KNOWLEDGE, ATTITUDE AND PRACTICES AMONG STAFF AND IN-PATIENTS ON PREVENTION AND CONTROL OF NOSOCOMIAL INFECTIONS AT KIRUDDU REFERRAL HOSPITAL, UGANDA

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DECLARATION

I, **Ekakoro Newton** declare that this dissertation and the work presented in it are my own and has been generated by me as the result of my original research

Signed: _____ Date: _____

APPROVAL

We, the undersigned, certify that we have guided, read and here by recommend the dissertation for acceptance to be examined by the Directorate of Research and Graduate Training of Kyambogo University.

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DEDICATION

If it was not due to tireless efforts from my parents, Mr Apollo Ekakoro and Mrs Lucy Amoit Ekakoro, reaching this level of study would have remained a dream forever. Daddy and Mummy, this study is dedicated to you as the pillars of strength for pushing me this far.

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May God reward you all abundantly

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LIST OF ABBREVIATIONS AND ACRONYMS

ACDP: Advisory Committee on Dangerous Pathogens

AIDS: Acquired Immunodeficiency Syndrome

AMR: Antimicrobial Resistance

C: Clostridium

CDC: Centre for Disease Control

CDCP: Centre for Disease Control and Prevention

E: East

EVD: Ebola Virus Disease

HACs: Health Associated Conditions

HAI: Hospital Associated Infection

HCAI: Healthcare Acquired Infection

HCW: Health Care Worker

HH: Hand Hygiene

HIV: Human Immunodeficiency Virus

HW: Health Worker

ICU: Intensive Care Unit

IPC: Infection Prevention and Control

IWH: Institute of Work and Health

KAP: Knowledge Attitude and Practice

KCCA: Kampala City Council Authority

MHA: Massachusetts Health & Hospital Association

ml: millilitre

MoH: Ministry of Health

MRSA: Methicillin Resistance Staphylococcus Aureus

N: North

NI: Nosocomial Infection

NICE: National Institute for Health and Care Excellence

OR: Odds Ratio

PPE: Personal Protective Equipment

SARS: Severe Acute Respiratory Syndrome

TB: Tuberculosis

WHO: World Health Organisation

ABSTRACT

Worldwide, the number of hospitalised patients suffering from hospital acquired infections, or HAIs, is gradually increasing. Rising rates of morbidity, mortality, long-term disability, prolonged hospital stays, microbial resistance, increased healthcare costs for patients and their families, and an increase in the financial strain on the healthcare system have made it a growing public health concern that impacts both the medical community and the general public. The aim of the study was to assess the knowledge, attitude and practices among hospital staff and in-patients in the prevention and control of nosocomial infections. A cross-sectional study design with a quantitative approach was utilized in this study. A sample of 219 respondents was used for the study including 141 patients and 78 hospital staff. Questionnaires were used to obtain information from both the patients and the hospital staff. Majority 64.1% of respondents reported that used Personal Protective Equipment (PPE) should be disposed of using standard municipal disposal procedures. Majority 66.7% of hospital staff believed they had a very high risk of acquiring infections from their patients. Majority 66.0% of patients always wash hands with soap and water at the hospital. More than half of the staffs 53.8% agreed that used Personal Protective Equipment (PPE) should be discarded through regular dustbin. There was 8.209×10^6 times more likeliness to acquire nosocomial infection among the patients that felt that they don't have to wash their hands if they aren't visibly unclean than those who were not sure at a at adj. OR = 8.209×10^6; 95% CI (3.112×10^6 – 2.165×10^7). Also, there was 4.227 times more likeliness to acquire nosocomial infection among the patients that felt that the cleaning staff should clean the floors of the wards twice in 24 hours' than those that felt cleaning to be done four times in 24 hours at adj. OR = 4.227;95% CI (1.341 – 13.328). In conclusion ensuring sensitization and awareness campaigns of new and outgoing patients and hospital staff, formulation and updating policies on matters relating to hospital infections and isolation of patients in cases which have been identified could be helpful in improving the knowledge and practice towards infection prevention at the hospital.

CHAPTER ONE: INTRODUCTION

1.1 Background

There is a gradual increase on hospital acquired infections (HAIs) among hospitalised patients throughout the globe (Sahilendengle *et al.,* 2020). Nosocomial infections are sometimes referred to as infections acquired via healthcare (MHA, 2020). Nosocomial infections (NI) are infections that develop during the course of treatment in a hospital or other healthcare institution but were absent or dormant at the time of admission (Begum *et al.,* 2017) and affects healthcare workers during their day to day hospital activities (Bayleyegn *et al.,* 2021; Razu *et al.,* 2021). The diseases develop at least 48 – 72 hours after admission (Agaba *et al.,* 2017) or within 10 days after discharge (Bayleyegn *et al.,* 2021). Healthcare personnel are susceptible to these infections when gathering, handling, and discarding specimens, handling and disposing of medical equipment, and physically interacting with patients during examinations (Bayleyegn *et al.,* 2021). The greatest clinical treatment in the world may be useless if hospitalised patients get further infections (Lopchan *et al.,* 2016). The odds of contracting an infection have progressively grown over the past several decades, and in acute care hospitals, five to ten percent of patients are hospitalised (Agaba *et al.,* 2017). According to Munyeshyaka *et al.,* (2021), lower respiratory tract infections, bloodstream infections, urinary tract infections (UTIs), surgical site infections, and other nonbacterial diseases are frequently brought on by nosocomial infection (Boev & Kiss, 2017). The majority of these nosocomial infections are caused by pathogens that are transmitted from patient to patient by means of medical

staff who do not consistently adhere to basic hospital hygiene precautions like hand washing (Olalekan *et al.,* 2012), the effective use of simple safety measures while performing invasive procedures (Fashafsheh *et al.,* 2015), and proper infection control practises (Olalekan *et al.,* 2012).

This is a growing public health concern that impacts the medical community as well as the general public. It is caused by rising rates of morbidity, mortality, long-term disability, prolonged hospital stays, microbial resistance, increased healthcare costs for patients and their families, and rising financial strain on the healthcare system (Haque *et al.,* 2018). Additionally, it poses an increasing risk to the overall standard of care and patient safety (Haque *et al.,* 2018). Nosocomial infections are thought to be 2–20 times more common in low- and middle-income nations than in high-income ones globally (Liu *et al.,* 2016). It is projected that both developing and wealthy nations experience more than 2.5 million nosocomial infection cases yearly (Bayleyegn *et al.,* 2021), with around 90% of infections taking place in settings with low resources in developing nations (Yazie *et al.,* 2019). According to reports, the incidence is 15% in the industrialised world among hospitalised patients, but it can range from 9% to 37% for patients who are admitted to the intensive care unit (Haque *et al.,* 2018). According to Alemu *et al.,* (2020), the prevalence of Health Care Acquired Infections (HCAI) among hospitalised patients is up to 19% higher in underdeveloped nations. According to research by Geberemariyam *et al.,* (2018), the high burden of hospital acquired infections in many developing nations is attributed to the high patient load, personnel shortage, and poor adherence to infection prevention and control strategies.

Infection prevention and control are essential to minimising injury to patients, medical staff, and visitors to healthcare facilities (WHO, 2019). Melesse *et al.*, (2021) state that infection prevention and control is a scientific approach and workable solution designed to shield patients and the healthcare system from infection-related harm. This is accomplished through strategies such as good practise and safe procedure in proper waste handling, good sanitation (Hussein *et al.*, 2017), proper sharps disposal, and adequate protective wear.

Three ideas must be taken into consideration for hospital acquired infection (HAI) prevention: knowledge, attitude, and practise (Naderi *et al.*, 2017). Several studies have found the relationship between the three concepts and the prevention mechanisms of HAIs.

Globally, Hinkin *et al.* (2014) research found that while most workers knew very little about using gel and other disinfecting methods, they did know enough about infections, wearing gloves, hand hygiene, and what to do if they cut themselves.. According to a research by Ghanbari *et al.*, (2013) on 130 nurses, the majority of nurses lacked enough knowledge and practise on the prevention of hospital infections, such as hand washing, safe handling of needles, and usage of Personal Protective Equipment (PPE) (Ghanbari *et al.*, 2013). In a study by Amin et al. (2013), just 34.3% of respondents correctly identified the need for hand washing when caring for patients with respiratory illnesses, and only 41.8% of respondents agreed that all patients, regardless of their diseases, are sources of infection. In contrast to the minority of respondents (31.9%) who thought that wearing PPE completely reduces the danger of contracting occupational illnesses, the majority of respondents

(56.6%) agreed that masks and gloves may be reused when treating the same patient.

In poor nations like Africa, there is still insufficient awareness of and adherence to safe injection practises (WHO, 2022). According to a research conducted in northern Nigeria with 421 health care workers, only a minority (29.9%) of these individuals never put on gloves before handling a patient or their property. Additionally, only a minority of respondents (12.6%) washed their hands prior to putting on gloves, only a minority of respondents (10.7%) wash their hands after putting on gloves, and only a minority of respondents (27.6%) never switch gloves after handling a patient. Ocra & Tagoe's (2014) study in Ghana found that 97 (46.2%) of the patients always cleaned their hands within the hospital or after leaving, 65 (31.0%) occasionally did so, and 48 (22.9%) never did. Less than half of those who washed their hands 64 (39.5%) always used soap, 46 (28.4%) occasionally, and 52 (32.1%) never washed their hands with soap.

In Uganda, a research by Sethi *et al.,* (2012) indicated that less than 50% of respondents stated they had easy access to clean water by patients, and up to 75% of Health Care Workers (HCWs) at Mulago General Hospital argued that their filthy hands might spread illnesses. This indicated that healthcare workers did not have adequate knowledge of how nosocomial infections spread as well as poor hospital practises (Sethi *et al.,* 2012).

However, third-world nations like Uganda have not paid enough attention to nosocomial infection prevention and control, which is the cornerstone of reducing nosocomial infections. Furthermore, there aren't many researches in

this particular field on hospital staff knowledge, attitudes, and practises related to nosocomial infection prevention and control. To better understand the knowledge, attitudes, and behaviours of hospital staff about the prevention and control of nosocomial infections, a research was done at Kiruddu Referral Hospital in light of the foregoing.

1.2 Statement of the problem

One of the biggest issues facing Uganda's health care systems today is the rising number of nosocomial infections. It was estimated at 7 to 28% (Ssekitoleko *et al.,* 2010). Many nosocomial infections are brought on by microorganisms that are spread from patient to patient by healthcare professionals. Kiruddu referral hospital has more than five years of experience in the provision of health care services to the community. The Uganda National Infection Prevention and Control Guidelines (2013), which were administered by the Ministry of Health in Uganda, include the fundamental precautionary practises of hand hygiene, the use of personal protective equipment, the safe disposal of sharp objects and waste management to reduce the risk of pathogen transmission.

With these in place infections acquired from health facilities are still increasing among the patients and staff this could be attributed to the limited knowledge, negative attitude and poor practice exhibited by the patients and staff at the health facilities towards infection prevention and control practices. If this is not addressed there will be an increase in the infections among the patients, healthcare workers at the hospital and national economic burden. Kiruddu referral hospital has the infection prevention and control precautions

and guidelines for all staff members' and patients (MoH, 2018). But until now, there hasn't been a review of staff and patient knowledge, attitudes, or practises related to infection prevention and control. Therefore, this study intends to assess the knowledge, attitude and practices of infection prevention at Kiruddu referral hospital.

1.3 Objectives

1.3.1 Main Objectives

Assessing the knowledge, attitude and practices among hospital staff and in-patients on prevention of nosocomial infections at Kiruddu referral hospital, Uganda

1.3.2 Specific Objectives

i. To assess the knowledge of staff and in – patients focusing on hand hygiene, personal protective equipment usage, sharps disposal and waste management on prevention of nosocomial infection at Kiruddu referral hospital.
ii. To assess the attitude of staff and in – patients focusing on hand hygiene, personal protective equipment usage and sharps disposal on prevention of nosocomial infection at Kiruddu referral hospital.
iii. To assess the practices of staff and in – patients focusing on hand hygiene, personal protective equipment usage, sharps disposal and waste management on prevention of nosocomial infection at Kiruddu referral hospital

1.4 Research hypothesis

Ho_1: There is no significant relationship between the knowledge of staff and in – patients on hand hygiene, personal protective equipment usage, sharps disposal, waste management and the prevention of nosocomial infection at Kiruddu referral hospital

Ho_2: There is no significant relationship between the attitude of staff and in – patients on hand hygiene, personal protective equipment usage, sharps disposal and the prevention of nosocomial infection at Kiruddu referral hospital

Ho_3: There is no significant relationship between the practice of staff and in – patients on hand hygiene, personal protective equipment usage, sharps disposal, waste management and the prevention of nosocomial infection at Kiruddu referral hospital.

1.5 Scope of the study

1.5.1 Geographical scope

The study was carried out at Kiruddu referral hospital. The five divisions of Kampala Capital City Authority (KCCA) are Central division, Kawempe division, Makindye division, Nakawa division and Rubaga division. Kiruddu referral hospital is located in Makindye division one of the five divisions of Kampala Capital City Authority (KCCA).

1.5.2 Content scope

The study aimed at assessing how knowledgeable the hospital staff and patients are towards the prevention of nosocomial infection, their attitude

towards prevention of nosocomial infection and their practices towards the prevention and control of nosocomial infections.

1.5.3 Time scope

The duration of the entire investigation was 6 weeks from 18th /April/2022 to 30th /May/2022. The chosen time frame allowed the researcher to collect necessary data and after write the report.

1.6 Significance of the study

The study findings will provide awareness on the factors that are influencing the increase in infections thus creating strategies to reduce their spread.

Policies will be created and put into place to guarantee that patients are shielded from infections contracted while visiting hospitals for medical treatment. The policies developed may be institutional or national in scope, and they can be suitably contextualised. The donor community and other external stakeholders can be educated about the best places to direct funds for the benefit of patients and healthcare professionals.

The study findings will help validate infection control recommendations to enhance patient outcomes during care, as well as to serve as a guideline and information source for other studies.

1.7 Justification

According to Ababa *et al.* (2017), infections remain the primary cause of sickness and mortality in Uganda. Deaths from nosocomial infections in hospitals continue to be a major medical priority. Healthcare workers that lack

the requisite expertise and use subpar infection control and prevention practices jeopardise patient safety. According to Uganda's Ministry of Health, increased measures for infection prevention and control are necessary since healthcare-acquired infections constitute a concern to the country's public health. Effective knowledge, good attitudes, and best practices in infection prevention and control among patients and healthcare personnel may lead to a decrease in the hospital's infection rate.

1.8 Conceptual framework

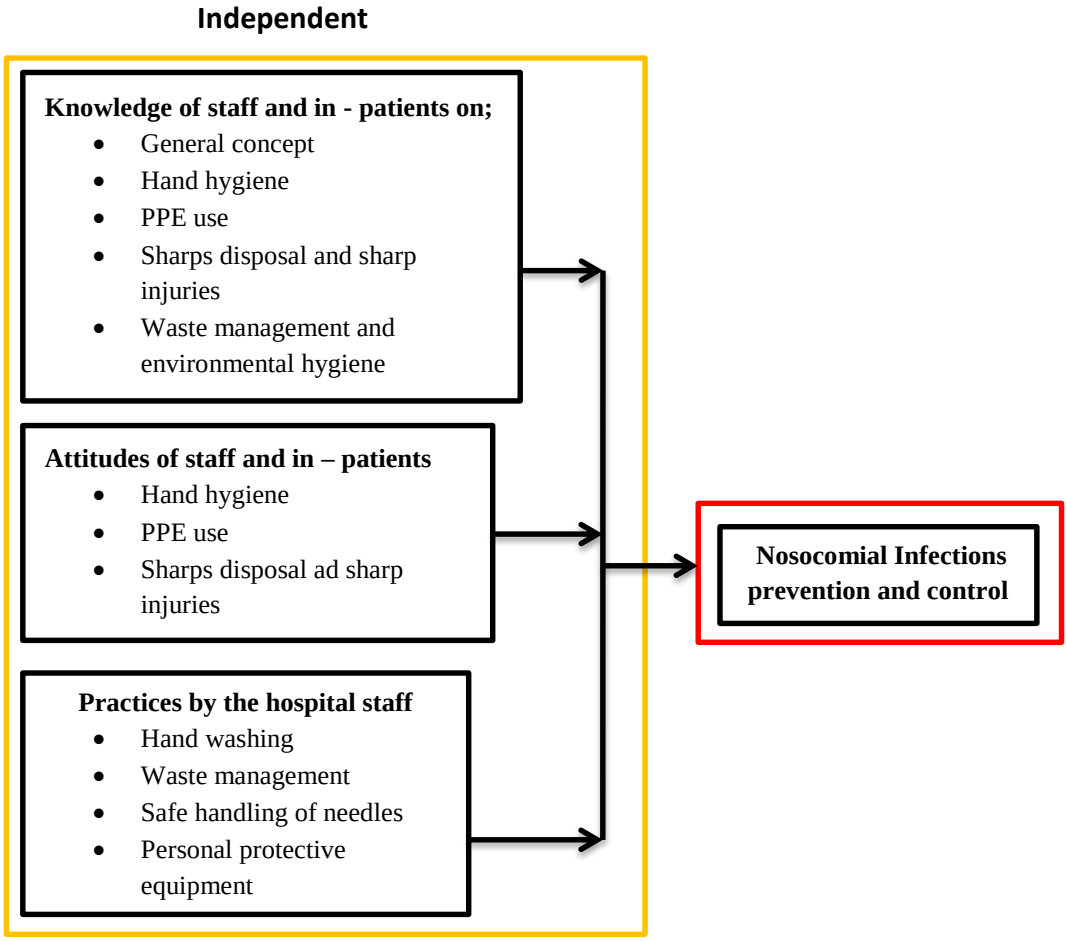

Figure 1.1: Conceptual framework

CHAPTER TWO: RELATED LITERATURE REVIEW

2.1 Theoretical framework

The Nightingale Environmental Theory served as the basis for this study. Nightingale's Environmental Theory was developed a few years before the Crimean War, during two difficult years of service during the War, and around four years after the War. Eventually, she published Notes on Nursing: What it is and what it is not (Nightingale, 1860), outlining her ideas about hygienic conditions that are in line with holistic patient care. Nightingale's judgements of the "health of houses," hospital design and planning, and nursing practice many of which were written when she was bedridden in her latter years all provide compelling evidence of her lifelong development of her environmental theory.

Better hygienic conditions and the subsequent drop in the death rate during the Crimean War reflect Nightingale's belief in and dedication to the components that make up her Environmental Theory. Her book "Health of Houses" goes into great depth about her timeless ideas on how to create and preserve healthy living environments in order to enhance nursing for the benefit of the patient. According to Nightingale, there are five fundamental ideas that need to be taken into account in order for a home to offer a healthy atmosphere: clean, effective drainage, light, pure water, and pure air. "Without these, no house can be healthy," she says. Additionally, it will be unhealthy to the extent that they lack (Nightingale, 1860). She also talks about how important these factors are in terms of "epidemic disease," particularly the scarcity of pure, clean water. She discusses illness, epidemics, and unhygienic circumstances

candidly and often; she understands the result of "contagion," but not its cause. The efficacy of these concepts when paired with the essential infection control procedures of hand washing and general hygiene was illustrated by her statistical model of war mortality rates (Nightingale, 1858). Moreover, the introduction of professional nurses and the improvement of Workhouse Infirmary conditions were closely linked to Nightingale's Environmental Theory (Nightingale, 1860) (Nixon, 2011). Additionally, there was a tight relationship to the Miasma Hypothesis, which was a widely held notion in the 19th century that bad air, as opposed to contaminated drinking water, may induce sickness (Attewell, 2010; Bostridge, 2009), as demonstrated by the cholera epidemics that occurred in London in 1831 and 1866 (Halliday, 2001). Nightingale deserves credit for recognising the need of hand washing as a fundamental form of infection control. She said, "Every nurse should be careful to wash her hands very frequently during the day"(Nightingale, 1860). Additionally, Nightingale (1863) offered some insightful observations regarding the "behaviour" of nurses in relation to infection. She stated, "True nursing ignores infection, except to prevent it," but she qualified this statement by adding that nurses would use "wise and humane management" to prevent infection in the first place.

Nightingale had a significant influence on the layout and architecture of hospitals. In her 1863 publication, "Notes on Hospitals" (Nightingale, 1863) Nightingale addressed the state of British hospitals, describing how, in comparison to smaller cities and villages, their conditions in London in 1861 were generally unsanitary and crammed with patients. She also provided important details about the recovery rates of patients, both now and in the

future, as hygienic circumstances improve. Nightingale's famous statement from 1863, "It may seem a strange principle to enunciate as the very first requirement in a hospital that it should do the sick no harm," provided insight into the significance of thoughtful hospital planning, construction, and administration. Nightingale went to considerable pains to clarify that hospitals were typically very unhygienic settings where "disease produced in hospital" might be exceedingly dangerous, even lethal. Once more, she refers to contagion as "the transmission of disease from person to person by contact" (Nightingale, 1863) and expresses her belief that infection, not contagion, might be breathed through the air (the Miasma Hypothesis). In her "Notes on Hospitals," Florence Nightingale discusses a variety of topics, including her thorough assessment of hospitals' hygienic state, flaws in their current design and construction, the fundamentals of hospital design and construction, convalescent homes, and paediatric hospitals. She preferred that hospitals be built in the pavilion style, which is a standalone, specially designed structure set apart from all other hospital buildings to provide for plenty of natural light, fresh air, and free. No ward was allowed to house more than 32 patients, usually with beds arranged such that there was enough space between them (Nightingale, 1863). Subsequently, many hospitals were constructed all over the world in this manner; however, solitary rooms are now more common, where appropriate, due to their better ability to control infections as well as privacy concerns.

In Nightingale's day, nurses and nursing practice were as vital to the daily functioning of hospitals as they are now. Patient well-being generally came in close second to cleanliness and appropriate hygiene procedures. This was

made possible by the appropriate use of antiseptic, namely carboxylic solutions, which are "the only safe method of disinfection". Florence Nightingale once stated, "Absolute cleanliness is the true disinfectant." The nature of infection and contagion, as well as the differences between antiseptics, disinfectants, and deodorants, must be taught to nurses (McDonald, 2010). Interestingly, Nightingale was not familiar with Ignacz Semmelweiss's work, despite having contact with other researchers who shared similar opinions. Semmelweiss had instituted handwashing with disinfectant in Vienna between obstetric patient examinations in 1847–1848 in an effort to lower the mortality rate. Moreover, her statistical study of the rates of obstetric mortality agreed with that of her colleagues. Several medical professionals realised in the middle of the 1800s that hospital-bound infections, or "hospitalism," were common and that they were associated with a high death rate because overall cleanliness was poor, and specifically because doctors weren't washing their hands.

2.2 Nosocomial infections

According to Ababa *et al.*, (2017), nosocomial infections (NIs) are defined as hospital acquired illnesses that manifest at least 48–72 hours following admission. These are the most typical problems that hospitalised patients face, but they occur more frequently in critical care units, which are the places where outbreaks usually start. Over 60% of all nosocomial infections are caused by three types of infections: primary bloodstream infection (typically connected to the use of an intravascular device), urinary tract infection (generally associated with the catheter), and pneumonia (usually associated with the ventilator) (Agaba *et al.,* 2017).

2.2.1 Types of nosocomial infections

Bloodstream infections associated with central lines, urinary tract infections associated with catheters, surgical site infections, and pneumonia associated with ventilators are the most prevalent types of infections. A summary of them is given below:

2.2.1.1 Central line-associated bloodstream infections (CLABSI)

According to Khan *et al.*, (2017), central line-associated bloodstream infections (CLABSIs) are nosocomial infections that can be fatal, with a death incidence rate ranging from 12% to 25%. In order to provide hydration and medication, catheters are inserted into central lines; nevertheless, extended use of these devices can result in significant bloodstream infections, which can impair health and raise the cost of care (WHO, 2016). Even though the number of CLABSI in US hospitals decreased by 46% between 2008 and 2013, an estimated 30,100 CLABSI still occur each year in US wards and intensive care units (ICUs) (CDC, 2015).

2.2.1.2 Catheter associated urinary tract infections (CAUTI)

Catheter-associated urinary tract infections (CAUTIs) are the most prevalent nosocomial infection type globally, according to Khan *et al.* (2017). According to 2011 acute care hospital data, more than 12% of infections reported were UTIs (CDC, 2016). CAUTIs are caused by the endogenous natural microbiota of patients. In contrast to the poor drainage from catheters, which leaves some urine in the bladder and stabilises bacterial residence, inside catheters act as a conduit for the admission of bacteria (Khan *et al.*, 2017). Meningitis, pyelonephritis, cystitis, and orchitis are among the

consequences that can arise from CAUTI, whereas in males it can lead to prostatitis, orchitis, and epididymitis (CDC, 2016).

2.2.1.3 Surgical site infections (SSI)

2% to 5% of surgical patients develop surgical site infections (SSIs), which are nosocomial infections. These are the second most common type of nosocomial infections; they are mostly caused by Staphylococcus aureus and prolong hospital stays and increase mortality rates (Anderson, 2011). The infections causing SSI originate from the patient's endogenous microbiota. Depending on the procedure and monitoring standards used, the incidence may rise to 20% (Khan *et al.*, 2017).

2.2.1.4 Ventilator associated pneumonia (VAP)

9–27% of patients on a mechanically assisted ventilator suffer from nosocomial pneumonia, also referred to as ventilator associated pneumonia (VAP). It often occurs 48 hours following tracheal incubation (Hunter, 2012). 86% of nosocomial pneumonia cases are associated with ventilation (Chand, 2014). Bronchial noises, leucopenia, and fever are typical indications of VAP (Khan *et al.*, 2017).

2.2.2 Pathogens of nosocomial infections

The three main causes of nosocomial infections are fungi, viruses, and bacteria. These microorganisms vary depending on patient populations, medical facilities, and even the environment in which care is given.

2.2.2.1 Bacteria

The most frequent pathogens that cause nosocomial infections are bacteria. Certain organisms are part of the patient's natural flora and only become pathogenic when the patient's immune system gets compromised. The type of harmful bacteria known as *Acinetobacter* is what causes infections in intensive care units. Eighty percent of reported infections are caused by it, and it is ingrained in both soil and water (Suresh & Joshi, 2013). A commensal bacterium called *Bacteroides fragilis* is present in the colon and gastrointestinal tract. When mixed with other bacteria, it can lead to illnesses (Jayanthi, 2014). Because *Clostridium difficile* replaces good bacteria with pathogenic ones, it inflames the colon, which can result in antibiotic-associated diarrhoea and colitis. Healthcare personnel can spread *C. difficile* to others by improperly cleaning their hands after handling an infected patient (Jayanthi, 2014). Enterobacteriaceae, which are resistant to carbapenems, are typically located in the gut and can cause infections if they spread to other regions of the body. *Klebsiella species* and *Escherichia coli* belong to the Enterobacteriaceae family. The defence against them is more challenging due to their high level of carbapenem resistance (CDC, 2017). Methicillin-resistant *S. aureus* (MRSA) can spread by contaminated hands, open wounds, and direct contact. Sepsis, pneumonia, and SSI are brought on by it entering the bloodstream or organs. It has a strong resistance to beta-lactam antibiotics (CDC, 2017).

2.2.2.2 Viruses

Nosocomial infections are largely caused by viruses in addition to bacteria. Routine surveillance indicates that 5 percent of nosocomial infections are caused by viruses (Khan *et al.*, 2017). They can spread through the mouth, faecal-oral, and respiratory pathways. The persistent viral disease known as hepatitis. Patients and healthcare providers can contract hepatitis viruses from one another. Inappropriate injection techniques are a common way for people to contract hepatitis B and C (CDC, 2017). According to Khan *et al.* (2017), additional viruses include rotavirus, influenza, herpes simplex virus, and HIV.

2.2.2.3 Fungal parasites

Fungal parasites are opportunistic pathogens that cause nosocomial infections in immunocompromised individuals. *Aspergillus spp* can contaminate the environment and cause illnesses. Infections during hospital stays can also be caused by *Cryptococcus neoformans* and *Candida albicans* (Khan et al., 2017). While *Aspergillus* infections are brought on by inhaling fungal spores from contaminated air during construction or restoration of a healthcare facility, Candida infections are caused by the endogenous microflora of the patient (Emily & Sydnor, 2011).

2.3 Knowledge of hospital staff

2.3.1 Nosocomial infections prevention and control

Nosocomial infections are another name for hospital-acquired illnesses (Khan *et al.*, 2015). According to Nejad *et al.*, (2011), these infections constitute a serious global safety problem for both patients and healthcare workers.

The process of erecting a barrier between a vulnerable host and the microorganisms that are necessary for providing safe and excellent care at the facility level is known as nosocomial infection prevention. Therefore, healthcare-associated infections (HAI) and the morbidity and mortality that go along with them can be avoided by implementing infection prevention strategies like the creation of a representative infection control committee, safe and good waste management practices, good sanitation, safety radiation, and occupational protection (Loftus *et al.,* 2019; Hussein *et al.,* 2017). Hussein *et al.* (2017) state that infection control also includes any procedures, guidelines, and programs designed to lessen or completely eradicate the potential for the spread of infectious diseases inside medical institutions..

Globally due to higher hospitalisation and prognosis, nosocomial infection is among the top causes of mortality and incurs financial costs (WHO, 2015). According to Saleem *et al.,* (2019), nosocomial infections are a public health issue that affects hundreds of millions of hospitalised patients and is linked to morbidity, death, and medical expenses. Patients contract the infection through pathogen transmission from one patient to another, through healthcare workers who routinely disregard basic hospital hygiene precautions like hand washing (Olalekan *et al.,* 2012), or through incorrect application of fundamental precautions during invasive procedures (Farrell *et al.,* 2016). Hospital staffs are thought to be primarily responsible for these infections. The hands of working staff members are the main source of cross-infection, according to Lemass *et al.,* (2013).

According to a Lee *et al.,* (2014) study, training increases compliance and awareness of standard precaution. To maintain patient safety, however, most

hospital employees do not follow infection prevention and control protocols when working in a medical environment. The high frequency of hospital acquired illnesses is caused by a lack of understanding in infection prevention and control (Lee *et al.*, 2014).

In sub Saharan Africa infectious illnesses account for more than 50% of all fatalities (WHO, 2018). Even with the availability of inexpensive interventions for infection prevention and control, very few people follow standard infection control procedures, especially in developing nations like Africa (Hussein *et al.*, 2017). According to a research by Olowookere on the knowledge, attitude, and practises of health workers there, just 42% of health professionals in a tertiary hospital in Ile-Ife, Nigeria, had good awareness of the Ebola virus illness, and nearly a quarter (24.2%) had a low risk perception (Olowookere *et al.*, 2015). The individuals' employment was the sole factor that predicted having strong knowledge. This indicated a knowledge gap among the healthcare professionals. As a result, Olowookere *et al.*, (2015) reported that health professionals' practises and awareness regarding Ebola Virus Disease (EVD) need to be improved.

In Uganda, bacterial infections alone were the cause of 20% of all under-five-year-old fatalities, 23% of all mortalities, and 26% of all hospitalisations in 2018 (MoH, 2018). The risk of infection transmission between patients and healthcare personnel is greater when there are many admissions and lengthy patient delays (Olowookere *et al.*, 2015). The Sustainable Development Goal (SDG) goal-3 has been implemented in order to provide everyone with access to high-quality basic healthcare services (MoH, 2018). However, weak guidelines to lower the risks and transmission of nosocomial infection might

lead to poor-quality healthcare systems. Nosocomial infections can be avoided by washing hands frequently, identifying patients who are at risk, and taking the necessary steps to reduce transmission (Wasswa *et al.,* 2015). Only 51% of respondents were aware of at least six of the eight major infection control measures evaluated, according to Wasswa et al. (2015). Additionally, 93.8% of the health facilities in Uganda's Arua district lacked infection control committees, sufficient supplies, or equipment for infection control.

2.3.2 Knowledge about infection control measures

During epidemics, medical facilities may function as disease amplifiers, having an effect on both hospital and public health, if infection control measures are not followed (WHO, 2016). WHO (2016) states that there is a significant knowledge gap between the practical use of infection control techniques and the lessons learnt throughout time. This discrepancy is even bigger in places with few resources, which has terrible consequences. Violations of infection control procedures undercut every advancement and investment made in healthcare (WHO, 2016).

According to Eskander *et al.,* (2013), it is the responsibility of critical care nurses to protect critically ill patients against infection. A study was done to gauge how well critical care nurses understood infection control best practises and how well they performed clinically. According to the study's findings (Eskander *et al.,* 2013), 63.6% of the tested sample showed poor knowledge levels. Through continuing in-service educational programmes, it was advised that critical care nurses should keep their knowledge and skills up to date (Eskander *et al.,* 2013). El-Enein *et al.,* (2011) assessed the extent to which

nurses in a dialysis unit used personal protective equipment and practised hand hygiene according to conventional procedures.

A gap in infection prevention and control protocols and a higher risk of getting nosocomial infections result from the survey's finding that less than half of nurses (47.1%) correctly comprehended the requirement to wash their hands before and after caring for a patient.

In their 2013 study to ascertain the infection prevention and control practises among healthcare professionals at Ridge Regional Hospital in Accra, Ghana (Hayeh & Esena, 2013). According to the data (Hayeh & Esena, 2013), only 39.2% of healthcare personnel had high understanding of IPC, and 51.0% had moderate knowledge (N=204). As the facility had 58% access to materials for infection prevention and control (IPC) practises, the overall compliance with IPC Guidelines was 54.9%. There was no statistical correlation between staff members' understanding of HAI prevention and their IPC training (Hayeh & Esena, 2013).

Only 45% of healthcare providers had knowledge of the classification of bio-medical waste management and colour coding, which made the prevention of nosocomial worse. In Bagepalli Taluk, a study to assess the knowledge and practise of bio-medical waste management among the healthcare professionals working in Primary Health Cares (PHCs) found that 24% and 65% of the healthcare professionals had good knowledge scores and moderate knowledge scores, respectively (Nagaraju *et al.,* 2013).

In a study conducted in Zimbabwe, Tirivanhu *et al.* (2014) underlined the difficulties facing nurses at the Bindura Provincial Hospital in their efforts to

prevent and manage infections (Tirivanhu *et al.*, 2014). Only 14 (28%) of 50 nurses, according to the study (Tirivanhu *et al.*, 2014), had a thorough comprehension of infection control principles, while 21 (42%) of 50 nurses did not use infection control manuals. This demonstrates the general ignorance of infection control principles among nurses. Infection control workshops were not well attended, as seen by the 68% of nurses who did not attend any workshops on infection prevention and control practises (Tirivanhu *et al.*, 2014). As a result, the healthcare facility's ability to control nosocomial infections declined.

Ghalya & Ibrahim (2014) evaluated the sources of information, attitudes, and knowledge that nursing students had on common precautions and infection control. The results showed that nursing students' total awareness ratings for common precautions and infection control were 45.83%. The least amount of knowledge was demonstrated by sharp injuries, indicators, using gloves, and alcohol-based hand massage (Ghalya & Ibrahim, 2014).

In Karachi, Pakistan's tertiary hospital, a cross-sectional study using self-administered questionnaires to assess nurses' attitudes, practises, and knowledge regarding the prevention of HAIs revealed a wider gap between knowledge of the spread of pathogens from food and infection control measures. Only 32.3% of participants exceeded this cut-off on the knowledge portion of the questionnaire, even though 95% of them did so. They contend that having sufficient information is inadequate to achieve results unless it is properly applied to infection control procedures (Aftab *et al.*, 2015).

Ojulong *et al.,* (2013) investigated the knowledge and attitudes of University of Namibia students studying health sciences about infection prevention and control. In 24.1% of all cases, study participants correctly identified the environment (air, water, and surfaces) as the main source of bacteria causing nosocomial illnesses (Ojulong *et al.*, 2013). Therefore, it was determined that significant curriculum improvement or revision is required to ensure early instruction in infection prevention and control before introducing them to the wards for health science students (Ojulong *et al.,* 2013).

In a survey with 350 participants to assess the knowledge, attitude, and practises of healthcare professionals in Kosovo hospitals about nosocomial infections, only 69% of the participants were aware that direct contact is the most prevalent form of transmission (Raka *et al.,* 2006). This study (Raka *et al.*, 2006) also found that 8.5% of health professionals had insufficient understanding of the dangers of HIV transmission from one patient following needle stick injury.

In a study by Amin *et al.,* (2013) on Standard Precautions and Infection Control, Medical Students' Knowledge and Behaviour at a Saudi University: Only 34.3% of doctors properly indicated the necessity for hand washing while treating patients with respiratory infections, according to the study The necessity for Change, revealing a knowledge gap on the probable origins of infection. In addition, 41.8% of physicians acknowledged that all patients are sources of infection, regardless of their illnesses.

The majority of respondents (96.8%) in a research by Alhassan et al. said they knew how to prevent and control hospital-acquired illnesses. On the other

hand, 78.8% of those surveyed were aware of the recommendations for preventing health-acquired infections. The World Health Organization's (WHO) "five moments of hand hygiene" were unfamiliar to more than half (53.8%) of the respondents (Alhassan et al., 2021). Similar investigations were conducted in Ghana and Nigeria, and the results showed that a good majority of doctors, laboratory personnel, nurses, and orderlies had strong understanding (Bello et al., 2011; Alice et al., 2013).

According to a Desta et al. study, there is a correlation between IPC knowledge level and marital status (Desta et al., 2018). Eighty-six percent of participants in a Mukwato et al. research reported having heard of infection prevention guidelines (Mukwato et al., 2008). According to a study done in Ethiopia by Alemayehu et al., 95.19% of medical professionals knew a good deal about infection prevention, whereas 4.81% knew very little (Alemayehu et al., 2016). 84.2% of the healthcare professionals in a study by Gulilat & Tiruneh that evaluated their knowledge, attitudes, and practices about infection prevention in medical facilities was done in Bahirdar City (Gulilat & Tiruneh, 2014).

2.4 Attitude towards infection prevention

According to the Oxford Dictionary, an attitude is "the way you feel, think, and act about something," in this example, the prevention and control of infections. This definition was published in 2010. Numerous studies have connected staff practices to the incidence, frequency, and effects of infection among healthcare workers (HCWs) in an institution (Hussein *et al.*, 2017; Melesse *et al.*, 2021; Anozie *et al.*, 2017).

The study by Hashmi *et al.,* (2012) made it abundantly evident that HCWs' careless and irresponsible behaviour was to blame for their inability to stop infection and intervene post-injury in cases of needle stick injuries. Hashmi *et al.,* (2012) revealed in a recent study that the prevalence of needle stick injuries and sharps injuries among HCWs presently employed in Najran, Saudi Arabia, is in part attributable to staff attitudes that are careless and uneducated (Hashmi *et al.,* 2012). Due to their limited exposure to clinical practises, HCWs and hospital personnel are at increased risk (Hashmi *et al.,* 2012). The requirement to serve in the medical field in the future necessitates medical staff's knowledge of the risks associated with needle sticks and best practises (Siddique *et al.,* 2008). It is crucial that they understand how to safeguard themselves from workplace dangers, including infection (Siddique *et al.,* 2008). The prevalence of infection among hospital employees and patients means that gaining information and changing one's mindset might make life safer (Siddique *et al.,* 2008).

This casual and uneducated mindset was also observed in the training of nurses, according to another research. The risks of needle sticks and other sharps injuries are not just important for already working healthcare professionals; they also begin as soon as they begin their training, according to Fashafsheh *et al.,* (2015). According to Fashafsheh *et al.,* (2015), despite the high hazards and negative effects that these injuries frequently bring about, the frequency and incidence of needle stick and sharps injuries are on the rise, in part due to the ignorance and negligence of HCWs. The question of whether the uneducated and reckless attitude is one of the "factors affecting career

aspirations of medical students in Mangalore, India" must ultimately be debated (Chakravathy *et al.,* 2015).

The research by Olalekan *et al.,* (2012) demonstrated the need to increase health care workers' awareness of nosocomial infections and preventive practises for nosocomial infections were advantageous for hand washing but unfavourable for self-reporting to the staff clinic when unwell (Olalekan *et al.,* 2012). As a result, precautions were taken against them. According to Olalekan *et al.,* (2012), there was no relationship between awareness of hospital policy or the presence of an infection control committee at the hospital and the willingness or capacity to report nosocomial infections.

The promotion of infection transmission from one location to another might be aided by a negative attitude towards infection prevention and control. According to Ward (2012), nursing students typically saw trained staff members take a poor approach to infection prevention and control. In addition, IPC was seen as an extra burden rather than a crucial component of patient safety and great care. In order to gather information for the development of evidence-based treatments, In a study published in 2012, McGaw et al. examined the attitudes of healthcare workers and their adherence to infection control procedures in the operating room of a teaching hospital in Jamaica. Only 17% of all participants in the study adhered to all seven infection control policies, leading the researchers to draw the conclusion that HCWs had below-average compliance with standard infection control guidelines (McGaw *et al.,* 2012).

According to Alhassan et al.'s study, the majority of respondents (95.5%) thought that hospital-acquired illness rates might be decreased by adhering to prevention measures ($P < 0.001$). According to Alhassan et al. (2021), more than half (53.2%) of respondents concurred that their workload has no impact on their capacity to follow infection prevention standards. About 55.1% of participants in a study by Gulilat & Tiruneh had a positive attitude, compared to 44.9% who had a negative attitude. They went on to say that since having a positive attitude towards the IPC is one of the strongest foundations of IPC compliance, there is a need for improvement (Gulilat & Tiruneh, 2014).

In three hospitals in Trinidad and Tobago, Unakal et al. conducted a study that revealed an attitude level of 53.3% for infection prevention and control. This translates to a practice level of 56.0%, indicating that attitude affects practice (Unakal et al., 2017). Rahiman et al.'s study conducted in South Africa revealed that the majority of nursing students had unfavourable opinions on IPC (Rahiman et al., 2018).

2.5 Practice of nosocomial infection prevention

In order to gather information for the development of evidence-based treatments, McGaw *et al.*,(2012) conducted a study in the operating department of a Jamaican teaching hospital to examine HCW attitudes and compliance with infection control practises. Only 17% of all participants in the study adhered to all seven infection control policies, leading the researchers to draw the conclusion that HCWs had below-average compliance with standard infection control guidelines (McGaw *et al.*, 2012).

Any age group can be impacted by infections that were created in hospitals or other healthcare facilities. These infections have the potential to aggravate clients' pre-existing or underlying medical issues, postpone their recovery, and lower their quality of life (Mehta *et al.*, 2014). Healthcare-associated infections can affect both healthy people and those who are ill (Mehta *et al.*, 2014). This implies that anybody who provides care for patients, including family members and healthcare professionals, runs the risk of contracting an illness related to that care. The risk of infections connected with healthcare can be decreased by maintaining high standards for infection control and a clean environment (Mehta *et al.*, 2014). Hand washing, using sharp objects and needles safely, managing contaminated items properly, and disposing of them properly are the markers of infection control practise.

In a study, Mandona et al. found that while 77% of medical professionals and institutions reported using acceptable practices generally, a good 20% also reported using poor practices, which require attention. According to Mandona et al. (2019), just 3% of healthcare professionals demonstrated exceptional practice. The majority of participants in a study by Bouchoucha et al. self-reported having good IPC habits. This is consistent with a study of nursing students that discovered positive self-reported behaviours towards IPC measures (Bouchoucha et al., 2021). Despite receiving training and being aware of the importance of handwashing, Ibrahim & Elshafie's study conducted in Ghana revealed that the majority of medical students had poor handwashing habits (Ibrahim & Elshafie, 2016).

2.5.1 Hand hygiene of the hospital staff, in patients

Hand washing is the most crucial preventative measure in the decrease of nosocomial healthcare-associated infections, claim Hamadah *et al.,* (2015). Before and after each encounter and procedure carried out in a facility, hand washing should be done, according to the Wisconsin Department of Health Services (2018). After coming into contact with the client, handling bodily fluids and blood, touching contaminated objects, removing gloves, switching from contaminated to clean body sites while providing client care, and after touching any objects or medical equipment near the client (Hamadah *et al.,* 2015).

Less than half of the participants in a research by Ghalya and Ibrahim (2014) agreed that the minimum time for normal hand washing should be between 40 and 60 seconds, indicating a gap in the use of effective preventative and control methods. Another study by Amin *et al.,* (2013) found that most respondents (64.9%) agreed that hand washing reduces the amount of microorganisms that can be acquired on the hands if they are dirty, while the majority (34.3%) agreed that hand washing is necessary with patients who have respiratory infections and the minority (44.2%) disagreed. This revealed a flaw in the effective use of infection prevention and control procedures.

Proper hand hygiene must be emphasised in health-related curricula and healthcare facilities since it can raise a patient's risk of morbidity and mortality (Hamadah *et al.,* 2015). More measures will be taken, leading to a bigger decrease in the incidence of health-associated infections, the more nurses are knowledgeable and aware of hand washing standards (Hamadah *et al.,* 2015). More than half of the respondents (56.7%) of the health professionals in a

research about hand hygiene that was done in Nigeria recognised that their hands needed to be cleaned before and after patient treatment, according to the study's findings (Bello *et al.,* 2011). However, only a minority of people were found to practise hand hygiene.

2.5.2 Personal protective equipment (PPE) by the hospital staff

To keep mucous membranes, airways, skin, and clothing safe from harmful germs, a variety of barriers and respirators can be employed singly or in combination (Lemass et al., 2013). Practise staff should evaluate the risks associated with any planned procedures or actions and choose Personal Protective Equipment (PPE) depending on the procedure's nature, the risk of exposure to blood, bodily fluids, mucous membranes, and non-intact skin, as well as the risk of contamination, according to Lemass *et al.,* (2013). Additionally, using basic hand hygiene is always important even when you are wearing gloves. Before putting on gloves, wash your hands, and practise good hand hygiene as soon as you take them off (Lemass *et al.,* 2013).

According to a research by Amin *et al.,* (2013), only 45.8% of participants agreed that gloves should be replaced between operations on the same patient (Amin *et al.,* 2013), this shows a gap in the utilisation of the personal protective equipment. In another study by (Eskander *et al.,* 2013), showed that Personal Protective Equipment (gloves, gown & mask) performance score was unsatisfactory with 57.1% of the respondents and there is a significance between the practice performance score and the qualification of the participants with P = 0.001 (Eskander *et al.,* 2013).

2.5.3 Safe handling of needles and other sharp objects by hospital staff

Healthcare workers must handle needles and other sharp objects safely to prevent the spread of blood borne infections (Wisconsin Department of Health Services, 2018). If such devices were readily available and reasonably priced, the US Needle Stick Safety and Prevention Act (Foley & Leyden, 2000) mandated the use of sharp objects with specified safety precautions. In view of the epidemics of hepatitis B and C infections, healthcare facilities should once again promote safe injection practices. The Centres for Disease Control and Prevention (CDCP) recommend that fresh needles and syringes be used for each injection given to a patient, and that, whenever possible, a single patient should be treated per drug vial. All medical personnel who give injections should adhere to these guidelines to the letter (CDCP, 2017). Sharps must be kept in a rigid, leak-proof, closable container that bears the biohazard emblem and is labelled sharps (Hraishawi & Naji, 2015). Sharps must be handled very carefully. It's not recommended to trim, break, or recap needles. Sharps storage containers shouldn't be more than two thirds full. If a container contains sharps, it needs to be sealed.

The majority of participants in a study by Aluko *et al.,* (2016) were aware of the hazards connected with HCFs and believed that recapping used needles constituted a dangerous behaviour (70%). Only 52.1% of people "always" followed the guidelines, while the majority (93.8%) dispose of sharps safely, with those who didn't (40%) often attributing their failure to do so to a lack of necessary safety equipment (Aluko *et al.,* 2016). According to a study on the KAP of needle stick injuries among dental students conducted in India, 27 (37.5%) third-year students were unaware of the proper way to dispose of

disposable needles and syringes, compared to 17 (42.5%) interns (Gambhir *et al.,* 2013). Approximately 31 (26%) reported they would encourage active bleeding at the injury site.

Injection safety procedures do not include sticking a needle in the mattress. In Kaduma State Command, Nigeria, Onyemoho *et al.,* (2013) evaluated the knowledge and practise of injection safety among the health-care staff at a Nigerian prison service health facility. According to the study's results, n= 74 (or 54%) of health professionals had good understanding of important injection safety practises, n= 20 (17%) had fair knowledge, and n= 40 (or 29%) had poor general knowledge (Onyemoho *et al.,* 2013). In addition, 70 (or 50%) of the 138 jail medical staff members practised safe injection techniques (Onyemoho *et al.,* 2013). According to Lemass *et al.,* (2013), healthcare professionals should only ever use one sterilised needle and one syringe. According to Lemass *et al.,* (2013), every practise should have a policy in place that outlines risk assessment, management, and staff guidance following exposure to blood and body fluids and needle stick injuries. Sharps injuries, their significance, prevention, and care must be made clear to all practising personnel (Lemass *et al.,* 2013).

2.5.4 Waste management by the hospital staff

The amount and variety of healthcare waste is rising globally (Harhey *et al.,* 2009). According to Harhey *et al.,* (2009), modern healthcare institutions have grown to be substantial establishments that generate both hazardous and non-hazardous waste, including food and stationery waste. The World Health Organisation (WHO) defines healthcare waste as all wastes generated during medical treatments in hospitals, research institutions, and labs, as well as from

minor and dispersed sources. Wastes generated during at-home medical operations including home dialysis, self-administration of insulin, and restorative care are included in this description (Chartier *et al.,* 2014).

The World Health Organisation (2018) states that waste from isolated patients, diagnostic samples that were destroyed because they contained body fluids including blood, swabs, and bandages, as well as contaminated supplies like disposable medical gadgets and swabs, and waste that contains blood and infectious agents is considered contaminated. Syringes and needles, scalpel blades, bandages, bedding, dirty clothes, and sanitary waste products are among the things that might endanger cleaners and those in charge of disposing of garbage, according to Burton (2017). Personnel should behave, think, and consider that everything being handled is contagious when working in a high-risk environment like a hospital setting (Burton, 2017). In general, 85% of wastes associated with health care settings are non-hazardous, but 15% of the waste is potentially infectious, according to the World Health Organisation (2018). The public, employees, and other patients may be impacted by the presence of hazardous organisms in this waste material (WHO, 2018).

As a result of poor hospital waste management, hospital employees, patients, and communities throughout the globe have all encountered a number of occupational, environmental, and public health problems (Emmanuel, 2007). Numerous needle stick injuries among hospital workers and scavenger families have been caused by handling tainted rubbish together with other types of waste (Salkin, 2004). According to Shiao *et al.*, (2005), there were 8,645 medical personnel in Taiwan who reported 7,550 needle stick and

sharps injuries. Hollow-bore needles that were infected were utilised in 66.7% of these occurrences. In Sub-Saharan Africa, 5% of HIV infections occur are brought on by reusing contaminated syringes and needles during medical treatment (Crabb, 2003).

The knowledge, attitudes, and behaviours of healthcare managers in respect to medical waste management and occupational safety practises were examined by Anozie *et al.,* (2017). They found that only one facility (1.9%) used the recommended methods for waste disposal. The majority of facilities (39/54; 72.2%) did not practise proper waste segregation before disposal. However, all of the facilities had sharp safety boxes. The majority of the rubbish was gathered using a standard trash can and thereafter dumped outside (50/54; 92.6%) (Anozie *et al.,* 2017)

According to a study by Nagaraju, only 24% of respondents indicated that they had the necessary knowledge of standard hospital waste management in India (Nagaraju *et al.,* 2013). This is concerning given the high risk and burden of infectious disease transmission that healthcare providers face worldwide, but particularly in low-income countries (Ogoina *et al.,* 2014).

2.6 Research gaps

The literature research has shown how diverse and intricate the issue of HAIs is. HAIs are common in Asia, Europe, and Africa, and their existence has a big effect on patient outcomes and hospital expenses. Because HAIs can spread through a variety of channels, treating and preventing them is a challenging task. The knowledge, attitude, and practices of healthcare professionals seem to have a significant impact on infection prevention and control. An overview

of the knowledge, attitudes, and practices of patients and health staff in Ugandan hospitals as a whole seems to be missing from the literature. focusing primarily on infection prevention measures. This is necessary to determine how the factors of knowledge, attitude, and practice affect infection prevention and control so that more focused methods can be developed to enhance them.

CHAPTER THREE: MATERIALS AND METHODS

3.1 Description of study area

The study was carried out from Kiruddu Referral Hospital. One of the five administrative divisions of the Kampala Capital City Authority (KCCA), Kiruddu referral hospital is located in Kiruddu town, atop Buziga hill, in Makindye division, in Kampala district. The Mulago National Referral Hospital is located roughly 13.5 kilometres (8 miles) to the south-east of this location. About 10 kilometres (6 miles) southeast of the city's central business district is where you'll find Kiruddu General Hospital. The coordinates of Kiruddu General Hospital are $0^0$14’53.0”N, $32^0$36’45.0”E (Latitude: 0.248056; Longitude: 32.612500). It’s a government aided hospital with about 200 beds, 250 staff, 25 private in – patients rooms and 500 outpatient consultations on a daily basis (www.Wikipedia.org.com).

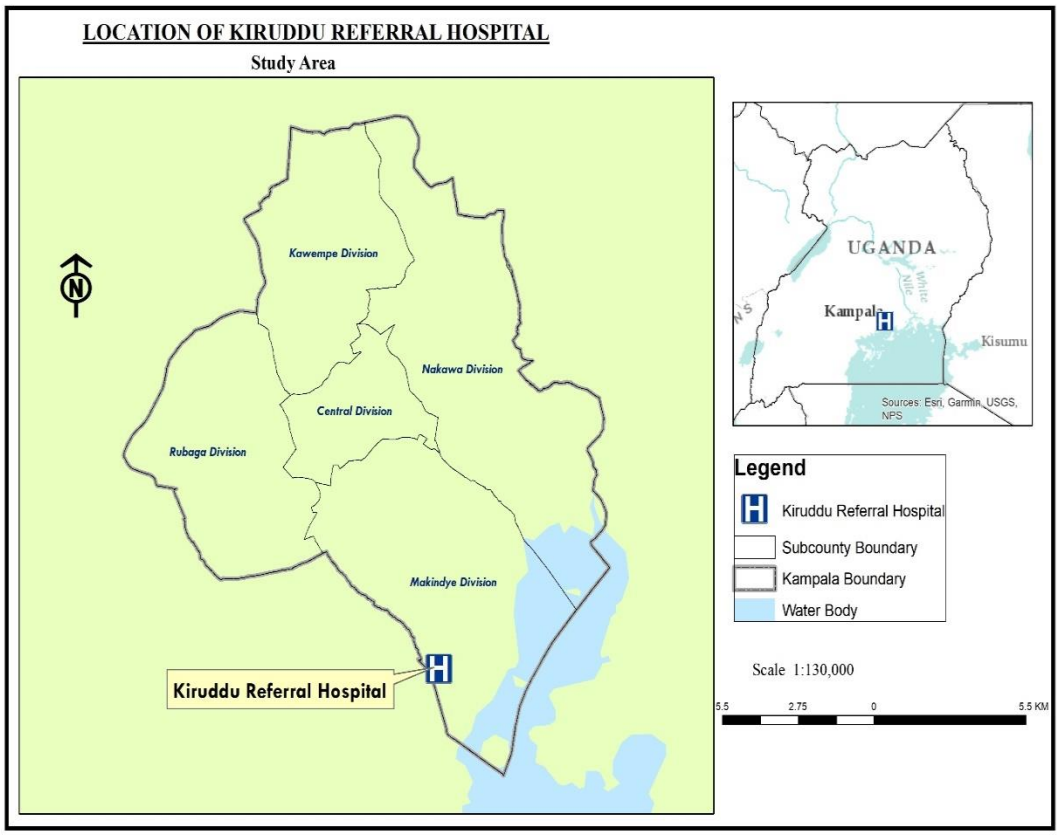

Figure 3.1: Map of study area

3.1.1 Management structure of the hospital

The management structure of the hospital comprises of the senior management team (Executive director, Hospital administrator, Finance manager, Principal nursing officer, Medical director, HR Manager, ICT Manager), hospital management team (Q. A Manager, Deputy administrator, Business dev. Manager, Head of public health & research, Head of pharmacy, Head of laboratory, Head of infection control) and head of departments and units.

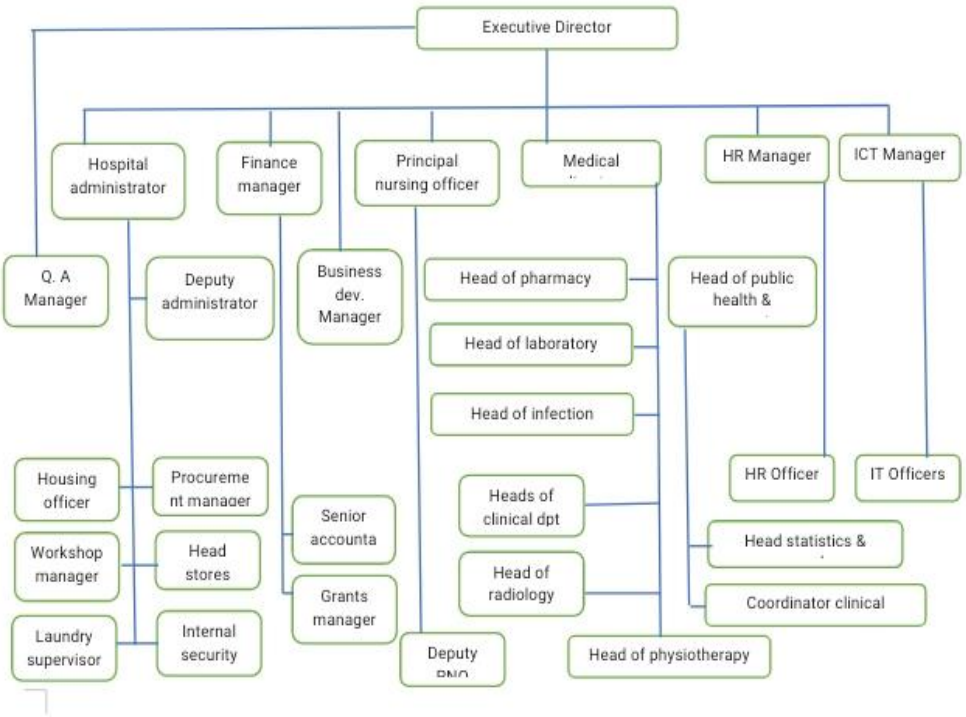

Figure 3.2: Management structure of the hospital

3.2 Study design

Kothari (2004) defines a study design as setting up parameters for data collection and analysis with the goal of balancing procedural efficiency with relevance to the research question. Research design is essential because it makes the many research activities run more smoothly, making research as efficient as possible and producing the most information with the least amount of time, money, and effort (Kothari, 2004). The study used a descriptive cross sectional design in relation to other similar studies in Romania (Voidazan *et al.,* 2020), Uganda (Agaba *et al.,* 2017), Ethiopia (Melesse *et al.,* 2021), Lebanon (Youssef *et al.,* 2021), Vietnam (Lien *et al.,* 2018), South Africa (Moodley *et al.,* 2021), Trinidad & Tobago (Unakal *et al.,* 2017), Uganda (Nalunkuma *et al.,* 2021) Bhutan (Gyeltshen *et al.,* 2021), China (Wu *et al.,* 2020). This design focuses on characterising a certain person or group of

people in order to determine the frequency of a circumstance, problem, attitude, or issue at a given moment in time. It was used because it is extremely simple in design, saves time and less costly.

3.2.1 Study approach

The study used a quantitative approach of data collection in relation to other similar studies in Uganda (Nalunkuma *et al.,* 2021), China (Wu *et al.,* 2020), Malaysia (Swe *et al.,* 2014), Saudi Arabia (Hashmi *et al.,* 2012), Nigeria (Amoran & Onwube, 2013). Leedy & Ormrod (2013) define the quantitative approach as the type of method that "involves looking at amount, or quantities, of one or more variables of interest." According to Gerring (2012), a quantitative method is "any inference based on large number of dataset observation, that is, statistical analysis." It was employed because statistical data was needed to investigate and quantify the situation.

3.3 Study population

Approximately 120 hospital staff working at the hospital comprised of (doctors, nurses, cleaners, lab technicians, pharmacists, and physicians) and approximately more than 200 in – patients at the hospital was the total population of the study.

3.3.1 Target population

The target population is made up of all the instances that the researcher wants to use as a basis for generalisations (Polit & Beck 2008). Following the change in the size of the study populations enabled the use of the Cochran formulae of sample size calculation using estimations to get the target population. For the staff a study by Unakal *et al.,* (2017) in Trinidad & Tobago was employed

while for the in – patients a study by Ocran & Tagoe, (2014) was employed. The target population for the study after applying the correction formulae was 144 in – patients and 89 hospital staff.

3.4 Eligibility Criteria

According to Polit and Beck (2008), exclusion criteria are qualities a person must not possess in order to belong to the population. The following were the inclusion and exclusion criteria for this study:

Inclusion criteria:

Staff

- Those who were at the hospital by the time of data collection
- Those who were not selected in the pilot study
- Those who were mot too busy and willing to participate in the study

In – patients

- Those who were at the hospital by the time of data collection
- Those who were not selected in the pilot study
- Those who were willing to participate in the study
- Those who were capable of answering the questions
- Those who were above 18 years
- Those who had stayed at the hospital for more than four days

3.5 Sample size determination

Table 3.1: Sample size determination

	In – patients	**Staff**
Assumption	By considering (53.8%) of patients who had some knowledge of HAIs in a regional hospital in Ghana by Ocran & Tagoe, (2014). P = 0.538 Margin of error (d) = 5% Z= standard normal distribution (Z=1.96)	By considering the 20.3% of health care workers who were knowledgeable towards infection prevention from three regional hospitals in Trinidad and Tobago by Unakal *et al.*, (2017). P = 0.203 Margin of error (d) = 5% Z= standard normal distribution (Z=1.96)
	$n = \frac{(Z\propto/_2)^2 P(1-P)}{d^2}.$ $n = \frac{(1.96)^2 \, X \, 0.538(1-0.538)}{0.05^2}.$ $n = \frac{0.9549}{0.0025}.$ $n = 381.96.$	$n = \frac{(Z\propto/_2)^2 P(1-P)}{d^2}.$ $n = \frac{(1.96)^2 \, X \, 0.203(1-0.203)}{0.05^2}.$ $n = \frac{0.6216}{0.0025}.$ $n = 248.64.$
Corrected sample size	Since the source population was less than 10,000 the correction formula was used. $n_f = \frac{n}{1+ n/_N}.$ $n_f = \frac{381.96}{1+ 381.96/_{200}}$ $n_f = \frac{381.96}{2.9098}$ $n_f = 131 \, respondents$	Since the source population was less than 10,000 the correction formula was used. $n_f = \frac{n}{1+ n/_N}.$ $n_f = \frac{248.64}{1+ 248.64/_{120}}$ $n_f = \frac{248.64}{3.072}$ $n_f = 81 \, respondents$
With 10% non-response rate	n = 131 + 13.1 **n = 144 respondents**	n = 81 + 8.1 **n = 89 respondents**

3.6 Sampling technique and procedures

The researcher used simple random sampling technique, to select sample from the staff and in – patients, during the study. The researcher selected the sample with a mind-set that, they are more knowledgeable in regards to the research topic.

3.7 Data collection methods

The researcher used a structured questionnaire to collect data from the staff and in – patients after obtaining consent from the participants, during the study.

3.8 Data collection instruments

3.8.1 Questionnaire

For staff

The study employed a structured questionnaire that had four sections: section 1 for sociodemographic characteristics (gender, age, marital status, work experience, occupation, education level, employment status, department, training acquired), section 2 for knowledge (open-ended and closed-ended questions, with a three-point likert scale on hand hygiene, personal protective equipment use, sharps disposal, and waste disposal), section 3 for attitude (thrifty or not), and section 4 for results.

For in – patients

A structured questionnaire with four sections was used in the study. These sections were: section 1 on socio-demographic characteristics (gender, age,

marital status, and level of education); section 2 on knowledge (open-ended and closed-ended questions); section 3 on attitude (open-ended and closed-ended questions); and section 4 on practises (three-point likert scale with Never, Occasionally, and Always as options).

The in – patients' questionnaire was translated into Luganda to cater for the patients who were not well versed with the English language. Therefore, both English and Luganda questionaries' were used for the patients at their convenience

3.9 Data analysis

Data was coded, entered, verified, and cleaned with great care. To ensure that the data was accurate in terms of quality and consistency, it was input twice into Microsoft Excel programme, version 19. The data were statistically analysed using both descriptive and inferential statistics using IBM SPSS statistical software, version 20. Socio-demographic variables (section 1) were given as frequencies, percentages, and bar charts in tabular form using descriptive statistics. By adding up the right answers to the knowledge, attitude, and practise questions, the data for sections 2, 3, and 4 were scored to assess the degree of knowledge, attitude, and practises. The scores were reported as mean, percentages.

Inferential statistics was used to provide deeper understanding of descriptive statistics, the Chi – square test was used to either accept or reject hypotheses by comparing proportions/percentages. Spearman's rank correlation coefficient was used to determine whether there was a correlation between the variables. The Kolmogorov-Smirnov test was used to determine whether the results were

normal. When necessary, the indicators of good knowledge, attitude, and practices were predicted using logistic regression. The odds ratio (OR) provided the strength of the association between variables. To control the effect of confounding factors the Mantel – Haenszel test statistic was done. For all statistical tests a 95% confidence interval (95% CI) was considered and decision was significant if the P – value is < 0.05.

3.10 Quality control issues

3.10.1 Pilot study

The pilot study was done from Kiruddu referral hospital and during the pilot study the questionnaires were pre-tested to identify problems with the design and to refine the questionnaires. To conduct the pilot study 10% of N=89 hospital staff (n= 9) and 10% of N=144 hospital staff (n= 14) patients were selected using simple random sampling method. The study found that the attitude questions for the patients were misunderstood by the respondents. However, more clarity was done towards section of attitudes of patients to make them clear with the help of the supervisors.

3.10.2 Validity

During the pilot study, the validity of the hospital staff questionaries' and patient questionaries' was evaluated. Representative questions were created for each Knowledge, Attitude, and Practice (KAP) category and assessed against the intended result in order to maximise validity. This gave a validity of 0.93 for the staff questionaries' and a validity of 0.81 for the patient's questionnaires. Validity was acquired using the formula as below;

$$CVR = \frac{N_e - (\frac{N}{2})}{N/2}$$

Where N_e = Number of essentials for an item

N = Number of experts

$$Validity\ index = mean\ of\ CVR$$

3.10.3 Reliability

The researcher, in collaboration with the statistician, co-supervisor, and supervisor, devised the instrument. To establish the reliability of the instrument, the pilot study was conducted on 10% of N=89 hospital staff (n= 9) and 10% of N=144 hospital staff (n= 14) patients were selected using simple random sampling method. The reliability acquired was 0.97 for the staff questionaries' and a validity of 0.88 for the patient's questionnaires. Reliability was acquired using the formula as below;

$$Reliability\ coefficient = \frac{N}{(N-1)}\ X\ \frac{(Total\ variance - sum\ of\ variance)}{Total\ variance}$$

N = Number of tasks

3.10.4 Data collectors

Research assistants were recruited, oriented and trained in a one-day workshop. The training course included instructions on interviewing techniques, field procedures, instructions on administering the questionnaires, the purpose of the study and variables in the study, the contents of the questionnaire and data quality management.

3.11 Ethical issues

A completed research proposal was submitted to the supervisor for approval, and then clearance was obtained from Kyambogo University, faculty of science, department of biological sciences to obtain research ethical review. Ethical review approval to conduct the research was obtained from Clarke International University Research Ethics Committee (CLARKE – 2022 – 342). A letter of acceptance was obtained from Kiruddu national referral hospital to carry out the study at the hospital. Informed permission papers have to be signed by each participant before they could answer the questions. The objectives, significance, and nature of the research project were explained to all participants, with an emphasis on the value of voluntary involvement and the opportunity to discontinue the study at any moment without consequences. The researcher gave the participants the reassurance that any information they shared would be treated with the strictest confidentially and used only for the objectives of the study. The researcher also gave the prospective participants the assurance that their names would be kept secret and that, if they desired, they may see the final study report, copies of which would be made available at Kiruddu national referral hospital. This was all done in part.

3.12 Plan to disseminate study findings

Results will be presented to Kiruddu National Referral Hospital and Kyambogo University directorate of research and graduate training to help the hospital administrators gain better understanding on the knowledge, attitude and practices of the staff and patients regarding prevention of nosocomial

infections as well as to fulfil the requirements for the award of Master of Public Health and to be kept in the library as reference for other researchers.

CHAPTER FOUR: RESULTS

4.0.1 Response rate

Since the study was primarily quantitative in nature, a questionnaire was used as the primary data-collection technique for the data presented in this chapter. Other methods, such observation, were used sparingly to address concerns with the questionnaire data. To put it another way, observational data were added to questionnaire data. To further explain the concerns and situations seen, several formal interviews were conducted in addition to the observation activities. The questionnaires were created in accordance with the study's objectives and research questions. The surveys were divided into four components that included participant socio demographics, knowledge, attitudes, and nosocomial infection prevention practises.

In collecting the data, a total of 233 questionnaires were distributed as from April 2022 to the staff and in – patients at Kiruddu referral hospital. Whereby the hospital staff received 38.2% (n = 89) of the questionnaires while the in – patients received 61.8% (n = 144) of the questionnaires. However, the questionnaires for the different groups were different though the responses from the in – patients' questionnaires could in one way or the other justify what has been provided by the hospital staff. The in – patients' questionnaires were converted into Luganda because it was the most local language used at the hospital, this means that the in – patients used both the English and Luganda questionnaires, whichever the in – patients felt comfortable filling.

Demographic characteristics of the hospital staff

Table 4.1: Demographic characteristics of the hospital staff

Variables	Categories	Frequency	Percentage
Gender	Male	50	64.1
	Female	28	35.9
Age	20 – 29 years	50	64.1
	30 – 39 years	18	23.1
	40 – 49 years	6	7.7
	> 50 years	4	5.1
Marital status	Single	47	60.3
	Married	29	37.2
	Widowed	2	2.6
Education level	Diploma	19	24.4
	Bachelors	57	73.1
	Masters	2	2.6
Occupation	Doctor	25	32.1
	Nurse	30	38.5
	Physician	8	10.3
	Pharmacist	5	6.4
	Lab technician	10	12.8
Work experience	1 – 5 years	51	65.4
	6 – 10 years	11	14.1
	11 – 15 years	9	11.5
	16 – 20 years	2	2.6
	> 20 years	5	6.4
Duration of shift	< 8 hours	21	26.9
	8 hours	25	32.1
	> 8 hours	32	41.0
Number of patients handled	< 5		3.8
	5 – 10	17	21.8
	11 – 15	19	24.4
	16 – 20	3	11.5
	> 20	30	38.5
Training on Occupational health	Yes	55	70.5
	No	23	29.5
Training on infection prevention	Yes	65	83.3
	No	13	16.7
Duration of training	1 day	24	30.8
	2 days	11	14.1
	3 days	11	14.1
	7 days	14	17.9
	15 days	5	6.4

The majority of the participants who completed the hospital staff questionnaire were male 64.1% (n = 50), over 36.2% were aged 21 – 29 years followed by 27.0% who were aged 30 – 39 years. More than half of the staff that participated in the study were single, over 38.5% of the participants were nurses followed by 32.1% who were doctors. Approximately three quarters of the staff had attained bachelor's degree as the highest level of education followed by 24.4% of the staff that had attained a diploma as the highest level. More than half of the staff had worked for between 1 to 5 years in a health-related field, over 41.0% of the participants worked for more than 8 hours. More than a third of the participants handled a mean number of more than 20 patients, majority 70.5% had acquired training on occupational health and safety and 83.3% of the participants agreed to having attained training on infection prevention at the hospital whereby majority 30.8% had it for a period of 1 day, while 17.9% of the participants had the training for 1 week (Table 4.1).

Table 4.2: Demographic characteristics of the patients

Variables	Categories	Frequency	Percentage
Gender	Male	66	46.8
	Female	75	53.2
Age	< 20 years	24	17.0
	20 – 29 years	51	36.2
	30 – 39 years	38	27.0
	40 – 49 years	11	7.8
	> 50 years	16	11.3
Marital status	Single	77	54.6
	Married	54	38.3
	Divorced	9	6.4
	Widowed	1	0.7
Education level	Illiterate	9	6.4
	Primary	30	21.3
	Secondary	73	51.8
	Diploma	19	13.5
	Bachelors	10	7.1

The patient participants were mainly dominated by the females. Majority 36.2% of the participants were aged 21 – 29 years followed by 27.0% who were aged 30 – 39 years. More than half of the participants were single followed by 38.3% who were married. More than half of the participants had attained a secondary certificate as the highest level of education followed by 21.3% that had attained a primary certificate as the highest level of education (Table 4.2).

4.1 Knowledge of staff and patients focusing on general concept, hand hygiene, PPE usage, sharp disposal ad sharps injuries and waste management on prevention of nosocomial infection at Kiruddu referral hospital.

The first objective described the knowledge of staff and patients on general concept, hand hygiene, PPE use, sharps disposal and sharp injuries and waste management at Kiruddu referral hospital.

4.1.1 Knowledge of staff focusing on general concept, hand hygiene, PPE usage, sharp disposal ad sharps injuries and waste management on prevention of nosocomial infection at Kiruddu referral hospital

4.1.1.1 General concept on nosocomial infection by hospital staff

Table 4.1: General concept knowledge of hospital staff on nosocomial infection

	Doctor n = 25	**Nurse n = 30**	**Physician n = 8**	**Pharmacist n = 5**	**Lab tech n = 10**	**Total n = 78**	χ^2	**Sig.**	**Prevalence**
Item	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**			**n (%)**
Nosocomial infections are infections acquired from the hospital **(True)**	23 (92.0)	30 (100.0)	5 (62.5)	4 (80.0)	10 (100.0)	72 (92.3)	0.019	0.991	28 (35.9)
An infection is nosocomial if it appears after;**(48 – 72 hrs)**	17 (68.0)	12 (40.0)	1 (12.5)	4 (80.0)	4 (40.0)	38 (48.7)	4.686	0.321	
Nosocomial infections can be transmitted through contaminated medical equipment **(True)**	22 (88.0)	26 (86.7)	7 (87.5)	4 (80.0)	10 (100.0)	69 (88.5)	1.506	0.471	
Nosocomial infection can be caused by bacteria only found in and around the hospital **(True)**	21 (84.0)	23 (76.7)	4 (50.0)	2 (40.0)	6 (60.0)	56 (71.8)	0.036	0.982	
All patients are a source of infection regardless of their diagnosis **(True)**	21 (84.0)	27 (90.0)	6 (75.0)	3 (60.0)	7 (70.0)	64 (82.1)	3.574	0.167	
All body fluids except sweat should be viewed as a source of infection **(True)**	16 (64.0)	12 (40.0)	3 (37.5)	0 (0.0)	3 (30.0)	34 (43.6)	0.737	0.692	

Under the general concept on NIs knowledge, responses were obtained from questions about the definition of NIs, period of infection, transmission of infection, cause of infection, and sources of infection. The staff included doctors, nurses, physicians, pharmacists and laboratory technicians (Table 4.3).

The study's findings demonstrate that 92.3% (n = 72) of the employees who took part in it were right in their understanding that nosocomial infections are those that are acquired from the hospital. The most knowledgeable of the staff were nursing staff 100.0% (n = 30) and laboratory technicians 100.0% (n = 10) while the physicians were the least knowledgeable about what nosocomial infection were with only 62.5% (n = 5). The hospital staff knowledge on the definition of NCs does not have a significant effect on the prevalence of NCIs ($\chi^2 = 0.019$, P = 0.991) (Table 4.3).

With regard to the period at which infection manifests, less than half of the staff 48.7% (n = 38) were knowledgeable about the time period a nosocomial infection appears. The majority of respondents were pharmacists 80.0% (n = 4) followed by the doctors, nurses and lab tech and physicians with the least knowledgeable. There was no significant effect between the responses on period at which infection manifests and prevalence of NIs ($\chi^2 = 4.686$, P = 0.321) (Table 4.3).

The results on transmission of NI via contaminated equipment showed that over 88.5% (n = 69) of the staff at the hospital agreed correctly that nosocomial infections are transmitted through contaminated equipment. The most knowledgeable were lab technicians 100% (n = 10) followed by doctors

88% (n = 22), physicians 87.5% (n = 7), nurses 86.7% (n = 26), and pharmacists 80% (n = 4) as the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 1.506$, P = 0.471) (Table 4.3).

More than half 71.8% (n = 56) of the respondents correctly agreed on nosocomial infection being caused by bacteria in and around the hospital of which 84.0% (n = 21) were doctors followed by nurses 76.7% (n = 23), lab technicians 60% (n = 6), physicians 50% (n = 4) and pharmacists 40.0% (n = 2) as the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 0.036$, P = 0.982) (Table 4.3).

The majority 82.1% (n = 64) of the staff correctly agreed that all patients are a source of infection, the most knowledgeable hospital staff were nurses 90.0% (n = 27) followed by doctors 84.0% (n = 21), physicians 75% (n = 6), lab technicians 70% (n = 7) and pharmacists 60.0% (n = 3) as the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 3.574$, P = 0.167) (Table 4.3).

From the study less than half of the hospital staff 43.6% (n = 34) correctly agreed that all body fluids except sweat should be viewed as a source of infection, the most knowledgeable hospital staff were doctors 64.0% (n = 16) followed by nurses 40.0% (n = 12), physicians 37.5% (n = 3), lab technicians 30% (n = 3) and pharmacists 0.0% (n = 0) as the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 0.737$, P = 0.692) (Table 4.3).

4.1.1.2 Hand hygiene knowledge of hospital staff on nosocomial infection prevention

Table 4.2: Hand hygiene knowledge of hospital staff on nosocomial infection

	Doctor n = 25	**Nurse n = 30**	**Physician n = 8**	**Pharmacist n = 5**	**Lab tech n = 10**	**Total n = 78**	χ^2	**Sig.**	**Prevalence**
Item	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**			**n (%)**
Hand hygiene is the most effective method to prevent nosocomial infection **(True)**	25 (100.0)	28 (93.3)	5 (62.5)	4 (80.0)	10 (100.0)	72 (92.3)	1.866	0.393	28 (35.9)
Hand hygiene is needed with patients with respiratory infections **(True)**	11 (44.0)	12 (40.0)	5 (62.5)	2 (40.0)	5 (50.0)	35 (44.9)	0.998	0.607	
The danger of spreading hospital acquired germs is reduced by washing hands with soap and water **(True)**	24 (96.0)	30 (100.0)	6 (75.0)	5 (100.0)	9 (90.0)	74 (94.9)	1.304	0.521	
After taking off your gloves, you should wash your hands **(True)**	24 (96.0)	30 (100.0)	6 (75.0)	5 (100.0)	9 (90.0)	74 (94.9)	0.364	0.833	
If hands are not dirty, using an alcohol-based antiseptic for hand hygiene is just as effective as using soap **(True)**	13 (52.0)	20 (66.7)	3 (37.5)	4 (80.0)	9 (90.0)	49 (62.8)	0.521	0.771	
Wearing gloves eliminates the need to wash your hands.	23 (92.0)	30 (100.0)	5 (62.5)	5 (100.0)	10 (100.0)	73 (93.6)	0.804	0.669	
Before and after having direct patient contact, hand hygiene should be practised **(True)**	22 (88.0)	30 (100.0)	7 (87.5)	5 (100.0)	10 (100.0)	74 (94.9)	0.364	0.833	
The recommended minimum time for normal hand washing is between 40 and 60 seconds.	22 (88.0)	23 (76.7)	6 (75.0)	2 (40.0)	9 (90.0)	62 (79.5)	0.454	0.797	

The sub-variable of hand hygiene knowledge on NI was explored. Results from Table 4.4 show that 92.3% (n = 72) of the staff correctly agreed that hand hygiene is the most effective method to prevent nosocomial infection. Out of these, 100% (n = 25) of the doctors and 100% (n = 10) of laboratory technicians were most knowledgeable about hand washing effectiveness to prevent infection followed by nurses 93.3% (n = 28), pharmacist 80% (n = 4) and physicians 62.5% (n = 5) as the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 1.866$, P = 0.393).

Regarding to responses on hand hygiene in relation to respiratory infections less than half of the hospital staff 44.9% (n = 35) were found to be knowledgeable on hand hygiene as a necessity for patients with respiratory infection. The most knowledgeable staff were physicians 62.5% (n = 5), while nurses 40.0% (n = 12) and pharmacists 40.0% (n = 2) were the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 0.998$, P = 0.607) (Table 4.4).

According to responses on hand hygiene and the usage of alcohol-based antiseptics, the majority of hospital staff 94.9% (n = 74) correctly understood that washing their hands with soap or an alcohol-based antiseptic lowers the risk of spreading hospital-acquired diseases. The most knowledgeable staff were nurses 100% (n = 30) and pharmacists 100% (n = 5) followed by doctors 96% (n = 24), lab technicians 90% (n = 9), and physicians 75% (n = 6) were the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 1.304$, P = 0.521) (Table 4.4).

Responses on hand hygiene in relation to removal of gloves showed that majority of the hospital staff 94.9% (n = 74) correctly agreed that hand washing is recommended after removal of gloves. The most knowledgeable staff were nurses 100% (n = 30) and pharmacists 100% (n = 5) followed by doctors 96% (n = 24), lab technicians 90% (n = 9), and physicians 75% (n = 6) were the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 0.364$, P = 0.833) (Table 4.4).

The majority of workers, 62.8% (n = 49), correctly reported that, if hands are not obviously unclean, using an alcohol-based antiseptic for hand hygiene is just as effective as using soap and water. The most knowledgeable staff were laboratory technicians 90% (n = 9), followed by pharmacists 80% (n = 4), nurses 66.7% (n = 20), doctors 52% (n = 13), and the physician's 37.5% (n = 3) as the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 0.521$, P = 0.771) (Table 4.4).

Regarding to responses on hand hygiene in relation to use of gloves showed that majority of the staff 93.6% (n = 73) correctly disagreed that use of gloves replaces need for hand washing. Among the staff the nurses 100% (n = 30), pharmacists 100% (n = 5) and lab technicians 100% (n = 10) were most knowledgeable followed by doctors 92% (n = 23) and physicians 62.5% (n = 5) as the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 0.804$, P = 0.669) (Table 4.4).

Responses on hand hygiene in relation to contact with patients showed that majority of the staff 94.9% (n = 74) agreed that hand hygiene should be performed before and after direct patient contact. The nurses 100% (n = 30), pharmacists 100% (n = 5) and lab technicians 100% (n = 10) were most knowledgeable followed by doctors 88% (n = 22) and physicians 87.5% (n = 7) as the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 0.364$, P = 0.833) (Table 4.4).

Regarding responses on duration of hand washing they showed that more than three quarters of the staff 79.5% (n = 62) correctly agreed that in standard hand washing: minimum duration should be from 40-60 seconds. The most knowledgeable staff were lab technicians 90% (n = 9) followed by doctors 88% (n = 22), nurses 76.7% (n = 23), physicians 75% (n = 6) and pharmacists 40% (n = 2) as the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 0.454$, P = 0.797) (Table 4.4).

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4.1.1.3 PPE Use knowledge of hospital staff on nosocomial infection prevention

Table 4.3: PPE use knowledge of hospital staff on nosocomial infection prevention

	Doctor n = 25	Nurse n = 30	Physician n = 8	Pharmacist n = 5	Lab tech n = 10	Total n = 78	χ^2	Sig.	Prevalence
Item	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**			**n (%)**
If there is no obvious contamination on the gloves, the same pair can be used for several patients **(False)**	23 (92.0)	28 (93.3)	5 (62.5)	4 (80.0)	10 (100.0)	70 (89.7)	1.784	0.410	28 (35.9)
Protective barriers against infection are provided by PPEs such masks and head coverings **(True)**	24 (96.0)	29 (96.7)	5 (62.5)	4 (80.0)	10 (100.0)	72 (92.3)	1.467	0.480	
The danger of developing nosocomial infections is eliminated by the use of PPEs **(True)**	23 (92.0)	24 (80.0)	6 (75.0)	4 (80.0)	10 (100.0)	67 (85.9)	4.079	0.130	
For their safety, PPEs are only appropriate for laboratory and cleaning employees **(False)**	11 (44.0)	11 (36.7)	1 (12.5)	2 (40.0)	2 (20.0)	27 (34.6)	1.185	0.553	
Only when there is blood contact should PPEs be worn **(False)**	21 (84.0)	26 (86.7)	4 (50.0)	4 (80.0)	9 (90.0)	64 (82.1)	5.119	0.077	
After being cleaned properly, gloves and masks can be used again **(False)**	24 (96.0)	30 (100.0)	5 (62.5)	5 (100.0)	10 (100.0)	74 (94.9)	0.580	0.748	
Old PPE should be disposed of in standard trash containers. **(False)**	16 (64.0)	11 (36.7)	2 (25.0)	2 (40.0)	5 (50.0)	36 (46.2)	6.431	0.040*	
When doing many operations on the same patient, gloves should be replaced **(True)**	23 (92.0)	27 (90.0)	4 (50.0)	3 (60.0)	8 (80.0)	65 (83.3)	3.308	0.191	
The most protective masks are those composed of cotton or gauze **(False)**	10 (40.0)	12 (40.0)	2 (25.0)	2 (40.0)	5 (50.0)	31 (39.7)	0.261	0.878	
If working with the same thing, masks and gloves can be reused.	19 (76.0)	19 (63.3)	4 (50.0)	4 (80.0)	8 (80.0)	54 (69.2)	0.872	0.647	

Over 89.7% (n = 70) of the personnel correctly disagreed with using the same pair of gloves for several patients as long as there is no obvious contamination on the gloves in their replies about the usage of PPE. The most knowledgeable staff were laboratory technicians 100% (n = 10) followed by nurses 93.3% (n = 28), doctors 92% (n = 23), pharmacists 80% (n = 4) and physicians 62.5% (n = 5) were least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 1.784$, P = 0.410) (Table 4.5).

Responses on PPEs in relation to provision of protection showed that majority of the staff 92.3% (n = 72) agreed PPEs like masks and hats offer infection-prevention barriers that are protective. Of all the staff, the laboratory technicians 100% (n = 10) were most knowledgeable followed by nurses 96.7% (n = 29), doctors 96% (n = 24), pharmacists 80% (n = 4) and physicians 62.5% (n = 5) as the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 1.467$, P = 0.480) (Table 4.5).

The majority of the hospital staff 85.9% (n = 67) correctly agreed that use of PPEs eliminate the risk of acquiring nosocomial infections. Of all the staff, the laboratory technicians 100% (n = 10) and doctors 92% (n = 23) were most knowledgeable while the physicians 75% (n = 6) were the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 4.079$, P = 0.130) (Table 4.5).

Responses on PPEs use in relation to persons suitable for their use showed that less than half 34.6% (n = 27) of the staff correctly disagreed with PPE being

exclusively suitable to only laboratory and cleaning staff for their protection. The doctors 44% (n = 11) were most knowledgeable followed by pharmacists 40% (n = 2), nurses 36.7% (n = 11), lab technicians 20% (n = 2) and physicians 12.5% (n = 1) were least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 1.185$, P = 0.553) (Table 4.5).

Responses on PPEs in relation to when it should be used showed that majority of staff 82.1% (n = 64) correctly disagreed with PPE being used only whenever there is contact with blood. The most knowledgeable staff were laboratory technicians 90% (n = 9), followed by nurses 86.7% (n = 26), doctors 84% (n = 21) and physicians 50% (n = 4) as the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 5.119$, P = 0.077) (Table 4.5).

Regarding to responses on PPEs in relation to re – use showed that majority of the staff 94.9% (n = 74) correctly disagreed with gloves and masks being re – used after proper cleaning. Of all the staff, the nurses 100% (n = 30), pharmacists 100% (n = 5) and lab technicians 100% (n = 10) were most knowledgeable followed by doctors 96% (n = 24) and physicians 62.5% (n = 5) as the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 0.580$, P = 0.748) (Table 4.5).

Responses on PPEs in relation to mechanism of discarding showed that less than half of the staff 46.2% (n = 36) correctly disagreed with used PPE being discarded through regular dustbins. The doctors 64% (n = 16) were most

knowledgeable, followed by lab technicians 50% (n = 5), pharmacists 40% (n = 2), nurses 36.7% (n = 11) and physicians 25% (n = 2) as the least knowledgeable. The staff knowledge had a significant effect on the prevalence of nosocomial infection (χ^2 = 6.431, P = 0.040) (Table 4.5).

The majority 83.3% (n = 65) of the staff correctly agreed that gloves should be changed between different procedures on the same patient, of all the staff, the doctors 92% (n = 23) were most knowledgeable, followed by nurses 90% (n = 27), lab technicians 80% (n = 8), pharmacists 60% (n = 3) and physicians 50% (n = 4) as the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection (χ^2 = 3.308, P = 0.191) (Table 4.5).

Regarding to responses on the material of masks showed that less than half of the staff 39.7% (n = 31) correctly disagreed with masks made of cotton or gauze being most protective, of all the staff, the laboratory technicians 50% (n = 5) were most knowledgeable, followed by doctors 40% (n = 10), nurses 40% (n = 12), pharmacists 40% (n = 2) and physicians 25% (n = 2) as the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection (χ^2 = 0.261, P = 0.878) (Table 4.5).

The majority of the staff 69.2% (n = 54) correctly disagreed that masks and gloves can be re-used if dealing with same patient. Of all the staff, lab technicians 80% (n = 8), pharmacists 80% (n = 4), doctors 76% (n = 19), nurses 63.3% (n = 19) and physicians 50% (n = 4) as the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection (χ^2= 0.872, P = 0.647) (Table 4.5).

4.1.1.4 Sharps disposal and sharp Injuries knowledge of hospital staff on nosocomial infection prevention

Table 4.4: Sharps disposal and sharp injuries knowledge of hospital staff on nosocomial infection prevention

	Doctor n = 25	**Nurse n = 30**	**Physician n = 8**	**Pharmacist n = 5**	**Lab tech n = 10**	**Total n = 78**	χ^2	**Sig.**	**Prevalence**
Item	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**			**n (%)**
To avoid harm, used needles should be capped after usage **(False)**	11 (44.0)	22 (73.3)	1 (12.5)	0 (0.0)	7 (70.0)	41 (52.6)	4.714	0.095	28 (35.9)
To avoid damage, used needles should be twisted after usage **(False)**	16 (64.0)	24 (80.0)	1 (12.5)	4 (80.0)	9 (90.0)	54 (69.2)	0.823	0.663	
Before being disposed of, used sharps should be shred (cut into little pieces).	3 (12.0)	3 (10.0)	2 (25.0)	0 (0.0)	2 (20.0)	10 (12.8)	1.729	0.421	
It should not be necessary to record injuries from sharp objects **(False)**	18 (72.0)	28 (93.3)	4 (50.0)	5 (100.0)	7 (70.0)	62 (79.5)	1.118	0.572	
In ordinary practise, needle-stick injuries are the least frequent **(False)**	13 (52.0)	19 (63.3)	3 (37.5)	3 (60.0)	7 (70.0)	45 (57.7)	2.240	0.326	
HIV-positive patients' needle stick injuries are treated with post-exposure prophylaxis (**true**)	21 (84.0)	27 (90.0)	4 (50.0)	3 (60.0)	10 (100.0)	65 (83.3)	0.172	0.918	

Responses on the recapping of used needles showed that 52.6% (n = 41) of the staff correctly disagreed that used needles should be recapped after use to prevent injuries. Of all the staff, none of the pharmacists were knowledgeable, whereas the most knowledgeable staff were nurses 73.3% (n = 22), lab technicians 70% (n = 7), doctors 44% (n = 11) and physician 12.5% (n = 1). The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 4.714$, P = 0.095) (Table 4.6).

Regarding to responses on the bending of used needles showed that more than half 69.2% (n = 54) of the staff correctly disagreed with used needles being bent after use to prevent injuries. The lab technicians 90% (n = 9) were most knowledgeable followed by pharmacists 80% (n = 4), nurses 80% (n = 24), doctors 64% (n = 16) and physicians 12.5% (n = 1) as the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 0.823$, P = 0.663) (Table 4.6).

Regarding to responses on the shredding of used sharp objects showed that less than a fifth of the staff 12.8% (n = 10) correctly agreed that soiled sharps objects should be shredded (cut into tiny pieces) before final disposal. Of all the staff, the physicians 25% (n = 2) were most knowledgeable, followed by lab technicians 20% (n = 2), doctors 12% (n = 3), nurses 10% (n = 3) while none of the pharmacists were knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 1.729$, P = 0.421) (Table 4.6).

Responses on the reporting of sharp injuries showed that more than three quarters 79.5% (n = 62) correctly disagreed with sharps injuries being

managed with no need of reporting. Of all the staff, the pharmacists 100% (n = 5) were most knowledgeable followed by nurses 93.3% (n = 28), doctors 72% (n = 18), lab technicians 70% (n = 7) and physicians 50% (n = 4) as the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection (χ^2 = 1.118, P = 0.572) (Table 4.6).

The majority of staff forty-five 57.7% (n = 45) correctly disagreed with needle – stick injuries being the least commonly encountered in general practice. The laboratory technicians 70% (n = 7) were most knowledgeable followed by nurses 63.3% (n = 19), pharmacist 60% (n = 3), doctors 52% (n = 13) and the physicians 37.5% (n = 3) as the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection (χ^2= 2.240, P = 0.326) (Table 4.6).

Regarding replies on the use of post-exposure prophylaxis for sharp injuries, it was accurately stated by 83.3% (n = 65) of the staff that post-exposure prophylaxis was used to treat injuries caused by a patient who is HIV-positive inflicting needle sticks. Of all the staff, the laboratory technicians 100% (n = 10) were the most knowledgeable followed by nurses 90% (n = 27), doctors 84% (n = 21), pharmacists 60% (n = 3) and physicians 50% (n = 4) as the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection (χ^2 = 0.172, P = 0.918) (Table 4.6).

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4.1.1.5 Waste management knowledge of hospital staff on nosocomial infection prevention

Table 4.5: Waste management knowledge of hospital staff on nosocomial infection prevention

	Doctor	**Nurse**	**Physician**	**Pharmacist**	**Lab tech**	**Total**			
	n = 25	**n = 30**	**n = 8**	**n = 5**	**n = 10**	**n = 78**	χ^2	**Sig.**	**Prevalence**
Item	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**			**n (%)**
Hospital waste has to be sorted before disposal **(True)**	23 (92.0)	28 (93.3)	5 (62.5)	5 (100.0)	9 (90.0)	70 (89.7)	5.675	0.129	28 (35.9)
Cleaning and disinfection are the same **(False)**	20 (80.0)	27 (90.0)	3 (37.5)	5 (100.0)	9 (90.0)	64 (82.1)	1.640	0.441	
Hospital wards have to be cleaned only 2 times in 24 hrs **(False)**	5 (20.0)	7 (23.3)	1 (12.5)	1 (20.0)	1 (10.0)	15 (19.2)	0.689	0.709	
Waste at the hospital should be collected twice monthly **(False)**	16 (64.0)	17 (56.7)	4 (50.0)	2 (40.0)	8 (80.0)	47 (60.3)	0.368	0.832	
Used PPE are to be discarded through regular municipal disposal systems **(False)**	12 (48.0)	9 (30.0)	1 (12.5)	1 (20.0)	5 (50.0)	28 (35.9)	1.308	0.520	

Staff responses on sorting of hospital waste showed that 89.7% (n = 70) of the staff agreed that hospital waste have to be sorted before disposal. Of all the staff, the pharmacists 100% (n = 5) were most knowledgeable followed by, nurses 93.3% (n = 28), doctors 92% (n = 23), lab technicians 90% (n = 9) and the physicians 62.5% (n = 5) as the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 5.675$, P = 0.129) (Table 4.7).

Responses concerning cleaning and disinfection showed that over 82.1% (n = 64) of the staff correctly disagreed that cleaning and disinfection are the same. The pharmacists 100% (n = 5) were the most knowledgeable followed by nurses 90% (n = 27), lab technicians 90% (n = 9), doctors 80% (n = 20) and the physicians 37.5% (n = 3) as the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 1.640$, P = 0.441) (Table 4.7).

Staff responses on cleaning of hospital wards showed that less than a fifth 19.2% (n = 15) of the staff correctly disagreed with cleaning the hospital wards for only 2 times in a day. Of all the staffs, the nurse 23.3% (n = 7) were most knowledgeable followed by doctors 20% (n = 5), pharmacist 20% (n = 1), physician 12.5% (n = 1), and lab technicians 10% (n = 1) were least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 1.689$, P = 0.709) (Table 4.7).

Responses concerning collection of waste showed that more than half 60.3% (n = 47) of the staff correctly disagreed with waste at the hospital being collected twice monthly. The lab technicians 80% (n = 8) were the most

knowledgeable followed by doctors 64% (n = 16), nurses 56.7% (n = 17), physicians 50% (n = 4), and the pharmacist 40% (n = 2) as the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 0.368$, P = 0.832) (Table 4.7).

Staff responses on disposal of hospital waste showed that less than half of the staff 35.9% (n = 28) correctly disagreed with used PPE being discarded through regular municipal disposal systems. Of all the staff, the lab technicians 50% (n = 5) were most knowledgeable followed by doctors 48% (n = 12), nurses 30% (n = 9), pharmacists 20% (n = 1) and the physicians 12.5% (n = 1) as the least knowledgeable. The staff knowledge did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 1.308$, P = 0.520) (Table 4.7).

4.1.2 Knowledge of in – patients on nosocomial infection prevention

Table 4.6: Knowledge of patients on nosocomial infection prevention

	Total		χ^2	Sig.	Prevalence
	n	**%**			**n (%)**
What are HAIs? 'Optional' **(infection got from health facilities)**	51	36.2	21.148	0.450	69 (48.9)
The hospital is always free from infections **(False)**	111	79.9	0.145	0.704	
Every patient should be taken as infectious no matter his/her diagnosis **(True)**	116	82.9	1.612	0.204	
The health workers (doctors, nurses) can be main transmitters of infections in between patients **(True)**	57	40.7	2.902	0.088	
Infection can be prevented by regular washing hands with water and soap and also by using sanitizers **(True)**	133	94.3	2.184	0.139	
All body fluids except sweat should be viewed as a source of infection **(True)**	117	83.0	1.127	0.569	

Patients response on the definition of what HAIs are showed that less than half 36.2% (n = 51) of the in – patients were knowledgeable. The patient's knowledge did not have a significant difference with the prevalence of nosocomial infection (χ^2 = 21.148, P = 0.450) (Table 4.8).

Regarding to responses on infections at the hospital showed that majority of the patients 79.9% (n = 111) correctly disagreed with the hospital always being free from infections. The patient's knowledge did not have a significant difference with the prevalence of nosocomial infection (χ^2 = 0.145, P = 0.704) (Table 4.8).

Responses regarding to caution at the hospital showed that majority of the in – patients 82.9% (n = 116) agreed that every patient should be taken as infectious no matter his/her diagnosis. The patient's knowledge did not have a significant difference with the prevalence of nosocomial infection (χ^2 = 1.612, P = 0.204) (Table 4.8).

Patients response on transmission of infections at the hospital showed that less than half of the in – patients 40.7% (n = 57) correctly agreed that the health workers (doctors, nurses) can be main transmitters of infections in between patients. The patient's knowledge did not have a significant difference with the prevalence of nosocomial infection (χ^2 = 2.902, P = 0.088) (Table 4.8).

Patients response on prevention of infections at the hospital showed that majority of the in – patients 94.3% (n = 133) correctly agreed that infection can be prevented by regular washing hands with water and soap and also by using sanitizers. The patient's knowledge did not have a significant difference

with the prevalence of nosocomial infection (χ^2 = 2.184, P = 0.139) (Table 4.8).

Regarding to responses on source of infection showed that more than three quarters of the in – patients 83.0% (n = 117) correctly agreed therefore, other from perspiration, all bodily fluids should be considered potential sources of infection. The patient's knowledge did not have a significant difference with the prevalence of nosocomial infection (χ^2 = 1.127, P = 0.569) (Table 4.8).

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4.2 Attitude of staff and in – patients focusing on the general hand hygiene, and PPE usage on control of nosocomial infection at Kiruddu referral hospital

This section describes the attitude of staff and in – patients regarding general concept, hand hygiene and PPE Use at the hospital.

4.2.1 Attitude of hospital staff on nosocomial infection prevention

Table 4.7: Attitude of hospital staff on nosocomial infection prevention

Item	Agree	Not sure	Disagree	χ^2	Sig.	Prevalence
Hand sanitizers irritate and make you feel dry.	23 (29.5)	14 (17.9)	41 (52.6)	3.388	0.184	28 (35.9%)
HCW-patient interactions are hampered by poor hand hygiene.	11 (14.1)	23 (29.5)	44 (56.4)	4.106	0.128	
I'm terrible at remembering to wash my hands.	20 (25.6)	8 (10.3)	50 (64.1)	2.797	0.247	
My chance of contracting an illness from one of my patients is quite minimal.	15 (19.2)	11 (14.1)	52 (66.7)	2.577	0.276	
I am less likely to contaminate my patients if I practise good hand hygiene.	63 (80.8)	8 (10.3)	7 (9.0)	0.182	0.913	
The significance of HCWs in preventing HAIs is crucial.	56 (71.8)	17 (21.8)	5 (6.4)	0.337	0.845	
I would feel awkward telling an HCW to practise good hand hygiene.	26 (33.3)	14 (17.9)	38 (48.7)	4.985	0.083	
I frequently overlook switching PPE between patients.	16 (20.5)	9 (11.5)	53 (67.9)	0.390	0.823	
My capacity to follow infection prevention standards is impacted by my workload.	35 (44.9)	9 (11.5)	34 (43.6)	0.055	0.973	
Even if it is uncomfortable, I would wear the essential personal protection equipment.	60 (76.9)	8 (10.3)	10 (12.8)	0.936	0.626	
Using alcohol-based hand sanitizers makes me feel safer than washing my hands with soap and water.	40 (51.3)	10 (12.8)	28 (35.9)	4.061	0.131	
Even if I receive a rise, I will still report for duty.	17 (21.8)	11 (14.1)	50 (64.1)	5.937	0.051	
Hand sanitizers irritate and make you feel dry.	13 (16.7)	10 (12.8)	55 (70.5)	1.126	0.569	

According to Table 4.9, only 29.5% (n = 23) of the hospital staff felt that had hygiene agents cause irritation and dryness on their hands while 52.6% (n = 41) of the hospital staff disagreed and 17.9% (n = 14) were not sure. The staff attitude did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 3.388$, P = 0.184) (Table 4.9).

Regarding to interaction between health care workers and patients, less than a fifth 14.1% (n = 11) of the hospital staff had a feeling that hand hygiene interferes with the interaction between them and the patients while 56.4% (n = 44) of the hospital staff disagreed and 29.5% (n = 23) were not sure. The staff attitude did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 4.106$, P = 0.128) (Table 4.9).

Responses regarding to hand hygiene performance, more than a quarter 25.6% (n = 20) felt that they usually forget to perform hand hygiene while 64.1% (n = 50) didn't have such a feeling disagreed and only 10.3% (n = 8) were not sure whether they usually forget to perform hand hygiene. The staff attitude did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 2.797$, P = 0.247) (Table 4.9).

Staff responses regarding to the acquiring of infections showed that less than a fifth 19.2% (n = 15) of the staff felt that their chance of contracting diseases from patients was extremely low while 66.7% (n = 52) had no such feeling and yet 14.1% (n = 11) were not sure. The staff attitude did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 2.577$, P = 0.276) (Table 4.9).

The majority of the hospital staff 80.8% (n = 63) had a feeling that they are less likely to spread diseases to their patients during treatment when they practise good hand hygiene, while 10.3% (n = 8) were not sure. The staff attitude did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 0.182$, P = 0.913) (Table 4.9).

Responses regarding to the prevention of hospital acquired infection showed that 71.8% (n = 56) of the staff felt that preventing of health acquired infections is part of their valuable role as health care workers at the hospital while 21.8% (n = 17) were not sure. The staff attitude did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 0.337$, P = 0.845) (Table 4.9).

Staff responses regarding to performing of hand hygiene showed that more than a third 33.3% (n = 26) of the hospital staff felt uncomfortable reminding a fellow health care workers to perform hand hygiene while 48.7% (n = 38) didn't have the feeling and yet 17.9% (n = 14) were not sure. The staff attitude did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 4.985$, P = 0.083) (Table 4.9).

Responses regarding to the change of PPE at work showed that less than a quarter 20.5% (n = 16) of the hospital staff felt that they usually forget to change personal protective equipment between patients while 67.9% (n = 53) didn't have the feeling and 11.5% (n = 9) were not sure. The staff attitude did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 0.390$, P = 0.823) (Table 4.9).

The majority of the staff 44.9% (n = 35) had a feeling that the workload affects their ability to apply infection prevention guidelines at the hospital while 43.6% (n = 34) didn't have such a feeling and 11.5% (n = 9) were not sure. The staff attitude did not have a significant effect with the prevalence of nosocomial infection ($\chi^2 = 0.055$, P = 0.973) (Table 4.9).

Responses regarding to the use of PPE showed that 76.9% (n = 60) felt that even if the required personal protective equipment is uncomfortable, they would still wear them while 12.8% (n = 10) didn't have such a feeling and 10.3% (n = 8) were not sure. The staff attitude did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 0.936$, P = 0.626) (Table 4.9).

According to staff comments comparing the usage of alcohol-based hand rubs and soap and water, 51.3% (n = 40) of staff believed that alcohol-based hand rubs were safer to use than soap and water for hand washing while 35.9% (n = 28) didn't and 12.8% (n = 10) were not sure. The staff attitude did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 4.061$, P = 0.131) (Table 4.9).

Staff responses regarding to the reporting to duty by staff showed that 21.8% (n = 17) had a feeling that they would continue to report for duty even though they got symptoms suggestive of nosocomial infections while 64.1% (n = 50) didn't have such a feeling and 14.1% (n = 11) were not sure. The staff attitude did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 5.937$, P = 0.051) (Table 4.9).

Responses regarding to the staying at work by staff showed that 16.7% (n = 13) felt that they would stay away from work in order to avoid contact with nosocomial infections while 70.5% (n = 55) didn't have such feeling and 12.8% (n = 10) were not sure. The staff attitude did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 1.126$, P = 0.529) (Table 4.9).

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4.2.2 Attitude of patients hand hygiene and general hospital hygiene on nosocomial infection prevention

Table 4.8: Attitude of patient's hand hygiene and general hospital hygiene on nosocomial infection prevention

Variable	Category	Frequency	Percentage	X^2	Sig.	Prevalence
I believe health workers should wash hands before any procedure	Yes	140	99.3	0.993	0.319	69 (48.9%)
	No	1	0.7			
It is right for a health worker to handle me without gloves	Yes	38	27.0	0.187	0.665	
	No	103	73.0			
It is necessary to wash hands before entering the hospital and after leaving	Always	105	74.5	6.293	0.043*	
	Sometimes	32	22.7			
	Never	4	2.8			
It is necessary to wash with soap and water	Always	93	66.0	2.279	0.320	
	Sometimes	42	29.8			
	Never	6	4.3			
I believe spacing between beds in multi – purpose rooms prevent the spread of infections	Yes	128	90.8	0.101	0.750	
	No	13	9.2			
I believe that lifts and stair case rails are a major cause of infection transmission in the hospital	Yes	121	85.8	2.205	0.138	
	No	20	14.2			
I feel I can acquire infections from using the toilets and urinals at the hospital	Agree	131	92.9	5.456	0.065	
	Disagree	3	2.1			
	Not sure	6	4.3			
	Missing	1	0.7			
I don't have to wash my hands if they aren't visibly unclean before doing any activity at the hospital.	Agree	31	22.0	8.896	0.012*	
	Disagree	108	76.6			
	Not sure	2	1.4			
I feel cleaning staff should clean the floors of the wards in 24 hours'	1 time	24	17.0	9.890	0.020*	
	2 times	65	46.1			
	3 times	33	23.4			
	4 times	19	13.5			

***= P < 0.05'**

Patients responses regarding to hand washing by the health workers showed that almost all 99.3% (n = 140) felt that health workers should wash hands before any procedure while only 0.7% (n = 1) had no such a feeling. The patient's attitude did not have a significant effect with the prevalence of nosocomial infection ($\chi^2 = 0.993$, P = 0.319) (Table 4.10).

The use of gloves on patients by health workers showed that 73.0% (n = 103) of the patients had a feeling it was not right for a health worker to handle them without gloves during any procedure while 27.0% (n = 38) didn't have such feeling. The patient's attitude did not have a significant effect with the prevalence of nosocomial infection ($\chi^2 = 0.187$, P = 0.665) (Table 4.10).

Patients response regarding to hand washing at the hospital showed that 74.5% (n = 105) felt that it was necessary to always wash hands before entering the hospital and after leaving, 22.7% (n = 32) felt that it was necessary to sometimes wash hands before entering the hospital and after leaving it while only 2.8% (n = 4) felt that it was not necessary to wash hands before entering the hospital and after leaving the hospital. The patient's attitude had a significant effect with the prevalence of nosocomial infection ($\chi^2 = 6.293$, P = 0.043) (Table 4.10).

Responses regarding to the use of detergents to wash hands by patients showed that 66.0% (n = 93) felt that it was necessary to always wash with soap, 29.8% (n = 42) felt that it was necessary to sometimes wash with soap while only 4.3% (n = 6) felt that it was not necessary to wash with soap. The patient's attitude did not have a significant effect with the prevalence of nosocomial infection ($\chi^2 = 2.279$, P = 0.320) (Table 4.10).

Patients responses regarding to spacing of beds at the hospital showed that 90.8% (n = 128) felt that spacing between beds in multi – purpose rooms prevents the spread of infections while 9.2% (n = 13) didn't have a similar feeling. The patient's attitude did not have a significant effect with the prevalence of nosocomial infection ($\chi^2 = 0.101$, P = 0.750) (Table 4.10).

The majority 85.8% (n = 121) of the patients had a feeling that lifts and stair case rails are a major cause of infection transmission in the hospital while 14.2% (n = 20) didn't have a similar feeling. The patient's attitude did not have a significant effect with the prevalence of nosocomial infection ($\chi^2 = 2.205$, P = 0.138) (Table 4.10).

Responses regarding to acquisition of infections showed that 92.9% (n = 131) of the patients felt that they can acquire infections from using the toilets and urinals at the hospital, 2.1% (n = 3) didn't have such a feeling while only 4.3% (n = 6) were not sure how they felt. The patient's attitude did not have a significant effect with the prevalence of nosocomial infection ($\chi^2 = 5.456$, P = 0.065) (Table 4.10).

Patients responses regarding to hand washing showed that less than a quarter 22.0% (n = 31) felt that they don't have to wash their hands if they aren't visibly unclean before doing any activity at the hospital, 76.6% (n = 108) didn't have a similar feeling while only 1.4% (n = 2) were not sure. The patient's attitude had a significant effect with the prevalence of nosocomial infection ($\chi^2 = 8.896$, P = 0.012) (Table 4.10).

Responses regarding to the cleaning of floors by staff showed that less than half of the patients 46.1% (n = 65) felt that cleaning staff should clean the

floors of the wards at the hospital twice in 24 hours and 13.5% (n = 19) felt that cleaning staff should clean the floors of the wards at the hospital four times in 24 hours. The patient's attitude had a significant effect with the prevalence of nosocomial infection ($\chi^2 = 9.890$, P = 0.020) (Table 4.10).

4.2.3 Association between attitude of patients and acquisition of nosocomial infection

Table 4.9: Association between attitude of patients and acquisition of nosocomial infection

Variable	Categories	B	Std. Error	df	Sig.	OR	95% Confidence Interval for OR	
							Lower bound	Upper bound
It is necessary to wash hands before entering the hospital and after leaving	Always	16.397	1437.408	1	0.991	$1.322x10^7$	0.000	
	Sometimes	15.794	1437.408	1	0.991	$7.231x10^6$	0.000	
	Never	ref.	ref.	ref.	ref.	ref.	ref.	ref.
I don't have to wash my hands if they aren't visibly unclean at the hospital.	Agree	15.921	0.495	1	0.000*	$8.209 x10^6$	$3.112 x10^6$	$2.165 x10^7$
	Disagree	17.318	0.000	1	.	$3.320 x10^7$	$3.320 x10^7$	$3.320 x10^7$
	Not sure	ref.	ref.	ref.	ref.	ref.	ref.	ref.
I feel cleaning staff should clean the floors of the wards in 24 hours'	1 time	-0.178	0.700	1	0.799	0.837	0.212	3.298
	2 times	1.442	0.586	1	0.014*	4.227	1.341	13.328
	3 times	0.974	0.613	1	0.112	2.649	0.797	8.803
	4 times	ref.	ref.	ref.	ref.	ref.	ref.	ref.

Table 4.11 showed the association between washing hands and cleaning of the floors in the wards and the acquisition of nosocomial infection among the patients shows that those that felt that they don't have to wash their hands if they aren't visibly unclean at the hospital were 8.209×10^6 times more likely to acquire nosocomial infection than those who were not sure and the patients that felt that the cleaning staff should clean the floors of the wards twice in 24 hours' were 4.227 times more likely to acquire nosocomial infection than those that felt cleaning to be done four times in 24 hours.

4.3 Practices of staff and patients focusing on general concept, hand hygiene and PPE usage on prevention of nosocomial infection at Kiruddu referral hospital.

4.3.1 Practice of hospital staff on nosocomial infection prevention

Table 4.10: Practice of hospital staff on nosocomial infection prevention

Practice	Yes	Not sure	No	χ^2	Sig.	Prevalence
I apply antiseptic hand rub to clean hands	66 (84.6)	6 (7.7)	6 (7.7)	0.567	0.753	28 (35.9%)
I practice high-level disinfection where sterilization is not applicable	52 (66.7)	14 (17.9)	12 (15.4)	3.598	0.166	
I use all PPE to prevent the risk of acquiring and/or transmitting infection	55 (70.5)	8 (10.3)	15 (19.2)	0.057	0.972	
I always mix dry and liquid healthcare wastes	19 (24.4)	9 (11.5)	50 (64.1)	0.033	0.983	
I always wear the necessary PPE, if splashes and spills of any body fluids are likely	59 (75.6)	8 (10.3)	11 (14.1)	0.548	0.760	
I usually examine patients in places other than your chamber	25 (32.1)	10 (12.8)	43 (55.1)	2.649	0.266	
	Always	**Sometimes**	**Never**			
I wear long-sleeved gown before invasive procedure	38 (48.7)	29 (37.2)	11 (14.1)	5.246	0.073	
I wash hands before putting on gloves and after putting on gloves	41 (52.6)	32 (41.0)	5 (6.4)	2.356	0.308	
I do you use glove (both hands)	58 (74.4)	16 (20.5)	4 (5.1)	3.486	0.175	

Results reveal that the majority of hospital staff 84.6%, or 66 people applied antiseptic hand rub to clean hands, whereas 7.7% or six people never did so and 7.7% or six people were unsure, according to the data. The staff practice did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 0.567$, P = 0.753) (Table 4.12).

In response to questions about disinfection, hospital staff members reported that 66.7% (n = 52) practise high-level disinfection when sterilisation is not necessary, 15.4% (n = 12) don't, and 17.9% (n = 14) were unsure whether they practise high-level disinfection when sterilisation is not necessary. The staff practice did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 3.598$, P = 0.166) (Table 4.12).

According to responses about the use of PPE by staff, more than half of respondents (70.5%) used all personal protective equipment (PPE) to reduce the risk of contracting an infection at the hospital, 19.2% (n = 15) don't, and 10.3% (n = 8) are unsure whether they used all PPE to reduce the risk. The staff practice did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 0.057$, P = 0.972) (Table 4.12).

Responses regarding to waste handling at the hospital showed that less than a fifth 24.4% (n = 19) always combine liquid and dry medical waste and 64.1% (n = 50) don’t always combine liquid and dry medical waste at the hospital while 11.5% (n = 9) were not sure whether they always combine liquid and dry medical waste. The staff practice did not have a significant difference with the prevalence of nosocomial infection ($\chi^2 = 0.033$, P = 0.983) (Table 4.12).

Staff responses regarding to use of PPE showed that approximately three quarters 75.6% (n = 59) of the hospital staff always put on the Wear the required personal protective equipment (PPE), which may include gloves, an apron, goggles, and a mask, if splashes and spills of any body fluids occur and 14.1% (n = 11) don't while 10.3% (n = 8) were not sure. The staff practice did not have a significant difference with the prevalence of nosocomial infection (χ^2 = 0.548, P = 0.760) (Table 4.12).

Responses regarding to patient handling among the staff showed that less than half 32.1% (n = 25) usually examine patients in places other than their chambers and 55.1% (n = 43) don't usually examine patients in places other than their chambers while 12.8% (n = 10) were not sure. The staff practice did not have a significant difference with the prevalence of nosocomial infection (χ^2 = 2.649, P = 0.266) (Table 4.12).

Staff responses regarding to the use of gowns at the hospital showed that less than half 48.7% (n = 38) always before invasive procedures, put on a long-sleeved gown. at the hospital and 37.2% (n = 29) sometimes before invasive procedures, put on a long-sleeved gown. at the hospital while 14.1% (n = 11) never before invasive procedures, put on a long-sleeved gown. at the hospital. The staff practice did not have a significant difference with the prevalence of nosocomial infection (χ^2 = 5.246, P = 0.073) (Table 4.12).

Responses regarding to the interaction of hand hygiene and use of gloves showed that more than half 52.6% (n = 41) always wash hands before putting on gloves and after putting on gloves and 41.0% (n = 32) sometimes wash hands before putting on gloves and after putting on gloves at the hospital

while 6.4% (n = 5) never wash hands before putting on gloves and after putting on gloves at the hospital. The staff practice did not have a significant difference with the prevalence of nosocomial infection (χ^2 = 2.356, P = 0.308) (Table 4.12).

Staff responses on the use of gloves showed that majority 74.4% (n = 58) always use gloves (both hands) and 20.5% (n = 16) sometimes use gloves (both hands) while 5.1% (n = 4) never use gloves (both hands). The staff practice did not have a significant difference with the prevalence of nosocomial infection (χ^2 = 3.486, P = 0.175) (Table 4.12).

4.3.2 Practice of patients on nosocomial infection prevention

Table 4.11: Practice of patients on nosocomial infection prevention

Practice	Never	Occasionally	All the time	χ^2	Sig.	Prevalence
I pour water in the toilets at the hospital before using it	8 (5.7)	18 (12.8)	115 (81.6)	0.663	0.718	69 (48.9%)
I clear all the litter around the ward where I am admitted	10 (7.1)	32 (22.7)	99 (70.2)	1.976	0.372	
I use the PPE (face masks) and beddings provided by the hospital	10 (7.1)	19 (13.5)	112 (79.4)	4.545	0.103	
I wash my hands with soap and running water at the hospital	4 (2.8)	19 (13.5)	118 (83.7)	3.119	0.210	
I put on a face mask all the time at the hospital	6 (4.3)	45 (31.9)	90 (63.8)	0.095	0.954	
I report to the health worker in case of any signs and symptoms	11 (7.8)	32 (22.7)	98 (69.5)	0.978	0.613	
I always encourage fellow patients to sanitise and wash hands at the hospital	17 (12.1)	43 (30.5)	81 (57.4)	0.197	0.906	
I clean and disinfect my beddings at the hospital	27 (19.1)	46 (32.6)	68 (48.2)	0.067	0.967	
I wash hands after touching the stair case hand rails	14 (9.9)	36 (25.5)	91 (64.5)	2.184	0.336	
I prefer using sanitizers to washing of hands with soap at the hospital	23 (16.3)	25 (17.7)	93 (66.0)	2.580	0.275	

Majority 81.6% (n = 115) of the patients all the time poured water in the toilets at the hospital before using them, 12.8% (n = 18) of the patients occasionally poured water in the toilets at the hospital before using them while 5.7% (n = 8) of the patients never poured water in the toilets at the hospital before using them. The patient's practice did not have a significant effect on the prevalence of nosocomial infection ($\chi^2 = 0.663$, P = 0.718) (Table 4.13).

The majority 70.2% (n = 99) of the patients all the time cleared all the litter around the ward where they are admitted, 22.7% (n = 32) of the patients occasionally clear all the litter around the ward where they are admitted while 7.1% (n = 10) of the patients never clear all the litter around the ward where they are admitted. The patient's practice did not have a significant effect on the prevalence of nosocomial infection ($\chi^2 = 1.976$, P = 0.372) (Table 4.13).

Responses regarding to equipment provided by the hospital showed that more than three quarters 79.4% (n = 112) of the patients all the time use the PPE (face masks) and beddings provided by the hospital, 13.5% (n = 19) of the patients occasionally use the PPE (face masks) and beddings provided by the hospital while 7.1% (n = 10) of the in – patients never use the PPE (face masks) and beddings provided by the hospital. The patient's practice did not have a significant effect on the prevalence of nosocomial infection ($\chi^2 = 4.545$, P = 0.103) (Table 4.13).

The majority of patients, 83.7% (n = 118), washed their hands with soap and running water at the hospital on a regular basis. 13.5% (n = 19), however, only do so occasionally. 2.8% (n = 4) never wash their hands with soap and running

water at the hospital. The patient's practice did not have a significant effect on the prevalence of nosocomial infection (χ^2 = 3.119, P = 0.210) (Table 4.13).

Responses regarding to the use of face masks showed that 4.3% (n = 6) never put on a face mask all the time at the hospital, 31.9% (n = 45) occasionally put on a face mask all the time at the hospital while 63.8% (n = 90) put on a face mask all the time at the hospital all the time. The patient's practice did not have a significant effect on the prevalence of nosocomial infection (χ^2 = 0.095, P = 0.954) (Table 4.13).

The majority 69.5% (n = 98) of patients reported to the health worker in case of any signs and symptoms all the time, 22.7% (n = 32) occasionally report to the health worker in case of any signs and symptoms while 7.8% (n = 11) never report to the health worker in case of any signs and symptoms. The patient's practice did not have a significant effect on the prevalence of nosocomial infection (χ^2 = 0.978, P = 0.613) (Table 4.13).

Responses regarding to hand washing showed that less than a fifth 12.1% (n = 17) of the patients never encourage fellow patients to sanitise and wash hands at the hospital, 30.5% (n = 43) occasionally encourage fellow patients to sanitise and wash hands at the hospital while 57.4% (n = 81) encourage fellow patients to sanitise and wash hands at the hospital all the time. The patient's practice did not have a significant effect on the prevalence of nosocomial infection (χ^2 = 0.197, P = 0.906) (Table 4.13).

Responses regarding to cleaning and disinfection showed that 19.1% (n = 27) never clean and disinfect my beddings at the hospital, 32.6% (n = 46) occasionally clean and disinfect my beddings at the hospital while 48.2% (n =

68) clean and disinfect my beddings at the hospital all the time. The patient's practice did not have a significant effect on the prevalence of nosocomial infection (χ^2 = 0.067, P = 0.967) (Table 4.13).

Staff responses regarding to hand washing showed that more than half 64.5% (n = 91) wash hands after touching the stair case hand rails all the time, 25.5% (n = 36) occasionally wash hands after touching the stair case hand rails at the hospital while 9.9% (n = 14) never wash hands after touching the stair case hand rails at the hospital. The patient's practice did not have a significant effect on the prevalence of nosocomial infection (χ^2 = 2.184, P = 0.336) (Table 4.13).

Responses regarding to the use of soap ad sanitizers showed that 16.3% (n = 23) never prefer using sanitizers to washing of hands with soap at the hospital, 17.7% (n = 25) occasionally prefer using sanitizers to washing of hands with soap at the hospital while 66.0% (n = 93) prefer using sanitizers to washing of hands with soap at the hospital all the time. The patient's practice did not have a significant effect on the prevalence of nosocomial infection (χ^2 = 2.580, P = 0.275) (Table 4.13).

CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Socio demographic characteristics of study participants

The socio demographic characteristics of the health professionals in this study highlight some concerns with Uganda's recruiting policy, the structure of public health facilities, and the efficacy of Uganda's health sector.

5.1.1 Hospital staff

Concerning the gender of the staff; males made up majority of the individuals that responded to the survey in its entirety. This could have been mainly because the study contained the doctors, physicians and lab technicians of which these professions are mostly dominated by the males than the females. This finding was in agreement with findings from similar studies by Ocran & Tagoe, (2014); Geberemariyam *et al.,* (2018); Bayleygn *et al.,* (2021). However, in disagreement with several similar studies in Asia and Africa which identified females to be the most dominant participants in their studies Aluko *et al.,* (2016); Dixit *et al.,* (2012); Nagaraju *et al.,* (2013); Olowookere *et al.,* (2015); Onyemoho *et al.,* (2013); Wasswa *et al.,* (2015); Lien *et al.,* (2018); Unakal *et al.,* (2017). The difference could be attributed to difference in the study population whereby in those studies majority of their participants were nurses and the nursing profession is mostly dominated with the females than the males.

The distribution of the age showed that more than half of the respondents were between 21 to 29 years of age. This could be attributed to the fact that in Uganda majority of the people going for nursing courses branch from their secondary level of education to the medical institutions, therefore providing

young staff who are energetic and efficient in the health facilities the finding was in accordance with studies by Eskander *et al.,* (2013); Fashafsheh *et al.,* (2015) though in disagreement with similar studies from Nigeria Aluko *et al.,* (2016); Olowookere *et al.,* (2015); Wasswa *et al.,* (2015); Ghana Hayeh & Esena, (2013) who noted that the participants that were 30 – 39 years of age were more dominant in their studies. The mean age was 44 years similar to that reported by Manyele *et al.,* (2008) in a similar study in Tanzania and much higher than the mean age reported by Tenna *et al.,* (2013) (30 years) and Bello *et al.,* (2011) (25 years). This signifies that majority of the staff were young adults as against older age groups reported, this highlights the need of safeguarding these young health professionals from hospital infections.

The marital status showed that majority of the single staff participated in the study, this could be attributed to majority of staff joining the health professional while still single at school and due to their busy schedule after school at the health facilities gives them an opportunity to remain single, this finding found to be in accordance with similar studies by Geberemariyam *et al.,* (2018); Labragne *et al.,* (2012) that had the single staff dominant in their studies, however in disagreement with most similar studies from Africa and Asia that noted the married staff as the most dominant in their studies Abdulraheem *et al.,* (2012); Wu *et al.,* (2020); Aluko *et al.,* (2016); Olowookere *et al.,* (2015); Fashafsheh *et al.,* (2015). The variations could result from various research populations and study settings.

Staff that had a work experience of less than 5 years in a health related field were the majority, the work experience of the respondents in this study is in concordance to those reported by Geberemariyam *et al.,* (2018); Bayleygn *et*

al., (2021); Ford and Tetrick, (2011) and much lower than those reported by Hayeh & Esena, (2013); Tenna *et al.,* (2013). It was higher than similar studies by Unakal *et al.,* (2017); Fashafsheh *et al.,* (2015); Aluko *et al.,* (2016). The study's findings were in disagreement with those of Onyemoho *et al.*, (2013), who pointed out that responders with more than 10 years of professional experience were more common and Abdulraheem *et al.,* (2012), who noted that respondents with 5 to 10 years of work experience were most prevalent in their study. Work experience enables better advice and training to the new ones who need guidance and training on issues of policy and cleanliness as well as decision making where the issue is concerned.

Majority of the respondents were nurses. This finding was in accordance and much lower than several similar studies in Africa and Asia where nurses were more dominant in their studies Paudyal *et al.,* (2008) (51.2%); Geberemariyam *et al.,* (2018) (61.4%); Bayleygn *et al.,* (2021) (62.7%); Hayeh & Esena, (2013) (95.1%); Eskander *et al.,* (2013) (81.8%); Aluko *et al.,* (2016) (52.4%); Olowookere *et al.,* (2015) (52.2%); Ocran & Tagoe, (2014) (42.3%). Being in the resource constraint countries of Africa and Asia could call for more health workers in the public health facilities to deliver services due to the increased number of patients at the health facilities more so the referral facilities thus this justifies the high number of nurses found in the various studies done in Africa and Asia. However, the study findings were in disagreement with a study by Tenna *et al.,* (2013) that noted that majority of the respondents in their study were the physicians with more than half of the respondents (51.0%). The variations could result from various research populations and study settings.

Majority of the staff that participated in the study had attained a bachelor's degree, this could have been because most of the content required by the professions at the health facilities if handled at the bachelor's level of education therefore most if the staff are bound to have the required level of education. The study finding was found to be in agreement with similar studies by Wu *et al.,* (2020); Aluko *et al.,* (2016); Bayleygn *et al.,* (2021); Unakal *et al.,* (2017). However, the study findings were in disagreement with similar studies by Hayeh & Esena, (2013); Ocran & Tagoe, (2014); Geberemariyam *et al.,* (2018) who noted that the staff with a diploma as the highest level of education were the most dominant respondents.

All Health Care Workers (HCWs) must complete extensive education as part of their training, especially in nations without established, well-structured infection control programmes. Developing nations with little resources, like Uganda, nonetheless have to cope with challenging problems connected to enforcing conventional precautions and occupational exposure to bloodborne viruses. Due to a lack of appropriate needle disposal systems, incorrect medical waste disposal, and an insufficient supply of personal protective equipment, the danger of occupational exposure is enhanced in this situation. According to the research's findings, a third of the personnel had never taken occupational health and safety training, and almost a quarter had never taken training in infection prevention.

5.1.2 Patients

Majority of the respondents in the study were females. This finding was in agreement with findings from similar studies by 78.2% Ibrahim *et al.,* (2017); 62.0% Barlean *et al.,* (2014); 53.6%. The high participation rate of the females

could be due to the fact that services at the hospital are provided without charge to the public because it is a government facility therefore, majority of women travel to public health institutions to receive treatment since their husbands' financial support is what influences them to be subservient to them and seek. However, it was in disagreement with several similar studies in Ghana and Nigeria which identified males to be the most dominant participants in their studies Ocran & Tagoe, (2014) and Otuyemi *et al.,* (2001) respectively. This difference could have been due to different study settings.

Majority of the respondents had between 21 to 29 years of age. This was in accordance with studies by 55.2% Ocran & Tagoe, (2014) and 64.0% Otuyemi *et al.,* (2001). Since they are still battling to survive in undeveloped countries, young people receive treatment at public health facilities even when they are not financially stable. The finding was in disagreement with similar study from Saudi Arabia by Ibrahim *et al.,* 2017 who noted that the participants that were >30 years of age were more dominant in their studies.

Majority of the patients had attained a secondary certificate, the study finding was found to be in agreement with similar studies by 38.6% Ibrahim *et al.,* (2017); 31.4% Barlean *et al.,* (2014); 42.2% Ocran & Tagoe, (2014). However, the study findings were in disagreement with similar study by Mousa *et al.,* (1997) they observed that primary certificate holders, who had the greatest degree of education, made up the majority of responders.

5.2 Knowledge of hospital staff and patients

5.2.1 Discussion

5.2.1.1 Knowledge of hospital staff

The purpose of the questionnaire's first component was to assess staff members' understanding of infection control. According to Khamis *et al.,* (2014), the amount of commitment shown by healthcare organisations to bringing Hospital Acquired Infections (HAIs) under control determines the infection prevention of HAIs. In this regard, keeping track of people's understanding of infection prevention will assist close any gaps and lower the incidence of HAIs. However, according to the current study the categories of which the knowledge of the hospital staff was acquired were; general concept of nosocomial infection, hand hygiene, Personal Protective Equipment (PPE) use, sharps disposal and sharps injuries and waste management and environmental hygiene this was similar to studies in Saudi Arabia by Amin *et al.,* (2013); Ghalya & Ibrahim, (2014).

5.2.1.1.1 General concept on nosocomial infection

The study showed that all the nurses and laboratory technicians were more knowledgeable than any other staff on the true definition of Nosocomial Infection (NI) while the physicians were the least knowledgeable. The incorporation of infection prevention principles in the nursing curriculum may be responsible for the nurses' high level of general concept understanding. The study showed that slightly more than half of the respondents did not know exactly the time a nosocomial infection appears since less than half of them correctly identified the time at which a NI appears this finding was not in

concordance with a study in Saudi Arabia by Ghalya & Ibrahim, (2014) that found 87.5% of the participants well versed with the time the NI appears, this difference in percentages could be due to difference in study area and difference in the study population.

Equipment that has been contaminated can spread an infection that was contracted in a hospital. According to the Centres for Disease Control and Prevention (CDC), *Pseudomonas Aeruginosa* can spread through contaminated and improperly cleaned equipment. In this regard, the study showed that less than a fifth of the participants did not realise that tainted hospital equipment may spread nosocomial diseases. The laboratory technicians were more knowledgeable than all the other staff that participated in the study with respect to this domain. This would eventually lead to increase in transmission of infection through equipment which is not sterile by the nurses and the doctors since they are the frontline handlers of the patients. Nearly a quarter of the staff at the hospital were not aware that nosocomial infections can be caused by bacteria only found in and around the hospital. This lack in knowledge gives room for easy spread of infections at the health facility.

Approximately three quarters of the respondents correctly agreed with all patients as a source of infection regardless of their diagnosis when performing and not performing any procedures, this good knowledge among staff may be due to inclusion of the concepts of infection transmission in their study curriculum. Amin *et al.,* (2013) and Amin & Al Wehedy (2009) discovered a similar tendency among primary care physicians in Saudi Arabia, however this

conclusion was significantly higher. This difference in percentage could be due to different study settings.

The study showed that staff did not know exactly what body fluids are a source of infection since more than half thought that sweat is included among the fluids that are a source of infection this finding was found to be relatively lower than a study by Amin *et al.*, 2013 (68.1%) and higher than a study in Saudi Arabia by Ghalya & Ibrahim, (2014) (48.96%). The difference in percentage could be due to different study settings and different study populations.

5.2.1.1.2 Hand hygiene

The most effective method of preventing the spread of bacteria that cause nosocomial infections is to practise good hand hygiene.

The best way now available to reduce the number of microorganisms on hands is to wash them with water and ordinary soap, according to CDC guidelines on hand hygiene (Hamadah *et al.*, 2015). In this survey, majority of the respondents correctly noted that maintaining good hand cleanliness is the best way to avoid nosocomial infections. Meaning they were aware of the need for hand hygiene in the prevention of infection. This high percentage could have been influenced by the sensitisation and implementation of the COVID – 19 prevention measures at the hospital since the study was carried out after the COVID – 19 pandemic where the hospital staffs were encouraged to wash their hands frequently to prevent infection transmission. The study showed that respondents did not know exactly the type of patients who needed hand hygiene when handled since less than half of them correctly identified that

hand hygiene is needed for patients with respiratory infections this was found to be much lower than findings by Ghalya & Ibrahim, (2014) (89.6%) and relatively higher than a study by Amin *et al.,* (2013) (34.3%). Lack of understanding may cause people to misunderstand the importance of hand cleanliness. More than three quarters of the respondents could answer the question regarding how long hands should be washed properly, this high percentage in the standard duration of hand washing could be attributed to the sensitisation on the right timing for hand washing due to the COVID – 19 pandemic. The finding was much higher than findings by Amin *et al.,* (2013) (39.0%) and Ghalya & Ibrahim, (2014) (44.8%).

Because there is a chance that hands could become contaminated during glove removal, it is crucial to wash hands with soap and water afterward. According to Pang *et al.,* (2014), gloves should be taken off as soon as the episode of care is finished, and then hands should be decontaminated. Additionally, gloves create a perfect, warm, moist environment for bacteria to flourish; as a result, hand decontamination will eliminate any stray bacteria from a person's hands. However, the study showed that less than a tenth of the respondents remained unaware of the need to wash hands after removing gloves, increasing the risk of infection. The good knowledge of washing hands after removal of gloves may be due to inclusion of the concepts of hand hygiene and PPE use in the learning curriculum of the staff. This finding was much lower than studies by Ghalya & Ibrahim, (2014) (34.37%) and Amin *et al.,* (2013) (41.4%). According to Pang *et al.,* (2014), hand hygiene is still the foundation of infection control, and all healthcare professionals need to be aware that using

PPE does not eliminate the necessity for safe hand-hygiene procedures and hand decontamination.

However, the current study revealed that less than a tenth of the respondents were aware that using gloves instead of washing their hands increases the risk of infection transmission. 33.5% of the personnel in a research by Amin *et al.,* (2013) wrongly reported that employing gloves eliminates the requirement for hand cleaning. The difference in percentages could be attributed to the study duration whereby the current study was done after the COVID – 19 pandemic in that the staff were already sensitised on the benefits of hand washing. Due to the fact that it is the most successful method of preventing the transmission of bacteria that cause nosocomial infection, knowledge of hand hygiene should be increased (Tavolacci *et al.,* 2008). During upcoming clinical training sessions, it's crucial to talk about how long to keep your hands clean and when to use alcohol hand massage.

5.2.1.1.3 Personal protective equipment use

Personal protective equipment (PPE) is any combination of barriers and respirators used to prevent hazardous microorganisms from coming into contact with mucous membranes, airways, skin, and clothing (Siegel *et al.,* 2007). The crucial significance of adhering to PPE usage was proven during the COVID - 19 pandemic outbreak in 2020 (Moodley *et al.,* 2021) as well as in other infection control practise guidelines (Jaeger *et al.,* 2011). Unfortunately, due to professional knowledge, attitudes, and behaviour as well as organisational and other factors (Reid *et al.,* 2011; Beam *et al.,* 2011), compliance by professionals was frequently suboptimal. In the poll, majority

92.3% of the workers reported they thought Personal Protective Equipment (PPE) including masks and head coverings provided protective barriers against infection; in a research conducted in Saudi Arabia, the figure was 98.9% (Ghalya & Ibrahim, 2014).

More than half of the respondents at the hospital were not knowledgeable on how the used PPE should be disposed off as they agreed that used PPE should be discarded through regular dustbin. This low percentage in the knowledge of PPE disposal could be attributed to the gap in teaching of waste management in the health workers curriculum. This could easily lead to potential increase in the spread of infection at the hospital due to poor handling at the hospital and signifies poor prevention and control of nosocomial infections at the health facility, this finding was in agreement with findings in Saudi Arabia (Ghalya & Ibrahim, 2014).

According to the study findings, more than a quarter of the staff agreed with the practise of re-using masks and gloves when working with the same patient in order to prevent the spread of infection from one body part to another of the same patient and in addition a tenth of the respondents felt that if there is no obvious contamination on the gloves, they can use the same set of gloves for several patients which showed that these staff were not knowledgeable on the mode of transmission of infection while using the gloves. This could have been influenced by the availability of PPE for use at the facility as other studies in Africa and Asia showed that staff re – used PPE due to the lack of adequacy of the PPE. This puts the patients at higher risk of acquiring nosocomial infection through the aid of the medical staff. More than half of the respondents were not knowledgeable with PPE being only suitable for

laboratory and cleaning staff for their protection this shows a misconception on the use of PPE by all staff at the hospital. PPE should not be worn solely when there is contact with blood, according to majority of the respondents. Health care personnel should wear gloves anytime they come into touch with different types of blood, saliva, mucous membranes, and non-intact skin, according to a research by Melesse *et al.,* (2021). This makes the staff knowledgeable on the use of PPE during procedures on patients at the hospital. The result of the present study shows that staff did not know exactly the most protective type of masks to be used at the health facility yet it is the main harbour for transmissible infections since nearly three quarters of the staff agreed with masks made of cotton or gauze as the most protective. This puts the health of the staff at risk of acquiring respiratory infection from the patient or the hospital surrounding.

5.2.1.1.4 Sharps disposal and sharps injuries

Recapping needles is a risky practise, since it frequently results in unintentional needle sticks among workers, claims OSEH (2010). This practise puts healthcare personnel at risk for illnesses including HIV and Hepatitis B. According to research by Schmid *et al.,* (2007) and Efstathiou *et al.,* (2011), needles should never be recapped since doing so might result in major risks such as needle-stick injuries. For this reason, needles should never be taken out of the syringe before disposal. Participants in their study suggested that this was caused by apprehension about contracting blood-borne illnesses like viral hepatitis (B & C) infection; this hypothesis could also clarify why most of the investigated sample had received a hepatitis B vaccine. Less than half of the respondents in this research nonetheless believed

that used needles should be recapped after use. In contrast, Janjua *et al.*, (2007) study discovered. Less than a fifth of the respondents correctly responded that used needles and other sharp objects should be shred before being disposed of. This study finding was in agreement with findings by Ghalya & Ibrahim, (2014) where they found 18.75% of the participants knowledgeable with shredding soiled sharps object. More than a fifth of the respondents agreed with the fact that used needles should be bent after use to prevent injuries, this puts the hospital staff handling the needles at risk of being pricked and eventually acquiring the infection from the patients thus this indicates that staffs need more education about sharp objects management. This low percentage in the knowledge of handling used needle sticks could be attributed to the gap in teaching of needle sticks in the health worker's curriculum.

In general health practice, needle stick are more fluent mainly due to poor handling of the needles by the health profession or in the process of disposal of the used syringes, nonetheless, the study revealed that fewer than 50% of participants felt that needle stick injuries were the least frequent in general practice, this was not in consistence and much higher than findings by Ghalya & Ibrahim, 2014 (24.96%), There may be methodological and environmental reasons for the variance in results, this signifies a gap in knowledge of the types of injuries experienced in medical practices and their prevalence and incidence among the staff. 20.5% of the staff incorrectly agreed with sharps injuries being managed with no need for reporting, this signifies gaps in sharps management among the staff thus high chances for acquiring nosocomial infection at the hospital.

5.2.1.1.5 Waste management and environmental hygiene

All medical wastes generated represent a health risk to patients, hospital employees, and the environment. These wastes will pose major risks to the environment and public health if they are not properly collected, stored, and disposed of (Ozder *et al.,* 2013). In medical facilities, the collection and storage of these wastes is primarily the responsibility of healthcare staff. In waste management, it's crucial that health staff members are knowledgeable and aware of the issue. Participants had trouble answering the question on environmental cleanliness and trash management. This is concerning given the significant risk and burden of infectious disease transmission that healthcare workers confront internationally, but especially in low-income nations like Uganda (Anozie *et al.,* 2017).

The hospital is a harbour of most of the infection acquired by the staff and patients as they are carrying out various procedures therefore its necessary to clean the hospital wards where the patients reside at least four times in 24 hours however the findings showed that more than three quarters of the respondents were not knowledgeable with the number of times the wards have to be cleaned, this low percentage in the knowledge of ward cleaning could be attributed to the gap in teaching of environmental hygiene in the health workers curriculum. However, on the other hand the staffs were knowledgeable on the mechanism of cleaning at the hospital.

The fact that Uganda is part of the developing country its experiences a high number of patients visiting the public hospitals like Kiruddu referral hospital since services are free and sometimes at a low cost thus making waste

generated daily from the hospital to accumulate thus the need for the waste to be collected frequently to prevent bulking of waste and potential spread of infection due to mishandling of waste however from this study more than a third of the respondents were not knowledgeable with the number of times waste should be collected monthly which may put the hospital staff and patients at risk of infections. More than three quarters of the respondents were knowledgeable about waste segregation measures whereby they agreed that the waste at the hospital should be sorted before disposal. The result of the present study shows that staff did not know exactly the disposal mechanisms of hospital waste since majority agreed that medical waste must be disposed of using standard municipal disposal methods. The low rate of knowledge could have been mainly because waste management is not emphasised on the occupational health and safety syllabus since majority of the respondents had acquired training on occupational health and safety and more than three quarters had got training on infection prevention. In order to produce a safe workplace and environment, it is vital to have proper understanding of standard waste management methods; as a result, individuals, especially hospital employees, should be taught or trained on these processes.

5.2.1.2 Knowledge of patients

Hospital healthcare linked infections may decline as a result of increased awareness of NI and adherence to prevention strategies including basic aseptic measures. Results show that 76.6% of patients had heard of HAIs, however that less than a half of those patients comprehended the real meaning of NI. These findings differ from those of an earlier research conducted in Ghana (Ocran & Tagoe, 2014). Majority of patients who heard about HAIs had

obtained information from doctors (46.0%), radio (17.7%), reading (14.9%) and television (11.3%). This could be attributed to the fact that the study was carried out after the COVID – 19 pandemic, therefore most of patients had got information from various medias on the infectious diseases ad where they can be acquired from. This study finding was in concordance with the study of Ocran & Tagoe, (2014) in Ghana.

About a fifth of the respondents believed the hospital is free from infections. This signifies that the patients were not knowledgeable about infection that could erupt in the hospital. In addition, the cleanliness of the hospital, frequent disinfection, and the neatness of the staff all contributed to respondent's belief that the facility is free of illnesses. This was not in consistence with a study by Ocran & Tagoe, (2014) in Ghana. More than three quarters of the respondents correctly agreed with the statement that every patient should be taken as infectious no matter their diagnosis this signifies that they were knowledgeable about transmission of infection between patient to patient however to the contrary the study further found out that the patients were not knowledgeable about the health worker to patient transmission of infection whereby only less than half correctly agreed that health workers can be main transmitters of infections in between patients. This puts the patients at a higher risk of acquiring infections both from the fellow patients and the healthcare workers.

The patients were discovered to be aware about infection control through washing hands as majority correctly agreed that infection can be prevented by regular washing hands with water and soap and also by sanitizers. This may have been the case primarily because the study was conducted during the

COVID-19 epidemic, which exposed the participants to the advantages of routinely washing their hands with soap and water. The result of the present study shows that patients were knowledgeable about what body fluids are a source of infection since a vast majority agreed that all body fluids except sweat is included among the fluids that are a source of infection.

5.2.2 Conclusion

The healthcare workers were more knowledgeable than the patients with regards to the infection prevention measures. Patients will experience fewer infections as a consequence of enhanced knowledge about HAIs, whereas HCWs will experience fewer HAIs as a result of rigorous adherence to and monitoring of compliance with hospital policies on HAIs.

5.2.3 Recommendations

5.2.3.1 Kiruddu referral hospital

1. As part of induction and at regular intervals, the hospital should make sure that new employees get in-service training on infection prevention and control standard measures. 16.7% of the workers, according to the present survey, did not attend seminars or in-service training relevant to infection prevention and control, and 29.5% of the workforce did not participate in training related to occupational health and safety.
2. It may be necessary to offer hand hygiene training sessions more regularly, with ongoing performance evaluation and monitoring, to encourage hospital personnel and patients to adhere to proper hand hygiene procedures.

3. Through ongoing in-service training programmes, the hospital should ensure that staff members are up to date on their knowledge and procedures. All staff members' awareness of IPC practises would be increased as a result, which would result in the provision of high-quality care to patients.
4. Events such as exhibits, poster-making, quizzes, debates, and other competitions about infection prevention and control should be organised routinely. The hospital personnel should be encouraged to participate in various activities related to infection prevention and control procedures. This will increase the healthcare staff's degree of expertise.

5.2.3.2 Ministry of health

1. In order to ensure that appropriate funds are set up expressly for infection prevention and control training, the minister of health should advocate for sufficient funding from the government. In several African nations, the COVID 19 pandemic economic slump that started in 2020 resulted in deficit reduction mostly through decreasing expenditure. In order to lessen the negative effects of the recession, we must inform our political leaders about the economic advantages of IPC.
2. The Ministry of Health needs to make sure that funds designated for infection prevention and control awareness don't go elsewhere. This can be accomplished by conducting sporadic spot checks for infection control in the hospitals.

3. A weekly or monthly talk show over television and radio on infection prevention and control.

5.2.3.3 Government of Uganda

1. The policy makers should make sure infection prevention and control policy manuals are made available to every hospital staff and patients.
2. Conferences on infection prevention and control should get funding both locally and globally. This will make it possible for the infection control team or committee to go to these conferences and stay up to speed on the most recent scientific data.
3. Infection prevention and control are essential (hospital acquired infections) should be emphasised in medical schools' curricula so that employees may learn about the fundamentals of infection prevention and control even before they begin their careers.

5.3 Attitude of hospital staff and patients

5.3.1 Discussion

5.3.1.1 Attitude of hospital staff

Majority of the respondents at the hospital felt that prevention of NI is a valuable part of the healthcare worker role however less than half would feel comfortable reminding a fellow health care worker to perform hand hygiene. This signifies that most health workers don’t carry out had hygiene.

Approximately more than a third of the respondents were affected by the workload to applying the infection prevention guidelines at the hospital, this was evidenced with majority of the staff working for more than 8 hours in the

day which strains them leading to failure to practice infection prevention measures thus high risk of infection among the patients and the staff.

This could be a factor that influences the wide spread of infections at the facility. This study finding was in disagreement, with a study by Cimiotti *et al.,* (2012) that found a much higher number of respondents with affected by the workload to apply the infection prevention guidelines and they also mentioned a link between the number of healthcare workers on duty and hospital acquired illnesses. Therefore, reducing hospital staff fatigue is a good strategy to help stop the spread of infections in hospitals.

The study showed that more than a tenth of the respondents could not wear the necessary PPE even if it is uncomfortable. The results were greater than those of a Knowledge, Attitude and Practice (KAP) study of healthcare workers on healthcare-associated Tuberculosis (TB), in which 6.2% of respondents reported they would refuse to wear a mask if it were unpleasant (Bhebhe *et al.,* 2014). This could have mostly been due to their perception that they were at a significant danger of contracting illnesses from their patients. This demonstrated the staff's favourable attitude towards the hospital's usage of PPE.

It's interesting to note that more than a fifth of the respondents reported they would still report to work at the hospital if they experienced signs of nosocomial infections. This result was much greater than that of a research conducted in South Africa by Moodley *et al.,* (2021), it found that 10% of participants reported they would still show up for work despite symptoms suggestive of COVID-19, putting their patients and colleagues in jeopardy.

More than a fifth of the respondents noted that they would avoid working at the hospital to avoid contact with nosocomial infections, this is higher than a study in South Africa where they found that 6.4% of the participants would quit to avoid contact with COVID-19 patients (Moodley *et al.,* 2021). This can be a sign that the right practises weren't successfully shared with all healthcare professionals. It is still significant in a nation that is already experiencing health workforce shortages in government facilities, so this could easily lead to workforce shortages

5.3.1.2 Attitude of patients

This research found out that the patients had a positive attitude towards the practice of hand hygiene since almost all believed that health workers should wash hands before any procedure though majority noted that sinks are inconveniently located at the hospital to do hand washing even if this didn't significantly influence the attitude of the patients towards hand hygiene (rho = 0.066, P = 0.441) as patients were shown to have a better attitude towards hand hygiene, with the majority of 74.5%, 22.7%, and 2.8% tending to wash their hands always, sometimes, and never, respectively, within and after leaving the hospital than a similar study by Ocran & Tagoe, (2014) where they found 46.2%, 31.0% and 22.9% tend to wash their hands always, sometimes and never respectively.

The high number of those that washed hands before entering the hospital and after leaving significantly influenced the prevention of nosocomial infection at the hospital. This positive attitude towards hand hygiene could be attributed to

the time period in which the current study was conducted whereby it was done amidst the COVID – 19 pandemic era thus sensitisation to prevent the infection through proper hand hygiene had played a great role.

Despite majority of the patients being knowledgeable on the need for infection prevention with the use of water and soap, 66.0%, 29.8% and 4.3% washed their hands with soap and water always, sometimes and never respectively. This finding was found to be higher than a study by Ocran & Tagoe, (2014) that found 39.0%, 28.4% and 32.1% washed their hands with soap and water always, sometimes and never respectively, this signified that the patients in the current study had a better attitude towards use of water and soap to wash their hands.

This positive attitude towards hand hygiene could be attributed to the time period in which the current study was conducted whereby it was done amidst the COVID – 19 pandemic era thus sensitisation to prevent the infection through proper hand hygiene had played a great role. However, more than half of the patients preferred use of sanitizer to the use of water and soap while at the hospital and this was mainly because; it kills germs easily and faster, it is easy to be used, it is easy to carry.

Majority of the respondents washed their hands if they aren't visibly unclean at the hospital this had a significant effect on the prevention of nosocomial infection of which those that felt that they don't have to wash their hands if they aren't visibly unclean at the hospital were more likely to acquire nosocomial infection than those who were not sure. Approximately a third of the respondents felt that the cleaning staff should clean the floors of the wards

twice at the hospital as this had a significant effect on the prevention of nosocomial infection of which those that felt that the cleaning staff should clean the floors of the wards twice in 24 hours' were more likely to acquire nosocomial infection than those that felt cleaning to be done four times in 24 hours.

5.3.2 Conclusion

Majority of the hospital employees believed they had a very high risk of contracting infections from their patients, but less than half reported their workload made it difficult for them to follow infection control procedures, and more than half reported they couldn't report to work if they had symptoms of nosocomial infections. Majority of patients always wash hands with soap and water at the hospital and more than two thirds agreed that healthcare workers should handle them with gloves.

5.3.3 Recommendations

5.3.3.1 Kiruddu referral hospital

1. Sensitisations and awareness campaigns of new and outgoing patients and hospital staff on infection prevention and control at the hospital.

5.3.3.2 Government of Uganda

1. The ratio of hospital personnel to patients may be improved by hiring additional employees, which will solve the issue of staff not having enough time to implement appropriate infection prevention and control measures.

5.4 Practice of hospital staff and patients

5.4.1 Discussion

5.4.1.1 Practice of hospital staff

Antiseptic hand rubbing is the single most efficient method for preventing infections in a variety of healthcare settings (Hammerschmidt & Manser, 2019). In this study more than a tenth of the respondents didn't apply antiseptic hand rub to clean hands while at the hospital, this was not in agreement with findings in Ethiopia 37.8% (Geberemariyam *et al.*, 2018). This could have been due to the fact that hand hygiene agents cause irritation and dryness on the hands as well as availability of antiseptic rubbing liquids and creams thus costly expenses. Previous studies have shown that individual knowledge gaps can affect safe hand hygiene procedures in healthcare settings, such as the recommended time for hand washing and the amount of hand rub to use. This was also evidenced in this study as few of the staff knew the recommended duration for washing hands despite efforts to encourage hand hygiene during the COVID -19.

The study also found out risk of burns and injury due to more than a fifth of the respodets not always wearing the necessary PPE if splashes and spills of any body fluids are likely. This finding was much higher than 2.2% found in a study by Geberemariyam *et al.*, (2018). This negligence on the use of could have been due to the majority of respodets that had not got training on occupational health and safety and had poor attitude towards infection prevention thus this shall impact the hospital and the government financially. This study may have shown a training gap that could cause medical personnel to use inadequate infection protection techniques.

Sterilisation and disinfection are the cornerstones of hospital infection control protocols. Every day, various hospitals perform a large number of surgical procedures. Many invasive procedures are performed at a variety of healthcare settings. When a surgical instrument or other medical device comes into contact with a patient's mucous membrane or sterile tissue during an operation, there is a greater possibility that the patient will become infected. Additionally, infections may spread from one patient to another, or between patients and the medical personnel. Inadequately sterilised equipment has been linked to many diseases and outbreaks in hospital settings (Mohapatra, 2017). In this study there was a high level of disinfection at the hospital as more than two thirds of the respondents practised high-level disinfection; this figure was significantly higher than the 58.2% found by Alemu *et al.*, (2020) in Ethiopia. The majority of the respondents had undergone infection prevention training and had a favourable attitude towards infection prevention, which may have contributed to the difference. This further signifies the influence of training on the practice of infection prevention

Health workers have designated areas that they perform examination of patients as they come to the hospital for treatment, the hospital being a harbour for infections health workers are susceptible to acquiring them. In this study however poor practice was realised among the respondents whereby more than a fifth of the respondents usually examined patients in places other than their chambers. This puts the health worker at risk of acquiring the infections from the patients through handling patient’s surfaces.

Health care workers (HCWs) should be protected by personal protective equipment (PPE), but they also have an obligation to protect patients and their

environment from hazards that could transmit disease. Guidelines on the use of personal protective equipment (PPE) in high-risk environments, such as Critical Care (CC) units, state that staff members working with suspected or confirmed infection cases should wear a fit-tested FFP3 respirator, a long-sleeved gown that repels fluid, eye/face protection, and disposable single-use gloves. Two pairs of gloves should be used, according to the centre for disease control (CDC, 2020), so that a badly dirty outer glove may be removed and changed securely while providing treatment. In this study there was poor utilisation of PPE as its use was not appropriated as less than a third used gloves both hands sometimes with only three quarter of the staff used both hands always. This could be drastic as it exposes the hospital staff to easily acquire infections from the patients.

By preventing the transmission of body fluids to the HCW's skin and clothing, protective gear helps to reduce the risk of secondary dissemination to hands and then to mucous membranes. In this study there was poor practice expressed in the use of long-sleeved gowns where by less than half wore long – sleeved gown before invasive procedure sometimes with more than a tenth never wearing it. This could eventually lead to acquisition of infection from the patients during the invasive practices at the hospital. This could be possibly explained that approximately two thirds of these respondents had less than five year's work experience and had negative attitude towards infection prevention.

5.4.1.2 Practice of patients

The assessment of the patients' practice towards infection control around the hospital revealed that majority of them had no trust on the hygiene at the

facility. In this study concerns of sanitation and hygiene were spelt out by the patients as majority of the patients poured water in the toilets all the time before using it at the hospital, this could have been mainly due to the toilets were unclean and they feared acquiring other infection from other patients like the urinary tract infection as almost all of the patients felt they could acquire infections from using the toilets and urinals at the hospital. However, the pouring of water only without any disinfectants could not necessarily destroy the organisms that may cause an infection thus the patients are still at risk of acquiring the infection as long as they use the dirty toilets, however majority of patients noted that patient safety is a priority for the hospital. The study found out that more than two thirds of the patients clear all the litter around the wards they are admitted all the time, this could have been due to the low rate of cleaning around the hospital by the cleaning staff and as the patients have good practice towards infection prevention they are moved to do the cleaning on their own without relying on the cleaning staff at the hospital.

Despite the hospital being the main inhibitor of infection and the high prevalence of nosocomial infections, slightly less than half noted by the patients at the hospital, two third of the patients would report to the health worker in case they acquire any signs and symptoms similar to those of nosocomial infections. This could have been influenced by the fact that the health workers at the hospital interact with the patients and inform them about HAIs and how to prevent them thus giving the patients confidence to inform them about their health conditions regarding nosocomial infection. Furthermore the study showed that almost all of the participating patients had used the lift or staircases at the hospital of which more than four out of five

agreed that the lifts and the stair case rails are a major cause of infection transmission in the hospital however a third of the patients did not wash hands after touching the staircase hand rails. This puts the patients at risk of acquiring infection from touching the rails due to the poor knowledge on hand hygiene while at the hospital. Two thirds of the patients preferred the use of sanitizers to washing hands with soap and water at the hospital this could have been mainly because sanitizers were available and they were easy to carry at the hospital as sinks were not easily accessible to allow the patients to wash their hands all the time. The COVID – 19 pandemic created the need for hand hygiene infection prevention mechanisms besides the hand washing with soap and water thus the creation of various hand sanitizers on the global market, although patients praised them to kill germs faster due to it being strong and effective on germ killing, however more than a tenth used soap and water mainly because the sanitizers are expensive to purchase and they contain strong chemicals that can cause side effects on their hands and skins when used.

5.4.2 Conclusion

More than half of the staff wash hands before putting on gloves and after putting on gloves. More than two thirds of the patients clearing all the litter around the wards they are admitted to yet patient's safety at the hospital was noted to be a priority. A third of the patients didn't wash hands after touching the rails of the staircases at the hospital. Cases of poor sanitation and hygiene were pointed out by the patients at the facility which made them not to easily reach areas like the toilets and urinals with the fear of acquiring infections.

5.4.3 Recommendations

5.4.3.1 Kiruddu referral hospital

1. The facility where the research investigation was conducted should provide appropriate hand hygiene facilities and simple accessibility. For instance, there should be accessible and readily available washbasins with running water, as well as paper towels.
2. The infection control team should closely monitor staff members while they work. This include reviewing the staff's hand hygiene routines, watching them do invasive operations that call for aseptic technique, isolating infectious situations to stop the spread of infection, and using barrier personnel.
3. The hospital should compare its infection rates to those of other hospitals and identify any issues with a particular infection type. This should spur a careful examination of treatment options and the alternatives to improve the situation by creating surveillance plans that precisely meet the hospital's needs.
4. The hospital should make sure that the IPC Committee fulfils its monitoring and oversight responsibilities and is actively operating.
5. It is crucial and effective to guarantee that infection prevention guidelines are available in working departments in order to promote the understanding and practise of infection prevention among healthcare professionals.
6. The infection control committee has to take a more proactive approach to monitoring the incidence of hospital acquired infections and

reporting findings to staff members and other authorities. By doing this, problems will be apparent and hence solvable.

7. The hospital staff should apply proper sterilisation and disinfection procedures.
8. The hospital should isolate patients in cases that have been identified to prevent the further spreading the infection.

5.4.3.2 Ministry of Health

1. The Ministry of Health shall always guarantee that the PPE needed for applying infection control measures is available.
2. The ministry of health should ensure the creation of a bio-medical waste management control committee to oversee the activities so that bio-medical waste produced at healthcare institutions is disposed of effectively and properly to safeguard the health of healthcare professionals and the general public
3. The hospital's employees and patients should have access to supplies like disinfectants so that they can follow adequate infection control procedures.
4. A fully fledged department to handle issues concerned with antiseptics wash liquids or gels on the infrastructure as well as on individuals hands and clothing’s or gear in case of boots should be put in place for proper implementation and management.

5.5 Suggestion for further research

1. Identification of the prevalence of nosocomial infection among the patients through laboratory tests and follow – up since the prevalence acquired in this study was oral and could have been affected by recall bias and identification bias.
2. To further our understanding of the infection control & safety precautios, more research is also advised. Because they could then concentrate more on the perceptions of staff, these studies should be conducted qualitatively rather than quantitatively.
3. To gauge the amount of practise, this study should be replicated using an observation checklist.
4. It is necessary to replicate the study using a sizable sample of patients from various private hospitals.
5. Investigating the connection between information, prior exposure, and adherence to recommended standard precautions
6. Future research should take into account more robust observational study designs to verify healthcare professionals' self-reported practises, as well as to identify real practises and the prevalence of HAIs as a result of suboptimal infection prevention practises.

5.6 Limitations of the study

1. Patients relied only on their subjective self-assessment in the questionnaires because there was no oversight of the staff's practices. As a result, it's possible that the replies were only knowledge-based and did not fairly represent people's actual attitudes and behaviours towards infection control procedures.

2. Because the study was conducted at a single location, generalisations regarding other public and private healthcare personnel cannot be made.
3. Response bias resulted from the use of self-reporting data, which would have impacted the findings' accuracy.
4. The study identified the self-reported practices; however, more research is necessary to understand how staff members are implementing these practices in actual clinical settings.

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APPENDICES

Informed Consent

Informed Consent to Participate in Research

I am/We are asking you to take part in a research study called:

Nosocomial infection prevention knowledge, attitude and practices among staff and in – patients at Kiruddu referral hospital, Uganda

Ekakoro Newton is the one in charge of this research project. The study will be carried out in Uganda at Kiruddu Referral Hospital.

Purpose of the study

The purpose of this study is to:

- To determine the knowledge of staff and in – patients on prevention of nosocomial infection at Kiruddu referral hospital.
- To assess the attitude of staff and in – patients on prevention of nosocomial infection at Kiruddu referral hospital.
- To assess the practices of staff and in – patients on prevention of nosocomial infection at Kiruddu referral hospital

Study Procedures

Because you are a member of the staff or an in-patient and can assist us in better understanding the knowledge, attitudes, and practices of staff and in-patients about the prevention of hospital acquired infections, you are being asked to participate in this study.

If you take part in this study, you will be asked to:

- Take part in answering semi-structured questionnaire;
- Filling in the questionnaire will take approximately 45 minutes;
- The questionnaire will be provided at the hospital and filled in from the hospital at a time and place most convenient to you as the participant;
- The questionnaire will contain open ended, closed ended and likert scale type of questions;

Benefits

Your participation in the study may not have any immediate benefits, but the hospital will be able to design and organise health education and infection control initiatives with the help of the information you supply.

Risk or Unease

There is little danger associated with this research. This implies that the hazards involved in this study are the same as those you encounter on a daily basis. There are no known dangers associated with research participants.

Compensation

Participants in research will not receive payment.

Confidentiality and Privacy

Your study materials will remain secret and confidential. You may need to provide your research records to certain individuals. Anyone who views your documents is required by law to maintain their complete confidentiality. These records will only be accessible to the following individuals: the research team, which includes the study's principal investigator and participants.

I might write on the insights this study has given me. I won't mention your name if I do. I won't release information that might identify you to the public.

Voluntary Participation / Withdrawal

Participation in this study should only be voluntary. There shouldn't be any pressure on you to participate in the study. You can choose at any moment to stop taking part in this research or to continue.

If you decide to discontinue participating in this study, there won't be any consequences or loss of benefits to which you are entitled.

You can obtain the responses to your queries, worries, or grievances.

Please get in touch with the researcher on if you have any queries, worries, or grievances regarding this study, or if you encounter an unfavourable incident or unexpected issue 0774837582 / 0754181240

For any general inquiries, complaints, concerns, or matters you would like to discuss with someone outside the research, please contact the executive secretary of UNCST at 0414-705500 and the chairperson of the CIUREC, Dr. Samuel Kabwigu, at 0312307400.

Assessment of understanding

Please select the option that most accurately reflects how well you understand the informed consent document above:

☐ I have read the informed consent form above and am aware of the advantages and risks associated with participating in the study. I agree to participate in the study and will sign the corresponding document.

☐ I have read the informed consent statement above, but I still have questions about the study, therefore I haven't given my complete consent to participate in it yet.

……..

Signature of Participant

Date ……..

Thumb print of Participant

……..

Signature of researcher

Date

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Printed Name of researcher

Questionnaire for staff

Dear Participant

Read the questions and mark your response off with a tick (√) in the circle provided and fill in the spaces with the answers.

SECTION 1 - Socio – demographic characteristics of the staff

1. Gender

Female ◯

Male ◯

2. Age

<20 years ◯

21 – 29 years ◯

30 – 39 years ◯

40 – 49 years ◯

>50 years ◯

3. Marital status

Single ◯

Married ◯

Divorced/Separated ◯

Widowed ◯

4. Working experience

1 – 5 ○

6 – 10 ○

11 – 15 ○

16 – 20 ○

>20 years ○

5. Occupation

Doctor ○

Nurse ○

Physician ○

Other Specify; _____

6. Educational level

Secondary ○

Diploma ○

Bachelor's Degree ○

Master's Degree ○

PhD. ○

Other Specify; _____

7. Duration of shift

< 8hrs ○

8hrs ○

> 8hrs ○

8. Mean number of patients interacted with during the shift

< 5 ○

5 – 10 ○

11 – 15 ○

16 – 20 ○

> 20 ○

9. Have you got training on occupational health and safety?

Yes ○

No ○

10. Ever taken training on infection prevention and control

Yes ○

No ○

11. Duration of the training

1 day ○

2 days ○

3 days ○

7 days ○

15 days ○

Knowledge of the staff

General concept on nosocomial infection

1. Nosocomial infections are infections acquired from the hospital

Agree ○

Disagree ○

Not sure ○

2. An infection is nosocomial if it appears after;

24 – 48 hours ○

48 – 72 hours ○

72 – 96 hours ○

96 – 120 hours ○

> 120 hours ○

3. Nosocomial infections can be transmitted through contaminated medical equipment

Agree ○

Disagree ○

Not sure ○

4. If Yes, list at least three medical equipment

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5. Nosocomial infection can be caused by bacteria only found in and around the hospital

Agree ○

Disagree ○

Not sure ○

6. All patients are a source of infection regardless of their diagnosis

Agree ○

Disagree ○

Not sure ○

7. All body fluids except sweat should be viewed as a source of infection

Agree ○

Disagree ○

Not sure ○

8. What type of nosocomial infections is most fluent in the hospital?

Urinary tract infection ○

Pneumonia ○

Surgical site infections ○

Blood stream infections ○

Cholera ○

Other: _____

9. Have you ever acquired a nosocomial infection?

○ Yes ○ No

10. If Yes, what were the signs and symptoms that showed that you had acquired it?

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Hand Hygiene		Agree	Not sure	Disagree
1.	Practicing good hand cleanliness is the best defence against nosocomial infections.			
2.	Gloves offer total defence against contracting or spreading infections.			
3.	Using an alcohol-based antiseptic or soap to wash your hands reduces the chance of spreading hospital-acquired infections.			
4.	I don't need to wash my hands before I touch a patient if they are not obviously filthy.			
5.	If hands are not obviously unclean, using an alcohol-based antiseptic for hand hygiene is just as effective as using soap and water.			
6.	Before doing any treatments that don't involve biological fluids, there's no need to wash your hands.			
7.	It is important to wash your hands both before and after having direct patient contact.			
8.	The recommended minimum time for a normal hand wash is between 40 and 60 seconds.			
9.	I am able to wear the same gloves for multiple patients as long as they are not soiled			

Personal protective equipment use		Agree	Not sure	Disagree
10.	Protective barriers against infection are provided by PPEs like masks and head caps.			
11.	By using PPEs, the chance of contracting nosocomial diseases is eliminated.			
12.	PPEs are only appropriate for the protection of laboratory and cleaning personnel.			
13.	PPEs ought to be used exclusively in situations where blood comes into contact.			
14.	Masks and gloves can be reused after being properly cleaned.			
15.	Used PPEs should be disposed of in standard dustbins.			
16.	Gloves should be replaced on the same patient during various procedures.			
17.	Cotton or gauze masks are the most protective.			
18.	Gloves and masks may be reused when working with the same patient.			
Sharps disposal and Sharp Injuries		**Agree**	**Not sure**	**Disagree**
19.	To avoid injury, used needles should be replaced after use.			
20.	After use, used needles should be twisted to prevent injury.			
21.	Before being disposed of completely, soiled sharps items should be shredded, or cut into little pieces.			

22.	Sharps injuries ought to be treated without requiring reporting.			
23.	In regular practice, needle-stick injuries are the least common.			
24.	When a patient has HIV, needle stick injuries are managed with post-exposure prophylaxis.			
Waste management and environmental hygiene		**Agree**	**Not sure**	**Disagree**
25.	Hospital waste has to be sorted before disposal			
26.	Cleaning and disinfection are the same			
27.	Hospital wards have to be cleaned 2 times in 24 hrs.			
28.	Waste at the hospital should be collected twice monthly			
29.	It is necessary to dispose of used PPE using the standard municipal disposal methods.			

Attitude of staff

Variables		**Agree**	**Not sure**	**Disagree**
1.	Equipment for hand hygiene is not always available.			
2.	It's not always possible to find clean towels to dry my hands after washing them.			
3.	Sinks are situated at an awkward place.			
4.	Hand sanitizers irritate and dry up the hands.			

5.	HCW-patient interactions are hampered by poor hand hygiene.			
6.	There are no sinks accessible.			
7.	I frequently neglect to wash my hands.			
8.	My chances of contracting infections from my patients are extremely low.			
9.	I am less likely to give my patients infections if I wash my hands.			
10.	One important aspect of the work of HCWs is HAI prevention.			
11.	It would be awkward for me to remind a healthcare worker to wash their hands.			
12.	I often forget to change PPE between patients			
13.	PPE is not readily available at the facility			
14.	My capacity to follow infection prevention standards is impacted by my workload.			
15.	Waste bins are readily available			
16.	There is a waste segregation policy at the hospital			
17.	Even though it is difficult, I would put on the necessary personal protection equipment because I feel safer utilising hand rubs with alcohol than I do washing my hands with soap and water.			
18.	I'll report for duty even if I start experiencing symptoms that could indicate a nosocomial illness.			

19.	To prevent coming into contact with nosocomial illnesses, I would avoid going to work.			
20.	Even though it is difficult, I would put on the necessary personal protection equipment because I feel safer utilising hand rubs with alcohol than I do washing my hands with soap and water.			
21.	Infection prevention posters are not present at my work areas			

Practices of the staff

Variables		Yes	Not sure	No
1. Five moments of hand washing				
a)	Prior to making contact with a patient			
b)	Prior to aseptic or clean processes			
c)	Following exposure to bodily fluids or danger			
d)	Following patient contact			
e)	Following contact with the patient's environment			
2.	Do you wash your hands with an antibacterial hand rub?			
3.	When sterilisation is not appropriate, do you employ high-level disinfection?			
4.	Do you use all available personal protective equipment (PPE) to reduce your risk of contracting an infection or passing it on to others?			
5.	Do you combine medical wastes that are liquid and dry?			
6.	If spills and sprays of bodily fluids are expected, do you wear the required personal protective equipment (PPE) such as gloves, an apron, goggles, and a mask?			
7.	Do you evaluate patients somewhere besides your examination room?			

		Always	Sometimes	Never
8.	How often do you wear long-sleeved gown before invasive procedure			
9.	How often do you wash hands before putting on gloves and after putting on gloves			
10.	How often do you use glove (both hands)?			

11. When do you change disinfectant chlorine solutions?

Every 24 h ○

Every two days ○

Immediately when it is soiled ○

I don't know ○

12. For how long do you soak reusable medical instruments in chlorine solution?

10 min ○

1 h ○

24 h ○

5 min ○

13. Where do you usually put sharp disposal boxes?

In high traffic area ○

At corridor ○

Any where ○

Hand reach area ○

Thank you for taking time off your busy schedule.

Questionnaire for in - patients

Dear Participant

Read the questions and mark your response off with a tick (√) in the circle provided and fill in the spaces with the answers.

Section 1: Socio – demographic characteristics of the in – patients

1. Gender

Female ◯

Male ◯

2. Age

<20 years ◯

21 – 29 years ◯

30 – 39 years ◯

40 – 49 years ◯

>50 years ◯

3. Marital status

Single ◯

Married ◯

Divorced/Separated ◯

Widowed ◯

4. Educational level

Primary ○

Secondary ○

Diploma ○

Bachelor's Degree ○

Master's Degree ○

Other Specify; _____

Knowledge

1. Have you heard of HAIs?

Yes ○

No ○

2. If yes, in your view what are HAIs?

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3. If Yes where did you hear the word HAIs from?

Radio ○

Reading ○

Internet ○

Doctor ○

Nurse ○

Television ○

Other specify; _____

4. Do you believe that the hospital is free from infections?

Yes ○

No ○

5. If yes, what made you believe that?

Hospital is nice and neat ○

Hospital is disinfected regularly ○

Hospital and health workers are neat ○

6. Have you come to the hospital sick for treatment and left worse off than you came?

Yes ○

No ○

7. Have you ever come to the hospital with a particular illness but felt you have gotten another illness or infection?

Yes ○

No ○

8. If yes, what makes you think so?

My illness worsen ○

The symptoms of my illness did not change ○

I suffered another illness ○

9. If yes what were the signs and symptoms that you acquired at the hospital yet they were not their on the day of arrival at the hospital?

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10. I take every patient infectious no matter his/her diagnosis

Yes ○

No ○

11. If yes then what scenarios at the hospital can prove to you that you can acquire an infection from another patient?

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12. The health workers (doctors, nurses) can be main transmitters of infections in between patients

Yes ○

No ○

13. If yes then what scenarios at the hospital show that a health worker can transmit the infections to the patients

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14. Do you believe that infection can be prevented by regular washing hands with water and soap and also by using sanitizers?

Yes ○

No ○

15. All body fluids except sweat should be viewed as a source of infection

Agree ○

Disagree ○

Not sure ○

Attitude

1. Health workers should wash hands before any procedure

Yes ○

No ○

2. Is it right for a health worker to handle you without gloves

Yes ○

No ○

3. Do you wash your hands within and after leaving the hospital

Always ○

Sometimes ○

Never ○

4. If yes do you wash with soap

Always ○

Sometimes ○

Never ○

5. I prefer use of sanitizer to the use of water and soap while at hospital

Yes ○

No ○

6. Give reason for your answer above

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6. Besides the reception, consulting room and laboratory do you visit other areas of the hospital such as laundry, washrooms, other wards

Yes ◯

No ◯

7. If yes give a view on their hygiene/cleanliness in regards to spreading infections

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8. If no, what prevents you from visiting such places?

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9. Do you believe spacing between beds in multi – purpose rooms prevents the spread of infections

Yes ◯

No ◯

10. Then what is your take on the spreading of beds in multi – purpose rooms in this hospital

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11. Have you used the lift or staircases at the hospital

Yes ◯

No ◯

12. Do you believe that lifts and stair case rails are a major cause of infection transmission in the hospital?

Yes ◯

No ◯

13. Do you believe that the hospital infection prevention measures are implemented at the hospital?

Yes ◯

No ◯

14. If no what shows that there is no proper implementation of the infection prevention measures at the hospital

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15. Patient safety is a priority for this hospital

Agree ○

Disagree ○

Not sure ○

16. I feel I can acquire infections from using the toilets and urinals at the hospital

Agree ○

Disagree ○

Not sure ○

17. Please comment as to why, the answer above

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18. Sinks are not available to allow me wash my hands efficiently

Yes ○

No ○

19. If my hands are not visibly dirty, there is no need to wash them before doing any activity at the hospital

Agree ○

Disagree ○

Not sure ○

20. Sinks are inconveniently located to do washing at the hospital

Agree ○

Disagree ○

Not sure ○

21. There is efficient cleaning and disinfection of the wards and hospital environment ○

Agree ○

Disagree ○

Not sure

22. If no, give your view on the cleaning pattern at the hospital

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23. In your view how many times do you think the cleaning staff should clean the floors of the wards in 24 hours' time at the hospital?

1 time ○

2 times ○

3 times ○

4 times ○

24. The health workers interact with the patients and inform them about HAIs and how to prevent them

Agree ○

Disagree ○

Not sure ○

25. The hospital doesn't provides me with PPE when mine is used up

Agree ○

Disagree ○

Not sure ○

26. How do you think government can do to improve the situation of the hygiene in the hospital?

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Practices

		Never	**Occasionally**	**All the time**
1.	I pour water in the toilets at the hospital before using it			
2.	I clear all the litter around the ward where I am admitted			
3.	I use the PPE (face masks) and beddings provided by the hospital			
4.	I wash my hands with soap and running water at the hospital			
5.	I put on a face mask all the time at the hospital			
6.	I report to the health worker in case of any signs and symptoms			
7.	I always encourage fellow patients to sanitise and wash hands at the hospital			
8.	I clean and disinfect my beddings at the hospital			
9.	I wash hands after touching the stair case hand rails			
10.	I prefer using sanitizers to washing of hands with soap at the hospital			

Thank you for taking time to fill in the questions.

Foomu ye enzikiziganya

Enzikiziganya okwetabba mu kunonyereza

Nze/ffe tukusaba okwetabba mukunonyereza okuyitibwa:

Obutegevu, endowooza ne ebikolwa bya abakozi ne abalwadde mu kwetanira endwadde ezisangibwa mu malwaliro munda mudwaliro lye kiruddu, Uganda.

Omuntu akulirwa okunonyereza kunno ayitibwa Ekakoro Newton. Okunonyereza kujja kukolebwa mu ddwaliro e kiruddu.

Ekigendererwa kyo okunonyereza kunno

- Okumanya obutegevu bwa abakozi ne abalwadde ku kwetanira endwadde ezisangibwa mu malwaliro ku ddwaliro e kiruddu
- Okwekenneenya endowooza ya abakozi ne abalwadde ku kwetanira endwadde ezisangibwa mu malwaliro ku ddwaliro e kiruddu
- Okwekenneenya ebikolwa bya abakozi ne abalwadde ku kwetanira endwadde ezisangibwa mu malwaliro ku ddwaliro e kiruddu

Enkola yokunonyereza

Osabidwa okwetabba mukunonyereza, kubanga oli omu ku bakozi/balwadde abasobola okutuyamba okutegera okumanya, endowooza ne ebikolwa bya abakozi ne abalwadde kukwetanira endwadde ezisangwa mu malwaliro.

Bwe wetabba mukunonyereza kunno, ojakusabibwa okku:

- Okudamu ebibuzo kulupapula
- Okudamu ebibuzo kuyinza okutwala edakikka 45

- Empapula ezokujuza zijja kuwebwa ku ddwaliro, era ojakudamu ebibuzo kusawa zoyagadde era nekifo kyeweyagalidde
- Ebibuzo bijja kuberamu okuyanika ensongazo ne okuggalwa ensongazo

Emiganyulo

Wayinza obutabawo emiganyulo emitereevu mukwetaba mukunonyereza kunno, naye obubaka bwowa bugyakuyamba mukuteekateeka nokuteegeka okusomesa kubyobulamu nokumannya ku kwewala endwadde esingibwa muddwaliro.

Okwenyamira oba okuyisibwa bubi

Okunonyereza kunno kutwalibwa okubera ne okwenyamira kutono. Ekyo kitegeza nti okwenyamira okukwataganyizibwa ne okunonyereza keykimu nebyo byofunna buligyo. Tewali kewnyamira kulala okumanyidwa bwewetaba mu kunonyereza kunno.

Kuliyirirwa

Tewali eyetaba mukunonyereza kunno egya kuliyirirwa

Eddembe ne ebyama

Tuggya kukuma ebivudde mu kunonyerezza kunno nga ekyama. Abantu abamu bayinzza okwetaga okulaba ebivudde mukunonyereza. Naye mumateeka buli atunula mu bivudde mukunonyeleza alinna okitwalanga ekyama. Abantu bokka abakilizibwa okutunula mu biwandiiko be:

Tiimu enonyeleza, kwotadde omunonyeleza omukulu nabbo abali kutiimu ye

Nyinza okulanga byengyizze mukunonyeleza kunno. Nebwemba nkikoze, siggya kutekako linya lyo. Siggya kulanga kintu kyonna ekisobozesa abantu okumanya nti gwe ani.

Okwetabamu kyeyagalire/okwejjulula-

Olinna okwetabamu kunonyereza kunno nga okikozze kyeyagalire. Tolinna kuwulira okupikirizibwa okwetabamu kunonyereza kunno. Oli wadembe okwetaba mukunonyereza kunno oba okwejjulula esawa yonna.

Tewajja kubera kibonerezo bwolekerawo okwetaba mukunonyereza kunno.

Osobola okufunna okuddamu kwe ebibuzo byo, ensonga oba okwemulugunya kwo

Oba olina ebibuzo byo, ensonga oba okwemulugunya ku kunonyeleza kunno, oba olabyewo ekitali kilungi, tukirira omunonyereza omukulu ku 0774837582 / 0754181240

Oba olinna ebibuzo ku dembe lyo mukunonyereza kunno, oba kwemulugunya, oba ensonga gyoyagala okutesako nomuntu ali wabweru wokunonyereza kunno, kubiri sentebe wa CIUREC Dr. Samuel Kabwigu ku (0312307400) oba sekulitale omukulu owa UNCST ku (0414 -705500).

Okwetegereza kwe enzikiriziganya

Bambi kebera box ki esinga okunyonyola okwetegereza kwe enzikiriziganya yo ku kiwandiiko kinno:

☐ Nsomye ekiwandiiko era ntegedde ebiwandikidwa ebikwatagana nokwetabba mukunonyereza kunno ne emiganyulo ne okwenyamira. Mpayo okukiriza okwetaba mu kunonyereza kunno era ngenda oku teka akabonero kange ku lupapula.

☐ Nsomye ekiwandiiko naye nkyalina ebibuzo ku kunonyereza era siwayo kukiriza kwange kwetaba mu kunonyereza

_____

Akabonero komuntu eyetaba mu kunonyereza

Olunaku

_____

Elinnya lyomuntu eyetaba mu kunonyereza

_____

Ekinkumu kyolugalo kyomuntu eyetaba mu kunonyereza

_____

Akabonero komuntu afunna okukilizibwa kwe enzikiliziganya

Olunaku

_____

Elinnya lyomuntu afunna okukilizibwa kwe enzikiliziganya

Ebibuzo bya abalwadde

Section esooka: Ebyobutonde bwa abalwadde

1. Ekikula

Mukazzi ◯

Musajja ◯

2. Olina emyaka emeka?

<20 ◯

21 – 29 ◯

30 – 39 ◯

40 – 49 ◯

>50 ◯

3. Bufumbo

Obwomu ◯

Mufumbo ◯

Wagattululwa ◯

Nnamwandu/ Ssemwandu ◯

4. Okusoma kwo

Primary ◯

Secondary ◯

Diploma ◯

Bachelor's Degree ◯

Master's Degree ◯

Other Specify; _____

Kumanya

1. Wali owulidde ku ebirwadde ebifunibwa mu ddwaliro?

Yee ○

Nedda ○

2. Oba Yee, olowooza ebirwadde binno kyeki?

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3. Oba Yee, ebirwadde binno wabiwulira wa?

Lediyo ○

Okusoma ○

Intaneeti ○

Musawo ○

Omujjanjabi ○

Televison ○

Ekilala londa; _____

4. Okiriza nti tewali ndwadde zisangibwa mu ddwaliro?

Yee ○

Nedda ○

5. Oba Yee, ki ekikulowozesa mugeri eyo?

Eddwaliro dungi ate wayonjo ○

Eddwaliro lifukibwako eddagala eritta obuwuka obuletta endwade ekiselakyona ○

Eddwaliro na abakozzi bayonjo ○

6. Wali oze muddwaliro nga oli mulwadde okufuna obujanjabi naye novawo nga olumizibwa okusinga nebwewazze?

Yee ○

Nedda ○

7. Wali oze muddwaliro nobulwadde naye nowulira nga ofunye obulwadde obulala?

Yee ○

Nedda ○

8. Oba Yee, ki ekikulowozesa otyo?

Obulwadde bwange bweyongera ○

Obubonera bwe ndwadde yange tebwakyuka ○

Nafuna obulwadde obulala ○

9. Oba Yee, bubonero ki bwe wafuna mu ddwaliro bwewali tolina kulunaku lwe wajja ku ddwaliro?

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10. Ntwala buli mulwadde nga asobola okunsigga obulwadde k'obere obulwadde bwalinna

Yee ○

Nedda ○

11. Oba Yee, mbeera ki mu ddwaliro esobola okutegeeza nti ofunye obulwadde okuva ewa omulwadde omulala?

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12. Abasawo ne abajjanjabi be basinga okusasanya obulwadde mu masekatti gga balwadde

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Yee ○

Nedda

13. Oba Yee, mbeera ki mu ddwaliro esobola okulaga nti abakozi mu ddwaliro basobola okusasanya obulwadde

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14. Okiriza nti, ebilwadde osobola okubiziyiza nga onaaba engalo na amazzi ne sabuni oba nokukozesa sanitiza?

Yee ○

Nedd ○

15. Ebya mazzi byonna ebiva mu mubiri tubi twalanga ensibuko yendwadde okugyako entuuyo.

Nzikkiriziganya ○

Mpakaanya ○

Simanyi ○

Endowooza

1. Abasawo na abajjanjabbi balina okunaaba mu ngalo ngatebanaba ku kola kintu kyonna mu ddwaliro

Yee ◯

Nedda ◯

2. Kiba kirungi omusawo oba omujjanjjabi okukolako nga tayambadde giraavu?

Yee ◯

Nedda ◯

3. Onaba engalo zo nga oli mu ddwaliro ne bwoba ovudde mu ddwaliro?

Ekiselakyona ◯

Ebiseera ebimu ◯

Sikikola ◯

4. Oba okikola, engalo ozinaba ne sabuni

Ekiselakyona ◯

Ebiseera ebimu ◯

Sikikola ◯

5. Neyunira sanitiza okusinga amazzi nga ndi mu ddwaliro

Yee ◯

Nedda ◯

6. Wa ensonga kulwakyi ozemu bwotyo mu No. 5

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6. Okugyako webaniriza abalwadde nabagenyi, gyebekennenya waliwo ebifo ebilala byo kyalira mu ddwaliro nga gyebolezza engoyye, ebinabiro, awakyamirwa, oba ebisenge ebilala ebya abalwadde?

Yee ◯

Nedda ◯

7. Oba Yee, tuuwe ku ndowooza yo ku buyonjo ne endabika ye bifo bino ku kusasanya obulwadde

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8. Oba nedda, ki ekikuziyiza okutuka mu bifo binno?

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9. Okiriza nti ebitanda okubiwa amabanga mu bisenge omuli abalwadde abangi ki ziyiza okusasana kwobulwadde

Yee ◯

Nedda ◯

10. N'olwekyo nsonga ki gyolina ku ngeri ebitanda gye biwebwamu amabanga mu ddwaliro linno.

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11. Wali okozesako lift oba amadala mu ddwaliro lino?

Yee ◯

Nedda ◯

12.Okiriza nti lift ne ebyuma byokwatako nga oka amadala bye bisinga okusasanya obulwadde mu ddwaliro?

Yee ◯

Nedda ◯

13.Okikiriza nti enkola eziziyiza okusasana kwobulwadde mu ddwaliro kutekebwa munkola bulungi mu ddwaliro lino?

Yee ○

Nedda ○

14. Oba nedda, ki ekilaga nti enkola eziziyiza okusasana kwobulwadde mu ddwaliro tekutekebwa munkola bulungi

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15. Obukumi bwa abalwadde eddwaliro lino kye lisinga okwetanira

Nzikkiriziganya ○

Mpakaanya ○

Simanyi ○

16. Endowooza nsobola okufuna obulwadde bwenkozesa awakyamirwa ne ebinabiro ku ddwaliro

Nzikkiriziganya ○

Mpakaanya ○

Simanyi ○

17. Mwattu nyoyola lwaki ozemu bwotyo mu No. 16

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18. Ebinabilwamu engalo tebiliwo kunzikiriza kunaba mungalo bulungi

Yee ◯

Nedda ◯

19. Engalo zange wezibba tezilabika kuba nkyafu, tewali nsonga lwaki nzinaba nga sinakola kintu kyonna mu ddwaliro

Nzikkiriziganya ◯

Mpakaanya ◯

Simanyi ◯

20. Ebyokunabilamu engalo tebitekedwa mubifo ebilungi oku nzikiriza okunaba mungalo ku ddwaliro

Nzikkiriziganya ◯

Mpakaanya ◯

Simanyi ◯

21. Okuyonjja ne okufuyira eddagala elitta obuwuka obuletta endwadde mu bisenge ne dwaliro bikolebwa bulungi

Nzikkiriziganya ◯

Mpakaanya ◯

Simanyi ◯

22. Oba nedda, wa ensonga yo ku ngeri gyebayonjja eddwaliro

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23. Mundowoza yo emilundi emeka abakozi ku ddwaliro gye balina okuyonjja ebisenge byabalwadde mulunaku olulamba?

Mulundi gumu ◯

Milundi ebbili ◯

Milundi esatu ◯

Milundi enna ◯

24. Abasawo na abajjanjabi banyumya nabalwadde nebaba bulira ku ndwadde ezisangibwa mu ddwaliro ate nengeri yokuzewala

Nzikkiriziganya ◯

Mpakaanya ◯

Simanyi ◯

25. Eddwaliro teligaba bituyamba kuziyiza ndwadde nga ebyange biwedewo

Nzikkiriziganya ◯

Mpakaanya ◯

Simanyi ◯

26. Olowoza gavementi esobola okukola ki oku tereza ensonga yobuyonjo mu ddwaliro?

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Enkola

		Sikikola	**Ebiseera ebimu**	**Ekiselakyona**
1.	Ngiwa amazzi mukabuyonjo mu ddwaliro ngasinaba kugikozesa			
2.	Nonda kasasiro yenna ali mukisenge kye bantademu ne nyonjjawo bulungi			
3.	Nkozesa ebiziyiza okufuna endwadde nga mask namasukka ebiwebewa eddwaliro			
4.	Nazza engalo ngankozesa sabuni ne amazzi ku ddwaliro			
5.	Nyambaa mask buli kisera mu ddwaliro			
6.	Ndopa ewa omusawo oba omujjanjjabi bwendaba obubonero bwendwadde yommu ddwaliro			
7.	Nkubirizanga abalwadde banange oku kozesa sanitiza nokunaba mungalo mu ddwaliro			
8.	Nyonjja, nokufeyirira edagala engoye zange mu ddwaliro			
9.	Nabba mungalo nga nvakukwata ku bumma obuli ku madala			
10.	Nkozesa sanitiza okusinga okunaba engalo ne sabuni na amazzi			

Webale nnyo okutwala budde okujuzamu ebibuzo

Acceptance letters