2002; Nofal et al., 2017; Sessa et al., 2011; Stein et al., 2003; Wasswa et al., 2015), which showed that most of respondents knew about the knowledge and perceptions about HCAs. Also, almost all participants (90%) reported that the most important method for preventing HCAs is the education of healthcare professionals and patients. This indicates that they recognize the importance of this knowledge and the need to participate in training programs to have an upgrade of knowledge.

According to the study, most of the respondents knew about the WHO's "five moments of hand hygiene" which is a tried-and-true method that is acceptable and practical for hand hygiene in all

healthcare settings and that every healthcare professional should be aware of. According to the Infection Control Africa Network (ICAN), HCWs' attitudes and behavioral patterns continue to encourage the spread of HCAs in Africa (Benjamin E et al, 2011).

In order to establish sustainable healthcare systems at the national and facility levels, IPC has been strengthened in the wake of emerging diseases like Ebola virus disease (EVD) and Coronavirus disease 2019 (COVID-19). Therefore, majority (n= 6) of the study participants agreed that there is an infection control team, but they were not active until the COVID-19 pandemic era. The COVID-19 became the eye opener because they do not have idea with regards to presence or absence of an infection control team in the hospital even though it exists.

## **6.2 Types of HCAs at the Greater Accra Regional Hospital (GARH)**

In response to the types of Healthcare-Associated Infections (HCAs) at the Greater Accra Regional Hospital (GARH), the participants shared their observations. The most common HCAI reported, particularly within the theater environment, was surgical site infections. It was noted that staff working in the emergency wards were particularly vulnerable to these infections due to the nature of their work. The urgency of emergency cases often led to lapses in basic infection prevention controls. This observation aligns with existing research. Rothe et al. (2013) had previously reported that HCAs are widespread in sub-Saharan Africa, with surgical site infections being a predominant concern. Seidelman and Anderson (2021) have also highlighted that surgical site infections are the leading cause of HCAs. Furthermore, the study participants mentioned other types of HCAs, including needle pricks, blood splashes, bloodstream infections, and wound infections. These findings resonate with the work of Nachman et al. (2020), which identified surgical site infections as the most predominant and frequent HCAs, followed by bloodstream infections, urinary tract infections, respiratory tract infections, and device-associated infections.

It's worth noting that the World Health Organization (WHO) (2016) has emphasized the persistence of surgical site infections, especially in high-volume surgical settings in the United States. Additionally, literature by Brenner and Nercelles (2016) has pointed out that HCAs may encompass a range of conditions, including pneumonia, bloodstream infections, urinary tract infections, and wound infections. To put the prevalence of surgical site infections into perspective, Seidelman and Anderson (2021) noted that these infections occur in a significant percentage of surgical procedures, ranging from 1% to 30%. This high incidence is particularly notable in low- and middle-income nations.

### **6.3 Factors associated with Surgical Site Infections on patients in the Greater Accra Regional Hospital?**

One of the primary objectives of healthcare systems is to provide quality and safe care, in which the reduction of hospital-acquired infections, which are an indicator of the quality of health services provided, plays a key role, as their existence indicates a failure to provide protection against infectious agents.

However, SSIs are more common among healthcare workers at most referral hospitals just as the Greater Accra Regional Hospital (RIDGE). Further, since it is a regional and a referral hospital the level of risk is significantly higher than in smaller facilities. According to staff at the surgical ward, risk factors associated with SSIs on patients in the Greater Accra Regional Hospital shows that out of every 1 to 15 operations, SSIs occur in 2 of patients that undergo surgery. Long procedures and deficiencies in the surgical scrub or the antiseptic skin preparation are two surgical risk concerns. Physical conditions including trauma, shock, blood transfusions, hypothermia, etc. enhance the risk of SSI. Additionally, it was discovered that diabetic patients had a greater risk of acquiring SSI following foot and ankle surgery. According to Hassan et al (2020), long hospital

stays, obesity, the length and complexity of a surgical treatment, patient co-morbidities, and higher wound contamination classification are all acknowledged risk factors for SSIs, These categories included risk factors related to the patient, risk factors related to the different types of surgical procedures, and risk factors related to the operating room or theater environment.

#### **6.4 Control and Prevention of HCAs in the Greater Accra Regional Hospital.**

Hand transmission is one of the most important methods of spreading infectious agents in healthcare facilities. According to Mathur, (2011), the most efficient, easiest and least cost method of infection prevention in a healthcare setting is hand hygiene. All the participants in this current study also agreed that transmission of hospital acquired infections can be prevented through personal hygiene. Majority reported that they practice personal hygiene, importantly hand washing after every section at every unit. Therefore, adherence to infection prevention and control protocols is critical at minimizing healthcare workers' exposure to surgical site infections. Moreover, respondents' response to hand hygiene practice shows that hand hygiene after patient contacts was reported (100%) for all respondents and this practice is in line with recommendation from the World Health Organization (WHO). Meanwhile only 33% (n=5) of the respondents reported hand hygiene before patient contact, this is not good compared to (100%) hand hygiene after patient contact meaning 67% of the respondents' do not wash their hands before taking care of patients. Hand hygiene before glove was also poorly practiced by the healthcare staff (26%) and this is low. However, 87% of healthcare staff practiced hand hygiene after wearing gloves.

According to all participants, there are safety boxes for disposal of used syringes and needles as well as detergents for decontamination of used instruments. Hand washing items, especially water and soap were always available but the least available IPC material according to the study was hand sanitizers which are not always available. Personal protective equipment (PPE) for use on

the ward, such as boots, goggles, lab coats, safety boots, gloves, aprons, etc., was also always available. Additionally, sterile items for wound dressing (such as gloves, gauze, lotion, etc.), as well as safety boxes for the disposal of sharps, were always available. Additionally, sterile gloves are used in surgical wards to lessen the spread of germs from the surgical team's hands to patients, prevent infection of team members by patients, and shield them from contamination by patients' blood and other fluids. (relate this to any existing literature)

The study revealed that the most performed hand hygiene time was after contact with contaminated equipment or surface. And the least times for hand hygiene was hand hygiene on arrival at work, before touching patients and wearing gloves. Also, availability of hospital monitoring of staff adherence to prevention of surgical site infection was not always available, representing (50%), followed by sometimes available (30%) and then always available (20%).

Most (n=6) of the health workers interviewed reported that training or workshop related to IPC were not always available. Others agreed that there are no serious in-service training/workshop related to infection prevention and control regularly. According to participants, the education of healthcare professionals, was found to be the most effective method for preventing hospital-acquired infections. This finding suggests that participants understand the significance of this knowledge and the need to take part in training programs in order to have their knowledge upgraded. Studies showing that healthcare personnel value attending seminars to improve their knowledge and attitudes about preventing hospital-acquired infections have supported these findings (Donati et al., 2019; Luo et al., 2010; Nofal et al., 2017; Sessa et al., 2011). Other studies have also reported that workers that take part in training programs exhibit higher levels of adherence to clinical practice recommendations (Chan et al., 2002; Donati et al., 2019). Additionally, the lack of relevant educational programs results in a lack of communication of vital

information, education, and promotion of the significance of following procedures, which encourages personnel to engage in risky actions that endanger both themselves and patients.

With gloves use, the most situations when the glove is used are changing gloves between patients' contacts (100%,) and the least situations when gloves are used is changing gloves between different procedures on the same patient (80%). These findings support previous studies which reported that personnel typically do not always use gloves, and compliance is typically only high when handling high-risk cases like HIV patients (Ganczak & Szych, 2007; Gershon et al., 1995; Parmeggiani et al., 2010). Facemasks are mostly (80%, n= 8), used when undertaking procedures likely to generate splashes as well as dealing with patients exposed wound.



## CHAPTER SEVEN

### CONCLUSION AND RECOMMENDATIONS

#### 7.0 Introduction

This chapter comprises of two sections. The first section presents the conclusion of the study in relation to the characteristics of respondents' and the set objectives. The second section presents key recommendations for different stakeholders.

#### 7.1 Conclusion

This study revealed that almost all the participants, both healthcare providers and patients, were knowledgeable about HCAs. All participants were aware and knew very well that (HCAs) are infections acquired at the hospital and are familiar with prevention guidelines. Also, majority of the respondents said they knew how to prevent and control hospital acquired infections. On the control of infections, all patients agreed that transmission of hospital acquired infections can be prevented through personal hygiene.

In this study, all of the study's health workers stated that they were trained in disease transmission and control during their professional training and were given clear work procedures and guidelines in their job category.

Moreover, all the respondents identified the hospital as the main source of nosocomial infection. They all agreed that staffs and patients should be considered potentially infectious regardless of their diagnosis and knew how to prevent and control hospital-acquired infections. It was said that nosocomial infection can be transmitted by medical equipment such as syringes, needles, catheters, stethoscope and thermometers, etc.

Lastly, the health workers strongly believed that policies and procedures for infection control should be adhered to at all times. The study shows that it is the responsibility of both health workers and patients to comply with the hospital acquired infection guidelines, that is the workload should not affect their ability to apply infection prevention guidelines.

## **7.2 Recommendations**

The following recommendations are addressed to the following organizations: The Greater Accra Regional Hospital and the Ministry of Health (MOH).

### **7.2.1 Greater Accra Regional Hospital**

An extremely active and effective infection prevention and control committee must be established by management of the hospital. Monitoring hand hygiene training and compliance is necessary. This will aid in tracking staff adherence to IPC and hospital-wide nosocomial infection rates.

At least twice a year, specialized infection control training needs to be conducted for hospital employees, especially those in the surgical department, to help them remember the risks they are already aware of because they are accustomed to their jobs and do not follow control procedures.

For IPC compliance, management of the hospital should make IPC resources like manuals and posters, personal protective equipment, etc., available to staff members.

To ensure that all HCWs are protected during all tasks and operations, the hospital administration should provide sufficient and suitable PPE. When handling bodily fluids like as blood, excretions, secretions, etc., it is required to wear clean gloves as well as a face mask during operations or patient care activities that are anticipated to produce splashes.

### **7.2.2 Ministry of Health (MOH)**

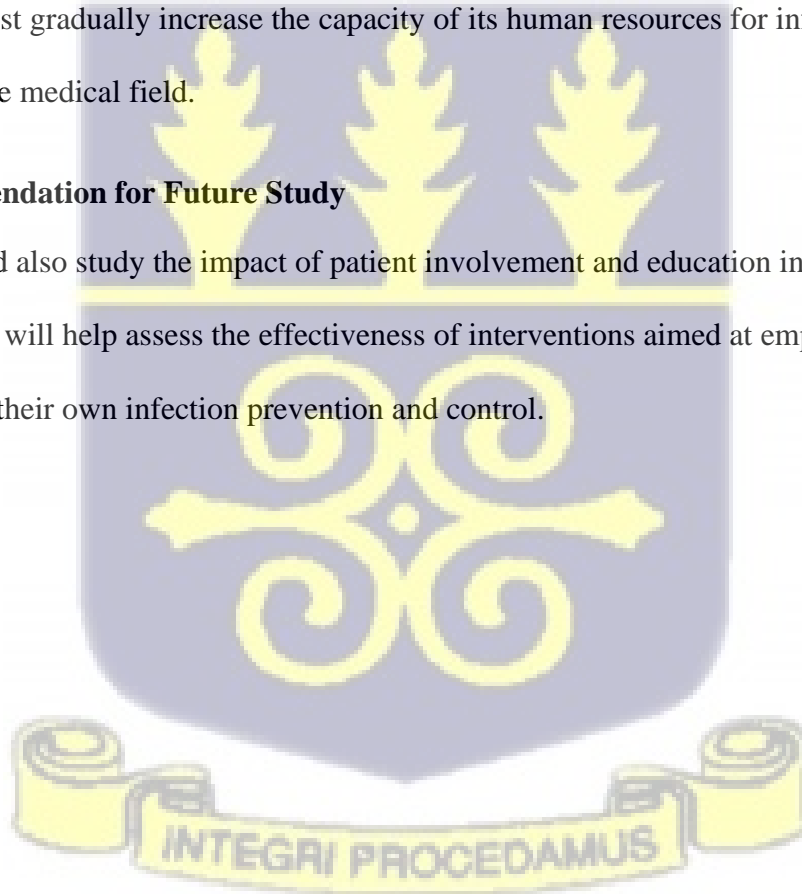
The Health Ministry is responsible for ensuring that healthcare facilities comply with IPC by establishing a monitoring team that will check to see if the management of healthcare facilities is providing the necessary IPC materials and if the personnel is complying with IPC.

The ministry must insist that all health programs' curricula incorporate IPC training. By addressing biological risk, defining preventative measures, and creating connections with other occupational health activities and programs, the ministry must also make sure that all health care professionals are safeguarded against occupational exposure.

The ministry must gradually increase the capacity of its human resources for infection prevention and control in the medical field.

### **7.2.3. Recommendation for Future Study**

Researcher could also study the impact of patient involvement and education in infection prevention. This will help assess the effectiveness of interventions aimed at empowering patients to participate in their own infection prevention and control.



## REFERENCES

- Alhassan, A. R. (2020). Nurses hand hygiene compliance: an observational study in Tamale teaching Hospital, Ghana. *ARC Journal of Nursing and Healthcare*, 6(2), 28-34.
- Ali S, Birhane M, Bekele S, Kibru G, Teshager L, Yilma Y, Ahmed Y, Fentahun N, Assefa H, Gashaw M, Gudina EK. Healthcare associated infection and its risk factors among patients admitted to a tertiary hospital in Ethiopia: longitudinal study. *Antimicrobial Resistance Infection Control*. 2018; 7 (1):2.
- Allegranzi B, Bischoff P, de Jonge S, et al. New (WHO) Recommendations on Preoperative Measures for Surgical Site Infection Prevention: An Evidence-Based Global Perspective. *Lancet Infect Dis* 2016; 16(12):e276–87. doi: 10.1016/S1473-3099(16)30398-X.
- Annual epidemiological report: Reporting on 2011 surveillance data and 2012 epidemic intelligence data. ECDC. 2013
- Bahegwa, R. P., Hussein, A. K., Kishimba, R., Hokororo, J., German, C., Ngowi, R., ... & Ngasala, B. (2022). Factors affecting compliance with infection prevention and control standard precautions among healthcare workers in Songwe region, Tanzania. *Infection prevention in practice*, 4(4), 100236.
- Brink A, Feldman C, Duse A, et al., Guideline for the Management of Nosocomial Infections in South Africa. *S Afr Med J* 2006; 96: 642-652.
- Bryman, A., (2011). Research methods in the study of leadership. *The SAGE handbook of leadership*, pp.15-28.
- Centers for Disease Control and Prevention. Surgical Site Infection (SSI) Event; 2018. Available from: <https://www.cdc.gov/nhsn/pdfs/pscmanual/9pscscscurrent.pdf>. Accessed September 2, 2018
- Centre for Disease Control and Prevention (CDC) 2019. Healthcare Associated Infections: Data Statistics
- Creswell, J.W. and Creswell, J.D., (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- Crowe B, Payne A, Evangelista PJ, et al. Risk factors for infection following total knee arthroplasty: a series of 3836 cases from one institution. *J Arthroplasty*. 2015; 30:2275-2278
- E. Patchen Dellinger. 2012. Surgical Site Infections. In: Elaine C. Jong, and Dennis L. Stevens, editors. *Netter's Infectious Diseases* 1st ed. Philadelphia: Elsevier Saunders; 2012:295–298

- Hikata T, Iwanami A, Hosogane N, et al. High preoperative hemoglobin A1c is a risk factor for surgical site infection after posterior thoracic and lumbar spinal instrumentation surgery. *J Orthop Sci.* 2014; 19:223-228.
- Labi, A. K., Obeng-Nkrumah, N., Owusu, E., Bjerrum, S., Bediako-Bowan, A., Sunkwa-Mills, G., ... & Newman, M. J. (2019). Multi-centre point-prevalence survey of hospital-acquired infections in Ghana. *Journal of Hospital Infection*, 101(1), 60-68.
- Labi A., Obeng-Nkrumah N., Owusu E., & Fenny A. P. (2020) Multi-center point-prevalence survey of hospital-acquired infections in Ghana
- Lemass S, Fernandes R, Meyers K, Taylor M, Leblanc D, et al. Comparison of COVID-19 infections among healthcare workers and non-healthcare workers (2013); 193:1–10. 10.1371/journal.pone.0241956. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
- Magill, S.S. et al. (2018). Changes in Prevalence of Health Care–Associated Infections in U.S. Hospitals. *New England Journal of Medicine*, 379, 1732-1744. DOI: 10.1056/NEJMoa1801550.
- Malangu N, Legothoane A. Analysis of occupational infections among health care workers in Limpopo province of South Africa. *Glob J Health Sci.* 2012 Nov 2; 5(1):44-51. doi: 10.5539/gjhs.v5n1p44. PMID: 23283035; PMCID: PMC4777004.
- Martin ET, Kaye KS, Knott C, Nguyen H, Santarossa M, Evans R, Bertran E, Jaber L. Diabetes and Risk of Surgical Site Infection: A Systematic Review and Meta-analysis. *Infect Control Hosp Epidemiol.* 2016 Jan; 37(1):88-99. doi: 10.1017/ice.2015.249. Epub 2015 Oct 27. PMID: 26503187; PMCID: PMC4914132.
- Nachman S, Fernandes R, Meyers K, Taylor M, Leblanc D, (2020). Comparison of COVID-19 infections among healthcare workers and non-healthcare workers; 193:1–10. 10.1371/journal.pone.0241956. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
- Olsen MA, Nepple JJ, Riew KD, et al. Risk factors for surgical site infection following orthopaedic spinal operations. *J Bone Joint Surg Am.* 2008; 90:62-69
- Rothe C, Schlaich C, Thompson S. Healthcare-associated infections in sub-Saharan Africa. *J Hosp Infect.* 2013 Dec; 85(4):257-67. doi: 10.1016/j.jhin.2013.09.008. Epub 2013 Oct 2. PMID: 24209885.
- Rowley, J., 2002. Using case studies in research. *Management research news.*
- Sebastian S. Does preoperative scalp shaving result in fewer postoperative wound infections when compared with no scalp shaving? A systematic review. *J Neurosci Nurs.* 2012 Jun; 44(3):149-56. doi: 10.1097/JNN.0b013e31825106d2. Review. PubMed PMID: 22555352.

Singh JA, Houston TK, Ponce BA, et al. Smoking as a risk factor for short-term outcomes following primary total hip and total knee replacement in veterans. *Arthritis Care Res.* 2011; 63:1365-1374.

Suetens C, Latour K, Kärki T, Ricchizzi E, Kinross P, Moro ML, Jans B, Hopkins S, Hansen S, Lyytikäinen O, Reilly J. Prevalence of healthcare-associated infections, estimated incidence and composite antimicrobial resistance index in acute care hospitals and long-term care facilities: results from two European point prevalence surveys, 2016 to 2017. *Eurosurveillance.* 2018; 23(46).

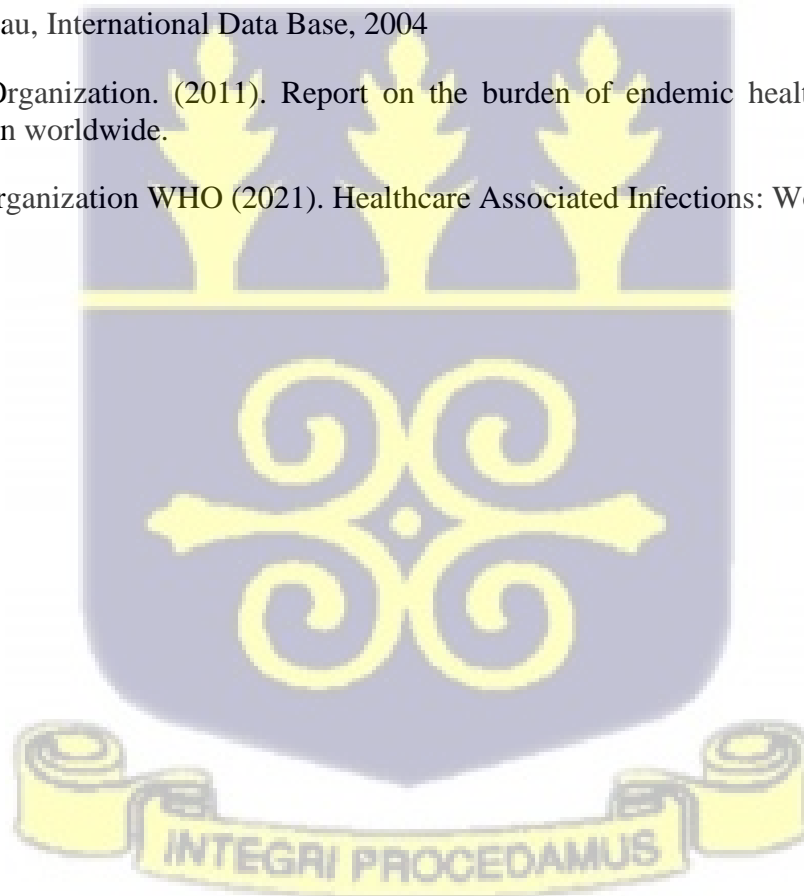
United Nations Development Group (UNDG) (2017). Monitoring and Evaluation: *UNDAF Companion Guidance*

U.S. Department of Health & Human Services. Centers for Disease Control and Prevention. National and State Healthcare-Associated Infections Progress report is based on 2014 data; 2016. Available from: <https://www.cdc.gov/HAI/pdfs/progress-report/hai-progress-report.pdf>. Accessed April 5, 2018

US Census Bureau, International Data Base, 2004

World Health Organization. (2011). Report on the burden of endemic health care-associated infection worldwide.

World Health Organization WHO (2021). Healthcare Associated Infections: World Factsheet



**APPENDIX I: PARTICIPANT INFORMATION SHEET (HEALTHCARE WORKERS)**

**STUDY TITLE: EVALUATION OF HEALTHCARE ASSOCIATED INFECTION  
AT THE GREATER ACCRA REGIONAL HOSPITAL.**

I am Vanessa Opoku-Darko, a student at the University of Ghana School of Public Health offering a master's degree in Public Health, Monitoring and Evaluation. I am conducting research on the topic "Evaluation of healthcare associated infection guidelines in the Greater Accra Regional Hospital" in partial fulfillment of the award of a master's degree. My contact details are as follows; Mobile: 0591482122

E-mail: [vanny.podark@gmail.com](mailto:vanny.podark@gmail.com) / [vopoku-darko001@st.ug.edu.gh](mailto:vopoku-darko001@st.ug.edu.gh)

Location: University of Ghana Campus

**BACKGROUND AND PURPOSE OF RESEARCH:** Health care associated infection (HCAI) acquired by patients while receiving care and represent the most frequent adverse event. In essence, HCAI's affect patients in a hospital or other health-care facility, and are not present or incubating at the time of admission. They also include infections acquired by patients in the hospital or facility but appearing after discharge, and occupational infections among staff. However, there is limited study done on healthcare associated infection in the county as a result of data quality to address health care associated infection guidelines. The paper seeks to evaluate healthcare associated infection guidelines at the Greater Accra Regional Hospital.

**NATURE OF RESEARCH:** This study is to do a process evaluation on health associated infections. This study will take place at the Greater Accra Regional Hospital where a total of twenty-five (25) participant being 15 patients and 10 healthcare workers will be interviewed.

**PARTICIPANTS INVOLVEMENT:** Participants will be required to answer some questions using interview guide, which will not take more than thirty (30) minutes of their time. The interview guide is designed in a friendly form though some of the questions may seem a bit unfriendly. Participants are reassured that their responses will not be used against them and it will be used solely for the purposes of the research.

**BENEFITS:** There are no direct benefits to the participant in this study. However, it is hoped that the findings from this research may be used to develop a coherent Evaluation plan/policy that will incorporate new methods of preventing or reducing HCAs and Institute strict adherence mechanisms for stringent compliance.

**RISK:** Taking part in this study will not expose participants to risk.

**COST:** There will be no direct cost to participants.

**COMPENSATION:** The Participants will be compensated with snacks in this study.

**PRIVACY AND CONFIDENTIALITY:** To ensure and increase anonymity, pseudonyms will be employed to identify participants. To preserve anonymity, audiotapes of data gathered will be stored under lock and key, accessible only to the researcher, and folders containing signed or thumb-printed consent forms and demographic information of participants will be kept in a separate drawer, also under lock and key.

**DATA STORAGE AND USAGE:** The data will be stored in a locked cabinet in the office. Data collected from the interview guide will be coded, edited, and would be used for data analysis.

**VOLUNTARY PARTICIPATION/WITHDRAWAL:** Participation is voluntary and participants have the right to decline to participate and also withdraw from the study at any time without penalty and without having to give any reasons.

**OUTCOME AND FEEDBACK:** The data collected will be analyzed and interpreted for the purpose of the research. After which the data collected will be discarded some months after the study is entirely completed. The results of the study will be published in journals and social media platforms to allow everyone the opportunity to know the finding and to be used as existing literature for future research.

**FUNDING INFORMATION:** The Principal Investigator solely funds this study.

**SHARING OF PARTICIPANTS INFORMATION/DATA:** Participants will be reassured that the data collected will not be shared with any individual or organization and will be used solely for research purposes by the Principal Investigator.

**PROVISION OF INFORMATION & CONSENT FOR PARTICIPANTS:** A copy of the Information sheet and consent form will be given to you after it has been signed or thumb-printed to keep.

**DECLARATION OF CONFLICT OF INTEREST:**

**All investigators have no conflict of interest to declare.**

**NOTE:**

Information provided by the health workers will not be disclosed to management.



## CONTACT INFORMATION

For further clarifications or questions, kindly contact the following;

1. Ms. Vanessa Opoku-Darko

Principal Investigator

0591482122

[Vanny.podark@gmail.com](mailto:Vanny.podark@gmail.com)

2. Dr. Paulina Tindana

Supervisor

0544905490

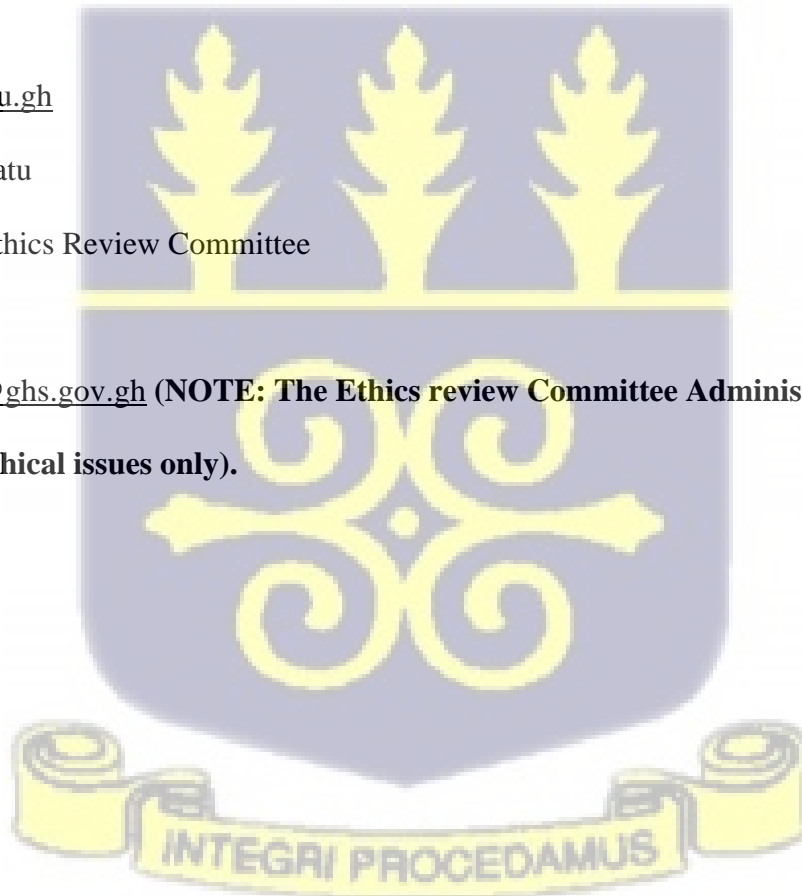
[ptindana@ug.edu.gh](mailto:ptindana@ug.edu.gh)

3. Nana Abena Apatu

Administrator Ethics Review Committee

0503539896

[ethics.research@ghs.gov.gh](mailto:ethics.research@ghs.gov.gh) (NOTE: The Ethics review Committee Administrator should be contacted for ethical issues only).



## **APPENDIX II: INFORMATION SHEET (PATIENTS)**

### **PROJECT TOPIC: EVALUATION OF HEALTHCARE ASSOCIATED INFECTION AT GREATER ACCRA REGIONAL HOSPITAL**

#### **Introduction**

I am Vanessa Opoku-Darko, a student at the University of Ghana School of Public Health offering a master's degree in Public Health, Monitoring and Evaluation. I am conducting research on the topic "Evaluation of healthcare associated infection guidelines in the Greater Accra Regional Hospital" in partial fulfillment of the award of a master's degree. My contact details are as follows;

Mobile: 0591482122

E-mail: [vanny.podark@gmail.com](mailto:vanny.podark@gmail.com) / [vopoku-darko001@st.ug.edu.gh](mailto:vopoku-darko001@st.ug.edu.gh)

Location: University of Ghana Campus

#### **Why is this research undertaken and what are its objectives?**

Health care associated infection (HCAI) acquired by patients while receiving care and represent the most frequent adverse event. In essence, HCAI's affect patients in a hospital or other healthcare facility and are not present or incubating at the time of admission. They also include infections acquired by patients in the hospital or facility but appearing after discharge, and occupational infections among staff.

However, there is limited study done on healthcare associated infection in the county because of data quality to address health care associated infection guidelines. The purpose of the research is

to develop a coherent evaluation plan that will incorporate new methods of preventing or reducing HCAI's and to institute strict adherence mechanism for stringent compliance.

**Who is participating in the research and is participation compulsory?**

The research participants would be doctors, nurses and patients who have experienced surgical site infection at the facility.

**What will participants be asked to do?**

The participants will be only asked to answer questions for the research

**What are the benefits of this research to participants?**

These guidelines are to protect both **staff** and patients who access the facilities from Healthcare Associated Infections and to help control the spread of infections within the facility environment

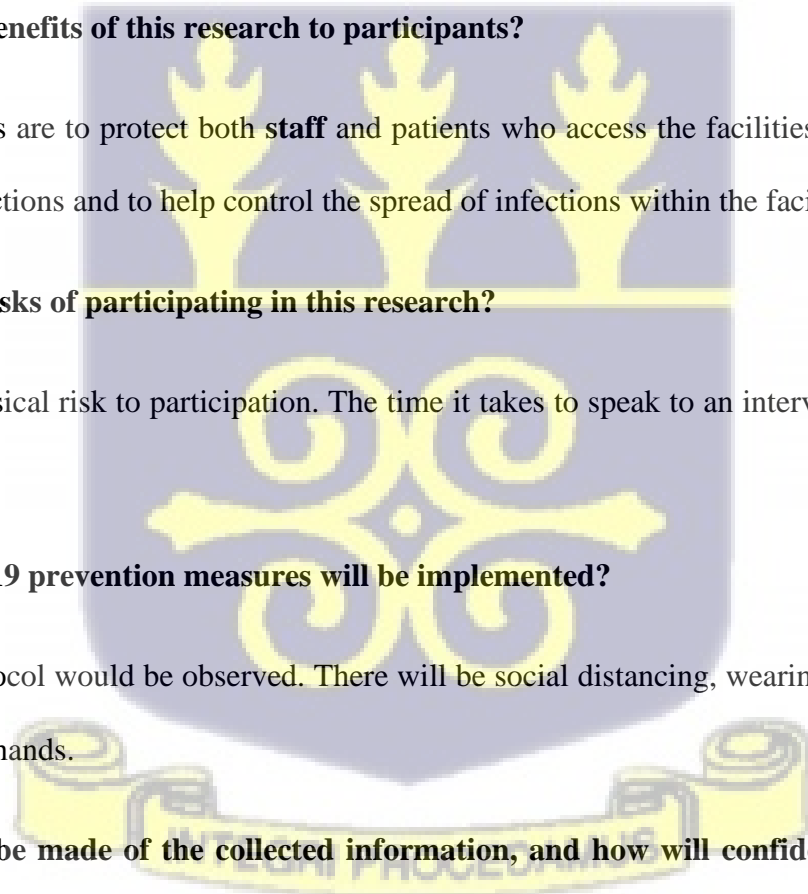
**What are the risks of participating in this research?**

There is no physical risk to participation. The time it takes to speak to an interviewer may be inconvenient.

**What COVID 19 prevention measures will be implemented?**

COVID 19 protocol would be observed. There will be social distancing, wearing of masks and washing of hands.

**What use will be made of the collected information, and how will confidentiality be ensured?**



Data collected from the interview guide will be coded, edited and would be used for data analysis.  
: Information that would be share with us during the interviews will be confidential and used only for the study.

**Can participants change their mind and withdraw from the project?**

Participation is voluntary and participants have the right to decline to participate and withdraw from the study at any time without penalty and without having to give any reasons.

**Will individual participants receive any payment or gifts for taking part in the research?**

The Participants will be compensated with snacks in this study.

**Has the study been reviewed and approved by an ethics committee?**

No ethics committee is currently reviewing the study protocol apart of the GHS ERC.

**Will participants be given the participants' information sheet and consent form?**

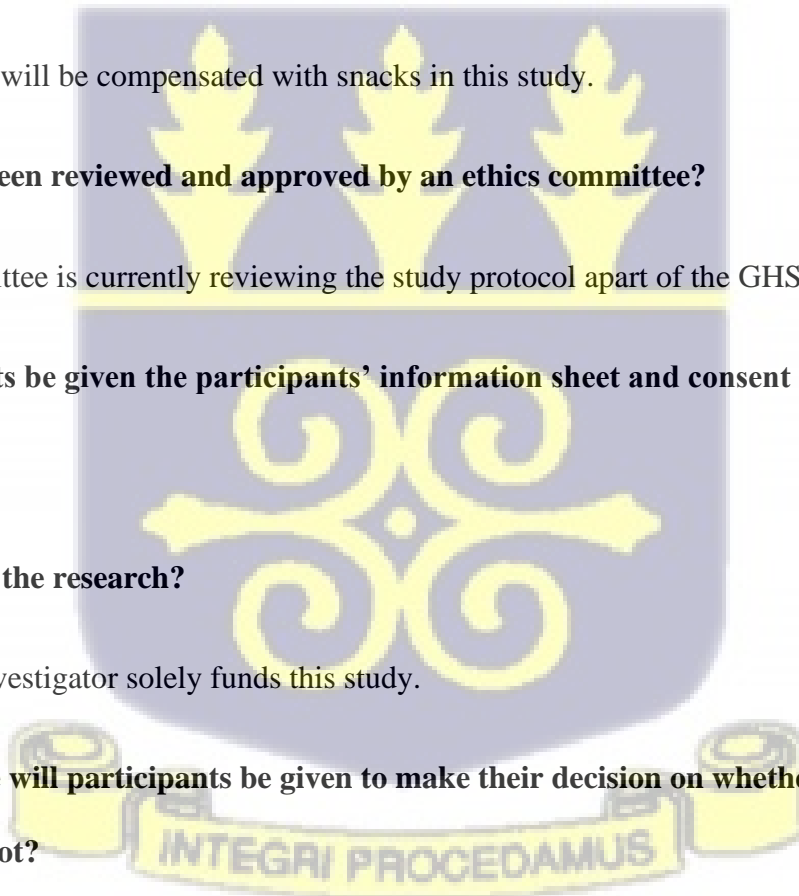
Yes

**Who is funding the research?**

The Principal Investigator solely funds this study.

**How much time will participants be given to make their decision on whether to participate or not?**

15 minutes



**What if participants have any questions or concerns about this study?**

Health care workers are free and welcome to ask questions or raise concerns on any aspects of the research that they do not understand or need further clarification. If any Health care worker has concerns about any aspect of this project, please speak to Vanessa Opoku-Darko, the Principal Investigator of the School of Public Health, Department of Health Policy, Planning and Management (HPPM), Legon, Accra, Ghana on telephone (0591482122) or email (vanny.podark@gmail.com), who will do his best to answer your query. For questions regarding the ethical aspects of this research or questions about your rights as a research participant, you may also contact Madam Nana Abena Apatu, the Administrator of the Ghana Health Service Ethics Review Committee, on 0503539896.



**APPENDIX III: CONSENT FORM (PATIENTS)**

**PROJECT TITLE: EVALUATION OF HEALTHCARE ASSOCIATED INFECTION**

**AT GREATER ACCRA REGIONAL HOSPITAL**

**PARTICIPANTS' STATEMENT**

I acknowledge that I have read or have had the purpose and contents of the Participants' Information Sheet read and all questions satisfactorily explained to me in a language I understand (*.....name of language*). I fully understand the contents and any potential implications as well as my right to change my mind (i.e. withdraw from the research) even after I have signed this form.

I voluntarily agree to be part of this research.

Name of Participant.....

Participants' Signature .....OR Thumb Print.....

Date:.....

**INTERPRETERS' STATEMENT**

I interpreted the purpose and contents of the Participants' Information Sheet to therefore named participant to the best of my ability in the (*.....name of language*) language to his proper understanding.

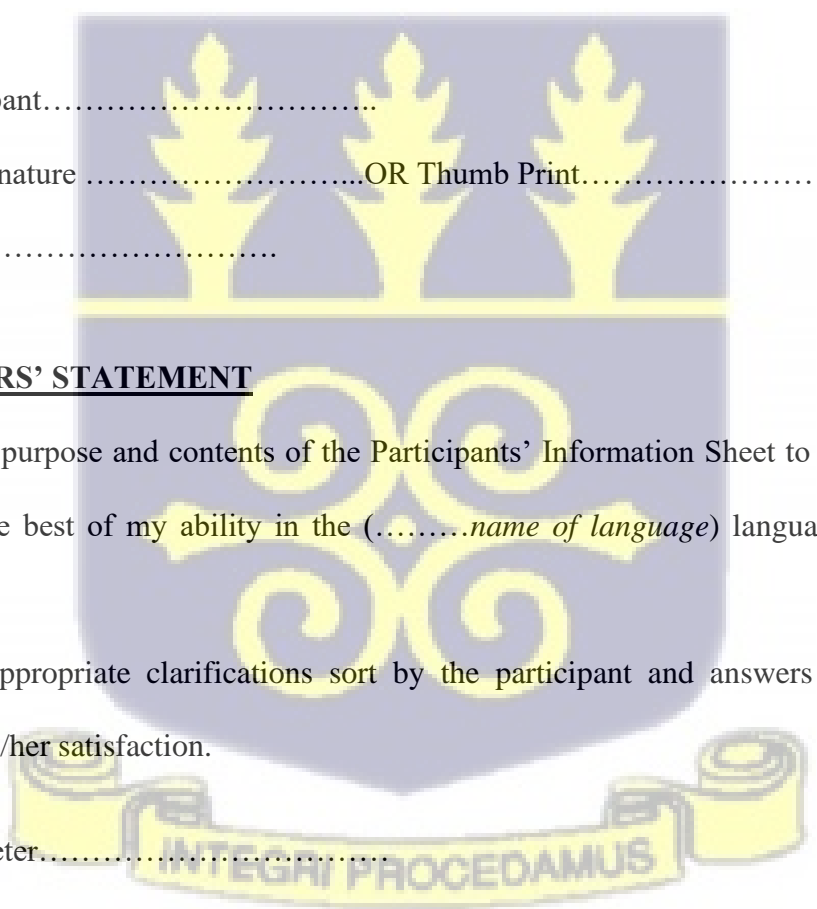
All questions, appropriate clarifications sort by the participant and answers were also duly interpreted to his/her satisfaction.

Name of Interpreter.....

Signature of Interpreter ..... OR Thumb Print .....

Date:.....

Contact Details



**STATEMENT OF WITNESS**

I was present when the purpose and contents of the Participant Information Sheet was read and explained satisfactorily to the participant in the language he/she understood (...*name of language*)

I confirm that he/she was given the opportunity to ask questions/seek clarifications and same were duly answered to his/her satisfaction before voluntarily agreeing to be part of the research.

Name:.....

Signature..... OR Thumb Print .....

Date:.....

**INVESTIGATOR STATEMENT AND SIGNATURE**

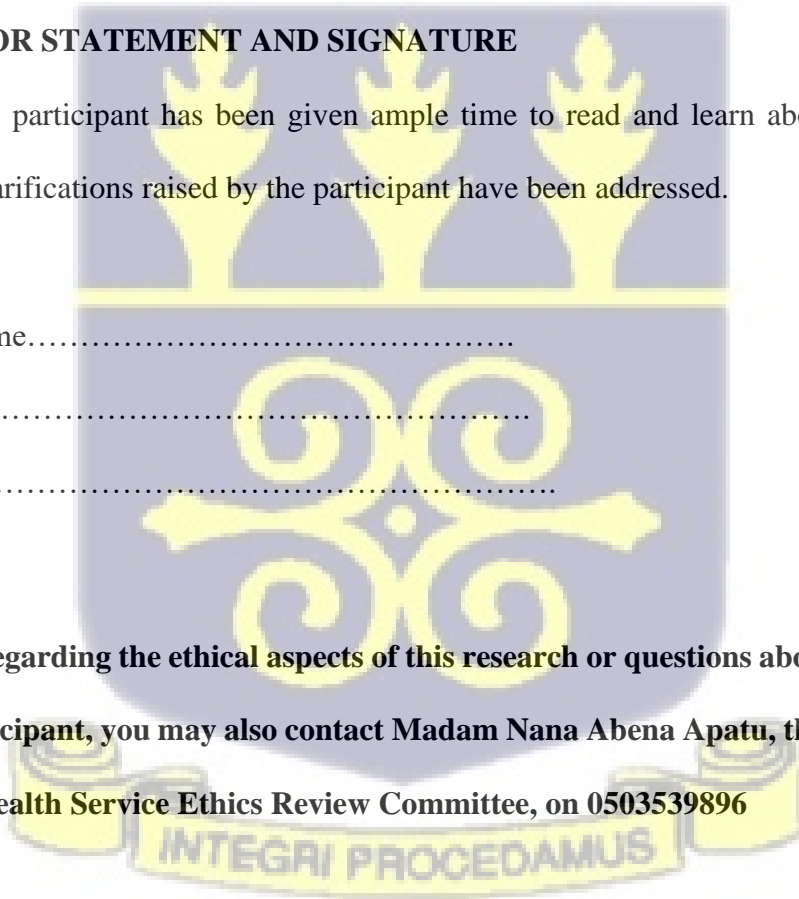
I certify that the participant has been given ample time to read and learn about the study. All questions and clarifications raised by the participant have been addressed.

Researcher's name.....

Signature .....

Date.....

**For questions regarding the ethical aspects of this research or questions about your rights as a research participant, you may also contact Madam Nana Abena Apatu, the Administrator of the Ghana Health Service Ethics Review Committee, on 0503539896**



**APPENDIX IV: INFORMATION SHEET (HEALTHCARE WORKERS)**

**PROJECT TOPIC: EVALUATION OF HEALTHCARE ASSOCIATED  
INFECTION AT GREATER ACCRA REGIONAL HOSPITAL**

**Introduction**

I am Vanessa Opoku-Darko, a student at the University of Ghana School of Public Health offering a master's degree in Public Health, Monitoring and Evaluation. I am conducting research on the topic "Evaluation of healthcare associated infection guidelines in the Greater Accra Regional Hospital" in partial fulfillment of the award of a master's degree. My contact details are as follows;

Mobile: 0591482122

E-mail: [vanny.podark@gmail.com](mailto:vanny.podark@gmail.com) / [vopoku-darko001@st.ug.edu.gh](mailto:vopoku-darko001@st.ug.edu.gh)

Location: University of Ghana Campus

**Why is this research undertaken and what are its objectives?**

Health care associated infection (HCAI) acquired by patients while receiving care and represent the most frequent adverse event. In essence, HCAI's affect patients in a hospital or other healthcare facility and are not present or incubating at the time of admission. They also include infections acquired by patients in the hospital or facility but appearing after discharge, and occupational infections among staff.

However, there is limited study done on healthcare associated infection in the county because of data quality to address health care associated infection guidelines. The purpose of the research is

to develop a coherent evaluation plan that will incorporate new methods of preventing or reducing HCAI's and to institute strict adherence mechanism for stringent compliance.

**Who is participating in the research and is participation compulsory?**

The research participants would be doctors, nurses and patients who have experienced surgical site infection at the facility.

What will participants be asked to do?

Participants will be asked to answers question pertaining to the research.

What are the benefits of this research to participants?

These guidelines are to protect both **staff** and patients who access the facilities from Healthcare Associated Infections and to help control the spread of infections within the facility environment.

**What are the risks of participating in this research?**

There is no physical risk to participation. The time it takes to speak to an interviewer may be inconvenient.

**What COVID 19 prevention measures will be implemented?**

COVID 19 protocol would be observed. There will be social distancing, wearing of masks and washing of hands.



**What use will be made of the collected information, and how will confidentiality be ensured?**

Data collected from the interview guide will be coded, edited and would be used for data analysis.  
: Information that would be share with us during the interviews will be confidential and used only for the study.

**Can participants change their mind and withdraw from the project?**

Participation is voluntary and participants have the right to decline to participate and withdraw from the study at any time without penalty and without having to give any reasons.

**Will individual participants receive any payment or gifts for taking part in the research?**

The Participants will be compensated with snacks in this study.

**Has the study been reviewed and approved by an ethics committee?**

No ethics committee is currently reviewing the study protocol apart of the GHS ERC.

**Will participants be given the participants' information sheet and consent form?**

Yes

**Who is funding the research?**

The Principal Investigator solely funds this study.



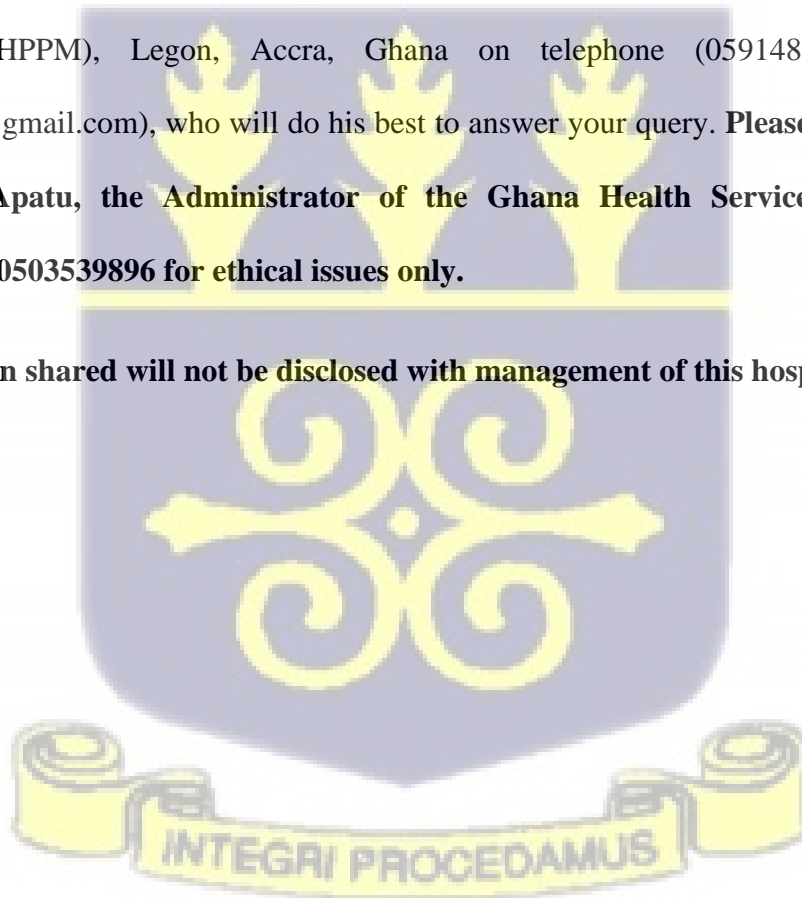
**How much time will participants be given to make their decision on whether to participate or not?**

15 minutes

**What if participants have any questions or concerns about this study?**

Health care workers are free and welcome to ask questions or raise concerns on any aspects of the research that they do not understand or need further clarification. If any Health care worker has concerns about any aspect of this project, please speak to Vanessa Opoku-Darko, the Principal Investigator of the School of Public Health, Department of Health Policy, Planning and Management (HPPM), Legon, Accra, Ghana on telephone (0591482122) or email (vanny.podark@gmail.com), who will do his best to answer your query. **Please contact Madam Nana Abena Apatu, the Administrator of the Ghana Health Service Ethics Review Committee, on 0503539896 for ethical issues only.**

**NB: Information shared will not be disclosed with management of this hospital.**



**APPENDIX V: CONSENT FORM (HEALTHCARE WORKERS) PROJECT TITLE:  
EVALUATION OF HEALTHCARE ASSOCIATED INFECTION AT GREATER  
ACCRA REGIONAL HOSPITAL**

**PARTICIPANTS' STATEMENT**

I acknowledge that I have read or have had the purpose and contents of the Participants' Information Sheet read and all questions satisfactorily explained to me in a language I understand (*.....name of language*). I fully understand the contents and any potential implications as well as my right to change my mind (i.e. withdraw from the research) even after I have signed this form.

I voluntarily agree to be part of this research.

Name of Participant.....

Participants' Signature .....OR Thumb Print.....

Date:.....

**INTERPRETERS' STATEMENT**

I interpreted the purpose and contents of the Participants' Information Sheet to therefore named participant to the best of my ability in the (*.....name of language*) language to his proper understanding.

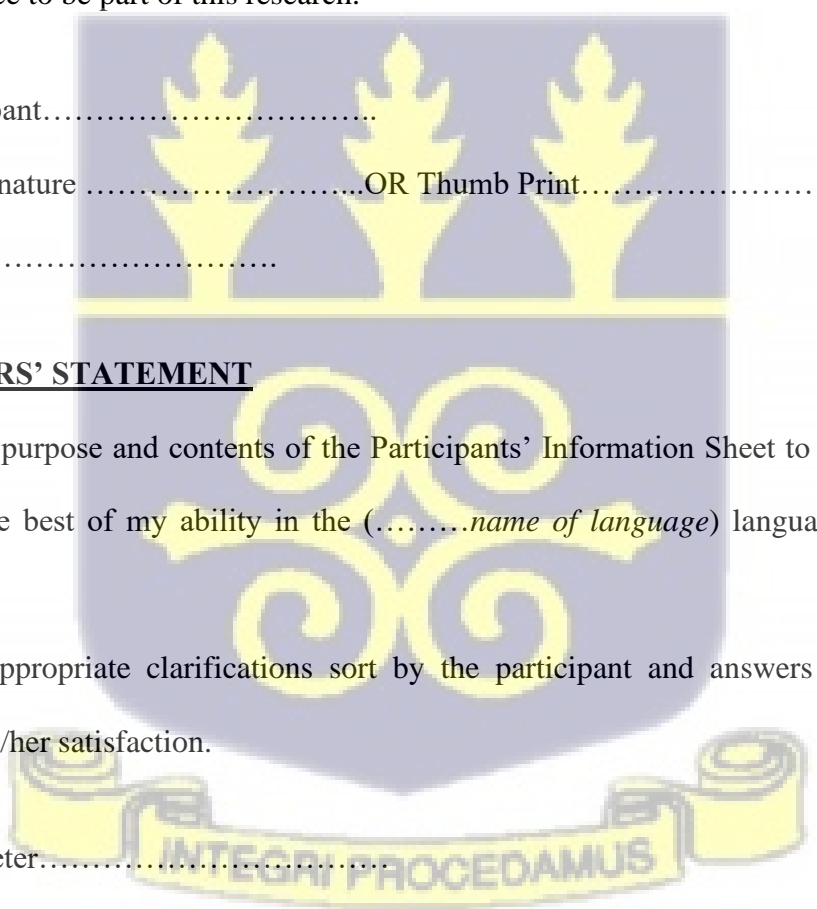
All questions, appropriate clarifications sort by the participant and answers were also duly interpreted to his/her satisfaction.

Name of Interpreter.....

Signature of Interpreter ..... OR Thumb Print .....

Date:.....

Contact Details



**STATEMENT OF WITNESS**

I was present when the purpose and contents of the Participant Information Sheet was read and explained satisfactorily to the participant in the language he/she understood (...*name of language*)

I confirm that he/she was given the opportunity to ask questions/seek clarifications and same were duly answered to his/her satisfaction before voluntarily agreeing to be part of the research.

Name:.....

Signature..... OR Thumb Print .....

Date:.....

**INVESTIGATOR STATEMENT AND SIGNATURE**

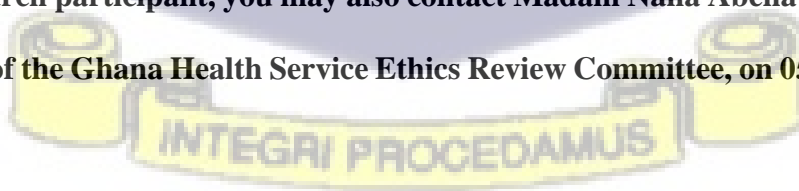
I certify that the participant has been given ample time to read and learn about the study. All questions and clarifications raised by the participant have been addressed.

Researcher's name.....

Signature .....

Date.....

**For questions regarding the ethical aspects of this research or questions about your rights as a research participant, you may also contact Madam Nana Abena Apatu, the Administrator of the Ghana Health Service Ethics Review Committee, on 0503539896.**



**DATA COLLECTION TOOLS**

**APPENDIX V: SEMI-STRUCTURED INTERVIEW TRANSCRIPT (PATIENTS)**

**EVALUATION OF HEALTHCARE ASSOCIATED INFECTION AT GREATER ACCRA REGIONAL HOSPITAL**

Background Dear participant, my name is Vanessa Opoku-Darko. I am a student of the school of Public Health, University of Ghana. I am conducting a study on Evaluation of healthcare associated infections at the Greater Accra Regional Hospital. The study is purely on academic exercise in partial fulfillment of the requirement for the award of MSc. PH Monitoring and Evaluation. All information given will therefore be treated confidential.

Date.....

Time.....

Venue.....

**SECTION A: DEMOGRAPHIC DATA**

**PATIENTS SURVEY**

**I would first like to start with some questions about you and your background;**

Can you tell me your age?

Can you tell me your sex?

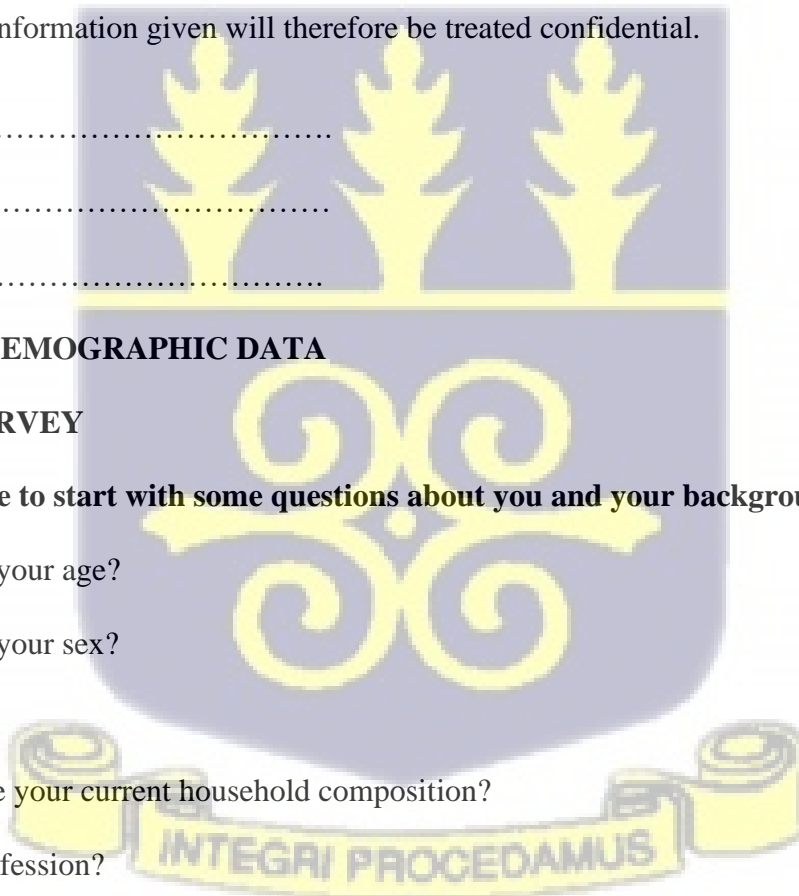
Marital status?

Can you describe your current household composition?

What is your profession?

What level of education have you completed?

What is your current occupation or employment?



**Knowledge and Perceptions of HEALTHCARE ASSOCIATED INFECTIONS (HCAIs) in general.**

**Now I would like to ask you some questions about your knowledge and perceptions of (HCAIs) in general;**

Are you familiar with hospital acquired infection prevention guidelines?

How do you perceive your risk of getting Healthcare Associated Infections?

Do you know how to prevent and control hospital acquired infections? Could you explain how transmission of HCAIs can be prevented?

Could you explain how HCAIs is transmitted?

Could you explain what measures one should take when one has HCAIs symptoms?

Please tell me your experience with HCAIs after diagnosed.

All **staff** and patients should be considered potentially infectious regardless of their diagnosis.

Infections can be transmitted by medical equipment such as syringes, needles, catheters, stethoscope, thermometers, etc. how sure are you?

**Respondents' response to the availability of IPC materials or services (Not always available, sometimes available, always available)**

**Pathogenic organisms from colonized and infected patients (and sometimes from the environment) transiently contaminate the hands of staff during normal clinical activities and can then be transferred to other patients. Hand transmission is one of the most important methods of spread of infectious agents in health care facilities.**

Hand washing items e.g. water, soap

Hand sanitizers

Personal protective equipment's for use on the ward

Safety boxes for disposal of used syringes and needles

In – service training/workshop related to infection prevention and control

Hospital monitoring of staff adherence to prevention of surgical site infection

Respondent's moment of hand hygiene practice/Yes/No

Before touching a patients

After body fluid exposure/risk

After touching a patients

Before clean/aseptic procedures

Respondents' response to hand hygiene practice.

After patient contact

After contact with contaminated equipment or surfaces

On arrival at work

Before patient contact

Before wearing gloves

After wearing gloves

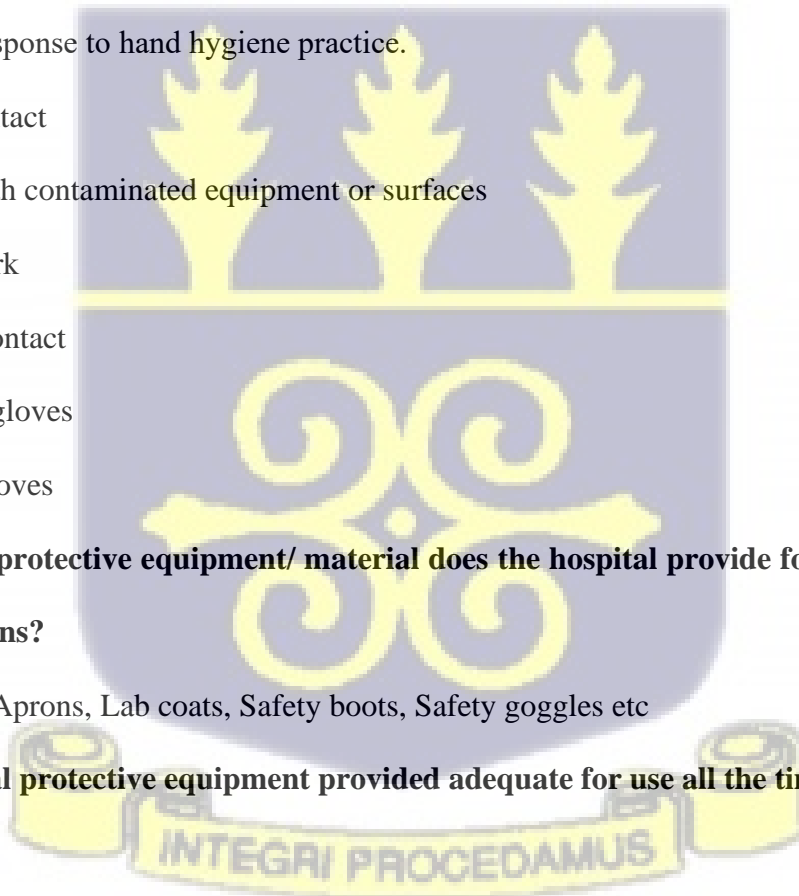
**What personal protective equipment/ material does the hospital provide for your use during operations?**

Masks, Gloves, Aprons, Lab coats, Safety boots, Safety goggles etc

**Are the personal protective equipment provided adequate for use all the time?**

Yes

No



**How often do you/HCWs use the personal protective equipment/material?**

Always

Occasionally

Rarely

Not at all

**What measures has the hospital management put in place to control healthcare associated infections**

Eliminating unnecessary

Providing safe medical devices

Providing barrier products such as gloves and pads

Conducting education and awareness on occupational safety and infection prevention control developing and availing guidelines on precautions

Proper management of medical sharps

Any other (specify).....

**What are your final recommendations for us to improve HCAIs**

**Closing the interview**

**I have asked all the questions I wanted to ask you.**

**- What experiences have you not yet been able to share regarding HCAIs**

**- What recommendations do you have for us?**

**Then I would like to show my gratitude to you for taking the time and effort to share your experiences, thoughts, and perceptions. This is very beneficial to our study and will help us to improve HCAIs. I will now stop the recording and close the interview.**

**< Stop recording | End of interview >**

***“Thank you very much for granting this interview and once again I assure you that this information will be treated as confidential.”***

**APPENDIX VI: SEMI-STRUCTURED INTERVIEW TRANSCRIPT (HEALTHCARE WORKERS)**

**EVALUATION OF HEALTHCARE ASSOCIATED INFECTION AT GREATER ACCRA REGIONAL HOSPITAL**

Background Dear participant, my name is Vanessa Opoku. I am a student of the school of Public Health, University of Ghana. I am conducting a study on Evaluation of healthcare associated infections at the Greater Accra Regional Hospital. The study is purely on academic exercise in partial fulfillment of the requirement for the award of MSc. PH Monitoring and Evaluation. All information given will therefore be treated confidential.

Date.....

Time.....

Venue.....

**SECTION A: DEMOGRAPHIC DATA**

**HEALTHCARE WORKERS SURVEY**

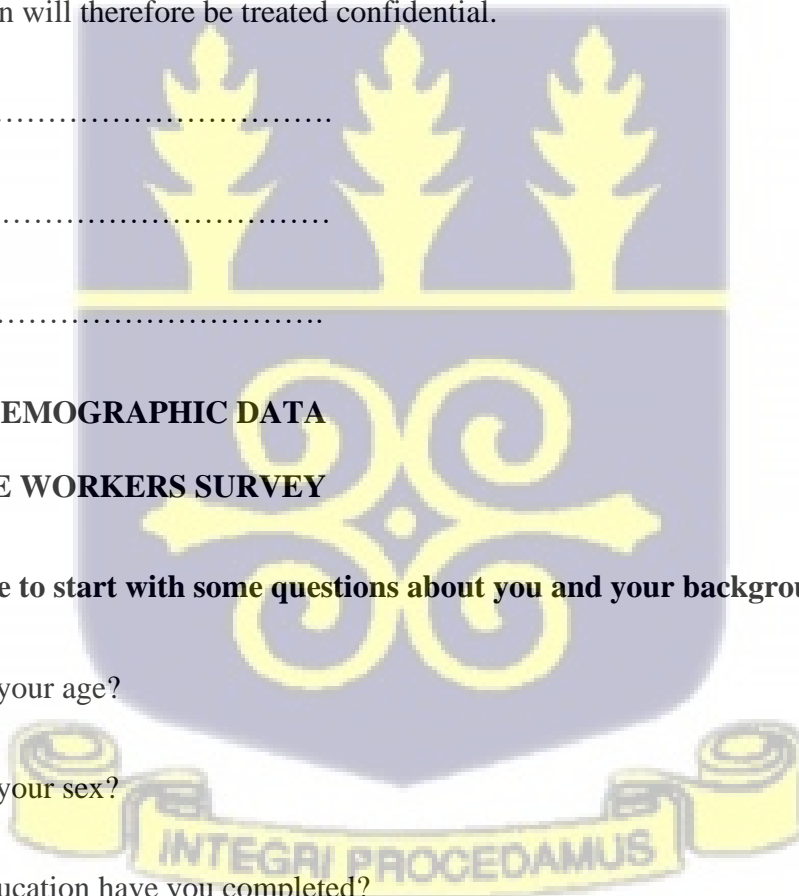
**I would first like to start with some questions about you and your background;**

Can you tell me your age?

Can you tell me your sex?

What level of education have you completed?

What is your profession?



Years of occupational experience

Years of experience in the surgical department

Hours of work daily

**Knowledge and perceptions of HEALTHCARE ASSOCIATED INFECTIONS  
(HCAIs) in general.**

Could you explain who is most vulnerable for HCAIs?

What are the common types of HCAIs in the Greater Accra Regional hospital?

Is there an increase in the number of cases of a particular infection?

Were you trained in disease transmission and control during your professional training?

Are you given clear work procedures/guidelines in your job category?

What are some of the surgical site infection prevention?

Nosocomial infection can be transmitted by medical equipment such as syringes, needles, catheters, stethoscope, thermometers, etc. YES NO

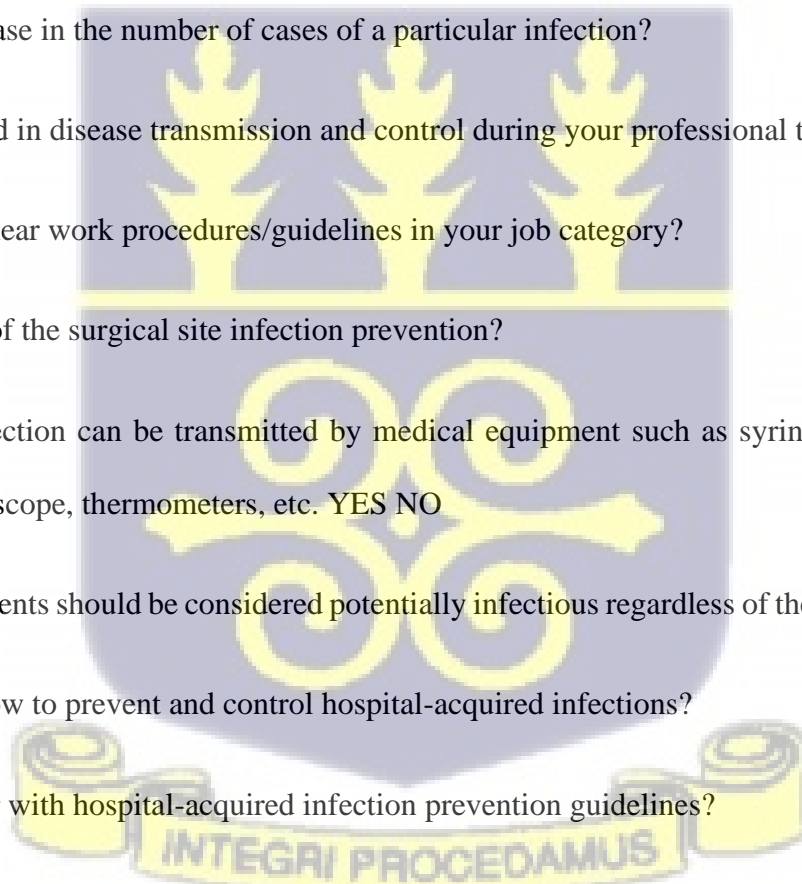
All staff and patients should be considered potentially infectious regardless of their diagnosis.

Do you know how to prevent and control hospital-acquired infections?

Are you familiar with hospital-acquired infection prevention guidelines?

There is no infection control team the in the hospital

I have to wash my hands even if I used gloves



Policies and procedures for infection control should be adhered to at all times

I should attend in-service training/workshop related to infection prevention and control regularly

The workload does not affect my ability to apply infection prevention guidelines.

It is my responsibility to comply with the hospital acquired infection guidelines.

I believe that following the prevention guidelines will reduce rates of hospital-acquired infection

I have to follow the procedural guidelines of the unit.

When do you usually do hand hygiene?

How available and accessible are IPC Materials

Sterile items for wound dressing e.g. gloves, gauze, lotion, etc.

Hand washing items e.g. water, soap

Hand sanitizers

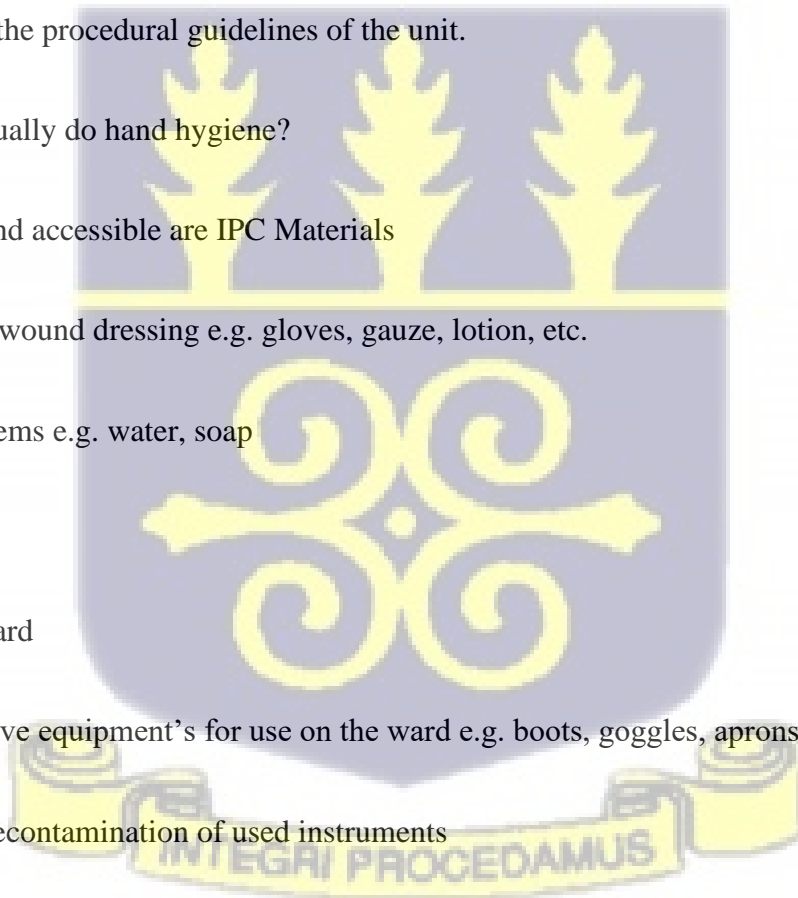
Gloves on the ward

Personal protective equipment's for use on the ward e.g. boots, goggles, aprons

Detergents for decontamination of used instruments

Safety boxes for disposal of used syringes and needles

In-service training/workshop related to infection prevention and control



Hospital monitoring of surgical site infection

Hospital monitoring of staff the adherence to the prevention of surgical site infection

Hospital feedback to health staff on surgical site infection report

### **Operation Room Checklist for IPC**

All areas & surfaces are clean, dry & dust free

Scrub facilities are available & well located

Pre-operative hair removal if needed is to be done on least possible skin area, as close as possible from operating time (not more than 2 hours using the electric hair clipper

Pre-operative skin antisepsis is achieved by the use of the proper antiseptic and being left over the skin for spontaneous drying.

A surgical mask is covering the mouth nose and beard when entering the operating room if an operation is about to begin or already underway, or if sterile instruments are exposed.

Mask is worn throughout the operation; other personnel in the operating theatre are wearing a surgical mask if an operation is being performed.

The team is calm with minimal movement and talking.

Dirty instruments and waste are properly handled and transported

Only the required surgical team is present in the operating room during the procedure.

The team does not remove surgical attire until the wound has been dressed and the risk of contact with bloody drapes had been eliminated

Surgical attire is taken off, gloves are the first to be taken off, hands and forearms are washed.

**What are your final recommendations for us to improve HCAIs**

**Closing the interview**

**I have asked all the questions I wanted to ask you.**

- What experiences have you not yet been able to share regarding HCAIs**
- What recommendations do you have for us?**

**Then I would like to show my gratitude to you for taking the time and effort to share your experiences, thoughts, and perceptions. This is very beneficial to our study and will help us to improve HCAIs. I will now stop the recording and close the interview.**

**< Stop recording | End of interview >**

***“Thank you very much for granting this interview and once again I assure you that this information will be treated as confidential.”***



## APPENDIX VII: ETHICS CLEARANCE

### GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

*In case of reply the number and date of this Letter should be quoted.*



Research & Development Division  
Ghana Health Service  
P. O. Box MB 190  
Accra  
Digital Address: GA-050-3303  
Mob: +233-50-3539896  
Tel: +233-302-681109  
Email: [ethics.research@ghs.gov.gh](mailto:ethics.research@ghs.gov.gh)  
12<sup>th</sup> January, 2023

My Ref. GHS/RDD/ERC/Admin/App/23/009  
Your Ref. No.

Vanessa Opoku-Darko  
Ghana Airport Company Limited,  
PMB 16, Accra

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of your Study Protocol.

GHS-ERC Number	<b>GHS-ERC: 016/12/22</b>
Study Title	Evaluation of Healthcare Associated Infection Guidelines at the Greater Accra Regional Hospital
Approval Date	12 <sup>th</sup> January, 2023
Expiry Date	11 <sup>th</sup> January, 2024
GHS-ERC Decision	<b>Approved</b>

#### This approval requires the following from the Principal Investigator

- Submission of a yearly progress report of the study to the Ethics Review Committee (ERC)
- Renewal of ethical approval if the study lasts for more than 12 months,
- Reporting of all serious adverse events related to this study to the ERC within three days verbally and seven days in writing.
- Submission of a final report after completion of the study
- Informing ERC if study cannot be implemented or is discontinued and reasons why
- Informing the ERC and your sponsor (where applicable) before any publication of the research findings.

**You are kindly advised to adhere to the national guidelines or protocols on the prevention of COVID -19**

Please note that any modification of the study without ERC approval of the amendment is invalid.

The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

Kindly quote the protocol identification number in all future correspondence in relation to this approved protocol

SIGNED... 

Dr. Naa-Korkor Allotey  
(Ag. Head, Ethics & Research Management Department)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra