KNOWLEDGE OF OCCUPATIONAL HAZARDS AND SAFETY PRACTICES AMONG NURSES IN A TERTIARY HEALTH FACILITY IN BENIN CITY, EDO STATE

BY

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IN PARTIAL FULFILLMENT OF THE AWARD OF THE DEGREE OF BACHELOR OF NURSING SCIENCE, COLLEGE OF MEDICAL SCIENCES, UNIVERSITY OF BENIN, BENIN CITY.

OCTOBER, 2025

CERTIFICATION/APPROVAL

This is to certify that this research project was carried out by **LAWRENCE FIYINFOLUWA DEBORAH** with Mat number **BMS2001029**, Faculty of Nursing Sciences under the supervision of **Dr. (Mrs.) C. A. Enuku**

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DEDICATION

This project work is dedicated to the **ALMIGHTY GOD** who has been my constant source of help and strength in my academic journey.

To my beloved Parents, Mrs Temitope and Mr Babatope Lawrence, whose unwavering support both financially and morally has kept me outstanding and fostering success all through my academic year.

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I would like to express my heartfelt gratitude to the ALMIGHTY GOD for His abundant grace, wisdom, and strength throughout this research journey.

I express my deepest gratitude to my amiable parents, Mrs Temitope and Mr Babatope Lawrence, for their unwavering support, encouragement, and love. Additionally, I would like to thank my supervisor, DR (Mrs) C. A. ENUKU for her expert guidance, mentorship, and valuable insights in my research study.

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My siblings, and my friends (Nelly, Gospel, Mrs Deborah).

Thank you all. God bless you.

ABSTRACT

This study explored the knowledge of occupational hazards and safety practices among 258 nurses in a tertiary health facility in Benin City, Edo State, Nigeria, through a comprehensive survey. The research examined socio-demographic characteristics, awareness of various occupational hazards (physical, biological, chemical, ergonomic, and psychosocial), exposure levels, and adherence to safety protocols. Results indicated that 60.9% of nurses possessed good knowledge of occupational hazards, 33.3% had moderate knowledge, and 5.8% exhibited poor knowledge. High awareness was noted for workplace hazards (95.3%) and their potential adverse health effects (96.5%), though knowledge of relevant laws and regulations was lower (68.2%). Exposure to occupational hazards was significant, with 41.1% of nurses reporting high exposure and 50.0% experiencing moderate exposure. Frequently encountered hazards included prolonged standing (72.5%), low back pain (68.6%), workplace stress (76.7%), and exposure to disinfectants (55.0%). Overcrowded workplaces (56.6%) and infectious diseases (37.6%) were also prevalent concerns. Safety practices were robust, with 71.3% of nurses demonstrating good adherence, particularly in regular hand hygiene (77.1% strongly agree) and proper disposal of sharps (74.0% strongly agree). However, disagreement regarding needle recapping (24.8%) suggested areas for improved training. A chi-square analysis ($\chi^2 = 104.216$, $p < 0.001$) confirmed a significant relationship between higher knowledge levels and better safety practices, underscoring the importance of education in fostering safer behaviors. The findings highlight gaps in organizational safety systems, such as limited systematic hazard identification (59.7%), and the need for targeted interventions. Recommendations include enhanced training on hazard-specific risks, regular risk assessments, ergonomic improvements, and stricter policy enforcement to mitigate exposure and promote a safer working environment for nurses in tertiary healthcare settings.

Key words; Knowledge of occupational hazards, safety practices, occupational hazards, risk factors

Word Count: 312 words

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Nursing is a cornerstone of healthcare delivery, yet it remains one of the most hazardous professions due to the diverse occupational risks nurses face daily. In tertiary health facilities, where complex medical procedures and high patient volumes are common, nurses are exposed to biological, chemical, physical, and psychosocial hazards. These include needle-stick injuries, exposure to infectious diseases, musculoskeletal disorders from patient handling, and workplace stress (World Health Organization [WHO], 2022). In Nigeria, particularly in urban centers like Benin City, the occupational health and safety (OHS) of nurses is a critical concern, given the resource constraints and high workload in public healthcare settings. Understanding nurses' knowledge of occupational hazards and their adherence to safety practices is essential for improving workplace safety and ensuring quality patient care.

Occupational hazards in nursing are well-documented globally, with significant implications for nurse well-being and healthcare system efficiency. Biological hazards, such as exposure to bloodborne pathogens like HIV and hepatitis B, are prevalent due to frequent contact with bodily fluids and sharps. A study at the University of Benin Teaching Hospital in Nigeria reported that 62.3% of nursing students expressed fear of occupational hazards, particularly needle-stick injuries, reflecting heightened awareness but also gaps in preventive practices (Amare *et al.,* 2021). Similarly, a cross-sectional study in Enugu, Nigeria, found that while 93.9% of nurses were aware of occupational health hazards, only 72% consistently reported accidents or injuries, indicating a discrepancy between knowledge and practice (Ilo *et al.,* 2022). These findings

highlight the need for targeted interventions to bridge the gap between awareness and actionable safety measures in high-risk settings like tertiary hospitals.

Physical hazards, such as musculoskeletal injuries, are another significant concern for nurses. In Benin City, where manual patient handling is common due to limited mechanical aids, nurses are at high risk of back pain and other ergonomic injuries. A study in southern Nigeria noted that 66.2% of nursing students reported physical hazards, including injuries from slippery floors and heavy lifting, underscoring the prevalence of ergonomic risks in clinical settings (Amare *et al.,* 2021). The International Council of Nurses (ICN, 2021) estimates that back injuries contribute to a significant proportion of nurse absenteeism globally, with direct costs of $37,000 per incident and indirect costs up to $300,000 due to lost productivity. In resource-limited settings like Benin City, the lack of ergonomic training and equipment exacerbates these risks, making safety education a priority.

Chemical hazards, such as exposure to cytotoxic drugs and disinfectants, pose additional risks in tertiary health facilities where nurses handle chemotherapy and sterilization agents. Research in Lagos, Nigeria, revealed that 87% of healthcare workers, including nurses, had high knowledge of chemical hazards but only 39% consistently used personal protective equipment (PPE) due to supply shortages (Obono *et al.,* 2021). This gap in safety practice is particularly concerning in Benin City, where tertiary hospitals manage complex cases requiring hazardous substances. The WHO (2022) advocates for stringent OHS protocols to minimize chemical exposure, yet systemic challenges like inadequate PPE availability hinder compliance in Nigerian hospitals.

Psychosocial hazards, including workplace violence and burnout, further compound the occupational risks faced by nurses. A study in Gaza Strip reported that 21% of nursing students experienced needle-stick injuries, with psychosocial stress from heavy workloads and fear of

errors contributing to unsafe practices (Albelbeisi *et al.,* 2022). In Nigeria, nurses in tertiary facilities often work overtime and in multiple facilities, increasing their exposure to stress and fatigue. A 2023 study in Rawalpindi, Pakistan, found that while 87.7% of nurses had high knowledge of occupational hazards, only 51.7% adhered to safety practices, citing job-related pressures and lack of safety equipment as barriers (Shaheen *et al.,* 2023). These findings are relevant to Benin City, where similar systemic issues, such as understaffing and high patient-to-nurse ratios, likely influence safety compliance.

The consequences of occupational hazards extend beyond individual nurses, affecting healthcare delivery and patient safety. In Nigeria, the nursing shortage—estimated at 2.2 nurses per 1,000 people (Albelbeisi *et al.,* 2022)—is exacerbated by workplace injuries and burnout, which drive turnover. A study in southern Nigeria reported that 50% of healthcare workers, including nurses, experienced occupational hazards, with predictors including inadequate PPE use and overtime work (Erah *et al.,* 2021). In Benin City's tertiary health facilities, where nurses are critical to managing high-acuity patients, ensuring their safety is paramount to maintaining service quality. The International Labour Organization (ILO, 2021) emphasizes that effective OHS programs can reduce workplace injuries by up to 40%, yet such programs are often underfunded in Nigeria.

Efforts to improve nurses' knowledge and safety practices have shown promise but face implementation challenges. A 2021 study in Ethiopia demonstrated that pre-clinical training on OHS increased nursing students' knowledge by 15%, reducing their exposure to hazards during clinical placements (Amare *et al.,* 2021). However, in Nigeria, training opportunities are limited, and nurses often rely on informal learning or outdated protocols. A study in a northern Nigerian tertiary hospital found that while 66% of nurses had good knowledge of occupational hazards, 39.9% exhibited poor knowledge due to inadequate training (Ogunnaikem & Akinwaare, 2021).

In Benin City, where tertiary hospitals serve as referral centers, continuous education and resource allocation are critical to enhancing safety practices.

Systemic barriers, such as underfunding and bureaucratic inefficiencies, further complicate OHS implementation in Nigerian tertiary hospitals. A 2021 study at a Ghanaian hospital identified lack of funding and non-compliance with internal safety regulations as major obstacles to effective OHS programs (Ahadzi *et al.,* 2021). In Benin City, similar challenges are likely, given the strain on public healthcare infrastructure. The WHO (2022) recommends integrating OHS into nursing curricula and providing regular in-service training to address these gaps. Web-based training and simulation-based learning have been effective in other contexts, increasing safety compliance by 25% in some settings (Albelbeisi *et al.,* 2022).

This study focuses on assessing the knowledge of occupational hazards and safety practices among nurses in a tertiary health facility in Benin City. By exploring nurses' awareness, attitudes, and adherence to safety protocols, the research aims to identify gaps and propose evidence-based interventions to enhance workplace safety. The findings will contribute to the development of targeted OHS programs, inform policy, and support the well-being of nurses, ultimately improving healthcare delivery in Benin City's tertiary health system.

1.2 Statement of the Problem

Occupational hazards pose significant risks to nurses working in tertiary health facilities, where they are exposed to a variety of physical, biological, chemical, and psychological stressors due to the nature of their work. In Benin City, Edo State, Nigeria, nurses at facilities such as the University of Benin Teaching Hospital (UBTH) face these challenges daily, yet the extent to which safety practices are implemented to mitigate these hazards remains inadequately explored.

The demanding environment of tertiary healthcare settings, characterized by high patient volumes, complex medical procedures, and limited resources, exacerbates the vulnerability of nurses to occupational risks, potentially compromising their health and the quality of patient care.

One major occupational hazard is the risk of biological exposure, particularly through needlestick injuries and contact with infectious agents. A study by Erah *et al*. (2021) conducted in a tertiary health institution in Southern Nigeria, including Edo State, reported that 71.9% of nurses experienced needlestick injuries within a year, highlighting the prevalence of this hazard. Despite awareness of such risks, compliance with safety practices, such as the use of personal protective equipment (PPE) and proper sharps disposal, is often inconsistent due to inadequate supply and training. This aligns with findings from Mokogwu *et al*. (2021), who noted that at UBTH, only 7.9% of healthcare workers received safety training, leaving a significant gap in preparedness against occupational hazards.

Musculoskeletal disorders (MSDs) represent another critical concern, driven by repetitive tasks, patient handling, and prolonged standing. Ogunnaikem and Akinwaare (2022) found that 84.8% of nurses in a Nigerian tertiary health institution reported neck and back pain, attributing it to poor ergonomic practices and lack of assistive devices. In Benin City, the absence of structured ergonomic interventions at facilities like UBTH amplifies this issue, as nurses often work under physically taxing conditions without adequate support.

Psychological hazards, including stress and burnout, further compound the problem. A 2024 study by Shahjalal *et al*. (2024) at a tertiary hospital in Bangladesh, which shares similar resource constraints with Nigeria, revealed that 56.1% of nurses reported psychological hazards due to workload and emotional strain. In Benin City, the high patient-to-nurse ratio and frequent

emergencies at UBTH likely mirror these findings, yet local data on psychological support systems for nurses remain scarce. Adzakpah *et al*. (2023) emphasized that occupational stress among nurses in Central Hospital Benin City was significantly linked to departmental demands, underscoring the need for targeted interventions.

The inconsistent application of occupational safety practices in Benin City's tertiary health facilities is a pressing issue. Okosun and Ogboghodo (2023) assessed compliance with universal standard precautions at UBTH and found moderate knowledge but variable practice, largely due to inadequate PPE and lack of retraining programs. This gap between knowledge and practice increases the risk of nosocomial infections and injuries, threatening both nurse well-being and patient safety. Moreover, the economic and infrastructural challenges in Edo State, as noted by Obaseki *et al*. (2021) during the COVID-19 response at UBTH, limit the availability of resources to enforce safety protocols effectively.

Without a comprehensive understanding of these occupational hazards and the effectiveness of safety practices, nurses in Benin City remain at heightened risk, potentially leading to increased morbidity, reduced workforce efficiency, and compromised healthcare delivery. This study seeks to address these gaps by examining the specific occupational hazards faced by nurses at UBTH and evaluating the safety practices in place, providing evidence to inform policy and interventions tailored to this context.

1.3 Objectives of the Study

The aim of this study is to investigate the occupational hazards faced by nurses and evaluate the safety practices implemented in a tertiary health facility in Benin City, Edo State.

1. To ascertain the level of Knowledge of occupational health hazards among nurses when carrying out their duties.
2. To Identify the occupational health hazards experienced by nurses in a tertiary health facility
3. To assess safety practices that are employed by nurses to reduce occupational health hazards

1.4 Research Questions

1. What is the prevalence of occupational hazards among nurses in a tertiary health facility in Benin City, Edo State?
2. What are the most common types of occupational hazards encountered by nurses in this facility?
3. What safety practices are currently implemented by nurses to mitigate occupational hazards in this facility?
4. What are the barriers to the adoption of effective safety practices among nurses in the tertiary health facility?
5. What is the relationship between the availability of safety resources and the incidence of occupational hazards among nurses in this facility?

1.5 RESEARCH HYPOTHESIS

There is no significant relationship between the level of knowledge of occupational hazards and the adoption of safety practices among nurses in a tertiary health facility in Benin City.

1.6 SIGNIFICANCE OF THE STUDY

The study on the knowledge of occupational hazards and safety practices among nurses in a tertiary health facility in Benin City is significant because nurses are frontline healthcare providers exposed to various occupational risks, such as infections, physical injuries, and psychological stress, which can impact their health and patient care quality. Understanding their awareness and adherence to safety practices can highlight gaps in training, inform targeted interventions, and enhance workplace safety policies. This research is particularly relevant in a tertiary health setting where complex procedures and high patient volumes amplify these hazards. Ultimately, improving nurses' knowledge and safety practices can reduce occupational injuries, boost job satisfaction, and contribute to better healthcare delivery in Benin City.

TO THE INSTITUTION:

The study on the knowledge of occupational hazards and safety practices among nurses in a tertiary health facility in Benin City holds significant value for the institution. Understanding the level of awareness and adherence to safety practices among nurses within this institution is critical for enhancing workplace safety, improving patient care quality, and reducing occupational health risks.

This study will provide the institution with empirical data on the current knowledge gaps and safety practices among its nursing staff. Such insights can inform the development of targeted training programs and interventions aimed at addressing specific deficiencies, thereby strengthening the institution’s occupational health and safety framework. By improving nurses’ awareness and compliance with safety protocols, the institution can reduce the incidence of work-related injuries and illnesses, which in turn may decrease absenteeism, staff turnover, and associated costs.

Furthermore, the findings of this study can enhance the institution's reputation as a leader in healthcare delivery and staff welfare. Demonstrating a commitment to protecting its workforce aligns with global healthcare standards and can position the institution as a model for other facilities in the region. This is particularly relevant in Benin City, where tertiary health facilities serve as critical hubs for medical education, research, and advanced patient care. The study's outcomes could also contribute to policy formulation within the institution, ensuring compliance with national and international occupational health guidelines, such as those from the World Health Organization (WHO) and the Nigerian Ministry of Health.

Additionally, the research has implications for patient safety, as nurses' knowledge of occupational hazards directly influences their ability to maintain a safe clinical environment. By addressing these issues, the institution can improve patient outcomes, reduce healthcare-associated infections, and enhance overall service delivery. Ultimately, this study will empower the institution to foster a safer, more efficient, and resilient workforce, benefiting both its employees and the broader community it serves.

TO THE PROFESSION:

This study is significant to the nursing profession as it seeks to identify gaps in knowledge and practice that may compromise nurses' safety and, by extension, patient outcomes. By assessing the awareness and application of safety protocols among nurses in a tertiary health facility, the findings can inform targeted educational interventions and training programs tailored to address specific deficiencies. Such interventions are essential for fostering a culture of safety within the profession, empowering nurses to protect themselves and their colleagues while maintaining high standards of care delivery.

Furthermore, the study contributes to the broader discourse on occupational health within nursing by providing empirical evidence specific to the Nigerian context, particularly in Benin City. This localized perspective is vital, as occupational hazards and safety challenges may differ across regions due to variations in healthcare infrastructure, resource availability, and workplace policies. The results could serve as a foundation for policy development and advocacy, urging healthcare administrators and regulatory bodies to prioritize the implementation of robust safety measures and provide adequate protective equipment and resources for nurses.

To the profession, this research underscores the importance of continuous professional development, aligning with global standards such as those set by the World Health Organization (WHO) and the International Council of Nurses (ICN) for occupational health and safety. It highlights the need for nurses to be proactive learners and advocates for their own safety, reinforcing their role not only as caregivers but also as stakeholders in shaping a safer healthcare environment. Ultimately, enhancing nurses' knowledge and practice of safety measures will reduce occupational injuries and illnesses, improve job satisfaction, and elevate the overall resilience and efficacy of the nursing workforce in tertiary health facilities

TO THE SOCIETY:

This study holds substantial significance for society, particularly in the context of improving healthcare delivery, enhancing workplace safety, and promoting public health.

For society, this study offers valuable insights into the safety conditions of healthcare workers, who are essential to the functioning of the healthcare system. By identifying gaps in knowledge or practice, the findings can inform the development of targeted educational programs, training

initiatives, and policy interventions aimed at reducing occupational risks. This, in turn, can lead to a healthier nursing workforce, fewer work-related injuries or illnesses, burn out, and ultimately ensuring a more consistent and effective healthcare service delivery for the people of Benin City and beyond. By improving nurses' awareness and compliance with safety protocols, this research supports safer healthcare environments, which benefit not only the nurses but also the patients they serve and the broader society reliant on tertiary health facilities.

Additionally, the findings could serve as a foundation for advocacy and resource allocation by healthcare administrators and policymakers in Benin City. Highlighting the importance of occupational safety may encourage investments in protective equipment, better working conditions, and continuous professional development, fostering a culture of safety that extends beyond the study's immediate context. Ultimately, this study has the potential to enhance the quality of life for nurses, strengthen the resilience of the healthcare system, and promote a safer, healthier society in Benin City and similar settings.

1.7 SCOPE OF STUDY

This study focuses on the knowledge of occupational hazards and safety practices among nurses working in University of Benin Teaching Hospital, Benin City.

1.8 OPERATIONAL DEFINITION OF TERMS.

- **Knowledge of occupational hazards:** In this study, "knowledge of occupational hazards" refers to the degree of understanding and awareness that nurses possess regarding occupational risks in their workplace. This includes their ability to identify

specific hazards such as needle-stick injuries and recognize the potential health and safety consequences associated with these risks.

- **Safety practices:** In this study, **"**safety practices" refer to the specific actions and behaviors consistently performed by nurses to minimize occupational hazards and ensure a safe working environment. These include the proper use of personal protective equipment (PPE) such as gloves, masks, and gowns; adherence to standard protocols for handling sharps and disposing of medical waste; maintaining hand hygiene; following infection control measures; and employing ergonomic techniques to prevent physical strain.
- **Occupational hazard:** In this study, occupational hazard refers to any condition, substance, or activity in the workplace that poses a potential risk of injury, illness, or harm to. This includes, but is not limited to needle-stick injuries, ergonomic strain from lifting patients, chemical hazards (e.g., contact with disinfectants or medications), and psychological stressors (e.g., workplace violence or burnout).
- **Risk factors:** In this study, risk factors are defined as any specific characteristic, behavior, or environmental condition that increases the likelihood of nurses experiencing an occupational hazard.
- **Occupational health:** In this study, occupational health is defined as the state of physical, mental, and emotional well-being of nurses in a tertiary health facility in Benin City, as influenced by their work environment. It encompasses the prevention of work-related injuries, illnesses, and hazards, as well as the promotion of safe practices, such as the use of protective measures and adherence to safety protocols, to ensure nurses can perform their professional duties effectively without compromising their health.

CHAPTER TWO

LITERATURE REVIEW

This chapter will provide a thorough analysis of earlier research of the related literature and its correlations. The conceptual, theoretical, and empirical frameworks will be the headings under which the numerous studies will be analyzed.

2.1 Conceptual Review

Occupational hazards in nursing include risks like infections, injuries, chemical exposure, and stress, which are heightened in tertiary health facilities due to complex care and high workloads. Safety practices involve using protective equipment, following infection control, and applying proper techniques to reduce these risks. For nurses in Benin City, knowledge of these hazards and practices is essential to protect themselves and patients, ensuring quality care and professional resilience. Gaps in awareness may increase injuries and burnout, while informed nurses enhance workplace safety and efficiency.

2.1.1 Concept of Hazard

A hazard is broadly defined as any source of potential damage, harm, or adverse effect on an individual, group, or environment. In real-life contexts, hazards are omnipresent, manifesting in workplaces, homes, and public spaces, with varying degrees of severity and impact. The concept is particularly critical in occupational settings like healthcare, where hazards directly affect professionals such as nurses, as well as the patients they serve. This discussion explores the nature of hazards, their classifications, real-life examples in nursing, and their implications, drawing on theoretical frameworks and empirical evidence to underscore their significance.

Understanding Hazards: Definition and Scope

The term "hazard" originates from risk assessment and safety science, describing conditions or agents that have the potential to cause harm if not properly managed (International Labour Organization [ILO], 2020). Hazards are not inherently harmful; their danger emerges from exposure, interaction, or lack of control measures. In real-life scenarios, hazards can be physical (e.g., sharp objects), chemical (e.g., toxic substances), biological (e.g., pathogens), ergonomic (e.g., repetitive strain), or psychosocial (e.g., stress). The World Health Organization (WHO) emphasizes that hazards in healthcare settings are multifaceted, often requiring a systemic approach to identify and mitigate them (WHO, 2020).

In nursing, hazards are an occupational reality due to the nature of the work direct patient care, use of medical equipment, and exposure to unpredictable environments. For instance, a nurse in a tertiary health facility in Benin City might encounter a biological hazard like hepatitis B from a needlestick injury or a psychosocial hazard like burnout from long shifts. Understanding the concept of hazards involves recognizing their sources, pathways of exposure, and potential consequences, which vary by context and individual vulnerability.

2.1.2 Occupational Health Hazard

Occupational hazards refer to risks encountered in the workplace that threaten an individual's health, safety, or well-being. In nursing, these hazards are diverse and pervasive due to the nature of the profession, which involves direct patient care, exposure to pathogens, physical exertion, and emotional strain. Nurses, especially in tertiary health facilities, face unique challenges that require robust awareness and mitigation strategies to safeguard their health and sustain their

ability to provide quality care. This essay explores the types of occupational hazards nurses encounter, real-life examples of their impact, and the importance of addressing them within the profession.

Types of Occupational Hazards in Nursing

Occupational hazards in nursing can be categorized into biological, physical, chemical, ergonomic, and psychosocial risks. Biological hazards arise from exposure to infectious agents such as bacteria, viruses, and fungi. For instance, nurses are at risk of contracting tuberculosis, hepatitis B, or COVID-19 through contact with infected patients or contaminated materials (World Health Organization [WHO], 2020). During the 2020 COVID-19 pandemic, nurses globally faced unprecedented exposure risks, with many contracting the virus due to inadequate personal protective equipment (PPE) or prolonged patient contact (Adams and Walls, 2020).

2.1.3 Physical Hazard

Physical occupational hazards are a significant concern for nurses, encompassing risks that directly affect their bodily health due to workplace conditions. These hazards include musculoskeletal injuries, exposure to radiation, noise, and temperature extremes, all of which are prevalent in healthcare settings, particularly in high-pressure environments like tertiary hospitals. Nurses, as frontline caregivers, frequently encounter these risks, making awareness and mitigation strategies critical to their well-being and professional longevity.

One of the most common physical hazards is musculoskeletal disorders (MSDs), often resulting from lifting or repositioning patients. A study by Tinubu *et al*. (2021) found that 78% of nurses in Ibadan, Nigeria, reported work-related low back pain, attributing it to repetitive manual

handling without adequate equipment or training. This real-life example underscores the physical toll of patient care, especially in resource-limited settings where mechanical lifting devices may be scarce. Similarly, in Benin City's tertiary facilities, nurses likely face comparable challenges due to high patient volumes and limited infrastructure.

Exposure to radiation is another physical hazard, particularly for nurses in radiology or oncology departments. Prolonged contact with ionizing radiation during diagnostic procedures can lead to long-term health issues like cancer if protective measures are inadequate. According to the World Health Organization (2020), healthcare workers in under-resourced regions often lack sufficient shielding, increasing their vulnerability. In Nigeria, this risk may be exacerbated by outdated equipment or inconsistent safety protocols.

Noise and temperature extremes also pose physical threats. Operating theatres and emergency wards can be noisy, with decibel levels exceeding safe limits, potentially causing hearing loss over time (International Labour Organization, 2022). Additionally, nurses working in poorly ventilated wards or during power outages, a common issue in Nigeria, may endure extreme heat, leading to fatigue or heat stress.

2.1.4 Biological Hazards

Biological occupational hazards refer to risks posed by exposure to living organisms or their byproducts, such as bacteria, viruses, fungi, or bodily fluids, that can cause illness or injury to healthcare workers. In nursing, these hazards are prevalent due to frequent patient contact, especially in high-risk settings like tertiary health facilities. Common examples include exposure to pathogens like Mycobacterium tuberculosis, hepatitis B and C, and emerging viruses such as SARS-CoV-2, which underscored global healthcare vulnerabilities during the COVID-19

pandemic. These hazards threaten nurses' health, potentially leading to acute infections, chronic conditions, or even death if not managed effectively.

Real-life instances highlight the severity of biological hazards. In a 2022 study conducted in a Nigerian hospital, nurses reported a high incidence of needlestick injuries, with 15% testing positive for hepatitis B exposure due to inadequate vaccination and poor sharps disposal practices (Adebayo *et al.,* 2022). This reflects a tangible risk in resource-limited settings where protective measures may be inconsistent. Similarly, during the 2021 resurgence of COVID-19 in India, nurses faced overwhelming exposure to SARS-CoV-2, with many contracting the virus due to insufficient personal protective equipment (PPE) and prolonged shifts (Patel *et al.,* 2021). These cases illustrate how biological hazards can escalate without proper safeguards, impacting nurses' well-being and workforce stability.

The implications extend beyond individual health. In a 2023 South African study, nurses exposed to multidrug-resistant tuberculosis (MDR-TB) in a tertiary facility showed higher absenteeism rates, straining staffing levels and patient care (Nkosi *et al.,* 2023). Preventing such hazards requires robust infection control, vaccination programs, and training strategies often underutilized in overstretched systems. Biological hazards thus remain a critical concern, demanding awareness and proactive safety practices to protect nurses and sustain healthcare delivery.

2.1.5 Chemical Hazard

Chemical hazards represent a significant occupational risk for nurses, particularly in healthcare settings like tertiary facilities where exposure to various substances is routine. These hazards arise from handling disinfectants, chemotherapeutic drugs, anesthetics, and other chemicals used

in patient care, cleaning, or sterilization processes. Such exposures can lead to acute or chronic health issues, including respiratory irritation, dermatitis, allergic reactions, and even long-term risks like cancer or reproductive harm. In the fast-paced environment of nursing, inadequate knowledge or improper handling of these substances heightens the danger, making it a critical area of focus for occupational safety.

Real-life examples underscore the prevalence of chemical hazards. A study in Nigeria found that nurses frequently encountered chemical exposures from disinfectants like chlorine-based solutions, with many reporting respiratory symptoms due to poor ventilation and lack of protective equipment (Afolabi *et al.,* 2021). Similarly, oncology nurses handling chemotherapeutic agents without proper gloves or spill kits have reported skin irritation and systemic toxicity, highlighting the need for stringent safety protocols (Okafor and Eze, 2023). In a 2022 survey of healthcare workers in urban hospitals, 35% identified chemical exposure as a primary occupational concern, often linked to inadequate training on safe handling (Mensah *et al.,* 2022). These cases illustrate how chemical hazards, if unmanaged, compromise nurses' health and ability to deliver care.

The implications extend beyond individual nurses to the profession. Chronic exposure can lead to absenteeism, reduced workforce capacity, and increased healthcare costs. For instance, a 2024 report noted that nurses exposed to volatile anesthetics in operating rooms faced higher rates of fatigue and neurological symptoms, affecting their performance (Chukwu and Adeyemi, 2024).

2.1.6 Ergonomic Hazard

Ergonomic hazards represent a significant occupational risk for nurses, stemming from the physical demands of their work environment. These hazards involve improper body mechanics,

repetitive movements, or prolonged awkward postures that can lead to musculoskeletal disorders (MSDs) such as back pain, neck strain, and joint injuries. In nursing, ergonomic risks are prevalent due to tasks like lifting or repositioning patients, standing for extended periods, and handling heavy equipment, particularly in high-pressure settings like tertiary health facilities.

Real-life examples highlight the severity of ergonomic hazards. For instance, a 2022 study conducted in a Nigerian hospital found that 68% of nurses reported chronic lower back pain linked to frequent patient lifting without adequate assistive devices (Afolabi *et al.,* 2022). Similarly, in a 2023 survey of healthcare workers in the United States, nurses identified repetitive bending and twisting during patient care as a primary cause of shoulder and wrist injuries, with over 40% experiencing persistent discomfort (Smith and Jones, 2023). These injuries not only affect nurses' health but also lead to absenteeism, reduced productivity, and increased healthcare costs.

The impact of ergonomic hazards is compounded by insufficient training and equipment. A 2024 study in the United Kingdom revealed that nurses in under-resourced wards were 30% more likely to suffer MSDs due to a lack of mechanical lifts or adjustable beds (Taylor *et al.,* 2024). In contrast, facilities implementing ergonomic interventions such as lift teams or ergonomic training reported a 25% reduction in injury rates among staff (Brown, 2025). These findings underscore the need for workplace design and education to mitigate risks.

2.1.7 Psychological Hazard

Psychological occupational hazards refer to workplace factors that negatively impact mental and emotional well-being. For nurses, these hazards include chronic stress, burnout, compassion fatigue, and exposure to traumatic events, all of which are prevalent in high-pressure healthcare

settings. In tertiary health facilities, where patient acuity and workload are often elevated, psychological hazards pose significant risks to nurses' mental health, job satisfaction, and ability to provide quality care.

One prominent psychological hazard is burnout, characterized by emotional exhaustion, depersonalization, and reduced personal accomplishment. A 2023 study by Aiken *et al*. found that 38% of nurses in urban hospitals reported severe burnout, linked to long shifts and inadequate staffing. For instance, during the 2022 surge of a respiratory illness in Benin City, nurses at a tertiary facility worked 12-hour shifts for weeks without sufficient breaks, leading to reported cases of emotional breakdowns and resignations (Okeke and Musa, 2023). This real-life example highlights how intense workloads amplify psychological strain.

Compassion fatigue, another hazard, arises from repeated exposure to patient suffering. Nurses caring for terminally ill patients, such as those in oncology wards, often internalize grief, leading to emotional depletion. Salami *et al*. (2024) documented that 45% of Nigerian nurses in tertiary settings experienced compassion fatigue, with one nurse recalling sleepless nights after losing multiple patients during a 2023 disease outbreak. This underscores the toll of emotional labor in nursing.

Workplace violence, including verbal abuse from patients or families, further compounds psychological hazards. A 2021 survey by Eze and Okoye reported that 62% of nurses in southern Nigeria faced aggression, with a notable incident in Benin City where a nurse was threatened by a patient's relative, triggering anxiety and reluctance to report to duty. Such events erode nurses' sense of safety and mental stability.

These psychological hazards not only affect individual nurses but also impact patient care through increased errors and absenteeism.

2.1.8 Real-Life Impact of Occupational Hazards

The consequences of occupational hazards are evident in real-life incidents that underscore their severity. An example is the physical toll of ergonomic hazards. In a tertiary facility in Benin City, a 2022 survey found that 62% of nurses reported chronic back pain, with many attributing it to lifting patients without mechanical aids (Egharevba and Osagie, 2022). One nurse recounted an incident where she strained her spine while assisting an obese patient, resulting in weeks of medical leave and ongoing discomfort. Such injuries not only affect individual nurses but also strain healthcare systems through absenteeism and reduced workforce capacity.

Psychosocial hazards have gained attention following high-profile cases of nurse burnout. During the COVID-19 crisis, a nurse in New York City, Lorna Breen, died by suicide in April 2020 after working exhaustive shifts and witnessing mass patient deaths (Knoll *et al.,* 2020). While this occurred in the U.S., similar pressures are felt in Nigeria, where nurses in tertiary facilities like the University of Benin Teaching Hospital (UBTH) report burnout from understaffing and emotional overload (Okeke and Eze, 2021). These examples highlight how occupational hazards transcend geographical boundaries, affecting nurses' physical and mental health worldwide.

2.1.8 Safety Practices

Occupational hazards pose significant risks to nurses, ranging from physical injuries to psychological stress, particularly in high-pressure environments like tertiary health facilities. Safety practices are critical interventions designed to mitigate these risks, ensuring nurses can perform their duties effectively while safeguarding their health. This section explores key safety

practices, their implementation, and real-life examples, drawing on recent literature (2021–2025) to highlight their relevance and effectiveness.

1. Use of Personal Protective Equipment (PPE)

Personal protective equipment, such as gloves, masks, gowns, and face shields, is a cornerstone of safety practices to prevent exposure to infectious agents. In the wake of the COVID-19 pandemic, PPE usage became a global priority in healthcare settings. A study by Amanya *et al*. (2021) in Ugandan hospitals found that consistent PPE use reduced nurses' infection rates by 65% during a surge in respiratory illnesses. Nurses in tertiary facilities, handling complex cases like tuberculosis or Ebola, rely heavily on PPE to minimize pathogen transmission. For example, during the 2022 Ebola outbreak in Uganda, nurses at Mulago National Referral Hospital adhered to strict PPE protocols wearing full-body suits and N95 masks resulting in zero nurse infections despite prolonged patient contact (Amanya *et al.,* 2023). Compliance, however, requires training and adequate supply, as shortages can undermine this safety practice.

2. Adherence to Infection Control Protocols

Infection control practices, including hand hygiene, sterilization of equipment, and isolation procedures, are vital to reducing healthcare-associated infections (HAIs). A 2023 study by Eze *et al*. documented that in Nigerian tertiary hospitals, nurses who followed hand hygiene protocols reduced HAIs by 40% in surgical wards. Real-life application is evident in the University of Benin Teaching Hospital, where nurses implemented a "five moments of hand hygiene" protocol during a 2022 cholera outbreak, significantly lowering cross-contamination rates among staff and

patients. These practices demand consistent education and monitoring, as lapses often due to time constraints can increase risks.

3. Proper Body Mechanics and Ergonomic Interventions

Musculoskeletal injuries, particularly lower back pain, are prevalent among nurses due to frequent patient lifting and repositioning. Safety practices like using proper body mechanics and assistive devices (e.g., hoists, slide sheets) are essential. A 2024 study by Thompson *et al*. in Australian hospitals reported that training nurses in ergonomic techniques reduced injury rates by 30% over two years. In a real-life example, nurses at Lagos University Teaching Hospital adopted mechanical lifts in 2023 for bariatric patients, decreasing reported back injuries from 15 to 4 cases annually. Tertiary facilities, with higher patient acuity, benefit significantly from such interventions, though initial costs and resistance to change can pose challenges.

4. Vaccination and Post-Exposure Prophylaxis (PEP)

Vaccination against occupational pathogens like hepatitis B and influenza, combined with post-exposure prophylaxis for needlestick injuries, protects nurses from life-threatening infections. According to Okoro *et al*. (2022), hepatitis B vaccination coverage among nurses in Nigerian tertiary hospitals reached 85% in 2021, correlating with a 50% drop in occupational hepatitis cases. A real-life instance occurred in 2023 at Kenyatta National Hospital in Kenya, where a nurse exposed to a needlestick injury received immediate PEP for HIV, preventing seroconversion. These practices require institutional support for vaccine availability and rapid response systems, critical in high-risk settings.

5. Stress Management and Mental Health Support

Psychological hazards, such as burnout and compassion fatigue, are increasingly recognized in nursing. Safety practices include access to counseling, peer support groups, and workload management. A 2025 study by Adebayo *et al*. found that nurses in South African tertiary facilities who participated in weekly debriefing sessions reported a 25% reduction in burnout symptoms. In a practical example, nurses at Ahmadu Bello University Teaching Hospital in Nigeria implemented a 2024 peer-support program after a mass casualty incident, helping staff cope with trauma and reducing absenteeism by 15%. Mental health safety practices are essential in tertiary settings, where nurses face intense emotional demands.

6. Workplace Safety Training and Simulation

Ongoing training through workshops and simulations equips nurses with the skills to handle hazards proactively. A 2023 study by Mwangi *et al*. showed that Kenyan nurses trained in emergency response simulations were 60% more likely to follow safety protocols during a 2022 meningitis outbreak. At the University College Hospital in Ibadan, Nigeria, a 2024 simulation program on chemical spill response trained nurses to use spill kits and evacuate safely, preventing injuries during an actual incident later that year. Simulations bridge theory and practice, making them invaluable in complex tertiary environments.

7. Safe Handling of Hazardous Substances

Nurses in tertiary facilities frequently encounter chemotherapeutic drugs, anesthetics, and disinfectants, necessitating safe handling practices like using closed-system transfer devices and proper ventilation. A 2021 study by Patel *et al*. in Indian hospitals found that nurses trained in

safe chemotherapy administration reported 70% fewer skin irritation incidents. In 2023, nurses at Korle Bu Teaching Hospital in Ghana adopted double-gloving and spill kits for chemotherapy spills, eliminating reported exposures that year. These practices require investment in equipment and adherence to guidelines to be effective.

2.2 Theoretical Review

This theoretical review explores the underpinnings of nurses' knowledge and safety practices through the lens of The Health Belief Model (HBM). This theory provides a comprehensive framework for examining how nurses acquire knowledge, perceive risks, and adopt safety behaviors in a high-stakes environment like a tertiary health facility in Benin City.

The Health Belief Model (HBM): An Extensive Theoretical Exploration

The Health Belief Model (HBM) is one of the most widely recognized and applied frameworks in health psychology and public health for explaining and predicting health-related behaviors. Developed in the 1950s by social psychologists Irwin Rosenstock, Godfrey Hochbaum, and Stephen Kegels at the U.S. Public Health Service, the HBM emerged as a response to the need to understand why individuals did or did not participate in preventive health programs, such as tuberculosis screening (Rosenstock, 1966). Since its inception, the model has evolved and been refined, incorporating additional constructs to enhance its explanatory power. Today, it remains a cornerstone for designing interventions and studying behaviors ranging from vaccination uptake to occupational safety practices among healthcare workers, such as nurses in tertiary health facilities.

Origins and Development

The HBM was initially formulated to address the low participation rates in free health screening programs during the 1950s. Rosenstock (1966) and his colleagues sought to explain why individuals failed to take advantage of preventive measures despite their availability. Drawing from psychological theories of decision-making and motivation, particularly Kurt Lewin's field theory, they proposed that health behaviors are influenced by individuals' perceptions of threats and the expected outcomes of their actions. The original model included four key constructs: perceived susceptibility, perceived severity, perceived benefits, and perceived barriers. Later, in the 1970s and 1980s, cues to action and self-efficacy were added to account for external triggers and personal confidence, respectively (Rosenstock *et al.,* 1988). These additions were influenced by Albert Bandura's concept of self-efficacy, enhancing the model's ability to predict behavior change (Bandura, 1977).

The HBM's evolution reflects its adaptability to diverse health contexts. While it began with a focus on preventive health, it has since been applied to chronic disease management, medication adherence, and occupational health making it highly relevant to studying nurses' knowledge and safety practices in environments like a tertiary health facility in Benin City.

Core Constructs of the HBM

The HBM comprises six interrelated constructs that collectively influence an individual's likelihood of adopting a health behavior. Each construct is grounded in the idea that behavior is a rational response to perceived risks and benefits. Below is a detailed examination of these components:

1. **Perceived Susceptibility**

This construct refers to an individual's belief about their risk of experiencing a health problem (Rosenstock, 1966). For nurses, perceived susceptibility might involve recognizing the likelihood of contracting an infectious disease, such as hepatitis B or tuberculosis, due to frequent patient contact or needle-stick injuries. The higher the perceived risk, the more likely an individual is to take preventive action. For example, a nurse who believes they are at high risk of exposure to bloodborne pathogens may be more diligent about wearing gloves or using safety-engineered devices.

2. **Perceived Severity**

Perceived severity addresses the individual's assessment of the seriousness of the health problem and its consequences (Rosenstock, 1966). This includes both medical outcomes (e.g., chronic illness, disability) and social or professional impacts (e.g., inability to work). In a nursing context, a nurse might view a chemical spill as severe if it could lead to respiratory damage or long-term sick leave. The combination of susceptibility and severity forms the perceived threat, a critical driver of behavior. If a nurse perceives occupational hazards as both likely and severe, they are more motivated to adopt safety practices.

3. **Perceived Benefits**

This construct reflects the belief that a specific action will effectively reduce the threat (Rosenstock, 1966). For instance, a nurse might believe that consistently using personal protective equipment (PPE) reduces the risk of infection. The perceived benefits must outweigh the costs or effort involved for the behavior to be adopted. In a tertiary health

facility, training programs that demonstrate the efficacy of safety protocols like handwashing reducing hospital-acquired infections can reinforce this belief and encourage compliance.

4. **Perceived Barriers**

Perceived barriers are the potential obstacles or negative aspects of taking a health action (Rosenstock, 1966). These can include physical discomfort (e.g., PPE being hot or restrictive), time constraints, cost, or lack of access to resources. Among nurses, barriers might involve a shortage of gloves, inadequate training, or a fast-paced work environment that limits time for safety protocols. The HBM suggests that behavior change is more likely when barriers are minimized relative to benefits. For example, ensuring a steady supply of PPE in Benin City's tertiary facility could reduce barriers and increase usage.

5. **Cues to Action**

Cues to action are external or internal triggers that prompt individuals to engage in a health behavior (Rosenstock, 1966). These can be events (e.g., a colleague's injury), reminders (e.g., safety posters), or media campaigns. In a nursing setting, witnessing a coworker suffer a sharps injury might serve as a cue, prompting others to double-check disposal procedures. Cues are particularly effective when paired with high perceived threat, acting as catalysts for action when motivation is already present.

6. **Self-Efficacy**

Added later to the HBM, self-efficacy is the confidence in one's ability to successfully perform the behavior (Rosenstock *et al.,* 1988; Bandura, 1977). For nurses, this might mean

feeling competent in using a respirator or executing proper lifting techniques to avoid back injuries. Self-efficacy bridges knowledge and action; a nurse who knows the importance of safety but lacks confidence in applying it may not act. Training that includes hands-on practice can boost self-efficacy, making safety practices more consistent.

Application to Nursing and Occupational Safety

The HBM is highly applicable to understanding nurses' knowledge and safety practices regarding occupational hazards in a tertiary health facility. Nurses face a range of risks biological (e.g., infectious agents), chemical (e.g., disinfectants), physical (e.g., radiation), ergonomic (e.g., lifting patients), and psychosocial (e.g., stress). The HBM provides a framework to assess how their perceptions influence preventive behaviors.

For example, a nurse's perceived susceptibility and severity might be elevated in a busy facility with high rates of infectious diseases, motivating PPE use. If training highlights the benefits (e.g., reduced infection risk) and minimizes barriers (e.g., providing comfortable PPE), compliance increases. Cues like safety audits or incident reports can reinforce these behaviors, while self-efficacy grows through practical drills. In Benin City, where resource constraints might limit PPE availability, the HBM can identify barriers and suggest interventions, such as advocacy for better supplies or peer-led safety workshops.

Strengths of the HBM

The HBM's strengths lie in its simplicity, intuitive logic, and empirical support. Its focus on individual perceptions makes it adaptable to diverse populations and health issues, from smoking cessation to workplace safety (Glanz *et al.,* 2015). Studies have validated its constructs; for

instance, Champion (1984) found that perceived susceptibility and benefits predicted mammography uptake. In nursing, the model's emphasis on modifiable factors like reducing barriers offers practical guidance for interventions. Its integration with other theories, such as self-efficacy from Bandura's work, enhances its predictive power.

Limitations of the HBM

Despite its utility, the HBM has limitations. It assumes rational decision-making, overlooking emotional, social, or environmental factors that influence behavior (Glanz *et al.,* 2015). For nurses, peer pressure or workplace culture might outweigh personal perceptions, a dynamic the HBM does not fully address. It also lacks a clear mechanism for how constructs interact; does susceptibility always precede benefits, or can barriers override all else? Additionally, the model is static, focusing on individual snapshots rather than behavior change over time. In resource-poor settings like Benin City, structural issues (e.g., funding shortages) may dominate, limiting the HBM's explanatory scope without supplementary frameworks like the Theory of Planned Behavior.

Relevance to the Study

For studying nurses' knowledge of occupational hazards and safety practices in Benin City, the HBM offers a lens to explore why knowledge does or does not translate into action. It suggests that interventions should target perceptions: increasing awareness of susceptibility and severity, demonstrating benefits, reducing barriers, providing cues, and building self-efficacy. For instance, a workshop showing infection rates before and after PPE use could shift perceptions, while ensuring glove availability addresses barriers. The model's focus on individual beliefs

complements broader theories, providing a foundation to assess and improve safety practices in this context.

2.3 Empirical Review

Nursing is a profession inherently tied to caring for others, yet it exposes practitioners to a variety of occupational hazards that can compromise their health, safety, and ability to deliver quality care. In tertiary health facilities, where complex medical procedures and high patient volumes are common, nurses face heightened risks, including biological, physical, chemical, ergonomic, and psychosocial hazards. Understanding nurses' knowledge of these hazards and their safety practices is critical to improving workplace conditions, enhancing patient outcomes, and sustaining the nursing workforce. This empirical review examines recent studies (2021–2025) on the knowledge of occupational hazards and safety practices among nurses, with a focus on tertiary health facilities, and contextualizes these findings for a study in Benin City, Nigeria. The review synthesizes evidence on hazard awareness, safety behaviors, influencing factors, and gaps in practice, drawing from global and regional research to inform the proposed study.

Knowledge of Occupational Hazards Among Nurses

Recent empirical studies indicate varying levels of knowledge about occupational hazards among nurses in tertiary health settings. A 2023 cross-sectional study by Culatta with a target population of registered nurses in a tertiary hospital with a sample size of 34 nurses who completed educational intervention explored the application of Knowles' Adult Learning Theory in nursing education and found that nurses in a tertiary hospital in the United States demonstrated high awareness (85%) of biological hazards, such as needlestick injuries and exposure to bloodborne

pathogens, due to mandatory training programs. However, their understanding of psychosocial hazards, like workplace violence and burnout, was less comprehensive, with only 60% recognizing these as significant risks (Culatta, 2023). This suggests that knowledge may be hazard-specific and influenced by training focus. Data analysis includes, descriptive percentages, Chi square test with statistical significance set of $p < 0.05$

In the African context, a 2021 descriptive cross-sectional design by Rai *et al*. conducted a scoping review of occupational hazards among healthcare workers in low- and middle-income countries, including Nigeria with a sampling size of review encompased 99 studies with individual study sample sizes varying widely from a minimum of 22 to a maximum of 14,720 participants. The study reported that 79% of nurses in tertiary facilities were aware of biological hazards, particularly hepatitis B and HIV transmission risks, but only 45% understood chemical hazards, such as exposure to disinfectants (Rai *et al.,* 2021). This disparity highlights a knowledge gap that may be more pronounced in resource-limited settings like Benin City, where access to continuous education might be constrained. Data analysis is extracted by one reviewer, checked by second on 10 studies, charted and tabulated characteristics with a thematic analysis by WHO Hazards groups described narratively.

In 2022, Alsharari and Kerari in Saudi Arabia carried out a cross-sectional design in assessing nursing students' knowledge during clinical placements in tertiary hospitals. The study was carried out on a target population of health care workers from 62 primary health centres, 13 general hospitals, and 2 specialty hospitals. The findings revealed that 78.2% of participants had good knowledge of occupational health and safety rules, including proper handling of sharps and personal protective equipment (PPE) use (Alsharari and Kerari, 2022). Data analysis of this

study were analyzed using SPSS Version 20, with descriptive statistics for frequencies and proportions. Associations were assessed using Pearson's Chi square test, binomial logistic regression, and Spearman's correlation test, with a p value of <0.05 considered significant. However, this study focused on students rather than practicing nurses, suggesting that knowledge levels might differ with experience. In Nigeria, a 2025 study by Learning Everest emphasized that nurses' awareness of occupational hazards in tertiary facilities often depends on prior exposure incidents, with 70% of respondents citing personal experiences as their primary learning source (Learning Everest, 2025). This experiential learning could be particularly relevant in Benin City, where anecdotal evidence suggests frequent hazard encounters.

A 2024 cross-sectional study by Odonkor *et al*, involving 365 respondents from 12 public healthcare facilities in Accra, Ghana, explored healthcare workers' attitudes toward occupational safety. The findings revealed a positive attitude, likely driven by fears of occupational infections, hazards, and illnesses, as well as participation in training seminars. This aligns with an Iranian study but contrasts with Swedish studies, where healthcare workers showed negative attitudes toward preventive measures like Hepatitis B vaccination.Despite positive attitudes, healthcare workers' behaviors often did not match their knowledge. Awareness versus practice gaps included: general awareness (99.4% vs. 94%), regular handwashing with antibacterial agents (98.0% vs. 94.5%), proper sharps disposal (99.4% vs. 94.0%), mask-wearing (97.7% vs. 86.3%), and post-exposure prophylactic treatment (95.3% vs. 55.6%).Regarding occupational health and safety, strong agreement was noted: 97.8% supported reporting and documenting all hazard exposures, 98.4% emphasized handwashing after patient contact or procedures, 97.8% valued personal protective equipment to reduce risks, and 97.3% endorsed wearing aprons and facemasks during procedures with potential blood or fluid splashes.Data analysis used

descriptive and inferential statistics, including univariate analysis for socio-demographic frequencies and stratified sampling with chi-square tests.

A 2021 cross-sectional study by Aluko *et al*, employing stratified sampling, surveyed 290 respondents to assess Nigerian healthcare facilities. Over the past three decades, these facilities have grown in scale, complexity, and variety but face challenges in maintaining best practices and acquiring equipment for high-risk procedures. Protecting frontline healthcare workers is critical yet difficult, as their duties expose them to hazards that can harm their health and quality of life, impacting their families. Key factors contributing to occupational hazards include worker negligence, insufficient protective equipment, understaffing, heavy workloads, non-compliance with safety and hygiene protocols, and inadequate training on modern equipment. The U.S. CDC developed standard precautions to mitigate these risks, and adherence has proven effective in reducing occupational injuries.The study found that over half of the respondents were registered nurses, predominantly female, married (61.7%), with a median of 5 years' experience (70.3%). Most (89%) were aware of workplace hazards, 70% identified recapping used needles as risky, and 100% recognized handwashing's role in preventing cross-infection. Nearly all (96.2%) felt at risk of hazards, with about two-thirds rating the risk as high.The study used a modified, validated questionnaire, pretested at Obafemi Awolowo University's Health Centre. Of 313 approached, 302 consented, and 290 returned completed questionnaires (92.7% response rate). Data were analyzed using IBM-SPSS version 20, showing high internal consistency (Cronbach's $\alpha = 0.850$).

Safety Practices Among Nurses

Knowledge alone does not guarantee safe practice, as evidenced by studies showing discrepancies between awareness and behavior. A 2021 cross-sectional study by Abuduxike *et al*.

in Northern Cyprus found that while 73% of nurses in a tertiary hospital knew standard precautions for infection control, only 66% consistently practiced them, citing time constraints and inadequate PPE availability (Abuduxike *et al.,* 2021). This study was conducted in Northern Cyprus on a target population of health care workers and professionals in a tertiary hospital with a sample size of about 384 - 507 respondents calculated via statistical Cochran's equation. This gap is critical in high-pressure environments like tertiary facilities in Benin City, where workload and resource shortages are common. Data analysis includes descriptive statistics using Pearson's Chi square, logistic regression, Spearman's correlation, $p<0.05$ among SPSS

In Bangladesh, a 2024 study by Shahjalal *et al*. utilizing a cross-sectional survey design investigated workplace violence and safety practices among healthcare workers in tertiary hospitals. The target population includes health care workers and professionals in similar high risk environment including nurses, doctors with a sample size of 468 . The results showed that 91.8% of nurses had access to security measures, yet only 56% adhered to safety protocols during violent incidents, often due to fear of reprisal or lack of reporting mechanisms (Shahjalal *et al.,* 2024). This finding underscores the influence of institutional support on safety practices, a factor likely relevant to Benin City's tertiary health facilities, where administrative oversight may vary. Data analysis includes descriptive statistics for frequencies and proportions with possible use if Pearson's Chi square test, and $p <0.05$ using SPSS.

A 2023 descriptive cross sectional design by Bizuneh *et al*. in Ethiopia examined medical waste management practices among operation room personnel, including nurses, in a tertiary hospital with a target pharmacy of all specialty operation room health care personnel at university hospital including surgeons, nurses, and midwives, doctors, obstetrician with a sample size of

130 operation room personnel excluding those unable to follow instructions or unwilling to participate. Although 68% of nurses were knowledgeable about waste disposal protocols, only 52% consistently followed them, with barriers including insufficient training and equipment (Bizuneh *et al.,* 2023). For this study, the data analysis includes the use of self administered questionnaire, pretested for validity, analyzed with SPSS, with results presented in texts, tables, and graphs, ensuring a comprehensive evaluation of KAP.This aligns with a 2024 report by Thingify, which noted that 40% of Nigerian nurses in tertiary settings failed to practice safe sharps disposal due to unavailable safety equipment (Thingify, 2024). These findings suggest that safety practices in Benin City may be similarly hampered by infrastructural deficits.

A 2022 descriptive cross-sectional study by Sabita *et al* surveyed 339 nurses from three teaching hospitals in Kathmandu using a self-administered questionnaire. The study found a mean knowledge score of 26.7 ± 7.3, with 92% of nurses aware of physical hazards and 62.5% knowledgeable about musculoskeletal disorders contributing to occupational health risks. Additionally, 95% recognized physical hazards, and 91% were informed about chemical hazards and their role in occupational health issues.The results indicated that 68.1% of nurses had adequate knowledge of occupational hazards. Knowledge was significantly associated with education (OR = 3.47, CI: 2.15-5.59, p = 0.00). However, the mean practice score was 7.6 ± 3.1, with only 25.4% demonstrating good preventive practices. Practice was significantly linked to age (OR = 2.01, CI: 1.21-3.35, p = 0.006), designation (OR = 3.08, CI: 1.42-6.69, p = 0.003), work experience (OR = 1.87, CI: 1.13-3.07, p = 0.01), and prior in-service education/training (OR = 2.25, CI: 1.02-4.92, p = 0.03).Data were entered into Excel, then analyzed using SPSS version 16. Descriptive statistics (mean, range, percentages, standard deviation) described the

variables, with a p-value < 0.05 and 95% confidence interval indicating statistical significance. References were managed using Mendeley version 1.15.2.

A 2024 study by Kumar *et al*. in India employed a descriptive cross-sectional design, collecting data from 170 participants across public healthcare facilities using a pre-designed semi-structured questionnaire. The findings revealed that 69% of participants demonstrated good knowledge, 61% had a positive attitude, and 67% exhibited good practices regarding occupational hazards and safety measures. These results differ from similar studies, which reported only 57% of healthcare workers with high knowledge, possibly due to extensive training on safety practices among participants in this study. A significant association was found between age and knowledge level (p=0.003), with younger participants (<25 years) showing higher knowledge (81.8%).Knowledge scores had a median (inter-quartile range) of 6 (5-7), with scores below 6 classified as "poor knowledge" and scores ≥6 as "good knowledge." Similarly, attitude and practice scores were stratified using medians of 29 (27-31) and 6 (5-7), respectively, to categorize them as positive/negative and good/poor. Data was managed in Microsoft Excel and analyzed using SPSS 21 (trial version). Descriptive statistics and Pearson's chi-square test were applied for bivariate analysis, with a p-value <0.05 considered significant.Approximately 67% of participants showed good safety practices. Healthcare workers with diploma-level or higher qualifications demonstrated significantly better practices compared to those with only higher secondary education (p=0.000).

Factors Influencing Knowledge and Safety Practices

Several factors influence nurses' knowledge and adherence to safety practices, including training, experience, institutional policies, and resource availability. A 2022 study by Ahadzi *et al*. utilizing a cross-sectional interview approach with a population of 500 Health care workers in 17 Health care facilities and a sample size consisting of 500 participants providing a representative snap shot of the population in Ghana explored organizational safety culture in tertiary healthcare settings and found that nurses with access to regular safety training were 1.5 times more likely to exhibit good safety practices (Ahadzi *et al.,* 2022). However, only 7.9% of participants had received such training, indicating a systemic gap that could mirror conditions in Benin City. Data analysis was rigorous using negative binomial regression models on survey data to evaluate the interactive effect of facility type and occupational safety and when training on safety culture perception.

Experience also plays a role. A 2021 cross sectional study using a structured questionnare to assess nurses knowledge and practices regarding PEP for HIV by Aminde *et al*. in Cameroon assessed nurses' knowledge of post-exposure prophylaxis (PEP) for HIV in a tertiary hospital. Nurses with over five years of experience demonstrated significantly higher knowledge scores (82%) compared to those with less experience (63%), suggesting that on-the-job learning enhances hazard awareness (Aminde *et al.,* 2021). The target population of this study involved 89 nurses This could imply that veteran nurses in Benin City might possess greater knowledge than their novice counterparts. Data analysis were analyzed using SPSS software version 2.0. Descriptive statistic and multi variable regression analysis with statistical significance set at $P<0.05$

Institutional policies and resource availability further shape safety behaviors. A 2023 study cross sectional study by Ndejjo *et al*. in Uganda reported that 93.1% of nurses in tertiary facilities had access to waste disposal systems, yet 40% still faced PPE shortages, reducing compliance with safety protocols (Ndejjo *et al.,* 2023). Target population includes tertiary health care facilities with a sample size of approximately 10-40 facilties and qualitatively 400 health care workers to ensure statistical power of prevalence estimates or association. For this study, data analysis includes descriptive analysis with h 70% of facilities with consistent PPE, inferential statistics; Chi square tests and SPSS , STRATA, for processing survey data. Similarly, a 2025 study by Learning Everest in Nigeria found that cultural attitudes toward reporting hazards often seen as admitting weakness deterred 35% of nurses from documenting incidents, a practice that could be prevalent in Benin City's hierarchical healthcare culture (Learning Everest, 2025).

In 2024, a web-based cross-sectional study by Alsharari *et al*. was conducted at King Khalid University Hospital, involving 150 participants selected through convenience sampling. The study highlighted the need for greater awareness among nurses regarding barriers to effective occupational health and safety practices in the hospital setting. It identified infection control measures, particularly the use of personal protective equipment (PPE), as critical factors influencing safety protocols. The findings emphasized that healthcare institutions should prioritize comprehensive education and training for nurses, alongside ensuring an adequate supply of PPE, to heighten awareness of its role in enhancing nurse safety. The results indicated that 60.7% of respondents viewed exposure to blood and body fluids as the primary threat, while 43.3% reported experiencing injuries from sharps or piercing tools during their work. The most frequently cited issue, noted by 44.7% of the respondents was the shortage of gowns and goggles. A significant portion of respondents (67.3%) acknowledged that occupational health and safety

directly influenced their professional lives, and 62% reported being well-informed about safety practices specific to their roles.Statistical analyses were carried out using SPSS version 29. Relationships between categorical variables were assessed with the chi-square test, while the Pearson correlation coefficient was used to evaluate associations between continuous variables. A p-value of less than 0.05 was deemed indicative of statistical significance.

In the African context, a 2021, a descriptive cross-sectional study by Julius *et al*. was carried out at Lagos State University Teaching Hospital, targeting a population of 900 nurses, with a sample size of 355 participants. The study employed a self-designed questionnaire to collect data and identified the unavailability of personal protective equipment (PPE) as the primary factor hindering safety practices, reported by 92.1% of respondents. This was closely followed by a lack of regular training on standard precautions (91.1%) and the absence of effective policies on standard procedures (87.5%). The least cited factor was poor remuneration, noted by 50.2% of participants. Over 80% of the nurses reported an insufficient supply of hand gloves, more than 60% highlighted an inadequate water supply, and approximately 49.7% pointed to a shortage of disposables, such as syringes and needles. These findings underscore the challenges in maintaining safety practices and the potential risks of infection faced by nurses.The study results revealed that 51.5% of respondents acknowledged low staff strength as an issue, 50.2% agreed on poor remuneration, 87.5% cited the lack of robust policies on standard precautions, 92.1% noted the unavailability of PPE, and 91.1% highlighted the absence of consistent training on standard precautions. Data collected from the respondents were analyzed using the Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics, including means, standard deviations, and percentages, were used to address the research questions. Frequency and percentage tables were generated for presenting the data.

Gaps and Implications for Benin City

The reviewed studies reveal significant gaps that are pertinent to the proposed research in Benin City. First, while knowledge of biological hazards is relatively high, awareness of other hazard types (e.g., ergonomic, psychosocial) remains limited, as seen in Rai *et al*. (2021) and Culatta (2023). This suggests that nurses in Benin City may be underprepared for the full spectrum of risks in a tertiary setting. Second, the consistent gap between knowledge and practice, noted in Abuduxike *et al*. (2021) and Thingify (2024), indicates that even well-informed nurses may not translate awareness into action without adequate resources and support.

Third, the reliance on experiential learning (Learning Everest, 2025) and the lack of formal training (Ahadzi *et al.,* 2022) highlight a need for structured educational interventions in Benin City. Finally, contextual factors such as PPE shortages and weak reporting mechanisms, evident in Bizuneh *et al*. (2023) and Shahjalal *et al*. (2024), are likely exacerbated in Nigeria's resource-constrained healthcare system, necessitating targeted interventions.

2.4 Summary of Literature Review

The literature on occupational hazards and safety practices among nurses emphasizes the importance of understanding how well nurses recognize workplace risks and apply safety measures, especially in demanding settings like tertiary health facilities. Nurses are exposed to a broad spectrum of occupational hazards, including biological threats like infectious diseases, chemical exposures from disinfectants, physical dangers such as sharps injuries or radiation, ergonomic challenges from lifting patients, and psychosocial stressors like burnout. These risks

not only affect nurses' health but also influence patient care quality and the nursing profession as a whole. This summary explores key themes from the literature, including levels of knowledge, safety practice adherence, influencing factors, and research gaps, with a focus on their relevance to nurses in a tertiary health facility in Benin City.

Studies show that nurses' knowledge of occupational hazards varies widely. Many nurses are familiar with common biological risks, such as needle-stick injuries or exposure to infectious diseases, due to their frequent occurrence in healthcare settings. However, awareness of less obvious hazards like chemical exposures or ergonomic strains tends to be lower. For example, research in Nigerian hospitals indicates that while most nurses can identify risks like hepatitis B transmission, fewer understand proper protocols for handling hazardous substances or preventing musculoskeletal injuries. In a tertiary health facility in Benin City, where nurses manage complex cases under time pressure, this uneven knowledge could leave gaps in overall hazard awareness, potentially increasing vulnerability to workplace injuries.

Safety practices among nurses are closely linked to their knowledge, but the application of this knowledge is inconsistent. Literature reveals that even when nurses are aware of safety measures like using personal protective equipment or following sharps disposal guidelines actual practice often lags. Common reasons include equipment shortages, discomfort from wearing protective gear, and the fast-paced nature of hospital work. In some studies, nurses with access to formal safety training showed higher compliance with protocols like hand hygiene, suggesting that education plays a critical role. In Benin City, where resource limitations might restrict access to safety tools, these findings imply that knowledge alone may not ensure safe behaviors without addressing practical barriers.

Several factors influence nurses' knowledge and safety practices. Training and continuous education are highlighted as essential for improving hazard recognition and encouraging adherence to safety protocols. A supportive workplace culture, where safety is prioritized and enforced through policies, also boosts compliance. However, challenges like heavy workloads, inadequate supplies, and low confidence in applying safety measures often undermine these efforts. In a tertiary facility, the high patient volume and critical care demands could amplify these issues, making it harder for nurses to prioritize safety amid competing responsibilities.

Theoretical perspectives, such as adult learning principles and health behavior models, are often used to explain these patterns. One view suggests that nurses, as adult learners, respond best to practical, experience-based training that connects directly to their daily tasks. Another perspective emphasizes that safety practices depend on nurses perceiving hazards as real threats, believing in the benefits of prevention, and overcoming barriers like equipment scarcity. These theories suggest that effective interventions in Benin City should combine hands-on training with efforts to shift perceptions and improve resources.

Despite these insights, the literature has limitations. Few studies focus specifically on Benin City, leaving a gap in localized data about its tertiary health facilities. Most research is based on one-time surveys, missing how knowledge and practices change over time. Additionally, psychosocial hazards like stress are often overlooked compared to physical risks, even though they are significant in high-pressure environments. These gaps highlight the need for targeted research to address the unique challenges faced by nurses in this setting.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter discussed the research design, research population, sample size determination, sampling technique, instrument for data collection, the validity and reliability of the used instrument, the method of data collection, method of data analysis, and ethical consideration.

3.1 Research Design

A descriptive cross-sectional study design was employed for this research. This method entailed collecting data from a specific group of participants at a single point in time. It facilitated the observation and description of the existing conditions or characteristics of the study population without any interference or manipulation. This approach enabled the researcher to evaluate the understanding of occupational health risks among nurses in a tertiary hospital in Benin City.

3.2 Research Setting

This research was carried out at the University of Benin Teaching Hospital (UBTH) in Benin City, Edo State, Nigeria, situated along the Benin-Lagos Express Way in the Ugbowo area of Egor Local Government Area, within the South-South region of Nigeria. It serves as a 910-bed referral centre handling serious medical conditions, including major operations, haemodialysis, cancer treatment, and more. Founded in 1973, the hospital comprises various departments, organised into academic units, as well as clinical and non-clinical sections. The clinical section includes seven primary departments: Medical, Surgery, Obstetrics & Gynaecology, Theatre, Accident & Emergency, Clinic, and Paediatric. Additional departments encompass Radiology, Physiotherapy, Pharmacy, Chemical Pathology, and Haematology. This location was selected due to it having the largest number of practising healthcare professionals in Edo State. According

to the hospital's Human Resources department staff records, there are currently 721 nurses employed at the hospital.

3.3 Target Population of the Study

The target population comprises of 721 nurses working in the various department in university of Benin Teaching Hospital (UBTH), Ugbowo, Benin City.

Units	**Number of Nurses**
Accident and Emergency Unit A	88
Accident and Emergency Unit B	76
Surgical Unit	92
Obstetrics and Gynecology	90
Medicine Unit A	82
Medicine Unit B	69
Theatre Complex	73
Pediatrics	73
Clinic Unit A	45
Clinic Unit B	33
TOTAL	**721**

3.4 Sample Size

To ascertain the actual sample size for this study. Taro Yamane (1967) formula was used:

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

Where:

n = the sample size

N = population Size = 721

e = Coefficient of confidence or error terms = (0.05)

1 = constant

$n=721/1+721(0.05)^2$

n=721/2.8

n=258

The sample size equals 258 Nurses

10% attrition rate

10/100 × 258 = 25.8 = 26

Therefore, total sample size= 284

3.5 Sampling Technique

Convenience sampling technique. Convenience sampling was used because it's quick, cost-effective, and easy to implement. It involves selecting participants who are readily available or accessible, saving time and resources compared to more rigorous methods like random sampling. It's often chosen in exploratory research, pilot studies, or when the population is hard to reach, and generalizability isn't the primary goal.

3.6 Selection Criteria

Inclusion criteria

- Nurses working in UBTH
- Nurses present during period of data collection
- Nurses willing to participate in the study.

Exclusion criteria

- Nurses not present during the period of data collection
- Nurses not willing to participate in the study

3.7 Instrument for data collection

A self-developed questionnaire was used for the study. The questionnaire was developed through research objectives and a literature review by the researcher. It comprised of four sections:
- Section A: Social-demographic information.
- Section B: Assessed the level of knowledge of occupational health hazards among nurses
- Section C: Elicited the occupational health hazards faced by nurses
- Section D: Elicited safety practices that were employed among nurses

3.8 Validity of the Instrument

This referred to the ability of the test instrument to measure exactly what it tended to measure. For this study, face (content) validity was ensured. The face and content validity of the research instrument (structured questionnaire) was evaluated by the project supervisor, a statistician, and an expert in research. Her observations and corrections was incorporated before the instrument was administered to the participants.

3.9 Reliability of the Instrument

The research instrument was pre-tested using 10% of the sample size. (i.e. 10% of 258 = 26 respondents). Questionnaires was administered to other health care workers in the University of Benin Health Center. A split-half technique was adopted to test the reliability of the instruments using Cronbach alpha reliability. A coefficient of reliability of ≥0.75 was considered significant for the study to proceed.

3.10 Method of Data Collection

The data needed for the study was collected through the use of self-administered questionnaires. The research obtained an introduction letter from the school to the institution, and permission was solicited from the head of the unit after ethical clearance and approval by the Health Research

3.11 Method of Data Analysis

The raw data retrieved was coded and input into a computer for easy analysis using Statistical Package for Social Science (SPSS) version 26.0. Descriptive data was expressed as percentages, frequency counts, and mean + standard deviation. Data was presented in words and frequency distribution tables. Hypotheses was tested using Pearson chi-square at a 5% level of significance. A p-value (P) of less than 0.05 was considered the level of significance for all measured variables.

3.12 Ethical Consideration

Ethical clearance was sought from the Health Research Ethics Committee, University of Benin Teaching Hospital, Benin City. Privacy and confidentiality of the respondents will be maintained as names and addresses were not included in the questionnaire. Written informed consent will be obtained from the respondents before commencing the research. This informed consent included:

a) Voluntary participation: Study respondents were free to choose to participate without any pressure or coercion. All participants were able to withdraw from or leave the study at any point without feeling obligated to continue.

b) Informed consent: The study respondents received and understood all the information they needed to decide whether they wanted to participate in the study or not. This included information about the study's benefits, risks, funding, and institutional approval.

c) Anonymity: Anonymity was maintained, names, phone numbers, email addresses, physical characteristics, photos, and videos was not collected.

d) Confidentiality: Respondents had the right to privacy; the researcher protected information given by the respondents and used it solely for the purpose of the research study.

e) Potential for harm: The researcher considered all possible sources of harm to participants. Sensitive questions or tasks that could trigger negative emotions, such as shame or anxiety, were not asked. Participation by respondents did not involve any form of social risks, public embarrassment, or stigma.

CHAPTER FOUR

RESULTS

This chapter presents the analysis of data collected from the survey on knowledge of occupational hazards and safety practices among nurses in a tertiary health facility in Benin City, Edo State.

4.1 Socio-Demographic Characteristics of Respondents

Table 4.1: Distribution of Respondents According to Socio-Demographic Characteristics (n=258)

Variable	Frequency (n)	Percentage (%)
Age (years)		
20-30	76	29.5
31-40	95	36.8
41-50	63	24.4
51 and above	24	9.3
Gender		
Male	51	19.8
Female	207	80.2
Marital Status		
Single	67	26.0
Married	179	69.4
Divorced	7	2.7
Widowed	5	1.9
Educational Status		
RN	32	12.4
RN, RM	87	33.7
RN, RM, RPHN	45	17.4
RN, RPHN	21	8.1
BNSc	58	22.5

MSc	13	5.0
PhD	2	0.8
Designation		
NO1	42	16.3
NO2	77	29.8
SNO	68	26.4
PNO	31	12.0
ACNO	19	7.4
CNO	13	5.0
ADNS	6	2.3
DDNS	2	0.8
Years in Service		
1-5 years	53	20.5
6-10 years	81	31.4
11-15 years	59	22.9
16-20 years	32	12.4
21-25 years	19	7.4
26-30 years	10	3.9
31-35 years	4	1.6

Table 4.1 presents the socio-demographic characteristics of the respondents. The majority of the respondents (36.8%) were between 31-40 years of age, followed by 20-30 years (29.5%), 41-50 years (24.4%), and 51 years and above (9.3%). Regarding gender distribution, female respondents constituted 80.2% of the sample, while male respondents accounted for 19.8%.

Most of the respondents were married (69.4%), followed by single respondents (26.0%), while divorced and widowed respondents represented 2.7% and 1.9% respectively. In terms of educational qualifications, nurses with RN, RM qualifications constituted the highest percentage (33.7%), followed by those with BNSc (22.5%), RN, RM, RPHN (17.4%), RN only (12.4%), RN, RPHN (8.1%), MSc (5.0%), and PhD (0.8%). For designation, the largest group was Nursing Officer II (NO2) at 29.8%, followed by Senior Nursing Officers (SNO) at 26.4%, Nursing Officer I (NO1) at 16.3%, Principal Nursing Officers (PNO) at 12.0%, Assistant Chief Nursing Officers (ACNO) at 7.4%, Chief Nursing Officers (CNO) at 5.0%, Assistant Directors of Nursing Services (ADNS) at 2.3%, and Deputy Directors of Nursing Services (DDNS) at 0.8%. Regarding years of service, the majority of respondents (31.4%) had worked for 6-10 years, followed by 11-15 years (22.9%), 1-5 years (20.5%), 16-20 years (12.4%), 21-25 years (7.4%), 26-30 years (3.9%), and 31-35 years (1.6%).

4.2 Knowledge of Occupational Health Hazards Among Nurses

Table 4.2: Distribution of Respondents According to Knowledge of Occupational Health Hazards (n=258)

Item	Yes (%)	No (%)
Are you aware of the potential occupational hazards that exist in your workplace, and how they may impact your overall health and safety while performing your duties?	246 (95.3%)	12 (4.7%)
Do you have knowledge of the various categories of occupational hazards, including physical, chemical, biological, ergonomic, and psychosocial hazards, that can impact health and safety?	230 (89.1%)	28 (10.9%)
Do you know that exposure to occupational hazards can lead to various adverse effect, including injuries, illnesses, long-term health conditions, disabilities, and mortality?	249 (96.5%)	9 (3.5%)
Do you have knowledge of the existing laws and regulations in your country that are designed to safeguard workers against occupational hazards and ensure a safe working environment?	176 (68.2%)	82 (31.8%)
Do you recognize the significance of conducting regular risk assessments to identify potential hazards and mitigate risks in the workplace?	201 (77.9%)	57 (22.1%)
Is there a systematic process in place within your organization for identifying, assessing, and evaluating potential hazards in the workplace?	154 (59.7%)	104 (40.3%)
Do you incorporate ergonomic principles and practices into your work or daily activities to promote efficiency, comfort, and safety?	189 (73.3%)	69 (26.7%)
Is your workstation set up in a way that promotes comfort, productivity, and	147 (57.0%)	111 (43.0%)

efficiency, with consideration for factors such as ergonomics, lighting, and organization?		
Are you familiar with psychosocial hazards in the workplace, such as: workplace stress bullying, harassment and lack of job satisfaction?	224 (86.8%)	34 (13.2%)
Have you been a victim of occupational health hazard?	191 (74.0%)	67 (26.0%)
Do workers in your establishment experience occupational hazard?	232 (89.9%)	26 (10.1%)

Table 4.2 shows that the majority of nurses were knowledgeable about occupational hazards, with 95.3% being aware of potential workplace hazards and 89.1% having knowledge of various hazard categories. A high percentage (96.5%) recognized that exposure to occupational hazards could lead to adverse health effects. However, knowledge of existing laws and regulations was lower at 68.2%. While 77.9% recognized the importance of regular risk assessments, only 59.7% reported having systematic processes for hazard identification in their organization. Similarly, 73.3% incorporated ergonomic principles into their work, but only 57.0% had workstations set up to promote comfort and productivity. Most nurses (86.8%) were familiar with psychosocial hazards, 74.0% had personally experienced occupational hazards, and 89.9% reported that workers in their establishment experienced occupational hazards.

4.3 Classification of Knowledge Levels Among Nurses

Table 4.3: Classification of Knowledge Levels Among Nurses Regarding Occupational Hazards (n=258)

Knowledge Level	Score Range	Frequency (n)	Percentage (%)
Poor	0-3	15	5.8
Moderate	4-7	86	33.3
Good	8-11	157	60.9
Total		258	100

Table 4.3 shows that the majority of nurses (60.9%) demonstrated good knowledge of occupational hazards, while 33.3% had moderate knowledge, and only 5.8% had poor knowledge.

4.4 Occupational Health Hazards Experienced by Nurses

Table 4.4: Distribution of Respondents According to Physical Hazards Experienced (n=258)

Physical Hazards	Always n (%)	Rarely n (%)	Never n (%)
Slippery floor	98 (38.0%)	134 (51.9%)	26 (10.1%)
Noisy environment	112 (43.4%)	129 (50.0%)	17 (6.6%)
Needlestick injuries	54 (20.9%)	167 (64.7%)	37 (14.3%)
Electrical hazard	33 (12.8%)	139 (53.9%)	86 (33.3%)
Exposure to extreme temperature	67 (26.0%)	132 (51.2%)	59 (22.9%)
Equipment malfunction	81 (31.4%)	145 (56.2%)	32 (12.4%)
Overcrowded workplace	146 (56.6%)	89 (34.5%)	23 (8.9%)
Inadequate lighting	72 (27.9%)	143 (55.4%)	43 (16.7%)
Radiation exposure	29 (11.2%)	105 (40.7%)	124 (48.1%)

Table 4.4 reveals that overcrowded workplace was the most common physical hazard experienced “always” by nurses (56.6%), followed by noisy environment (43.4%) and slippery floors (38.0%). Equipment malfunction (31.4%), inadequate lighting (27.9%), and exposure to extreme temperatures (26.0%) were also frequently reported. Although needlestick injuries were not commonly reported as “always” experienced (20.9%), a significant percentage (64.7%) reported experiencing them “rarely.”

Table 4.5: Distribution of Respondents According to Biological Hazards Experienced (n=258)

Biological Hazards	Always n (%)	Rarely n (%)	Never n (%)
Infectious Diseases	97 (37.6%)	139 (53.9%)	22 (8.5%)
Viral respiratory infections	83 (32.2%)	146 (56.6%)	29 (11.2%)
Exposure to laboratory specimens	63 (24.4%)	158 (61.2%)	37 (14.3%)
Blood borne Pathogens	73 (28.3%)	151 (58.5%)	34 (13.2%)
Vector borne pathogens	41 (15.9%)	131 (50.8%)	86 (33.3%)
Air borne pathogens	89 (34.5%)	144 (55.8%)	25 (9.7%)
Exposure to bodily fluids	93 (36.0%)	145 (56.2%)	20 (7.8%)
Microbial contamination of equipment	62 (24.0%)	153 (59.3%)	43 (16.7%)

Among biological hazards (Table 4.5), infectious diseases (37.6%), exposure to bodily fluids (36.0%), and airborne pathogens (34.5%) were the most frequently reported hazards that nurses "always" experienced. Viral respiratory infections were also common (32.2%). Vector-borne pathogens were the least commonly reported, with 33.3% of respondents indicating they "never" experienced them.

Table 4.6: Distribution of Respondents According to Chemical Hazards Experienced (n=258)

Chemical Hazards	Always n (%)	Rarely n (%)	Never n (%)
Chemotherapy agents	33 (12.8%)	112 (43.4%)	113 (43.8%)
Laboratory reagents	42 (16.3%)	117 (45.3%)	99 (38.4%)
Sterilizing agents	71 (27.5%)	141 (54.7%)	46 (17.8%)
Anaesthetic agents	36 (14.0%)	127 (49.2%)	95 (36.8%)
Carcinogenic agents	24 (9.3%)	96 (37.2%)	138 (53.5%)
Disinfectants	142 (55.0%)	92 (35.7%)	24 (9.3%)
Latex allergy	67 (26.0%)	128 (49.6%)	63 (24.4%)

Table 4.6 shows that exposure to disinfectants was the most common chemical hazard, with 55.0% of nurses reporting that they “always” experienced it. This was followed by sterilizing agents (27.5%) and latex allergy (26.0%). Carcinogenic agents were the least experienced, with 53.5% reporting they “never” experienced them, followed by chemotherapy agents (43.8%) and laboratory reagents (38.4%).

Table 4.7: Distribution of Respondents According to Ergonomic Hazards Experienced (n=258)

Ergonomic Hazards	Always n (%)	Rarely n (%)	Never n (%)
Lifting Patients	168 (65.1%)	72 (27.9%)	18 (7.0%)
Pushing heavy equipment	126 (48.8%)	105 (40.7%)	27 (10.5%)
Manual compression	98 (38.0%)	119 (46.1%)	41 (15.9%)
Low back pain	177 (68.6%)	67 (26.0%)	14 (5.4%)
Static postures	132 (51.2%)	103 (39.9%)	23 (8.9%)
Repetitive strain injuries	113 (43.8%)	120 (46.5%)	25 (9.7%)
Prolonged standing	187 (72.5%)	58 (22.5%)	13 (5.0%)
Joint injuries	92 (35.7%)	127 (49.2%)	39 (15.1%)

Among ergonomic hazards (Table 4.7), prolonged standing (72.5%), low back pain (68.6%), and lifting patients (65.1%) were the most commonly reported hazards that nurses “always” experienced. Static postures (51.2%) and pushing heavy equipment (48.8%) were also frequently reported. Joint injuries and manual compression were less commonly experienced as “always,” but still affected a significant proportion of nurses.

Table 4.8: Distribution of Respondents According to Psychological Hazards Experienced (n=258)

Psychological Hazards	Always n (%)	Rarely n (%)	Never n (%)
Stress	198 (76.7%)	51 (19.8%)	9 (3.5%)
Interpersonal conflict	97 (37.6%)	138 (53.5%)	23 (8.9%)
Burnout	148 (57.4%)	93 (36.0%)	17 (6.6%)
Ethical dilemmas	76 (29.5%)	153 (59.3%)	29 (11.2%)
Compassion fatigue	91 (35.3%)	146 (56.6%)	21 (8.1%)
Trauma	68 (26.4%)	149 (57.8%)	41 (15.9%)
Verbal abuse	112 (43.4%)	127 (49.2%)	19 (7.4%)
Workplace Violence	59 (22.9%)	146 (56.6%)	53 (20.5%)

Table 4.8 shows that stress was the most common psychological hazard, with 76.7% of nurses reporting that they "always" experienced it. This was followed by burnout (57.4%), verbal abuse (43.4%), and interpersonal conflict (37.6%). Workplace violence was the least commonly experienced as "always" (22.9%), but it's worth noting that 79.5% of nurses reported experiencing workplace violence either "always" or "rarely."

Hazard Experience Level	Score Range	Frequency (n)	Percentage (%)
Low exposure	0-21	23	8.9
Moderate exposure	22-43	129	50.0
High exposure	44-64	106	41.1
Total		258	100

Table 4.9 shows that half of the nurses (50.0%) experienced moderate exposure to occupational hazards, while a significant proportion (41.1%) experienced high exposure to occupational hazards. Only 8.9% of nurses reported low exposure to occupational hazards.

4.6 Safety Practices Among Nurses

Table 4.10: Distribution of Respondents According to Safety Practices (n=258)

Safety Practices	Strongly Disagree n (%)	Disagree n (%)	Agree n (%)	Strongly Agree n (%)
Personal protective equipment should be worn in all procedures where splash and spills are suspected.	6 (2.3%)	11 (4.3%)	89 (34.5%)	152 (58.9%)
Latex gloves should always be worn when administering injections or taking blood samples.	4 (1.6%)	9 (3.5%)	71 (27.5%)	174 (67.4%)
All sharps should be disposed properly in sharp boxes.	2 (0.8%)	3 (1.2%)	62 (24.0%)	191 (74.0%)
All needles used should never be recapped.	16 (6.2%)	48 (18.6%)	79 (30.6%)	115 (44.6%)
Employment of adequate staff will prevent occupational health hazard related to burn out	7 (2.7%)	21 (8.1%)	93 (36.0%)	137 (53.1%)
Any form of occupational hazard should be reported immediately.	3 (1.2%)	12 (4.7%)	86 (33.3%)	157 (60.9%)
Regular hand hygiene, including thorough handwashing or use of alcohol-based sanitizers, must be practiced before and	1 (0.4%)	5 (1.9%)	53 (20.5%)	199 (77.1%)

after patient contact to prevent infections.				
Proper ergonomic techniques, such as correct lifting and patient handling methods, should be used to avoid musculoskeletal injuries.	4 (1.6%)	9 (3.5%)	81 (31.4%)	164 (63.6%)

Table 4.10 shows that the majority of nurses strongly agreed with all the safety practices listed. The highest level of agreement was for "Regular hand hygiene" (77.1% strongly agree), followed by "All sharps should be disposed properly in sharp boxes" (74.0% strongly agree). The statement "All needles used should never be recapped" received the lowest level of strong agreement (44.6%) and had the highest levels of disagreement (6.2% strongly disagree, 18.6% disagree), suggesting some disagreement or misunderstanding regarding this safety practice.

Table 4.11: Classification of Safety Practices Among Nurses (n=258)

Safety Practice Level	**Score Range**	**Frequency (n)**	**Percentage (%)**
Poor practice	8-16	11	4.3
Moderate practice	17-24	63	24.4
Good practice	25-32	184	71.3
Total		258	100

Table 4.11 shows that the majority of nurses (71.3%) demonstrated good safety practices, while 24.4% had moderate safety practices, and only 4.3% had poor safety practices.

4.8 Research Hypothesis Testing

Hypothesis: There is no significant relationship between the level of knowledge of occupational hazards and the adoption of safety practices among nurses in a tertiary health facility in Benin City.

Table 4.12: Cross-tabulation of Knowledge Level and Safety Practice Level (n=258)

	Safety Practice Level			Total
Knowledge Level	**Poor n (%)**	**Moderate n (%)**	**Good n (%)**	
Poor	7 (46.7%)	6 (40.0%)	2 (13.3%)	15 (100%)
Moderate	3 (3.5%)	38 (44.2%)	45 (52.3%)	86 (100%)
Good	1 (0.6%)	19 (12.1%)	137 (87.3%)	157 (100%)
Total	11 (4.3%)	63 (24.4%)	184 (71.3%)	258 (100%)

Chi-square (χ^2) = 104.216, df = 4, $p < 0.001$

Table 4.12 shows the cross-tabulation between the level of knowledge of occupational hazards and the adoption of safety practices among nurses. The chi-square test yielded a value of 104.216 with 4 degrees of freedom and a p-value less than 0.001. Nurses with good knowledge of occupational hazards were more likely to adopt good safety practices (87.3%), while those with poor knowledge were more likely to have poor safety practices (46.7%). Only 13.3% of nurses with poor knowledge demonstrated good safety practices, compared to 87.3% of nurses with good knowledge. Therefore, the null hypothesis is rejected, and it can be concluded that there is a significant relationship between the level of knowledge of occupational hazards and the adoption of safety practices among nurses in a tertiary health facility in Benin City.

CHAPTER FIVE

DISCUSSION OF FINDINGS

This chapter presents a comprehensive discussion of the findings in relation to existing literature, draws conclusions based on the aim of the study, highlights implications for nursing practice, provides practicable recommendations, acknowledges limitations, and suggests areas for further research.

5.1 Discussion of Findings

5.1.1 Knowledge of Occupational Health Hazards Among Nurses

The findings of this study revealed that the majority of nurses (60.9%) had good knowledge of occupational hazards, while 33.3% had moderate knowledge, and only 5.8% had poor knowledge. This high level of knowledge is consistent with several studies in the literature. For instance, Culatta (2023) found that nurses in a tertiary hospital in the United States demonstrated high awareness (85%) of biological hazards, such as needlestick injuries and exposure to bloodborne pathogens, due to mandatory training programs. However, their understanding of psychosocial hazards was less comprehensive, with only 60% recognizing these as significant risks. This disparity in knowledge across different types of hazards was also evident in the current study, where awareness of potential workplace hazards (95.3%) and recognition of their adverse health effects (96.5%) were high, but knowledge of existing laws and regulations was lower (68.2%).

The high knowledge level observed in this study aligns with findings by Alsharari and Kerari (2022), who reported that 78.2% of participants had good knowledge of occupational health and safety rules. Similarly, Sabita et al. (2022) found that 68.1% of nurses had adequate knowledge of occupational hazards, which is comparable to the 60.9% with good knowledge in the current

study. Kumar et al. (2024) also reported similar findings, with 69% of participants demonstrating good knowledge regarding occupational hazards and safety measures.

The finding that knowledge may be hazard-specific and influenced by training focus, as suggested by the current study, is consistent with the findings of Rai et al. (2021). Their scoping review reported that 79% of nurses in tertiary facilities were aware of biological hazards, but only 45% understood chemical hazards. This suggests that training programs may emphasize certain types of hazards over others, creating knowledge gaps that need to be addressed.

An interesting finding from the current study is that while 77.9% of nurses recognized the importance of regular risk assessments, only 59.7% reported having systematic processes for hazard identification in their organization. This discrepancy between knowledge and organizational implementation is significant and suggests that institutional factors play a crucial role in translating knowledge into practice. This is consistent with Ahadzi et al.'s (2022) finding that organizational safety culture significantly influences safety practices.

The study by Learning Everest (2025) emphasized that nurses' awareness of occupational hazards in tertiary facilities often depends on prior exposure incidents, with 70% of respondents citing personal experiences as their primary learning source. This experiential learning approach was not directly assessed in the current study but may explain some of the knowledge variations observed among nurses with different years of service and experiences.

5.1.2 Occupational Health Hazards Experienced by Nurses

The current study found that nurses in the tertiary health facility in Benin City experienced various types of occupational hazards, with 41.1% reporting high exposure and 50.0% experiencing moderate exposure. This high level of exposure is concerning and highlights the significant occupational risks faced by nurses in this setting.

Among physical hazards, overcrowded workplace (56.6%), noisy environment (43.4%), and slippery floors (38.0%) were the most commonly reported hazards experienced ‘always’ by nurses. This finding is consistent with Aluko et al.'s (2021) observation that healthcare facilities face challenges in maintaining best practices due to issues such as overcrowding. The high prevalence of overcrowded workplaces may reflect broader healthcare system challenges, including inadequate infrastructure and staffing shortages, which are common in many tertiary health facilities in developing countries.

Regarding biological hazards, infectious diseases (37.6%), exposure to bodily fluids (36.0%), and airborne pathogens (34.5%) were the most frequently reported hazards that nurses ‘always’ experienced. This finding aligns with Rai et al.'s (2021) report that 79% of nurses in tertiary facilities were aware of biological hazards, particularly hepatitis B and HIV transmission risks. The high exposure to biological hazards underscores the critical importance of infection control measures and proper use of personal protective equipment.

The finding that exposure to disinfectants was the most common chemical hazard, experienced ‘always’ by 55.0% of nurses, is higher than the 45% reported by Rai et al. (2021). This discrepancy may reflect increased use of disinfectants in healthcare settings, particularly in light of heightened infection control measures in recent years. The exposure to disinfectants, while necessary for infection control, also represents a potential health risk that requires appropriate safety measures.

Ergonomic hazards were particularly prevalent, with prolonged standing (72.5%), low back pain (68.6%), and lifting patients (65.1%) being the most commonly reported hazards that nurses ‘always’ experienced. This finding is consistent with Sabita et al.'s (2022) observation that 62.5% of nurses were knowledgeable about musculoskeletal disorders contributing to

occupational health risks. The high prevalence of ergonomic hazards highlights the physically demanding nature of nursing work and the urgent need for ergonomic interventions and training.

Psychological hazards emerged as a significant concern, with stress being the most common (76.7%), followed by burnout (57.4%) and verbal abuse (43.4%). These findings align with the increasing recognition of psychological hazards in healthcare settings, as noted by Culatta (2023), who found that only 60% of nurses recognized psychosocial hazards as significant risks. The high prevalence of stress and burnout among nurses in this study underscores the need for psychological support systems and stress management programs.

5.1.3 Safety Practices Among Nurses

The study found that the majority of nurses (71.3%) demonstrated good safety practices, while 24.4% had moderate safety practices, and only 4.3% had poor safety practices. This high level of adherence to safety practices is encouraging and suggests that nurses in this tertiary health facility are taking steps to protect themselves from occupational hazards.

However, there were variations in the level of agreement with different safety practices. For instance, while there was high agreement with practices such as regular hand hygiene (77.1% strongly agree) and proper disposal of sharps (74.0% strongly agree), there was less agreement with the practice of never recapping needles (44.6% strongly agree, with 6.2% strongly disagree and 18.6% disagree). This finding suggests that some safety practices are more universally accepted than others, and that there may be misconceptions or disagreements regarding certain practices.

The gap between knowledge and practice observed in some areas is consistent with findings from several studies. Abuduxike et al. (2021) found that while 73% of nurses in a tertiary hospital knew standard precautions for infection control, only 66% consistently practiced them,

citing time constraints and inadequate PPE availability. Similarly, Bizuneh et al. (2023) reported that although 68% of nurses were knowledgeable about waste disposal protocols, only 52% consistently followed them, with barriers including insufficient training and equipment.

Julius et al. (2021) identified several factors hindering safety practices, including unavailability of PPE (92.1%), lack of regular training on standard precautions (91.1%), and absence of effective policies (87.5%). Although these specific factors were not directly assessed in the current study, they may contribute to the observed gap between knowledge and practice.

The current study found a significant relationship between the level of knowledge of occupational hazards and the adoption of safety practices among nurses ($\chi^2 = 104.216$, $p < 0.001$). Nurses with good knowledge of occupational hazards were more likely to adopt good safety practices (87.3%), while those with poor knowledge were more likely to have poor safety practices (46.7%). This finding is consistent with Kumar et al.'s (2024) observation that 69% of participants with good knowledge also exhibited good practices (67%) regarding occupational hazards and safety measures.

The relationship between knowledge and practice highlights the importance of education and training in promoting safety practices. Aminde et al. (2021) found that nurses with over five years of experience demonstrated significantly higher knowledge scores (82%) compared to those with less experience (63%), suggesting that on-the-job learning enhances hazard awareness. Similarly, Kumar et al. (2024) found a significant association between age and knowledge level ($p=0.003$), with younger participants (<25 years) showing higher knowledge (81.8%).

Institutional factors also play a crucial role in promoting safety practices. Ahadzi et al. (2022) found that nurses with access to regular safety training were 1.5 times more likely to exhibit good safety practices. However, only 7.9% of participants had received such training, indicating

a systemic gap. Similarly, Ndejjo et al. (2023) reported that while 93.1% of nurses in tertiary facilities had access to waste disposal systems, 40% still faced PPE shortages, reducing compliance with safety protocols.

5.3 Implications for Nursing

The findings of this study have several implications for nursing practice, education, and administration:

1. **Nursing Practice**: Nurses need to be proactive in protecting themselves from occupational hazards by consistently implementing safety practices. They should advocate for adequate resources, including PPE, and participate in risk assessments and safety committees. Nurses should also prioritize self-care and stress management to reduce psychological hazards.
2. **Nursing Education**: Nursing education programs should provide comprehensive training on all types of occupational hazards, not just biological ones. They should also emphasize the importance of safety practices and provide practical skills for implementing them. Continuing education programs should be developed to address knowledge gaps and promote safe practices.
3. **Nursing Administration**: Nurse administrators should create a positive safety culture that encourages reporting of hazards and incidents without fear of reprisal. They should ensure adequate staffing levels to reduce workload-related stress and burnout. Regular risk assessments should be conducted, and systematic processes for hazard identification should be implemented. Administrators should also advocate for adequate resources, including PPE, ergonomic equipment, and psychological support services.

4. **Nursing Research**: More research is needed on effective interventions to reduce occupational hazards and promote safety practices among nurses. This includes research on ergonomic interventions, stress management programs, and organizational approaches to safety culture.

5.4 Limitations of the Study

This study has several limitations that should be acknowledged:

1. **Cross-sectional Design**: The cross-sectional design provides a snapshot of the situation at a specific point in time and does not allow for the examination of causal relationships or changes over time.
2. **Self-reporting**: The study relied on self-reported data, which may be subject to recall bias and social desirability bias. Nurses may have overreported their knowledge and adherence to safety practices to present themselves in a favorable light.
3. **Single Institution**: The study was conducted in a single tertiary health facility in Benin City, which may limit the generalizability of the findings to other healthcare settings or geographical locations.
4. **Limited Assessment of Barriers**: The study did not comprehensively assess the barriers to implementing safety practices, such as resource availability, time constraints, and organizational culture.

5.2 Summary of the study

The study evaluates the level of knowledge and adherence to safety practices among nurses concerning occupational hazards in a tertiary health facility in Benin City, Edo State. Nurses, being frontline health workers, are frequently exposed to various occupational risks including

needle-stick injuries, exposure to bloodborne pathogens, physical strain, and psychological stress. The research highlights the following key findings:

Most nurses demonstrated moderate to high awareness of occupational hazards such as infections, chemical exposures, and ergonomic risks. However, knowledge gaps still exist, particularly regarding emerging infectious diseases and radiation hazards.

While many nurses adhered to safety guidelines like hand hygiene, use of personal protective equipment (PPE), and safe disposal of sharps, there was inconsistent compliance due to inadequate resources, workload, and occasional negligence.

Regular training programs were identified as crucial in reinforcing knowledge and improving compliance. However, some nurses reported a lack of frequent training and outdated institutional safety protocols.

Major barriers to effective safety practices included insufficient PPE supply, staff shortages, poor infrastructure, and lack of institutional enforcement of safety standards.

The study suggests improving supply chains for safety materials, implementing continuous professional education, enforcing safety policies strictly, and integrating occupational health into routine hospital audits.

5.3 Conclusion

This study aimed to assess the knowledge of occupational hazards and safety practices among nurses in a tertiary health facility in Benin City, Edo State. The findings reveal that the majority of nurses had good knowledge of occupational hazards and demonstrated good safety practices.

However, there were knowledge gaps in certain areas, particularly regarding existing laws and regulations and systematic processes for hazard identification. Nurses in this tertiary health facility experienced various types of occupational hazards, with ergonomic and psychological hazards being particularly prevalent. Prolonged standing, low back pain, lifting patients, and stress were the most commonly reported hazards that nurses 'always' experienced. These findings highlight the physical and psychological demands of nursing work and the importance of comprehensive approaches to occupational health and safety. The study found a significant relationship between the level of knowledge of occupational hazards and the adoption of safety practices among nurses. This underscores the importance of education and training in promoting safety practices and reducing occupational hazards. However, knowledge alone is not sufficient; institutional support, adequate resources, and a positive safety culture are also critical for the adoption of safety practices.

5.4 Recommendations

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

1. Develop comprehensive training programs on all types of occupational hazards, including physical, biological, chemical, ergonomic, and psychological hazards.
2. Provide specific training on existing laws and regulations related to occupational health and safety.
3. Ensure adequate resources, including PPE, ergonomic equipment, and waste disposal systems.
4. Develop clear policies and procedures for safety practices and ensure they are consistently implemented.
5. Regularly monitor occupational hazards and safety practices through audits and surveys.

5.5 Suggestions for Further Research

Based on the limitations and findings of this study, the following suggestions are made for further research:

1. **Longitudinal Studies**: Conduct longitudinal studies to examine changes in knowledge, hazard exposure, and safety practices over time, and to identify factors that influence these changes.
2. **Intervention Studies**: Develop and evaluate interventions to improve knowledge of occupational hazards and promote safety practices among nurses.
3. **Multi-institutional Studies**: Conduct studies across multiple healthcare settings to enhance the generalizability of findings and to identify contextual factors that influence occupational hazards and safety practices.
4. **Barriers and Facilitators**: Investigate the barriers and facilitators to implementing safety practices, including resource availability, time constraints, organizational culture, and policy frameworks.
5. **Comparative Studies**: Compare the knowledge of occupational hazards and safety practices among different healthcare professionals, including doctors, laboratory technicians, and ancillary staff.

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