

**KNOWLEDGE AND PRACTICE OF STANDARD PRECAUTIONS AMONG NURSES
IN A TERTIARY HEALTH FACILITY, BENIN CITY.**

BY

OGIRIBO Otaroghene Gloria

BMS2001042

DEPARTMENT OF MEDICAL-SURGICAL NURSING

FACULTY OF NURSING SCIENCE

UNIVERSITY OF BENIN

BENIN CITY

EDO STATE.

OCTOBER, 2025.

**KNOWLEDGE AND PRACTICE OF STANDARD PRECAUTIONS AMONG NURSES
IN A TERTIARY HEALTH FACILITY, BENIN CITY.**

BY

OGIRIBO Otaroghene Gloria

**DEPARTMENT OF MEDICAL SURGICAL NURSING FACULTY OF NURSING
SCIENCES, UNIVERSITY OF BENIN, BENIN CITY, EDO STATE.**

**IN PARTIAL FULFILLMENT OF THE AWARD OF THE DEGREE OF BACHELOR OF
NURSING SCIENCES, DEPARTMENT OF MEDICAL SURGICAL NURSING,
FACULTY OF NURSING SCIENCE, UNIVERSITY OF BENIN, BENIN CITY.**

OCTOBER, 2025.

CERTIFICATION

This is to certify that this research project by **OGIRIBO Otaroghene Gloria** with **MATRICULATION NUMBER BMS2001042** has been examined and approved for the award of "**BACHELOR OF NURSING SCIENCE CERTIFICATE.**"

OGIRIBO Otaroghene Gloria

.....

Student Name

Sign & Date

PROF. (MRS) C.E. OMOROGBE

.....

Project Supervisor

Sign & Date

PROF. (MRS) C.E. OMOROGBE

.....

Head of Department (MED-SURG)

Sign & Date

.....

.....

External Examiner

Sign & Date

DEDICATION

I dedicate this Project work to GOD ALMIGHTY, whose guidance and strength have been my constant companion throughout my academic journey, and to my wonderful family and my friends for their love and support.

ACKNOWLEDGMENT

I wish to express my sincere gratitude to Almighty God for all he has done and will still do for me, thank you. I also express my gratitude to my project supervisor Prof (Mrs.) C.E Omorogbe for her kind supervision, constructive criticism and guidance through the course of this work. May God bless and reward you abundantly Ma.

To the Dean of the Faculty Prof. F.U. Okafor, I say a big thank you for your leadership. Special thanks to my wonderful lectures, Prof. (Mrs.) R.E. Esewe, Rev. Sis. Chukwurah Joan, Prof. (Mrs.) J.A Afemikhe, Dr. (Mrs.) Enuke, Dr. (Mrs.) Okose O, Dr. T.A Ehwarieme, Mrs Iniomor, Mrs. Okupa, Mrs. Edo-Osagie, Mrs. Chegwe and all other lecturers who have impacted knowledge through their dedicated work. I wish to present my special thanks to the faculty of Nursing Science, University of Benin for their commitment and support to seeing students attain the very best in character and learning.

I would like to acknowledge with gratitude and continually appreciate the support and unrelenting efforts and love of my parents; Mr. Mark Esiri and Mrs. Victoria Ufuoma OGIRIBO, My Uncles and to my wonderful Siblings: Glory, Gaius, Victory, Bright, Omega and Gladness OGIRIBO and Adamson Praise. They not only assisted me financially but also extended their Support morally, emotionally and with their prayers. I say thank you. My gratitude also, goes to my friends; Ogbuze Rita, Omokhegbele Success, Okhaware Omolegho, for their unwavering support and companionship. Finally, to those of you who have contributed in one way or the other towards the success of this research, may God reward you all Amen.

ABSTRACT

The objectives of this study were to determine the level of knowledge of standard precautions among nurses, assess their level of adherence to standard precautionary practices, and examine the relationship between knowledge and adherence among nurses in the University of Benin Teaching Hospital (UBTH), Benin City. A descriptive cross-sectional research design was adopted for the study. Data were collected using a structured, self-administered questionnaire distributed to 272 nurses, out of which 241 were properly completed and analyzed, representing a response rate of 88.6%. Data were analyzed using descriptive and inferential statistics, including frequencies, percentages, means, and the chi-square test. The findings revealed that a majority of the respondents (88%) demonstrated good knowledge of standard precautions, while 90% reported high adherence to standard precautionary practices. The chi-square test result ($\chi^2 = 0.2935$, $df = 1$, $p = 0.20$) indicated no statistically significant relationship between nurses' knowledge and adherence to standard precautions. The study also identified positive influencing factors such as the availability of personal protective equipment (PPE), functional hand hygiene facilities, institutional policies, regular infection prevention and control (IPC) training, and supervision. Conversely, high workload and emergency situations were reported as major barriers to consistent adherence. It was concluded that although nurses at UBTH possess adequate knowledge and good adherence to standard precautions, continuous training, adequate staffing, and sustained provision of resources are necessary to maintain effective infection prevention practices.

Keywords: *Standard precautions, knowledge, adherence, infection prevention, nurses, Benin City*

TABLE OF CONTENTS

Title Page	i
Certification	ii
Dedication	iii
Acknowledgement	iv
Abstract	v
Table of Contents	vi
List of Tables	ix
List of Figures	x
CHAPTER ONE: INTRODUCTION	
1.1 Background of the Study	1
1.2 Statement of the Problem	4
1.3 Research Objectives	7
1.4 Research Questions	7
1.5 Research Hypotheses	7
1.6 Significance of the Study	8
1.7 Scope of the Study	10
1.8 Operational Definition of Terms	11
CHAPTER TWO: LITERATURE REVIEW	
2.1 Conceptual Review	15
2.2 Theoretical Framework	22
2.3 Empirical Review	26
CHAPTER THREE: METHODOLOGY	
3.1 Research Design	32
3.2 Research Setting	33
3.3 Population of the Study	34
3.4 Sample Size Determination	35
3.5 Sampling Technique	36
3.6 Instrument for Data Collection	37
3.7 Validity of the Instrument	39
3.8 Reliability of the Instrument	39
3.9 Method of Data Analysis	40
3.10 Ethical Considerations	41
CHAPTER FOUR: RESULTS	
Table 4.1 Socio-demographic and Professional Information of Respondents	43

Research Question 1: Knowledge Regarding Standard Precautions	46
Table 4.2 Knowledge Regarding Standard Precautions among Nurses	46
Figure 4.1 Knowledge Regarding Standard Precautions among Nurses	49
Research Question 2: Level of Adherence to Standard Precautions	50
Table 4.3 Practice/Adherence to Standard Precautions	50
Figure 4.2 Bar Chart Showing Practice/Adherence to Standard Precautions	52
Research Question 3: Relationship Between Knowledge and Adherence	53
Table 4.4 Relationship Between Level of Knowledge and Adherence to Standard Precaution Practices	53
Supplementary Analysis: Perceived Factors Influencing Adherence	54
Table 4.5 Perceived Factors Influencing Adherence	55
Figure 4.3 Pie Chart Showing Perceived Factors Influencing Adherence	57
Hypothesis Testing	
Table 4.6 Relationship between Level of Knowledge and Adherence to Standard Precautions	58

CHAPTER FIVE: DISCUSSION AND FINDINGS

5.1 Discussion of Major Findings	59
5.2 Implication to Nurses	68
5.3 Summary	70
5.4 Conclusion	72
5.5 Limitations of the Study	73
5.6 Recommendations	74
5.7 Suggestions for Further Studies	76
References	77

Appendices

Appendix I: Informed Consent Form	81
Appendix II: Cover Letter to Respondents	83
Appendix III: Questionnaire	84
Reliability Test	
Ethical Approval Letter	

List of Tables

Table 3.1 Distribution of Target Nurse Population by Ward/Unit at UBTH (February 2025)

Table 3.2 Proportional Allocation of Sample Size by Ward/Unit

Table 4.1 Socio-demographic and professional information of respondents

Table 4.2 Knowledge regarding standard precautions among nurses

Table 4.3 Practice/Adherence to Standard Precautions

Table 4.4 Perceived factors influencing adherence

Table 4.5 Relationship between the level of knowledge regarding standard precautions and the level of adherence to standard precaution practices

List of Figures

Figure 2.1 Conceptual model illustrating the Theory of Planned Behavior applied to nurses' Standard Precaution adherence

Figure 4.1 Bar chart showing practice/Adherence to Standard Precautions

Figure 4.2 Pie chart showing perceived factors influencing adherence

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

A persistent and significant concern within global healthcare delivery systems is the occurrence of nosocomial infections, often termed Healthcare-Associated Infections (HAIs). These infections exert a considerable negative impact on patient health outcomes while simultaneously increasing healthcare expenditures (World Health Organization, 2022). Essential measures to counteract these adverse events are robust Infection Prevention and Control (IPC) frameworks, which are fundamentally reliant on the application of Standard Precautions (SPs) (Taylor & Coffey, 2023; World Health Organization, 2022).

Standard Precautions function as the basic, minimum required set of safety protocols and infection control practices applied universally during the care of all patients, at all times, and in all healthcare settings (World Health Organization, 2022). This approach is predicated on the foundational principle that healthcare workers must always assume any patient could potentially be a source of infection transmission, regardless of their diagnosis or perceived infection status (AbuAlrub & Al-Khawaldeh, 2023; World Health Organization, 2022). The overarching aim is to protect both health workers and patients by reducing the risk of microorganism transmission from recognized and unrecognized sources (World Health Organization, 2022).

Consistent adherence to SPs is crucial for preventing the spread of microorganisms between patients, healthcare workers, and the environment via various routes like

direct/indirect contact or respiratory droplets (World Health Organization, 2022). This adherence involves consistently performing key actions based on risk assessment, such as meticulous hand hygiene, the use of personal protective equipment (PPE), safe injection practices, respiratory hygiene, appropriate environmental cleaning, and safe handling of sharps and waste disposal (Taylor & Coffey, 2023; World Health Organization, 2022).

Frontline nursing personnel (including Registered Nurses and Student Nurses involved in care) are crucial actors in effectively translating SP guidelines into practice, especially those directly responsible for patient care (Ghabayen et al., 2023; Ogunrinde et al., 2023). Their duties inherently involve sustained and close physical engagement with patients, demanding unwavering commitment to these safety protocols to disrupt microbial transmission pathways (AbuAlrub & Al-Khawaldeh, 2023; Rezaei et al., 2024). This requirement is particularly critical within complex medical environments like tertiary hospitals, including the University of Benin Teaching Hospital (UBTH) in Benin City. Such institutions manage high volumes of patients with diverse conditions, amplifying the potential for pathogen dissemination and underscoring the need for optimal SP compliance by nursing staff (Emekolom et al., 2024).

Despite the universal acceptance of SPs' importance, empirical evidence frequently points to suboptimal levels of both knowledge and practical adherence among healthcare professionals globally, including Nigeria (Alreshidi et al., 2021; Ghabayen et al., 2023; Lim et al., 2021; Ogunrinde et al., 2023; Oyewumi et al., 2022). It is

widely acknowledged that possessing adequate theoretical knowledge does not automatically guarantee consistent performance in clinical settings – a discrepancy often termed the "knowledge-practice gap" (Alreshidi et al., 2021; Rezaei et al., 2024). Studies within Nigeria reflect this trend, reporting inconsistent SP understanding and application among nurses, potentially linked to factors like resource limitations, training gaps, workload pressures, or staff attitudes (Emekolom et al., 2024; Ogunrinde et al., 2023; Onubogu et al., 2022; Oyewumi et al., 2022). Research related to the COVID-19 pandemic, for instance, highlighted areas where SP adherence among Nigerian nurses needed strengthening (Afemikhe et al., 2020; Oyewumi et al., 2022). Furthermore, documented issues like the prevalence of occupational exposures through needlestick injuries emphasize the tangible consequences of SP lapses in Nigerian healthcare facilities (Onubogu et al., 2022).

Within the specific context of Edo State, where UBTH operates, investigations indicate existing complexities in how local nurses implement infection control (Afemikhe et al., 2020). Preliminary research suggests nurses' adherence may be shaped by factors like institutional support, PPE adequacy, individual attitudes, and clinical background (Emekolom et al., 2024). This localized information reinforces the justification for a dedicated assessment focusing squarely on the nurse cohort within UBTH. A clear understanding of their present knowledge, routine practices, and perceived influences on adherence is essential for formulating effective, setting-specific interventions (Ghabayen et al., 2023; Rezaei et al., 2024).

Consequently, the present research aims to specifically evaluate the current status of knowledge and practice related to standard precautions among nurses engaged in direct patient care at the University of Benin Teaching Hospital (UBTH), Benin City. Furthermore, this study seeks to identify factors that these nurses perceive as significantly impacting their consistent use of SPs. Acquiring this targeted, contemporary data is deemed crucial for informing evidence-based initiatives designed to enhance IPC effectiveness and foster a stronger culture of safety for both patients and healthcare providers at UBTH (Taylor & Coffey, 2023; World Health Organization, 2022).

1.2 Statement of the Problem

Although Standard Precautions (SPs) are universally acknowledged as a critical strategy for ensuring safety within healthcare settings (World Health Organization, 2022; Taylor & Coffey, 2023), their consistent and correct application by healthcare professionals remains an area of ongoing concern. Research literature frequently indicates that healthcare professionals' understanding of SPs can be incomplete, and adherence to these essential protocols is often less than optimal (Alreshidi et al., 2021; Ghabayen et al., 2023; Ogunrinde et al., 2023; Oyewumi et al., 2022). Furthermore, a persistent challenge highlighted in numerous studies is the discrepancy between possessing knowledge of proper procedures and translating that knowledge into routine actions during patient care, often termed the knowledge-practice gap (Rezaei et al., 2024).

This international pattern resonates within Nigeria, where studies have also indicated variability in how consistently nurses apply SPs and in their level of relevant knowledge (Ogunrinde et al., 2023; Oyewumi et al., 2022). Even during periods demanding heightened infection control vigilance, such as the COVID-19 pandemic, complete compliance among Nigerian nursing staff was not always observed, suggesting that reinforcing these fundamental practices remains necessary (Afemikhe et al., 2020; Oyewumi et al., 2022). The tangible risks associated with inconsistent adherence are underscored by findings regarding the prevalence of occupational exposures, like needle-stick injuries, within Nigerian tertiary healthcare facilities, which are often linked to deviations from SPs (Onubogu et al., 2022).

Within the specific context of Edo State, where the University of Benin Teaching Hospital (UBTH) is located, local research suggests existing complexities related to nurses' infection control behaviors (Afemikhe et al., 2020). Importantly, recent preliminary data from a tertiary institution within Edo State points towards several factors potentially impacting nurses' adherence to SPs; these may include the reliable availability of protective gear, the influence of established institutional protocols, staff attitudes toward safety measures, and perhaps the length of their clinical careers (Emekolom et al., 2024). However, given that this information is preliminary (preprint status) and may not specifically isolate the experiences of nurses in the current routine environment, a significant gap remains. There appears to be a lack of current, detailed information specifically characterizing the knowledge and practices of nurses

operating today within the unique context of UBTH.

Therefore, the core problem driving this research is the deficit of up-to-date, specific, and comprehensive information regarding both the understanding and the practical implementation of standard precautions among the frontline nursing staff at the University of Benin Teaching Hospital (UBTH). Since factors influencing practice can shift over time—including resource levels, policy updates, training initiatives, and even staff awareness (Ghabayen et al., 2023; Lim et al., 2021)—it is crucial to assess the current situation directly. An evaluation is needed to gauge whether the contemporary knowledge held by UBTH's nurses aligns with current best-practice recommendations (AbuAlrub & Al-Khawaldeh, 2023; World Health Organization, 2022) and, significantly, how effectively this knowledge is applied in their day-to-day work, considering the various potential influencing factors operating within this specific hospital setting (Emekolom et al., 2024; Ogunrinde et al., 2023).

This lack of current, targeted data poses a barrier to informed action by UBTH's management and clinical leadership. It hinders the ability to precisely identify needs and tailor continuous education, allocate resources effectively to address specific shortfalls experienced by nurses, or refine institutional policies to better support consistent SP adherence (Ghorbanmovahhed et al., 2023). Persisting with this knowledge gap potentially sustains avoidable risks of infection transmission, impacting the safety of both the patients entrusted to UBTH's care and the dedicated nursing staff who serve them.

1.3 Research Objectives

The aim of this study is to assess the knowledge and practice of standard precautions among nurses at the University of Benin Teaching Hospital (UBTH), Benin City.

The specific objectives are to:

1. Determine the level of knowledge regarding standard precautions among nurses at UBTH, Benin City.
2. Assess the level of adherence to standard precaution practices among nurses at UBTH, Benin City.
3. Examine the relationship between knowledge of standard precautions and adherence to standard precautions practices among nurses at UBTH, Benin City.

1.4 Research Questions

This study seeks to answer the following questions:

1. What is the level of knowledge regarding standard precautions among nurses at UBTH, Benin City?
2. What is the level of adherence to standard precaution practices among nurses at UBTH, Benin City?
3. Is there a relationship between knowledge of standard precautions and adherence to standard precaution practices among nurses at UBTH, Benin City?

1.5 Research Hypotheses

There is no significant relationship between the level of knowledge regarding standard precautions and adherence to standard precaution practices at UBTH, Benin

City.

1.6 Significance of the Study

The investigation into the knowledge and application of standard precautions among nurses at the University of Benin Teaching Hospital (UBTH) holds considerable potential to generate valuable insights, contributing meaningfully to infection prevention and control efforts within this specific tertiary healthcare environment. The anticipated outcomes of this research are expected to benefit multiple groups and inform various aspects of healthcare delivery and education:

1. **Enhancement of Nursing Practice at UBTH:** This study is poised to illuminate the specific areas where nurses at UBTH may currently possess knowledge gaps or face challenges in consistently adhering to standard precautions. By providing detailed, context-specific data, the findings can serve as a crucial foundation for developing targeted competency development initiatives, moving beyond generic training to address the actual learning needs identified within this group. Furthermore, identifying the facilitators and barriers perceived by the nurses themselves (such as resource availability or workload pressures) can empower both frontline staff and nursing leadership to advocate for and implement practical changes aimed at fostering a more supportive environment for optimal infection control practices during daily patient care.

2. **Informing UBTH Management and Institutional Policy:** The research will

provide actionable intelligence for the administrative leadership, the dedicated Infection Prevention and Control (IPC) committee, and nursing service managers at UBTH. Empirical data detailing current adherence levels and the factors influencing them within their own institution can underpin more effective strategic planning. This evidence can guide decisions regarding the deployment of resources (such as ensuring consistent availability of PPE and hand hygiene materials), justify potential revisions or reinforcements of existing institutional policies governing SPs, and catalyze targeted quality improvement projects designed to bolster the overall institutional framework for patient and staff safety.

3. **Contributions to Nursing Education:** Insights derived from this study may prove beneficial for refining nursing education programs, both at the undergraduate and postgraduate levels. Understanding the specific knowledge deficits or practical application challenges encountered by nurses working within a major teaching hospital like UBTH can help educators identify areas in the curriculum that might require strengthening or alternative pedagogical approaches. This can contribute to better preparing future generations of nurses to navigate the real-world complexities of infection prevention within demanding tertiary care settings.

4. **Advancing Patient Safety:** Ultimately, the primary beneficiaries of improved infection control practices are the patients. By providing data that can lead to enhanced knowledge and more consistent adherence to standard precautions by nurses, this research contributes directly to reducing the likelihood of patients acquiring Healthcare-Associated Infections (HAIs) during their stay at UBTH. This translates to

a safer care environment, potentially leading to better clinical outcomes and a more positive patient experience.

5. Foundation for Future Research: This study will establish a critical empirical baseline concerning standard precaution knowledge and practice specifically tailored to the nursing staff at UBTH in the current period. This data can serve as a benchmark against which the effectiveness of future IPC interventions or policy shifts within the hospital can be measured. Moreover, the specific influencing factors identified in this research may highlight phenomena worthy of more focused and in-depth exploration through subsequent qualitative or interventional studies conducted within UBTH or comparable healthcare settings.

In summary, the significance of this research lies in its potential to provide context-specific, evidence-based insights necessary to drive practical advancements in infection prevention and control, tailored specifically to the needs and challenges of the nursing staff at the University of Benin Teaching Hospital.

1.7 Scope of the Study

This research specifically investigates nurses' knowledge of standard precaution, their self-reported practice and adherence, and the relationship between knowledge and adherence among nurses working within various inpatient wards and specialized units, such as Medical wards, Surgical units, Obstetrics & Gynecology, Pediatrics, Accident & Emergency, Intensive Care Units, and Theatre Complex at the University of Benin Teaching Hospital (UBTH) in Benin City. In addition, the study provides

insights into perceived factors that may influence adherence, such as availability of resources, training, workload, and institutional policies.

Consequently, student nurses, nurses primarily in administrative or purely non-clinical roles, and other healthcare professionals were excluded from this study's population. This study encompasses core standard precautions elements relevant to clinical nursing practice, including but not limited to hand hygiene, appropriate use of personal protective equipment (PPE), safe injection practices, and sharps management. The findings of this study were specific to the context of nurses practicing at UBTH in Benin City, Edo State, Nigeria.

1.8 Operational Definition of Terms

For clarity and consistency in this research, the following key terms are operationally defined as they were used and measured in this specific study:

1. **Standard Precautions (SPs):** Standard Precautions are the minimum infection prevention and control measures recommended globally by the World Health Organization and adopted by the University of Benin Teaching Hospital (UBTH) to prevent the spread of infection. They serve as foundation of safe nursing and medical practice, ensuring protection of both healthcare workers and patients from blood borne and other infectious agents. In this study, SPs are operationally defined to include core practices such as hand hygiene, use of personal protective equipment (PPE), safe injection practices, respiratory hygiene, environmental cleaning, sharps management, and waste disposal. These practices formed the framework for assessing both knowledge and self-reported adherence among nurses.

2. **Knowledge of Standard Precautions:** Knowledge refers to the information, awareness, and understanding that nurses have about the concept, principles, and procedures of SPs. It includes familiarity with guidelines, recognition of key infection prevention practices, and comprehension of their importance in patient safety. In this study, knowledge is operationally defined as the score obtained by respondents on structured questionnaire items designed to test correct awareness and understanding of SPs. Responses were graded, scores were categorized into poor, fair, or good knowledge levels, based on predetermined cut-off points. This categorization allowed for systemic comparison of nurses' knowledge levels across the study population.

3. **Adherence to Standard Precaution Practices:** Adherence refers to which nurses consistently implement SPs during their daily patient care activities. It demonstrates the extent of compliance with recommended infection prevention practices such as hand hygiene, use of PPE, safe handling of sharps, and proper waste disposal. In this study, adherence is operationally defined as the level of compliance self-reported by nurses using a structured Likert-scale checklist that measured the frequency of performing specific SP-related actions. The scale provided response options ranging from "never" to "always", which we're quantified to generate adherence scores. These scores were further categorized into consistent or inconsistent adherence, making it possible to evaluate differences in practice levels among the respondents.

4. **Nurses:** Nurses are professional healthcare providers who deliver direct or indirect care to patients and are central to prevention and control of

healthcare-associated infections. They function as frontline caregivers in clinical wards and are responsible for applying SPs to reduce risks of cross-contamination. In this study, nurses are operationally defined as registered nurses employed at UBTH and working in selected clinical units such as Medical, Surgical, Obstetrics and Gynecology, Pediatrics, Accident and Emergency, Intensive care units and Theatre. The study specifically excluded student nurses, administrative personnel, and non-nursing healthcare professionals. This ensured the sample focused on staff directly involved in patient care.

5. **Tertiary Health Facility:** A tertiary health facility is a higher-level healthcare facility that provides specialized services, advanced medical care, and serves as referral center for lower-level healthcare facilities. It also often serves as training site for health professionals and contributes to research in healthcare. In this study, the tertiary health facility operationally defined as University of Benin Teaching Hospital (UBTH), located in Benin City, Edo State, Nigeria. UBTH is a federal teaching hospital with multiple specialties, which provided the institutional and geographical setting for research. The hospital's diverse clinical units made it an appropriate site for assessing knowledge and adherence to SPs among nurses.

6. **Perceived Influencing Factors:** Perceived influencing factors refer to the conditions or elements that nurses believe affect their ability or willingness to adherence to SPs in their daily practice. These may include the availability and accessibility of resources such as PPE and hand hygiene facilities, adequacy of training and continuing education, workload and staffing levels, and support from

institutional policies. In this study, perceived influencing factors are operationally defined as the responses obtained from nurses through specific items in the questionnaire addressing their views resource availability, training effectiveness, workload, institutional support, and personal attitudes toward infection control. The analysis of these perceptions provided supplementary insights into potential barrier or facilitators of adherence, even though they were not stated as primary research objective.

CHAPTER TWO

LITERATURE REVIEW

This chapter reviews relevant literature related to standard precautions in nursing practice. It focuses on three key areas: nurses' knowledge of standard precautions, their adherence to these practices, and the relationship between knowledge and adherence. The review also considered perceived factors that may influence adherence, as supplementary context. It is organized into four sections: conceptual review, theoretical framework, empirical review, and summary of literature with identified gaps.

2.1 Conceptual Review

2.1.1 Concept of Standard Precautions

Standard Precautions (SPs) are a set of infection prevention and control (IPC) measures that aim to reduce the spread of infectious agents within healthcare settings. They serve as the basic level of practice expected from all healthcare workers regardless of the patient's diagnosis or infection status (World Health Organization [WHO], 2020). The idea of SPs developed from earlier concept of universal precautions introduced in the 1980s and was later expanded to cover both blood borne and contact-transmissible infections. The main principle behind SPs is that all patients' blood and body fluid should be treated as potentially infectious, and similar preventive method should therefore be applied to everyone (Centers for Disease Control and Prevention [CDC], 2024).

The main components of SPs include hand hygiene, use of personal protective

equipment (PPE), respiratory hygiene and cough etiquette, safe injection practices, environmental cleaning, reprocessing of instruments and equipment, safe handling of sharps, and proper waste disposal (WHO, 2020; CDC, 2024). When these components are properly applied, they help to break the chain of infection and protect both healthcare workers and patients from healthcare-associated infections (HAIs).

Mohammed et al. (2024) reported that regular adherence to SPs greatly reduces occupational exposure and infection risks among healthcare workers. Their study among healthcare professionals in Ethiopia showed that adherence levels improved when PPE was readily available and when staff received previous training on infection control. Similarly, Tarakcioglu Celik and Ozdemir (2025), in a study conducted among oncology nurses, found that while awareness of SPs was high, compliance varies depending on workload and level of policy enforcement within the hospital. These findings show that even in advanced healthcare settings, full adherence to SPs remains an ongoing challenge.

In Nigeria, the National Center for Disease Control (NCDC, 2020) incorporated SPs as part of the national infection prevention and control (IPC) guidelines for all healthcare facilities. However, research still shows gaps in compliance among nurses in tertiary hospital due to factors such as limited availability of materials, heavy workload, and inadequate institutional supervision (Oyewumi et al., 2022; Emekolom et al., 2024). This highlights the need to continually strengthen adherence to SPs, especially among nurses who are in direct and frequent contact with patients.

In summary, standard precautions form the foundation for infection prevention and

control in nursing practice. Their consistent and correct application is essential for ensuring patient safety, protecting healthcare workers, and promoting quality nursing care in tertiary facility such as the University of Benin Teaching Hospital (UBTH).

2.1.2 Knowledge of Standard Precautions

Knowledge of standard precautions refers to the understanding that healthcare workers, especially nurses, have regarding infection prevention principles and the correct application of precautionary measures in patient care. Adequate knowledge of SPs enables nurses to identify risky procedures, apply protective barriers correctly, and make informed decisions to prevent healthcare-associated infections (HAIs). The World Health Organization (2020) emphasized that sufficient knowledge and continuous awareness among healthcare providers are essential for the consistent application of SPs in all healthcare settings.

Nurses' knowledge of SPs usually covers areas such as hand hygiene, use of personal protective equipment (PPE), handling of sharps, safe injection practices, and proper waste disposal. When nurses possess a clear understanding of these components, they are likely to adhere to infection prevention protocols and protect both themselves and their patients (Rezaei et al., 2024). Knowledge also contributes to development of positive attitudes towards infection control and helps to reduce occupational exposure to blood borne pathogens (Taylor & Coffey, 2023).

Several studies have assessed the knowledge of SPs among nurses globally and within Africa. Mohammed et al. (2024), found that healthcare workers who received infection prevention training demonstrated significantly higher knowledge levels

than those who had not. Similarly, Tarakcioglu Celik and Ozdemir (2025) reported high awareness among oncology nurses but noted that actual understanding of some SP components—such as environmental cleaning and waste segregation—was inconsistent. These findings suggest that while most nurses are aware of SP guidelines, their depth on knowledge specific practices can vary.

In Nigeria, Afemikhe et al. (2020) observed that nurses generally had good theoretical knowledge of infection prevention principles but demonstrated varying levels of understanding across SP components. The study highlighted that knowledge was strongly influenced by training opportunities and years of professional experience. Likewise, Ameh et al. (2021) found that although nurses were familiar with the concept of SPs, some lacked detailed knowledge of specific elements such as safe injection practices and waste segregation. Onyemocho et al. (2022) also reported that continuous professional training and availability of infection control guidelines improved knowledge and compliance among healthcare workers.

Kermode et al. (2020) and Gracia-Zapirain et al. (2021) further emphasized the role of institutional support and access to educational materials in improving SP-related knowledge. They noted that structured training programs and regular supervision enhance nurses' understanding and retention of SP concepts. In a more recent study, Oyewumi et al. (2022) reported that nurses in Nigerian tertiary hospitals possessed moderate to high knowledge levels but identified gaps related to practical application, especially in high-workload environments.

Overall, findings from these studies suggest that while nurses are aware of the

importance of standard precautions, their level of knowledge differs depending on training, exposure, and institutional support. Knowledge of SPs remains a critical factor that influences adherence and overall infection control behavior among nurses in tertiary health facilities such as the University of Benin Teaching Hospital (UBTH).

2.1.3 Adherence to Standard Precautions

Adherence to standard precautions refers to the consistent and correct application of infection prevention measures by healthcare workers during all aspects of patient care, regardless of patients' infection status (World Health Organization [WHO], 2022). It reflects the extent to which healthcare professionals integrate infection control guidelines into their daily clinical practice to prevent the transmission of infectious agents. The Centers for Disease Control and Prevention emphasized that these precautions should be applied at all times and in all settings to ensure safety for both patients and healthcare workers (CDC, 2024).

Effective adherence to SPs serves as a cornerstone for preventing healthcare-associated infections and reducing occupational hazards among healthcare professionals. Studies have shown that compliance with SPs not only protect healthcare workers but also improves patient safety outcomes (Rezaei et al., 2024; Abalkhali et al., 2021). However, adherence rates vary widely among institutions and countries, often reflecting differences in resources, policy enforcement, and training opportunities. Research from Saudi Arabia and Northern Cyprus, for example, indicated that compliance improved when infection prevention was prioritized institutionally and supported by adequate PPE and supervision (Abalkhali et al., 2021;

Abuduxike et al, 2021). Similarly, in-service education and routine monitoring have been identified as positive predictors of adherence (AbuAlrub & Al-Khawaldeh, 2023).

Despite global efforts, challenges to consistent adherence persist, especially in resource-constrained settings. Lim et al. (2021) noted that adherence may decline under conditions of high workload or staff shortages, while insufficient supplies and administrative barriers further reduce compliance. These observations suggest that adherence is not solely a matter of individual responsibility but is closely linked to systemic and institutional factors that either promote or hinder infection control behavior.

In Nigeria, several studies have identified similar challenges. Adherence to SPs among nurses has been described as inconsistent, often due to inadequate supply of protective materials, heavy workloads, and irregular training sessions (Afemikhe et al., 2020; Maitanmi et al., 2021; Ogunrinde et al., 2023). Emekolom et al. (2024) also observed that limited institutional monitoring and absence of strict enforcement mechanisms contributed to lapses in compliance, even when knowledge levels were high. Such gaps highlight the persistent divide between awareness and actual practice among Nigerian nurses.

Organizational culture plays a crucial role in shaping adherence behaviors. Berdida and Grande (2024) found that a positive safety climate and visible managerial commitment promote higher compliance levels. When infection prevention is framed as a collective professional responsibility, adherence becomes a norm rather than an

obligation. This underscores the importance of leadership, teamwork, and consistent supervision in reinforcing compliance with infection control protocols.

In summary, adherence to standard precautions among nurses is influenced by multiple factors including knowledge, resource availability, workload, and organizational support. Sustained compliance requires not only individual diligence but also a conducive work environment supported by adequate materials, continuous education, and strong managerial oversight. Within tertiary healthcare facilities such as the University of Benin Teaching Hospital (UBTH), these elements remain vital for maintaining a safe and infection-free clinical setting.

2.1.4 Perceived Influencing Factors of Adherence to Standard Precautions

Although this study primarily examined nurses' knowledge and practice of standard precautions, the literature highlights several perceived factors that influence adherence levels in clinical settings. These factors help to explain the variations in compliance observed across different health facilities and contexts.

Adherence is often influenced by the adequacy of materials and equipment available for infection prevention. When protective resources such as gloves, masks, and hand hygiene supplies are limited, nurses may be unable to apply standard precautions consistently. Studies across various settings have shown that adherence improves when institutional support and logistics are sufficient to sustain daily practice (Maitanmi et al., 2021; Emekolom et al., 2024). Furthermore, workload and time constraints play a role; nurses working in high-demand units tend to skip some precautionary steps when under pressure, thereby reducing overall compliance (Lim

et al., 2021).

Training and supervision has also been noted as subtle but important enablers of adherence. Continuous professional education reinforces knowledge and strengthens nurses' motivation to comply with infection control guidelines, while supportive supervision ensures accountability and corrective feedback when lapses occur (Abalkhail et al., 2021; AbuAlrub & Al-Khawaldeh, 2023). In addition, institutional culture shapes nurses' perception of infection control. When hospital leadership promotes safety, teamwork, and open communication, adherence becomes an accepted part of nursing rather than a separate responsibility (Berdida & Grande, 2024).

Overall these influencing factors—ranging from availability of materials and workload to training, supervision, and workplace culture—provide useful insights to how nurses' behavior towards infection prevention develops within the clinical environment. Understanding them supports the interpretation of adherence patterns identified in this study and guides future interventions aimed at improving compliance with standard precautions in tertiary health facilities such as University of Benin Teaching Hospital (UBTH).

2.2 Theoretical Framework

This study was anchored on the Theory of Planned Behavior (TPB) propounded by Ajzen (1991). The TPB provides a psychological explanation of how individual intentions and behaviors are influenced by personal, social, and environmental factors. The theory assumes that human behavior is not spontaneous but planned and guided

by intention, which in turn is determined by three components: attitude towards behavior, subjective norms, and perceived behavioral control. The theory has been extensively used in health research to understand and predict behaviors related to infection prevention, safe clinical practice, and compliance with professional standards (Abalkhail et al., 2021; Lim et al., 2021; Oyewumi et al., 2022).

The TPB is especially relevant to this study because adherence to standard precautions (SPs) by nurses is both a cognitive and behavioral process. While knowledge of SPs provides the necessary foundation, actual compliance requires motivation, favorable attitudes, supportive norms, and the perception that one has the ability and resources to perform the required actions. In the context of University of Benin Teaching Hospital (UBTHH), these psychological and contextual determinants are crucial in understanding why some nurses comply more consistently than others despite similar training and exposure to infection control protocols (Emekolom et al., 2024; Abuduxike et al., 2021).

2.2.1 Theory of Planned Behavior (TPB)

The TPB posits that an individual's behavioral intention is the most immediate predictor of actual behavior (Ajzen, 1991). In this study, the behavior of interest was nurses' adherence to Standard Precautions. According to the theory, nurses' intention to adherence is shaped by three interrelated components:

1. Attitude Towards the Behavior

This refers to how nurse's overall positive or negative evaluation of complying with SPs. It reflects beliefs about the consequences of adherence—such as preventing

infections, ensuring patients safety, and protecting oneself from occupational hazards—and the value placed on these outcomes. Positive attitudes have been associated with higher adherence rates, especially when reinforced through continuous education and leadership support (Afemikhe et al., 2020; Abalkhail et al., 2021). Conversely, negative attitudes, often linked to perceived inconvenience or time constraints, tend to reduce compliance.

2. Subjective Norms

This dimension represents the social pressures and expectations perceived by the nurse regarding adherence to SPs. It captures the influence of coworkers, supervisors, and institutional culture. When nurses perceive that colleagues and supervisors value and consistently practice infection prevention measures, their motivation to comply strengthens. Studies have shown that team culture, visible managerial commitment, and peer modeling significantly affects compliance levels (AbuAlrub & Al-Khawaldeh, 2023; Al-Faouri et al., 2021; Lim et al., 2021). On the other hand, when institutional emphasis on infection control is weak, compliance behaviors tends to decline

3. Perceived Behavioral Control (PBC)

This refers to nurse's perceived ease or difficulty in performing SP-related tasks. It includes internal factors (knowledge, confidence, and experience) and external factors (availability of PPE, adequate staffing, supportive work systems, and managerial workload). High perceived behavioral control strengthens intention and can directly predict adherence even when motivation is moderate (Berdida & Grande, 2024;

Emekolom et al., 2024). Limited resources or high patient loads, as reported in Nigerian and other developing contexts, can lower perceived control and consequently hinder consistent compliance (Oyewumi et al., 2022; Rezaei et al., 2024).

Ajzen (1991) also emphasized that these three factors—attitude, subjective norms, and perceived control—do not operate independently but interact to influence behavioral intention. In clinical settings, this means that a nurse who values infection prevention (positive attitudes), feels social encouragement from peers and superiors (supportive norms), and has adequate means and confidence (high PBC) will likely adhere to SPs more consistently.

Application of TBP to This Study

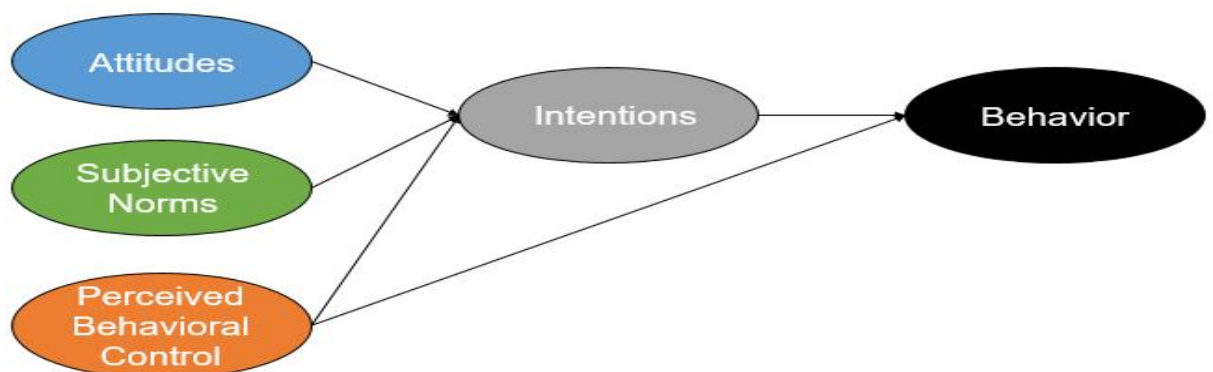
The Theory of Planned Behavior was applied to explain how psychological, environmental and institutional factors combine to shape nurses' adherence to SPs at UBTH. The attitude component was reflected in nurses' perceptions about the importance of infection control and personal safety; the subjective norm was captured by their sense of professional and peer expectations within their work units; and perceived behavioral control represented their confidence and capacity to comply amidst constraints such as workload and resource availability.

In this study, the TPB guided not only the design of the instrument but also the interpretation of findings. For example, a nurses' knowledge score reflected the cognitive foundation influencing attitude, while reported practice levels represented the behavioral outcome. Situational factors such as the availability of infection co trip

materials, leadership supervision, and institutional policy enforcement served as external moderators influencing PBC. Similar applications of TPB have been reported in studies exploring healthcare workers' compliance with SPs across Nigeria, Saudi Arabia, and Ethiopia (Abuduxike et al., 2021; Mohammed et al., 2024; Tarakcioglu Celik & Ozdemir, 2025).

By applying this theoretical model, the study was able to interpret observed gaps between knowledge and practice among nurses at UBTH in a more comprehensive manner. It demonstrated that noncompliance is not merely a result of lack of knowledge, but also attitudinal barriers, social influences, and perceived control limitations. Thus, the TPB provided a coherent framework linking the study variables, objectives, and findings, and formed a strong foundation for developing recommendations aimed at strengthening infection prevention behaviors among nurses.

Figure 2.1. Conceptual model illustrating the Theory of Planned Behavior applied to nurses' Standard Precaution adherence.



2.3 Empirical Review

Several studies have investigated nurses' knowledge, practice, and adherence to

Standard Precautions (SPs) as well as the factors influencing compliance across various healthcare settings. Findings from these studies provided the empirical foundation for this research and offered valuable insights into patterns of infection prevention behavior.

2.3.1 Knowledge of Standard Precautions

Nurses across different settings have generally demonstrated moderate to high knowledge of SPs, although consistent application remains a challenge (Abalkhail et al., 2021; Abuduxike et al., 2021). In Saudi Arabia, knowledge was highest for hand hygiene and PPE use but declined for injection safety, indicating selective understanding of SP components. Similar findings were observed in Northern Cyprus, where moderate knowledge levels were reported, yet compliance was hindered by inadequate supervision and shortages of infection control materials (Abuduxike et al., 2021).

In Ethiopia, previous training was identified as a significant predictor of knowledge among healthcare workers (Bayleyegan et al., 2021). Further, Mohammed et al. (2024) found that continuous infection control training and regular supply of PPE improved both knowledge and compliance scores among healthcare professionals.

In Nigeria, nurses have also shown good awareness of SPs but inconsistent application in practice. During the COVID-19 pandemic, nurses in Edo State demonstrated strong knowledge of infection control principles but poor consistency in implementation (Afemikhe et al., 2020). Similar trends were observed in Ekiti State, where nurses' knowledge was high but their daily practice of SPs remained uneven

(Ogunrinde et al., 2023). Likewise, knowledge alone did not always translate into adherence, emphasizing the persistent “knowledge-practice gap” reported in many Nigerian studies (Oyewumi et al., 2022).

2.3.2 Practice and Adherence to Standard Precautions

Studies have reported wide variations in adherence to SPs among nurses, often linked to institutional culture, training, and work conditions. In Jordan, compliance was strongly associated with positive attitudes and active supervision (Al-Faouri et al., 2021), while higher organizational support and teamwork improved nurses’ adherence in similar contexts (AbuAlrub & Al-Khawaldeh, 2023).

Evidence from Saudi Arabia showed that nurses practiced hand hygiene more frequently than other SP components, but compliance with PPE use and safe injection techniques remained limited (Alreshidi et al., 2021). In contrast, adherence improved in healthcare environments where management emphasized safety culture and provided resources. A study among Filipino nurses revealed that a positive safety climate, job satisfaction, and supportive leadership were significant predictors of SP compliance (Berdida & Grande, 2024).

Across African settings, adherence levels have been influenced by work environment and resource availability. Healthcare workers in Cameroon displayed high awareness but poor adherence to waste disposal and sharps handling due to insufficient equipment and supervision (Takougang et al., 2024). In another study, heavy workload, limited staffing, and inadequate infection control materials were identified

as major barriers to adherence among nurses (Lim et al., 2021).

In Nigeria, adherence has been inconsistent across tertiary hospitals. Nurses in Edo State reported difficulty maintaining compliance due to limited PPE supply, high workload, and minimal monitoring (Emekolom et al., 2024). Similarly, inadequate managerial supervision and lack of time were found to reduce adherence among nurses in Lagos State (Maitanmi et al., 2021). These studies collectively suggest that beyond knowledge, adherence depends on environmental and institutional factors that enable or constrain practice.

2.3.3 Factors Influencing Knowledge and Adherence

Multiple studies have highlighted that nurses' compliance with SPs is shaped by a combination of behavioral, institutional, and contextual factors. Regular infection control training and strong managerial commitment have consistently been shown to enhance compliance (Rezaei et al., 2024). In Iran, introducing infection control link nurse programs improved adherence and hand hygiene performance among nurses by promoting accountability and role modeling (Ghorbanmovahhed et al., 2023).

Institutional support and resource availability were also found to be strong predictors of adherence. In Pakistan, nurses who had access to infection control equipment and regular supervision reported higher compliance (Zahir et al., 2024). Among oncology nurses, adherence varied with workload and policy enforcement, suggesting that strict supervision and staff motivation were key to consistent compliance (Tarakcioglu Celik & Ozdemir, 2025).

In Nigeria, environmental and administrative factors remained major determinants of

adherence. Limited institutional support, inadequate supplies, and lack of ongoing training reduced nurses' perceived control over infection prevention behaviors (Emekolom et al., 2024). These findings align with the Theory of Planned Behavior, which emphasizes that knowledge alone does not determine behavior; intention and perceived behavioral control also influence the likelihood of consistent adherence.

2.3.4 Empirical Evidence in the Nigerian Context

Studies within Nigeria continue to reveal gaps in infection prevention despite growing awareness among healthcare workers. Needlestick injuries and low hepatitis B vaccination coverage among hospital staff suggest persistent weaknesses in SP compliance (Onubogu et al., 2022). Similarly, a survey in northern Nigeria found high rates of hospital-acquired infections due to poor adherence and limited infection surveillance (Abubakar, 2020).

State-level investigations also reflect these trends. In Edo State, nurses' adherence was affected by insufficient PPE, weak policy enforcement, and excessive workload (Afemikhe et al., 2020; Emekolom et al., 2024). Comparable challenges were noted in other Nigerian hospitals, where infection control committees were either inactive or lacked adequate resources to monitor compliance (Ogunrinde et al., 2023).

Overall, the reviewed studies indicate that nurses generally possess satisfactory knowledge of SPs, but actual adherence remains inconsistent due to organizational, behavioral, and environmental challenges. These findings justify the present study's focus on examining the relationship between knowledge and adherence to SPs among nurses at the University of Benin Teaching Hospital (UBTH) and assessing factors

that influence their compliance behavior.

From the reviewed literature, it is evident that nurses' knowledge and adherence to standard precautions remain critical to preventing healthcare-associated infections across diverse clinical settings. Although several international and regional studies have documented varying levels of compliance and influencing factors, there is limited evidence specific to tertiary healthcare institutions in Benin City, Nigeria. This gap underscores the relevance of the present study, which seeks to assess the level of knowledge and practice of standard precautions among nurses in the University of Benin Teaching Hospital (UBTH) and contribute context-specific insights to improve infection control practices.

CHAPTER THREE

METHODOLOGY

This chapter presents the methodology that was employed to investigate the level of knowledge and practical application of standard precautions among nurses at the University of Benin Teaching Hospital (UBTH) in Benin City, Edo State, Nigeria. It detailed the research design, study population, sampling technique, data collection method, and data analysis procedure. The methodology was structured to ensure that the study's objectives are achieved while maintaining validity and reliability.

3.1 Research Design

A descriptive cross-sectional survey design was used to assess nurses' knowledge and adherence to Standard Precautions (SPs). This design was appropriate because it allowed data to be collected at a single point in time, providing insights into nurses' knowledge and practices regarding standard precautions (Ghabayen et al., 2023). A quantitative research approach was employed, as it enabled the researcher to objectively measure nurses' knowledge and self-reported practice using structured questionnaires. This method ensured data consistency and facilitated statistical analysis to determine relationships between knowledge and practice (Creswell & Creswell, 2023). The survey design also allowed for the inclusion of a large sample of nurses across various units—such as surgical, medical, and intensive units—making it cost-effective, time-efficient, and suitable for describing the current situation among nurses at UBTH.

3.2 Research Setting

This study was conducted at the University of Benin Teaching Hospital (UBTH), Benin City, Edo State, Nigeria. UBTH is a tertiary healthcare facility established in 1973 and located in Ugbowo, within Egor Local Government Area of Edo State. Edo State comprises of 18 local government areas. Egor Local government where University of Benin Teaching Hospital is located falls within the Southern Senatorial District of the State.

UBTH provides a wide range of clinical and diagnostic services, making it one important healthcare facility in the state, region and the nation at large. The hospital has an estimated bed capacity of over nine hundred and ten (910) (UBTH, 2024), with nineteen (19) clinical departments and three (3) medical laboratory department and three (3) emergency departments. These departments offer emergency services for the general/primary health needs of the people. They offer both outpatient and in-patient services, providing care for primary, secondary, and tertiary health needs.

The hospital has a large and diverse workforce of trained healthcare professionals, including nurses who form the frontline of patient care and play a critical role in preventing the transmission of infectious diseases. Data for this study were collected from nurses working across various clinical units where patient care and infection control are routinely practiced. UBTH also adheres to standardized Infection Prevention and Control (IPC) guidelines recommended by the World Organization Health (WHO) and the Nigerian Centre for Disease Control (NCDC), making it an appropriate environment for assessing the nurses' knowledge and practice of standard precautions.

3.3 Target population.

The target population for this study comprised registered nurses who were actively involved in direct patient care at University of Benin Teaching Hospital (UBTH). These nurses worked in critical units where the application of standard precautions was routinely required to prevent infection transmission.

Table 3.1 Distribution of Target Nurse Population by Ward/Unit at UBTH (February 2025).

Ward/Unit	Number of Nurses
Accident and Emergency Unit A	74
Accident and Emergency Unit B	72
Medical Unit A	76
Medical Unit B	78
Surgical Unit	77
Pediatrics	65
Obstetrics and Gynecology	86
Intensive Care Units (ICUs)	42
Theatre Complex	73
Total	643

(Source, Human Resources Department, February 2025).

The total number of nurses across these departments was 643. These nurses possessed varying levels of knowledge, clinical experience, and exposure to Infection Prevention and Control (IPC) guidelines, making them suitable participants for

assessing the knowledge and practice of standard precautions in the hospital.

3.4 Sample Size Determination

The sample size of this study was determined using Taro Yamane's (1967) formula, which is widely applied in educational and health research for calculating representative sample size from a finite population.

The formula is expressed as:

$$n = \frac{N}{1 + N(e)^2}$$

Where

n= required sample size

N= total population (643)

e= margin of error (0.05)

Substituting the values into the formula:

$$n = \frac{643}{1 + 643(0.05)^2}$$

$$n = \frac{643}{1 + 643(0.0025)}$$

$$n = \frac{643}{1 + 1.6075}$$

$$n = \frac{643}{2.6075}$$

$$n = 246.596$$

Therefore, the computed sample size was approximately 247 nurses. However, to account for possible non-responses, attrition or incomplete questionnaire return, an additional 10% of the sample size was included to improve the representativeness and ensure adequate data for analysis, as recommended in quantitative research (Creswell & Creswell, 2023).

$$10\% \text{ of } 247 = 24.7 \approx 25$$

$$247 + 25 = 272$$

Therefore, the final sample size was 272 nurses.

A proportionate stratified sampling technique was used to ensure fair representation of nurses across all major clinical units at UBTH. The number of nurses selected from each unit was determined using the formula:

$$n_i = N_i / N \times n$$

Where

n_i = sample size for each unit

N_i = population of each unit

N = total population (643)

n = total sample size (272)

Table 3.2 Table for Sample Size Determination

Academic level	Determination of sample size in each level	Sample size per level
Accident and Emergency Unit A	74/643x272	31
Accident and Emergency Unit B	72/643x272	30
Medical Unit A	76/643x272	32
Medical Unit B	78/643x272	33
Surgical Unit	77/643x272	33
Pediatrics	65/643x272	27
Obstetrics and Gynecology	86/643x272	36
Intensive Care Units (ICUs)	42/643x272	18
Theatre Complex	73/643x272	32
	Total	272

3.5 Instrument for Data Collection

Data for this study were collected using a structured self-administered questionnaire developed by the researcher after an extensive review of related literature and validated instruments on Standard Precautions (SPs). The questionnaire was designed to assess nurses' knowledge and self-reported adherence to SPs, as well as to obtain contextual information on perceived factors that could influence adherence in clinical practice.

A total of 272 questionnaires were distributed to nurses across the Accident and Emergency Units (A and B), Medical Units (A and B), Surgical Unit, Obstetrics and Gynaecology Unit, Paediatrics Unit, Intensive Care Unit, and Theatre Complex of the University of Benin Teaching Hospital (UBTH). This number represented a 10 percent increase above the calculated sample size of 247, to account for possible non-responses or incomplete returns.

To ensure clarity, internal consistency, and easy comprehension, the questionnaire was divided into four sections as follows:

1. Section A: Socio-demographic and Professional Data

This section elicited information on respondents' age, gender, marital status, level of education, years of professional experience, and current ward or unit of assignment.

2. Section B: Knowledge of Standard Precautions

This section contained multiple-choice and true/false questions measuring respondents' understanding of the concepts and core components of SPs, including hand hygiene, use of personal protective equipment (PPE), safe injection practices, environmental cleaning, and waste management.

3. Section C: Practice and Adherence to Standard Precaution

This section assessed nurses' self-reported adherence to SPs during patient care using a five-point Likert scale ranging from Always (5) to Never (1). Items covered adherence to hand hygiene, PPE use, sharps safety, and safe waste segregation practices.

4. Section D: Perceived Influencing Factors

This section explored respondents' perceptions of possible factors that could affect their adherence to SPs, such as workload, availability of PPE, administrative support, training opportunities, and institutional policies.

These items were included to provide contextual insight for interpreting the findings and strengthening the discussion, although they were not tested as part of the main study objectives or hypotheses.

The questionnaires were distributed by the researcher with the assistance of ward managers during different shifts to ensure maximum participation. Completed instruments were retrieved within one week, allowing adequate time for responses and ensuring a satisfactory return rate.

3.6 Validity

To ensure that the research instrument accurately measured what it was intended to measure, the questionnaire underwent face and content validity checks. The instrument was reviewed by the research supervisor from the Department of Nursing Science, University of Benin, and by the data analyst/statistician assisting with the study.

Both experts examined the instrument for clarity of wording, relevance of items, logical arrangement of sections, and alignment with the study objectives and hypotheses. Their feedback focused on improving question structure, ensuring content appropriateness, and maintaining consistency between the research variables and questionnaire items.

Based on their professional input, minor adjustments were made to enhance clarity, readability, and coverage of key study concepts, after which the instrument was judged to possess adequate validity for the intended population.

This process ensured that the questionnaire accurately represented the constructs of nurses' knowledge and adherence to Standard Precautions as examined in this study.

3.7 Reliability

The reliability of the research instrument was determined to ensure internal

consistency and stability of the questionnaire items. A pilot study was conducted using 10% of the calculated sample size (approximately 27 nurses) who shared similar characteristics with the main study population but were not included in the final sample.

The responses from the pilot test were analyzed using the Cronbach's Alpha reliability coefficient, which measures the internal consistency of items within each section of the questionnaire. The computed reliability coefficients were as follows:

1. Section B (Knowledge of Standard Precautions): 0.82
2. Section C (Practice and Adherence to Standard Precautions): 0.85
3. Section D (Perceived Influencing Factors): 0.79

An overall reliability coefficient of 0.82 was obtained for the entire instrument, indicating a high level of internal consistency, as values above 0.70 are generally considered acceptable (Creswell & Creswell, 2023).

These results confirmed that the questionnaire was reliable and suitable for use in collecting consistent and dependable data from the study participants.

3.8 Method of Data Analysis

The data obtained from the completed questionnaires were carefully checked for completeness, coded, and entered into the Statistical Package for the Social Sciences (SPSS) version 27.0 for analysis. Data analysis was conducted in accordance with the study objectives and hypotheses.

Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize respondents' demographic characteristics, knowledge levels,

and adherence to Standard Precautions (SPs). Tables and figures were employed to present the results clearly and concisely.

To determine the relationship between variables, inferential statistics were applied. Specifically, the Chi-square (χ^2) test of association was used to test the formulated hypothesis at a 0.05 level of significance ($p < 0.05$). This test was appropriate because the variables under study were categorical and measured at nominal and ordinal levels.

Findings from the analysis were presented in tables and interpreted in relation to the research objectives and hypotheses, providing both descriptive and inferential insights into nurses' knowledge and adherence to Standard Precautions at the University of Benin Teaching Hospital.

3.9 Ethical Considerations

Ethical approval and clearance were obtained before the commencement of data collection to ensure that the rights, dignity, and safety of all participants were protected throughout the study. The following ethical principles guided the research process:

1. Ethical Approval:

Formal ethical clearance was obtained from the Ethics and Research Committee of the University of Benin Teaching Hospital (UBTH) prior to data collection. Permission was also sought from the Head of Nursing Services to allow access to the wards and staff nurses for the study.

2. Informed Consent:

The purpose, objectives, and procedures of the study were clearly explained to the participants. Written informed consent was obtained from each participant before administering the questionnaire. Participation was entirely voluntary.

3. Confidentiality and Anonymity:

The identities of respondents were not recorded on the questionnaire to maintain confidentiality. All collected data were treated anonymously and used solely for academic purposes.

4. Voluntary Participation:

Participation in the study was strictly voluntary. Participants were informed of their right to withdraw from the study at any stage without any form of penalty or disadvantage.

5. Data Protection and Integrity:

Completed questionnaires were handled and stored securely to prevent unauthorized access. Data were analyzed objectively, and the results were presented honestly without manipulation.

6. Acknowledgement of Sources:

All sources of information, including literature and data used in this research, were properly acknowledged to avoid plagiarism.

CHAPTER FOUR

RESULTS

This chapter deals with the representation of data collected regarding the knowledge and practice of standard precautions among nurses in a tertiary institution, Benin City. A total of 272 questionnaires were distributed to nurses actively involved in providing care to patients at UBTH, 241 were properly filled and valid for data analysis, giving a response rate of 88.6%. The results are presented in tables and figures, organized according to the study objectives and research questions.

Table 4.1: Socio-demographic and Professional Characteristics of Respondents

(n =241)

Variable	Frequency (n = 241)	Percent (%)
Age		
21–25 years	22	9.1
26–30 years	63	26.1
31–35 years	71	29.5
36–40 years	39	16.2
41–45 years	27	11.2
46–50 years	12	5.0
51 years and above	7	2.9
Gender		
Male	36	14.9
Female	205	85.1
Highest Nursing Qualification		
RN Diploma	43	17.8
RM Only	14	5.8
RN & RM	85	35.3
BNSc	61	25.3
Post-Basic Specialty	21	8.7
MNSc/MSc in Nursing	15	6.2
PhD in Nursing	2	0.8
Marital Status		
Single	84	34.9
Married	138	57.3
Divorced	9	3.7

Widowed	6	2.5
Separated	4	1.7

Table 4.1 Cont'd

Variable	Frequency (n = 241)	Percent (%)
Current Rank/Cadre		
Nursing Officer II	59	24.5
Nursing Officer I	43	17.8
Senior Nursing Officer	67	27.8
Principal Nursing Officer	38	15.8
Assistant Chief Nursing Officer	20	8.3
Chief Nursing Officer	14	5.8
Years of Clinical Practice		
1–5 years	48	19.9
6–10 years	91	37.8
11–15 years	53	22.0
16–20 years	32	13.3
More than 20 years	17	7.1
Current Ward/Unit		
A&E Unit A	25	10.4
A&E Unit B	15	6.2
Surgical Ward	32	13.3
Obstetrics & Gynecology Ward	28	11.6
Medical Ward A	21	8.7
Medical Ward B	34	14.1
Operating Theatre Complex	26	10.8
Pediatrics Ward	19	7.9
ICU	18	7.5
Orthopedics Ward	13	5.4
Neurosurgery Ward	10	4.1
Received IPC Training (Past 2 Years)		
Yes	174	72.2
No	67	27.8

Table 4.1 shows that the majority of respondents were females (85.1%), aged between 31–35 years (29.5%), and married (57.3%). Most nurses held RN & RM qualifications (35.3%), and the majority had 6–10 years of clinical experience (37.8%). The highest concentration of nurses was in the surgical and medical wards,

and 72.2% of the respondents had received Infection Prevention and Control (IPC) training in the past two years.

Answering Research Questions

Research Question 1: What is the level of knowledge regarding standard precautions among nurses at UBTH, Benin City?

Table 4.2: Knowledge regarding standard precautions among nurses

Items	Frequency	Correct (%)	Wrong (%)	Mean	Remark
An infection acquired by a patient during hospital admission is called a nosocomial infection.					
True	241(100.0)	241 (100.0)	0 (0.0)	2.0	Good
False	0 (0.0)				
Nosocomial infections are NOT commonly transmitted through direct contact.					
True	31 (12.9)	210 (87.1)	31 (12.9)	1.9	Poor
False	210 (87.1)				
Hands should always be protected with gloves when handling body fluids.					
True	233 (96.7)	233 (96.7)	8 (3.3)	2.0	Good
False	8 (3.3)				
Needles should be recapped before disposal.					
True	26 (10.8)	215 (89.2)	26 (10.8)	1.9	Poor
False	215 (89.2)				
PPE should be worn when handling patient bed linen.					
True	188 (78.0)	188 (78.0)	53 (22.0)	1.8	Good
False	53 (22.0)				
Eye/mask/gown protection is required when blood splashes are likely.					
True	232 (96.3)	232 (96.3)	9 (3.7)	2	Good
False	9 (3.7)				
Standard precautions apply to which patients?					
Only confirmed infections	8 (3.3)	217 (90.0)	24(10.0)	1.9	Good

Isolation only	5 (2.1)
All patients	217 (90.0)
Surgery only	11 (4.6)

Table 4.2 Cont'd

Items	Frequency	Correct (%)	Wrong (%)	Mean	Remark
When are you required to perform hand hygiene?					
Only after contact	9 (3.7)	219 (90.9)	22(9.1)	1.9	Good
Before aseptic tasks	6 (2.5)				
All 5 moments	219 (90.9)				
When hands look dirty	7 (2.9)				
Alcohol rub is NOT preferred when:					
Hands soiled/C. diff	211 (87.6)	211 (87.6)	30(12.4)	1.9	Good
Before gloves	8 (3.3)				
After gloves	13 (5.4)				
Between patients	9 (3.7)				
Minimum time for alcohol rub to be effective:					
5 seconds	5 (2.1)	202 (83.8)	39(16.2)	1.8	Good
10 seconds	8 (3.3)				
20–30 seconds	202 (83.8)				
1 minute	26 (10.8)				
Which PPE should be removed last?					
Gloves	18 (7.5)	182 (75.5)	59(14.5)	1.8	Good
Gown	14 (5.8)				
Goggles	27 (11.2)				
Mask/Respirator	182 (75.5)				
Best action when sneezing without tissue?					
Use hands	7 (2.9)	208 (86.3)	33(13.7)	1.9	Good
Use elbow	208 (86.3)				
Turn away	11 (4.6)				
Suppress sneeze	15 (6.2)				
When should sharps be disposed?					
When full	13 (5.4)	201 (83.4)	50(16.6)	1.8	Good
¾ full	201 (83.4)				
Half full	17 (7.1)				
End of shift	10 (4.1)				
Safe injection practice includes:					
Same needle reuse	3 (1.2)	227 (94.2)	14 (5.8)	1.9	Good
Recapping	7 (2.9)				

One sterile per injection	227 (94.2)		
Shared vials	4 (1.7)		
		Grand Mean	1.8 Good

Mean Cut-off = 1.5

Table 4.2 shows that the highest mean value of 2.0 was recorded for the items “An infection acquired by a patient during hospital admission is called a nosocomial infection,” “Hands should always be protected with gloves when handling body fluids,” and “Eye/mask/gown protection is required when blood splashes are likely,” all reflecting good knowledge. This was followed by items with a mean of 1.9, including “Nosocomial infections are NOT commonly transmitted through direct contact,” “Needles should be recapped before disposal,” “Standard precautions apply to which patients?,” “When are you required to perform hand hygiene?,” “Alcohol rub is NOT preferred when:,” “Best action when sneezing without tissue?,” and “Safe injection practice includes:,” indicating a similarly good level of knowledge. The items with a mean of 1.8 were “PPE should be worn when handling patient bed linen,” “Minimum time for alcohol rub to be effective,” “Which PPE should be removed last?” and “When should sharps be disposed?,” which also fall within the good knowledge category. The grand mean was 1.8, indicating an overall good knowledge regarding standard precautions among nurses.

Figure 4.1: Knowledge regarding standard precautions among nurses

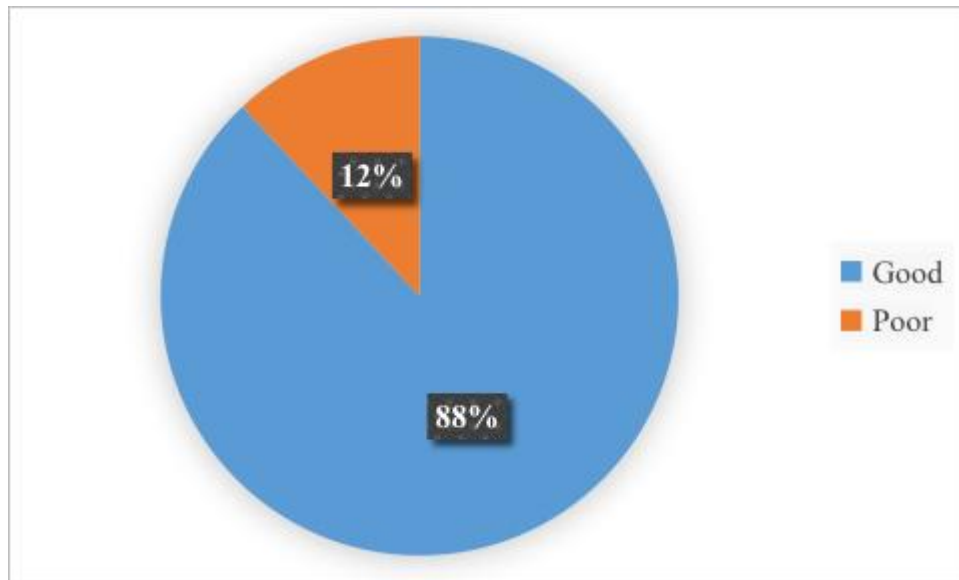


Figure 4.1 shows the level of knowledge regarding standard precautions among nurses. A total of 212 respondents (88%) had good knowledge, while 29 respondents (12%) had poor knowledge.

Research Question 2: What is the level of adherence to standard precaution practices among nurses at UBTH, Benin City?

Table 4.3: Practice/Adherence to Standard Precautions

Items	Never (%)	Rarely (%)	Often (%)	Always (%)	Mean	Remark
I perform hand hygiene (wash or rub) before and after providing a nursing procedure.	5 (2)	27 (11)	69 (29)	140 (58)	3.4	High
I perform hand hygiene before and after having direct contact with a patient's intact skin.	4 (2)	21 (9)	63 (26)	153 (63)	3.5	High
I perform hand hygiene after touching inanimate surfaces or objects in the patient's immediate surroundings.	3 (1)	20 (8)	61 (25)	157 (65)	3.5	High
I wear gloves when contact with blood, body fluids, mucous membranes or non-intact skin is likely.	2 (1)	15 (6)	83 (34)	141 (59)	3.5	High
I put on a mask and gown when performing procedures likely to involve splashes or aerosols of body fluids.	6 (2)	22 (9)	80 (33)	133 (55)	3.4	High
I dispose of used sharps immediately into a designated sharps container without attempting to recap.	4 (2)	11 (5)	68 (28)	158 (65)	3.6	High
I use a new sterile needle and syringe for every injection given.	2 (1)	6 (3)	53 (22)	180 (75)	3.7	High
I handle used/soiled linen carefully, avoiding shaking it.	3 (1)	14 (6)	63 (26)	161 (67)	3.6	High
I ensure patient care equipment shared between patients is cleaned or disinfected appropriately.	2 (1)	8 (3)	55 (23)	176 (73)	3.7	High
I find my compliance with SPs is lower when my workload increases significantly or during emergencies.	17 (7)	34 (14)	73 (30)	117 (48)	3.2	High
Grand Mean						High

Mean Cut-off = 2.5

Table 4.3 shows the practice and adherence to standard precautions among nurses.

The highest mean score of 3.7 was recorded for the items "I use a new sterile needle

and syringe for every injection given” (75% always), and “I ensure patient care equipment shared between patients is cleaned or disinfected appropriately” (73% always). This was followed by a mean of 3.6 for “I dispose of used sharps immediately into a designated sharps container without attempting to recap” (65% always), and “I handle used/soiled linen carefully, avoiding shaking it” (67% always). Items with a mean of 3.5 include “I perform hand hygiene before and after having direct contact with a patient’s intact skin” (63% always), “I perform hand hygiene after touching inanimate surfaces or objects in the patient’s immediate surroundings” (65% always), and “I wear gloves when contact with blood, body fluids, mucous membranes or non-intact skin is likely” (59% always). The item “I perform hand hygiene before and after providing a nursing procedure” and “I put on a mask and gown when performing procedures likely to involve splashes or aerosols of body fluids” both had a mean of 3.4, while “I find my compliance with SPs is lower when my workload increases significantly or during emergencies” had the lowest mean of 3.2. The grand mean was 3.5, indicating high overall adherence to standard precautions.

Figure 4.2: Bar chart showing practice/Adherence to Standard Precautions

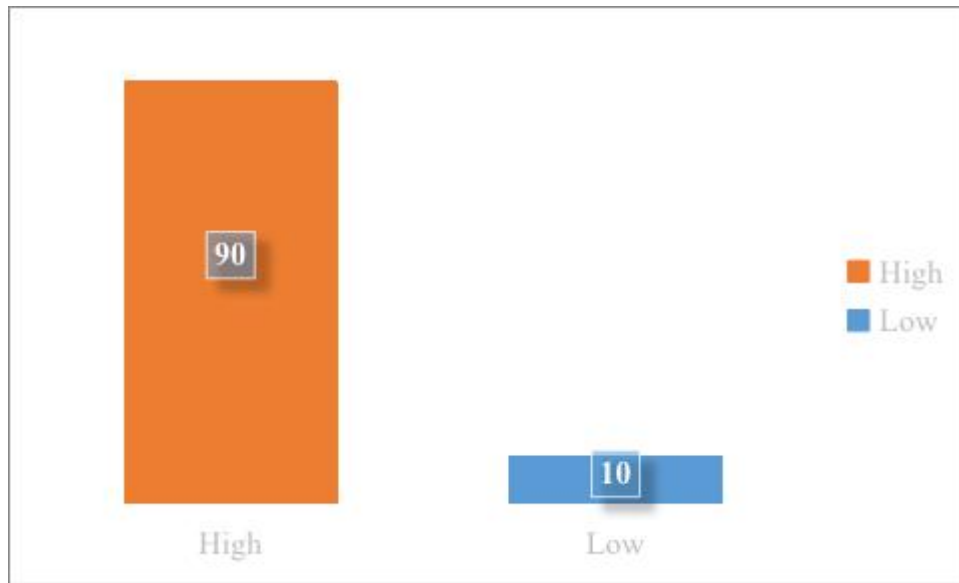


Figure 4.2 presents a bar chart indicating the level of practice and adherence to standard precautions. The chart shows that 218 respondents (90%) demonstrated high adherence, while only 23 respondents (10%) had low adherence.

Research Question 3: Is there a significant relationship between nurses' level of knowledge and adherence to Standard Precautions at UBTH, Benin City?

To address this research question, a chi-square test of association was conducted to determine whether a significant relationship existed between the level of knowledge regarding standard precautions and the level of adherence to standard precaution practices among nurses.

Table 4.4: Relationship Between Level of Knowledge and Adherence to Standard Precaution Practices

Adherence Level	Knowledge (Good)	Knowledge (Poor)	χ^2	Df	p-value	Decision
High	212 (88.0 %)	29 (12.0 %)				
Low	218 (90.5 %)	23 (9.5 %)	0.2935	1	0.20	Not Significant

Table 4.4 shows the association between knowledge and adherence to standard precautions among nurses. The chi-square test yielded $\chi^2 = 0.2935$, $df = 1$, and $p = 0.20$, indicating no statistically significant relationship ($p > 0.05$). This implies that while most nurses demonstrated good knowledge and high adherence, knowledge alone did not significantly predict adherence behavior. Therefore, the null hypothesis stating that there is no significant relationship between nurses' knowledge and adherence to standard precautions is accepted.

Research Question (Supplementary): Perceived Factors Influencing Adherence

Although the study's primary objectives focused on assessing nurses' knowledge, adherence, and the relationship between them, additional data were collected to provide contextual understanding of factors perceived to influence adherence to standard precautions. This supplementary analysis offers insight into possible barriers and enablers affecting nurses' compliance at the University of Benin Teaching Hospital (UBTH). The results are presented in Table 4.4 below.

Table 4.5: Perceived factors influencing adherence

Items	Strongly Disagree (%)	Disagree (%)	Agree (%)	Strongly Agree (%)	Mean	Remark
I believe adhering strictly to Standard Precautions is important for my personal safety.	5 (2)	22 (9)	104 (43)	110 (46)	3.3	Influential
Standard Precautions are effective in preventing infections in patients under my care.	3 (1)	18 (7)	105 (44)	115 (48)	3.4	Influential
Adequate supplies of Personal Protective Equipment (gloves, masks, gowns, etc.) are consistently available when needed in my unit.	13 (5)	33 (14)	96 (40)	99 (41)	3.2	Influential
The unavailability of necessary PPE sometimes influences my ability to practice infection prevention correctly.	6 (2)	27 (11)	85 (35)	123 (51)	3.3	Influential
Hand hygiene supplies (soap, water, alcohol rub) are conveniently located and always functional.	4 (2)	17 (7)	103 (43)	117 (48)	3.4	Influential
I have received sufficient training on Standard Precautions and feel confident in my knowledge.	7 (3)	19 (8)	112 (46)	103 (43)	3.3	Influential
Regular refresher training on IPC/SPs is needed to maintain best practices.	1 (0)	9 (4)	110 (46)	121 (50)	3.5	Influential
UBTH's policies regarding Standard Precautions are clear and actively encouraged in my unit.	4 (2)	16 (7)	110 (46)	111 (46)	3.4	Influential

Table 4.5 Cont'd

Items	Strongly Disagree (%)	Disagree (%)	Agree (%)	Strongly Agree (%)	Mean	Remark
My workload is often too high to allow for consistent adherence to all Standard Precautions.	9 (4)	31 (13)	97 (40)	104 (43)	3.2	Influential
Emergency situations often make it difficult to use PPE correctly or perform hand hygiene adequately.	7 (3)	29 (12)	95 (39)	110 (46)	3.3	Influential
My years of clinical experience positively influence my adherence to Standard Precautions.	8 (3)	24 (10)	112 (46)	97 (40)	3.2	Influential
Prompt supervision or feedback from the IPC team or supervisors would encourage better adherence.	3 (1)	12 (5)	97 (40)	129 (54)	3.5	Influential
Grand Mean					3.3	Positive

Mean cut-off = 2.5

Table 4.5 presents the perceived factors influencing adherence to standard precautions.

The highest mean of 3.5 was recorded for the items “Regular refresher training on IPC/SPs is needed to maintain best practices” (50% strongly agree) and “Prompt supervision or feedback from the IPC team or supervisors would encourage better adherence” (54% strongly agree). This was followed by a mean of 3.4 for “Standard Precautions are effective in preventing infections in patients under my care” (48% strongly agree), “Hand hygiene supplies (soap, water, alcohol rub) are conveniently located and always functional” (48% strongly agree), and “UBTH's policies regarding Standard Precautions are clear and actively encouraged in my unit” (46% strongly agree). A mean of 3.3 was recorded for the items “I believe adhering strictly to Standard Precautions is important for my personal safety” (46% strongly agree), “The

unavailability of necessary PPE sometimes influences my ability to practice infection prevention correctly” (51% strongly agree), “I have received sufficient training on Standard Precautions and feel confident in my knowledge” (43% strongly agree), “Emergency situations often make it difficult to use PPE correctly or perform hand hygiene adequately” (46% strongly agree), and “My workload is often too high to allow for consistent adherence to all Standard Precautions” (43% strongly agree). The items “Adequate supplies of Personal Protective Equipment (gloves, masks, gowns, etc.) are consistently available when needed in my unit” and “My years of clinical experience positively influence my adherence to Standard Precautions” both recorded a mean of 3.2. The grand mean was 3.3, indicating a generally positive perception of the factors influencing adherence.

Figure 4.3: Pie chart showing perceived factors influencing adherence

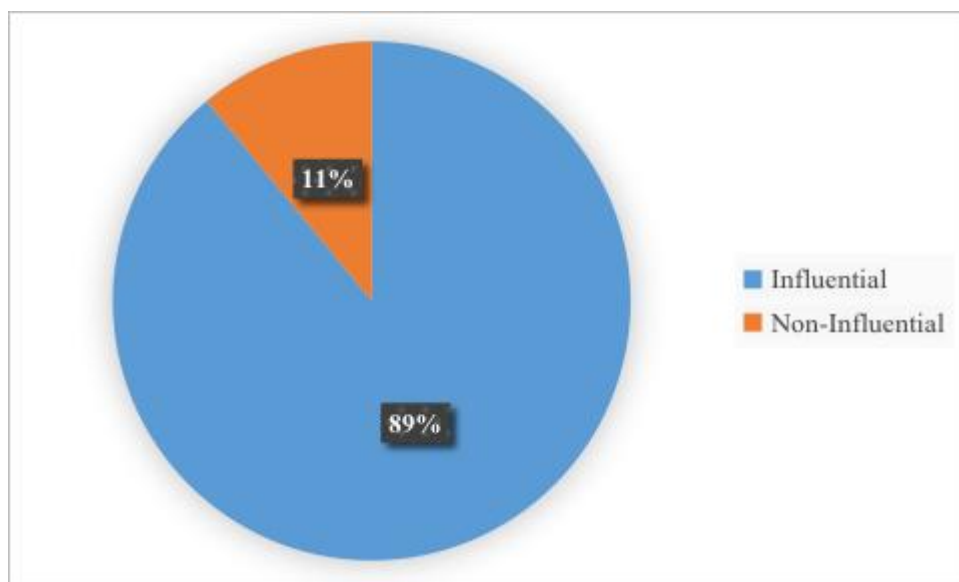


Figure 4.3 presents a pie chart showing perceived factors influencing adherence to standard precautions. A majority of respondents, 214 (89%), reported the above perceived factors as Influential, while only 27 (11%) reported as non-Influential

factors.

Hypothesis Testing

There is no significant relationship between the level of knowledge regarding standard precautions and the level of adherence to standard precaution practices among nurses at UBTH, Benin City.

Table 4.6: Relationship between the level of knowledge regarding standard precautions and the level of adherence to standard precaution practices

Adherence	Knowledge (Good)	Knowledge (Poor)	Test Statistics (χ^2)	Df	p-value	Decision
High	212 (88.0%)	29 (12.0%)				
Low	218 (90.5%)	23 (9.5%)	0.2935	1	0.20	Not Significant (H₀ Accepted)

Table 4.6 presents the relationship between nurses' knowledge of standard precautions and their adherence to standard precaution practices. Among respondents with high adherence, 88.0% had good knowledge, while 12.0% had poor knowledge. Similarly, among those with low adherence, 90.5% had good knowledge and 9.5% had poor knowledge.

The Chi-square test yielded $\chi^2 = 0.2935$, $df = 1$, and $p = 0.20$ ($p > 0.05$), indicating no statistically significant relationship between nurses' level of knowledge and adherence to standard precaution practices.

Therefore, the null hypothesis is accepted, implying that knowledge alone does not necessarily determine adherence to standard precautions among nurses at UBTH, Benin City.

CHAPTER FIVE

DISCUSSION AND FINDINGS

This chapter discusses the major findings of the research compared with the literature reviewed, the implication for nursing, summary, conclusion, Recommendations and Suggestions for further Studies.

5.1. Discussion of major Findings

The study assessed the knowledge and practice of standard precautions among nurses in a tertiary institution, Benin City. The socio-demographic and professional characteristics of the study participants at UBTH reveal several notable patterns that both align with and differ from previous research contexts, providing important insights for interpreting SP adherence findings. The predominant age group was 31-35 years (29.5%), with 64.7% of respondents under 40 years, indicating a relatively young nursing workforce. The gender distribution (85.1% female) aligns with typical nursing demographics seen in previous studies, such as Da'seh et al. (2023), though the 14.9% male representation suggests potentially greater gender diversity than some comparative settings. The qualification profile shows interesting diversity, with 35.3% holding both RN & RM qualifications, 25.3% with BNSc degrees, and 15.7% with post-graduate qualifications (including 0.8% PhD holders). This educational distribution appears more advanced than that reported in some previous Nigerian studies and supports Afemikhe et al.'s (2020) observation that higher academic qualifications predict better practice. The presence of post-graduate qualified nurses might contribute to the knowledge base and practice standards within UBTH. The

experience profile shows 37.8% having 6-10 years of practice, with 42.4% having over 10 years of experience. This distribution provides a solid foundation for examining Al-Faouri et al.'s (2021) findings regarding the positive correlation between years of clinical experience and SP compliance. The substantial proportion of experienced nurses might explain some of the positive findings regarding SP knowledge and adherence. The high proportion (72.2%) of nurses receiving IPC training within the past two years contrasts positively with Maitanmi et al.'s (2021) findings where lack of regular training was cited as a major barrier by 91.1% of respondents. This suggests UBTH has made significant investments in continuing professional development, potentially addressing one of the key barriers identified in previous research. The diverse representation across different clinical areas (from 4.1% in Neurosurgery to 14.1% in Medical Ward B) provides a comprehensive view of SP practices across varying risk environments. This distribution enables analysis of how different clinical contexts might influence SP adherence, as suggested by Al-Faouri et al.'s (2021) observations about emergency settings affecting compliance. The rank distribution shows a pyramid structure with more junior staff (24.5% Nursing Officer II) than senior staff (5.8% Chief Nursing Officer), with a substantial middle tier of Senior Nursing Officers (27.8%). This hierarchy provides opportunities for mentorship and supervision, aspects identified as important in previous studies for maintaining SP compliance. These demographic and professional characteristics suggest UBTH has a relatively young but well-qualified nursing workforce, with good access to continuing education and a balanced mix of experience levels. The

educational profile and recent IPC training rates particularly stand out as potential strengths compared to previous study contexts, possibly contributing to the positive findings regarding SP knowledge and adherence. However, the relatively young age profile might necessitate continued emphasis on experiential learning and mentorship, as suggested by the relationship between experience and practice quality noted in previous research.

Level of knowledge regarding standard precautions among nurses

The findings from this study reveal a notably high level of knowledge regarding Standard Precautions (SPs) among nurses at UBTH, with 88% of respondents demonstrating good knowledge. This represents a substantial improvement from the "moderate level of knowledge" (74.3% mean correct responses) reported in Emekolom et al.'s (2024) preprint study at the same institution. The current findings more closely align with international benchmarks, such as those reported by Da'seh et al. (2023) in Jordanian military hospitals, where over three-quarters of nurses demonstrated "good" or "very good" knowledge levels. This suggests UBTH nurses' SP knowledge has evolved to meet standards comparable to well-performing international healthcare institutions. Detailed analysis of specific knowledge components reveals particularly strong understanding in several critical areas. Nurses demonstrated excellent comprehension of basic infection control principles, with 93.4% correctly identifying nosocomial infections. Near-universal understanding was observed regarding PPE requirements, with 96.7% and 96.3% correct responses for

glove use and eye/mask/gown protection respectively. Similarly, strong grasp of hand hygiene principles was evident, with 90.9% correctly identifying all 5 moments for hand hygiene. Safe injection practices were also well understood, garnering 94.2% correct responses. However, some knowledge gaps persist, particularly in areas requiring specific procedural knowledge. These include handling of patient bed linen (22% incorrect responses), proper PPE removal sequence (24.5% incorrect responses), and appropriate timing for sharps disposal (16.6% incorrect responses). These findings suggest potential areas for targeted educational interventions. The current study extends beyond Afemikhe et al.'s (2020) research, which focused specifically on Transmission-Based Precautions during COVID-19 in Edo State. While Afemikhe et al. found that higher academic qualifications predicted better practice, the present study provides a more comprehensive assessment of routine SP knowledge across multiple domains. The higher knowledge levels demonstrated here may reflect successful integration of lessons learned during the pandemic period into broader infection control awareness and education. The generally high knowledge levels across multiple SP domains suggest effective theoretical training at UBTH, creating a strong foundation for examining how this knowledge translates into practice. This is particularly relevant given the knowledge-practice gap highlighted in previous literature, including studies by Da'seh et al. (2023) and Al-Faouri et al. (2021). The comprehensive understanding demonstrated by nurses at UBTH positions the institution well for focusing on practical implementation and adherence to these well-understood principles. The findings indicate successful theoretical education

regarding SPs at UBTH while highlighting specific areas that may benefit from additional training emphasis. This creates a clear pathway for targeted interventions to address remaining knowledge gaps while maintaining the overall high standard of SP knowledge among the nursing staff.

Level of adherence to standard precaution practices among nurses

The current study reveals remarkably high adherence to Standard Precautions (SPs) among nurses at UBTH, with 90% of respondents demonstrating high adherence levels. These findings align with and even slightly exceed the "good compliance" levels reported in Emekolom et al.'s (2024) preprint study from the same institution. The results also correspond well with Ogunrinde et al.'s (2023) findings from Ekiti State, which reported 96.6% overall compliance among nurses in tertiary hospitals. However, these findings present a notably different picture from international studies. While UBTH nurses show consistently high adherence across multiple SP components, Al-Faouri et al.'s (2021) study of Jordanian nurses found only "intermediate level compliance" (61.4%). This marked difference might reflect varying institutional contexts, resource availability, or potentially different self-reporting patterns across cultural settings. Detailed analysis of specific practice components reveals particularly strong adherence in several critical areas. The highest compliance was observed in areas of direct patient safety impact, with 75% of nurses reporting they "always" use new sterile needles and syringes for injections (mean=3.7), and 73% consistently ensuring shared patient care equipment is properly cleaned or disinfected (mean=3.7). High adherence was also noted in sharps handling

(65% "always" comply, mean=3.6) and careful linen handling (67% "always" comply, mean=3.6). Hand hygiene practices show strong but slightly lower consistent adherence, with 58-65% of nurses reporting they "always" perform hand hygiene across different clinical scenarios (means ranging 3.4-3.5). This aligns with the generally good hand hygiene compliance noted in Ogunrinde et al.'s (2023) regional study, though the current study provides more granular detail about specific hand hygiene moments. Notably, the study identified that workload pressure impacts SP adherence, with 48% of nurses acknowledging that their compliance decreases during high workload or emergencies (mean=3.2). This finding resonates with challenges identified in previous studies, including Afemikhe et al.'s (2020) identification of staff shortages as a significant barrier, and Maitanmi et al.'s (2021) findings regarding workload impacts on SP practices. The consistently high adherence levels reported across multiple SP components suggest effective translation of knowledge into practice at UBTH, contrasting with the knowledge-practice gaps often reported in literature. However, these self-reported findings should be interpreted considering potential social desirability bias, a limitation also present in comparable studies. The impact of workload on adherence highlights an important area for institutional support and intervention, despite the overall positive findings. These results suggest that UBTH has developed effective systems for promoting SP adherence among its nursing staff, while also identifying specific areas where additional support might help maintain high compliance during challenging circumstances such as high workload periods or emergencies.

Perceived factors that influence adherence to standard precautions among nurses Although not part of the primary objectives, an additional analysis was carried out to identify perceived factors influencing adherence to standard precautions among nurses

The findings regarding perceived factors influencing adherence to Standard Precautions (SPs) among nurses at UBTH reveal predominantly positive perceptions, with 89% of respondents reporting positive influencing factors. This high proportion of positive perceptions aligns with but somewhat exceeds the generally favorable findings from previous Nigerian studies. Analysis of specific factors reveals several key themes that both support and extend previous research findings: The high positive response regarding PPE availability (81% agreeing/strongly agreeing) presents an interesting contrast to earlier studies. While Maitanmi et al. (2021) reported 92.1% of nurses citing PPE non-availability as a barrier at LASUTH, and Emekolom et al. (2024) identified resource availability as a significant challenge, UBTH nurses appear to face fewer resource constraints. Similarly, the strong positive perception of hand hygiene supplies availability (91% agreeing/strongly agreeing) suggests better resource provision than previously documented in comparable settings. The findings indicate strong institutional support for SP implementation, with 89% of respondents affirming clear policies and active encouragement. This contrasts with Maitanmi et al.'s (2021) finding where 87.5% reported poor policy as a barrier. However, the strong agreement (96%) on the need for regular refresher training aligns with previous studies highlighting ongoing training needs, even when baseline knowledge is

adequate. Despite the overall positive perceptions, 83% of respondents acknowledged that high workload impacts SP adherence, and 85% noted challenges in emergency situations. This corresponds with findings from Ogunrinde et al. (2023) regarding workplace pressure and Al-Faouri et al.'s (2021) observations about emergency setting challenges. These consistent findings across studies suggest persistent systemic challenges that transcend institutional boundaries. The positive influence of clinical experience (86% agreeing/strongly agreeing) aligns with Al-Faouri et al.'s (2021) findings about experience correlating with compliance. The strong support (94%) for supervision and feedback as compliance enhancers provides new insight into potential intervention strategies not extensively explored in previous studies. The strong positive beliefs regarding personal safety (89%) and infection prevention effectiveness (92%) suggest a robust foundation of understanding and motivation, supporting Afemikhe et al.'s (2020) findings about safety awareness during the COVID-19 pandemic. These findings suggest that UBTH has potentially addressed some of the traditional barriers identified in previous studies, particularly regarding resource availability and policy framework. However, persistent challenges related to workload and emergency situations indicate areas requiring continued attention. The results also highlight the importance of maintaining positive enabling factors like regular training and supervision, even in settings with generally favorable conditions for SP adherence.

The result of the hypothesis testing revealed no statistically significant relationship between nurses' level of knowledge regarding standard precautions and their

adherence to standard precaution practices ($\chi^2 = 0.2935$, $df = 1$, $p = 0.20$). This indicates that although most nurses demonstrated good knowledge and high adherence, knowledge alone did not significantly predict adherence behavior. This finding is consistent with the studies by Da'seh et al. (2023) and Al-Faouri et al. (2021), which also observed that knowledge does not necessarily translate to consistent compliance. Therefore, the null hypothesis was accepted, suggesting that other contextual and institutional factors—such as workload, supervision, and availability of resources—may exert greater influence on adherence to standard precautions among nurses at UBTH.

5.2 Implication to nurses

The findings of this study carry significant implications for nursing practice, particularly within tertiary healthcare institutions like the University of Benin Teaching Hospital (UBTH). The high level of knowledge and adherence to standard precautions (SPs) among nurses underscores the critical role of continuous professional education and institutional support in promoting safe and effective patient care. The fact that 88% of nurses demonstrated good knowledge of SPs and 90% reported high levels of adherence suggests that when nurses are adequately trained and resourced, they are well-positioned to prevent healthcare-associated infections and maintain high standards of hygiene and safety.

However, the study also highlights areas requiring further attention. Knowledge gaps in specific procedures—such as proper PPE removal, linen handling, and sharps disposal—point to the need for targeted refresher training. These gaps, if unaddressed, could undermine overall infection control efforts despite otherwise strong compliance. Moreover, the findings reveal that factors such as high workload and emergency pressures still affect nurses' ability to consistently adhere to SP protocols. This indicates a need for institutional strategies that provide workload relief and ensure that safety practices are not compromised under pressure.

Nurses also reported that the availability of resources such as PPE and hand hygiene supplies, as well as the presence of clear policies and supervisory support, were strong enablers of adherence. These findings reinforce the importance of supportive workplace environments in fostering best practices. The study further suggests that

mentorship from experienced nurses and regular supervisory feedback can be effective in reinforcing adherence to SPs, particularly for younger or less experienced staff.

In essence, this study implies that while knowledge and positive perceptions are vital, they must be reinforced through ongoing education, supportive supervision, and an enabling work environment. Nurses should remain proactive in seeking updates on SP guidelines and participating in refresher courses. At the same time, nurse managers and institutional leaders must prioritize staff development, adequate staffing, and resource availability to sustain and enhance adherence to standard precautions across all clinical settings.

5.3 Summary

This study explored the knowledge and practice of standard precautions among nurses in a tertiary healthcare institution, specifically at the University of Benin Teaching Hospital (UBTH), Benin City. The results revealed that the majority of nurses possessed a good understanding of standard precautions, including hand hygiene, the use of personal protective equipment (PPE), and safe handling of sharps and patient care equipment. Additionally, a high percentage of respondents reported consistently applying these precautions in their clinical practice, indicating a strong level of adherence.

Despite the overall positive findings, the study identified some challenges that hinder optimal compliance. These included high workload, emergencies that sometimes limit adherence, and occasional lapses in the proper use or disposal of protective materials. Furthermore, while institutional support—such as availability of resources, training, and supervisory feedback—was acknowledged as a facilitator of good practice, there remains room for improvement in ensuring consistency and sustainability in training and resource provision.

The study demonstrated that nurses at UBTH are generally knowledgeable and compliant with standard precautions, but ongoing efforts are needed to address practical challenges and ensure continuous professional development. These findings serve as a foundation for recommending targeted interventions that support safer healthcare delivery and infection prevention within hospital settings.

Furthermore, the hypothesis testing revealed no statistically significant relationship between nurses' knowledge and adherence to standard precautions, indicating that knowledge alone may not ensure consistent compliance in practice.

5.4 Conclusion

In conclusion, this study highlights the positive impact of comprehensive education, training, and institutional support on the knowledge and practice of standard precautions (SPs) among nurses at the University of Benin Teaching Hospital (UBTH). The findings reveal that the majority of nurses at UBTH demonstrate a strong understanding of SPs and adhere to these practices consistently, which is essential for ensuring patient safety and preventing healthcare-associated infections.

However, the study also underscores the need for continued attention to certain challenges, such as addressing specific knowledge gaps and mitigating the impact of high workload and emergency situations on adherence. The importance of maintaining adequate resource availability, regular training, and supervision cannot be overstated, as these factors were found to significantly influence SP compliance. Overall, while the results are promising, there is an ongoing need to reinforce the knowledge and practices of standard precautions through targeted interventions. By focusing on continuous education, addressing systemic challenges, and fostering a supportive clinical environment, UBTH can further enhance the quality of care and the safety of both patients and healthcare workers.

The study also found no significant relationship between knowledge and adherence, underscoring the importance of addressing environmental and institutional factors—such as supervision, workload management, and consistent supply of PPE—to sustain adherence regardless of knowledge levels.

5.5 Limitations of study

While this study provides valuable insights into the knowledge and practice of standard precautions (SPs) among nurses at the University of Benin Teaching Hospital (UBTH), several limitations should be considered when interpreting the findings.

First, the study primarily relied on self-reported data from participants, which is susceptible to social desirability bias. Nurses may have over-reported their adherence to SPs, particularly in areas where they are aware of the importance of compliance. This could result in inflated estimates of actual practice compared to observed behavior.

Second, the study focused on a single tertiary institution, limiting the generalizability of the findings to other healthcare settings in Nigeria or internationally. Different institutional contexts, resource availability, and cultural factors could influence SP knowledge and practice, which may vary from the results presented in this study.

5.6 Recommendations:

Based on the findings of this study, several recommendations are proposed to further improve the knowledge, practice, and adherence to standard precautions (SPs) among nurses at the University of Benin Teaching Hospital (UBTH) and similar healthcare institutions:

- While the study found high levels of knowledge regarding SPs, there remain certain knowledge gaps, particularly in procedural aspects such as the proper removal of personal protective equipment (PPE) and handling of patient bed linen. It is recommended that UBTH continue to provide regular refresher courses and targeted training to address these gaps, with a focus on procedural skills and practical application in clinical settings. Additionally, training should emphasize the importance of compliance during high-stress situations, such as emergencies and heavy workloads.
- Despite the strong theoretical knowledge, some gaps in practice were noted, particularly regarding hand hygiene and the handling of sharps and linens. It is recommended that the hospital implement more hands-on, practical training sessions to ensure that nurses are not only knowledgeable but also consistently apply SPs in all clinical scenarios. Simulation-based training and on-the-job mentoring can be effective strategies for improving practical adherence.
- The study identified workload pressures as a significant barrier to SP adherence. To mitigate this, it is recommended that UBTH consider strategies

for reducing nurse-patient ratios and ensuring adequate staffing, particularly during peak periods. Additionally, the implementation of workload management tools or job reorganization may help alleviate pressure on nurses and support their ability to consistently follow SPs.

- While UBTH demonstrated a strong institutional framework for supporting SP adherence, ensuring the continuous availability of PPE, hand hygiene supplies, and other infection control resources is crucial. The hospital should prioritize maintaining adequate stock levels and ensure that nurses have easy access to these essential materials, especially during high-demand periods.

5.7 Suggestion for Further study

While this study provides valuable insights into the knowledge and practice of standard precautions (SPs) among nurses at the University of Benin Teaching Hospital (UBTH), several areas remain unexplored and could benefit from further research.

The following suggestions are made for future studies to build upon the findings of this research:

- Future research could adopt a longitudinal design to track changes in SP knowledge and adherence over time. Such studies would help assess the long-term effectiveness of ongoing training programs and institutional interventions, as well as the evolution of practice as nurses gain more experience and as new infection control guidelines emerge.
- Given the findings that workload pressure negatively impacts SP adherence, further studies could delve deeper into the specific relationship between workload, nurse-patient ratios, and SP compliance. Research could focus on identifying specific workload-related challenges and exploring strategies to mitigate their effects on infection control practices, particularly during high-demand periods.
- This study was conducted within a single tertiary institution, UBTH. Future research could compare SP knowledge and adherence across different healthcare settings, such as primary healthcare centers, secondary hospitals, and other tertiary institutions in Nigeria. This would provide a broader

understanding of how institutional resources, organizational culture, and staffing levels influence SP practices in various healthcare environments.

References

- Abalkhail, A., Hassan, A., Al-Johani, S., Al-Semrani, A., & Al-Sheikh, G. (2021). Knowledge, attitude, and practice of standard precautions among healthcare workers in King Abdulaziz Medical City, Riyadh, Saudi Arabia. *Journal of Infection and Public Health*, *14*(9), 1178–1184. <https://doi.org/10.1016/j.jiph.2021.07.017>
- Abubakar, U. (2020). Point-prevalence survey of hospital acquired infections in three acute care hospitals in Northern Nigeria. *Antimicrobial Resistance and Infection Control*, *9*, Article 63. <https://doi.org/10.1186/s13756-020-00722-9>
- AbuAlrub, R. F., & Al-Khawaldeh, O. A. (2023). The nurses' knowledge and compliance with standard precautions to prevent healthcare-associated infections. *The Open Nursing Journal*, *17*, e187443462306231. <https://opennursingjournal.com/VOLUME/17/ELOCATOR/e187443462306231/>
- Abuduxike, G., Vaizoglu, S. A., Asut, O., & Cali, S. (2021). An assessment of the knowledge, attitude, and practice toward standard precautions among health workers from a hospital in Northern Cyprus. *Safety and Health at Work*, *12*(1), 66 - 73. <https://doi.org/10.1016/j.shaw.2020.09.003>
- Afemikhe, J. A., Esewe, R. E., Enuke, C. A., & Ehwarieme, T. A. (2020). Transmission based precaution practices among nurses in Edo State, Nigeria during COVID-19 pandemic. *African Journal of Reproductive Health*, *24*(2s), 98–107. <https://doi.org/10.29063/ajrh2020/v24i2s.14>
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Al-Faouri, I., Okour, S. H., Alakour, N. A., & Alrabadi, N. (2021). Knowledge and compliance with standard precautions among registered nurses: A cross-sectional study. *Annals of Medicine and Surgery*, *62*, 419–424. <https://doi.org/10.1016/j.amsu.2021.01.058>
- Alreshidi, F. S., Alaseeri, R. A., Almutairi, G. M., Alreshidi, N., Alanazi, A. F., & Alotaibi, A. F. (2021). Knowledge, attitude and practice of standard infection control precautions among health-care workers in a university hospital in Qassim, Saudi Arabia: A cross-sectional survey. *International Journal of Environmental Research and Public Health*, *18*(22), 11831. <https://www.google.com/search?q=https://doi.org/10.3390/ijerph182211831>
- Bayleyegn, B., Mehari, A., Damtie, D., & Negash, M. (2021). Knowledge, attitude and practice on hospital-acquired infection prevention and associated factors among healthcare workers at University of Gondar

- Comprehensive Specialized Hospital, Northwest Ethiopia. *Infection and Drug Resistance*, 14, 259–266. <https://doi.org/10.2147/IDR.S290992>
- Berdida, D. J. E., & Grande, R. A. N. (2024). Nurses' safety climate, quality of care, and standard precautions adherence and compliance: A cross-sectional study. *Journal of Nursing Scholarship*, 56(3), 442–454. <https://www.google.com/search?q=https://doi.org/10.1111/jnu.12960>
- Centers for Disease Control and Prevention. (2024, May 15). *Summary of Infection Prevention Practices in Dental Settings: Basic Expectations for Safe Care*. U.S. Department of Health & Human Services. <https://www.google.com/search?q=https://www.cdc.gov/oralhealth/infectioncontrol/summary-infection-prevention-practices/standard-precautions.html>
- Creswell, J. W., & Creswell, J. D. (2023). *Research design: Qualitative, quantitative, and mixed methods approaches* (6th ed.). Sage publications.
- Da'seh, A., Al-Zaru, I., Hayajneh, A., & Obaid, O. (2023). The nurses' knowledge and compliance with standard precautions to prevent healthcare-associated infections. *The Open Nursing Journal*, 17, e187443462306231. <https://doi.org/10.2174/18744346-v17-e20230711-2023-3>
- Emekolom, O. N., Oladipupo, E. O., & Saka, S. A. (2024). *Factors affecting compliance with universal standard precaution among nurses in a tertiary institution in Edo State* [Preprint]. Research Square. <https://www.google.com/search?q=https://doi.org/10.21203/rs.3.rs-4867421/v1>
- Ghabayen, F., ALBashtawy, M., Abdelkader, R., Jarrah, S., Eshah, N., Abdalrahim, A., Saifan, A., Alkhaldeh, A., Rayan, A., Ayed, A., Al-Amer, R., Mohammad, K., Al-Dwaikat, T., Al Omari, O., Albashtawy, S., ALBashtawy, B., & Al Dameery, K. (2023). Knowledge and compliance with standard precautions among nurses. *SAGE Open Nursing*, 9. <https://doi.org/10.1177/23779608231189966>
- Ghorbanmovahhed, S., Shahbazi, S., Gilani, N., Ostadi, A., Shabanloei, R., & Gholizadeh, L. (2023). Effectiveness of implementing of an infection control link nurse program to improve compliance with standard precautions and hand hygiene among nurses: A quasi-experimental study. *BMC Medical Education*, 23, Article 265. <https://www.google.com/search?q=https://doi.org/10.1186/s12909-023-04208-1>
- Lemiech-Mirowska, E., Kiersnowska, Z. M., Michalkiewicz, M., Depta, A., & Marczak, M. (2021). Nosocomial infections as one of the most important problems of healthcare system. *Annals of Agricultural and Environmental Medicine*, 28(3), 369–373. <https://doi.org/10.26444/aaem/122629>
- Lim, S. H., Bouchoucha, S. L., Aloweni, F., & Suhari, N. A. B. (2021). Evaluation of infection prevention and control preparedness in acute care nurses: Factors influencing adherence to standard precautions. *Infection, Disease & Health*, 26(2), 132–138. <https://www.google.com/search?q=https://doi.org/10.1016/j.idh.2020.11.005>

- Maitanmi, B. O., Adeoye, O., Maitanmi, P. T., & Olalekan, O. (2021). Factors influencing standard precautions practices among nurses in Lagos State University Teaching Hospital, Ikeja, Lagos State, Nigeria. *Texila International Journal of Nursing*, 7(1), 1-11. <https://www.google.com/search?q=https://doi.org/10.21522/TIJNR.2015.07.01.Art001>
- Ogunrinde, O., Olukolade, F., Akpor, O., Ojo, A., Ojo, I., Alebiosu, I., & Olorunfemi, O. (2023). Attitude and compliance of nurses to standard precautions to infection control in Ekiti State, Southwest Nigeria. *African Journal of Reproductive Health*, 27(6s), 60–69. <https://www.google.com/search?q=https://doi.org/10.29063/ajrh2023/v27i6s.8>
- Onubogu, C. U., Nwaneli, E. I., Chigbo, C. G., Egbuniwe, M. C., Egeonu, R. O., Chukwurah, S. N., Maduekwe, N. P., Onyeyili, I., Umobi, C. P., & Emelumadu, O. F. (2022). Prevalence of needle stick and sharps injury and Hepatitis B vaccination among healthcare workers in a South-East Nigerian tertiary hospital. *West African Journal of Medicine*, 39(1), 24–30.
- Oyewumi, Z. O., Akingbade, O., Afolalu, O., Adeyeye, S., Jolayemi, K. I., & Atekoja, O. E. (2022). Compliance with standard precaution practices during the early phase of the Covid-19 pandemic among nurses in Nigeria. *Africa Journal of Nursing and Midwifery*, 24(2), 1–16. <https://doi.org/10.25159/2520-5293/12074>
- Rezaei, F., Ghorbannejad, M., Najarkolaie, F. R., Kordian, A., Salamat, F., Riseh, F., & Esmi, A. (2024). Knowledge and performance of nurses in observing standard precautions: A narrative review. *Journal of Pharmacy & Bioallied Sciences*, 16(Suppl 1), S888–S894. https://www.google.com/search?q=https://doi.org/10.4103/jpbs.jpbs_1836_24
- Takougang, I., Lekeumo Cheuyem, F., Ze, B. R. S., Djifack Tadongfack, A. R., & Dongmo Sonea, E. G. (2024). Awareness of standard precautions, circumstances of occurrence and management of occupational exposures to body fluids among healthcare workers in a regional level referral hospital (Bertoua, Cameroon). *BMC Health Services Research*, 24, Article 424. <https://doi.org/10.1186/s12913-024-10855-x>
- Taylor, B., & Coffey, R. (2023). Infection Control. In *StatPearls*. StatPearls Publishing. Retrieved April 26, 2025, from <https://www.ncbi.nlm.nih.gov/books/NBK519017/>
- Tsegaye, D., Yazew, A., Gedfew, M., Yilak, G., & Yalew, Z. M. (2023). Non-pharmacological pain management practice and associated factors among nurses working at comprehensive specialized hospitals. *SAGE Open Nursing*, 9. <https://doi.org/10.1177/23779608231158979>
- Victoria State Government Department of Health. (2023, August 21). *Infection control - standard and transmission-based precautions*. Department of Health. <https://www.health.vic.gov.au/infectious-diseases/infection-control-standard-and-transmission-based-precautions>

World Health Organization. (2022). *Infection prevention and control core components: A guide for implementation* (Report No. WHO/UHL/IHS/IPC/2022.1).

<https://www.who.int/publications/i/item/WHO-UHL-IHS-IPC-2022.1>

Yamane, T. (1967). *Statistics: An Introductory Analysis* (2nd ed.). Harper and Row.

Zahir, S., Khan, K., Sardar, N., Jahan, S., Ali, M. M., Khan, A., Khattak, J., Mazhar, S., & Shah, J. (2024). Insights into standard precaution knowledge and adherence among healthcare workers: Evidence from tertiary care hospitals in Peshawar, Pakistan: Standard precautions and healthcare workers. *Pakistan Journal of Health Sciences*, 5(04), 19–24.

<https://www.google.com/search?q=https://doi.org/10.54393/pjhs.v5i04.1344>

APPENDIX I

INFORMED CONSENT FORM

Title of Study:

Knowledge and Practice of Standard Precautions among Nurses in a Tertiary Health Facility, Benin City

Introduction

You are invited to participate in a research study being conducted by **Ogiribo Otaroghene Gloria**, a 500-level student of the **Faculty of Nursing Science, University of Benin**. This study is part of the requirements for the award of the **Bachelor of Nursing Science (B.N.Sc.) degree**.

Purpose of the Study

The purpose of this study is to assess the **knowledge and practice of standard precautions among nurses** in a tertiary healthcare institution in Benin City. The findings will help identify strengths and gaps in infection prevention and control, and provide useful recommendations for improving nursing practice.

Procedure

If you agree to participate, you will be asked to complete a short questionnaire designed to obtain information about your knowledge and practice of standard precautions. Completing the questionnaire will take approximately **10–15 minutes** of your time.

Voluntary Participation

Participation in this study is **entirely voluntary**. You are free to **decline or withdraw** at any time without any consequences or loss of benefits. You may also choose not to answer specific questions if you feel uncomfortable doing so.

Confidentiality

All information provided will be kept **strictly confidential** and used **solely for**

academic purposes. Your name or any identifying details will **not** appear on the questionnaire or in the final report. Data will be securely stored and accessible only to the researcher and her supervisor.

Risks and Benefits

There are **no known risks** associated with participating in this study. Although you may not receive any direct benefit, your participation will contribute to improving infection control practices and patient safety within healthcare settings.

Consent Statement

I have read and understood the above information about this research study. I have been given the opportunity to ask questions, and my questions have been answered to my satisfaction. I voluntarily agree to participate in this study.

Participant’s Name: _____

Signature: _____

Date: _____

Researcher’s Name: Ogiribo Otaroghene Gloria

Signature: _____

Date: _____

Researcher’s Contact Information:

Ogiribo Otaroghene Gloria
Faculty of Nursing Science,
University of Benin, Benin City, Edo State
08055339038

APPENDIX II
COVER LETTER TO RESPONDENTS

Faculty of Nursing Science,
University of Benin,
Benin City,
Edo State.

Dear Respondent,

I am a 500 Level student of the department of Nursing, of the above mentioned institution conducting a research study “**knowledge and practice of standard precautions among nurses in a tertiary health facility, Benin City.**” as part of the requirement for the completion of a Bachelor’s Degree in Nursing Science. The purpose of the research is to assess nurses’ knowledge and practice of standard precautions in order to improve infection prevention and control within healthcare settings

.Kindly assist by completing the attached questionnaire sincerely and independently. There are no right or wrong answers — only your honest responses are required. All information obtained will be treated with **strict confidentiality** and used **solely for academic purposes**. No names or identifying details are required.

Your participation is voluntary, and you may choose not to participate or withdraw at any time without any consequences.

Thank you for your time and cooperation.

Yours faithfully,

Ogiribo Otaroghene Gloria

500-Level Student,
Faculty of Nursing Science,
University of Benin

APPENDIX III

QUESTIONNAIRE

KNOWLEDGE AND PRACTICE OF STANDARD PRECAUTIONS AMONG NURSES IN A TERTIARY HEALTH FACILITY, BENIN CITY.

Instructions:

This questionnaire is designed to collect information on nurses' knowledge and practice of standard precautions. Please read each question carefully and tick (✓) the option that best applies to you. Your responses will be kept **confidential** and used **only for academic purposes**. Do not write your name on the questionnaire.

Section A: Socio-Demographic and Professional Information

This section gathers background information. Please tick (✓) or fill in as appropriate.

1. **Age on your last birthday:**

- 21–25 years
- 26–30 years
- 31–35 years
- 36–40 years
- 41–45 years
- 46–50 years
- 51 years and above

2. **Gender:**

- Male
- Female

3. **Highest Nursing Qualification:**

- Registered Nurse (RN Diploma)
- Registered Midwife (RM) only
- RN & RM
- Bachelor of Nursing Science (BNSc)
- Post-Basic Specialty (Specify: _____)
- Master's Degree (MNSc/MSc) in Nursing
- PhD in Nursing

4. **Marital Status:**

- Single
- Married
- Divorced
- Widowed
- Separated

5. **Current Rank/Cadre:**

- Nursing Officer II

- Nursing Officer I
- Senior Nursing Officer
- Principal Nursing Officer
- Assistant Chief Nursing Officer
- Chief Nursing Officer
- Other (Specify: _____)

6. Years of Clinical Practice as a Nurse:

- 1–5 years
- 6–10 years
- 11–15 years
- 16–20 years
- More than 20 years

7. Current Ward/Unit of Practice: (Select ONE primary unit)

- Accident & Emergency (A&E) Unit A
- Accident & Emergency (A&E) Unit B
- Surgical Ward (Specify if possible: _____)
- Obstetrics & Gynecology Ward/Unit
- Medical Ward Unit A
- Medical Ward Unit B
- Operating Theatre Complex
- Pediatrics Ward/Unit
- Intensive Care Unit (ICU)
- Orthopedics Ward
- Neurosurgery Ward
- Other (Specify: _____)

8. Have you received specific training on Infection Prevention and Control (IPC) / Standard Precautions within the last 2 years?

- Yes
- No

Section B: Knowledge Regarding Standard Precautions

This section assesses your understanding. Please select the single best answer.

9. An infection acquired by a patient during hospital admission is called a nosocomial infection.

- True
- False

10. Nosocomial infections are NOT commonly transmitted through direct contact between patients and healthcare workers.

- True
- False

11. When handling any patient body fluids, hands should always be protected with gloves.

- True
- False

12. After use, needles should ideally be recapped before disposal to prevent injury.

- True
- False

13. PPE (like gowns or aprons) should routinely be worn when handling patient bed linen.

- True
- False

14. If splashes of blood or body fluids are likely, the nurse must wear a mask, eye protection (goggles/face shield), and a gown.

- True
- False

15. Standard Precautions apply to which patients?

- a) Only those with confirmed infections
- b) Only those in isolation
- c) All patients
- d) Only those undergoing surgery

16. When are you required to perform hand hygiene according to the WHO 5 Moments?

- a) Only after patient contact
- b) Only before aseptic tasks
- c) Before touching a patient, before clean/aseptic procedures, after body fluid exposure risk, after touching a patient, AND after touching patient surroundings
- d) Only when hands look dirty

17. Alcohol-based hand rub is the preferred method for hand hygiene EXCEPT when:

- a) Hands are visibly soiled or after caring for a patient with C. difficile infection
- b) Before putting on gloves
- c) After removing gloves
- d) Between caring for different patients

18. The minimum time needed for an effective alcohol-based hand rub is generally considered to be:

- a) 5 seconds
- b) 10 seconds
- c) 20-30 seconds
- d) 1 minute

19. Which item of PPE should typically be removed LAST?

- a) Gloves

- b) Gown
- c) Goggles/Face shield
- d) Mask/Respirator

20. **The recommended action if you cough or sneeze and do not have a tissue is to:**

- a) Use your hands
- b) Use your upper sleeve or elbow
- c) Turn away quickly
- d) Suppress the cough/sneeze

21. **Used sharps should be disposed of in a puncture-resistant container when it is:**

- a) Completely full
- b) Three-quarters (3/4) full
- c) Half full
- d) At the end of every shift

22. **Which principle is key to safe injection practices?**

- a) Using the same needle for multiple injections on the same patient if quick
- b) Recapping needles carefully after use
- c) Using one sterile needle and one sterile syringe for only one injection
- d) Sharing multi-dose vials between patients without changing needles

Section C: Practice/Adherence to Standard Precautions

This section asks how often you perform specific actions. Please indicate the frequency honestly. **Please rate your level agreement with the following statement**
N-Never, R-Rarely, S-Sometimes, O-Often, A-Always)

S/N		N	R	S	O	A
23.	I perform hand hygiene (wash or rub) before and after providing a nursing procedure.					
24.	I perform hand hygiene before and after having direct contact with a patient's intact skin.					
25.	I perform hand hygiene after touching inanimate surfaces or objects in the patient's immediate surroundings.					
26.	I wear gloves when contact with blood, body fluids, mucous membranes or non-intact skin is likely.					

S/N		N	R	S	O	A
27.	I put on a mask and gown when performing procedures likely to involve splashes or aerosols of body fluids.					
28.	I dispose of used sharps immediately into a designated sharps container without attempting to recap.					
29.	I use a new sterile needle and syringe for every					

	injection given.					
30.	I handle used/soiled linen carefully, avoiding shaking it.					
31.	I ensure patient care equipment shared between patients is cleaned or disinfected appropriately.					
32.	I find my compliance with SPs is lower when my workload increases significantly or during emergencies.					

Section D: Perceived Factors Influencing Adherence

This section explores views on factors affecting Standard Precautions practice at UBTH.

Please rate your level of agreement with the following statements. (SD-Strongly Disagree, DA-Disagree, N-neutral, A-Agree & SA-Strongly Agree)

S/N		SD	DA	N	A	SA
33.	I believe adhering strictly to Standard Precautions is important for my personal safety.					
34.	Standard Precautions are effective in preventing infections in patients under my care.					
35.	Adequate supplies of Personal Protective Equipment (gloves, masks, gowns, etc.) are consistently available when needed in my unit.					
36.	The unavailability of necessary PPE sometimes influences my ability to practice infection prevention correctly.					
37.	Hand hygiene supplies (soap, water, alcohol rub) are conveniently located and always functional.					
38.	I have received sufficient training on Standard Precautions and feel confident in my knowledge.					
39.	Regular refresher training on IPC/SPs is needed to maintain best practices					

40.	UBTH's policies regarding Standard Precautions are clear and actively encouraged in my unit.					
41.	My workload is often too high to allow for consistent adherence to all Standard Precautions.					
42.	Emergency situations often make it difficult to use PPE correctly or perform hand hygiene adequately.					
43.	My years of clinical experience positively influence my adherence to Standard Precautions.					
44.	Prompt supervision or feedback from the IPC team or supervisors would encourage better adherence.					

Thank You for Your Participation!