BISHOP STUART UNIVERSITY

ASSESSING THE KNOWLEDGE, PRACTICES AND BARRIERS TO IMPLEMENTATION OF HAND HYGIENE AMONG HEALTH CARE WORKERS IN BUSHENYI DISTRICT UGANDA

BY

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15/BSU/MPPH/010

A RESEARCH DISSERTATION SUBMITTED TO THE DIRECTORATE OF GRADUATE STUDIES, RESEARCH GRANTS AND PUBLICATIONS IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF PUBLIC HEALTH OF BISHOP STUART UNIVERSITY

OCTOBER, 2017
DECLARATION

I. Ebosie Jennifer Chibuogwu, a student of Master of Public Health in Bishop Stuart University (Kakoba Campus) do hereby declare that this research report titled “Assessing the knowledge, Practices and Barriers to Implementation of Hand Hygiene Among Health Care Workers in Bushenyi District Uganda” is my original work and has neither been awarded at any institutional level or produced by any other person.

Signed: .............................................. Date: 04-10-2017

EBOSIE JENNIFER CHIBUOGWU
ATTESTATION

This is to certify that this dissertation titled “Assessing the Knowledge, Practices and Barriers to Implementation of Hand Hygiene among Health Care Workers in Bushenyi District Uganda” is an original research conducted by Ebosie Jennifer Chibugwu, registration number 15/BSU/MPH/010, was supervised by me Prof. Edward Ssemakula and is ready for presentation to the graduate school.

Signed: ........................................... Date: 11th October 2017
Prof. Edward Ssemakula
SUPERVISOR

Signed: ........................................... Date: 32/11/2017
Dr. Francis Kazibwe
DEDICATION

I dedicate this research work to God almighty who makes all things possible, my entire family, my classmates, all the authors cited in this project and my friends Estella Ega, Anthony Bosah for their concern, love, inspiration and support to ensure that this project is completed.
ACKNOWLEDGEMENT

The researcher wishes to recognize the role played by the entire staff and administration of Bishop Stuart University, the lecturers and all my colleagues in this course who had assisted me one way or the other to achieve the completion of this project.

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In a special way, I thank my entire family, siblings, friends and loved ones for their encouragement, support and ideas towards this research project. Estella, Tony and Jimmy, thanks for being my research assistants.

Above all, I thank the Almighty God whose grace and mercy guided me all through in this endeavour.
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<thead>
<tr>
<th>%</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>ABHRs</td>
<td>Alcohol Based Hand Rub Solution</td>
</tr>
<tr>
<td>ARI</td>
<td>Acute Respiratory Infections</td>
</tr>
<tr>
<td>CDC</td>
<td>Centre for Disease Control</td>
</tr>
<tr>
<td>HCAIs</td>
<td>Health care Associated Infections</td>
</tr>
<tr>
<td>HCP</td>
<td>Health care professional/provider</td>
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<td>HCRI</td>
<td>Health Care Related Infection</td>
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<td>HCWs</td>
<td>Health care workers</td>
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<td>HH</td>
<td>Hand Hygiene</td>
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<td>ICUs</td>
<td>Intensive Care Units</td>
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<tr>
<td>KAP</td>
<td>Knowledge, Attitudes and Practice</td>
</tr>
<tr>
<td>KIU</td>
<td>Kampala International University</td>
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<tr>
<td>MOH</td>
<td>Ministry of Health</td>
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<tr>
<td>MRSA</td>
<td>Methicillin-resistant <em>S. aureus</em></td>
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<tr>
<td>RLS</td>
<td>Resource limited settings</td>
</tr>
<tr>
<td>UNHRO</td>
<td>Uganda National Health Research Organization</td>
</tr>
<tr>
<td>USA</td>
<td>United States of America</td>
</tr>
<tr>
<td>VHTs</td>
<td>Village Health Teams</td>
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<tr>
<td>WHO</td>
<td>World Health Organization</td>
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DEFINING KEY CONCEPTS

A health care worker: All staff working in hospital/health centre and give care to the patient including Doctors, Nurses, Clinicians, Pharmacists, Physiotherapists, Laboratory technicians, Health care assistants and cleaning attendants (WHO, 2009).

Nosocomial: Originating or taking place in a hospital, acquired in a hospital, especially in reference to an infection. The term "nosocomial" comes from two Greek words: "nosus" meaning "disease" + "komeion" meaning "to take care of." Hence, "nosocomial" should apply to any disease contracted by a patient while under medical care. However, common usage of the term "nosocomial" is now synonymous with hospital-acquired. Nosocomial infections are infections that have been caught in a hospital and are potentially caused by organisms that are resistant to antibiotics. A nosocomial infection is specifically one that was not present or incubating prior to the patient's being admitted to the hospital, but occurring within 72 hours after admittance to the hospital (WHO, 2009).

Hygiene: is a set of practices performed for the preservation of health. According to the World Health Organization (WHO), "Hygiene refers to conditions and practices that help to maintain health and prevent the spread of diseases (WHO, 2009).

Hand hygiene: it is the practice of keeping the hands free from pathogens by washing with plain and antimicrobial soaps and water or using alcohol based hand rubs whenever indicated as per 5 moments for hand hygiene (WHO, 2009).

Medical hygiene: pertains to the hygiene practices related to the administration of medicine, and medical care, that prevents or minimizes disease and the spreading of disease (WHO, 2009).
**Knowledge:** is a familiarity, **awareness** or understanding of someone or something, such as **facts, information, descriptions,** or **skills,** which is acquired through **experience** or **education** by **perceiving, discovering,** or **learning.**

**Hospital:** is a **health care** institution providing **patient** treatment with specialized medical and nursing staff and medical equipment. The best-known type of hospital is the general hospital, which typically has an **emergency department** to treat urgent health problems ranging from fire and accident victims to a **heart attack** (WHO, 2009).
ABSTRACT

The purpose of the study was to determine the knowledge, level of adherence to hand hygiene practice and barriers to implementation of hand hygiene practices among health care workers in Bushenyi District. The objectives included to; assess the level of knowledge on hand hygiene practices among health care workers, assess the level of adherence to hand hygiene practices, identify the challenges and factors limiting adherence to hand hygiene practices and ascertain the possible strategies for addressing the factors limiting adherence to hand hygiene practices. The study applied a Cross-sectional study design, using a structured questionnaire to collect data on 201 participants. The study revealed that there is a disparity between the opinion and the practices of hand hygiene among health care workers. Hand washing adherence rate was 86%, with highest compliance among doctors (43%). Compliance was (94%) after patient contact and 47.3% before contact. More than 84.1% staff was aware about facts viz: diseases prevented by hand washing, ideal duration of hand washing, and reduction of Health Care Associated Infections (HCAIs) with hand washing. Reasons for non-adherence emerged as lack of time (p= 0.032), forgetfulness (p=0.049)], use gloves instead (p= 0.003), and lack of disposable towels (p=0.000). The study concluded that hand hygiene compliance was inadequate, doctor compliance rate was 43%, nurses 31% and others 26%, despite having good hand hygiene knowledge. Adequate training of healthcare workers regarding hand hygiene guidelines may be a factor to be considered for improvement of hand hygiene compliance.

Key words: Hand hygiene, Health care workers, Hand hygiene practices, Health care associated infection, Resources.
CHAPTER ONE

BACKGROUND OF THE STUDY

1.0 Introduction

In this chapter the researcher explained the background of the study, statement of the problem, purpose of the study, objectives of the study (general and specific), research questions, scope of the study and significance of the study.

1.1 Background

Hand hygiene is a topic at the forefront of patient safety. Hospital acquired infection is one of the causes of preventable deaths in our health care system. The Centre for Disease Control and Prevention defined hand hygiene as any method that removes or destroys micro-organisms on hands or intact skin. Hand hygiene remains an important measure of preventing the spread of antimicrobial resistant pathogens and subsequent nosocomial infection. Hand hygiene has long been regarded as the cornerstone of infection control efforts and an essential measure for prevention of healthcare-associated infections (HCAIs) (WHO, 2009; Rotter, 2007).

The World Health Organization estimates that 10-30 per cent of all hospital admissions result in health care acquired infections. The average prevalence rate of health care acquired infection in Europe is 7.1%, resulting in 16 million extra days of hospital stay and these accounts for a loss of approximately 7 billion dollars a year (excluding indirect costs), states annual report on communicable diseases (Haley, et al., 2005).

The Centre for Disease Control and Prevention estimates that there are approximately 1.7 million hospital associated infections that cause up to 99,000 deaths per year. These infections not only cause a significant amount of morbidity and mortality, but they also greatly increase health care costs. Hand hygiene compliance is one of the most effective and economical ways to combat the spread of infection within a hospital (Boyce, 2000).
Health care associated infections are an important cause of morbidity and mortality among hospitalized patients world-wide. Transmission of health care associated pathogens most often occur via contaminated hands of health care workers. Despite the importance of hand hygiene in the health care setting, adherence to hand hygiene standards remains universally low. In the United States, rates of adherence have been shown to be as low as 36% but there has been substantial attention paid to increasing adherence based on patient safety concerns and regulatory and accreditation agency requirements (Haley, et al., 2005). The high prevalence of these infections, as high as 19%, in developing countries poses a challenge to health care providers (Goldmann & Larson, 2010).

Data from low and middle-income countries suggest that hand hygiene adherence rates are very low in resource limited areas, with baseline reports as low as 5% of all opportunities for hand hygiene (Cantwell & Larson, 2008). There are limited data evaluating hand hygiene adherence and hand hygiene campaign effect in resource limited settings, especially in Sub-Saharan Africa.

The WHO Multimodal Hand Hygiene strategy has been implemented extensively in high income, resource intensive countries; however there remains limited data on the impact of such programs in resource limited countries, especially in sub-Saharan Africa. Effective hand hygiene campaigns are urgently needed in developing countries, where the prevalence of HCAIs is estimated to be at least three times higher than in the USA and Europe (Zimakoff & Holstein, 2012).

In Sub-Saharan Africa, hand hygiene has been described as the cornerstone and starting point in all infection control programs, with the hands of healthcare staff being the drivers and promoters of infection in critically ill patients. Hand hygiene has been identified as the treating intervention strategy that will drive down cross-transmission of pathogens in the healthcare
environment. It has been proven to reduce the incidence of nosocomial infections (Zimakoff & Holstein, 2012).

Recent literature suggests that the burden of HCAIs may be disproportionately high in resource limited settings (RLS) with rates of HCAIs estimated to be two to twenty times that of developed countries. One of the major reasons for these high rates of HCAIs is the lack of infection control programmes, which have been neglected due to limited resources, competing priorities and other barriers. Poor hand hygiene in resource limited settings likely play a role in nosocomial transmission of bacterial pathogens and are important cause of the high rates of HCAIs. Significant cultural, behavioural and institutional factors have been identified as unique barriers to appropriate hand hygiene adherence in these settings (Meengs & Nelson, 2013).

While rates of HCAIs are incompletely defined in Ethiopia, they are assumed to be high; one recent study reported nosocomial infections in 39% of hospitalized patients (Schmitz et al., 2014). In knowledge, attitudes and practice (KAP) survey that was conducted at two teaching referral hospitals in Addis Ababa Ethiopia, health care workers (HCWs) were found to have a good understanding of the importance of hand hygiene and TB infection control principles. However, this knowledge did not translate into effective implementation of infection control practices. Potential barriers to implementing effective hand hygiene and TB infection control practices identified by the KAP survey included lack of infrastructure, training and infection control role models as well as hand hygiene products that caused skin irritation to a large proportion of HCWs (Tenna et al., 2013). (Wasswa et al., 2015)

While hand hygiene is beginning to attract more attention, few resource limited countries especially in Sub-Saharan Africa have well developed infection control and prevention programmes (Meengs & Nelson, 2013). This KAP survey represents the second study to report
the implementation of the WHO Multi-modal Hand Hygiene Strategy in Sub-Saharan Africa.

The only other study in Sub-Saharan Africa was conducted in Mali, which showed similar increases in hand hygiene adherence.

The World Health Organization (WHO) estimates that over 1.4 million people suffer from nosocomial infections at any one time, with the proportion of these infections being up to 20 times higher in low and middle-income countries. These infections are among the leading cause of death and morbidity among hospitalized patients and present a considerable public health burden (Zimakoff & Holstein, 2012).

Albert & Condie (2011) argued that although there is limited data on nosocomial infections in Sub-Saharan Africa, several studies done in Algeria, Burkina Faso, Senegal and Tanzania have indicated hospital-wide prevalence rates ranging from 2.5% to 14.8%. Higher cumulative incidence rates have been reported in surgical wards in Ethiopia and Nigeria ranging from 5.7–45.8%. In developing countries, a growing proportion of nosocomial infections can be assigned to methicillin-resistant S. aureus (MRSA) and multi-drug resistant Gram-negative bacteria. A survey done in an Argentinean general hospital revealed incidence rates of Clostridium difficile, the commonest cause of nosocomial infectious diarrhoea to range from 37 to 84 cases per 10,000 admissions between 2000 and 2005 while the annual incidence of the same infection was 8.7 cases per 10 000 hospitalizations in a study done in South Africa.

Most nosocomial infections can be prevented with readily available and inexpensive strategies like adhering to recommended infection control measures such as hand hygiene and wearing of gloves. Globally, standard precautions of infection control are considered an effective means of protecting healthcare workers, patients and the public and reducing nosocomial infections. A meta-analysis by Aiello and Larson indicated that appropriate hand hygiene practices significantly reduced the risk of nosocomial infections while a case-control study conducted in
Brazil singled-out poor hand hygiene in addition to overcrowding and understaffing as risk factors for nosocomial infections (Harbarth, et al., 2002).

A number of factors may influence adherence to infection control. A healthcare worker was more likely to be compliant if he/she had more experience on the job, was more knowledgeable about transmission of blood-borne pathogens and was strongly committed to a positive occupational safety climate (Wong, et al., (2004; Serah, 2012). A descriptive exploratory study conducted in Botswana amongst emergency department nurses identified resource constraints such as the lack of the necessary facilities, inadequate equipment and materials, inadequate staffing and the lack of sustainable in-service education as factors that could prevent them from complying with infection control measures.

Several studies conducted amongst doctors and nurses in Ethiopia, Nigeria, and Uganda concluded that the knowledge, understanding and interpretation of infection control measures are not adequate. This thus adversely affected the implementation of the measures. Although knowledge of standard precautions of infection control may improve adherence to the measures, other influencing factors which this study was not able to investigate such as attitude are equally important (Griffith, et al., 2003).

In Uganda, the Ministry of Health (MOH) lists five basic standard precaution measures that can enhance infection control within the health facilities. These are: hand hygiene, adequate protective wear, proper sterilization, proper sharps disposal and safe waste management. However, findings from a national service provision assessment survey conducted by MOH showed that only 6% of health facilities had all infection control items while supervisory visits to health facilities in Arua District in 2006 revealed that less than 60% of the assessed facilities implemented the required infection control measures (Mearkle et al., 2016).
Studies that have been done with regards to hand hygiene practices include a study to understand the barriers to hand hygiene in ophthalmic outpatients in two Ugandan specialist eye hospitals. The study showed that lack of facilities, variable training and staff perceptions were observable barriers to effective hand hygiene (Mearkle et al., 2016). A formative and baseline survey on hand washing with soap was carried out by the National Sanitation Working Group among the groups of children most susceptible to diarrhoea diseases and Acute Respiratory Infections (ARI) to provide information to be used in the design of a national hand washing with soap campaign. The targeted groups were school-aged children and children less than five years of age (Foca & Jakob, 2000). Another study which assessed the implementation of infection control in health facilities has been done in Arua District, Uganda. This study determined predictors of hand washing among healthcare workers (HCWs) in Arua district, Uganda. The study showed that most health facilities lacked infection control committees and adequate supplies/equipment for infection control. Healthcare workers are more likely to wash their hands if they have ever suffered from nosocomial infection, received in-service training on infection control, were educated beyond ordinary level or knew hand washing as one of the infection control measures (Wasswa et al., 2015).

1.2 Statement of the Problem

Improper hand hygiene by healthcare workers (HCWs) is responsible for about 40% of nosocomial infections resulting in prolonged illness, hospital stays, long-term disability and unexpected high costs on patients and their families, and also lead to a massive additional financial burden on the healthcare system (Kotwal et al., 2013). Most nosocomial infections can be prevented with readily available and inexpensive strategies like adhering to recommended infection control measures such as hand hygiene and wearing of gloves (Foca & Jakob, 2000; Wasswa et al., 2015).
The world Health Organization estimates that over 1.4 million people suffer from nosocomial infections with the vast majority of these occurring in low and middle income countries (Pittet & Donaldson, 2005). These infections are among the leading cause of death and morbidity among hospitalized patients and present a considerable public health burden in these countries (Wasswa et al., 2015). Several studies done on nosocomial infections in Algeria, Burkina Faso, Senegal and Tanzania have indicated hospital-wide prevalence rates ranging from 2.5% to 14.8%.

The spread of nosocomial infections in developing countries especially in Sub-Saharan Africa remains a serious public health challenge, especially in high risk settings such as health care facilities due to lack of knowledge and poor compliance to hand hygiene practices among healthcare workers (Wandel, Maes, Labeau, & Blot, 2010).

There is a paucity of published data on infection control practice, attitudes or resources in these settings, particularly among healthcare workers (Mearkle et al., 2016). In Uganda, hand washing with soap by adults after using toilets has increased from 14% to 32 % in 2007 (Uganda Water and Environment Sector Performance Report, 2014). This reflects that only three out of every ten Ugandans wash their hands with soap after using the toilet. In Bushenyi district there has been limited research conducted that specifically focused on assessing the knowledge, practices and factors limiting the implementation of hand hygiene practices among health care workers in health care settings.

Hand hygiene compliance monitoring and health care associated infections incidence reporting are yet to be standardized across countries, including Uganda. In order to maintain increased levels of hand hygiene practices, education has to be imparted and awareness has to be created on continuous basis.
Despite evidence that hand hygiene reduces transmission of potential pathogens or anti-microbial resistant organisms, sustained improvements in adherence to hand hygiene recommendations and proper hand washing technique among health care workers are uncommon, even after educational efforts. This study sought to assess the extent to which hand hygiene practices were known and followed by doctors, nurses and other health workers in hospitals in Bushenyi district, Uganda and whether there were barriers to the implementation of hand hygiene practices among these health care workers.

1.4 Objectives of the Study

1.4.1 General objective

The general objective of this study was to determine the knowledge, level of adherence to hand hygiene practice and barriers to implementation of hand hygiene among health care workers in Bushenyi District.

1.4.2 Specific objectives

i) To assess the level of knowledge on hand hygiene practices among health care workers in Bushenyi District.

ii) To assess the level of adherence to hand hygiene practices among health care workers in Bushenyi District.

iii) To identify the factors limiting adherence to hand hygiene practices among health care workers in Bushenyi District.
1.5 Research Questions

i) To what extent are health workers knowledgeable about hand hygiene practices in Bushenyi District?

ii) To what extent do the health workers practise hand hygiene in Bushenyi District?

iii) What are the key factors limiting adherence to hand hygiene practices among health workers?

iv) What are the possible strategies for addressing the factors limiting adherence to hand hygiene practices among health workers?

1.6 Study hypothesis

Null hypothesis

There are no factors limiting health care workers from implementing hand hygiene in Bushenyi District.

Alternative hypothesis

There are factors limiting health care workers from implementing hand hygiene in Bushenyi District.

1.7 Justification of the Study

In Uganda, data from studies suggest that the knowledge and level of adherence to hand hygiene practices by health workers is low. Significant cultural, behavioural and institutional factors have been identified as unique barriers to appropriate hand hygiene adherence in hospital/health centre settings. Therefore, the study is expected to create awareness, change behavior and improve the overall knowledge gap among health care workers on hand hygiene practices in Bushenyi District and Uganda in general. Study findings will thus serve as a key step to enable policy makers develop a successful infection control programme. The study will
also open doors for further research, workshops and seminars in hand hygiene practices as a means of infection control in hospitals in Bushenyi District and the society at large.

1.8 Scope of the Study

1.8.1 Geographical scope

This study was conducted in Bushenyi District located in South-western region of Uganda which is a distance of about 340km by road from Kampala, the capital city of Uganda. Bushenyi district is situated along Mbarara-Kasese road sixty-eight kilometres (68kms) away from Mbarara town and five hours drive from Kampala. Bushenyi district is bordered by Rubirizi district to the West, Buhweju district to the Northeast, Sheema district to the East, Mitooma district to the South and Rukungiri district to the West. The district is made up of 1 county (Igara), 9 sub-counties, 1 Municipal Council, 4 Town Boards, 3 Wards, 64 Parishes and 565 villages. The study was carried out in three (3) health facilities that is; Kampala International University Teaching Hospital (KIUTH) Ishaka; Kitagata District Hospital and the Health Centre IV. According to Uganda Bureau of Statistics census report 2014, Bushenyi district has a population of 234,443 people; women constitute 51.3% and men 48.7% with about 89% of the total population rural and 11% urban. The population growth is 2% and the literacy rate is 38%. About half of the population can access safe water 49.6% with a childhood malnutrition of 43% (Bushenyi District Record, 2014).

1.8.2 Content scope

The study made an assessment on the knowledge, practices and barriers to implementation of hand hygiene practices among health care workers in Bushenyi district and it assessed the level of adherence to hand hygiene practices among health care workers, identified the challenges /factors limiting adherence to hand hygiene practices among health workers and ascertained
the possible strategies for addressing the factors limiting adherence to hand hygiene practices among health workers in selected hospital settings.

### 1.8.3 Time scope

The study was conducted between August 2016 and June 2017. This was considered long enough for the research i.e. collecting data, analysing and presenting the report before the university deadline of May, 2017.

### 1.9 Significance of the Study

This study is expected to create awareness and improve the overall knowledge about hand hygiene practices among health care workers in Bushenyi District and Uganda.

This study will make the hospital management appreciate the importance of adherence to hand hygiene practices and further the implementation of a successful hand hygiene programme in these hospitals to ultimately control infection transmission between the health workers and patients in the respective hospitals in the district.

The study is expected to create cultural, behavioural and institutional changes towards adherence to hand hygiene practices both in the hospitals and society at large.

The findings from the study will enable policy makers to develop a successful infection control programme for the populace.
1.10 Conceptual framework

The framework above provides a description and the relationship between independent and dependent variables. In the process the functioning of the independent variable, operates through intervening variables to achieve the dependent variable. Ultimately, because the study was assessing the knowledge, practices and barriers to implementation of hand hygiene practices among health care workers in Bushenyi district, the study looked at hand hygiene as the dependent variable while the independent variables were knowledge practices and barriers to implementation.

Knowledge and adoption of hand hygiene practices depends on factors like age, gender, level of education, level of knowledge, profession and access to solutions and other utilities. All these factors determine the adaptability to hand hygiene by health workers. Proper hand
hygiene at the health facility keeps the hospital environment free from germs hence reducing nosocomial incidences. However, the adoption to hand hygiene practices by health workers also depends on type of facility, formal HH education, time/heavy workload, attitude/cultural norms, availability of solutions, hospital environment and number of patients present at the facility at a time.

1.12 Organization of the dissertation

This dissertation was divided into five chapters and each chapter is described as below:

Chapter one gives an overview of the research problem, purpose and significance of the study, objectives of the study, conceptual and definition of terms.

Chapter two pinpoints the work of other researchers which are related to my study and helped me pick the objectives and methodology.

Chapter three shows the methods used to obtain the objectives of the study.

Chapter four presents the results obtained from the study.

Chapter five deals with discussion, conclusion and the recommendations made from the study.
CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The literature review provided a background for understanding current knowledge on topic and illuminates the significance of the study. A literature review is a body of text that aims to review the critical points of current knowledge including substantive findings as well as theoretical and methodological contributions to the topic. Literature review are secondary sources, and as such, do not report any experimental work. The literature review relevant for this study is presented in the following sections: the level of knowledge on hand hygiene practices among health care workers, level of adherence to hand hygiene practices among health care workers, factors limiting adherence to hand hygiene practices among health workers and the strategies for addressing the factors limiting adherence to hand hygiene practices. Improper hand hygiene practices by healthcare workers (HCWs) is responsible for about 40% of nosocomial infections. Hand hygiene has long been considered one of the most important control measures for preventing health care associated infections. Prevention and control of Healthcare Associated Infections (HCAIs) remain major priority for countries around the world. It can effectively be advanced through the simple and inexpensive practice of proper hand hygiene between patient contact by doctors, nurses, health assistants and other support staff (Samuel, Almedom, Hagos, Albin, & Mutungi, 2005).

2.1.1 Nosocomial infections globally

Nosocomial infection is a global public health problem with an estimated 1.5 million suffering consequences at any given time. It is noted that at least 25% of all hospital infections in the developing world are nosocomial acquired. The hands of health care providers (HCPs) are major agents of infection transmission in hospitals leading to the campaign to improve hand hygiene, Clean Care is Safer Care. Two types of hand colonizing flora are predominant in hand...
skins. These are the resident flora that are not easily removed by the simple friction associated hand washing and the transient micro-organisms which are not usually hand colonizers but they are most likely associated with infection (Graham, 2010). Various types of such microbes are found on patients, instruments and other items and are important in infection transmission. Improper hand washing practices serve as means of infection transmission in hospital wards and proper hand washing is the single most important means of reducing cross-infections in hospitals but adherence remains a major challenge (Larson et al., 2002).

### 2.1.2 Nosocomial infections in Uganda’s health sector

Uganda’s health system is divided into national and district-based levels. At the national level are the national referral hospitals, regional referral hospitals, and semi-autonomous institutions including the Uganda Blood Transfusion Services, the National Medical Stores, the Uganda Public Health Laboratories and the Uganda National Health Research Organization (UNHRO) (Cantwell & Larson, 2008). The lowest rung of the district-based health system consists of Village Health Teams (VHTs). These are volunteer community health workers who deliver predominantly health education, preventive services, and simple curative services in communities. They constitute level 1 health services. The next level is Health Center II, which is an outpatient service run by a nurse. It is intended to serve 5,000 people. Next in level is Health Center III (HCIII) which serves 10,000 people and provides in addition to HC II services; in patient, simple diagnostic, and maternal health services (Tenna et al., 2013).

In Uganda, hospital care is a precious gift, therefore little concern is given to hospital safety and very seldom Hospital Acquired Infection (HAI) risk is evaluated. Like other developing countries, the magnitude of the Hospital Acquired Infection (HAI) problem remains underestimated or even unknown largely because HAI diagnosis is complex and surveillance activities to guide interventions require expertise and resources. Uganda still lacks surveillance
systems and this is because of social and health-care system deficiencies that are aggravated by economic problems. Additionally, overcrowding and understaffing in hospitals result in inadequate infection control practices, and a lack of infection control policies, guidelines and trained professionals also add to the extent of the problem (Graham, 2010).

2.2 Knowledge on hand hygiene practices among health care workers

Health care related infections (HCRI) in hospitals result in many negative impacts on patients, families and healthcare workers worldwide. It represents a major burden around the world and affects the safety and quality of care for patients. World Health Organization (WHO) ranks HCRI as one of the top ten causes of hospital deaths annually (Larson, 2002).

Patients, health care workers, and the environment are major reservoirs of health care related infections. The transmission of infection from patient to patient mainly occurs at the hand of health care workers. Patients’ skin, mucous and any discharge can be colonized by many organisms, which are transferred to surrounding surfaces and contaminate the environment in the hospital. The hands of the health care workers are contaminated through daily caring for patient or his environment, despite wearing gloves (Pittet & Perneger, 2009; Preston, 2011). Therefore, hand hygiene (HH) is considered the most effective way to prevent cross-transmission of HCRI. Health care related infection is estimated to affect 10% of patients in developed countries, and 25% in developing countries. Consequently, this will have a high impact on the quality of care, reflected in increased morbidity and mortality rates.

In the US, hospital patients contract two million infections per year, approximately one infection for every 25 patients. These infections can be life-threatening and difficult to treat. Hand hygiene is considered one of the most simple but important ways to break the chain of infection. Proper hand hygiene before and after each contact with any patient is an important measure to prevent HCRI (Preston, 2011).
There are limited studies regarding HH in Palestine so far. Furthermore, there are no established and organized systems within the Ministry of Health (MOH) in Palestine for registering HCRIIs. Health care workers, especially nurses and physicians, have the most physical contact with patients, and thus they are the primary vector for infection transmission within hospitals (Preston, 2011).

Although HCRI is a major threat to patients’ health and safety, it is highly preventable by proper hand hygiene. Enhancing and promoting compliance with HH among health care workers is very important to prevent HCRI, and this needs to be based on baseline data by assessing the knowledge, practices and attitudes of Palestinian health care workers. Furthermore, studying and comparing knowledge, practices and attitudes regarding HH and the results may be used to reform and change the curricula for health sciences, as following the guidelines for proper HH may reduce HCRI by one-third. Assessing the knowledge, practices and attitudes for physicians and nurses may also help in recognizing the factors that affect their compliance with HH, as it is still low (Dubbert & Chapman, 2010).

Hand hygiene is an important aspect of the care provided to hospitalized patients. Hand hygiene generally refers to hand washing with water and soap, or by using antiseptic solution or alcohol-based hand rubs. Hand hygiene saves lives, so that it is very important to assess how much information or knowledge physicians and nurses have about HH. Hand hygiene also is an effective and cost-efficient way to reduce the number of microorganisms, thereby reducing the rate of transfer of microorganisms to hospitalized patients and this will reduce the number of HCRI (Webster & Cartwright, 2004).
2.3 Adherence to hand hygiene practices among health care workers

2.3.1 Attitude of health care workers towards hand hygiene compliance

Foca and Jakob (2000), conducted a before after prospective, observational, intervention study in a mixed medical surgical ICU of a tertiary level hospital. The authors aim was to investigate the HCWs’ hand hygiene compliance rate in ICU and to assess the reason for hand hygiene non-compliance. All health care workers in ICU that come in contact with patient were observed before and after a multimodal interventional strategy (Education, posters, verbal reminders, and easy availability of products). A self-reported questionnaire was circulated to assess perception regarding compliance. Results show that hand hygiene compliance among medical personnel working in the ICU was 26% and the most common reason cited for non-compliance was lack of time (37%). The overall compliance improved significantly followed by the intervention to 57.36% (p<0.000), Nursing students (9.8- 33.33% (p<0.0000), Resident trainees 21.62 – 60.71% (p < 0.0000), Visiting consultant (922-57.14%, p= 0.0001), Physiotherapist (75.95%, p= 0.413) and premedical staff (10.71- 55.45%, p<0.0000). The authors concluded that hand hygiene compliance among health care workers in the ICU is poor. However, intervention strategies, such as the one used, can be useful in improving the compliance rate significantly.

Pittet and Allegranzi (2006) conducted a cross-sectional study to assess the compliance with hand hygiene guidelines among nursing staff in secondary care hospitals in Kuwait. The researchers used direct observation using the Lewisham observation tool and self-administered questionnaire in six major public secondary care hospitals in Kuwait. Scale were considered as indications for hand hygiene. A self-administered questionnaire was prepared and pilot tested and then distributed to nursing staff at each ward immediately after conducting the inspection; 550 were distributed and 454 were completed and returned. Among 204 observation sessions, a total of 935 opportunities and 312 hand hygiene practices were recorded. The Result of the
study was that the overall compliance was 33.4%. The observed compliance significantly varied between different ward categories from 14.7% in emergency to 55% in medical wards. Of the 454 nursing staff that participated in self-reported compliance, 409 (90%) indicated that they always washed their hands upon practicing patient care activities. Nurses consistently reported higher compliance after conducting patient care activities rather than before. Being busy with work (42.2%), having sore/dry hands (30.4%) and wearing gloves (20.3%) were the most frequently reported hindrances to improving hand hygiene. Finally, the authors concluded that observed hand hygiene compliance among nursing staff in secondary care hospitals in Kuwait was poor. High self-reported compliance may reflect a high level of awareness of hand hygiene but may also suggest that improving compliance through increasing awareness has probably reached saturation.

Kurlat et al., (2008) conducted a study to assess the short and longer-term success of strategies to improve hand hygiene compliance and to determine whether a sustained increase in hand hygiene compliance can reduce rates of health care-associated infection. The researchers conducted electronic searches of the Cochrane Central Register of Controlled Trials; The Cochrane Effective Practice and Organization of Care Group specialized register of trials; MEDLINE; Pub Med; EMBASE; CINAHL; and the BNI. All databases were searched to July 2006; MEDLINE was searched from 1980, CINAHL from its inception, and the remainder from 1990 until July 2006. The data collection analysis done by two reviewers independently extracted data and assessed data quality. The result of the study was that two studies met the criteria for review. One was a randomized controlled trial. The other was a controlled before and after study. Both were poorly controlled. Statistically significant post intervention increase in hand washing was reported in one study up to four months after the intervention. In the other there was no post-intervention increase in hand hygiene compliance. Finally, the authors concluded that there is little robust evidence to inform the choice of interventions to improve
hand hygiene. It appears that single interventions based on short, 'one off' teaching sessions are unlikely to be successful, even short-term. There is need to undertake methodologically robust research to explore the effectiveness of soundly designed interventions to increase hand hygiene compliance.

Higuera et al., (2005), conducted a study to identify the predictors of noncompliance with hand washing during routine patient care. The participants in the study were Health Care Workers (HCWs). Doctors, nurses and ward aides working in different wards of the hospital were observed for compliance with hand washing. The result of the study was that in 270 observed opportunities for hand washing, average compliance was 63.3%. Noncompliance was highest among doctors followed by nurses. Ward aides were most compliant. Finally, the authors concluded that compliance with hand washing was moderate. Variation across the hospital ward and type of HCW suggests that targeted educational programs may be useful. Noncompliance suggests that understaffing may decrease quality of patient care.

Rezende and Modena (2008) conducted an observational study to determine the baseline compliance and assess the attitudes and beliefs regarding hand hygiene of HCWs and visitors in intensive care units (ICUs) at KCMH. Observed hand hygiene compliance of HCWs and visitors in ICUs before patient contact for eight hours. A self-administered questionnaire was employed to measure attitudes and beliefs about hand hygiene for two-week period. The result of the study was that overall hand-hygiene compliance obtained from this observational study was less than 50% and differed markedly among various professional categories of HCWs and visitors. In questionnaire-based study, patient needs perceived as a priority (51.2%) was the most common reason for non-compliance, followed by forgetfulness (35.7%), and skin irritation by hand-hygiene agents (15.5%). Subjects believed to improve their compliance by multiple strategies including available low irritating hand-hygiene agents (53.4%), information
of current nosocomial infection rate (49.1%) and easily accessed hand-hygiene supplies (46.3%). Almost all subjects (99.7%) claimed to know correct hand-hygiene techniques. Hand washing with medicated soap was perceived to be the best means of hand decontamination (37.8%). Authors concluded that hand-hygiene compliance of HCWs and visitors is unacceptably low. Their knowledge, behavior, attitudes, and beliefs toward hand hygiene need to be improved by the multimodal and multidisciplinary approach.

2.4 Factors limiting adherence to hand hygiene practices among health workers

2.4.1 Factors Influencing Noncompliance with Hand Hygiene

Risk factors for noncompliance with hand hygiene have been determined objectively in several observational studies or interventions to improve compliance (Rosenthal, 2005; Rezende & Modena, 2008). Factors influencing reduced compliance, identified in observational studies of hand hygiene behavior, included being a physician or a nursing assistant rather than a nurse; being a nursing assistant rather than a nurse; being male; working in an intensive care unit (ICU); working during weekdays rather than the weekend; wearing gown and gloves; using an automated sink; performing activities with high risk for cross-transmission; and having many opportunities for hand hygiene per hour of patient care.

In the largest hospital-wide survey ever conducted by Pessoa-Silva et al., (2004) they also identified predictors of noncompliance with hand hygiene during routine patient care. Variables included professional category, hospital ward, time of day or week, and type and intensity of patient care, defined as the number of opportunities for hand hygiene per hour of patient care. In 2,834 observed opportunities for hand hygiene, average compliance was 48%. In multivariate analysis, compliance was highest during weekends and among nurses (odds ratio [OR] 0.6, 95% CI 0.4-0.8). Noncompliance was higher in ICUs than in internal medicine (OR 2.0, CI 1.3-3.1), during procedures with a high risk for bacterial contamination (OR 1.8,
CI 1.4-2.4), and when intensity of patient care was high (21 to 40 opportunities [OR 1.3, CI 1.0-1.7], 41 to 60 opportunities [OR 2.1, CI 1.5-2.9], >60 opportunities [OR 2.1, CI 1.3-3.5]) compared with a reference level of 0 to 20 opportunities.

In other words, compliance with hand washing worsened when the demand for hand cleansing was high; on average, compliance decreased by 5% (±2%) per increment of 10 opportunities per hour when the intensity of patient care exceeded 10 opportunities per hour. Similarly, the lowest compliance rate (36%) was found in ICUs, where indications for hand washing were typically more frequent (on average, 20 opportunities per patient per hour). The highest compliance rate (59%) was observed in paediatrics, where the average activity index was low (on average, eight opportunities per patient per hour). This study confirmed modest levels of compliance with hand hygiene in a teaching institution and showed that compliance varied by hospital ward and type of health-care worker, thus suggesting that targeted educational programs may be useful. These results also suggested that full compliance with current guidelines may be unrealistic and that facilitated access to hand hygiene could help improve compliance (Larson, 2014).

2.4.2 Perceived Barriers to Hand Hygiene

Several barriers to appropriate hand hygiene have been reported. Reasons reported by health-care workers for the lack of adherence with recommendations include skin irritation, inaccessible supplies, interference with worker-patient relation, patient needs perceived as priority, wearing gloves, forgetfulness, ignorance of guidelines, insufficient time, high workload and understaffing, and lack of scientific information demonstrating impact of improved hand hygiene on hospital infection rates (Goldmann & Larson, 2010).

2.4.3 Risk Factors for Noncompliance
Some of the perceived barriers for the lack of adherence with hand hygiene guidelines have been assessed or even quantified in observational studies. The most frequently reported reasons associated with poor compliance, in addition to those mentioned above, are inconveniently located or insufficient numbers of sinks; low risk for acquiring infection from patients; belief that glove use obviates need for hand hygiene; and ignorance of or disagreement with guidelines and protocols (Khatib, Jamaleddine, Abdallah, & Ibrahi, 1999).

Skin irritation by hand hygiene agents is an important barrier to appropriate compliance. The superficial skin layers contain water to keep the skin soft and pliable and lipids to prevent dehydration of the corneocytes (Haley & Bregman, 2002). Hand cleansing can increase skin pH, reduce lipid content, increase trans epidermal water loss, and even increase microbial shedding. Soaps and detergents are damaging when applied to skin on a regular basis, and health-care workers need to be better informed about their effects. Lack of knowledge and education on this topic is a key barrier to motivation. Alcohol based formulations for hand disinfection (whether isopropyl, ethyl, or n-propanol, in 60% to 90% vol/vol) are less irritating than antiseptic or no antiseptic detergents. Alcohols with added emollients are at least as well tolerated and efficacious as detergents. Emollients are recommended and may protect against cross-infection by keeping the resident skin flora intact, and hand lotions help protect skin and may reduce microbial shedding (Goldmann & Larson, 2010).

The value of easy access to hand hygiene supplies, whether sink, soap, medicated detergent, or waterless alcohol-based hand rub solution, is self-explanatory. Asking busy health-care workers to walk away from the patient bed to reach a wash basin or a hand antisepsis solution invites noncompliance with hand hygiene recommendations (Zimakoff & Holstein, 2012). Engineering controls could facilitate compliance, but hand hygiene behavior should be carefully monitored to identify negative effects of newly introduced devices.
Wearing gloves might represent a barrier for compliance with hand hygiene. Failure to remove gloves after patient contact or between dirty and clean body site care for the same patient constitutes noncompliance with hand hygiene recommendations (Webster & Cartwright, 2004). Washing and reusing gloves between patient contact is ineffective, and hand washing or disinfection should be strongly encouraged after glove removal. In a study involving artificial contamination, organisms were cultured from 4% to 100% of the gloves and observed counts were up to 4.7 log on hands after glove removal (Preston, 2011).

Additional barriers to hand hygiene compliance include lack of active participation in promotion at the individual or institutional level, of a role model for hand hygiene, of institutional priority assigned to hand hygiene, of administrative sanctions for noncompliance; and of an institutional climate encouraging safety (Larson, et al., 2002). A system change may be necessary for improvement in hand hygiene practices by health-care workers.

2.5 Addressing the factors limiting adherence to hand hygiene practices among health workers

2.5.1 Improving Adherence with Practices

Zimakoff & Holstein (2012) revisited hand hygiene behavioural theories in an attempt to better understand how to target more successful interventions. These researchers proposed a hypothetical framework to enhance hand hygiene practices and stressed the importance of considering the complexity of individual and institutional factors in designing behavioural interventions (Dubbert & Chapman, 2010). Behavioural theories and secondary interventions have primarily focused on the individual, which is insufficient to effect sustained change. Interventions aimed at improving compliance with hand hygiene must be based on the various levels of behaviour interaction. Thus, the interdependence of individual factors, environmental constraints, and institutional climate should be considered in strategic planning and
development of hand hygiene promotion campaigns (Pittet & Perneger, 2009). Factors associated with noncompliance with recommendations are related not only to the individual worker but also to the group to which he or she belongs and, by extension, to the parent institution. Factors influencing compliance at the group level include lack of education and performance feedback; working in critical care (high workload); downsizing and understaffing; and lack of encouragement or role models from key staff. Factors operating at the institutional level include lack of written guidelines; lack of appropriate hand hygiene agents; lack of skin care promotion and agents; lack of hand hygiene facilities; lack of atmosphere of compliance; and lack of administrative leadership, sanctions, rewards, and support (Preston, 2011; Dubbert & Chapman, 2010). Interventions to promote hand hygiene in hospitals should consider variables at all these levels.

The complex dynamic of behavioural change involves a combination of education, motivation, and system change. Various psychosocial parameters influencing hand hygiene behavior include intention, attitude toward the behavior, perceived social norms, perceived behavioral control, perceived risk of infection, habits of hand hygiene practices, perceived model roles, perceived knowledge, and motivation. Factors necessary for change include dissatisfaction with the current situation, perception of alternatives, and recognition, both at the individual and institutional level, of the ability and potential to change. While the last factor implies education and motivation, the former two necessitate primarily a system change (Pittet & Perneger, 2009).

Among reasons reported for poor adherence with hand hygiene recommendations, some that are clearly related to the institution (i.e., the system) include lack of institutional priority for hand hygiene, need for administrative sanctions for noncompliance or rewards for compliance, and lack of an institutional climate that encourages safety. Whereas all three reasons would
require a system change in most institutions, the last would also involve management commitment, visible safety programs, an acceptable level of work stress, a tolerant and supportive attitude toward reported problems, and belief in the efficacy of preventive strategies (Doebbeling et al., 2008).

2.5.2 Strategies for Improvement

Improvement in infection control practices requires questioning basic beliefs, continuous assessment of the stage of behavioral change, interventions with an appropriate process of change, and supporting individual and group creativity. Because of the complexity of the process of change, single interventions often fail, and a multimodal, multidisciplinary strategy is necessary (Albert & Condie, 2011).

A framework for change should include parameters to be considered for hand hygiene promotion, together with the level at which each change must be applied: education, motivation. Some parameters are based on epidemiologic evidence and others on the authors’ and other investigators’ experience and review of current knowledge (Meengs & Nelson, 2013). Some parameters may be unnecessary in certain circumstances and helpful in others. Changing the hand hygiene agent could be beneficial in institutions or hospital wards with a high workload and a high demand for hand hygiene when waterless hand rub is not available. However, a change in the recommended hand hygiene agent could be deleterious if introduced during winter, when skin is more easily irritated (Haley, et al., 2005).

Several parameters that could potentially be associated with successful promotion of hand hygiene would require a system change. Enhancing individual and institutional self-efficacy (the judgment of one’s capacity to organize and execute actions to reach the objective), obtaining active participation at both levels, and promoting an institutional safety climate
represent major challenges that exceed the current perception of the infection control practitioner’s role (Haley, et al., 2005).

More research is needed to determine whether education, individual reinforcement technique, appropriate rewarding, administrative sanction, enhanced self-participation, active involvement of a larger number of organizational leaders, enhanced perception of health threat, self-efficacy, and perceived social pressure, or combinations of these factors would improve health-care workers’ adherence to recommendations. Ultimately, compliance with hand hygiene could become part of a culture of patient safety in which a set of interdependent elements interact to achieve a shared objective (Harbarth, et al., 2002).

More readily achievable than major system change, easy and timely access to hand hygiene in a timely fashion and the availability, free of charge, of skin care lotion both appear to be necessary prerequisites for appropriate hand hygiene behavior. In particular, in high-demand situations, such as in critical care units, in high-stress working conditions, and at times of overcrowding or understaffing, having health-care workers use a hand rub with an alcohol-based solution appears as the best method for achieving and maintaining a higher level of compliance with hand hygiene (Rezende & Modena, 2008; Rosenthal, 2005). Alcohol-based hand rub, compared with traditional hand washing with unmedicated soap and water or medicated hand antiseptic agents, may be better because it requires less time, acts faster, and irritates hands less often. This method was used in the only program that reported a sustained improvement in hand hygiene compliance associated with decreased infection rates (Kurlat, et al., 2008).

Finally, strategies to improve compliance with hand hygiene practices should be multimodal and multidisciplinary. It is important to note, however, that the proposed framework for such strategies needs further research before implementation (Haley & Bregman, 2002).
CHAPTER THREE

MATERIALS AND METHODS

3.0 Introduction
This chapter described the area of study in geographical terms, location and different tribes within the study area, study design, sample size determination, pre-test and collection of data, data analysis, presentation and limitation of the study.

3.2 Study Design
A cross sectional design was employed in the study using qualitative and quantitative methods. Cross sectional design was appropriate because it systematically described the research problem and provided facts as they were at the time of the study. This study design was used to assess the frequency and distribution of the problem in a defined population or representative subset. Triangulation of methodologies, using both qualitative and quantitative approaches enabled a greater understanding of the existing knowledge, staff adherence to effective hand hygiene practices and the existing barriers to optimal hand hygiene practice.

3.3 Study Area
This study was conducted in Bushenyi District located in South-western region of Uganda. The district is made up of 1 county (Igara), 9 sub-counties, 1 Municipal Council, 4 Town Boards, 3 Wards, 64 Parishes and 565 villages. The study focused on three (3) health facilities in the district that include; Kampala International University Teaching Hospital (KIUTH); Kitagata District Hospital and the Health Centre IV. According to Uganda Bureau of Statistics census report 2014, Bushenyi district had a population of 234,443 people; with women constituting 51.3% and men 48.7%, with about 89% of the total population rural and 11% urban. The population growth is 2% and the literacy rate is 38%. About half of the population can access safe water 49.6% with a childhood malnutrition of 43% (Bushenyi District Record, 2014). Like
many other districts in Uganda, nosocomial infections in Bushenyi district remain a serious public health challenge, especially in high risk settings such as health care facilities. This is attributed to lack of knowledge and poor compliance to hand hygiene practices among healthcare workers.

3.3 Study population

The study population comprised of healthcare providers working at the selected health facilities. Only medical doctors, nurses, pharmacists, medical laboratory scientists and health assistants who were working in the various wards of the hospital/health centre IV in Bushenyi District at the time of study and had served for a minimum of one month with the hospital/health centre, were included in the study. Doctors, nurses, pharmacists, medical laboratory scientists and health assistants who were not working in the wards at the time of the study and those who had worked for less than a month in the hospital/health centre were excluded. Other administrators and non-medical personnel were also excluded.

3.4 Sample size

The total number of health professionals in the hospitals and health centres IV was 421. The sample size was determined using Krejcie and Morgan table (1970) where the table provided the equivalent sample size for each population size. The population size here was 421 and the equivalent sample size was 201.

Table 1: Sample distribution
<table>
<thead>
<tr>
<th>Hospital/health centre</th>
<th>No. of health workers</th>
<th>Sample proportion</th>
<th>Target respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>KIUTH</td>
<td>202</td>
<td>$202/421 \times 201$</td>
<td>96</td>
</tr>
<tr>
<td>Kitagata District Hospital</td>
<td>172</td>
<td>$172/421 \times 201$</td>
<td>82</td>
</tr>
<tr>
<td>Health Centre IV</td>
<td>47</td>
<td>$47/421 \times 201$</td>
<td>23</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>421</strong></td>
<td></td>
<td><strong>201</strong></td>
</tr>
</tbody>
</table>

### 3.5 Sampling Technique and Procedure

The study focused on all hospitals and health centres in Bushenyi District. Bushenyi District has two health centre IVs and three hospitals with total number of 421 health professionals. The multi-stage cluster sampling technique was used to select the three health facilities used in the study. Multi-stage sampling divides large populations into stages to make the sampling process more practical. In the first stage, the Western region is divided into collection districts and some of these collection districts selected. In the second stage, the selected collection district (Bushenyi District) is divided into 3 blocks and in the third stage, hospitals and health centres are listed within selected blocks and the three health facilities used were randomly selected from the blocks. Systematic random sampling was applied using the sampling interval of “three” to select the 201 respondents from the three selected health facilities to constitute the sample size. The sampling interval was calculated by dividing the population size by the desired sample size. Simple random sampling was used to select the first respondent and the other respondents were selected after the 3rd person.

### 3.6 Data collection tools

#### 3.6.1 Questionnaire

A semi structured questionnaire with both closed and open ended questions in English language was employed to obtain quantitative data from health professionals. Section A constituted the respondents’ demographic information such as; gender, age, marital status, level of education, position in the organisation and name of the health facility. Section B, C, D and E comprised
of the varying questions regarding the study phenomenon. The questionnaire facilitated the respondents to express their opinions regarding the level of knowledge on hand hygiene practices among health care workers, level of adherence to hand hygiene practices among health care workers, the factors limiting adherence to hand hygiene practices as well as the possible strategies for addressing the various factors limiting adherence to hand hygiene practices among health workers. This tool captured data from medical doctors, nurses, pharmacists, medical laboratory scientists and health assistants.

3.6.2 Key Informant Interview

To capture in-depth information on the topic, interviews were conducted to enable the researcher get information from the medical superintendent of the hospitals and heads of health centre IVs as well as the heads of each department in the health facilities using interview guide.

3.7 Data quality control

3.7.1 Content Validity

The researcher ensured content validity of instruments by consulting experienced and skilled researchers including the supervisor. The researcher first piloted a questionnaire before administering it to test its validity. Results from the field helped to further refine and standardize the questionnaires.

3.7.2 Content Reliability

To ensure quality of this study, the researcher took several measures during the field work, analysis and conclusion process. Before real collection of data, data instruments were pre-tested on 2 respondents from each group to determine their reliability and these respondents were not among the interviewers. Reliability of the questionnaires in relation to the consistency of the respondents’ answers was computed using the Cronback’s Alpha Coefficient of over 0.70.
3.8 Data Management and Analysis

3.8.1 Data Management

The data collected was entered into Microsoft Excel version 2007 to ease management and removal of errors after which it was transferred to STATA version 13 for further data analysis. The chi-squared test was used to check the significant variables at P ≤ 0.05.

3.8.2 Data Analysis

This involved processing of the data which was done at three levels using STATA. The three levels included; Univariate, Bivariate and Multivariate analysis. Techniques for summarizing data for continuous variables were used and these included mean, variance and standard deviation while frequencies and percentages were used for categorical variables. Chi-square tests were used to test any possible associations between categorical variables, significant relationships were determined at (p≤0.05). The chi-square test statistic ($X^2$) that was used was in form of:

$$(x)^2 = \sum_{i=1}^{r} \sum_{j=1}^{c} \left( \frac{O_{ij} - E_{ij}}{E_{ij}} \right)^2 \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots 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\ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldotted
\[
\log \left( \frac{p_{ji}}{p_1} \right) = a_i + \beta_j x_i + bx_2 + bx_3 = \cdots \tag{3.2}
\]

Where: \( a_i \) - represents the constant

\( p_j \) - represents the probability of the \( j^{th} \) category

\( \beta_j \) – Regression coefficients

\( x_{ij} \) – independent variables

\( P_1 \) – prob. of the base category

Data from interviews was analysed by thematic content analysis. The data was coded and categorized and common themes were identified. Analysis of the norms, perceptions and attitudes of health professionals towards hand hygiene practices was done.

3.9 Ethical considerations

To make sure that the study upholds ethical criteria, the researcher fulfilled the following:

3.9.1 Institutional consent

Ethical approval for the study was obtained from the Research and Ethics Committee of Bishop Stuart University. Permission was obtained from the office of the District Health Office (DHO) Bushenyi to proceed to the respective health centres to start data collection. Permission was also obtained from the heads of the selected health facilities to use their staffs during the study.

3.9.2 Informed Consent

An informed consent was obtained from participants. They were informed that their participation in the study was voluntary and they had the right to terminate their participation on their own free will at any point without any consequences. Participants were informed of the purpose of the study, the criteria for participation in the study, procedures to be followed
and any risks or benefits which would be involved during the study were explained to the respondents. The participants were asked to sign or thumbprint willingly after understanding the information given by the researcher.

### 3.9.3 Privacy and Confidentiality

The participants were assured of privacy and the researcher ensured that their information was not shared with the public. Participants were assured of confidentiality by using the information provided by the respondents only for the purposes of the research. Data collected from the respondents was anonymous and kept confidential.

### 3.9.4 Justice

Every respondent was treated equally without giving a particular group priority. All the respondents had equal chances of being selected for the study.

### 3.9.5 Human Rights

In the course of the study, the respondents were treated with utmost respect for their human rights. They were entitled to their decisions and that was respected.

### 3.10 Limitations of the study

- The respondents feared to give information that was not in favour of the hospitals or health centres. In these case, respondents were reassured that any information given would be held confidential.

- The respondents did not have time to fill the questionnaires due to conditions of their work, for example some health professionals were busy consulting with the patients during data collection. To overcome this problem, proper arrangements were made with heads of health units to choose convenient time for data collection.
CHAPTER FOUR

RESULTS

4.0 Introduction

This chapter presented research findings of descriptive statistics and regression model. Descriptive statistics presented findings of socio-demographic characteristics which included age, marital status, education, and profession.

4.1 Demographic information

This section presents the demographic characteristics (age, marital status, education level, and profession) of the respondents that participated in the study.

Figure 1: Distribution of the sample by gender

As indicated figure 4.1 above, more than a half 52.7% of the respondents were women while 47.3% were men.

Table 2: Descriptive Statistics of age and education level in years

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years</td>
<td>201</td>
<td>19</td>
<td>56</td>
<td>31.00</td>
<td>10.223</td>
</tr>
<tr>
<td>Education in years</td>
<td>201</td>
<td>14</td>
<td>18</td>
<td>15.22</td>
<td>1.125</td>
</tr>
<tr>
<td>Valid N (list wise)</td>
<td>201</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In terms of age distribution, the minimum age was 19 years, maximum 56 years and average age distribution was $31 \pm 10$ respectively. The years spent in school were a minimum of 14 and a maximum of 18, the average number of years in school was 15.

**Figure 2: Distribution of the sample by marital status**

As indicated in figure 4.2, the married respondents were 63.7%, those that were never married 28.4%, divorced/separated 4%, widowed 3% and others like those that were cohabiting 1%.

**Figure 3: Distribution of the sample by profession**

Professionally, the respondents were largely nurses 38.3%, followed by doctors 28.9%, health assistants 19.4%, Laboratory scientists 9.9% and the pharmacists 3.5%.

**4.2 Level of knowledge on hand hygiene practices among health care workers**
Knowledge was assessed by evaluating health worker understanding of hand hygiene practice, sources of contamination, washing solutions used for hand hygiene, techniques applied in practicing hand hygiene and knowledge on health-care associated infection. The analysis for each of these items and overall knowledge across the different areas are presented below.

**Table 3: Definition of hand hygiene practices**

<table>
<thead>
<tr>
<th></th>
<th>Count</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>169</td>
<td>84.1</td>
</tr>
<tr>
<td>No</td>
<td>32</td>
<td>15.9</td>
</tr>
<tr>
<td>Total</td>
<td>201</td>
<td>100.0</td>
</tr>
</tbody>
</table>

This table assessed health care workers understanding of hand hygiene practices. 84.1% of health workers reported hand washing as a practice of using soap and water to keep hands free from germs.

**Figure 4: Solutions used for hand hygiene**

77.6% of the respondents reported the practice of washing hands before and after attending to the patient because they knew hand hygiene was highly effective in preventing health care associated infections. For hand washing solutions, 69.7% knew water and soap, 18.4% hot water, 6.5% reported alcohol-based hand rub and 5.5% talked of cold water.
Table 4: Reasons for practicing hand hygiene

<table>
<thead>
<tr>
<th>Category Reasons for hand hygiene</th>
<th>Response</th>
<th>Count</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>For hygiene (keeping the hands clean)</td>
<td>26</td>
<td>12.9</td>
</tr>
<tr>
<td></td>
<td>To prevent cross infections</td>
<td>138</td>
<td>68.7</td>
</tr>
<tr>
<td></td>
<td>to guard against germs</td>
<td>37</td>
<td>18.4</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>201</td>
<td>100.0</td>
</tr>
</tbody>
</table>

This table shows the main reasons for washing hands before and after attending to the patients by health workers. 68.7% reported prevention of cross infection, 31.1% reported for hygiene (keeping the hands clean) and to guard against germs.

Figure 5: Perceived hand hygiene actions that are most effective in preventing transmission of germs to the health-care worker

This figure shows the opinion of the health workers on the most effective hand hygiene actions in preventing transmission of germs to the health worker. 98.5% reported use of hot water and antiseptic soap, followed by use of alcohol hand rubs 94% and 88.1% reported the use of gloves.

In terms of effectiveness, 82.1% rated hand hygiene actions highly effective, average by 12.4% and very low by 5.5% of the respondents.
4.3 Level of adherence to hand hygiene practices among health care workers in Bushenyi district.

Table 5: Opportunities that required health workers to practice hand hygiene

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Count</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before touching a patient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>95</td>
<td>47.3</td>
</tr>
<tr>
<td>No</td>
<td>106</td>
<td>52.7</td>
</tr>
<tr>
<td>Total</td>
<td>201</td>
<td>100.0</td>
</tr>
<tr>
<td>Immediately after a body fluid exposure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>180</td>
<td>89.6</td>
</tr>
<tr>
<td>No</td>
<td>21</td>
<td>10.4</td>
</tr>
<tr>
<td>Total</td>
<td>201</td>
<td>100.0</td>
</tr>
<tr>
<td>After exposure to the immediate surroundings of a patient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>189</td>
<td>94.0</td>
</tr>
<tr>
<td>No</td>
<td>12</td>
<td>6.0</td>
</tr>
<tr>
<td>Total</td>
<td>201</td>
<td>100.0</td>
</tr>
<tr>
<td>Immediately before a clean/aseptic procedure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>186</td>
<td>92.5</td>
</tr>
<tr>
<td>No</td>
<td>15</td>
<td>7.5</td>
</tr>
<tr>
<td>Total</td>
<td>201</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The table above shows the adherence rate to hand hygiene: after exposure to the immediate surroundings of a patient (94%), before a clean/aseptic procedure (92.5%), immediately after a risk of body fluid exposure (89.6%), and before touching a patient (47.3%).

Table 6: Compliance rate among health workers

<table>
<thead>
<tr>
<th>Compliance rate among health workers</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctors</td>
<td>43</td>
</tr>
<tr>
<td>Nurses</td>
<td>31</td>
</tr>
<tr>
<td>Others</td>
<td>26</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

From the observations made doctors had better hand hygiene compliance rate (43%) than nurses (31%) and others (26%).
Table 7: Components of hand washing

<table>
<thead>
<tr>
<th>Components of hand washing</th>
<th>Count</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of soapy water in basin</td>
<td>49</td>
<td>24.4</td>
</tr>
<tr>
<td>Use of running tap water only</td>
<td>28</td>
<td>13.9</td>
</tr>
<tr>
<td>Use of running water and antiseptic soap</td>
<td>78</td>
<td>38.8</td>
</tr>
<tr>
<td>Use of alcohol only</td>
<td>36</td>
<td>17.9</td>
</tr>
<tr>
<td>I don’t know</td>
<td>10</td>
<td>5.0</td>
</tr>
<tr>
<td>Total</td>
<td>201</td>
<td>100.0</td>
</tr>
</tbody>
</table>

This table shows the identification of the above as the components of hand washing with 38.8% reporting the use of running water and antiseptic soap, 24.4% use of soapy water in basin, 17.9% use of alcohol only, 13.9% use of running tap water only and 5% were not aware of what to use. 97.5% of the health workers reported that contaminated hands were a vehicle for transmitting healthcare-associated infections and hand hygiene was recommended to eliminate the infection.

Table 8: Level of adherence to washing solutions when attending to the patients

<table>
<thead>
<tr>
<th></th>
<th>Always</th>
<th>50/50</th>
<th>Not always</th>
</tr>
</thead>
<tbody>
<tr>
<td>An alcohol-based hand rub</td>
<td>95(47.3%)</td>
<td>62(30.8%)</td>
<td>44(219%)</td>
</tr>
<tr>
<td>Hot water only</td>
<td>93(46.3%)</td>
<td>50(24.9%)</td>
<td>58(28.9%)</td>
</tr>
<tr>
<td>Hot water and antiseptic soap</td>
<td>156(77.6%)</td>
<td>26(12.9%)</td>
<td>19(9.5%)</td>
</tr>
</tbody>
</table>

From the analysis, the level of adherence to hand hygiene practices among health care workers was 88.6% compared to 11.4% who did not practice hand hygiene. When attending to patients, 77.6% reported hot water and antiseptic soap as the most used practice, followed by use of alcohol-based hand rub by 47.3% and finally hot water by 46.3%.

4.4 Perceived challenges /factors limiting adherence to hand hygiene practices among health workers in Bushenyi district.
Table 9: Logistic Regression Analysis output for the factors preventing health workers from performing hand hygiene as recommended

<table>
<thead>
<tr>
<th>Factor</th>
<th>True</th>
<th>%</th>
<th>OR (95%CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of time/ too busy</td>
<td>True</td>
<td>144</td>
<td>71.6</td>
<td>1.810 (.342, 1.919)</td>
</tr>
<tr>
<td></td>
<td>False*</td>
<td>57</td>
<td>28.4</td>
<td>1</td>
</tr>
<tr>
<td>Lack of alcohol-based hand rub</td>
<td>True</td>
<td>186</td>
<td>92.5</td>
<td>2.031 (.572, 7.206)</td>
</tr>
<tr>
<td></td>
<td>False*</td>
<td>15</td>
<td>7.5</td>
<td>1</td>
</tr>
<tr>
<td>Forgetfulness</td>
<td>True</td>
<td>170</td>
<td>84.6</td>
<td>1.15 (0.75, 1.76)</td>
</tr>
<tr>
<td></td>
<td>False*</td>
<td>31</td>
<td>15.4</td>
<td>1</td>
</tr>
<tr>
<td>Nobody else does</td>
<td>True</td>
<td>88</td>
<td>43.8</td>
<td>.666 (.313, 1.416)</td>
</tr>
<tr>
<td></td>
<td>False*</td>
<td>113</td>
<td>56.2</td>
<td>1</td>
</tr>
<tr>
<td>It’s not important</td>
<td>True</td>
<td>60</td>
<td>29.9</td>
<td>5.24 (1.95, 14.10)</td>
</tr>
<tr>
<td></td>
<td>False*</td>
<td>141</td>
<td>70.1</td>
<td>1</td>
</tr>
<tr>
<td>Use gloves instead</td>
<td>True</td>
<td>179</td>
<td>89.1</td>
<td>4.36 (2.76, 6.87)</td>
</tr>
<tr>
<td></td>
<td>False*</td>
<td>22</td>
<td>10.9</td>
<td>1</td>
</tr>
<tr>
<td>Lack of towels</td>
<td>True</td>
<td>112</td>
<td>55.7</td>
<td>6.37 (4.01, 10.13)</td>
</tr>
<tr>
<td></td>
<td>False*</td>
<td>89</td>
<td>44.3</td>
<td>1</td>
</tr>
<tr>
<td>Short patient contact</td>
<td>True</td>
<td>127</td>
<td>63.2</td>
<td>.926 (.316, 2.712)</td>
</tr>
<tr>
<td></td>
<td>False*</td>
<td>74</td>
<td>36.8</td>
<td>1</td>
</tr>
<tr>
<td>Valid</td>
<td></td>
<td>201</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

* = Reference category

From the analysis presented in the table above, a Logistic Regression model was applied to determine the significant factors preventing health workers from performing hand hygiene as recommended by WHO in the health system.

In this study, lack of time was a statistically significant factor (p=0.032) and health professionals who lacked time were nearly 2 times more likely not to practice hand hygiene compared to those with enough time [OR: 1.810 (95%CI: .342, 1.919)].
Lack of alcohol-based hand rub was not a significant factor (p=0.273) preventing health workers from performing hand hygiene but it was two times likely to affect hand hygiene practice among health workers [OR: 2.031 (95%CI: .572, 7.206)].

The analysis indicated that forgetfulness was a significant factor (p=0.049). Health workers who were too forgetful were nearly two times more likely not to practice hand hygiene compared to those who are not forgetful [OR: 1.15 (95%CI: 0.75,1.76)].

From the findings, it was indicated that health workers were 0.66 times less likely to practice hand hygiene if nobody else does it [OR: .666 (95%CI: .313, 1.416)]. However, this was not a significant factor at (p=0.291).

The analysis indicated that health workers who considered hand hygiene not important had more chance of not practicing it [OR: 5.24 (95%CI: 1.95, 14.10)] and this was a significant factor (p=0.001) affecting health workers from performing hand hygiene.

In this study, Health professionals who preferred to use gloves than any other practice were four times more likely not to do hand hygiene compared to those who preferred all the practices [OR: 4.36 (95%CI: 2.76,6.87). This was a significant factor (p=0.003) preventing health workers from adopting the practice.

The results showed that health workers that lacked disposable towels to use had more chances of not practicing hand hygiene compared to those who had access to disposable towels [OR: 6.37 (95%CI: 4.01,10.13). This was a significant factor at (p=0.000).

Results further revealed that health workers who had short time contact with the patients were nine times likely not to practice hand hygiene compared to those who usually have long time intervals with the patients [OR: 9.26 (95%CI: .316, 2.712)]. However, this was not a significant factor at (p=0.888).
4.5 Strategies for addressing the factors limiting adherence to hand hygiene practices

Table 10: Strategies for addressing the factors limiting adherence to hand hygiene practices

<table>
<thead>
<tr>
<th>Possible strategies</th>
<th>Count</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaders and senior managers at the institution must support and openly promote hand hygiene</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>174</td>
<td>86.6</td>
</tr>
<tr>
<td>No</td>
<td>27</td>
<td>13.4</td>
</tr>
<tr>
<td>Total</td>
<td>201</td>
<td>100.0</td>
</tr>
<tr>
<td>The health-care facility should make alcohol-based hand rub always available at each point of care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>187</td>
<td>93.0</td>
</tr>
<tr>
<td>No</td>
<td>14</td>
<td>7.0</td>
</tr>
<tr>
<td>Total</td>
<td>201</td>
<td>100.0</td>
</tr>
<tr>
<td>Hand hygiene posters must be displayed at point of care as reminders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>178</td>
<td>88.6</td>
</tr>
<tr>
<td>No</td>
<td>23</td>
<td>11.4</td>
</tr>
<tr>
<td>Total</td>
<td>201</td>
<td>100.0</td>
</tr>
<tr>
<td>Each health-care worker should receive education on hand hygiene</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>173</td>
<td>86.1</td>
</tr>
<tr>
<td>No</td>
<td>28</td>
<td>13.9</td>
</tr>
<tr>
<td>Total</td>
<td>201</td>
<td>100.0</td>
</tr>
<tr>
<td>Clear and simple instructions for hand hygiene should be made visible for every health-care worker</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>174</td>
<td>86.6</td>
</tr>
<tr>
<td>No</td>
<td>27</td>
<td>13.4</td>
</tr>
<tr>
<td>Total</td>
<td>201</td>
<td>100.0</td>
</tr>
<tr>
<td>Health-care workers should regularly receive feedback on their hand hygiene performance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>162</td>
<td>80.6</td>
</tr>
<tr>
<td>No</td>
<td>39</td>
<td>19.4</td>
</tr>
<tr>
<td>Total</td>
<td>201</td>
<td>100.0</td>
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From the analysis in the table above, study respondents reported a number of strategies for addressing the factors limiting adherence to hand hygiene practices, 93% reported that health-facility administration should always make an alcohol-based hand rub available at each point of care, 88.6% revealed that hand hygiene posters must be displayed at point of care as reminders to health workers, 86.6% of the participants recommended leaders and senior administrators at the studied health facilities to support and openly promote hand hygiene among health workers, 86.6% suggested that clear and simple instructions for hand hygiene should be made visible for every health-care worker, 86.1% reported that each health-care
worker must be provided or receive education on hand hygiene and 80.6% revealed that health-care workers should regularly receive feedback on their hand hygiene performance.
CHAPTER FIVE
DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

5.0 Introduction

This chapter gave a brief account of the study including discussions and conclusions drawn from findings and the recommendations to improve adherence to hand hygiene by health workers.

5.1 Summary

This study was undertaken to assess the knowledge, practices and barriers to implementation of hand hygiene practices among health care workers in Bushenyi district western Uganda.

The specific objectives of the study were to;

- Assess the level of knowledge on hand hygiene practices among health care workers in Bushenyi District
- Assess the level of adherence to hand hygiene practices among health care workers in Bushenyi District.
- Identify the challenges /factors limiting adherence to hand hygiene practices among health workers in Bushenyi District.
- Ascertain the possible strategies for addressing the factors limiting adherence to hand hygiene practices among health workers in order to eliminate nosocomial infections in the hospital settings.

5.2 Discussion of findings

Adequate hand hygiene practice among healthcare workers is the single most effective means of preventing nosocomial infections. Hand hygiene compliance is based on disinfecting hands appropriately. According to Sydnor and Perl (2011) patients in hospital are at high risk of developing infections that they did not have before admission. They further argued that most
health care-associated infections are spread by direct contact, especially via the hands of health workers. Traditionally, hand hygiene such as washing hands before and after seeing patients, has been considered the single most important way of reducing such infections, but compliance with hand hygiene protocols in health care workers is poor.

5.2.1 Demographic characteristics

Profession
The results of the study show that many of the respondents were nurses (38.3%). Nurses contribute to the majority population of the health care workers in many health institutions. According to Yawson (2013) nurses constitute the largest percentage of the health care workers (HCW) and they are the “nucleus of the health care system”. Because they spend more time with patients than other HCWs, their compliance with hand washing guidelines seems to be more vital in preventing the disease transmission among patients (Rezende & Modena, 2008).

Gender
The results of this study further revealed that many of the respondents were females compared to males. This suggests that the health care workforce in these facilities is dominated by females especially in the nursing profession. This finding was in line with the Statistic from Botswana Ministry of health (2011) which indicated that nursing profession is mainly dominated by females throughout the world including Botswana. It is therefore not surprising that majority of the respondents were females. However, according to United Nation statistics (2006) the percentage of female employee in Botswana is 34% while male is 55% which prove to be exceptions in nursing cadre, where majority of employees are females. Goldmann & Larson, (2010) further revealed that female healthcare workers tend to wash hand more often than male ones, meaning, that it is expected that more females than males would practice hand washing.

Age
The results revealed that the youngest respondents were 19 years and the eldest respondents 56, average age distribution of the respondents was 31 years. This was in line with Preston, (2011) who stated that the hand hygiene compliance was highest in the age group of 20-40 years old. Studies reveal that younger HCWs are likely to practice hand-washing compared to older ones. Zimakoff & Holstein, (2012) also found that younger HCWs were more compliant than older ones.

**Education**

The results of this study revealed that the minimum level of education was 14 years and a maximum of 18 years. Average level of education was 15 years. Majority of the respondents have acquired different levels of education up to tertiary level. Hand hygiene is part of standard precautions which are taught in pre-clinical exposure to all health care workers. This was in line with Meengs & Nelson, (2013) who argued that the high level of knowledge on hand washing by the HCWs is not unexpected by virtue of their medical background. The results of Pittet & Perneger, (2009) study showed that hand hygiene was independent from level of education, meaning, it is all about priorities and behaviour change.

Effective hand hygiene is essential for reducing healthcare associated infections. However, compliance of healthcare workers to hand hygiene guidelines are reportedly generally poor. Dubbert & Chapman, (2010) found that student nurses were not using a correct hand washing technique, and were doing so less frequently. In this study, the hand hygiene opportunities were not adequately used. It is therefore important to instil adequate knowledge and good attitudes and practices at the time of primary training of the healthcare workers as suggested by Preston, (2011). The fact that most of health care workers have gone up to tertiary level means that they can effectively apply their knowledge of hand hygiene to their clinical practice.

**5.2.1 Level of knowledge on hand hygiene practices among health care workers**
Level of knowledge was assessed by evaluating health worker understanding of sources of contamination, washing solutions used for hand hygiene, techniques applied in practicing hand hygiene and knowledge on health-care associated infections through the questionnaire.

Majority of the health care workers’ knowledge, understanding and interpretation of hand hygiene practices were assessed. From the analysis 84.1% of the health workers defined and understood hand washing as a practice of using soap and water to keep hands free from germs that can result in healthcare associated infections as compared to 15.9%. In an interview with one of the medical superintend, he had this to say;

“………………to me, I understand hand hygiene to mean the washing of hands with soap and running tap water as well as applying alcohol based hand rub to keep the hands clean and prevent transmission of infections”.

The main hand washing solutions used for hand hygiene included; water and soap (69.7%), hot water (18.4%) and alcohol-based hand rub (6.5%). Majority of the health workers were knowledgeable about water and soap but few knew about alcohol-based hand rub which is recommended. The main reasons for using such solutions for hand washing before and after attending to patients included prevention of cross infection (68.7%) and keeping the hands clean and free from germs (31.1%). In interview session with one of the senior nursing officers in charge, she revealed;

“…………….by the time I have been working at this healthy facility, we have been using mainly running tap water and soap because other solutions like alcohol based hand rub and antiseptic soaps are not provided regularly. We health workers usually wash hands with these solutions to prevent picking from or giving infections to the patients”.
The health care workers knowledge on components of hand washing was low with only 38.8% reporting the use of running water and antiseptic soap. 97.5% of the health workers reported that contaminated hands were a vehicle for transmitting HCAIs. Perceived hand hygiene actions that were most effective in preventing transmission of HCAIs included use of hot water and antiseptic soap (98.5%), followed by use of alcohol hand rubs (94%) and use of gloves (88.1%). These hand hygiene actions were rated highly effective by 82.1% of the respondents and average by 12.4%. Hand washing with hot water and antiseptic soap was perceived to be the best means of hand decontamination (98.5%).

5.2.2 Level of adherence to hand hygiene practices among health care workers in Bushenyi district

In this section, most of the health care workers identified components of hand washing with 38.8% reporting the use of running water and antiseptic soap, 24.4% soapy water in basin, 17.9% use of alcohol only and 13.9% use of running tap water only. The percentage of health workers that identified use of running water and antiseptic soap as components of hand washing was low (38.8%). In an interview with an Executive Director at KIUTH, he revealed;

“…………hand washing in this hospital is low because we try to provide water and soap for the staff but most times staff make use of gloves more because they find it easier than using water and soap. Additionally, shortage of funds has not enabled us provide antiseptic soaps regularly”.

This study showed that HCPs tend to wash their hands more often after contact with patients than before contact. From the findings, majority indicated that they washed their hands after performing patient care activities. Compliance rate with hand hygiene opportunities varied across procedures and among various professional categories of health workers; 94% washed their hands after exposure to the immediate surroundings of a patient, 92.5% before a
clean/aseptic procedure, 89.6% after a risk of body fluid exposure and only 47.3% washed before touching a patient. The average compliance rate with hand hygiene opportunities from the health workers after performing patient care activities was 92%. In an interview with the head of nursing department in the health facilities, she revealed;

“……………..when we are in the wards especially during busy hours, we are not usually conscious of washing our hands before touching patients forgetting that we could have contaminated our hands from touching surfaces or from the surroundings. In my experience, the consciousness of hand washing is more after contact with patients because we health workers do not want to get infected. Sometimes, some health workers feel their contact with the previous patient was too short for them to have picked up any infection”

This study inferred that the remaining 8% that did not comply with hand hygiene opportunities is still a significant number for concern. Furthermore, the number of health workers who are conscious of washing their hands before performing any patient care activity is still low (47.3%). Whereas WHO guidelines require HCWs to perform hand hygiene every time before and after patient contact.

This finding is similar to that of other studies. In one of such studies, a hand washing rate of zero percent was reported before health care professionals (HCPs) interacted with patients, this increased to 63% hand washing rate after HCPs-Patients interaction. This finding thus underscores the need for urgent intervention measures by hospital management with respect to hand washing policy, emphasizing the need for hand washing before Patients-HCPs contact/interaction. This observation is similar to findings in other studies which reported that a major motivation to hand washing is fear of contracting disease from patients. The patients are equally protected from infectious agents if all HCPs practice good hand hygiene.
In addition, doctors (43%) showed higher compliance than nurses (31%) and other health care workers (26%). Regarding the variation in practice of hand washing, doctors showed better hand washing practices than other groups at the health facilities. The doctors understood hand washing techniques better than other professional categories. The level of adherence to hand hygiene among HCWs is still low even with doctors reporting the highest compliance rate 43%. This finding is similar to UPTH study in which doctors were found to have a better hand washing practice than the nurses. However, it contrasts with the study by (Meengs & Nelson, 2013) conducted at Emergency Unit of Royal Infirmary in United Kingdom in which the nurses had a better hand washing practice than the doctors in all the observed patients-HCPs interactions (62.5% and 20.7% respectively). A possible explanation for the better hand washing practice among the nurses may be because some nursing procedures such as changing and emptying patient’s urinary, diaper and beddings exposes them to highly infectious agents, and hence the need to wash their hands frequently is rather inevitable.

Respondents were asked how they routinely used an alcohol-based hand rub, boiled water or soap and cold water for hand hygiene. The effectiveness of use of each individual solution when attending to the patient in the various wards was assessed. 77.6% reported adherence to use of hot water and antiseptic soap after attending to patients, followed by use of alcohol-based hand rub (47.3%) and finally boiled/hot water (46.3%). The overall hand-hygiene compliance among HCWs was 88.6%. HCWs reported higher rate of compliance after conducting patient care activities rather than before. This study showed that the health workers’ use and understanding of alcohol hand rub as a recommended component of hand hygiene practice is low. These findings were in support with (Pittet & Allegranzi, 2006) who conducted a cross-sectional study to assess the compliance with hand hygiene guidelines among nursing staff in secondary care hospitals in Kuwait. During their study, out of 204 observation sessions, a total of 935 opportunities and 312 hand hygiene practices were
recorded. The result of the study showed that the overall compliance was 33.4%. The observed compliance significantly varied between different ward categories from 14.7% in emergency to 55% in medical wards. Of the 454 nursing staff that participated in self-reported compliance, 409 (90%) indicated that they always washed their hands upon practicing patient care activities. Nurses consistently reported higher compliance after conducting patient care activities rather than before. The high self-reported overall compliance (88.6%) and higher compliance with hand hygiene solutions after patient care activities in this study may reflect a high level of awareness of hand hygiene among health workers in Busenyi District.

5.2.3 Perceived factors limiting adherence to hand hygiene practices among health workers in Busenyi district

A logistic regression model was adopted to determine the significant factors preventing health care workers from performing hand hygiene as recommended by WHO in the health system. Among the highlighted factors; lack of time or health workers being too busy (p= 0.032), forgetfulness (p=0.049), HH not considered important (p=0.001), use of gloves instead (p= 0.003), and lack of disposable towels (p=0.000) were perceived as the main significant factors limiting adherence to hand hygiene practice among HCWs. In this study factors such as lack of alcohol hand rub (OR: 2.031) and short patient contact (OR: 9.26) showed high odd risks. In an interview with the medical superintendent of one of the health facilities, he revealed:

“………….the hospital management tries as much as possible to provide what staff needs for hand hygiene. Due to lack of funds items such as disposable towels, alcohol hand rubs, and antiseptic soaps are not regularly provided. Also we do not have enough sinks conveniently located to enable us maximize hand hygiene. We provide gloves regularly. Tap water and soap is also available but sometimes water may not be regular especially during dry season when there is
less rainfall. We have guidelines on hand hygiene, even though they are not displayed”.

These study findings are in comparison with (Webster & Cartwright, 2004) who stated that wearing gloves might represent a barrier for compliance with hand hygiene. Failure to remove gloves after patient contact or between dirty and clean body site care for the same patient constitutes noncompliance with hand hygiene recommendations. Washing and reusing gloves between patient contacts is ineffective, and hand washing or disinfection should be strongly encouraged after glove removal. In a study involving artificial contamination, organisms were cultured from 4% to 100% of the gloves and observed counts were up to 4.7 log on hands after glove removal.

Findings can further be compared to (Larson, et al., 2002) who stated that additional barriers to hand hygiene compliance include lack of active participation in promotion at the individual or institutional level, of a role model for hand hygiene, of institutional priority assigned to hand hygiene, of administrative sanctions for noncompliance; and of an institutional climate encouraging safety. A system change may be necessary for improvement in hand hygiene practices by health-care workers.

5.2.4 Strategies for addressing the factors limiting adherence to hand hygiene practices

In regard to the strategies for addressing the factors limiting adherence to hand hygiene practices, 93% of the respondents recommended hospital administration to always make an alcohol-based hand rub available at each point of care, 88.6% recommended hygiene posters to be displayed at each point of care to act as reminders for the health workers, 86.6% of the participants recommended leaders and senior administrators at the health facilities to support and openly promote hand hygiene among health workers, 86.6% recommended the need for clear and simple instructions for hand hygiene to be made visible for every health-care worker,
86.1% recommended that each health-care worker should receive education on hand hygiene and 80.6% revealed that health-care workers should regularly receive feedback on their hand hygiene performance.

The findings of this study are comparable to (Pittet & Perneger, 2009) who in a multicentre survey to determine measures that may help HCPs to improve on their hand hygiene, most respondents in the survey were not in favour of interventions involving rewards or punishment but were more attracted to interventions that make hand washing easier such as provision and easy accessibility to hand washing materials and continuous health education on infection control and hand washing. These measures if put in place will greatly enhance hand washing practices among HCPs.

Findings are also in support with (Haley, et al., 2005) who stated that several parameters that could potentially be associated with successful promotion of hand hygiene would require a system change. Enhancing individual and institutional self-efficacy (the judgment of one’s capacity to organize and execute actions to reach the objective), obtaining active participation at both levels, and promoting an institutional safety climate represent major challenges that exceed the current perception of the infection control practitioner’s role.

5.3 Conclusion

This study was undertaken to assess the knowledge, practices and barriers to implementation of hand hygiene among health care workers in Bushenyi district western Uganda. The specific objective of the study were to; assess the level of knowledge on hand hygiene practices among health care workers in Bushenyi District, assess the level of adherence to hand hygiene practices among health care workers, identify the factors limiting adherence to hand hygiene practices among health workers and ascertain the possible strategies for addressing the factors
limiting implementation of hand hygiene practices among health workers so as to eliminate nosocomial infections in the hospital settings.

In conclusion, health care workers in Bushenyi District were found to have good knowledge and positive attitude to hand washing. However, this knowledge did not translate into effective implementation of hand hygiene. The study concluded that the level of adherence to hand hygiene practices among health care workers in Bushenyi district was low. Identification of components of hand washing by HCWs was poor and hand hygiene opportunities were not adequately utilized as recommended by WHO. The high self-reported adherence may reflect a high level of awareness of hand hygiene. Compliance with hand washing is higher after conducting patient care activities rather than before.

The study concluded that lack of time/too busy, forgetfulness, use of gloves instead, lack of disposable towels, lack of alcohol-based hand rub and HH not considered important were identified as the main factors limiting adherence to hand hygiene practices among health workers in Bushenyi district.

The study concluded that the possible strategies for addressing the factors limiting adherence to hand hygiene practices among health workers could be useful in improving compliance rate significantly. Strategies should emphasize on measures to improve facilities available for hand hygiene such as regular provision of alcohol-based hand rub, disposable towels at each point of care and increase adherence through continuing education of HCWs by ensuring that hand hygiene posters are displayed at points of care, clear and simple instructions for hand hygiene are made visible for every HCW, hospital management should support and openly promote hand hygiene among health care workers, HCWs must receive education on hand hygiene practice and regularly receive feedback on their hand hygiene performance.
Hand hygiene is an effective strategy to prevent health care-associated infections and limit the transmission of microorganisms, including antibiotic-resistant organisms (ARO). It is a required practice for all health care providers and it is recommended in all national and international infection control guidelines.

5.4 Recommendations

Based on the study findings, the following were the areas for recommendation;

The hospital management and administrators of health facilities in Bushenyi District should improve facilities available for hand hygiene as well as increasing health care worker to patient ratio, this would reduce work pressure and may play very important role in increasing hand hygiene compliance among the health workers hence reducing cross transmission of infections among the patients.

Hand hygiene education should be delivered to HCWs prior to clinical placement. There is need to reorient the HCWs before they begin the hospital work about hand hygiene practices; hand hygiene campaign should be conducted regularly and made part of continuing education for health care workers. Hand hygiene posters should be updated frequently as reminders.

Policy makers should utilize these findings to improve national guidelines on standards expected for hand hygiene practices and facilities to promote hand hygiene practices in hospitals in Uganda.

The heads of departments in health facilities should always emphasize the importance of hand hygiene to increase positive attitude and responsibility among health care providers. Attitude can be improved by increasing one’s knowledge via education program while self-efficacy can be enhanced by social learning from role models or providing positive performance feedback and rewards.
There is need for hospital administration to monitor staff performance and ensure that hand hygiene is practised as recommended. Hand hygiene opportunities performed by personnel should be monitored and recorded to assess adherence and feedback provided to personnel regarding their performance. Hand hygiene programs and continuous quality improvement are necessary.

5.5 Area for further research

More studies are needed to explore the relationship between availability of resources and facility design, product dispenser placement and designated hand washing sinks play a pivotal role in hand hygiene hence they are essential at any point of care.

This study revealed only the hand hygiene compliance. There is need to conduct further studies on hand hygiene to demonstrate reduction in HAIs, as well as reduced mortality and morbidity at Mbarara regional referral hospital.
REFERENCES


APPENDICES
APPENDIX I: QUESTIONNAIRE FOR THE RESPONDENTS

I, Ebosie Jennifer Chibuogwu, a student of Bishop Stuart University carrying out a study “To assess the knowledge, practices and barriers to implementation of hand hygiene practices among health care workers in Bushenyi district Uganda”. The study is for academic purposes only. The information given will be treated with maximum confidentiality. Your name will not be required and there will be no rewards.

Instructions
Please respond appropriately based on your level of knowledge.

Name of health facility…………………………………. Position……………………………………

SECTION A: Background information of the respondent

Q.1. Sex of the respondents
1. Male □
2. Female □

Q.2. Age in years………………………………………………………….

Q.3. Level of education in years………………………………………

Q.4. Marital status
4. Widowed □ 5. Any other……………………………………

Q.5. Profession
1. Doctor □ 2. Nurse □ 3. Laboratory scientist □
4. Health assistant □ 5. Pharmacist □

SECTION B: Level of knowledge on hand hygiene practices among health care workers

Q.6. Do you know what is meant by a hand hygiene practice?
(a) Yes □ (b) No □
Q.7. If yes, define hand hygiene?

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Q.8. Do you usually wash your hands before and after attending to the patient?
(a) Yes  □  (b) No  □

9. If yes, which washing solutions do you use?

a) An alcohol-based hand rub  □
b) Cold water  □
c) Hot water  □
d) Water and soap  □
e) Others……………………………………….

Q.10. Why do you wash your hands before and after attending to the patient?
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Q.11. Which of the following hand hygiene opportunities require one to practice hand hygiene?

a) Before touching a patient  Yes  □  No  □
b) Immediately after a risk of body fluid exposure  Yes  □  No  □
c) After exposure to the immediate surroundings of a patient  Yes  □  No  □
d) Immediately before a clean/aseptic procedure  Yes  □  No  □

Q.12. Which of the following are components of hand washing?

a) Use of soapy water in basin

b) Use of running tap water only

c) Use of running water and antiseptic soap

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d) Use of alcohol only  
  
e) I don’t know  

Q.13. Do you believe that contaminated hands are a vehicle for transmitting healthcare-associated infections (HCAIs)?
(a) Yes  
(b) No  

Q.14. Which of the following hand hygiene actions is most effective in preventing transmission of germs to the health-care worker?

a) Use of gloves  
  Yes  
  No  

b) Use of Alcohol hand rubs  
  Yes  
  No  

c) Use of water and soap  
  Yes  
  No  

Q.15. What is the effectiveness of hand hygiene in preventing health care-associated infection?

a) Very low  
  b) Low  
  c) High  
  d) Very high  

SECTION C: Level of adherence to hand hygiene practices among health care workers in Bushenyi District.

Q.16. Do you routinely use an alcohol-based hand rub, boiled water or soap and water for hand hygiene?
(a) Yes  
(b) No  

Q.17. If yes, how effective do you use each of the following when attending to the patient?  
Please tick one  on the scale of your opinion.

a) An alcohol-based hand rub  
Not effective  - - - - - - - - - - - - - - - - Very effective  

b) Boiled water  
Not effective  - - - - - - - - - - - - - - - - Very effective  

c) Soap and water  
Not effective  - - - - - - - - - - - - - - - - Very effective  

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d) Others …………………………………….

SECTION D: Challenges /factors limiting adherence to hand hygiene practices among health workers in Bushenyi District.

Q.18. Could there be factors that prevent you from performing hand hygiene as recommended?
(a) Yes □ (b) No □

Q.19. What factors prevent you from performing hand hygiene as recommended?

a) Lack of time/ too busy: True □ False □
b) Lack of alcohol-based hand rub: True □ False □
c) Forgetfulness True □ False □
d) Nobody else does True □ False □
e) It’s not important True □ False □
f) Use gloves instead True □ False □
g) Lack of towels True □ False □
h) Short patient contact True □ False □

SECTION E: Possible strategies for addressing the factors limiting adherence to hand hygiene practices

Q.20. In your opinion, do you believe the following actions can improve hand hygiene permanently in your institution/ ward?

a) Leaders and senior managers at your institution support and openly promote hand hygiene YES/NO

b) The health-care facility makes alcohol-based hand rub always available at each point of care YES/NO

c) Hand hygiene posters are displayed at point of care as reminders YES/NO

d) Each health-care worker receives education on hand hygiene YES/NO
e) Clear and simple instructions for hand hygiene are made visible for every health-care worker

YES/NO

f) Health-care workers regularly receive feedback on their hand hygiene performance YES/NO

Q.21. Do you feel that you can improve your compliance with hand hygiene?

(a) Yes ☐ (b) No ☐

Q.22. If yes, how?

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Q.23. Any last remarks about the study?

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Thank you for your participation.
APPENDIX II: INTERVIEW GUIDE FOR KEY INFORMANTS

Please respond appropriately based on your level of knowledge.

Name……………………………………………..Tel. No………………………………………………

Name of health facility…………………………… Position………………………………………

What is your age in years?

What is your level of education in years?

What is your profession?

Are you in position to define a hand hygiene practice?

How do you define hand hygiene in your own opinion?

Do health workers in this hospital wash hands before, and after attending to the patient?

Which washing solutions do they commonly use?

How important is washing hands before, and after attending to the patient?

In your own opinion, what do you think are hand hygiene opportunities require a health worker to wash their hands?

What are the components of hand washing?

What hand hygiene actions are most effective in preventing transmission of germs to the healthcare worker?

What is the effectiveness of hand hygiene in preventing health care-associated infection?

What are some of the factors that prevent health workers in this hospital from performing hand hygiene as recommended?

What measures can be put to improve hand hygiene practices among health workers in this hospital?
APPENDIX III: CONSENT FORM

STUDY TITLE: ASSESSING THE KNOWLEDGE, PRACTICES AND BARRIERS TO IMPLEMENTATION OF HAND HYGIENE PRACTICES AMONG HEALTH CARE WORKERS IN BUSHENYI DISTRICT UGANDA

INVESTIGATOR: EBOSIE JENNIFER CHIBUOGWU

You are invited to participate in this study to assess the knowledge, practices and barriers to implementation of hand hygiene practices among health care workers’ in Bushenyi district Uganda.

The appointed people and review board at the School of Post Graduate Studies and Bishop Stuart University Mbarara have approved the study and its procedure. If you are to participate in the study, you will be requested to

1. Sign this consent form
2. To answer the questions in the questionnaire

There is no risk associated with the study and participation will only take approximately 15 minutes of your time. You are free to ask any question about the study.

Your participation is voluntary; you have the right to withdraw at any time you wish to quit. Whatever is discussed will be kept confidential between you and the investigator. The district officials and hospital administrators have been informed about this study for ethical consideration and they have granted the permission.

Participant Declaration

I have read this consent and it is clear to me, I voluntarily consent to participate in the study.

…………………………………..                   ……………………………………………
Participant                                                    Investigator
Date…………………….                    Date…………………………..

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