ASSESSMENT OF HAND-HYGIENE PRACTICES AMONG HEALTH CARE WORKERS AT KISORO HOSPITAL, KISORO DISTRICT

BY NSENGA ALEX
16/ AIBEHS/1318/W

A RESEARCH REPORT SUBMITTED TO KABALE UNIVERSITY DEPARTMENT OF COMMUNITY HEALTH, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE A WARD OF BACHELOR OF ENVIRONMENTAL HEALTH SCIENCE OF KABALE UNIVERSITY

SEPTEMBER, 2019

DECLARATION

I declare that Assessment of Hand-Hygiene Practices among Health Workers at Kisoro Hospital in Kisoro District is my own work and that all sources that I have used or quoted have been indicated and acknowledged by means of complete references and that this work has not been

Signature.....

Date: ...20/09/2019.....

NSENGAALEX

REG No: 16/A/BEHS/1318/W

APPROVAL

This is to certify that this research report entitled "Assessment of Hand-Hygiene among Health Workers at Kisoro Hospital in Kisoro District" is an original research conducted by Nsenga Alex and has been supervised by me and now ready for submission to the department.

Signed: ..... ***Date: 27/09/2019***

Name: ..MWINDUKWEZI BENJA.

UNIVERSITY SUPERVISOR

DEDICATION

I dedicate this report to God almighty and my family especially my beloved wife Kedrace Mujawimana, our children Kerisha and Christiana for their physical, financial, and spiritual support rendered to me towards the completion of this dissertation.

May God bless you abundantly!

ACKNOWLEDGEMENT

With utmost gratitude I would like to thank my supervisor Mr Benja Twinomuhwezi for his words of encouragement and guidance rendered to me throught the process of compiling this report. Special thanks also goes to entire lecturers of Kabale University and my fellow classmates for the good cooperation exhibited during entire studies.

I would like to recognize Mr. Mberwa Cranmer the district water officer for Kisoro district and the staff of works and health departments and also the staff of Kisoro Hospital and Busanza health Centre IV for the support rendered to me during data collection and compilation of this report.

I'm also proud to acknowledge all the efforts, contributions and prayers from colleagues, relatives and friends towards the accomplishment of this dissertation, to mention but a few my cousin Bizaba, Beda and Jackson

May Almighty God bless you all.

TABLE OF CONTENTS

LIST OF ABBREVIATIONS/ACRONYMS

CDC	Centre for Disease Control and Prevention
CDCP	Centre for Disease Control and Prevention
HCAis'	Health Care Acquired Infections
HCWs	Health Care Workers
HH	Hand Hygiene
LTC	Long-Term Care
MOH	Ministry of Health
USA	United States of America
WHO	World Health Organization Health
HCAI	Care Acquired infections Resource
RLS	Limited Settings

LIST OF TABLES

LIST OF FIGURES

DEFINITION OF TERMS

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).

Adherence: Refers to acting in accordance with or meeting rules or standards in reference to hand hygiene *(Oxford English Dictionary* 2015).

Barrier

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).

Hand washing: Refers to washing hands with plain soap and water (WHO, 2009). In this study, hand washing means washing hands with antimicrobial or non-antimicrobial soap and water.

Hospital: Is a health care institution providing patient treatment with specialized medical and nursing staff and medical equipment (WHO, 2009).

Hygiene: Refers to conditions and practices that help to maintain health and prevent the spread of diseases (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.

Nosocomial infection: 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).

ABSTRACT

According to WHO, (2017), annual report, 70% of the hospital acquired infections can be averted by the practice of hand hygiene (HH) which is a systematic procedure of cleansing hands using soap and water or using antiseptic hand rub for removal of transient microorganism from hands.

Purpose of the study: The main purpose of the study was to assess the hand hygiene practices among health care workers at Kisoro hospital in Kisoro District in order to contribute to the control of poor hygiene related diseases. Specific objectives of the study were; to examine the level of knowledge of health workers on hand-hygiene practice, to determine the level of adherence to hand-hygiene practice among health workers and to identify key barriers m implementation of hand-hygiene practice among health workers at Kisoro hospital in Kisoro District.

Study design: The study employed a cross-sectional, descriptive study design usmg both qualitative and quantitative methods of data collection.

Findings of the study: A total of 106 health care workers were involved in the study as study respondents. The study findings revealed that 91(85.8%) of the respondents had good knowledge about hand hygiene. 83 (96.7%) of the respondents had high awareness in respect to practice of hand washing before touching a patient and lowest awareness in respect to practice of hand hygiene after exposure to immediate surroundings of a patient. Regarding knowledge on commonly used agents in hand hygiene, the study revealed that the biggest number of respondents was using water and soap 63(60%) for hand hygiene. Level of adherence to hand hygiene practices was at 57%. However, 91(85.8%) of the respondents reported lack of continuous flow of water as the major barrier hindering health care workers from practicing hand hygiene. **Conclusion:** The study concluded that most of the health workers know the meaning of hand hygiene and five moments of hand hygiene but the actual practice of hand hygiene is still a big challenge

Recommendation: The study recommended that, refresher trainings/CMEs' for health care workers on hand hygiene including socio-behavioral change communication should be organized by the Ministry of health through the District health department to increase awareness among health care workers about the importance of hand hygiene and change a negative attitude of health care workers towards hand hygiene practice. The study also recommended that; there is need for proper quantification of hand hygiene items such as hand sanitizers, gloves, soap by the hospital management in order to avoid stock outs and while ordering for hospital supplies such items should be given priority since hand hygiene is one of the most important ways to reduce the prevalence of hospital acquired infections.

CHAPTER ONE:

INTRODUCTION

1.0 Introduction

This chapter covers the background of the study, statement of the problem, objectives of the study general and specific), research questions and scope of the study, significance and the conceptual framework of the study.

11 Background of the Study

Acording to World Health Organization, annual report, (WHO,2016), it is estimated that over 1.4 million people suffer from nosocomial infections at any one time and the proportion goes 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. 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 t ea significant amount of morbidity and mortality, but they also greatly increase health care costs.

According to WHO, 2017), annual report, shows that 70% of the hospital associated infections can **be** averted by the practice of hand hygiene (HH) which is a systematic procedure of cleansing hands using soap and water or using antiseptic hand rub for removal of transient microorganism **from** hands and in the way of keeping the skin condition.

Hand hygiene is the simplest and effective measure to prevent infections (WHO, 2016). Any action of hand cleaning is referred to as hand hygiene (Pittet, 2001). The process can remove soil, dirt, microorganisms and involves washing hands with soap and water, rinsing hands with water and drying thoroughly with a disposable towel or hand dryer (Widmer, 2010). If hands are not visibly soiled, an alcohol-based hand rub or gel is recommended to replace soap and water Eiamsitrakoom et al., 2013).

Hand hygiene compliance is one of the most effective and economical ways to combat the spread of infection within a hospital (Boyce, 2010). On the other hand, 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

teen regarded as the cornerstone of infection control efforts and an essential measure for prevention of healthcare-associated infections, (WHO, 2009; Rotter, 2017).

According to (Haley,et al, 2015), 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., 2015).

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, 20 I 2).

However, (Albert & Condie, 2011), argue 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 Uganda, according to national service provision assessment survey conducted by MOH, 2016. The survey 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 five basic standard precaution measures that can enhance infection control within the health facilities.

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).

According to 2010 health information management systems report for Kisoro Hospital, hand washing is affected by inconstant water supply by National water and Sewerage Corporation. This ze to constant power blackout in Kisoro District

Kisoro district budget conference 2018, indicates that there is need for promotion of rain water marvesting to mitigate the high rates of water bills which has stressed other programs at Kisoro Hispital. Rain water harvesting will not only cut down water bills but also contribute to improved ~~ delivery including sanitation and hygiene practices.

1.2 Statement of the Research Problem

proper hand hygiene by healthcare workers (HCWs) is responsible for about 40% of msocomial infections resulting in prolonged illness, hospital stays, long-term disability and mexpected high costs on patients and their families, and also lead to a massive additional fancial burden on the healthcare system (Kotwal et al., 2013). Most nosocomial infections can te prevented with readily available and inexpensive strategies like adhering to recommended infection control measures such as hand hygiene and wearing of gloves (Foca & Jakob, 2010; asswa et al., 2015).

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 is due to lack of knowledge and poor compliance to hand hygiene practices among healthcare workers (Wandel, Maes, Labeau, & Blot, 2010).

In Uganda, hand washing with soap by adults after using toilets has increased from 36% to 37% in 2016/2017 financial year (Uganda Water and Environment Sector Performance Report, 2017). This reflects that only three out of every ten Ugandans wash their hands with soap after using the toilet.

In Kisoro district there has been no research conducted that specifically focused on assessing the knowledge, practices and barriers to implementation of hand hygiene practices among health care workers in health care settings hence this study seeks to assess the extent to which hand hygiene practices are known and followed by doctors, nurses and other health workers in Kisoro hospital in Kisoro District and whether there are barriers to the implementation of hand hygiene practices among these health care workers.

1.3 Objectives of the Study

1.3.1 General objective of the Study

The general objective of this study was to assess the hand hygiene practices among health care workers in Kisoro Hospital in Kisoro District so as to contribute on the control of poor hygiene related diseases.

1.3.2 Specific Objectives

i. To examine the level of knowledge of health workers on hand-hygiene practice at Kisoro hospital in Kisoro District.

ii. To determine the level of adherence to hand-hygiene practice among health workers at Kisoro hospital in Kisoro District.

iii. To identify key barriers in implementation of hand-hygiene practice among health workers **at** Kisoro hospital in Kisoro District.

1.4 Research Questions

i. Are health workers knowledgeable on hand-hygiene practice at Kisoro Hospital?
ii. What is the level of adherence to hand-hygiene practice among health workers at Kisoro Hospital?
iii. What are the barriers of hand-hygiene practice among health workers at Kisoro Hospital?

15 Scope of the Study

The scope of this report is presented in three sub-sections that include; the content scope, geographical scope and time scope.

15.1 Content Scope

The study involved assessment of the knowledge, practices and barriers to implementation of and hygiene practices among health care workers at Kisoro Hospital in Kisoro District and also assessed the level of adherence to hand hygiene practices among health care workers, identified he challenges/factors limiting adherence to hand hygiene practices among health workers, possible strategies and ways for addressing the factors limiting adherence to hand hygiene practices among health workers in selected hospital sections/ departments were suggested.

1.5.2 Geographical Scope

The study was conducted at Kisoro Hospital found in Kisoro District. Kisoro district is located approximately 460km south west of Kampala a capital city of Uganda. It lies east of Rumangabo and Virunga mountains in the DRC. It is bordered by Kanungu district in the North, Rubanda

District in the East, the Republic of Rwanda in the south and Democratic Republic of Congo in the west located in an idyllic setting under the peaks of Muhabura Mountains which are parts of Virunga Mountains and home mountain Gorillas. The district has one county, 13 sub counties, 48 parishes, 389 villages and with its headquarters located in Kisoro municipal council. It has a population of about 287179 (District Management Improvement Plan 2014/ 2015).

5.3Time Scope

The study was conducted within July- Sept 2019, according to the time table. This was considered **enough** for the research activities i.e. collecting data, analyzing and presenting the report to the University.

1.6 Significance of the Study

The findings of this report will contribute to the body of knowledge regarding infection prevention; in particular, the barriers associated with non-compliance to hand-hygiene standards among health workers.

The recommendations of this report will also enable the management of Kisoro district hospital and the district leadership at large to plan and implement hand-hygiene promotion programs to address the identified barriers associated with non-compliance of hand hygiene during critical moments.

This study is expected to create awareness and improve the overall knowledge about handhygiene practices among health care workers in Kisoro District Hospital, Kisoro District and Uganda at large. 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 program in the hospital to ultimately control infection transmission between the health workers and patients in Kisoro district hospital.

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

The findings from the study will enable policy makers to develop a successful infection control program for the population.

Fig**1:**Conceptual Framework

independent variables

Independent variables

- **Gender**
- **Age**
- **Level** of qualification
- Cadre/profession
- **Level** of knowledge

Dependent Variables

Hand hygiene practices

- Free hospital germ environment
- Reduced nosocomial incidences

Intervening Variables

- ✓ Lack of soap/hand sanitizers
- ✓ Formal HH education/training
- ✓ Attitude/cultural norms
- ✓ Lack of flowing water
- ✓ Hospital environment
- ✓ Long distance between a patient's bed and washing

The framework above provides a description of 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 assessed the knowledge, practices and barriers to implementation of hand hygiene practices among health care workers in Kisoro District Hospital, the study looked at hand hygiene as the dependent variable while the independent variables was knowledge practices and barriers to implementation of hand hygiene.

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 depend on type of facility, formal training on HH practices, time/heavy workload, attributes/cultural norms, availability of solutions, hospital environment and number of patients reset at the facility at a time.

CHAPTER TWO:

LITERATURE REVIEW

24 Introduction

This chapter presents the review of literature related to assessment of hand-hygiene practices among health care workers. The literature reviewed is in line with the objectives of the study.

2.1 Level of knowledge on hand hygiene practices among health care workers

In a study conducted by Asadollahi on nurses' knowledge regarding hand hygiene and its individual and organizational predictors in neonatal units in the hospitals affiliated to Tabriz university of Medical Science, Iran revealed that, although majority 98% of the respondents knew that hand hygiene was the best measure for HAis prevention and control, only 45% knew and were adequately able to mention the 5 moments for hand hygiene. This indicates that, still more than half of the respondents lacked knowledge on the 5 moments for hand hygiene. Asadollahi et al. (2015)

Hand hygiene compliance is acting in accordance with the WHO *My 5 moments for hand hygiene.* It includes washing of hands with soap and water or using alcohol-based hand-rub **hen** there is an indication or 'moment' for it as stipulated by the "Five moments for hand hygiene", i.e. before touching a patient, before a procedure, after a procedure or body fluid exposure, after touching a patient and after touching a patient's surroundings. WHO (2009).

Even though the main source of HAIs is the patient's endogenous flora, 20-40% of HAl's have been attributed to cross infection via the hands of health care workers, which may be contaminated by direct contact with the patient's intact skin or inanimate objects in the environment (Weber, Rutala and Miller et al., 2010). Hand hygiene was selected as the first pillar to promote the Global Patient Safety Challenge of the WHO World Alliance for Patient Safety; thereby signifying its importance in the patient safety agenda (WHO 2016). Bereket et al (2012) emphasize that reducing HAi's rates depends on a variety of factors but emphasis should **be** placed on staff related procedures especially hand hygiene.

According to the *5 Moments for hand hygiene* approach, all health care workers are required to perform hygiene at the following 5 distinct stages of caring for patients; before patient contact which involves cleaning hands before touching a patient when approaching him or her to protect the patient against pathogens carried on the hands; before an aseptic task which involves cleaning hands immediately before any aseptic task to protect the patient against harmful

microorganisms, including the patient's own microorganisms from entering his or her body; after body fluid exposure risk which involves cleaning hands immediately after an exposure body fluids and after glove removal to protect oneself and the health care environment from harmful patient micro-organisms; after patient contact which involves cleaning hands after sting a patient and his or her immediate surroundings when leaving; and after contact with parent surroundings which involves cleaning hands after touching any object or furniture in the parent's immediate surroundings when leaving, even if the health workers has not contacted the parent to protect oneself and the health care environment from harmful patient microorganisms
(WHO 2012).

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., 2013; Wong, et al., 2014;).

Jiali conducted a cross-sectional study on knowledge, attitude and practice of hand hygiene among health care assistants and patient's family members at a tertiary hospital in Guangzhou, southern China. The findings revealed that, although majority 85% of the respondents knew hand hygiene equipment such as soap and water; and alcohol-based hand antiseptics among others, only 54% knew that hand washing with plain soap is indicated in routine health care and fur washing hands soiled with dirt, blood or other organic materials. However, majority 95% blew the benefits/importance of hand washing with soap such as removing many transient organisms if hands are washed for 15 seconds and if washed for 30 seconds reduces the bacterial count. Jiali, (2015)

According to Ango, Awosan, Adamu, Salawu, Sani and Asma (2017) study on knowledge, attitude and practice of hand hygiene among healthcare providers in Semi-urban Communities of Sokoto State, Nigeria, 75% of the respondents knew that, hand washing with an antiseptic agent is indicated for the instances such as; heavy microbial soiling, for example in the presence of infection or a high level of contamination with organic matter such as infected wounds and feces; prior to performing invasive procedures (e.g., the placement and care of intravascular catheters, indwelling urinary catheters; before contact with patients who have immune defects, damage to the integumentary system (e.g., wounds, burns), or percutaneous implanted devices and before and after direct contact with patients who have antimicrobial-resistant organisms.

-

- l-i'l09) conducted an assessment of knowledge attitude and practice of hand mg healthcare workers in Ain Shams University hospitals Cairo, Egypt and their igs vealed that only 42% of the respondents knew that, alcohol-based hand sanitizers are mrae for use when hands are visibly dirty or contaminated with proteineous materials _ ~ ~fore, in such situations, the hands of the health care worker first should be ...:::;:::::c:::s;:::: ~ ~ and water. Then, an antiseptic hand rub, using an alcohol-based hand arr abe applied to prevent pathogen transmission.

icted in Bahir Dar in 2012 showed that a majority (90.7%) of HCWs knew hand ezsoneway of prevention method of HAis (Gulilat, 2014). In another study by Rabbi et -= c::ka:reda similar proportion of workers in Bangladesh were knowledgeable on hand ee moments such as before taking meal and after defecation .

ere andOkafor, 2013), revealed that, most of HCWs in a tertiary hospital in Nigeria also ~ ~ biowledge, meaning a score of over 66.6% on the hand hygiene knowledge test. +ever. Mahadeo and Shinde's survey in (2014) reported even though most of nursing staff .- s:::.:ans at Karad mastered the requirements of performing hand washing (e.g. avoid erg jewelry), they did not know the correct moments of hand hygiene, and only around 40%

mrsing staff knew the correct technique of hand rubbing (Mahadeo and Shinde, 2014).

- : LeYel of adherence to hand-hygiene practices among health workers

ami hygiene is recognized as one of the most effective intervention to control the transmission - -xtions in a hospital as well as control of antimicrobial resistance. However, compliance to mad hygiene has been disappointingly low in many health settings. Hospital-acquired infections , •:.-- occur because of lapses in accepted standards of practice on the part of health care personnel. Mathur, (2011).

Te systematic reviews of studies on compliance to hand hygiene conducted in various settings ah as hospitals and nursing homes revealed low compliance rates of between 20% and 50% mong nurses in developed and developing countries (Ahlstrom 2014; Abdella et al., 2014; Sakihama et al., 2014).

Higuera et al., (2015), 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 ~""Served for compliance with hand washing. The result of the study was that in 270 observed

tad washing, average compliance was 63.3%. Noncompliance was highest by nurses. Ward aides were most compliant. Finally, the authors with hand washing was moderate. Variation across the hospital ward suggests that targeted educational programs may be useful. Noncompliance as umierstaffing may decrease quality of patient care.

aherence rate of 36% was found in intensive care units, where indications for hand ere typically more frequent. The highest adherence rate of 59% was observed in -.:=m=..:s -~ere the average intensity of patient care was lower than in other hospital sudy indicates that much needs to be done to improve adherence to hand hygiene ssher and Wickett, 2012) .

amservation study in 2014 reported that the adherence among 140 Chinese HCAs was The United Kingdom also had a similar low adherence rate of 30% in 2016 Clarie and Storr, 2016). Yet Mahadeo's study reported that only 8% of student nurses saf nurses were compliant with WHO's 'Five Moments of Hand Hygiene' (Mahadeo ~-.:.-::."C.~ **:Ol-!}.** The hand hygiene compliance among HCWs in Taiwan was better, with an ateee ate **of 88%** (Tan et al., 2016). Similarly, approximately three-quarters of health care vars aiso showed good hand hygiene practice in a survey conducted by Ekwere (Ekwere **aair.2013).**

±cluster-randomized controlled Trial in long-term care (LTC) facilities in Hong Kong aez arHCWs' hand hygiene compliance was below 30% (Ho, Seto, Wong and Wong, _ 6'.::::::ng and Wu's study reports that the hand hygiene practice among nursing assistants of fclties in Taiwan was only 30 % as well (Huang and Wu, 2008). Similar poor hand :::e::r,:;r.£tices of HCWs appeared in Italian and Canadian LTC facilities (Smith, Carusone Le **2008;** Pan et al., 2008).

zed literature suggests that the burden of HCAis may be disproportionately high in **rscure** limited settings (RLS) with rates of HCAls estimated to be 2-20 times that of **eimped**countries. One of the major reasons is the lack of infection control programs such as ~ -:;iene, which have been neglected due to limited resources, competing priorities and **rater** carriers. Poor hand hygiene in resource limited settings likely play a role in nosocomial :t, **s ssion** of bacterial pathogens and are important cause of the high rates of HCAls.

::- - ,. , cultural, behavioral and institutional factors have been identified as unique barriers a:::µ-..*?1iate hand hygiene adherence in these settings (Meengs & Nelson, 2013).

pured questionnaire was circulated to assess perception regarding compliance. Results a **hand**hygiene compliance among medical personnel working in the ICU was 26% and common reason cited for noncompliance was lack of time (37%). The overall **uiiae** improved significantly followed by the intervention to 57.36% (p<0.000), Nursing **mes** **(9.8-** 33.33% (p<0.0000), Resident trainees 21.62- 60.71% (p < 0.0000), Visiting **nstint** /9.22-57.14%, p= 0.0001), Physiotherapist (75.95%, p= 0.413) and premedical staff *5545%,* p<0.0000). The authors concluded that hand hygiene compliance among health ~ wo;kers in the ICU is poor. However, intervention strategies, such as the one used, can be **usel in** improving the compliance rate significantly (Foca & Jakob, 20 l 0).

Barriers in the implementation of hand-hygiene practice among health care workers

tsi factors for noncompliance with hand hygiene have been determined objectively in several **servational** studies or interventions to improve compliance. Factors influencing reduced **mpliance,** identified in observational studies of hand hygiene behavior, included being a **tysician** 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 isk for cross-transmission; and having many opportunities for hand hygiene per hour of patient **are** (Rosenthal, 2015; Rezende & Modena, 2008) .

In a study by Naik et al (2014), self-reported reasons for frequent lack of compliance to hand hygiene included the (1) hand washing agents cause skin irritation and dryness, (2) lack of soap **or** too busy/hand washing takes too long, (3) wearing of gloves; hands do not look dirty; and 4) a perceived low risk of acquiring infection from patients.

Adherence has become the great challenge influencing effective hand hygiene. Several studies have analyzed different factors leading to low hand hygiene practice, which included: lack of awareness, lack of hand hygiene facilities, lack of clean water and hand hygiene products, work overload, irritation or dryness caused by hand washing products, lack of guidelines on hand hygiene and role modeling. The perception on hand hygiene's importance also affects people's hand hygiene practice. A qualitative study by Dyson et al. in 2010 indicates the most common barrier was environmental factors, such as poor hand washing facilities (Dyson et al., 2010).

Studies conducted in Taiwan and mainland's China indicated that the main barriers to hand hygiene practice are divided into two major groups: the objective factors and subjective factors

--- ffi:::..;:::s include; hand sanitizers' irritation, lack of hand dryer, heavy workload, m.::'::==E::?:::?::1 .::;-:g:iene equipment and products, inconvenient location of sink and alcohol -.'.'"'- -:;:..:...-s ~ lack of relevant guidelines. The subjective factors include; lack of hand ₒ inoiedge, misperceptions of hand hygiene, no rewards or punishment, and a negative r : :r; c,,-- aand washing would affect their relationship with patients (Wu, Ren and Tan,

- am et al, 2009).

ig to (Goldmann and Larson, 2010), the study revealed that several barriers to am.riae hand hygiene were reported by healthcare workers for their lack of adherence with = 1: : e-...darions including; skin irritation, inaccessible supplies, interference with workermer relationships, patient needs perceived as priority, wearing gloves, forgetfulness,

~ of guidelines, insufficient time, high workload and understaffing, and lack of seific information demonstrating impact of improved hand hygiene on hospital infection es

arson et al., (2012), revealed that additional barriers to hand hygiene compliance include; lack **active** participation in promotion at the individual or institutional level, lack of a role model **hand** hygiene, lack of administrative sanctions for noncompliance, lack of an institutional **irate** encouraging safety.

Lai of easy access to hand hygiene supplies, whether sink, soap, medicated detergent, or aeriess alcohol-based hand rub solution, is self-explanatory. Asking busy health-care workers **walk** away from the patient's bed to a hand-washing facility or a hand antisepsis solution es non-compliance with hand hygiene recommendations. Zimakoff & Holstein, (2012).

?: **~1dy**involving artificial contamination, organisms cultured from 4% to 100% of the gloves **.:c::** ~""Served counts were up to 4. 7 times more on hands after glove removal. Preston, (2011).

earing gloves might represent a barrier for compliance with hand hygiene. Failure to remove es after patient contact or between dirty and clean body site care for the same patient **mstit**utes non-compliance with hand hygiene recommendations. Washing and reusing gloves erween patient contacts is ineffective, and hand washing or disinfection should be strongly **ms** raged after glove removal. Webster & Cartwright, (2014).

CHAPTER THREE:

METHODOLOGY

30 Introduction

This chapter presents the methodology that was used in this study and is discussed under subheadings that include; study design, study area, study population, inclusion criteria, sample sizedetermination, sampling procedure, research instruments, content validity, content reliability, data collection procedures, data management, data analysis, ethical considerations, limitations experienced during the study and dissemination of results.

3.1 Study Design and Rationale

The study was a cross-sectional, descriptive in nature and was done usmg qualitative and quantitative methods of data collection. For quantitative research design, a semi structured questionnaire was used to generate numerical data and statistics to be used to organize and interpret the data collected. The qualitative data was generated using key informants' interviews.

3.2 Study Area and Rationale

The study was conducted at Kisoro Hospital in Kisoro District. Kisoro district hospital is one of me government owned health facilities found in Kisoro district. Kisoro hospital is headed by a medical superintendent, a senior hospital administrator and has 162 staffs inclusive of maintenance and support staff (Kisoro district annual health sector report 2017-2018). Kisoro Hospital has a bed capacity of 140 beds and serves approximately 5,000 patients monthly both out patients and in patients.

Kisoro district is located approximately 460km south west of Kampala a capital city of Uganda. It lies east of Mgahinga Mountains. It is bordered by Kanungu district in the North, Rubanda district in the East, the Republic of Rwanda in the south and Democratic Republic of Congo in the West, located in an idyllic setting under the peaks of Mgahinga Mountains which are parts of Virunga Mountains and home mountain Gorillas.

3.3 Study Population

The study population comprised of healthcare providers working at Kisoro Hospital basically; medical doctors, nurses, midwives, pharmacists, medical laboratory scientists, clinical officers and other allied health workers who were working in the various wards of the hospital at the time of study. A total of 106 health workers were involved in the study as study respondents.

3.3.1 Inclusion Criteria

Te study included only medical doctors, nurses, midwives, pharmacists, medical laboratory scientists and clinical officers who were working in the various wards of the hospital at the time **f study** and had served for a minimum of one month with the hospital and who were willing to participate in the study.

33.2 Sample Size Determination

The sample size of health workers who participated in this study was determined using the Kish and Leshie formula (1965) .

.:: = Z^2p (l-P)/d^2

where n is the sample size

Z is the standard normal deviation at 95% confidence level (i.e. 1.96)

Pis the proportion of target population (which is 50% or 0.5)

d is the acceptable degree of error (in this case 5% or 0.05)

n= $(1.96)^2$ X 0.5 x $0.5/0.05^2$ = 384

Since the total population of respondents involved is less than 10,000 (149), the following formulae applied.

Sample size estimation *(nf)* was calculated as follows;

nf= the desired sample size (when the population is less than 10,000) n=the desired sample size (when the population is more than 10,000) N=the estimate of the population size

nf= n

N= 149 (Population of health workers working in Kisoro District Hospital)

nf n 384 384

1 +n 1 + 384 1 + 2.6

N 149 384 3.6

= 106

Therefore, the sample size was 106 health workers who participated in the study. **3.3.3**

Sampling Procedure

The researcher used convenient sampling procedure when selecting the respondents who participated in this study. Convenient sampling is a non-probability sampling technique where respondents are selected because of their convenient accessibility and proximity to the researcher during data collection time. On the other hand, convenient sampling is a type of

r.ability sampling in which people (health workers) were sampled simply because they ere ovenient' sources of data for the researcher. In probability sampling, each element in emulation has a known nonzero chance of being selected through the use of a random sen procedure.

fer securingthe permission from relevant district authorities and Kisoro hospital, the rrzerwas introduced to in charges of different departments where he requested health

iers to participate in the study individually and whoever accepted willingly was sampled and :::;;;;:b::e,-=in the study. However, where individual health workers declined from participating in e sudy, the researcher moved to the next health worker. The researcher targeted 10 health rers per day for a period of 11 working days to cover up the sample size of 106 respondents

ty those who were working day shift.

ii **Research Instruments**

structured self-administered questionnaire in English was used to collect data. Selfaministered questionnaire is a document used to gather self-report data via self-administration

questions. The use of structured questionnaires in research enhances the objectivity and s:::::,:c:: statistical analysis. The respondents filled and completed the instrument for themselves.

The questionnaires used had questions guided by the objectives of the study outlined in the first aper of the study as well as the literature review presented in Chapter 2. The questionnaire as designed to capture information on socio-demographic characteristics of the respondents, iowledge on hand hygiene, adherence to hand hygiene and barriers to hand hygiene among health workers at Kisoro Hospital in Kisoro District.

35 Data quality control

5.1 Content Validity

The researcher consulted experienced and skilled researchers including the supervisor to ensure tent validity. The researcher first piloted a questionnaire before administering it to test its

alidity. Results from the field helped to further refine and standardize the questionnaires.

352 Content Reliability

-.::: ensure quality of this study, the researcher took several measures during the field work, alysis and conclusion process. Before real collection of data, data instruments were pretested a. 2 respondents from each group to determine their reliability and these respondents were not included among the interviewees.

-

Data Collection **Procedures**

t!:e ~roval of the research proposal, the researcher got an introduction letter from Ka bale .aesty that enabled him proceed to seek permission from Kisoro District Chief ::: s ariYe officer and Kisoro Hospital to carry out the study. After obtaining permission, the **rear.her** sampled around 10 respondents per day for a total of 11 working days. Data

en was subjected to strict controls and procedures that was followed precisely to ensure _ **c;e** rlar.a is valid, reliable and useful. Data was obtained on Hand Hygiene practices among

ECW at Kisoro Hospital. The healthcare workers were informed about the purpose of the study onsent was obtained prior to issuing and filling of the questionnaire.

hie questionnaires were delivered by the researcher personally to the participants. The **prcipants**were given clear instructions of filling the questionnaires and the time expected to **taken** while filling the questionnaire was fully explained to the participants. Data was **rected** among health workers working day shift only. The participants were followed in their **respective** departments (work place) during day shift to fill the questionnaires.

3a1 Data Management

The filled questionnaires or filled interview guides from which the data was extracted, were uected from participants after every data collection day, cleaned and edited, then kept in an emvelope until time of data analysis to ensure that no data is misplaced and lost.

36.2 **Data Analysis**

formation obtained from the questionnaires were coded and updated on a coding framework. **Quantitative** data was analyzed using a computer application called Microsoft Excel for generating graphs/pie charts and tables. This computer application (Microsoft Excel) was used tecause it helped the researcher in mathematical calculations and generating the frequency/percentage tables, graphs and pie-charts.

3.7 **Ethical considerations**

After acquiring permission letter from Kabale University, The researcher proceeded to Kisoro District where further permission was obtained from Kisoro District administration and Kisoro Hospital leadership to go on to the respective departments to start data collection from the health **workers.** Permission was also obtained from the ward managers to use their staffs during the **study** by giving them copies of letters endorsed by Chief administrative officer and Medical superintendent for Kisoro Hospital.

normed consent was obtained from respondents and were informed that their participation in me study was voluntary and they have the right to terminate their participation on their own free

=...1 **at** any point without any consequences. Participants were informed of the purpose of the smdy, the criteria for participation in the study, procedures to be followed and any risks or benefits to be involved during the study were explained to the respondents. Participants were **±siled** to sign willingly after understanding the information given by the researcher.

Respondents were assured of privacy and the researcher further explained to them that their mformation wouldn't be shared with the public and would only be used for the purposes of research. Data collected from the respondents was anonymous and kept confidential. Every respondent was treated equally without giving a particular respondent or ward priority and had equal chances of being selected for the study.

3.8 Limitations experienced during the Study

Some respondents were found busy handling patients during data collection and another time +as scheduled for such respondents

Some key informants complained of lack of time for the interview whereby an appropriate appointment was made with them.

3.9 Dissemination of Results

Compiled work in form of the booklet which is approved were submitted to the following; Kabale University as requirement for the award of a Bachelor's Degree and in the library for future reference; *Kisoro* district Hospital to make the recommendations known to them and, the researcher will also have a copy of the approved booklet.

CHAPTER FOUR

PRESENTATION AND INTERPRETATION OF FINDINGS mr dnction

m mer presents the data from the field. It also contains the analysis and interpretation of

collected.

-Demographic Characteristics of the Respondents

106 respondents' were interviewed and the characteristics investigated were; age of **et are worker,** gender of the health care worker, educational level of the health care **ad** profession of the health care worker among other characteristics. The study **s w** socio-demographic characteristics of respondents and the results are discussed **mergs** attached to the study findings using descriptive statistics. Frequencies and **e** used to present the findings as seen in table 1 below;

Socio-Demographic Characteristics of Respondents

Socio-demographic Characteristics		*Frequency*	*%age*
(years)	Below 29 years	21	19.8
	30-39	70	65.9
	<40 years	15	14.1
	Male	34	32.1
	Female	72	67.9
Level of Education	Certificate	56	52.8
	Diploma	41	38.7
	Degree	9	8.5
Profession **Cadre**	Nurse	46	43.3
	Midwife	17	16.0
	Allied health	38	35.8
	Doctor	5	4.7

w Sare; **Primary** data)

The study findi- in table I above, show that ages of the respondents ranged from 23 to 57 **a**gher percentage were and 70(65.9%) of the respondents were aged between 30-39 years, .198%**)** aged below 29 years and the followed by least 15(14.1%) were above 40 years of

-

of the respondents representing 72(67.9%) were females and only health care workers, regarding educational level of the respondents, the in the table I above revealed that most of the respondents 56(52.8%) **followed** by 41(38.7%) who are diploma holders while only 9 (8.5%) the **study** further revealed that 46(43.3%) of the respondents were nurses, **who** were allied health professionals. The third category was midwives respondents 5(4. 7%) were medical doctors.

iledge on Hand Hygiene Practices Among Health Care Workers

tetive one was meant to examine the level of knowledge of health workers on wr:?---rices in Kisoro district hospital. This objective was measured by collecting **or level** of knowledge about hand hygiene, the most commonly used agents in **five** moments of hygiene and hand washing techniques. The study revealed

2 Below indicates those who knew and those who did not know the meaning of hand

	Frequency		Percentage
	Know the meaning of hand hygiene	91	85.8%
no	Don't know the meaning of hand hygiene	15	14.1%

revealed that 91(85.8%) of the respondents who were the majority knew the meaning hygiene, only 15 (14.1%) of the respondents did not know what is meant by hand This calls for immediate continuous medical education to enlighten these health care ers about hand hygiene since they are in constant contact with the five moments of hand and they are not practicing hand hygiene. Key informant interview 1 stated that

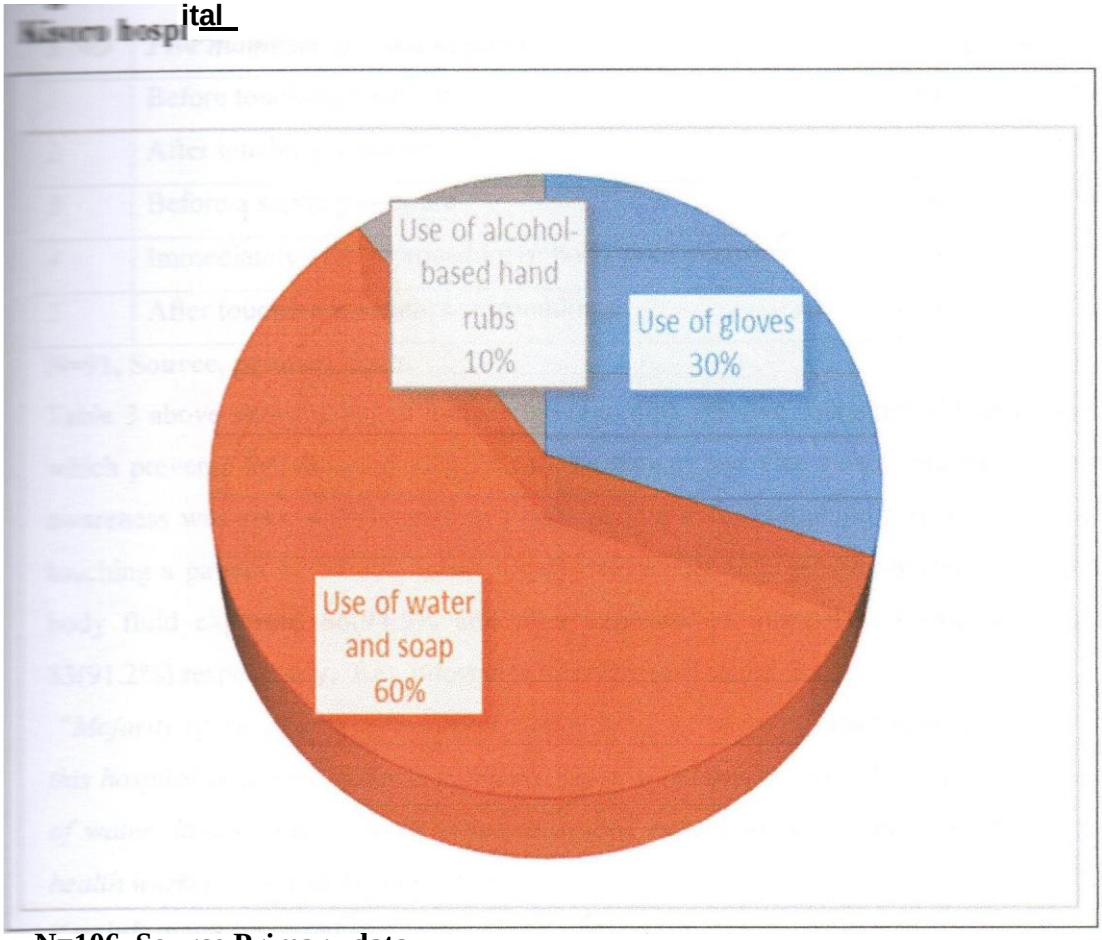
Most of the health workers are aware of the importance of hand hygiene",

Key informant interview 2 was also in agreement with key informant interview 1 and me study findings, he further stated that

"It's true that most health workers are aware of the importance of hand hygiene."

-

~~ 2: mowing commonly used agents for hand hygiene among health-care workers at ital



N=106, Source Primary data

Regarding knowledge on commonly used agents in hand hygiene, the study revealed that majority of the respondents totaling to 63(60%) used soap with water, 32(30%) of the respondents used gloves to protect their hands against infection, only 10 (10%) reported using alcohol-based hand rubs for hand washing. The alcohol-based hands rubs could be least used due to shortage of supplies since they are not readily available and accessed by all the health workers. Key informant interview 2 stated that

",\,,fast of the health workers use water with soap because they are readily available most of the time, others prefer hand sanitizers but they are most times out of stock due to high consumption in times when we have shortage of water".

_..mae.:: !Practices of five moments of hand hygiene among health care workers

- U	Fie moments of hand hygiene	Frequency	%age
	Before touching a patient	83	91.2
-	-...:'er touching a patient	84	92.3
,,,	Before a septic procedure	88	96.7
	Immediately after a procedure or body fluid exposure	86	94.5
	After touching a patient's surroundings	83	91.2

• Source, primary data.

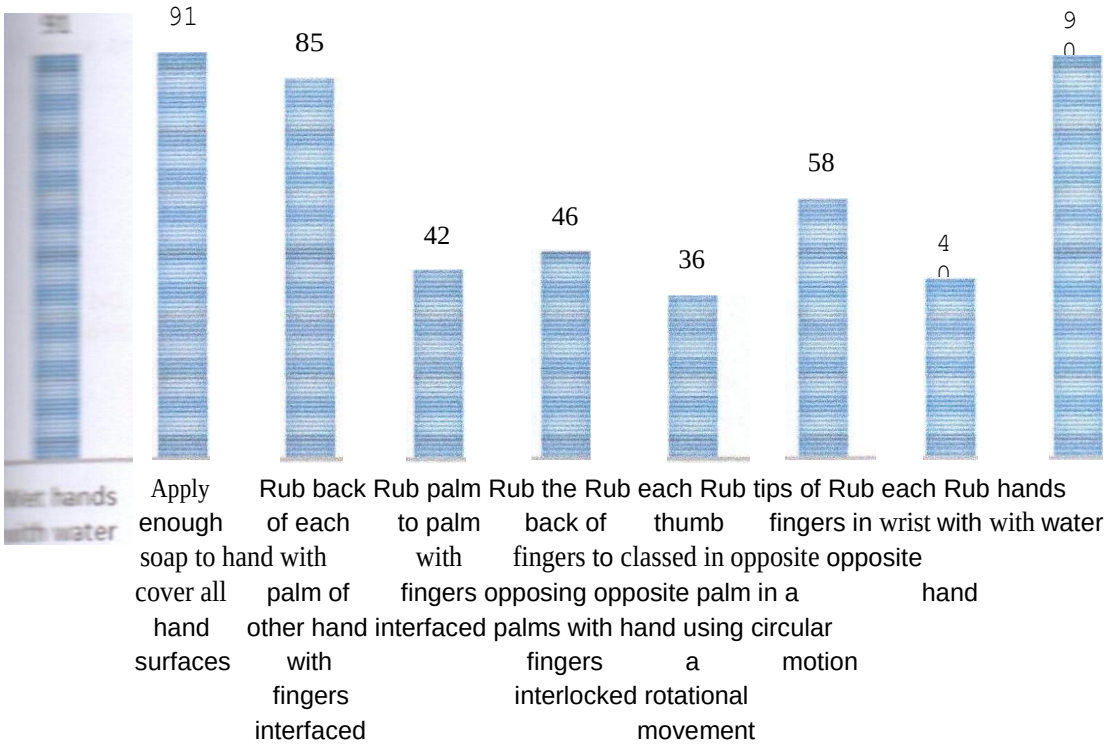
e 3**above** shows level of knowledge regarding the five moments of hand hygiene actions prevents transmission of germs to the patient and vice versa, (the five moments) better mzzness was seen with respect to practices like before touching a patient 83(91.2 %), after sting a patient 84(92.3%) immediately before aseptic procedure 88(96.7 %), after a risk of **fluid** exposure 86(94.5% and after exposure to immediate surroundings of a patient IE- -- :.2%) respectively. Key informant interviewee 3 stated that;

***Majority** of the health care workers know the 5 moments of hand hygiene but the problem in **hospital** is observing the 5 moments which is determined by other factors such as presence r **rater,** availability of soap, availability and access to hand sanitizers and the attitude of **ialth** workers towards hand hygiene*"

~- informant interviewee 1 stated that;

***Most** health workers know the 5 moments of hand hygiene but most of the time they do not **wash** their hand unless the procedure is aseptic and it's compulsory to wash hand but otherwise washing hands after removing gloves is observed by few health workers in this hospital"*

lliw=t3: Hand washing techniques

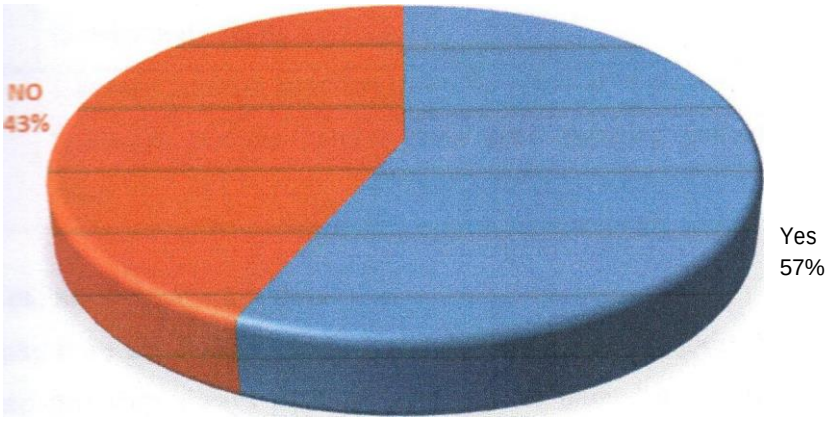


Te study revealed that majority 91(100%) of the respondents were highly knowledgeable about ,r::e :st technique of wet hands with water, majority 91(100%) of the respondents were highly iowledgeable about the 2" technique of applying enough soap to cover all hand surfaces, still majority 85(93.4%) of the respondents were knowledgeable about the 3" technique of rubbing te back of each hand with palm of other hand with fingers interfaced.

However, less than half 42(46.1%) of the respondents were not knowledgeable about the 4" chnique of hand washing, half 46(50.5%) of the respondents were knowledgeable about the 5 chnique of hand washing, less than 36(39.5%) of the respondents were knowledgeable about **c:e** 6th technique of rubbing each thumb classed in opposite hand using a rotational movement, core than half 58(63.7%) of the respondents were knowledgeable about the 7 technique of -.l>bing tips of fingers in opposite palm in a circular motion, less than half 40(43.9%) of the respondents were knowledgeable about the 8" technique of rubbing each wrist with opposite hand and almost all 90(98.9%) of the respondents were knowledgeable about the 9" technique **of** rinsing hands with water as shown in figure 3 above.

4..:: ~ of adherence to hand hygiene practices among health care workers

sudy objective two was meant to determine the level of adherence to hand-hygiene practice g health care workers at Kisoro district hospital. The study revealed the following results; **ED"C -4: Level of Adherence to hand hygiene**



N=106, Source, primary data

The study revealed that more than half 60(57%) of the respondents were consistently using .i:cohol-based hand rubs, plain water and water with soap. However, 46(43%) of the respondents were not consistently using any of the methods. Key informant interviewee 4 stated that; *consistency in hand hygiene by health workers is still a big challenge most especially in*

uations when there is lack of water, lack of soap, lack of hand sanitizers usually due to adequate stocks of hand sanitizers.

Table 4: showing most commonly used items by health workers in hand hygiene

S NO	***Items commonl.y used in hand hygiene***	***Frequency***	***%age***
	Alcohol-based hand rub	11	18.3
	Plain water	20	33.3
	Soap with water	29	48.3

N=60, Source, primary data

Results in the table 4.4 above, reveals that almost half, 29 (48.3%) of the respondents routinely use soap and water in practicing hand hygiene, followed by 20 (33.3%) who routinely use plain water alone and only 11 (18.3%) reported that they routinely use alcohol-based hand rub.

-

a aeen'nderence towards hand hygiene practices

itic ating *level of adherence to hand hygiene Frequency*		*% age*
practices		
arc perform hand-hygiene immediately before any aseptic 6l		57.5
procedure		
#rs5 **perform** hand-hygiene immediately after an exposure 82		77.3
to risky body fluids		
always perform hand-hygiene after removal of gloves	41	38.6
always **perform** hand-hygiene after changing patients bed 33		31.1

st. 5are, primary data

s **i**the study in table 5 above revealed that majority 82(77.3%) of the respondents

i::5z:: ~ **:tlways** perform hand-hygiene immediately after an exposure to risky body

ed by 61(57.5%) who also agreed that they always perform hand-hygiene **meeiamety before any** aseptic procedure, 41(38.6%) of the respondents said that they always **r , ::, [-- • .:,-h~giene** after removal of gloves and the least mentioned being 33(31.1 %) who **~i::it::Z.** ~ **:tlways** perform hand-hygiene after changing patients bed linen .

«5 **Barriershindering health workers from practicing hand hygiene**

sty objective three was meant to identify key barriers in implementation of hand-hygiene **miceamong** health workers in Kisoro district hospital.

Take e: **Barriers hindering health workers from practicing hand hygiene**

~‖ ***Barriers hindering health workers from practicing hand hygiene***	***Frequency***	***%age***
‖ Absence of soap	82	77.3
‖ Lack of constant flow of water	91	85.8
Distant hand washing facilities from service points	27	25.4
Poor attitude of health workers towards hand washing	58	54.7
Inadequate supply of gloves and disinfectants	81	76.4

=106, Source, primary data

The study results in table 6 above, show that majority 91 (85 .8%) of the respondents reported tar lack of continuous flow of water was the major barrier hindering health care workers from

-

__ -~e followed by 82(77.3%) who reported that absence of soap at washing **main** barrier hindering health care workers from practicing hand hygiene.

red that Inadequate supply of gloves and disinfectants was the barrier hindering _.__ ~ **5um** practicing hand hygiene, slightly more than half 58(54.7%) of the

:::s:::::=:::.::::::sc:::::r:r..x **mat** poor attitude of health care workers towards hand washing was the ,.:e:: ~ ~=i from practicing hand hygiene and 27(25.4%) reported that distance ashing facilities and service points was also another barrier hindering them from hygiene practices most especially attending to patients on the general wards :::::~::s ~t movements between the patient and hand washing facilities which are zsz **point** from patients' beds.

Σ-(@ O+"**wfations** by health care workers to improve hand hygiene practices

-_ Rrn,mmendations by health care workers to improve hand hygiene practices

«>	*Recommendations by health workers*	***Frequency***	***%age***
	Constant supply of water	102	96.2
-.	Constant supply of adequate gloves, soap and hand sanitizers	98	92.4
	Refresher training /CMEs' on hand hygiene practices	84	79.2

sad revealed that nearly, all I 02(96.2%) health-care workers endorsed that constant _ of **water can** improve hand hygiene practices, 98(92.4%) endorsed constant supply of **aezane gloves,** soap and hand sanitizers can improve hand hygiene practices and 84(79.2%) rse **that they** needed refresher training/CMEs' in hand hygiene and hand hygiene should be edat all times as shown in table 7 above.

es mformant interviewee 4 stated that;

We have a challenge of lack of a constant supply of water, the hospital sometimes **eis** *1* ***or*** *2 days without water, which affects all infection prevention measures in place ...._....,__~* ***hand*** *hygiene and leads to over consumption of hand sanitizers and hence stock outs* ***d sanitizers"***

informant *5, stated that*

-The Hospital management is already in the process of gathering resources for ***custruction*** *and installation of rain water harvesting systems as an alternative water supply* **msem** ***and*** *also to cut down the high costs of water"*

CHAPTER FIVE

DISCUSSION OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS 5.1.

Discussion of the findings

5.1.1. Examining the level of knowledge of health workers on hand-hygiene practice at Kisoro hospital in Kisoro District.

The findings in table 2 indicates that majority of the respondents representing 91 (85 .8%) knew what is meant by hand hygiene and 15(14.2%) of the respondents did not know. This indicates the need for immediate continuous medical education to enlighten these health care workers about hand hygiene and its importance. The study findings above are in agreement with Asadollahi et al., (2015) who revealed that, majority 98% of the respondents knew that hand hygiene was the best measure for HAis prevention and control. The study findings are also in agreement with Gulilat, (2014), who showed that a majority (90.7%) of HCWs knew hand hygiene as one of the ways of preventing HAis. Rabbi et al, (2013), also indicated that a similar proportion of workers in Bangladesh were knowledgeable on hand hygiene

The study revealed that there was high awareness in respect to practice of hand washing before touching a patient representing 83 (96. 7%) and lowest awareness in respect to practice of hand hygiene after exposure to immediate surroundings of a patient was 83(91.2%). This implies that health workers are highly knowledgeable about hand washing before touching a patient but less knowledgeable about hand washing when exposed to patient's surroundings'.

The study findings above are in agreement with the study done by Asadollahi et al., (2015) on nurses' knowledge regarding hand hygiene and its individual and organizational predictors in neonatal units in the hospitals affiliated to Tabriz University of Medical Science which revealed that majority 98% of the respondents knew that hand hygiene was the best measure for HAis prevention and control and the few respondents were able to mention the 5 moments for hand hygiene.

Regarding knowledge on commonly used agents in hand hygiene as indicated in figure 2, the study revealed that the biggest number of respondents were using water and soap 63 (60%) for hand hygiene. This implies that water and soap are still the easiest and accessible means of hand washing at the hospital. The study findings above are in agreement with Jiali et.al (2015) which revealed that, majority 85% of the respondents knew hand hygiene equipment such as soap with water; and alcohol-based hand antiseptics among others.

u2 Determining the level of adherence to hand-hygiene practice among health workers a Kisoro district hospital.

Te findings in figure 4 revealed that level of adherence to hand hygiene practices was at 57%, mplying that 60(57%) of the respondents were consistently using alcohol- based hand rubs, water, and water with soap while 46 (43%) of the respondents were not consistently using any of te methods above. This study outcome indicates that even though health care workers are iowledgeable about the importance of hand hygiene, the persistent actual practice is still a iallenge to most health care workers. The study findings above are in agreement with Mathur

: **11)** study which revealed that compliance to hand hygiene has been disappointingly low in **many** health settings leading to hospital-acquired infections because of lapses in accepted standards of practice on the part of health care workers.

The findings in table 4 also indicates water with soap as the most commonly used items in hand .::-giene 29(48.3%) while the least used item was alcohol based hand rub 11(18.3%). This indicates that alcohol-based hand rub is the least commonly used yet they should be the ones to be used commonly since they can be carried along with the health worker while attending to patients. The above findings are in agreement with WHO, (2017), annual report which showed that 70% of the hospital associated infections can be averted by the practice of hand hygiene 1--IH) which is a systematic procedure of cleansing hands using soap and water or using antiseptic hand rub for removal of transient microorganism from hands.

The findings in table 4 indicates majority 82(77.3%) of the respondents agreed that they always perform hand hygiene immediately after an exposure to risky body fluids followed by 61(57.5%) who said that they always perform hand hygiene before any aseptic procedure, 41(38.6%) of the respondents said that they always perform hand hygiene after removal of gloves and the least mentioned was 33(31.1 %) who said that they always perform hand hygiene after changing patients bed linen. The above study results indicate that most of the health care workers do not wash hands after removing gloves and don't wash hands after changing patients' linen, this therefore means that they are likely to carry infection from one patient to another while delivering services leading to high incidences of hospital acquired infections.

The above findings are in agreement with study done by Yan, (2014), who reported that the adherence among 140 Chinese HCAs was poor. The United Kingdom also had a similar low adherence rate of 30% in 2016 (Randle, Clarke and Storr, 2016).

5.13 Key barriers in implementation of hand-hygiene practice among health workers at Kisoro hospital

The findings in table 5, show that majority 91(85.8%) of the respondents reported lack of continuous flow of water as the major barrier hindering health care workers from practicing band hygiene followed by 82(77.3%) who reported that absence of soap at washing facilities as the main barrier hindering health care workers from practicing hand hygiene. This does not only affect hand hygiene practice in the hospital but also entire cleanliness, infection prevention and control.

Inadequate supply of disinfectants and gloves as third 8 I (76.4%), poor attitude of health workers towards hand washing as the fourth 58(54.7%) and the least was distant hand washing facilities from service points 27(25.4%) as the barrier hindering health workers from practicing hand hygiene. These findings indicates that there is need for constant water supply to the hospital and monitoring of health care workers to observe hand hygiene. The study findings are also in agreement with Larson et al., (20 I 2), which revealed that additional barriers to hand hygiene compliance include; lack of active participation in promotion at the individual or institutional level, lack of a role model for hand hygiene, lack of administrative sanctions for noncompliance, lack of an institutional climate encouraging safety.

Findings in table 6 indicates that I 02(96.2%) health care workers endorsed that constant supply of water can improve hand hygiene practices while 98(92.4%) of the respondents recommended constant supply of adequate gloves, soap and hand sanitizers. This indicates that supply of water alone cannot increase the compliance of hand hygiene, other contributing factors should be considered such as periodic mentorships on hand hygiene to the health care workers and adequate supply of hand washing related materials. The study findings above are in agreement with Naik et al (2014), which revealed that lack of compliance to hand hygiene was due to (1) lack of soap or too busy/hand washing takes too long, (3) wearing of gloves; hands do not look dirty; and (4) a perceived low risk of acquiring infection from patients.

5.2 Conclusion

The study concluded that most of the health workers know the meaning of hand hygiene and five moments of hand hygiene but the actual practice of hand hygiene is still a big challenge to most health workers.

It was found out that most health workers were consistently using alcohol-based rubs, water and water with soap while cleaning their hands and a small number of the respondents were not consistently using any of these methods.

Lack ofconstant flow of water, absence of soap on hand washing facilities, inadequate supply of gloves/ disinfectants and poor attitude towards hand washing were major barriers hindering health care workers from practicing hand hygiene. This shows that there is need for introducing measures to increase knowledge among health workers on hand hygiene, change negative attitude towards hand hygiene and avail facilities for hand hygiene in the hospital which plays a very important role in increasing hand hygiene compliance among health care workers and reducing cross transmission of infections among health workers and patients receiving services at the hospital.

5.3 Recommendations

Basing on the study findings, the following actions are highly recommended in order to effect hand hygiene practices at Kisoro hospital.

The study recommends that, refresher trainings/CMEs' for health care workers on hand hygiene including socio-behavioral change communication should be organized by the Ministry of health through the District health department to increase awareness among health care workers about the importance of hand hygiene in combating hospital acquired infections and change a negative attitude of health care workers towards hand hygiene practice.

There should be proper quantification of hand hygiene items such as hand sanitizers, gloves, soap by the hospital management in order to avoid stock outs and while ordering for hospital supplies such items should be given a high priority since hand hygiene is one of the most important ways to reduce the prevalence of hospital acquired infections, morbidity, mortality, and health-care costs among hospitalized patients.

The study recommended that, Kisoro hospital management needs to prioritize construction and installation of rain water harvesting systems as an alternative water supply system to cut down the high costs of water and enable constant supply of water in case of interrupted water supply **by** National water. This will contribute to constant water supply at hand washing facilities hence increasing opportunities for hand washing.

The hospital administration should advocate for increased funding to accommodate high water running costs and limit stock out of hand sanitizers and gloves. This will increase chances for practicing hand hygiene if the hand hygiene materials are always available.

Areas for further research

Further research should be carried out with emphasis on health workers' attitude and cultural beliefs influencing hand hygiene in order to bring to light all the practices. This would then guide policy makers in finding solutions to insufficient hand hygiene practices at Kisoro hospital and Uganda at large.

REFERENCES

Abd Elaziz, K.M. & Bakr, 1.M. (2009). Assessment of knowledge attitude and practice of handwashing among healthcare workers in Ain Shams University hospitals Cairo. J Prev Med Hyg. 2009; 50(1):19-25.

Abdella, M.N., Tefera, M.A., Eredie, A.E., Landers, T.F., Malefia, Y.D. & Alene, K.A. (2014). Hand hygiene compliance and associated factors among health care providers in Gondar University Hospital, Gondar, North West Ethiopia. *BMC Public Health* 14 (96)

Ahlstrom, M. & Valles, C.F. (2014). *Hand hygiene compliance among nursing staff in a Philippine Private Hospital.* Sophia Hemmet: Hogskola. From: http://www.divaportal.se/smash/get/diva2

Albert & Condie, (2016). Hand-washing patterns in medical intensive care units. N Engl J Med; 304:1465.

Ango, U.M., Awosan, K.J., Adamu, H., Salawu, S., Sani, M.M. & Asmau, H.I. (2017). Knowledge, Attitude and Practice of Hand Hygiene among Healthcare Providers in Semi-Urban Communities of Sokoto State, Nigeria. *International Journal of Tropical Disease & Health.* 26(2): 1-9, 2017; Article no. IJTDH.36599

Asadollahi, M., Bostanabad, A.M., Jebraili, M., Mahallei, M., Seyyed, R. & Abdolalipour, M. (2015). Nurses' knowledge regarding hand hygiene and its individual and organizational predictors. *Journal Caring Science* 14 (1):45-53.

Bereket, W. Hemalatha, K. Getenet, B, Wondwossen, T, Solomon, A, Zeynudin, A & Kannan, S. (2012). Update on bacterial nosocomial infections. *European Review Medical Pharmacology Sciences* 16 (8): 1040-1044.

Boyce, J.M. (2015). It is time for action: improving hand hygiene in hospitals. Ann Intern Med; 130:153-5.

Centers for Disease Control and Prevention (CDC, 2012). Hand hygiene basics. From: http://www.cdc.gov/handhygiene/Basics.html

Dyson, J., Lawton, R.J., Jackson, C. & Cheater, F. (20 I 0). Does the use of a theoretical approach tell us more about hand hygiene behaviour? The barriers and levers to hand hygiene. *Journal of Infection Prevention.* 20 l 0.

Eiamsitrakoon, T., Apisarnthanarak, A., Nuallaong, W., Khawcharoenporn, T. & Mundy, L.M. (2013). Hand hygiene behavior: translating behavioral research into infection control practice. Infect Control Hosp Epidemiol. 2013; 34:1137-45

Ekwere, T.A. & Okafor, I.P. (2013). Hand hygiene knowledge and practices among healthcare providers in a tertiary hospital, south west, Nigeria. *International Journal of Infection Control.* 2013; 9.

Foca & Jakob, (2010). Endemic Pseudomonas aeruginosa infection in a neonatal intensive care unit. *New England Journal of Medicine*, 343:695-700.

Goldmann & Larson, (2016). Hand-washing and nosocomial infections. N Engl J Med 2; 327:120-2.

Gulilat, K. (2014). Assessment of Knowledge, Attitude and Practice of Health Care Workers on Infection Prevention in Health Institution Bahir Dar City Administration. *Science Journal of Public Health.* 2014; 2:384.

Gulilat, K. (2014). Assessment of Knowledge, Attitude and Practice of Health Care Workers on Infection Prevention in Health Institution Bahir Dar City Administration. *Science Journal of Public Health.* 2014; 2:384

Ho, M.L., Seto, W.H., Wong, L.C. & Wong, TY. (2012). Effectiveness of multifaceted hand hygiene interventions in long-term care facilities in Hong Kong: a cluster-randomized controlled trial. Infect Control Hosp Epidemiol. 2012; 33:761

Huang, T.T. & Wu, S.C. (2008). Evaluation of a training programme on knowledge and compliance of nurse assistants' hand hygiene in nursing homes. *The Journal of hospital infection.* 2008; 68: 164

Ijiali, H. (2015). Knowledge, attitude and practice of hand hygiene among health care assistants and patient's family members at a tertiary hospital in Guangzhou, southern China: A cross-sectional study. A Dissertation submitted in partial fulfillment of the requirements for the Degree of Master of Public Health at the University of Hong Kong.

Khatib, Jamaleddine, Abdallah, & Ibrahi, (2009). Hand washing and use of gloves while managing patients receiving mechanical ventilation in the ICU. Chest; 116:172-5.

Kisoro District Local government, 2018. Budget conference frame work paper Kisoro

District, (2010). Health unit information management system annual report

Kotwal, A., Anargh, V., Singh, H., Kulkarmi, A., & Mahen, A. (2013). Hand hygiene practices among health care workers (HCWs) in tertiary care facility in Pune. *Medical Journal Armed Forces India, 69(1),* 54-56.http://doi.org/10.1016/j.mjafi.2012.08.011

Larson, E.L., McGinley, K.J., Foglia, A., Leyden, J.J., Boland, N., Larson, J., & Altobelli, L.C. (2012). Hand washing practices and resistance and density of bacterial hand flora on two pediatric units in Lima, Peru. Am J Infect Control; 20:65-72.

Mahadeo, B. & Shinde, V.R.M. (2014). A Study to Assess Knowledge, Attitude and Practices of Five Moments of Hand Hygiene among Nursing Staff and Students at a Tertiary Care Hospital at Karad. *International Journal of Science and Research.* 2014; 3.

Malihe Asadollahi, M., Bostanabad, M.A., Jebraili, M., Mahallei, M., Rasooli, A.S. & Abdolalipour, M. (2015). Nurses' Knowledge Regarding Hand Hygiene and Its Individual and Organizational Predictors. *Journal of Caring Sciences,* 2015, 4(1), 45-53.

Mathur, P. (201 I). Hand hygiene: Back to the basics of infection control. *Indian Journal Medical Res* 134 (5):611-620.

Naik, S., Khanagar, S., Kumar, A., Vadavadagi, S., Neelakantappa, H.M. & Ramachandra, S. (2014). Knowledge, attitude, and practice of hand hygiene among dentists practicing in Bangalore City- A cross-sestional survey. *The Journal of International Society of Preventive Community Dentistry* 4 (3):159-163.

Oxford Dictionary of English. (2015). 3 edition. Oxford University Press. England

Pan, A., Domenighini, F., Signorini, L., Assini, R., Catenazzi, P. & Lorenzotti, S. (2008). Adherence to hand hygiene in an Italian long-term care facility. *American journal of infection control.* 2008; 36:495

Rabbi, S.E. & Dey, N.C. (2013). Exploring the gap between hand washing knowledge and practices in Bangladesh: a cross-sectional comparative study. BMC public health. 20 l3. 34

Randle, J., Clarke, M. & Storr, J. (2016). Hand hygiene compliance in healthcare workers. *The Journal of hospital infection.* 2016; 64:205

Rotter, F. (2017). Semmelweis' sesquicentennial: a little-noted anniversary of hand washing. Current Opinion in Infectious Diseases 2018; *11*:457-60.

Sakihama, T., Honda, H., Saint, S., Fowler, K.E., Shimizu, T., Kamiya, T., Sato, Y., Arakawa, S., Lee J.J., Iwata, K. & Mihashi, T.Y. (2014). Hand hygiene adherence among health care workers at Japanese hospitals: A multicenter observational study in Japan. *Japanese Patient Safety* 12 (1):1-7.

Smith, A., Carusone, S.C. & Loeb, M. (2008). Hand hygiene practices of health care workers in long-term care facilities. *American journal of infection control.* 2008; 36:492

Tan, L.L., Li, Y.J. & Sun, S.M. (2016). Survey on Health Care Workers'Hand Hygiene in a First-class Hospital at Grade 3. *Journal of Nursing* (Taiwan). 2016; 13.No.6:11

Vissher, M.O. & Wickett, R.R. (2012). Hand hygiene compliance and irritant dermatitis: a juxtaposition of health care issues. *International Journal of Cosmetic Science* 34:402-15.

Wandel, B.D., De, Maes, L., Labeau, S., & Blot, S. (20 l 0). Behavioral determinants of hand hygiene compliance in intensive care units, 19(3), 230-240. http://doi.org/10.4037 /ajcc20 10892.

Weber, DJ, Rutala, AW, Miller, MB, Huslage, K, Sickbert-Bennett, E. 2010. Role of hospital surfaces in the transmission of emerging health care associated pathogens: Norovirus, Clostridium difficile, and Acinetobacter species. *American journal of Infection Control* 38 (6):$25-$33.

WHO. (2009). *A guide to the implementation of the WHO mulimodal hand hygiene improvement strategy.* From: http://whqlibdoc.who.int/publications/ 2009/9789241597906_eng.pdf

WHO. (2009). *Guideline on hand hygiene in healul care.* From: http://whqlibdoc.who.int/publications/2009/9789241597906_eng.pdf

WHO. (2009). *Guidelines on hand hygiene* **in** *health care: a summary.* Fron. www.who.int/gps/5may/.../who_guidelines-handhygiene_summary. pdf

WHO. (2012). Importance of good hand hygiene for patient safety. Avail-able: http://www.who.int/mediacentre/news/notes/2012/hygiene_20120504/en/

WHO. (2015). *Hand hygiene.* From: www.who.int/patientsafety/solutions/patientsafety.htm

WHO. (2016). Your 5 moments for hand hygiene. Available: http://www.who.int/gpsc/tools/5momentsHandHygiene_A3.pdf

Widmer, A.F. (2010). Replace Hand Washing with Use of a Waterless Alcohol Hand Rub? Clin Infect Dis. 2010; 31 (1):136

Wu, Yunyan, Ren, Z.F. & Tan, L.C. (2014). Current status of hand hygiene knowledge of caregivers in hospital and its influence factors. *Journal of Nursing* (China). 2014; 21. No.17:67

Yan, Z. (2014). Survey of the current hand hygiene behaviors and its influencing factors among care-workers. Chinese Nursing Management. 2014; 14. No.5.

Yuan, C.T., Dembry, L.M., Higa, B., Fu, M., Wang, H. & Bradley, E.H. (2009). Perceptions of hand hygiene practices in China. *Journal of Hospital Infection.* 2009; 71: 157

Zimakoff & Holstein, (2015). A multicentre questionnaire investigation of attitudes toward hand hygiene, assessed by the staff in fifteen hospitals in Denmark and Norway. *Am J Infect Control;* 20:58-64

APPENDICES

Appendix I: Consent Form

Topic: Assessment of Hand-Hygiene practices among Health Care Workers at Kisoro hospital in Kisoro Hospital.

Dear Respondent,

My name is Nsenga Alex, a student at Kabale University offering bachelor of environmental health science. Jam carrying out a research study on the above mentioned topic and lam requesting you to kindly participate in this study by taking part in the interviews. Your participation in this study is voluntarily and you are free to withdraw from it at any time you wish. In addition, the study is purely for academic purposes and no monetary benefits are attached it.

The purpose of this study is to assess the knowledge, practice and barriers to implementation of Hand-Hygiene among Health Workers at Kisoro Hospital in Kisoro Hospital so as to establish the areas of weakness and strength that need improvements thus, enhancing health service delivery.

Your participation in this study will last for around 20-30 minutes while filling the questionnaire. In addition, your participation is completely confidential and your identity will not be revealed in the findings of this study.

I have clearly explained the purpose and objectives of the study to you and you have consented to participate.

Researcher's Signature: ..... Date: .....

I have been clearly explained to the purpose and objectives of the study and I willingly consent to participate.

Respondent's Signature: ..... Date: .....

Appendix II: Self-Administered Questionnaire

Instructions

1. Do not put your name on this guide.
2. Please tick the most correct answer of your choice OR fill in the space provided.

Section A: Socio-demographic characteristics

1)Gender Male ☐ Female

2)State your age in years ....

3) Level of qualification/education
   a) Certificate
   b) Diploma
   c) Bachelor's degree

d)Any other (specify) .....

4) Profession/cadre
   a) Nurse
   b) Midwife
   c) Doctor

d)Any other (specify) ....

Section B: Level of Knowledge on hand-hygiene practice among health workers

5) Do you know what is meant by hand-hygiene?
   a) Yes
   b) No

6) If yes from question 5, define hand-hygiene?

   ……

   ……

7) Do you know the 5 moments of hand-hygiene?
   a) Yes
   b) No

8) If yes from question 7, list them down please.

   ……

   ……

   ……

9) Do you know the equipment of hand-hygiene?
   a) Yes
   b) No [if no go to qn 11.]

10) Can you list them down please?

……

……

……

11) Do you know why alcohol-based hand rubs should be used during hand-hygiene?

a) Yes

b) No

12) If yes, can you write the reasons down?

……

……

……

13) Do you know hand-hygiene techniques?

a) Yes

b) No

14) List the hand-hygiene techniques you know.

a) .....

b) .....

c) .....

d) .....

e) .....

f) .....

g) .....…… .....……. …… .. ……

h) ..... .

15) What are the roles of hand-hygiene in the health facility?

……

……

……

18.	**Which of the following hand hygiene opportunities require one to practice hand hygiene?**		
	Before touching a patient	Yes	No
	Immediately after a risk of body fluid exposure	Yes	No
	After exposure to the immediate surroundings of a patient	Yes	No
	Immediately before a clean/aseptic procedure	Yes	No

19.	**Do you believe that contaminated hands are a vehicle for transmitting healthcare associated infections (HCAis)?**	Yes	No
20.	**Which of the following hand hygiene actions do you use most in preventing transmission of germs? (Tick one mostly used)**		
	Use of gloves		
	Use of Alcohol hand rubs		
	Use of water and soap		

Section C: Level of adherence to hand-hygiene practice among health workers

21.	**Do you routinely use an alcohol-based hand rub, boiled water or soap and water for hand hygiene?**	**Yes**	**No**
22	If **yes from question 21, how often do you use each of the following when attending to the patient? (Please tick one on the scale of your opinion).**	**Very often**	**Not often**
	a). Alcohol-based hand rub		
	b). Boiled water		
	c). Soap and water		

23. After reading each statement carefully, please indicate X in the appropriate box to indicate how strongly you agree or disagree with each statement related to hand hygiene.

The rating scale values are interpreted as: **1), Very often 2), Often 3), Sometimes 4), Never**

Statement	**Rating scale**			
	1	2	3	4
I, always perform hand-hygiene immediately before any aseptic procedure				
I, always perform hand-hygiene immediately after an exposure to risky body fluids				
I, always perform hand-hygiene after removal of gloves				
I, always perform hand-hygiene after changing bed linen				
I, always perform hand hygiene when caring for patients in non-isolation rooms				

Section D: Barriers in the implementation of hand-hygiene practice among health workers

24. What stops or hinders you from practicing hand hygiene while attending to patients if any

a) .

b) .

c) ....

d) .....…… ....

e) ..... .

25. What do you think should be provided or done to help you practice consistent hand hygiene according to guidelines?

a)..... .....

b)..... .....

c)..... .....

d) ..... …… ……. …… ..... …… ……

Thank you for answering all the questions

Appendix III: Key Informants' interview guide

I'm a student of Kabale University conducting research on **"assessment of hand-hygiene practices among health care workers in Kisoro district hospital".** You have been selected as one of the key respondents in this study because I strongly believe that you have the necessary information required for the study, I request you to spare sometime and answer a few questions. The information obtained is for academic purposes only and will be treated with utmost confidentiality. Thank you in advance.

1. What is your job title?
2. What is the level of knowledge of health workers in regard to hand-hygiene practices?
3. On average how many health workers do you observe practicing hand hygiene on a

   daily basis?

4. Which barriers do you think could be hindering health workers from practicing hand hygiene
5. In your view, what do you think should be done to improve hand hygiene practice among health workers?