Factors Influencing the Attitude and Practice of Nurses Towards Prevention of Nosocomial Infection in Lagos State University Teaching Hospital, Ikeja Lagos State.

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Abstract
Nosocomial infections are defined as new infections, either localized or systemic, that occur in patients receiving medical care in hospitals or other healthcare settings. These infections are a major cause of death and increased morbidity among hospitalized patients and healthcare workers. This study investigated the factors affecting nurses' attitudes and practices regarding the prevention of nosocomial infections. Utilizing a descriptive survey research design and purposive sampling of 260 respondents, the study found that while nearly all clinical nurses at the surveyed hospital had sufficient knowledge about preventing nosocomial infections, not all applied this knowledge. Although 70% were aware of prevention methods, only 74.6% consistently washed their hands after every procedure. Additionally, 95% of respondents reported that personal protective equipment (PPE) was not always available in adequate amounts for all healthcare workers, highlighting the importance of resource availability in preventing nosocomial infections. Furthermore, 76.4% of respondents did not view handwashing after each procedure as a waste of time, indicating that time constraints also influence infection prevention practices. In summary, the study found that while most respondents had good knowledge of nosocomial infection prevention, several factors hindered their ability to implement effective practices.

Keywords: Attitude, Knowledge, Nosocomial Infection, Practice, Prevention.

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CHAPTER ONE
Introduction
1.1 Background To The Study
Hospital-acquired infections (HAIs), also known as nosocomial infections, can be either localized or systemic. Healthcare workers (HCWs) often contract these infections through their interactions with patients during examinations and various daily tasks, such as collecting, processing, and disposing of specimens, as well as handling medical equipment. Conversely, patients typically acquire these infections while they are hospitalized.
Symptoms of these infections typically manifest 48–72 hours after a patient is admitted to a healthcare facility or within 10 days following discharge. People of all ages can be affected, but those with weakened immune systems, the elderly, and children are particularly vulnerable. These infections can significantly impair the quality of healthcare services. According to a 2011 report from the US Centers for Disease Control and Prevention (CDC), there were 37,000 deaths associated with HAIs in the US, compared to 111,000 in Europe. These infections contribute to around 16 million hospital admissions annually, placing substantial financial and operational strain on the healthcare system (Elham M. Khatrawi, Priyadarshi Prajjwal, Muhammad Farhan, Pugazhendi Inban, Shraddha Gurha, Saud M. S. Al-ezzi, Mohammed D. M. Marsool, Prerna Ahuja, and Mohammed, 2023).
Healthcare professionals are frequently exposed to microorganisms, many of which can lead to serious or even fatal infections. Nurses, in particular, are often at risk of infection through their routine care and daily activities.
Nosocomial infection (NI), also known as hospital-acquired infection (HAI) or healthcare-associated infection (HCAI),

refers to infections that occur during the course of care but were not present at the time of the patient's admission to the hospital or other healthcare facility (Nejad, Allengranzi, Syed, Ellis, and Pittet, 2011). It is estimated that the risk of acquiring such infections is 2 to 20 times higher in developing countries compared to developed ones, where 5% to 10% of hospitalized patients contract these infections (World Health Organization, 2008).

Many infection control measures, such as proper hand hygiene and correct application of basic precautions during invasive procedures, are straightforward and inexpensive but require staff accountability and behavioral changes. Enhancing staff education and improving reporting and surveillance systems are also crucial (Bouallegue et al., 2013). The human factor is significant in influencing the likelihood of contracting nosocomial infections. Adequate nursing staff levels are essential because a higher patient-to-nurse ratio increases the risk of these infections (Clifford et al., 2023).

Nosocomial infections can also be acquired from the environment or staff within a healthcare facility. These infections can spread through various means, including contaminated equipment, bed linens, and air droplets. Epidemiological studies indicate that such infections can be transmitted through direct person-to-person contact, contaminated equipment, and medical procedures (WHO, 2008; CDC, 2009). The affected areas depend on the virulence of the pathogens, their accessibility to patients, and the patients' susceptibility. Common types of nosocomial infections include those affecting the urinary tract, surgical wounds, respiratory system, and bloodstream.

The WHO reports that there are 7.1 million cases of hospital-acquired infections annually, affecting 1 in 20 individuals. These infections lead to approximately 99,000 deaths each year and impose an estimated societal cost of $32 million (Cardo, 2010). Although healthcare professionals are expected to have sufficient knowledge of infection control at the time of their professional training, evidence shows that infections continue to be transmitted by healthcare workers, with nurses being particularly involved due to their extensive patient contact. Understanding nurses' knowledge and practice regarding infection prevention could offer solutions to address this healthcare issue. Despite the high prevalence of infections upon patient admission, healthcare providers also act as vectors for pathogenic agents. Hospitals create environments conducive to the spread of nosocomial infections due to factors like inadequate infection control practices, patient overcrowding, and the need for reservoirs, susceptible hosts, and modes of transmission for pathogens. Many infections are spread due to lapses in control measures such as disinfectant use, glove usage, and hand sanitizer application (Clifford, 2022). Research has shown that measures like handwashing can reduce the incidence of nosocomial infections, yet compliance remains low even with the availability of hand sanitizers. This study aims to evaluate the factors influencing nurses' attitudes and practices towards the prevention of nosocomial infections at Lagos State University Teaching Hospital, Ikeja, Lagos.

1.2 Statement of Problem

Nosocomial infections are recognized as significant issues that negatively affect the quality of healthcare and contribute to adverse healthcare outcomes. Literature highlights that these infections have severe repercussions on patient safety, including prolonged hospital stays, increased healthcare costs, economic strain on patients and their families, and even death (William López-Quintero et al., 2021). Transmission of these infections often occurs during medical procedures when healthcare workers, including nurses, fail to adhere to aseptic techniques. Despite advancements in healthcare systems, the risk of nosocomial

infections persists. Semmelweis (2008) demonstrated that handwashing and the use of sanitizers are effective in reducing the incidence of such infections, yet compliance with these practices among healthcare workers, particularly nurses, remains inadequate.

This research aims to evaluate the factors that influence nurses' attitudes and practices concerning the prevention of nosocomial infections at Lagos State University Teaching Hospital, Ikeja, Lagos.

1.3 Objectives Of Study

The study aims to:

1. Evaluate the factors affecting nurses' knowledge about preventing nosocomial infections at Lagos State University Teaching Hospital (LASUTH).
2. Examine the correlation between the availability of resources and the effectiveness of nosocomial infection prevention at LASUTH.
3. Investigate how time constraints impact the prevention of nosocomial infections among nurses at LASUTH.

1.4 Significance Of Study

The results of this study will provide valuable benefits to various groups:

- **Nurses:** The research will enhance their understanding of how to prevent nosocomial infections.
- **Patients/Clients:** It will significantly improve their overall health and safety.
- **Student Nurses:** The findings will serve as a useful resource for student nurses during their clinical training.
- **Future Researchers:** The insights gained will be useful for researchers conducting similar studies in the future.

1.5 Research Questions

1. What is the level of knowledge of nurses in the prevention of nosocomial infection?
2. What is relationship between availability of resources in the prevention of nosocomial infection?
3. What is the relationship between time constraint in the prevention of nosocomial infection?

1.6 Research Hypothesis

1. There is no substantial link between nurses' knowledge levels and the prevention of nosocomial infections.

2. There is no notable connection between time constraints and the prevention of nosocomial infections.

1.7 Scope Of Study

This research was carried out at LASUTH and includes all registered nurses across various ranks, both senior and junior nursing staff.

1.8 Limitations

• The researcher have limited time to conduct an in-depth study.
• The researcher need to balance academic responsibilities with the task of gathering data for the research.

1.9 Operational Definitions of Terms

- **Nosocomial Infection:** Infection acquired from the hospital environment
- **Attitude:** An opinion about something
- **Practice:** This is the actual application or use of an idea, belief or method as opposed to theories relating to it.
- **Prevention:** Is act of stopping something from happening
- **Factors:** A variable that influences the prevention of nosocomial infection.
- **Influence:** The impact that something has on the way that a person thinks or behaves or on the way that something works or developed.

- **Nurses:** Highly skilled healthcare providers.

CHAPTER TWO

Literature review

2.0 introduction

Nejad, Ellis, and Pirate (2011) defined nosocomial infection as an infection acquired during the process of receiving care, which was not present or apparent at the time of a patient's admission to a hospital or healthcare facility. It has been estimated that the risk of healthcare-associated infections is 2 to 20 times higher in developing countries compared to developed countries, with 5% to 10% of patients in developed countries acquiring such infections during hospital stays.

Nosocomial infections are also described as infections that were neither present nor incubating at the time of admission to a healthcare facility. Most infections that become clinically evident after 48 hours of hospitalization are considered hospital-acquired.

Additionally, nosocomial infections can be defined as infections contracted from the healthcare facility's environment or staff. These infections are transmitted to vulnerable patients in clinical settings through various means, such as contaminated equipment, bed linens, air droplets, and other sources. Healthcare professionals, especially nurses, are frequently exposed to microorganisms that can cause serious or even fatal infections during their routine activities (Kosgerolu, Ayranci, Vardarel, and Dincer, 2008). The infection may originate from external sources, another infected patient, infected staff members, or, in some cases, the source may remain unknown. Sometimes, the infection arises from the patient's own normal skin flora, which becomes opportunistic following surgery or procedures that compromise the skin barrier. Even in these cases, the infection is still classified as nosocomial since it developed in a healthcare setting.

Nosocomial infections can lead to serious conditions such as pneumonia, urinary tract infections, bloodstream infections, and other severe illnesses. Many of these infections are challenging to treat due to antibiotic resistance. They typically occur:

- Within 48 hours of hospital admission
- Up to 3 days after discharge
- Up to 30 days after surgery

2.1conceptual review

According to the WHO (2008), there are approximately 7.1 million cases of hospital-acquired infections annually. One in every 20 individuals contracts a hospital-acquired infection, leading to 99,000 deaths per year and costing society an estimated $32 million. These infections result in serious complications that negatively affect hospital care:

i. Worsening the prognosis of the patient's primary illness
ii. Increasing mortality rates
iii. Prolonging hospital stays
iv. Reducing patients' quality of life

Additionally, they demand costly investigations, treatments, and control measures, raising healthcare costs (Scott Stewart et. al., 2021).

2.1.0 Types of Nosocomial Infections

Nosocomial infections have various causes, including:

i. Pneumonia
ii. Bloodstream infections
iii. Urinary tract infections
iv. Surgical site infections
v. Gastrointestinal infections
vi. Central nervous system infections
vii. Catheter-related infections
viii. Respiratory tract infections other than pneumonia (WHO, 2010; L.F Pittet et. al., 2021).

2.1.1Pneumonia

Hospital-acquired pneumonia is one of the most common and life-threatening nosocomial infections, particularly

associated with the use of mechanical ventilators. Ventilator-associated pneumonia occurs in around 20% of patients who are on ventilators for over 48 hours, resulting in longer hospital stays, increased antibiotic use, higher mortality, and higher costs. Nosocomial pneumonia is especially prevalent in intensive care units (ICUs), with the infection rate among ventilated patients reaching 3% per day (Martins et. al., 2022). Although ventilator-associated pneumonia has a high fatality rate, determining the exact risk is difficult due to high patient comorbidity.

Microorganisms that colonize the stomach, upper airway, and bronchi often cause pneumonia, with infections spreading to the lungs. These organisms are typically endogenous (from the digestive system or nose and throat) but can also be exogenous, often originating from contaminated respiratory equipment. Gram-negative organisms are the primary cause of hospital-acquired pneumonia, particularly Pseudomonas aeruginosa, Staphylococcus aureus, and Enterobacter species. Between 1986 and 2003, Acinetobacter species were the only gram-negative bacteria that significantly increased as a cause of ICU pneumonia. Their resistance to antibiotics, especially carbapenems, has created significant treatment challenges (L. Nicholson et. al., 2021).

A recent survey found that 26.4% of 679 P. aeruginosa isolates and 36.8% of 427 Acinetobacter baumannii isolates causing ventilator-associated pneumonia were resistant to carbapenems. Recent hospitalizations, antibiotic exposure, and residence in long-term care facilities are the most significant risk factors (S. Blot et. al., 2022).

2.1.2 Bloodstream Infection

a) Localized: peripheral thrombophlebitis, abscesses
b) Systemic: bacteremia, sepsis, endocarditis, metastatic infection

Bloodstream infections are life-threatening and are most commonly linked to central vascular catheter use. These infections may also be associated with gram-negative organisms in other areas, such as the lungs, genitourinary tract, or abdomen. Given an appropriate portal of entry, nearly any gram-negative organism can cause a bloodstream infection, with Klebsiella species, Escherichia coli, Enterobacter species, and P. aeruginosa being the most common. As with hospital-acquired pneumonia, emerging antibiotic resistance, particularly against extended-spectrum cephalosporins and carbapenems, is a growing concern (Thomas et. al., 2020).

Sources of Infection:

- Contamination during catheter or cannula insertion
- Later contamination from skin along the catheter
- Contaminated catheter hub or line during manipulation
- Contaminated intravenous fluids
- Hematogenous spread from another infection site

Influencing Factors:

- Insertion site: subclavian, jugular, femoral

Clinical Features of Bloodstream Infection:

- Local signs of inflammation at the insertion site: redness, tenderness, swelling, slight purulent discharge (more common in peripheral lines than central lines)
- Systemic signs: fever, rigors, and no other source of infection
- Clinical improvement after catheter removal
- Elevated inflammatory markers and pathogens in blood cultures

Management of Line-Related Sepsis:

i. Blood culture
ii. Catheter removal and culture of its tip
iii. Antibiotic therapy if symptoms persist after catheter removal, guided by culture

results
iv. For long-term catheters: catheter treatment

Prevention and Control:

i. Appropriate choice of catheter and insertion site
ii. Aseptic and atraumatic insertion (skin disinfection, barrier precautions), proper fixation to the skin
iii. Sterile preparation of total parenteral nutrition (TPN) bags
iv. Minimized opening of the IV set for additives, with strict aseptic technique for each opening
v. Adequate hygiene and regular dressing of the insertion site, with frequent review
vi. Timely replacement of the giving set and catheter:
a. Every 72 hours for giving sets, or 24 hours if lipid emulsions or blood products are used
b. Peripheral catheter every 48 hours, central catheter every 7 days, tunneled lines for longer durations
c. Removal of the catheter when no longer necessary (Thomas et. al., 2020).

2.1.3 Urinary Tract Infections

Gram-negative organisms are the most common cause of hospital-acquired urinary tract infections, with nearly all cases linked to urethral catheterization. After the second day of catheter use, the risk of bacterial infection is estimated to increase by 5% to 10% per day. Key risk factors include diabetes, female gender, and being over the age of 50. Although most cases are asymptomatic, there is a risk of ascending infections, such as pyelonephritis, bacteremia, and sepsis. The most effective management strategy is catheter removal, rather than antibiotic treatment.

Prevention:

i. Catheterization only when absolutely necessary
ii. Sterile and atraumatic catheter insertion
iii. Use of closed sterile drainage systems
iv. Ensuring proper patient hygiene
v. Timely replacement of the catheter
vi. Regular bacteriological screening of urine cultures (WHO, 2010).

2.1.4 Routes of Transmission

Route	Description
Contact transmission	The most important and frequent mode of transmission of nosocomial infections is by direct contact which involves body surface to the body surface contact and physical transfer of microorganisms between a susceptible host and infected or colonized person
Droplet transmission	Transmission occurs when droplet containing microbes from the infected person are propelled a short distance through the air and deposited on the patient body; droplets are generated from source person mainly by coughing, sneezing, and talking, during the performance of certain procedures, such as bronchoscopy.
Airborne transmission	Dissemination can be either airborne droplet nuclei (small – particles residue of evaporated droplets containing microorganisms that remain suspended in the air for long period of time) or dust particles containing the infectious agent. Microorganism carried in this manner can be dispersed widely by air currents and may become inhaled by a susceptible host within the same room or over a longer distance from the source patient, depending on environment factors; therefore, special sir-handing and ventilation are required to prevent airborne transmission.

Common vehicle Transmission	This applies to microorganism transmitted to the host by contaminated items, Such as food, water, medication, devices, and equipment
Vector borne Transmission	this occur when vectors such as mosquitoes, flies, rats, and other vermin transmit Microorganisms.

(Price and Monarca, 2009).

2.1.5 General Measures for Preventing Nosocomial Infections

These guidelines have been created for healthcare workers involved in patient care, especially in wards and critical care units, and for those responsible for infection surveillance and control in hospitals.

Isolation

Isolation is a precautionary method designed to prevent the spread of microorganisms through common transmission routes in hospitals. Since controlling agent and host factors is challenging, preventing transmission is the main focus. This includes isolating infectious patients in specialized hospitals or rooms, such as those with infected wounds or patients who have undergone joint transplants.

To assess the need for isolation, screen all patients for the following:

i. Neutropenia or immune disorders
ii. Diarrhea
iii. Skin rashes
iv. Known communicable diseases (e.g., tuberculosis)
v. Known carriers of epidemic bacterial strains

There are two types of isolation:

i. **Protective Isolation**: For neutropenic or immunocompromised patients, to reduce their risk of contracting opportunistic infections.
ii. **Source Isolation**: For patients who are colonized or infected, to minimize transmission to other patients or healthcare staff.

Isolation rooms should have tightly fitting doors, glass partitions for observation, and ventilation systems that provide negative pressure (for source isolation) or positive pressure (for protective isolation) (Guideline for Isolation Precaution, 2012).

Hand Hygiene

Hand hygiene refers to cleaning hands with soap and water or antiseptic hand rub to remove transient microorganisms and maintain cleanliness. It is one of the simplest and most effective ways to prevent infections. However, around 50% of healthcare-associated infections occur due to inadequate hand hygiene by healthcare providers.

Hand Washing

Frequent hand washing is considered the single most important practice to reduce the risk of transmitting microorganisms from one person to another or between different areas on the same patient.

Moments for Hand Washing:

i. Before touching a patient – to protect the patient from harmful germs on your hands
ii. Before performing aseptic procedures – to protect the patient from harmful germs, including their own
iii. After exposure to bodily fluids – to protect both the patient and healthcare provider from harmful germs
iv. After touching the patient's surroundings

– to protect yourself and the healthcare environment from harmful germs

Washing hands promptly and thoroughly between patient interactions and after contact with blood, bodily fluids, secretions, excretions, and contaminated equipment is crucial for infection control. Studies show that 40% of nosocomial infections among immunocompromised patients are linked to healthcare workers' contaminated hands. The goal of hand hygiene is to eliminate transient flora through proper hand washing techniques using regular or antiseptic soap, or alcohol-based hand gels. Research from the Robert Koch Institute (2022) supports the finding that improved hand hygiene compliance, including the use of alcohol-based hand rubs, can reduce nosocomial infection rates by as much as 40% (Kramer et. al., 2022).

Gloves

Along with hand washing, gloves are essential in reducing the risk of microorganism transmission. Gloves serve three main purposes in hospitals:

i. To provide a protective barrier for healthcare workers, preventing contamination when touching blood, bodily fluids, secretions, excretions, mucous membranes, or non-intact skin

ii. To reduce the likelihood that microorganisms on healthcare workers' hands will be transferred to patients during care procedures involving contact with mucous membranes or non-intact skin

iii. To prevent transmission of microorganisms from one patient to another through healthcare workers' hands or fomites

Gloves must be changed between patient interactions, and hand washing is necessary after glove removal. Wearing gloves does not eliminate the need for hand hygiene, as gloves may have small, undetected defects or tear during use, allowing hands to become contaminated. Failure to change gloves between patient contacts poses a significant infection control risk. Some nurses mistakenly believe that hand hygiene is unnecessary after glove use (Tavolacci et. al., 2010).

2.1.6 Factors Affecting Proper Hand Washing and Use of Sanitizer

i. Lack of hygiene resources, such as access to personal towels or tissue paper for drying hands, impacts hand hygiene practices.

ii. When towels or tissue paper are unavailable or inaccessible, wet hands can deter effective hand hygiene.

iii. Training on hand hygiene compliance has been found to significantly improve adherence among healthcare providers.

iv. High workloads, especially when wards are at full capacity, make it difficult to maintain proper hand hygiene practices.

2.1.7 Prevalence of Nosocomial Infections

A substantial body of literature explores the prevalence, incidence, and risk factors of nosocomial infections, along with their transmission and the associated societal and healthcare costs (Jones, 2021; Zhan et. al., 2021; Klevens et. al., 2023). The overall morbidity, mortality, and excess costs from these infections continue to increase, regardless of the patient's age or diagnosis. Nosocomial infections are especially prevalent in hospitalized children and neonates in intensive care units. According to Richards et. al. (2009), infants under two months are more vulnerable to nosocomial infections than older children, with bloodstream infections being the most common across all age groups. Neonates are at risk due to exposure to microorganisms during healthcare procedures. Therefore, extra caution is required during such procedures. Epidemiological studies also show that nosocomial infections are common in adults and the elderly. Elderly patients, particularly those receiving medical care, are highly susceptible to these infections due to weakened immune defenses, making them more prone to pathogen invasion. Respiratory and genitourinary infections are the most

frequent nosocomial infections in the elderly (Bouallgue et. al., 2013; Maselli et. al., 2011). Regardless of the affected system or the responsible pathogens, nosocomial infections significantly contribute to morbidity, mortality, prolonged hospital stays, and increased use of healthcare resources in the elderly population.

2.1.8 Factors Affecting Implementation of Nosocomial Infection Control

Several factors impact the effective implementation of nosocomial infection control:

i. **Excessive workload on nurses**: When nurses are overloaded with patients, they may avoid using infection control measures, such as not wearing appropriate protective gear (e.g., face masks) when dressing a wound (Azuka et. al., 2022).

ii. **Lack of knowledge**: Some nurses lack adequate knowledge of infection control protocols, leading to non-compliance with standard precautions and exposing both nurses and patients to infections.

iii. **Limited resources**: Resource constraints, such as staff shortages or lack of a constant water supply, contribute to poor adherence to infection control measures (Hanmore et. al., 2014).

iv. **Insufficient time**: Due to time constraints, nurses may rush through patient care tasks during their shifts, neglecting to implement proper infection control practices, such as thorough hand washing or using personal protective equipment (Henry et. al., 2020).

2.2. EMPIRICAL REVIEW

The empirical framework relies on observable and measurable phenomena, drawing knowledge from real-world experiences rather than theoretical assumptions or beliefs.

A descriptive study assessing the level of knowledge and practices among trained nurses regarding the prevention of hospital-acquired infections revealed that, although most nurses had sufficient knowledge about preventing nosocomial infections, not all adhered to the practices due to a lack of equipment and poor working conditions.

Hamid et. al. (2020) further found that factors such as age and years of work experience did not significantly influence nurses' knowledge or implementation of nosocomial infection control measures.

In another study conducted with nurses working in surgical wards at Azady Training Hospital in Kirkuk, it was found that most nurses had not received training on infection control and had not participated in continuous education programs on the subject.

Ogoina et. al. (2015) reported that despite good knowledge of hand hygiene practices among healthcare workers, particularly nurses at a tertiary hospital in Kano, Nigeria, the lack of sufficient water supply and other factors negatively impacted adherence to hand hygiene practices.

2.2.1 Factors Influencing Nurses' Knowledge in Preventing Nosocomial Infections

Numerous studies highlight the critical role of education in preventing nosocomial infections. Research into the knowledge and attitudes of healthcare personnel regarding the transmission of nosocomial infections across different patient groups suggests that education is key to preventing and controlling these infections.

One study assessed disinfection and sterilization practices in hospital operating units while evaluating the knowledge and attitudes of 216 nurses from 16 hospitals over three months. Using a survey that included questions on knowledge and attitudes, and employing regression analysis, the study examined the relationship between variables such as knowledge, disinfection and sterilization practices, and the use of protective measures. The results showed that most respondents acquired their knowledge about nosocomial infection prevention from continuing education, colleagues, and mass media. Despite this,

95% expressed a desire for further learning on infection transmission prevention. The study found that some nurses lacked comprehensive knowledge about disinfection and sterilization procedures, indicating that targeted educational programs could significantly reduce infection rates.

Gon et. al., (2020) explored healthcare workers' adherence to hand hygiene following interventions. These interventions included problem-based and task-oriented hand hygiene education, training on handling and nursing care, and the provision of alcohol-based antiseptics. A follow-up assessment two months later showed increased hand hygiene compliance among nurses before and after patient contact during risky procedures. This improvement led to a noticeable reduction in nosocomial infections and shortened hospital stays, from 11 to 6 per 1000 patient-days. These findings suggest that targeted educational programs can enhance hand hygiene compliance and reduce nosocomial infections.

Similarly, Berhe et. al., (2021) evaluated adherence to infection control practices using self-reports and assessed the motivational factors for compliance and beliefs about nosocomial infection prevention. Registered nurses reported better compliance with contact isolation compared to other healthcare workers, with 77% adhering to hand hygiene practices before and after patient contact. Patient safety was identified as a key motivator for this compliance.

Emergency departments (EDs) are particularly challenging environments due to the high prevalence of infectious diseases and the increased likelihood of exposure to blood and bodily fluids. EDs have higher infection rates compared to patient wards or intensive care units (ICUs) because 70% of nursing activities in these settings increase the risk of infection. Thus, systematic infection control in EDs is essential to prevent both hospital-acquired and community-acquired infections. Despite this, EDs often have lower compliance with safety precautions compared to outpatient clinics, patient wards, and ICUs, due to frequent emergencies and limited organizational resources. Compliance is influenced by both individual nurse characteristics and the organizational environment. The ecological systems theory suggests that the interaction between humans and their environment is crucial, emphasizing the need to consider organizational factors when analyzing compliance with safety precautions (Kim and Lee et. al., 2021). Although the impact of organizational factors on compliance has been under-researched, it is evident that organizational features, such as hand hygiene facilities, staffing, and infection control culture, affect compliance. Identifying these factors is essential for understanding and improving adherence to safety precautions in EDs.

Previous research on internal factors affecting compliance with safety precautions has identified general characteristics, such as education level, and specific traits, including self-efficacy, knowledge, and attitudes toward safety precautions. While self-efficacy, knowledge, and attitude were found to be correlated, education level and awareness emerged as significant predictors. However, these studies provided limited insight into the individual-level factors influencing nurses. Ethical awareness among nurses is linked to patient safety management and adherence to practice guidelines. In emergency departments (EDs), where time constraints and urgent situations often prevail, ethical awareness becomes crucial for ensuring compliance with safety precautions. Therefore, examining how ethical awareness impacts ED nurses' adherence to safety protocols is essential.

Organizational factors affecting compliance with safety precautions include the infection control culture, size, type of ED, and overall safety environment. Variations in facilities, equipment, and human resources influence

not only the nurse-to-patient ratio in emergency settings but also the development of an organizational culture focused on infection control and safety (Kim and Lee et. al., 2021).

Most previous research has focused on general self-efficacy as a predictor of compliance with safety precautions (Kim and Park et. al., 2020; Song et. al., 2022; J.D. Rosinski et. al., 2023). However, general self-efficacy does not adequately capture self-efficacy in specific work-related contexts. This study is notable for its focus on safety precaution (SP) self-efficacy, specifically measuring nurses' confidence in adhering to SPs. Future research should explore how SP self-efficacy impacts compliance among emergency department (ED) nurses.

While no previous studies have directly examined the link between ethical awareness and compliance with SPs among ED nurses, our findings align with earlier research showing that increased ethical awareness enhances adherence to patient safety practices, including infection control. Ethical awareness has been identified as a predictor of infection control behaviors among nurses. The current study highlights the influence of ethical awareness on infection control practices and suggests the need for further research on how ethical awareness and other individual-level factors impact compliance with SPs.

In summary, compliance with SPs among ED nurses is affected by a combination of a supportive organizational culture for infection control, individual self-efficacy, and ethical awareness. The organizational culture for infection control had a significant impact, accounting for 55.4% of the variation in compliance. This underscores the importance of developing a feedback system and enhancing communication and teamwork to cultivate a positive organizational culture. To improve SP compliance, organizations should implement educational programs focused on SP self-efficacy and ethical awareness, and adopt robust policy interventions targeting organizational factors such as the culture of infection control (Kim and Lee et. al., 2021).

2.2.1.0 Behavioral Perspectives

A crucial factor in limiting the spread of nosocomial infections is healthcare workers' adherence to infection control practices. Social cognitive models can be utilized to assess the behavioral determinants influencing healthcare workers' hand hygiene practices and, consequently, the transmission of nosocomial infections. Research examining the link between cognitive factors, workload in a nursery unit, and nurses' compliance with hand hygiene practices found that perceived behavioral control and intention were significant predictors of hand hygiene adherence (O'Boyle et. al., 2020).

Additionally, some studies have found that key motivators for compliance with hand hygiene practices among healthcare workers include perceived behavioral control and intention. For instance, Lankford et. al., (2022) conducted an observational study that examined the factors influencing adherence to hand hygiene practices among healthcare workers. The study found that healthcare workers were significantly less likely to wash their hands if they were in a room with a peer or higher-ranking individual who did not perform hand hygiene. Similarly, studies by Pittet and colleagues (2010) and Sax et. al., (2007) indicated that the primary determinants for compliance with hand hygiene practices were the behavior of other healthcare workers, normative beliefs, control beliefs, and attitudes.

The factors identified as predictors for adherence to protocols aimed at reducing the transmission of nosocomial infections included acting as a role model, peer pressure (stemming from perceived expectations from colleagues), perceived positive opinion or pressure from superiors or important referents—such as administration, perceived control over hand hygiene behavior, positive attitudes toward

hand hygiene after patient contact, perceived risk of infection during patient contact, perceived high public health threat, and belief in the benefits of performing hand hygiene to protect healthcare workers from infection.

These findings suggest that behavioral perspectives are significant contributors to healthcare workers' noncompliance with recommended protocols to prevent the spread of nosocomial infections. Therefore, these factors should be considered when planning and implementing quality patient care. Literature also indicates that a lack of knowledge, experience, and education; absence of rewards or encouragement; lack of role models from colleagues or supervisors; lack of institutional priority for hand hygiene; lack of active participation in hand hygiene promotion at both the individual and institutional levels; and lack of institutional guidelines significantly contribute to low compliance with hand hygiene practices among healthcare workers.

Several studies have documented that healthcare workers can contaminate their hands or gloves with various microorganisms while performing procedures that involve touching patients' intact skin. Existing literature suggests a strong link between poor compliance with recommended infection control guidelines by healthcare workers and the transmission of pathogens, some of which become resistant to antibiotics and other chemotherapeutic agents. The following paragraphs will address the role of nurses in the transmission of nosocomial infections. It is well-established in numerous studies that nurses may contribute to the spread of nosocomial infections due to their frequent and direct contact with patients.

Pittet and colleagues (2007) conducted a study using microbiological assays to assess the extent of contamination on healthcare workers' hands before and after engaging in patient care activities, such as wound care, intravenous catheter care, respiratory tract care, and handling of patients' secretions. The study found that the number of bacteria recovered from nurses' fingertips often exceeded 300 per milliliter. This indicates that patient care activities involving direct contact, particularly those related to respiratory tract care, are likely to result in the contamination of healthcare workers' hands with bacteria.

Additionally, multiple studies have documented that nosocomial infections persist across various patient age groups and healthcare facilities or units, suggesting that hands are likely the most common mode of transmission. However, findings indicate that the proper application of aseptic precautions by healthcare personnel can significantly reduce the spread of nosocomial infections. Moreover, improving hand hygiene compliance and incorporating recommended practices into nursing care protocols are crucial for reducing the incidence of these infections (Pessoa-Silva and colleagues, 2007).

2.2.1.1 Impact of Nosocomial Infection

Research has identified three main burdens that nosocomial infections place on the healthcare system: the increased cost of quality healthcare, the unnecessary loss of lives, and financial strain. Additionally, nosocomial infections pose significant problems for patient safety, leading to prolonged hospital stays (ranging from 7 to over 25 days), elevated healthcare costs, and higher mortality rates. These issues are particularly severe for high-risk groups, such as hospitalized neonates and immunocompromised adults (Pittet et. al., 2011).

2.2.1.2 Safe Injection Practices

The World Health Organization (WHO) defines a safe injection as one that uses appropriate equipment, does not harm the recipient, does not expose the provider to avoidable risks, and does not result in hazardous waste (WHO, 2002). Unsafe injection practices include using the same needle or syringe for multiple patients,

recapping used needles, improper disposal of syringes and needles, and administering unnecessary injections (Luby, 2001). WHO reported that 17-19% of injections performed in Sub-Saharan Africa in 2000 were unsafe (Ezzati, Lopez, Rodgers, & Murray, 2004).

A 2005 study in South Africa revealed that syringe reuse was common among healthcare workers (HCWs), with many believing that changing the needle but not the syringe was sufficient for safety. Moreover, 30% of HCWs did not consider using a new needle for each patient important (Shisana, Mehtar, Mosala, & Zungu-Dirwayi, 2005). In contrast, a study in Zambia's Ronald Ross Hospital found no reported cases of needle or syringe reuse. In this study, 62.3% of used syringes and needles were disposed of in improvised sharps containers, and only 9.1% of HCWs reported experiencing a needle-stick injury in the year preceding the study.

In Benin, adherence to safe injection practices was found to be below average, with only 48.4% of nurses following proper injection protocols and 47.5% demonstrating excellent practices. However, 23% of nurses regularly recapped needles, leading to needle-stick injuries in 58.2% of cases (Omorogbe, Omuemu, & Isara, 2012). Similarly, a study in Nigeria revealed high levels of unsafe injection practices among primary healthcare workers, with needle recapping occurring in 86.7% of health facilities. In 80% of these facilities, improperly disposed needles were found outside safety boxes, and 33.3% of cases involved needles being discarded outside the facilities. Although 95.2% of participants reported using safety boxes for syringe and needle disposal, 53.9% resorted to burning or burying the used needles, while 29.2% used local incineration. Notably, 3.3% of facilities disposed of used needles in open dumpsites, and 1.5% reported discarding them in a pit.

In Kenya, the Ministry of Health (MOH) launched a National Policy on Safe Injection Practices and Waste Management in 2007. This initiative aimed to promote safer injection practices and the proper management of medical waste through training, provision of adequate supplies, and behavior change communication. Despite this policy, a 2018 study at the Kenyatta National Hospital (KNH) found a high prevalence of needle-stick injuries among HCWs at 45.6%. Alarmingly, 31.9% of HCWs reported recapping needles, and 8% of them subsequently suffered needle-stick injuries (Kisaka, 2021).

2.2.1.3 Compliance with the Use of PPE

The Occupational Safety and Health Administration (OSHA) defines personal protective equipment (PPE) as equipment worn to reduce exposure to workplace hazards that could lead to serious injuries and illnesses (OSHA, 2004). PPE includes items such as full-body suits, gloves, eye protection, footwear, and respirators. The selection of appropriate PPE depends on factors like anticipated exposure, durability, and suitability for the task (Centers for Disease Control and Prevention, 2016). Despite the effectiveness of PPE in preventing nosocomial infections, its proper use remains suboptimal.

A study by Gulilat in Ethiopia revealed a relatively low overall use of PPE, approximately 36%. While the use of gowns during procedures was high at 99%, only 73% of participants reported wearing gloves when required. Moreover, just 31.1% of healthcare workers (HCWs) donned gloves regardless of the patient's condition, and the use of caps was notably low at 15.8% (Gulilat, 2014). In Nigeria, a study by Okechuku found that gloves were the most commonly used PPE. The majority of HCWs (88.44%) wore a gown or plastic apron only when performing procedures that might generate splashes, while 68.95% reported using masks and eye protectors.

Similarly, Haile's study indicated that most HCWs used PPE based on the likelihood of exposure and the patient's diagnosis. A total

of 88.7% of respondents reported always wearing gloves when there was a risk of exposure to infectious body fluids, but only 32.4% wore PPE regardless of the patient's diagnosis. The use of goggles and waterproof aprons was below 50% (Kisaka, 2021).

Okello et. al., (2017) investigated the barriers and factors affecting PPE use at St. Mary's Hospital in Lacor, Northern Uganda. They found that 2% of the 59 respondents were unaware of the purpose of PPE, and 13% did not use PPE when it was indicated. Among those who did use PPE, 10% used it inappropriately. Additionally, 23.7% of respondents did not know how to properly don and doff PPE. Barriers to compliance included the unavailability of adequate PPE, poor fitting, substandard gloves, and a lack of training on PPE usage (Okello, Kansime, Odora, Apio, & Pecorella, 2017).

2.2.1.4 Healthcare Worker Determinants of Compliance

The individual characteristics of healthcare workers (HCWs), such as age, gender, years of experience, training, and attitude, significantly affect compliance with infection prevention and control (IPC) measures. Studies in Nigeria have shown that suboptimal knowledge and poor interpretation of IPC guidelines among healthcare workers substantially hinder the implementation of these measures (Amoran & Onwube, 2013). A study conducted in Benin on injection safety revealed that only 55.7% of respondents had adequate knowledge of safe injection practices, which was greatly influenced by factors such as their nursing experience, age, and gender (Omorogbe et. al., 2012).

In a study assessing standard precaution practices in public hospitals in Addis Ababa, Ethiopia, factors like low educational level, older age, and a positive attitude were positively associated with adherence to standard precaution practices. Health professionals with a positive attitude were eight times more likely to follow the recommended IPC measures compared to those with a negative attitude. Additionally, compliance with IPC measures was found to be lower among degree holders compared to healthcare workers with diploma qualifications. Older healthcare professionals also demonstrated higher compliance levels than their younger colleagues aged 20-29 years (Angaw, Gezie, & Dachew, 2019).

These findings align with a study conducted in Saudi Arabia, where older nurses (aged 60-69) were observed to practice better surgical site infection prevention techniques than their younger counterparts. This was attributed to the greater years of experience among older healthcare workers (HCWs) (Alabdulrazaq, Almutairi, Alhsaon & Alsaigh, 2018). A recent study on infection prevention and control (IPC) in outpatient facilities in Tanzania also noted that the age and gender of healthcare workers influenced compliance levels. Compliance with the correct use of gloves was negatively associated with age, with lower compliance rates observed among those over 30 years old. Furthermore, female HCWs were more likely to adhere to hand hygiene practices compared to male HCWs (Powell-Jackson et. al., 2020).

Similarly, a study by Haile et al. (2017) found that female HCWs were 2.18 times more likely to comply with standard precautions than their male counterparts. However, in a study examining perceived barriers to preventive measures for COVID-19, factors such as age, sex, profession, and work experience were significantly associated with adherence to IPC standards. Interestingly, this study found that male HCWs were four times more likely to comply with preventive measures compared to female HCWs (Birihane, Bayih, Alemu & Belay, 2020).

The impact of healthcare workers' (HCWs) attitudes and risk perception on compliance with infection prevention and control (IPC) measures was highlighted in a study conducted in Addis Ababa. This study

revealed that doctors were more likely to perform hand hygiene when they perceived a higher risk of infection. Similarly, in research by Akagbo, Nortey, and Ackumey (2017), 39% of respondents did not comply with standard precautions due to a perceived low likelihood of exposure. Hand hygiene was performed 97% of the time after evident contact with blood or other body fluids, 82% after wound care, and 82% when hands appeared dirty (Tenna et. al., 2013).

In a study conducted in Virginia among healthcare professionals, only 83% of respondents consistently wore gloves when attending to patients. Among those who did not always use gloves, 53% believed patients were of low risk, and 43% attributed their lack of glove use to forgetfulness. Similarly, a Kenyan study reported low compliance rates with hand hygiene, but HCWs noted that the likelihood of washing hands increased twofold after a procedure due to a high perception of risky exposure (Ngugi et. al., 2019). The link between HCW attitudes and proper IPC practices was also evident in Maosa (2012), where low adherence to hand hygiene was attributed to HCWs feeling that using gloves could easily substitute for handwashing.

2.2.1.5 Health Facility Determinants of Compliance

Health facility determinants significantly influence the implementation of infection prevention and control (IPC) measures. These factors include the availability of IPC policies and guidelines, sufficient supplies, adequate staffing, the presence of IPC committees, and supportive hospital management (Wang et. al., 2024). A study in Brazil found that institutional factors were the primary reasons for non-adherence to standard precautions (Piai-Morais, Orlandi, & De Figueiredo, 2015). This finding aligns with Okechukwu and Modteshi (2012), where a lack of infection prevention supplies was the main reason healthcare workers (HCWs) did not always use the appropriate personal protective equipment (PPE) during medical procedures.

One study indicated that the presence of IPC committees was positively associated with higher adherence levels (Abdella et. al., 2014). In this study, HCWs who were aware of an IPC committee's existence were 2.6 times more likely to comply with IPC measures than those unaware. This finding is consistent with research in Italy, which showed that the presence of an IPC committee led to a reduction in healthcare-associated infections (HAIs) (Sydnor & Perl, 2011). Additionally, HCWs who receive frequent support from hospital management are more likely to adhere to IPC measures (Haile et. al., 2017).

Similar findings were reported in a study conducted in Brazil, where management support had the most significant impact on healthcare workers' (HCWs) adherence to infection prevention and control (IPC) measures (Brevidelli & Cianciarullo, 2009). Frequent training for HCWs has also been shown to increase compliance levels. For instance, Teshager, Haileselassie Engeda, and Worku (2015) found a significant association between knowledge of surgical site infection prevention and a history of training on infection prevention methods. Health facility management is responsible for providing resources that ensure a safe working environment and support the proper implementation of IPC precautions to prevent healthcare-associated infections (HAIs).

Mpamize (2016) reported that the regular supply of personal protective equipment (PPE) and training of HCWs significantly influenced IPC practices. Similarly, Moyo (2013) found that lack of water supply, inadequate PPE, poor maintenance of medical equipment, and insufficient staffing contributed to noncompliance with IPC measures among nurses at Mbagathi District Hospital. These findings were also supported by studies conducted by Birihane et. al., (2020) and Akagbo et. al., (2017).

2.2.2 Relationship Between Resource Availability and Prevention of Nosocomial Infections

Healthcare-associated infections (HAIs) pose a significant challenge to healthcare systems and patient safety. Evidence indicates that implementing evidence-based infection prevention and control (IPC) measures effectively can significantly reduce HAIs. The COVID-19 pandemic has highlighted the critical need for robust IPC practices to manage and prevent infectious disease outbreaks in healthcare settings. The global spread of SARS-CoV-2 has underscored the necessity for strengthening IPC programs, especially in settings with limited resources (Allegranzi et. al., 2022).

In a large-scale multi-country study, national IPC focal points were interviewed to evaluate the implementation of IPC programs at the national level. Among the low-income countries surveyed, only nine (45%) reported having a national IPC program, four (20%) had documents outlining implementation strategies, and only one (5%) monitored compliance with IPC practices. Experts have emphasized the need for standards like the World Health Organization (WHO) IPC program minimum requirements to effectively manage infectious disease threats, especially in low-resource settings where the burden of HAIs is notably higher. A systematic review from 2011 revealed that the pooled prevalence of HAIs in resource-limited settings was 15.5 per 100 patients, compared to an average prevalence of 7.1 per 100 patients in Europe and an estimated incidence of 4.5 per 100 patients in the USA. Although progress in outbreak preparedness and IPC has been made in regions like Africa since the 2014–2016 Ebola outbreaks, the long-term effectiveness and sustainability of IPC practices require improved evidence and adequate resources.

Robust evidence on effective IPC strategies in low-resource settings is still limited. To contribute to this body of knowledge, we aimed to qualitatively evaluate examples of IPC implementation in these environments and summarize the key lessons learned (Ogunsola and Mehtar, 2020).

Challenges such as inadequate hospital infrastructure, shortages of resources and workforce, insufficient staff education, lack of in-service IPC training and supervision, and high visitor numbers were identified as barriers to effective IPC in hospitals. These barriers are consistent with those observed in other resource-limited settings. Additionally, high patient volumes, disruptions in the supply chain, elevated infection rates, and attacks on healthcare infrastructure due to conflict have further compounded these challenges, adding to the burden on hospitals and their IPC programs. Local strategies for enhancing IPC despite limited resources include appointing departmental IPC champions and developing illustrated guidelines for in-service training.

Several studies have investigated the sources of bacterial infections in hospitals, revealing bacterial colonies on various environmental surfaces such as beddings, stethoscopes, computers, catheters, and small electronic devices used by healthcare workers. However, research on medical equipment in sub-Saharan Africa and its role in spreading hospital-acquired infections among patients and staff is limited. Globally, hospitals use over 50,000 types of medical equipment daily. Despite their crucial role in healthcare, the maintenance and management of this equipment in low- and middle-income countries (LMICs) pose significant challenges. In these regions, medical equipment is often poorly maintained and neglected, with studies indicating that 30 to 50% of equipment in low-resource settings is out of service. This issue is exacerbated by the lack of trained medical engineering personnel and the overwhelming patient loads faced by healthcare workers.

The risk of nosocomial or hospital-acquired infections is significantly heightened in low-resource settings due to several factors. The

extensive sharing of available medical equipment among numerous patients exacerbates this risk. Contributing factors include equipment design, user training and competency, facility design, water quality, and the quality of sterilization and disinfectants. In low- and middle-income countries (LMICs), these risks are further amplified by resource constraints, such as the reuse and sharing of single-use medical devices and consumables, as well as inadequate implementation of risk management policies (Ssekitoleko, Oshabaheebwa, and Munabi et. al., 2020).

Understanding the role of medical equipment in the transmission of hospital-acquired infections is crucial for effective public health management, given the frequent contact between patients, health workers, and this equipment. In a study conducted in Uganda, nearly 90% of medical equipment tested was found to be positive for bacterial microorganisms linked to common infections in the region. Additionally, two-thirds of the equipment was contaminated at multiple sites. While the highest contamination rates were found on areas frequently touched by users and patients (60% and 66%, respectively), it was concerning that over half of the remote areas were also contaminated (55%), indicating inadequate disinfection practices. Moreover, the bacteria identified were resistant to multiple antibiotics, raising the risk of spreading multidrug-resistant strains within the community. These findings underscore the need for improved disinfection and sterilization practices for medical equipment in Uganda's public health facilities (Ssekitoleko, Oshabaheebwa, and Munabi et. al., 2020). Most doctors and nurses indicated that their failure to comply with PPE usage and handwashing protocols is primarily due to the unavailability of necessary supplies and handwashing materials (Saeed et. al., 2021).

2.2.3 Relationship Between Time Constraints in the Prevention of Nosocomial Infection among the Nurses.

Time constraints at work have been found to affect health workers' adherence to IPC guidelines. Among the participants, 66.4% reported that time constraints hindered their hand hygiene practices. This high percentage aligns with a study where 26% of participants cited lack of time as a barrier to effective infection prevention and control practices (Chipfuwa et. al., 2023). Additionally, compliance with IPC guidelines improved from 25% during periods of staff shortages to 70% when staffing levels returned to normal (Harbarth et. al., 1999). This improvement is attributed to the perception that IPC standard precautions are viewed as an additional workload rather than an essential component of patient safety and quality care (Ward, 2012).

Some health personnel have noted that adhering to IPC guidelines, such as washing hands before and after patient contact, changing gloves between patients, and segregating waste, can be time-consuming. According to Harbarth et. al., (1999), these IPC practices often compete with other healthcare tasks for the workers' time and are frequently neglected during periods of increased workload or staff shortages. The chi-square test results from this study indicated a significant association between time constraints and compliance with IPC precautions. Multivariate analysis revealed that health workers who did not experience time constraints were 40.5 times more likely to adhere to IPC policies compared to those who always faced time constraints. The adjusted odds ratio showed that those without time constraints were 92.36 times more likely to follow IPC guidelines. This supports the idea that limited time impedes health workers' ability to comply with IPC measures (Njovu et. al., 2021). The variation in compliance across departments may be attributed to differing task demands. Despite efforts to disseminate IPC policies, non-

compliance due to time constraints remains prevalent.

Wong and Lee et. al., (2020) pointed out a lack of empirical evidence regarding the ideal duration of hand washing for the general public. For healthcare workers, a minimum hand washing time of 20 seconds is recommended by guidelines (WHO 2009a, 2020b). In the UK, it is suggested that healthcare staff use a method like singing the "Happy Birthday" song twice while washing their hands, which roughly equals 20 seconds. It is crucial that, after decontaminating hands with soap and water or alcohol-based hand gel as per WHO (2009a) guidelines, healthcare workers thoroughly clean commonly missed areas of the hands. These often-neglected areas, as noted in the literature, include the fingertips, palms, backs of the hands, thumbs, and wrists. Effective hand hygiene is a crucial tool in preventing healthcare-associated infections, cross-infections, and the spread of antimicrobial resistance. While hand washing may seem straightforward, it is influenced by a variety of factors such as proper knowledge, correct decontamination techniques, human behavior, the environment, and strong leadership. The COVID-19 pandemic has highlighted the importance of maintaining rigorous hand hygiene practices. It is essential that healthcare staff adhere to these standards consistently, not just during periods of heightened concern (Hillier, 2020). Our definitions of time-location groups were based on unit-level locations, which means patients might have interacted with each other during procedures or short-term transfers within the hospital. Additionally, we could not account for potential transmission from healthcare workers who may work across different units, such as physicians and support staff. The time-based criteria used to define hospital-acquired infections (HAIs) may also lead to misclassification. For example, community-acquired cases with delayed testing could be mistakenly classified as hospital-acquired, although the influenza viruses in these cases might not be genetically linked to those found in the hospital (Tiffany, Adam, Andrew, William, Emily, Keith, and Petrie, 2023).

Our findings indicate that nosocomial infections are associated with higher resource use and longer hospital stays (Benenson et al., 2020).

2.3 Theoretical Framework

Social Cognitive Theory

In 1941 Miller and Dollard proposed a theory of social learning. In 1963 Bandura and Walters broadened the social learning theory with the principles of observational learning and vicarious reinforcement.

This theory, utilized in psychology, education, and communication, posits that a significant part of an individual’s knowledge acquisition is linked to observing others in social contexts, experiences, and through external media influences. It suggests that when individuals watch a model perform a behavior and see the outcomes of that behavior, they remember the sequence of events and use this information to guide their own future actions. Observing a model can also trigger individuals to perform behaviors they have already learned. Essentially, people learn not just by trying out new behaviors and experiencing success or failure, but by replicating the actions of others, which is crucial for the survival and progression of humanity. The decision to imitate observed behavior is influenced by whether the behavior results in rewards or punishments. This theory considers the interplay of three factors: environment, personal cognition, and behavior.

E**nvironment** encompasses factors that impact an individual's behavior and includes both social and physical elements. The social environment involves influences from family, friends, and colleagues, while the physical environment includes aspects such as availability of certain foods. These environmental conditions can affect an individual's ability to effectively perform a

behavior by creating a supportive setting that enhances self-efficacy with the right resources and support.

Personal cognition refers to an individual's self-efficacy concerning a behavior, which is their belief in their own capability to successfully complete the behavior. This means fostering confidence in one's ability to achieve the desired behavior.

Behavior refers to the outcomes or responses an individual receives after performing a behavior. It emphasizes the importance of providing opportunities for learners to experience successful learning by performing the behavior correctly.

This model posits that behavior is influenced by the interaction of three factors: environment, personal cognition, and behavior itself. It also suggests that the consequences of responses mediate behavior. The theory further asserts that people are more likely to learn and model behaviors from individuals they identify with. This is known as **vicarious capacity**, an observational learning mechanism that is governed by processes such as attention span, retention, motor reproduction, and motivation (Bandura, 2010).

Bandura proposed that people learn by observing and imitating the behaviors of significant others, and that behaviors are shaped by factors such as symbolizing capability, forethought, self-regulation, and vicarious capability. In the context of social-cognitive theory, a healthcare facility serves as the environment where interactions occur between experienced and novice nurses. Consequently, it can be hypothesized that less experienced nurses will model their behavior on that of their more experienced counterparts.

Another relevant theory is the Health Belief Model, which explains and predicts health behaviors based on individual attitudes and beliefs. Developed in the 1950s by social psychologists Hochbaum, Rosenstock, and Kegels, this model was created to understand why few people engaged in disease prevention and detection programs.

The Health Belief Model suggests that an individual's health-related behavior is influenced by their perceptions in four key areas:

i. The seriousness of a potential illness
ii. Their own vulnerability to that illness
iii. The perceived benefits of taking preventive measures
iv. The obstacles to taking such actions

In nursing, this model is particularly relevant for understanding patient compliance and preventive health practices. It asserts that health-seeking behavior is driven by how a person perceives the threat of a health issue and the perceived value of actions to mitigate that threat.

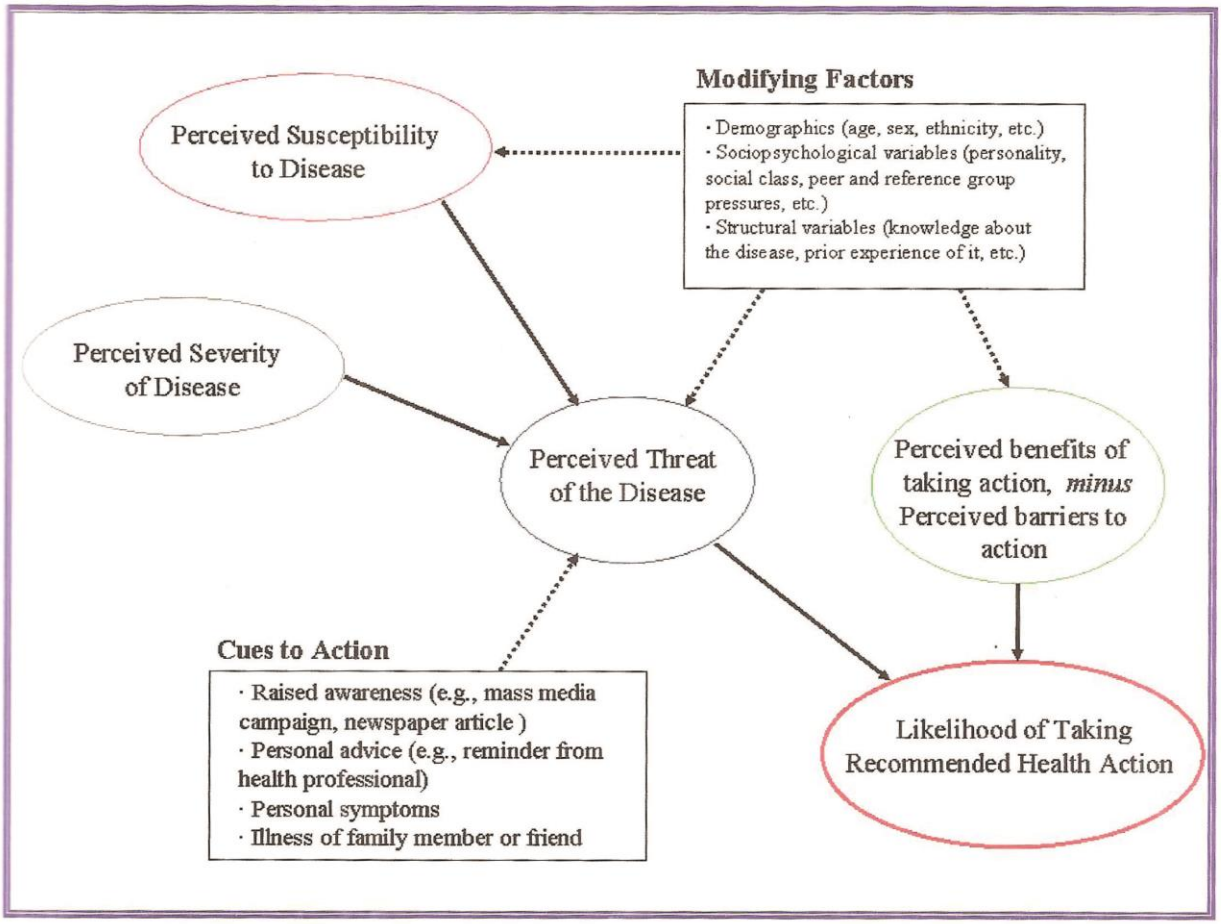
The Health Belief Theory examines how a person's beliefs influence their behavior, providing insight into how both clients and healthcare providers approach health and therapeutic interventions. The model incorporates constructs such as perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy to explain a person's readiness to act.

The theory suggests that these constructs help predict behaviors related to health prevention, promotion, and adherence to infection control guidelines. Additionally, healthcare professionals, especially nurses, are guided by both social and moral standards. The theory also allows individuals to evaluate the potential outcomes of a behavior before actually engaging in it.

2.3.1 Relevance of the theory to the topic

Research indicates that positive health behaviors among healthcare workers, particularly nurses, can reduce the incidence of persistent nosocomial infections (Pittet et. al., 2011). For instance, if a nurse understands the importance of preventing nosocomial infections, they are more likely to take necessary precautions, thereby improving patient outcomes and enhancing the quality of care. Additionally, studies have demonstrated that the adherence to

hand hygiene practices among nurses is significantly influenced by role models. In this observational study, the researcher noted that healthcare workers were less compliant with hand hygiene protocols when a high-ranking officer such as chief matron did not carry out hand hygiene practices.



2.4 Summary Of The Literature Review

Gaps Identified in the Empirical Review

The literature review highlights a scarcity of studies on Infection Prevention and Control (IPC) in Nigeria, with a particular absence of research conducted in Lagos State. This lack of studies limits evidence-based decision-making, which could otherwise enhance IPC practices both in Lagos and across Nigeria.

This study aims to address this gap by enhancing the understanding necessary to achieve the government's objective of delivering affordable, high-quality healthcare for all. Additionally, many existing studies have concentrated on specific aspects of quality individually, such as focusing solely on safe injection practices or examining healthcare workers' characteristics affecting IPC practices (Tenna et. al., 2023). This study seeks to take a broader approach by investigating factors influencing nurses' attitudes and practices regarding the prevention of nosocomial infections. It will examine both the inputs—such as healthcare worker and health facility determinants—and the processes, including the implementation of hand hygiene, PPE usage, and safe injection practices.

Infection prevention and control

There is limited research addressing the foundational gaps necessary for effectively reducing the risks and spread of healthcare-associated infections (Alp, Cookson, Erdem, Rello, Akhvlediani, and Akkoyunlu et. al., 2019). Persistent challenges such as conflicting political agendas, resource

limitations, insufficient trained personnel, and lack of surveillance data continue to hinder progress. Furthermore, although there is robust evidence supporting the efficacy of IPC measures, additional research is needed to explore and validate innovative technologies, assess the cost-effectiveness of interventions, and develop practical implementation strategies and local solutions for low-resource settings (Allegranzi et. al., 2022).

Antimicrobial resistance

Antimicrobial resistance (AMR) has long been a critical issue but is now emerging as an even greater threat to public health. Recently, there has been a concerning shift in the burden of AMR from Gram-positive to Gram-negative bacteria and Candida auris—an emerging multidrug-resistant yeast linked to severe invasive infections and high mortality rates in healthcare settings (Forsberg, Woodworth, Walters, Berkow, Jackson, Chiller et. al., 2019). This shift may exacerbate the strain on already limited healthcare resources, as resistant Gram-negative pathogens could overshadow the progress made in combating resistant Gram-positive pathogens. Effective prevention and control of hospital-acquired infections are becoming increasingly vital for enhancing healthcare, particularly in low- and middle-income countries (LMICs). This discussion aims to explore the opportunities available for implementing Infection Prevention and Control (IPC) programs, including antimicrobial stewardship, in resource-limited settings.

Effective infection control does not necessarily require costly resources and can be implemented with minimal expense. According to the WHO, the fundamental components of infection prevention and control (IPC) are applicable to a wide range of healthcare settings. IPC is multidisciplinary and multi-modal, yet all its elements are interrelated. This approach can be integrated into a network spanning hospitals, regions, and countries, whether in high-resource or low-resource settings, thereby providing valuable insights for stakeholders involved in policy-making and implementation (World Health Organization, 2019).

The advent of electronic media and satellite communication has greatly benefited healthcare in recent times. A wealth of resources and knowledge on infection prevention is now accessible via the internet. Evidence from studies conducted in developed countries, such as those by the CDC, NHSN, AHRQ, and IHI in the USA, NICE guidelines in the UK, and similar organizations in the EU and Australia, is available and could be adapted for use in low- and middle-income countries (LMICs). Although the fundamental principles of infection prevention are consistent, applying all methods may be challenging in resource-limited settings, where innovation plays a crucial role. Various tools for assessing infection control have been developed by the WHO and USAID to address these challenges. The Infection Control Assessment Tool (ICAT) is designed to identify areas for enhancing IPC practices and is readily accessible. However, it's important to note that standards established by developed countries may be difficult to achieve in low- and middle-income countries (LMICs) due to resource constraints, differing institutional priorities, and a lack of expertise. Further research is needed to identify tools that are suitable, available, accessible, affordable, and applicable in low-resource settings to address these gaps effectively.

IPC Education, Training and Research as a gap

The existence of policies and guidelines alone does not guarantee their implementation in resource-limited settings. To build capacity, structured curricula should be integrated into medical and nursing education, and healthcare workers (HCWs) should receive in-house training through workshops and Continuous

Mandatory Education (CME). Translating international guidelines into local languages can make them more accessible and practical for HCWs in their daily routines. Additionally, leveraging communication technology offers a cost-effective means to spread knowledge about IPC and antimicrobial resistance (AMR) to HCWs, patients, and the public.

Research demands both funding and expertise. Financial support for research from high-income countries can be instrumental in addressing infectious diseases that affect people globally (Ferez and Bonomo, 2019). While there is substantial evidence demonstrating the cost-benefit of IPC programs in high-income countries, similar studies are needed in low-resource settings to evaluate their effectiveness and applicability.

Monitoring/audit of IPC practices and feedback as a gap

Monitoring, auditing, and providing feedback are crucial for raising awareness among healthcare workers and fostering attitudinal changes, as well as involving stakeholders in enhancing patient care. Audits and feedback typically result in minor yet significant improvements in professional practices. Implementing a feedback and feed-forward cycle is an effective method for positive reinforcement, promoting healthy competition, and encouraging active engagement within healthcare organizations.

Workload, staffing and bed occupancy (acute care facility only) as a challenge/gap

The WHO's workload indicators and staffing needs offer a framework for healthcare managers to plan and allocate workloads based on available manpower and resources. Health system leaders must take the initiative to enhance the effectiveness of these programs by properly aligning and funding them. Facilitating a cultural shift relies more on perseverance and the examples set by organizational leaders rather than significant financial investments. It involves identifying and empowering motivated individuals to manage the program, which falls under the administration's responsibility. The challenge lies in leveraging communication technology to train selected healthcare workers on policy implementation. Most crucial is fostering a positive change in attitude and behavior among all healthcare workers toward preventing HAIs. An increase in hand hygiene compliance serves as a prime example of how persistence and positive feedback can lead to behavioral change among healthcare workers.

Identifying high-risk areas for infections within healthcare settings (e.g., operating theaters, ICUs, labs) and equipping them with essential infrastructure, equipment, and supplies such as hand hygiene products, masks, gloves, and gowns can promote a culture shift toward safer practices. Proper protocols for usage must be established to ensure effective utilization and to prevent misuse and wastage.

After reviewing the findings from the narrative review, environmental scan, and discussions with the expert working group, several gaps and challenges were identified. Although there is limited evidence on the specific infection risks associated with these services, existing reports and publications highlight contributing factors that can guide risk mitigation strategies. Currently, no established surveillance system exists for monitoring complications related to the personal services industry. This summary identifies gaps and challenges to raise public health awareness and highlights opportunities to address concerns through policy, regulation, and guidelines, aiming to promote and monitor best practices for the health of Nigerians.

Gaps in the impact of infrastructural changes at facility level on the reduction of infections and resistance

Limited data exist on how infrastructural changes affect Health Care Associated

Infections (HCAI). A 2016 meta-analysis suggested that a high density of hand-washing stations and single-patient rooms could help reduce HCAI transmission rates in short-term care facilities (Stiller, Salm, Bischoff, and Gastmeier, 2016). However, experts point out that infrastructural changes are seldom viewed as research opportunities. Ideally, IPC outcomes should be evaluated for any new healthcare facility or renovation. For example, when installing sinks, showers, or bathtubs in healthcare settings, there should be an analysis of how easily these fixtures can be disinfected. Additionally, the placement and design of hand sanitizers should be based on evidence indicating where healthcare personnel are most likely to use them. Interestingly, not all IPC experts agreed that there is a need for additional IPC research, despite the dearth of high-quality evidence clearly displayed in many of IPC guidelines (Berríos-Torres, Umscheid, Bratzler, Leas, Stone and Kelz, 2017; Centers for Disease Control and Prevention, 2020).

Gaps in epidemiologic data

Surgical Site Infection (SSI) is the second most common type of Hospital Acquired Infection (HAI) in Europe and the USA. In low-to-middle-income countries (LMICs), data indicate that one in ten individuals undergoing surgery contracts an HAI (Vargas-Alzate, Higita-Gutiérrez, López-López, Gallet, and Quiceno, 2017). Even in high-income countries, in-hospital SSI estimates may not be entirely reliable. This is often due to the limited allocation of time, budget, and human resources or a lack of expertise in study design, data collection, and interpretation (Purba, Setiawan, Bathoorn, Postma, Dik, and Friedrich, 2018).

Gaps in SSI surveillance methodology

The need for a surveillance program for Surgical Site Infections (SSI) has been well recognized since the late 1960s. This need was emphasized by Dr. Cruse and his team, who argued that retrospective data are unreliable due to the inaccuracy of hospital records for SSI studies. They proposed prospective wound surveillance (Sullivan, Gupta, and Cook, 2017), which is now considered the gold standard for effective surveillance. Hand hygiene is recognized as a key behavioral factor in preventing infections. Research using the Health Belief Model has assessed physicians' perception and motivation to prevent antibiotic resistance (ABR) in hospitalized children. While awareness of the issue was high, many participating physicians believed ABR was a greater national problem than within their own institutions.

Previous studies have highlighted the lack of appropriate infrastructure, financial constraints, and capacity as key reasons for disparities in infection prevention and control (IPC) between regions (Bardossy et. al., 2016; Lynch et. al., 2007). In resource-limited settings, infection control poses unique challenges since personnel are often not adequately trained to identify key risk factors for infection. Basic prevention measures like hand hygiene, contact precautions, and the use of face masks and gloves are sometimes not implemented due to a lack of these essential resources. Significant efforts are required to strengthen infectious disease control programs in these healthcare settings. Enhancements in equipment, facilities, supplies, and operational standards are needed. More importantly, all healthcare personnel—including physicians, nurses, administrative workers, and other staff—must develop the necessary awareness, knowledge, and skills to protect themselves against emerging infectious diseases.

CHAPTER THREE

Methodology

3.0 Introduction

In this chapter, the research methodology, research design settings target populations of the study were presented. The sampling technique, instrument for data collections validity and reliability of instrument, method of data collection, method of data analysis and ethical consideration were stated.

3.1 Research Design

The design for this study was descriptive research design. This design was chosen because of its capacity to identify, extract and describe respondent's opinion using sample on factors that influence the attitude and practice of nurse toward prevention of nosocomial infection and different techniques of data collection and analysis to gather data.

3.2 Study Area

This study was carried out among clinical Nurse working in surgical wards both male and female ward, Theatre, Burns and plastic ward, of Lagos State University Hospital Ikeja, which was established in June 25th 1995, the hospital is located in Ikeja, 1- 5 Oba Akinjobi way GRA Ikeja Local Government Area of Lagos State. It has a total staff strength of 1686, with 28 Nursing Administrator, 12 Departmental Managers, and 35 Nursing Managers, the total Nurses are 750. Lagos State University Teaching Hospital Ikeja support over 850, in patient bed space with various Departments.

3.3 Study Population

The target populations for this study were nurses working in Lagos State University Teaching Hospital Ikeja. These respondents were selected for the study because they are in a better position to give accurate and reliable information regarding patient care.

3.4 Sample Size Determination

The sample size for this study was calculated by using this formular

$n = N/1+N(e)^2$

where;

n = sample size

N = population under study

1 = constant

e = margin of error (0.05)

N = 750

$n = 750/1+750\ (0.05)^2$

n = 750/1+1.875

n = 750/2.875; n = 260.87; n = 261

Therefore, our sample size (n) will be 261 approximately

3.5 Sampling Technique

A simple random technique was used for this study. This method was used because of easy administration of the instruments without manipulation as every Nurse has an equal chance of participation.

3.6 Instrument For Data Collection

The main instrument for data collection was structured designed questionnaire. The questionnaire was developed by the researcher after review of relevant literature. It was designed to cover the question related to the assessment of factors that influence the attitude and practice of nurses to towards prevention of nosocomial infection.

The questionnaire was self- developed instrument which consist of five sections (A, B, C, D & E). First part of the questionnaire was developed to address ethical issues; it consists of a brief introduction by the researcher, purpose of the study and a plea for voluntary participation and guarantee that collected responses will be treated with utmost confidentiality. The second part consisted of the demographic data of the respondents, while the remaining part focused on the items relating to each of the research questions.

3.7 Validity Of The Instrument

The questionnaire for the study was drafted and validated after consulting journals and various textbooks including the internet. The

questionnaire was scrutinized by expert in the field of research before it was typed out for administration.

3.8 Method Of Data Collection

Questionnaire was used to collect the data for this study. Systematic random sampling was utilized and purposive sampling was used to select the wards in which the research was conducted. Questionnaire was distributed to the target population and respondents was assured of confidentiality of information obtained from them.

3.9 Method Of Data Analysis

The analysis of data was done by coding the responses of the respondents. The result was represented in percentage, respondents' opinions was organized and analyzed using frequency tables and hypothesis was tested using Pearson and Spearman correlation analysis.

3.10 Ethical Consideration

A letter of permission was written to the Lagos State University Teaching Hospital (LASUTH) ethical committee to secure the approval to conduct the research in their facility.

The information that was provided was handled with care ensuring that respondent's opinion is protected and their voluntary consent well secured, confidentiality was guaranteed, their opinion was properly presented and many facets of the ethical and legal implications was kept in mind during all stages of the research project. Respondent's autonomy was well respected.

CHAPTER FOUR

Data Analysis And Results

Data Analysis

A total number of 261 questionnaires were distributed, 260 were recovered and analyzed for the study. The responses are presented below in series of tables.

Table 4.1: Socio-Demographics Characteristics of the Respondents

	Frequency	**Percent**
Age		
20-30yrs	65	25.0
31-40yrs	70	26.9
41-50yrs	58	22.3
51-60yrs	67	25.8
Total	260	100.0
Mean age and SD		25.1±5.8
Gender		
Male	100	38.5
Female	160	61.5
Total	260	100.0
Religion		
Christianity	80	30.8
Islam	60	14.0
Traditional	65	25.0
Others	55	21.2
Total	260	100.0
Ethnicity		
Yoruba	75	28.8
Igbo	60	23.1
Hausa	55	21.2
Others	70	26.9

Total	260	100.0
Years of Working Experience		
<10yrs	67	25.8
11-25yrs	78	30.0
26-30yrs	62	23.8
>30yrs	53	20.4
Total	260	100.0
Marital status		
Married	77	29.6
Single	60	23.1
Divorced	62	23.8
Others	61	23.5
Total	260	100.0

Table 4.1: Socio-Demographics Characteristics of the Respondents (Contd)

	Frequency	**Percent**
Highest level of Education		
Diploma in Nursing	60	23.1
Degree in Nursing	125	48.1
Master	55	21.2
Others	20	7.7
Total	260	100.0

From table 4.1 above, it shows majority (26.9%) of the respondent are between the ages of 31-40 years, (61.5%) are females, (30.8%) are Christian, (28.8%) are Yoruba tribes, (30.0%) have working experience between 11-25 years, (29.6%) are married, (48.1%) have BSc degrees in Nursing, while the minority (22.3%) of the respondent are between the ages of 41-50 years, (21.2%) are Hausa tribes, (20.4%) have working experience of more than 30 years, (23.1%) are singles and (7.7%) had no degree in nursing.

Research Question 1: What is the nurses' level of knowledge on the prevention of nosocomial infection?

Table 4.2: Knowledge on the Prevention of Nosocomial Infection among Respondents

Variables	**Frequency**	**Percent**
Heard About Nosocomial Infection		
Yes	234	90.0
No	26	10.0
Total	260	100.0
Think younger nurses are more careful in preventing nosocomial infection than older nurses		
Yes	190	73.1
No	70	26.9
Total	260	100.0
Think brain drain or job burnout can contribute to the occurrence of nosocomial infection		

Yes	252	96.9
No	8	3.1
Total	260	100.0
Think that emotional exhaustion contributed to the occurrence of the nosocomial infection		
Yes	170	65.4
No	90	34.6
Total	260	100.0
Think prolong stay in the hospital contribute to nosocomial infection		
Yes	213	81.9
No	47	18.1
Total	260	100.0
Think Nurses are responsible for patient having nosocomial infection through negligence		
Yes	23	8.8
No	237	91.2
Total	260	100.0

Table 4.2: Knowledge on the Prevention of Nosocomial Infection among Respondents (Contd)

Variables	**Frequency**	**Percent**
Think retraining of Nurses would improve use of infection control materials effectively		
Yes	183	70.4
No	77	29.6
Total	260	100.0
Use personal protective equipment when caring for patient with infection disease		
Yes	209	80.4
No	51	19.6
Total	260	100.0
Think demographic level contribute to nosocomial infection		
Yes	28	10.8
No	232	89.2
Total	260	100.0
Think patient contribute to the occurrence of nosocomial infection		
Yes	248	95.4
No	12	4.6
Total	260	100.0

Table 4.2 above reveals that majority (90.0%) of the respondent have heard about nosocomial infection, (73.1%) thinks younger nurses are more careful in preventing nosocomial infection than older nurses, (96.9%) thinks brain drain or job burnout contribute to the occurrence of nosocomial infection, (65.4%) thinks that emotional exhaustion contributed to the occurrence of the nosocomial infection, (81.9%) thinks prolong stay in the hospital contribute to nosocomial infection, (91.2%) thinks Nurses are not responsible for patient having nosocomial infection through negligence, (70.4%) thinks retraining of Nurses would improve use of infection control materials effectively**,** (80.4%) use personal protective equipment when caring for patient with infection disease**,** (89.2%) thinks demographic level does not contribute to nosocomial infection and most (95.4%) of the respondent thinks patient contribute to the occurrence of nosocomial infection, while the minority (10.0%) of the respondent have not heard About Nosocomial Infection, (26.9%) thinks older nurses are more careful in preventing nosocomial infection than younger nurses**,** (3.1%) thinks brain drain or job burnout cannot contribute to the occurrence of nosocomial infection, (34.6%) indicates No to the question that emotional exhaustion contributed to the occurrence of the nosocomial infection, (18.1%) says No to the question that prolong stay in the hospital contribute to nosocomial infection, (8.8%) of the respondent thinks Nurses are responsible for patient having nosocomial infection through negligence, (29.6%) thinks retraining of Nurses would not improve the use of infection control materials effectively, (19.6%) don't use personal protective equipment when caring for patient with infection disease, (10.8%) think demographic level contribute to nosocomial infection and the minority (4.6%) of the subjects thinks patient does not contribute to the occurrence of nosocomial infection.

Table 4.3: Table showing overall score of Knowledge on the Prevention of Nosocomial Infection among Respondents

GRADE	FREQUENCY	PERCENTAGE (%)
Good	182	70.0
Poor	78	30.0
Total	260	100.0

Table 4.3 above reveals majority 70.0% (n=182) of respondents have good knowledge of prevention of Nosocomial Infection**,** while 30.0% (n=78) have poor knowledge of prevention of nosocomial infection.

Research Question 2: What are the resources available in the prevention of nosocomial infection?

Table 4.4: Availability of resources in the prevention of nosocomial infection

Variables	Frequency	Percent
Presence of standard precaution guidelines in your ward		
Yes	178	68.5
No	82	31.5
Total	260	100.0
Presence of adequate materials for hand hygiene in your ward		
Yes	162	62.3
No	98	37.7

Total	260	100.0
Bed capacity in your facility meet international standards		
Yes	110	42.3
No	150	57.7
Total	260	100.0
Bed occupancy in your facility kept to one patient per bed		
Yes	260	100.0
Total	260	100.0
Adequate spacing of at least 1 meter between patient beds ensured in your facility		
Yes	244	93.8
No	16	6.2
Total	260	100.0
Quality running water, soap and single-use towels in all wards and at all points of care for hand hygiene practices		
Yes	112	43.1
No	148	56.9
Total	260	100.0

Table 4.4: Availability of resources in the prevention of nosocomial infection (Contd)

	Frequency	**Percent**
Alcohol-based hand-rub solution available at all point of care for hand hygiene practices		
Yes	111	42.7
No	149	57.3
Total	260	100.0
Sufficient power supply in your facility day and night for all purposes		
Yes	102	39.2
No	158	60.8
Total	260	100.0
Availability of appropriate and well-maintained materials for cleaning		
Yes	196	75.4
No	64	24.6
Total	260	100.0
PPE available at all times and in sufficient quantity for all uses for all health care workers		
Yes	13	5.0
No	247	95.0
Total	260	100.0

Table 4.4 above reveals majority 68.5% (n=178) of the respondent indicates Yes to the presence of standard precaution guidelines in your ward, 62.3%(n=162) says there is presence of adequate materials for hand hygiene in their ward, 42.3%(n=110) says Yes to bed capacity in their facility meet international standards, 93.8%(n=244) affirms there is adequate spacing of at least 1 meter between patient beds ensured in their facility, 43.1%(n=112) accept there is quality running water, soap and single-use towels in all wards and at all points of care for hand hygiene practices, 57.3%(n=149) says there is no alcohol-based hand-rub solution available at all point of care for hand hygiene practices, 60.8%(n=158) indicates no sufficient power supply in their facility day and night for all purposes, 75.4%(n=196) indicates there is availability of appropriate and well-maintained materials for cleaning, 95.0%(n=247) reveals there is no PPE available at all times and in sufficient quantity for all uses for all health care workers, while the minority 31.5%(n=82) of the respondent indicates there is no presence of standard precaution guidelines in their ward, 37.7% (n=98) says there is no presence of adequate materials for hand hygiene in their ward, 57.7% (n=150) says No to bed capacity in their facility meet international standards, 6.2%(n=16) says there is no adequate spacing of at least 1 meter between patient beds ensured in their facility, 56.9%(n=148) indicates there is no quality running water, soap and single-use towels in all wards and at all points of care for hand hygiene practices, 42.7%(n=111) says there is alcohol-based hand-rub solution available at all point of care for hand hygiene practices, 39.2%(n=102) indicates there is sufficient power supply in their facility day and night for all purposes, 24.6%(n=64) indicates there is no availability of appropriate and well-maintained materials for cleaning and the minority 5.0%(n=13) of the respondent indicates there is PPE available at all times and in sufficient quantity for all uses for all health care workers, while the minority.

Research Question 3: What are the time constraints in the prevention of nosocomial infection among the nurses?

Table 4.5: Time constraints in the prevention of nosocomial infection among the nurses

	SA		**A**		**Not decided**		**SD**		D	
	Freq.	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**
I don't practice hand hygiene because I don't have time	50	19.2	54	20.8	10	3.8	84	32.3	62	23.8
I think washing of hands following every procedure is a waste of time	20	7.7	12	4.6	2	0.8	194	74.6	32	12.3
Sharing of syringes and needles saves time and makes work faster	0	0.0	0	0.0	2	0.8	196	75.4	62	23.8
Teaching patient on nosocomial is time consuming	18	6.9	13	5.0	5	1.9	141	54.2	83	31.9

Putting on PPE for every procedure is a waste of time	28	10.8	15	5.8	3	1.2	156	60.0	58	22.3

From table 4.5 above, majority 32.3%(n=84) of the respondent strongly disagree to the question on I don't practice hand hygiene because I don't have time, while minority 19.2%(n=50) strongly agree to the question above, 74.6%(n=194) strongly disagree to I think washing of hands following every procedure is a waste of time and 7.7%(n=20) strongly agree that washing of hands following every procedure is not a waste of time, 75.4%(n=196) strongly disagree that sharing of syringes and needles saves time and makes work faster, while very few 0.8%(n=2) are undecided, most 54.2%(n=141) of the respondent strongly disagree that teaching patient on nosocomial is time consuming and few 6.9%(n=18) strongly agree that teaching patient on nosocomial is time consuming, majority 60.0%(n=156) of the subjects strongly disagree that putting on PPE for every procedure is a waste of time, while minority 10.8%(n=28) of the subjects strongly agree to putting on PPE for every procedure is a waste of time.

4.2 Answering of Research Questions

What is the knowledge of registered nurses in the prevention of nosocomial infection?

From table 4.3 above, it shows the overall score of Knowledge on the Prevention of Nosocomial Infection among Respondents. Majority of respondents 70.0%, (n=182) have good knowledge of prevention of Nosocomial Infection**.**

This provided answer to research question I which stated that "what is the knowledge of registered nurses about nosocomial infection"

What is the relationship between availability of resources in the prevention of nosocomial infection?

From table 4.4 above, it shows respondents response on the relationship between availability of resources in prevention of nosocomial infection revealed that 178(68.5%) of the respondent indicate Yes, while 82 (31.5%) indicates No to the above question on the presence of standard precaution guidelines in your ward. 162(62.3%) indicates Yes, while 98(37.7%) indicates No to the question on presence of adequate materials for hand hygiene in your ward. 110(42.3%) indicates Yes, while 150(57.7%) indicates No to the question on bed capacity in your facility meet international standards. All respondents 260 (100%) indicates Yes to the question on bed occupancy in your facility kept to one patient per bed. 112(43.1%) indicates Yes, while 148(56.9%) says No to the question on quality running water, soap and single-use towels in all wards and at all points of care for hand hygiene practices. 111(42.7%) indicates Yes, while 149(57.3%) indicates No to the question on alcohol-based hand-rub solution available at all point of care for hand hygiene practices. 102(39.2%) indicates Yes, while 158(60.8%) indicates No to the question on sufficient power supply in your facility day and night for all purposes. 196(75.4%) says Yes, while 64(24.6%) says No to the question on availability of appropriate and well-maintained materials for cleaning. 13(5.0%) says Yes, while majority of the respondents 247(95%) says No to the question on PPE available at all times and in sufficient quantity for all uses for all health care workers. This provided answer to research

question II which stated that "What is the relationship between availability of resources in the prevention of nosocomial infection?

What is the relationship between time constraint and prevention of nosocomial Infection?

Table 4.5 above reveals the respondent response on the relationship between influence of time factor in the prevention of nosocomial infection revealed that 50(19.2%) of the respondent indicate that they strongly agree, 10(3.8%) of the respondent indicate (undecided), while 62(23.8%) of the respondent indicate disagree and the others 84(32.3%) of the respondent indicate strongly disagree that I don't practice hand hygiene because I don't have time. 20(7.7%) of the respondent indicates strongly agree, 2(0.8%) undecides, while 194(74.6%) indicates strongly disagree that I think washing of hands following every procedure is a waste of time. 196(75.4%) of the respondent strongly disagree, while 2(0.8%) undecides that Sharing of syringes and needles saves time and makes work faster. 18(6.9%) of the respondent strongly agree, while 141(54.2%) strongly disagree that Teaching patient on nosocomial is time consuming. 28 (10.8%) of the respondent strongly agree, while 156 (60.0%) strongly disagree that putting on PPE for every procedure is a waste of time. This provided answer to research question III which stated that "What is the relationship between influences of time constraint in the prevention of nosocomial infection?

4.3 Hypothesis Testing

Hypothesis 1

$H_0$1: There is no significant association between nurses' knowledge on the prevention of Nosocomial infection and highest-level education

Table 4.6: Associating nurses' knowledge on the prevention of Nosocomial infection and highest-level education

	Knowledge					
Highest Level Education	**Good**	**Poor**	**Total**	χ^2	**df**	***Pvalue***
Diploma	45(75.0)	15(25.0)	60(100.0)	22.369[a]	1	.000
Degree	102(81.6)	23(18.4)	125(100.0)			
Master	45(81.8)	10(18.2)	55(100.0)			
Others	15(75.0)	5(25.0)	20(100.0)			
Total	207(79.6)	53(20.4)	260(100.0)			

Result in Table 4.6 above indicates a statistically significant association between nurses' knowledge on the prevention of Nosocomial infection and highest-level education as P=0.000 was recorded which is lesser than P<0.05. Hence, the earlier set hypothesis is rejected and the alternate hypothesis (H_1) is accepted. This shows that there is a significant association between nurses' knowledge on the prevention of Nosocomial infection and highest-level education.

HYPOTHESIS 2

$H_0$2: There is no significant association between nurses' knowledge on the prevention of Nosocomial infection and years of working experience

Table 4.7: Associating nurses' knowledge on the prevention of Nosocomial infection and years of working experience

	Knowledge				

Years of working experience	Good	Poor	Total	χ^2	df	*Pvalue*
<10yrs	40(59.7)	27(40.3)	67(100.0)	18.031[a]	3	.100
11-25yrs	50(64.1)	28(35.9)	78(100.0)			
26-30yrs	42(67.7)	20(32.3)	62(100.0)			
>30yrs	30(56.6)	23(43.4)	53(100.0)			
Total	162(62.3)	98(37.7)	260(100.0)			

Result in Table 4.7 above indicates no statistically significant association between nurses' knowledge on the prevention of Nosocomial infection and years of working experience as P=0.100 was recorded which is greater than P<0.05. Hence, the earlier set hypothesis is accepted and the alternate hypothesis (H_1) is rejected. This shows that there is no significant association between nurses' knowledge on the prevention of Nosocomial infection and years of working experience.

CHAPTER FIVE
Discussions of Findings
5.1 Discussion of Findings
Section A: Demographic Data

Table 4.1 above, shows that 65(25.0%) were within 20-30years, 70(26.9%) are between age 31-40years, 58(22.3%) are between the age of 41-50years and the other 67(25.8%) are between the age of 51-60years.

100(38.5%) of the respondents are males while 160(61.5%) were Females; this shows that majority of nurses in Lagos State University Teaching Hospital are Females.

75(28.8%) were Yoruba, 60(23.1%) were Igbo, 55(21.2%) are Hausa, 70(26.9%) are from other ethnic tribe, this shows that majority of the respondents are Yoruba,
80(30%) were Christian and 60(14%) were Muslims, 65(25%) were Traditional worshipers and others religion were 55(21.2%), this shows that majority of the respondents were Christian.

77(29.6%) were married, while 60(23.1%) were single 62(23.8%) were divorced and other marital status (separate) were 61(23.5%) this shows that majority of the nurses are married.

25% have less than 10years experience, 30% have between 11-25 years' experience, 23.8% have between 26-30 years' experience and 20.4% have more than 30 years' experience, this shows majority of respondents have years of experience

60(23.1%) have diploma certificate in nursing, 125(48.1%) have BNSc. certificate, 55(21.2%) have their masters in nursing, while 20(7.7%) have other certificates (RM, CHEW etc).

From the table 4.1 above, majority (26.9%) of the respondents were between the ages of 31-40 years, (61.5%) were females, (30.8%) were Christian, (28.8%) were Yoruba tribes, (30.0%) had working experience between 11-25 years, (29.6%) were married, (48.1%) had BNSc degree, while the minority (22.3%) of the respondents were between the ages of 41-50 years, (21.2%) were Hausa tribes, (20.4%) had working experience of more than 30 years, (23.1%) were singles and (7.7%) others had no degree in nursing.

Section B: Knowledge of Nurses On The Prevention Of Nososcomial Infection.

From table 4.2 above, 90% of the respondents have heard about nosocomial infection. The finding is in line with (Carlos et. al., 2020), which was documented that healthcare workers especially the nurses have sufficient knowledge to practice safe patient care and follow infection control guideline.

73.1% thinks younger nurses are more careful in preventing nosocomial infection than older nurses. This finding contrasts with a study conducted in Saudi Arabia, where older nurses (aged 60-69) were observed to practice better surgical site infection prevention techniques than their younger counterparts. This was attributed to the additional years of experience among the older healthcare workers (Sham et. al., 2021).

96.9% thinks brain drain or job burnout contributed to the occurrence of nosocomial infection. This finding aligns with the work of Laure Pitet et. al., (2021), which indicates that a high workload, particularly when a ward is at full capacity, contributes to the occurrence of nosocomial infections.

81.9% thinks prolong stay in the hospital contributed to nosocomial infection. This finding supports the work of Zand F. et. al., (2023), who suggested that although the number of patients admitted to ICUs is lower than in other wards, the incidence of nosocomial infections appears to be higher due to the longer duration of admissions. It also aligns with Benenson et. al., (2020), who assert that nosocomial infections are linked to both increased resource utilization and a longer length of hospital stay.

91.2% thinks nurses are not responsible for patient having nosocomial infection through negligence and most 95.4% of the respondents thinks patient contributed to the occurrence of nosocomial infection. This finding is consistent with a study by Berhe et al., (2021), which used self-reports to assess adherence to infection control practices. The study found that registered nurses demonstrated better compliance with contact isolation compared to other healthcare workers, with 77% reporting adherence to hand hygiene before and after patient contact. The main motivating factor for their compliance was patient safety. However, this result contrasts with the work of Tiffany et. al., (2023), who noted that nurses are frequently exposed to microorganisms, many of which can lead to serious or even fatal infections.

70.4% thinks retraining of nurses would improve use of infection control material effectively. This finding aligns with the study by Reed et. al., (2014), which reported that the majority of survey respondents learned about measures to prevent nosocomial infections through continuing education courses, colleagues, and mass media. Additionally, 95% of respondents expressed a desire to learn more about preventing nosocomial infection transmission. These findings suggest that effective educational programs aimed at raising awareness of transmission could play a significant role in reducing the occurrence of these infections. The study also supports findings from research conducted in Kenya, which indicated that frequent training of healthcare workers increases compliance levels. This is evidenced by Teshager et. al., (2015), who found that knowledge and prevention of surgical site infections were significantly associated with a history of training in infection prevention methods.

80.4% use personal protective equipment when caring for patient with infection disease. This study aligns with research conducted in Nigeria by Okechuku, which found that gloves were the most frequently used PPE. Most healthcare workers (88.44%) wore gowns or plastic aprons only during procedures likely to produce splashes, while 68.95% used masks and eye protectors. Similarly, Kisaka's study in Haile observed that PPE use was based on the likelihood of exposure and the patient's diagnosis (Kisaka, 2021). However, these findings contrast with those of Ogoina et. al., (2015), who reported that 2% of healthcare workers at St. Mary's Hospital in Lacor, Northern Uganda, were unaware of the purpose of PPE, 13% did not use PPE when necessary, and 10% used inappropriate PPE. Additionally, 23.7% did not know how to properly don and doff PPE (Okello,

Kansime, Odora, Apio, & Pecorella, 2017). The study also contradicts findings from Ethiopia by Gulilat, which indicated a low overall practice of PPE use (about 36%). Although gown use during procedures was high (99%), only 73% of respondents used gloves when required, and only 31.1% consistently donned gloves regardless of the patient's condition. Cap usage was reported to be low at 15.8% (Gulilat and Tiruneh, 2014).

89.2% thinks demographic level does not contributed to nosocomial infection. This finding supports Hamid et. al., (2020), which indicated that factors like age and years of experience did not affect nurses' knowledge and practices regarding nosocomial infection measures. However, this is inconsistent with the views of Amoran & Onwube (2013), who argued that individual characteristics such as age, gender, years of experience, training, and attitude significantly influence the level of compliance with Infection Prevention and Control measures.

26.9% thinks older nurses are more careful in preventing the nosocomial infection than younger nurses. This finding aligns with a study conducted in Saudi Arabia, where older nurses (ages 60-69) were observed to practice better surgical site infection prevention techniques than their younger counterparts. This improvement was attributed to the greater years of experience among the older healthcare workers (Allegranzi et. al., 2022).

From table 4.3 above, it reveals majority 70.0% (n=182) of the respondents have good knowledge of preventing nosocomial infection, while 30.0% (n=78) have poor knowledge of preventing nosocomial infection. This study supports Saeed et. al., (2021), who argue that healthcare workers' (HCWs) knowledge of infection prevention and control (IPC) procedures is essential for effective IPC. Adherence to IPC measures is crucial for ensuring HCWs' safety, protecting patients, and maintaining a safe care environment. It also aligns with Carlos et. al., (2020), which found that healthcare workers, particularly nurses, generally possess sufficient knowledge to practice safe patient care and adhere to infection control guidelines. However, this study contrasts with Sadoth et. al., (2006), which reported that some nurses lack adequate knowledge of infection control measures, leading to non-compliance with standard precautions and increased risk of infections for both nurses and patients.

Majority 78(30.0%) of the subjects had 11-25 years of working experience, while the minority 53(20.4%) had more than 30 years of working experience. This finding does not align with the view of Amoran & Onwube (2013), who argue that individual characteristics of healthcare workers, such as age, gender, years of experience, training, and attitude, significantly influence their level of compliance with Infection Prevention and Control measures.
Hypothesis 2 also concluded that there is no significant association between nurses' knowledge on the prevention of Nosocomial infection and years of working experience (Table 4.7)

The result therefore implies that all of the respondents have heard about nosocomial infection and this was in line with research objective I which stated that "To assess the knowledge of registered nurses on the prevention of nosocomial infection".

Section C: Availability Of Resources In The Prevention Of Nosocomial Infection

From Table 4.4 above, it shows that majority 68.5%(n=178) of the respondents indicate Yes to the standard precaution guidelines in your ward. This finding aligns with the study by Wong et. al. (2020) conducted in China, which highlights that health facility factors significantly impact the implementation of IPC measures. These factors include the presence of IPC policies and guidelines,

sufficient supplies, adequate staffing, the existence of IPC committees, and supportive hospital management. The finding is also consistent with Lowe et. al., (2022), who identified barriers such as inadequate hospital infrastructure, resource and workforce shortages, insufficient staff education, lack of in-service IPC training and supervision, and high visitor numbers as obstacles to effective IPC in hospitals, similar to challenges observed in other resource-limited settings.

Majority 62.3%(n=162) of the respondent says there is presence of adequate materials for hand hygiene in their ward. This result contrasts with Saeed (2021), which found that most doctors and nurses cited the unavailability of PPE and handwashing materials as reasons for their non-compliance with using protective equipment and performing hand hygiene.

Majority 57.7%(n=150) of the respondent says no to bed capacity in their facility meets international standards. This result aligns with a study conducted in Brazil, which identified institutional factors as the primary reasons for non-compliance with standard precautions (Piai-Morais, Orlandi, and Figueiredo, 2015).

Majority 93.8%(n=244) of the respondents affirms there is adequate spacing of at least 1 meter between patient beds ensured in their facility while the minority 6.2%(n=16) of the respondent says there is no adequate spacing of at least 1 meter between patient bed ensured in their facility. This study does not align with research conducted in London by Lowe et. al., (2021), which found that inadequate bed capacity led to overcrowding on wards. In their study, beds were too close together, and patients had to use alternative spaces like mattresses in corridors and on ward floors. This overcrowding hindered regular cleaning practices and contributed to an increased risk of Hospital Acquired Infections (HAIs). The study also highlighted that poor structural design exacerbated overcrowding, making it difficult for staff to adhere to IPC protocols due to the high volume of patients and visitors, and the challenges of managing restrictions in a tense and crowded environment.

Majority 148(56.9%) of the respondents says no, while minority 112(43.1%) says yes to the question on ‘’do you have quality running water, soap and single-use towels in all wards and at all points of care for hand hygiene practices’’. This study is consistent with Ogunsola and Mehtar (2020), who emphasize that healthcare settings, especially in low-resource environments, must adhere to minimum standards such as those set by the World Health Organization (WHO) IPC program to effectively manage infectious disease threats. The higher burden of HAIs in these settings underscores the need for these standards. However, robust evidence on effective IPC implementation strategies in such environments remains scarce.

Majority 149(57.3%) of the respondents says no, while the minority 111(42.7%) says yes to the question that ‘do you have alcohol-based hand-rub solution available at all point of care for hand hygiene practices’, also, majority 247(95.0%) of the respondent says no while minority 13(5.0%) says yes to the question ‘’ Is PPE available at all times and in sufficient quantity for all uses for all health care workers?’’. This finding aligns with Saeed (2021), which noted that the primary reasons for noncompliance with PPE use and handwashing among doctors and nurses are the lack of availability and insufficient handwashing materials. It also supports Tomczyk Sara et. al., (2022), who emphasize that adherence to standards like the World Health Organization (WHO) IPC program is crucial for managing infectious disease threats, especially in low-resource settings where HAIs are more prevalent. For instance, a 2011 systematic review found that the pooled prevalence of HAIs in

resource-limited settings was 15.5 per 100 patients, compared to 7.1 per 100 patients in Europe and 4.5 per 100 patients in the USA. While progress has been made in outbreak preparedness and IPC in regions such as Africa since the 2014–2016 Ebola outbreak, effective and sustainable IPC practices still require better evidence and resources. The finding is also consistent with Hanmore et al. (2014), which reported that limited resources, such as staff shortages and unreliable water supply, contribute to poor compliance with infection control measures. Similarly, Azuka et. al., (2022) found that nurses with higher patient loads are more likely to neglect the use of personal protective equipment, like face masks, when performing wound care.

Majority 158(60.8%) of the respondent says no, while the minority 102(39.2%) says yes to the question ‘’is there sufficient power supply in your facility day and night for all purposes such as pumping and boiling water, sterilization and decontamination, lighting in toilet, etc?’’. This finding aligns with the work of Lowe, Wood, and Lange et. al., (2021), which highlights that inadequate hospital infrastructure, resource and workforce shortages, insufficient staff education and IPC training, and large numbers of visitors are significant barriers to effective IPC in hospitals, mirroring challenges observed in other resource-limited settings. It also supports Ssekitoleko et. al., (2020), which notes that 30 to 50% of equipment in low-resource countries is out of service. Poor maintenance of medical equipment is partly due to a lack of trained medical engineering staff and the overwhelming patient load on healthcare workers. Additionally, the extensive sharing of equipment among numerous patients heightens the risk of nosocomial infections or hospital-acquired infections in these settings.

75.4%(n=196) indicates there is availability of appropriate and well-maintained materials for cleaning while the minority 24.6%(n=64) of the respondents indicates there is no availability of appropriate and well-maintained materials for cleaning. This study contrasts with the findings from Lowe et. al., (2021) in London, which identified inadequate and poorly maintained buildings as significant barriers to effective IPC. The study noted that damaged surfaces such as walls and floors were challenging to clean, and structural issues like uneven pavements further complicated cleaning efforts. For instance, a head nurse in sub-Saharan Africa highlighted similar issues, noting that broken windows and doors exacerbated the problem by allowing dust, insects, and mosquitoes to persist despite daily cleaning efforts.

95.0%(n=247) reveals there is no PPE available at all times and in sufficient quantity for all uses by all health care workers while the minority 5.0%(n=13) of the respondents indicates there is PPE available at all time and in sufficient quantities for all uses by all health care workers. This result aligns with findings from Lowe et. al., (2021), which identified resource shortages as a significant barrier to effective IPC in many hospitals. Participants from various hospital types reported shortages of essential items, including hospital furniture, medicines, and IPC supplies such as PPE, hand hygiene products, and cleaning equipment. A project manager overseeing a surgical ward for wounded patients in rural sub-Saharan Africa connected these resource deficiencies to higher infection rates, stating, "We always have the same problem—if they cannot access the right equipment, we see infections."

Section D: Influence Of Time Constraint In The Prevention Of Nosocomial Infection.

From Table 4.5 above, majority 32.3%(n=84) of the respondents indicate that they (Strongly disagree) to the above question on I don’t practice hand hygiene because I don’t have time, while minority 19.2%(n=50) of the respondent indicate

(Strongly Agree). This shows that there is no association between time factor and prevention of nosocomial infection, this finding does not align with studies by Henry et. al., (2020), which identified insufficient time as a major factor affecting nurses' ability to prevent nosocomial infections, and Chipfuwa et. al., (2023), which found that 26% of participants cited lack of time as a barrier to effective infection prevention and control practices.

Majority 194(76.4%) of the respondents indicates strongly disagree, while the minority 20(7.7%) indicates strongly agree to the question ‘’I think washing of hands following every procedure is a waste of time’’. This finding is consistent with the recommendations from Wong and Lee (2020) and WHO (2020), which suggest that a minimum hand washing duration of 20 seconds is optimal for healthcare staff. Techniques such as singing the 'Happy Birthday' song while washing hands help ensure this duration. It is also emphasized that healthcare workers should follow proper decontamination procedures with soap and water or alcohol-based hand gel, paying particular attention to commonly missed areas of the hands. Additionally, this finding supports Hillier (2020), who argued that effective hand hygiene is a crucial tool for preventing healthcare-associated infections, cross-infection, and the spread of antimicrobial resistance. Hand washing is a complex issue with compliance influenced by several factors, including accurate knowledge, proper decontamination techniques, human behavior, the environment, and effective leadership. This finding aligns with Kosgerolu et. al., (2010), who noted that nurses, frequently exposed to various infections during their duties, can prevent these infections through adherence to proper hand hygiene and other infection control measures. Similarly, Pires et. al., (2021) emphasized the importance of washing hands thoroughly and promptly between patient contacts and after exposure to blood, body fluids, secretions, excretions, or contaminated equipment as a crucial component of infection control and isolation precautions. The spread of nosocomial infections among immunocompromised patients is connected with healthcare workers’ hand contamination in almost 40% of cases, and is a challenging problem in the modern hospitals.

Majority 196(75.4%) of the subjects strongly disagree, while very few 2(0.8%) are undecided to the question on ‘’sharing of syringes and needles saves time and makes work faster’’. This study supports the findings of Luby (2001), which identified unsafe injection practices such as using a needle or syringe on multiple patients, recapping used needles, improper disposal of syringes and needles, and administering unnecessary injections. Additionally, the results align with a study conducted at Ronald Ross Hospital in Zambia by Omorogbe, Omuemu, & Isara (2012), where no respondents reported reusing needles or syringes. The study also found that 62.3% of used syringes and needles were disposed of in makeshift sharp disposal boxes. However, this study contrasts with Shisana, Mehtar, Mosala, & Zungu-Dirwayi (2005), which reported that syringe reuse was a common practice and many healthcare workers believed injections were safe as long as the needle was changed, even if the syringe was not.

Most 54.2%(n=141) of the respondents strongly disagree that teaching patient on nosocomial is time consuming and few 6.9%(n=18) strongly agree to the above question. This result aligns with a study conducted at Yonsei University, Korea, which highlights the CDC's recommendation for hospitals and health institutions to offer infection control education to patients, healthcare providers, visitors, and medical and nursing school trainees, following standard medical infection guidelines (Kim, Eunyoung, Sang Suk, and Sunghee, 2021).

Majority 156(60.0%) of the respondents indicates strongly disagree, while the

minority 28(10.8%) indicates strongly agree to the question ‘’Putting on PPE for every procedure is a waste of time’’. This finding aligns with Hillier (2020), who emphasized that the COVID-19 pandemic has underscored the critical importance of effective hand hygiene practices. However, it is crucial for healthcare staff to adhere to hand hygiene standards consistently, not just during crises. This finding contrasts with Augustine F.F. et. al., (2023), which reported that although efforts were made to spread the Infection Prevention Control policy, high levels of non-compliance were attributed to time constraints at work.

5.2 Implication To Nursing

Nosocomial infection is subgroup of healthcare infections that originate in any healthcare setting. Prevention of nosocomial infection should be implemented by nurses which include hand hygiene, use of personal protective equipment, sterilization and disinfection, isolation of patient. Nosocomial infection has been recognized as a problem affecting the quality of healthcare and a principal source of adverse healthcare outcomes, the findings in this study suggest that the strong educational standard, set in place, should be continued and enforced. Additionally monitoring adherence to and compliance with establish guidelines set by centers for disease control and prevention (CDC) by healthcare workers should be sustained.

Furthermore, the fundamental role of healthcare institution to provide support in form of adequate staffing and infection control materials should be intensified.

5.3 Limitation Of The Study

This study surveyed only one health facility in Lagos State; hence, this cannot be said to be representative of the total nurse’s population in State at large. Also, in comparison to other studies, some of the reviewed studies were conducted on small samples which limit the generalization of the findings of these studies. Therefore, there may have been confounding variables which were not taken into consideration, but which may have impacted the results, therefore impacting the generalization of the findings. Also, no funding was received for this study.

5.4 Summary

This study was carried out to assess the factors influencing the attitude and practice of nursing toward prevention of nosocomial infection among nurses. Questionnaire was the instrument used to obtain data from the respondent. A total 260 questionnaire with both open ended and close ended questions were used to collect data from clinical nurses in Lagos State University Teaching Hospital using a simple random sampling method.

In chapter 1 the background of study, research problem, objectives, significant of the study, research question, scope of study and operational definition of terms were stated. The related literatures were reviewed in chapter two and the research design (methodology) was highlighted in chapter three. The distributed questionnaire was filled and returned, the data analysis in chapter four. The findings of this study reviewed that majority of the respondent have adequate knowledge on prevention of nosocomial infection but there are some limiting factors which hinder their effective practice.

5.5 Conclusion

Based on the findings in this study, it can be concluded that registered nurses regardless of their years of experience and qualification are knowledgeable about nosocomial infection, its causes and risk factors for its transmission and the recommended guidelines for reducing its spread, also effective practice of the prevention of nosocomial infection is low due to some factors.

5.6 Recommendation

Based on the findings from this study, the following recommendations are made:

- Nurses should be encouraged to update their knowledge by means of in service continuing educational programs
- Newly employed nurses should be trained on infection control practice at regular intervals.
- A checklist should be put in place to check nurses' compliance to set guidelines regarding practice of infection control measures.
- Government should employ more nurses in order to reduce workload on already engaged ones.
- The hospital should ensure adequate provision of infection control materials and facilities e.g. hand washing sinks, soap, and disinfectants for cleaning and disinfecting equipment, gloves, mask and gowns should also be provided.
- Adoption of acceptable guidelines based on evidenced based nursing practice is also recommended.
- Nurses should educate the patient and their relatives on importance of basic hygiene practices especially hand washing.

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Appendix

Questionnaire

Factors Influencing the Attitude And Practice Of Nurses Towards Prevention Of Nosocomial Infection In Lagos State University Teaching Hospital, Ikeja Lagos State.

Section A: Demographic Data

Please tick (√) the appropriate column from the options below;

1. Age range in years (a) 20 – 30() (b) 31 – 40() (c) 41 – 50() (d) 51 and above ()
2. Sex (a) male () (b) female ()
3. Ethnicity (a) Yoruba () (b) Hausa () (c) Igbo () (d) If others, specify ……..……
4. Marital status (a) married () (b) single () (c) divorced () (d) If others, specify ……..…….
5. Religion (a) Christianity () (b) Islam () (c) Traditional () (d) If others, specify ……...
6. Year of experience in years (a) less than 10() (b) 11 – 25() (c) 26 – 30() (d) more than 30
7. Educational level (a) diploma in nursing () (b) BNSc () (c) master of science () (d) if others specify …….
8. Name of duty ward (a) medical ward () (b) surgical ward () (c) emergency ward () (d) If

Section B: Factors Influencing The Knowledge Of Nurses In The Prevention Of Nosocomial Infection.

9. Have you heard of Nosocomial infection? a. Yes () b. No ()
10. Do you think younger nurses are more careful in preventing nosocomial infection than older nurses? a. Yes () b. No ()
11. Do you think brain drain or job burnout can contribute to the occurrence of nosocomial infection? a. Yes () b. No ()

12. Do you agree that workplace safety prevent the nosocomial infection?

a. Yes () b. No ()

13. Do you think that emotional exhaustion contributed to the occurrence of the nosocomial infection? a. Yes () b. No ()
14. Do you think prolong stay in the hospital contribute to nosocomial infection? a. Yes () b. No ()
15. Do you think Nurses are responsible for patient having nosocomial infection through negligence? a. Yes () b. No ()
16. Do you think retraining of Nurses would improve use of infection control materials effectively? a. Yes () b. No ()
17. What is personal protective equipment? a. wash of hands b. use of gloves, mask and boots c. use of hand sanitizer d. none of the above
18. Do you normally use personal protective equipment when caring for patient with infection disease? a. Yes () b. No ()
19. Do you think demographic level contribute to nosocomial infection? a. Yes ()

b. No ()

20. Do you think patient contribute to the occurrence of nosocomial infection? a. Yes ()

b. No ()

Section C: Relationship Between Availability of Resources In The Prevention Of Nosocomial Infection.

21. Are there standard precaution guidelines in your ward? a. Yes () b. No ()
22. Are there adequate materials for hand hygiene in your ward? a. Yes ()b. No ()
23. Is the design of wards in your facility in accordance with international standards regarding bed capacity? a. Yes () b. No ()
24. Is bed occupancy in your facility kept to one patient per bed? a. Yes () b. No ()
25. Is adequate spacing of at least 1 meter between patient beds ensured in your facility? a. Yes () b. No ()
26. Do you have quality running water, soap and single-use towels in all wards and at all points of care for hand hygiene practices? a. Yes () b. No ()
27. Do you have alcohol-based hand-rub solution available at all point of care for hand hygiene practices? a. Yes () b. No ()
28. Is there sufficient power supply in your facility day and night for all purposes such as pumping and boiling water, sterilization and decontamination, lighting in toilet, etc? a. Yes () b. No ()
29. Are appropriate and well-maintained materials (like detergent, mops, buckets, etc) for cleaning available? a. Yes () b. No ()
30. Is PPE available at all times and in sufficient quantity for all uses for all health care workers? a. Yes () b. No ()

Section D: Relationship Between Time Constraints In The Prevention Of Nosocomial Infection Among The Nurses.

1 = strongly agree 2= agree 3= undecided 4 = disagree 5 = strongly disagree

S/N	Question	1	2	3	4	5
1	I don't practice hand hygiene because I don't have time					
2	I think washing of hands following every procedure is a waste of time					

3	Sharing of syringes and needles saves time and makes work faster					
4	Teaching patient on nosocomial is time consuming					
5	Putting on PPE for every procedure is a waste of time					