# KNOWLEDGE, PERCEPTION AND DETERMINANTS OF PATIENT SAFETY AMONG MEDICAL AND NURSING STUDENTS IN THE UNIVERSITY OF BENIN (UNIBEN), BENIN CITY, EDO STATE

**BY**

**OSASUYI LOUISA OSAGUONA (Miss)**

**MED1807479**

**DEPARTMENT OF PUBLIC HEALTH AND COMMUNITY MEDICINE, SCHOOL OF MEDICINE,**

**COLLEGE OF MEDICAL SCIENCES**

**UNIVERSITY OF BENIN, BENIN CITY, EDO STATE, NIGERIA**

**MAY, 2026**

# KNOWLEDGE, PERCEPTION AND DETERMINANTS OF PATIENT SAFETY AMONG MEDICAL AND NURSING STUDENTS IN THE UNIVERSITY OF BENIN (UNIBEN), BENIN CITY, EDO STATE

**BY**

**OSASUYI LOUISA OSAGUONA (Miss)**

**MED1807479**

**BEING A ONE-YEAR PROJECT PRESENTED TO THE DEPARTMENT OF PUBLIC HEALTH AND COMMUNITY MEDICINE, SCHOOL OF MEDICINE, COLLEGE OF MEDICAL SCIENCES, UNIVERSITY OF BENIN, BENIN CITY, EDO STATE, NIGERIA**

**IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF BACHELOR IN MEDICINE AND BACHELOR IN SURGERY (MBBS) DEGREE IN THE UNIVERSITY OF BENIN, BENIN CITY**

## DEDICATION

I dedicate this project first to God Almighty for His grace and guidance throughout my academic journey. I also dedicate it to my family for their constant love, support and encouragement, as well as to my friends and well-wishers.

## ACKNOWLEDGEMENTS

I give all glory to God Almighty for His grace and strength to go through with this project.

My sincere gratitude goes to my supervisors, Prof. Obehi Okojie and Dr. Ndubuisi Mokogwu for their invaluable guidance and patience throughout the conduct of this research work.

I also sincerely appreciate the Head of Department and all lecturers in the Department of Public Health and Community Medicine, University of Benin, for the knowledge and training provided during the course of my study.

My appreciation also goes to the management of University of Benin and University of Benin Teaching Hospital for granting the necessary approval and providing an enabling environment for this study. I am equally grateful to all the medical and nursing students who participated in this research for their cooperation and willingness to provide the required information.

I deeply appreciate my parents, Dr. and Prof. (Mrs.) Osaguona, for their unwavering love, prayers, sacrifices, financial support and constant encouragement throughout my academic journey. I am also grateful to my siblings, Dr. Etinosa, Osamudiame and Eseosa as well as my entire family for their constant support and understanding.

Special appreciation goes to Dr. Omotade Tosin and Dr. Ohiole Ovbiagele for their guidance and valuable contributions to this project.

Finally, I appreciate my friends and everyone who contributed to the success of this research work. May God bless you all abundantly.

## DECLARATION

I hereby declare that this project work titled **'KNOWLEDGE, PERCEPTION AND DETERMINANTS OF PATIENT SAFETY AMONG MEDICAL AND NURSING STUDENTS IN THE UNIVERSITY OF BENIN'** is original and was carried under the supervision of PROF OBEHI OKOJIE and DR. NDUBUISI MOKOGWU and has not been published elsewhere for the award of a degree or certificate.

---

**OSASUYI LOUISA OSAGUONA**

**MED1807479**

**+234 907 693 9110**

**suyi.osaguona@gmail.com**

## CERTIFICATION

This is to certify that this research work titled 'knowledge, perception and determinants of patient safety among medical and nursing students in the university of Benin' was carried out in the Department of Community Health, School of Medicine, College of Medical Sciences, University of Benin, Benin City, Edo State, Nigeria as part of the requirements for the award of Bachelor of Medicine, Bachelor of Surgery (MBBS) by **OSASUYI LOUISA OSAGUONA** with matriculation number **MED1807479** under the supervision of **PROF OBEHI OKOJIE** and **DR. NDUBUISI MOKOGWU.**

_____ _____

**PROF OBEHI OKOJIE** (**Date)**

MBBS, FMCPH, FWACP

Professor/Consultant (Project Supervisor),

Department of Public Health and Community Medicine,

School of Medicine,

College of Medicine,

University of Benin/ University of Benin Teaching Hospital (UBTH),

Benin City, Edo State, Nigeria.

**DR. NDUBUISI MOKOGWU** **(Date)**

MBBS; MPH; FWACP

Cosultant/Senior Lecturer (Project Supervisor),

Department of Public Health and Community Medicine,

School of Medicine,

College of Medical Sciences,

University of Benin/University of Benin Teaching Hospital (UBTH),

Benin City, Edo State, Nigeria.

**Dr. (Mrs) O. E. OBARISIAGBON** **(Date)**

Deleted[Mide 02]:

MBBS; MPH; FMCPH

Head of Department,

Associate Professor/Consultant,

Department of Public Health and Community Medicine,

College of Medicine,

University of Benin/ University of Benin Teaching Hospital (UBTH),

Benin City, Edo State, Nigeria.

**TABLE OF CONTENTS**

**LIST OF TABLES**

**LIST OF FIGURES.**

**LIST OF ABBREVIATIONS**

**APSQ-III:** Attitudes to Patient Safety Questionnaire III

**CPOE:** Computerized Physician Order Entry

**EHRs:** Electronic Health Records

**FMoH:** Federal Ministry of Health

**HAIs:** Healthcare-associated infections

**IBM:** International Business Machines

**LMICs:** Low- and middle-income countries

**NMA:** Nigerian Medical Association

**SBAR:** Situation-Background-Assessment-Recommendation

**SPSS:** Statistical Package for the Social Sciences

**UBTH:** University of Benin Teaching Hospital

**UNIBEN:** University of Benin

**WHO:** World Health Organization

## DEFINITION OF TERMS

**Adverse effect:** an unfavourable or harmful medical occurrence experienced by a patient during medical treatment or a clinical trial.

**Outpatient:** patient receiving medical care without hospital admission.

**Patient harm:** injury or adverse outcomes resulting from medical care rather than the underlying disease.

**Patient safety:** absence of preventable harm to a patient during the process of health care and reduction of risk of unnecessary harm associated with health care to an acceptable minimum.

**Patient safety culture:** attitudes, beliefs, and behaviors that shape the safety of patients in healthcare facilities.

## ABSTRACT

**Background:** Patient safety is a fundamental component of quality healthcare and an essential aspect of healthcare training. Medical errors and preventable adverse events remain major causes of morbidity and mortality globally, particularly in low- and middle-income countries such as Nigeria. Adequate knowledge and positive perceptions of patient safety are important for promoting safe clinical practice and reducing preventable harm. However, gaps in patient safety education and training continue to exist among medical and nursing students.

**Objective:** This study assessed the knowledge, perception and determinants of patient safety among medical and nursing students in the University of Benin (UNIBEN), Benin City, Edo State.

**Methods:** A descriptive cross-sectional study was conducted among 420 consenting medical and nursing students in the University of Benin selected through a stratified sampling technique. Data was collected using a structured, self-administered questionnaire adapted from the WHO Patient Safety Curriculum Guide and the Attitudes to Patient Safety Questionnaire III (APSQ-III). The questionnaire assessed respondents' socio-demographic characteristics, knowledge of patient safety, perception toward patient safety, and determinants influencing patient safety knowledge and perception. Data collected was analyzed using IBM SPSS version 27.0. Descriptive statistics such as frequencies, percentages, means and standard deviations were used to summarize the data. Chi-square test and multivariable analysis were used to determine associations and predictors of patient safety knowledge and perception. Statistical significance was set at $p < 0.05$. Results were presented in tables, charts and prose.

**Results:** A total of 420 respondents participated in the study, with a mean age of 22.2 ± 2.6 years. Most respondents, 383 (91.2%) had heard of patient safety with lectures 298 (71.0%) and clinical postings 273 (65.0%) being the major sources of information. Three hundred and eighty-nine (92.6%) of respondents had good knowledge of patient safety. Respondents residing off-campus were significantly less likely to have good knowledge of patient safety compared to those living in school hostels (OR = 0.376, 95% CI: 0.145-0.974, p = 0.044), while respondents who had not heard of patient safety were about 92% less likely to have good knowledge compared to those who were aware (OR = 0.081, 95% CI: 0.029-0.227, p < 0.001). Overall, 273 (65%) had positive perception of patient safety. Majority agreed that patient safety is a global issue (92.4%), most clinical errors are preventable (92.6%), patient involvement improves safety (93.3%) and teamwork reduces errors (88.8%). Respondents sponsored by parents were about three times more likely to have positive perception compared to those who sponsored themselves (OR = 3.296, 95% CI: 1.325-8.194, p = 0.010). Determinants influencing patient safety included supervisory emphasis on patient safety (96.7%), integration of safety concepts into lectures and training (87.1%), adequate clinical training (71.7%), practical teaching methods (97.9%), and personal motivation (86.7%).

**Conclusion:** Medical and nursing students in the University of Benin demonstrated generally good knowledge and positive perceptions of patient safety. Despite this, gaps still exist in system-based understanding of patient safety. Strengthening patient safety education through improved curriculum integration and simulation-based learning is recommended to further promote patient safety culture among future healthcare professionals.

**Keywords:** Patient safety; Knowledge; Perception; Determinants; Medical students; Nursing students; University of Benin; Nigeria.

# CHAPTER ONE

# INTRODUCTION

## 1.1 BACKGROUND

Patient safety is an important aspect of quality healthcare. It aims at preventing harm and prioritizing the wellbeing of patients during the delivery of medical care. As health systems evolve, the principle of "first, do no harm" remains fundamental. However, preventable patient harm continues to burden healthcare systems in both developed and developing countries[1].

Patient harm in healthcare may arise from various sources with medication errors being among the most common. These can occur at any stage of the medication process from prescribing, dispensing, or administration and often result from miscommunication, look-alike/Sound-alike drug names, or dosing mistakes leading to adverse drug events[2,3] that may prolong treatment and increase costs. Diagnostic errors, such as misdiagnosis or delayed diagnosis, also significantly contribute to patient harm by resulting in inappropriate or postponed treatments, which can worsen outcomes[4,5].

Healthcare-associated infections (HAIs) pose another major risk, especially where infection control practices are suboptimal. Common HAIs include urinary tract infections from indwelling catheters, surgical site infections, pneumonia, and bloodstream infections, all of which increase morbidity, lengthen hospital stays, and escalate healthcare costs[6]. Procedural complications during surgeries or invasive procedures are also critical concerns; errors like wrong-site surgeries, retained instruments, and anesthesia mishaps can occur due to poor protocol adherence or breakdowns in teamwork.

Additional hazards include patient falls and pressure ulcers, particularly among frail or immobile individuals[1], laboratory mistakes, radiation dosing errors, and unsafe transfusions. Communication failures among healthcare providers or with patients can result in misunderstandings, medication inconsistencies, or missed follow-ups further increasing the risk of harm.

Importantly, patient harm is not limited to physical injuries. Emotional harm, such as anxiety, loss of dignity, or reduced confidence in care providers, is increasingly recognized as a legitimate form of harm. Studies emphasize that disrespectful or dismissive behavior by healthcare workers can be as damaging as clinical errors, undermining patient experience and satisfaction[7].

The importance of patient safety has gained significant attention in the last decade, especially following the world health organization (WHO) global patient safety report highlighting the prevalence of medical errors and their impact on patient outcomes[8]. The modern movement for patient safety gained momentum with the 1999 publication of the Institute of Medicine's report, "To Err Is Human: Building a Safer Health System." This pivotal document revealed that between 44,000 and 98,000 individuals die annually in hospitals from preventable medical errors in hospitals, prompting a call to action for the improvement of patient safety[9,10].

In current times, WHO states that unsafe care is one of the top 10 causes of death and disability worldwide, with approximately 1 in 10 patients harmed during hospital care in high-income countries, and the burden estimated to be even higher in low- and middle-income countries (LMICs) like Nigeria[1]. The issue of patient harm is a significant cause for concern both internationally and inside the healthcare system of Nigeria[11] with both clinical and economic implications for healthcare systems. Medical mistakes substantially influence global morbidity and mortality rates, including a broad range of preventable adverse effects[12].

Addressing patient harm is essential for improving healthcare quality and safety and it involves the collaboration of many stakeholders, including healthcare professionals, patients, administrators, lawmakers, and regulators[13]. Healthcare professionals, such as doctors and nurses, are responsible for delivering care and following safety protocols. Patients also play a vital role by actively participating in their care and communicating effectively with providers. Administrators and hospital leaders establish policies, allocate resources, and foster a culture of safety within healthcare organizations. Lawmakers create laws and regulations to set safety standards and protect public health. Regulators monitor compliance with these standards through inspections and enforcement actions.

Patient safety requires a comprehensive approach which encompasses system reforms, staff training, effective communication, technology adoption, patient engagement and a culture that encourages reporting and learning from errors. Fostering a safety-oriented culture encourages healthcare workers to report errors and near-misses without fear of punishment which help to identify risks and develop targeted interventions[14]. Regular training on patient safety principles, communication skills, and error prevention strategies enhances staff competence. Professional development such as simulation-based training has been shown to improve skills, team performance and error management[15]. The implementation of the Electronic Health Records (EHRs) and Computerized Physician Order Entry (CPOE) systems improve communication and reduce medication errors[16].

Additionally, developing and adhering to standardized clinical pathways, checklists, and protocols minimize variability and prevent errors; for example, the WHO Surgical Safety Checklist is a proven tool to improve surgical outcomes[17]. Effective communication among healthcare providers through tools like the Situation-Background-Assessment-Recommendation

(SBAR) reduces misunderstandings and errors during handovers[18]. Involving patients in their care, providing clear instructions, and encouraging questions also improve safety outcomes as educated patients are better equipped to recognize and report errors or adverse events[19].

The WHO's World Alliance for Patient Safety developed the "Global Patient Safety Challenge," focusing on areas such as medication safety, surgical safety, and infection prevention. These initiatives promote the adoption of safety standards, reporting systems, and safety culture improvements across countries[20]. While much attention has traditionally been focused on harm in hospitalized patients, outpatients are equally vulnerable. Outpatient care often involves less direct supervision, making patients responsible for managing their treatments which increases the risk of errors, missed appointments and adverse events going unnoticed, highlighting the need for care coordination protocols and patient education[21].

In Nigeria, efforts to improve patient safety have been initiated by government agencies, professional bodies, and international partners. The Federal Ministry of Health (FMoH) developed policies aimed at strengthening healthcare systems, including infection control, medication safety, and quality assurance. The Nigerian Medical Association (NMA) and other professional bodies have also organized training and awareness campaigns on patient safety[22]. Like many other countries, Nigeria adopted the WHO Surgical Safety Checklist to reduce surgical complications[23], and several hospitals have integrated infection prevention protocols.

Despite these positive initiatives, the country continues to face significant challenges. Resource constraints, inadequate infrastructure, and limited healthcare funding hinder the full implementation and of safety measures, posing ongoing barriers to achieving optimal patient safety standards.

For the next generation of healthcare professionals, medical and nursing students, a deep understanding of patient safety principles, a positive perception of its importance, and a clear grasp of its determinants are not just academic exercises, but essential skills for their future practice. Early education is critical, especially as newly qualified professionals are among those most vulnerable to making errors due to limited experience[24].

Globally, studies report that although students recognize the importance of patient safety, their actual knowledge and confidence levels vary significantly[25-27]. Differences between medical and nursing students' perceptions of patient safety have also been noted. Research shows that medical students tend to focus more on systemic and latent causes of error, whereas nursing students often emphasize personal responsibility and error prevention[28].

The determinants of these students' knowledge and perceptions are multifaceted. A 2023 study identified several influencing factors, including the clinical learning environment, the curriculum, and the attitudes of their clinical instructors and mentors[29]. Students often enter clinical settings with theoretical knowledge, but their real-world experiences shape their perceptions of safety culture. A "blame and shame" approach to errors can discourage students from reporting incidents, which is essential for maintaining an effective safety system[30].

The curriculum itself is a key determinant. Several studies have pointed to the need for a more integrated and comprehensive approach to patient safety education. A 2020 systematic review found that while many nursing and medical programs include elements of patient safety, they are often fragmented and lack a cohesive framework[31]. Experts advocate for the integration of topics such as human factors, systems thinking, root cause analysis, and non-technical skills like communication and teamwork throughout the curriculum, rather than as standalone modules.

A study conducted in 2019 found that interactive and experiential learning methods, such as simulation-based training, are more effective in improving students' knowledge and attitudes towards patient safety compared to traditional lecture-based teaching[32,33]. These methods allow students to practice their skills in a safe environment and learn from their mistakes without compromising patient well-being. However, these methods are rarely utilised in LMICs, where educational resources and clinical infrastructure are often constrained.

Furthermore, research highlights a "hidden curriculum" in many medical and nursing schools, where the unspoken norms and behaviors of senior staff can contradict formal teachings on patient safety. A 2021 study emphasized that while students may be taught the importance of speaking up, the hierarchical nature of healthcare system can create a culture of silence, where they feel intimidated to voice concerns about potential safety breaches[34].

Recognizing that the foundations of safe practice are laid during undergraduate education, emphasis should be placed on adequately preparing medical and nursing students. Ultimately, a commitment to patient safety will positively impact health outcomes while reducing costs associated with patient harm, improve system efficiency and help in restoring the public’s trust in healthcare systems.

## 1.2 STATEMENT OF PROBLEM

The World Health Organization (WHO) states that unsafe care is one of the top ten causes of death and disability worldwide, with approximately one in ten patients harmed during hospital care in high-income countries, and the burden estimated to be even higher in low- and middle-income countries (LMICs) like Nigeria[1].

Patient safety is a fundamental aspect of quality healthcare and has been recognized globally as a priority by the World Health Organization[1]. However, the foundation of a strong patient safety culture begins during the training of future healthcare providers, including medical and nursing students. Despite its importance, studies show gaps in knowledge, attitudes, and practices related to patient safety among healthcare students who represent the next generation of providers[35]. A 2022 study revealed that among undergraduate health science students in Southwest Ethiopia, only 43.2% had good knowledge and 45.4% had a positive attitude towards patient safety [36]. These gaps in knowledge and attitude towards patient safety can have serious implications for both patients and healthcare systems such as an increased risk of medical errors, compromised patient outcomes, and reduced trust in healthcare services.

Globally, studies report that although medical and nursing students recognize the importance of patient safety, their actual knowledge and confidence levels vary significantly[25-27]. Evidence indicates persistent gaps in current educational approaches. Many institutions lack structured safety education, or deliver it in fragmented formats. Furthermore, most curricula underemphasize non-technical skills such as communication, teamwork, and incident reporting[37]. These gaps are especially significant in LMICs, where educational resources and clinical infrastructure are often constrained.

Additionally, literature reveals important differences in how medical and nursing students perceive the causes of adverse events with medical students more likely to attribute errors to systemic issues, while nursing students often focus on individual responsibility[38]. These conceptual differences may disrupt the effective collaboration between medical and nursing professionals in practice hence the need for integrated training efforts.

In Nigeria and many other developing countries, the level of awareness and understanding of patient safety among medical and nursing students remain underexplored, potentially affecting the preparedness of future healthcare professionals to recognize or prevent errors in clinical environments, undermining efforts to improve healthcare outcomes and reduce preventable harm[39].

Patient harm can lead to increased morbidity, prolonged recovery, and, in severe cases, death. Financially, the impact of patient harm is substantial, resulting from repeated tests, prolonged hospital stays, additional treatments and legal liabilities which increase healthcare costs and impose a financial burden on both patients and healthcare systems. Moreover, frequent errors can undermine patient trust in healthcare providers and the system overall, reducing patient engagement and compliance with medical recommendations.

## 1.3 JUSTIFICATION

While recognition of the importance of patient safety education for future healthcare professionals is increasing, significant gaps remain in knowledge, perceptions, and practical application, especially in Nigeria. These gaps emphasize the need to explore not only what clinical students know and how they perceive safety but also the factors influencing these outcomes in both educational and clinical settings.

Understanding medical and nursing students' knowledge, perceptions, and the determinants influencing their knowledge and perception of patient safety is necessary for identifying training gaps and developing targeted educational interventions. This study aims to assess these aspects among medical and nursing students, identifying factors that may hinder or promote a safety

culture in their future practice. It will serve as a baseline assessment, providing data on the current state of patient safety knowledge, perceptions, and influencing factors among healthcare students in Nigeria. Such baseline information is crucial for designing effective change communication strategies aimed at improving safety attitudes and promoting a culture of patient safety from the early stages of professional formation.

Moreover, the study will contribute to the existing body of knowledge by filling a critical gap in literature regarding the knowledge and perceptions of patient safety among Nigeria's future healthcare professionals. The findings can inform curriculum reforms, improve clinical training programs, guide policy and institutional efforts to strengthen safety culture and ultimately contribute to reducing medical errors and adverse events in Nigerian health settings.

## 1.4 RESEARCH QUESTIONS

1. What is the level of knowledge of patient safety principles and practice among medical and nursing students?
2. How do medical and nursing students perceive the importance of patient safety in their training and future practice?
3. What are the key determinants influencing medical and nursing students' knowledge and perceptions of patient safety?

## 1.5 GENERAL OBJECTIVES

To assess the knowledge, perception and determinants of patient safety among medical and nursing students in the university of Benin (UNIBEN) with a view to improve patient safety culture in healthcare.

## 1.6 SPECIFIC OBJECTIVES

1. To assess the knowledge of patient safety among medical and nursing students in the University of Benin.
2. To determine the perception of patient safety among medical and nursing students in the University of Benin.
3. To identify the determinants of patient safety knowledge and perception among medical and nursing students in the University of Benin.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 KNOWLEDGE OF PATIENT SAFETY AMONG MEDICAL AND NURSING STUDENTS

In 2018, a cross-sectional study was conducted to examine the level of knowledge about patient safety among final year nursing students. A total of 2011 students from 23 educational institutions across Australia and New Zealand were recruited for the study. Data was collected through an online patient safety quiz consisting of 45 multiple-choice questions developed based on the Patient Safety Competency Framework for Nursing Students. A Modified Angoff approach was used to determine 67.3% as the pass mark for the quiz. Findings revealed a total of 899 (44.7%) students obtained a pass mark on the quiz. Mean scores were 29.35/45 or 65.23% (SD 5.63). Participants scored highest in the domains of person-centred care and therapeutic communication, and lowest scores for infection prevention and control and medication safety. In eight of the participating institutions, less than 50% of students attained a pass mark[40]. The large sample size and centre study area enhances generalizability of the findings.

A mixed-method study was conducted in January 2023 among third- and fourth-year nursing students enrolled in online nursing programs at academic institutions in Malaysia to assess and explore their knowledge, attitudes, and learning experiences regarding sustainable patient safety. A convenience sampling technique was used to select the 383 participants in the quantitative phase and a purposive sampling technique was used to select 20 participants in the qualitative phase. Data was collected using a self-reported questionnaire in the quantitative phase of the study, 383 students participated using a self-reported questionnaire, and a semi-structured

interview schedule was used to collect data in the qualitative phase. Quantitative Data was analysed using descriptive and inferential statistics and qualitative data was analysed using inductive content analysis with the aim of theme and sub-theme categorization. The study findings regarding knowledge revealed that 228 (59.53%) had good knowledge,155 (40.47%) had poor knowledge[41]. The use of a convenience sampling technique in this study may introduce a risk of selection bias.

A cross-sectional study conducted from May to November 2021 to assess the knowledge of patient safety practice among 678 undergraduate health science students at Jimma University Institute of Health, Ethiopia. A stratified sampling technique was used to select study participants from each stratum medical and dental students who were in fourth year and above, pharmacy students in fifth year, nursing, midwifery, public health officer, environmental health, anesthesia, and medical laboratory students who were above third year) using their list from the sampling frame. A semi-structured self-administered questionnaire was used to collect data from the participants. EPI data 3.1 was used for data entry, and SPSS version 25 was used for analysis. Results showed that 43.2% [95% CI: (39.4, 47.2)] of the students had good knowledge of patient safety and 56.8% had poor knowledge[36]. The study's large sample size enhances the statistical reliability of the findings. However, the inclusion of other health science disciplines limits their direct applicability to medical and nursing students.

In 2016, a cross-sectional survey was carried out among third- and fourth-year physiotherapy students at University of Ghana (UG) and University of Health and Allied Sciences (UHAS) to evaluate their knowledge, perceptions, and attitudes towards patient safety. The study recruited 80 clinical-year students using convenience sampling, and data were gathered using a self-administered questionnaire. Findings showed 78 (97.5 %) respondents had moderate level of

overall knowledge on patient safety[42]. A key limitation of this study is its relatively small sample size drawn exclusively from physiotherapy students, which limits the extent to which the findings can be generalized to a broader population.

A descriptive cross-sectional study conducted in 2020 to investigate the knowledge, attitude, sources of knowledge, as well as the relationship between knowledge and attitude towards patients' safety among clinical students in Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria. A convenient sampling technique was used to select 281 students from the Department of Nursing Science, Medicine, Dentistry, Medical Rehabilitation and Pharmacy. Data was collected using a semi-structured questionnaire and was analyzed using Statistical Package for Social Sciences (version 25). Findings from this study revealed that 68.7% of the respondents had good knowledge, 19.6% had fair knowledge and 11.7% had poor knowledge[43]. The use of a convenience sampling technique in this study may introduce a risk of selection bias.

A cross-sectional study was conducted in 2025 at the University of Nigeria Teaching Hospital (UNTH), Enugu, to assess the knowledge, attitude, and practice of patient safety among final-year medical students. The study population consisted of final-year medical students at UNTH, with a total sample size of 105 consenting participants. A structured self-administered questionnaire was employed as the data collection tool to evaluate students' knowledge, perceptions, and attitudes towards patient safety. Result showed that majority of the students (92.5%) had heard of Patient Safety[44]. The study did not provide specific scores or detailed measures of students' knowledge making it difficult to assess the level of their understanding beyond basic awareness.

## 2.2 PERCEPTION OF PATIENT SAFETY AMONG MEDICAL AND NURSING STUDENTS

A descriptive cross-sectional study conducted in 2023 among 1,226 undergraduate medical students across all Jordanian medical schools examined students' attitudes toward patient safety using the Attitudes to Patient Safety Questionnaire III (APSQ-III). Participants were selected through stratified sampling, and data were collected via a self-administered online Google Form. The overall mean APSQ score indicated a positive attitude (mean = 4.9 ± 0.65). The highest scores were recorded in "Working hours as an error cause" (5.86 ± 1.37), "Team functioning" (5.77 ± 1.27), and "Importance of patient safety in the curriculum" (5.25 ± 0.99), while a neutral attitude was observed for "Professional incompetence as an error cause" (3.56 ± 0.69)[45]. Conducting the study across multiple centers increased the generalizability of its findings.

A cross-sectional study conducted in January 2020 among 700 medical students at a premier medical university in Kuala Lumpur, Malaysia, assessed their attitudes toward patient safety using the 26-item Attitudes Toward Patient Safety Questionnaire (APSQ-III). Participants were selected through simple random sampling, and data were collected via a self-administered Google Form. Achieving a 46.3% response rate, the findings showed that students demonstrated positive attitudes in six of nine domains, which included Safety Training (85.2%), Error Reporting (76.3%), Working Hours (89.5%), Error Inevitability (86.1%), Team Functioning (94.6%), and Patient Involvement (80.1%). Attitudes were less positive in Disclosure Responsibility (68.5%), Professional Incompetence (70.0%), and Safety Curriculum (71.1%)[46]. The study's strength was the use of a standardized and validated instrument which helped to improve the internal validity of the study findings.

A cross-sectional study was conducted in 2021 among undergraduate health science students at Jimma University Institute of Health, Southwest Ethiopia, to assess their knowledge, attitude, and practice of patient safety and to identify factors associated with patient safety practice. Using a stratified sampling technique, a total of 678 students were selected. Data were collected through a pretested, semi-structured, self-administered questionnaire. The results showed that 308 students (45.4%) exhibited positive attitudes toward patient safety[36].

A cross-sectional descriptive study conducted in 2020 among 178 undergraduate medical students at Ibn Al Jazzar Medical School in Sousse, Tunisia, assessed students' attitudes toward patient safety using the Attitudes to Patient Safety Questionnaire (APSQ III). Stratified sampling ensured representation across all study levels, and data were collected electronically via Google Forms. The overall mean score for patient safety culture was 5.33 ± 0.5, with the highest domain scores recorded for "working hours as a cause of error" (6.38 ± 1.0) and "team functioning" (6.24 ± 0.8), while "professional incompetence as a cause of error" scored lowest (4.01 ± 1.0). Most students (93%) acknowledged that heavy workload and inadequate breaks increased medical error risk[47]. The study's strength was its use of a standardized and validated questionnaire.

A descriptive cross-sectional study was conducted in 2021 at Obafemi Awolowo University, Ile-Ife, to investigate the knowledge, attitude, and sources of knowledge, as well as the relationship between knowledge and attitude toward patient safety among clinical students. The study population consisted of clinical students drawn from the Departments of Nursing Science, Medicine, Dentistry, Medical Rehabilitation, and Pharmacy. A total of 281 students participated in the study, selected through a convenience sampling technique. Data were collected using a semi-structured self-administered questionnaire. The findings revealed that 35.9% of the

respondents demonstrated a positive attitude toward patient safety, while 64.1% exhibited a negative attitude. Almost two-thirds, 62.3% believed that most errors are beyond staff control, 67.3% of the respondents disagreed with the idea that competent physicians do not make mistakes, and 65.5% of respondents agreed that learning from mistakes can help prevent future incidents[43]. Due to the relatively small sample size and use of convenience sampling technique, findings may not fully represent all clinical students and comparing smaller groups within the sample may be difficult.

A cross-sectional study was conducted in 2025 at the University of Nigeria Teaching Hospital (UNTH), Enugu, to assess the knowledge, attitude, and practice of patient safety among final-year medical students. The study population consisted of final-year medical students at UNTH, with a total sample size of 105 consenting participants. A structured self-administered questionnaire was employed as the data collection tool to evaluate students' awareness, perceptions, and attitudes towards patient safety. The findings showed that 81.1% of respondents reported feeling encouraged to report medical errors, while 98.1% of students expressed a strong interest in receiving further training on patient safety[44]. The relatively small sample size limits the generalizability of the findings to other medical institutions in the country.

Formatted[Mide 02]: Font: 4 pt

## 2.3 DETERMINANTS OF PATIENTS SAFETY KNOWLEDGE AND PERCEPTION AMONG MEDICAL AND NURSING STUDENTS

A descriptive cross-sectional study conducted in 2019 at the College of Medicine, King Saud Bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia, explored the perceptions and attitudes of undergraduate medical students toward patient safety education. A self-administered questionnaire was provided to participants of all academic levels, and 301 (249 male; 52 female)

participants in total were chosen using a non-probability convenience sampling technique. The study found significant gender differences in two key domains: male students scored higher in "Patient involvement in reducing errors" ($p = 0.012$), while female students scored higher in "Importance of patient safety in the curriculum" ($p = 0.001$). Students aged above 24 years showed significantly greater appreciation of the "Importance of patient safety in the curriculum" ($p = 0.039$)[48]. The use of a non-probability convenience sampling technique introduces potential selection bias and limits the representativeness of the sample.

A descriptive cross-sectional study conducted in 2023 among 1,226 undergraduate medical students across all Jordanian medical schools examined students' attitudes toward patient safety using the Attitudes to Patient Safety Questionnaire III (APSQ-III). Stratified sampling was used to select participants, and a self-administered online Google Form was used to collect data. The study revealed that female students scored significantly higher than males in four domains: "Patient safety training received," "Working hours as an error cause," "Error inevitability," and "Professional incompetence as an error cause" ($p \leq 0.05$), while male students scored higher in "Patient involvement in reducing error" ($p \leq 0.05$). First-generation medical students had lower scores for "Professional incompetence as an error cause" ($p \leq 0.05$). Clinical-stage students demonstrated significantly higher scores in "Team functioning," "Error inevitability," and "Working hours as an error cause" ($p \leq 0.05$)[45]. The multi-centre study approach enhances the generalizability of its findings.

A cross-sectional descriptive study conducted in 2020 among 178 undergraduate medical students at Ibn Al Jazzar Medical School, Sousse, Tunisia, assessed students' attitudes toward patient safety using the Attitudes to Patient Safety Questionnaire (APSQ-III). Stratified sampling ensured representation across all academic levels, and data were collected electronically via

Google Forms. Findings showed that male students scored significantly lower than females in "Professional incompetence as a cause of error" (3.7 ± 0.9 vs. 4.1 ± 1.0, $p = 0.01$) but were significantly more comfortable reporting their own errors (5.0 ± 1.2 vs. 4.5 ± 1.3, $p = 0.03$). Older students (aged > 25 years) scored higher in "Patient safety training received" (5.4 ± 0.8, $p = 0.02$) and "Working hours as an error cause" (6.7 ± 0.5, $p < 0.001$). Fourth- and fifth-year students ($p < 0.001$) also demonstrated greater awareness of the importance of patient safety training and recognized the impact of long working hours on medical errors compared to junior students[47]. A key strength the study is the use of stratified sampling which ensures proportionate representation of subgroups, enhancing the accuracy and reliability of the study findings.

A cross-sectional study was conducted in 2016 among third- and fourth-year physiotherapy students at the University of Ghana and the University of Health and Allied Sciences to determine their level of knowledge, perception, and attitude toward patient safety. The study included 80 clinical-year students who were recruited using convenience sampling. Data were collected through a self-administered questionnaire. Findings revealed no significant association between the level of study and students' knowledge of patient safety ($p = 0.712$)[42]. The relatively small sample size though limits the extent to which the results can be generalized to the broader student population.

A descriptive cross-sectional study conducted in 2021 at Obafemi Awolowo University, Ile-Ife, examined the knowledge, attitude, and sources of knowledge, as well as the relationship between knowledge and attitude toward patient safety among clinical students. The study included 281 participants drawn from the Departments of Nursing Science, Medicine, Dentistry, Medical Rehabilitation, and Pharmacy, selected using a convenience sampling technique. Data were collected through a semi-structured self-administered questionnaire. Findings revealed a

significant association between students' knowledge of patient safety and their course of study ($\chi^2 = 9.822$, $p = 0.01$), with nursing science students demonstrating lower levels of knowledge compared to their counterparts in other disciplines[43]. The use of convenience sampling however limits the representativeness of the sample and increases the risk of sampling bias.

# CHAPTER THREE

# METHODOLOGY

## 3.1 STUDY AREA

This study was conducted at the University of Benin (UNIBEN), located in Benin City, Edo State, Nigeria. Edo State, in southern Nigeria with Benin City as its capital, is renowned for its rich cultural heritage as the home of the ancient Benin Kingdom. The State lies within the Niger Delta region, bounded by latitudes 6º 06' N, 6º 30' N, and longitudes 5º 30' E, 5º 45' E with an area of about 500 square kilometers[49]. It is primarily inhabited by the Edo (Benin) people, along with the Esan, Etsako, Owan, and Akoko-Edo ethnic groups[50].

Benin City's culture is deeply rooted in tradition, with the Oba of Benin as traditional monarch. The Edo language is widely spoken, while English language is used in formal, educational, and administrative settings. Benin City serves is a major centre for education and healthcare services in the South-South region of Nigeria. The city is also famous for its art especially bronze casting, ivory carving, and woodwork, which hold historical and spiritual significance. Cultural events such as the Igue Festival reflect the city's values of ancestry and unity. Despite modernization and urban development, traditional beliefs and practices remain integral to daily life.

The University of Benin was established in 1970 and is one of Nigeria's top public universities. It offers a wide range of undergraduate and postgraduate programs across multiple faculties and institutes, including the Faculty of Medicine and the Faculty of Nursing. The students are from

diverse geographical and socio-cultural backgrounds. The University of Benin has two campuses: the Ugbowo Campus and the Ekehuan Campus. The Ugbowo Campus, which serves as the main campus contains major facilities for teaching, research, and student life, such as a central library, a digital library, and a university health centre[51]. The Ekehuan Campus, though smaller in land size compared to the main campus, accommodates several departments particularly in the arts and humanities. It also provides essential facilities such as a health centre and student hostels[52].

For the purpose of this study, the Ugbowo Campus was used the main study area, as it houses the College of Medical Sciences, which includes both medical and nursing students. The University of Benin is affiliated with the University of Benin Teaching Hospital (UBTH)[53], a large tertiary teaching hospital in Benin City. UBTH provides clinical training, and hands-on experience for medical and nursing students. It supports teaching and service delivery across multiple specialties and is the main site for clinical rotations.

### 3.2 STUDY DESIGN

A descriptive cross-sectional design was utilised for this study.

### 3.3 STUDY POPULATION

This study was conducted among medical and nursing students in the University of Benin (UNIBEN), Benin City, Edo State, Nigeria.

### 3.4 SELECTION CRITERIA

- **INCLUSION**

Undergraduate medical and nursing students enrolled in the University of Benin who give consent to participate in the study.

- **EXCLUSION**

Non-clinical medical and nursing students.

### 3.5 DURATION OF STUDY

The study was carried out between April 2025 and May 2026.

- Conceptualization and initial writeup: 5 months
- Data collection: 3 months
- Analysis: 1 month
- Final writeup: 2 months

### 3.6 SAMPPLE SIZE DETERMINATION

Using the Cochran formula for a cross-sectional study

$n = \frac{z^2pq}{d^2}$

Where;

n = Minimum Sample Size.

Z = Normal standard deviation set at 95% confidence interval (1.96)

p = Prevalence rate of a particular characteristics of the target population

Using the 43.2% prevalence of good knowledge of patient safety among among undergraduate health science students at Jimma University Institute of Health, Ethiopia[36].

p = 0.432

q = The complementary probability = 1-p

q = 1 – 0.432 = 0.568

d = Degree of precision set at 0.05

Hence;

$n = \frac{z^2pq}{d^2}$

$n = \frac{1.96^2 \times 0.432 \times 0.568}{0.05^2}$

n = 377.05 ≈ 378

Therefore, the minimum sample size for this study was 378 participants.

To make room for non-response, a 10% non-response rate was added to the minimum sample size, using the formula for non-response rate

ns = n/1-nr

Where;

ns = Adjusted sample size

n = Calculated sample size

nr = Non response rate =10%= 0.1

Hence;

ns = 378/1-0.1

ns = 420

Therefore, the adjusted minimum sample size for this study was 420 participants.

### 3.7 SAMPLING TECHNIQUE

A multistage sampling technique was utilised for this study. The total number of medical and nursing students in the clinical classes which was obtained from the administrative body served as the sampling frame for this study.

**Medical Students**

MED 21O (400 level) – 159, MED 200 (500 level) – 186, MED 190 (600 level) – 151, MED 180 (Final year) – 146.

**Nursing Students**

300 level – 216, 400 level – 216, 500 level – 170.

The total population of eligible students was 1,244, consisting of 642 medical students and 602 nursing students.

**Stage 1: Stratification and selection by department**

A stratified sampling technique was used to select respondents from both categories (medical students and nursing students). The total number of respondents per department was determined by proportional allocation using the formula;

Number of students to represent a department = (Total number of students in one department / Sampling frame) x sample size

**Medical students** - $\frac{642}{1244} \times 420 = 216.7 \approx 217$

**Nursing students** - $\frac{602}{1244} \times 420 = 203.3 \approx 203$

Thus, 217 medical students and 203 nursing students will be selected for the study.

**Stage 2: Stratification and allocation by academic level**

Within each department, students were further stratified according to academic level. The number of students to be selected from each level per department was also determined by proportional allocation using the formula;

Number of students to represent each level per department = (Total number of students in one level / Total number of students in the department) x Number of students to represent a department

**Medical Students (n = 217):**

MED 21O (400 level) - $\frac{159}{642} \times 217 \approx 54$

MED 200 (500 level) - $\frac{186}{642} \times 217 \approx 63$

MED 190 (600 level) - $\frac{151}{642} \times 217 \approx 51$

MED 180 (Final year) - $\frac{146}{642} \times 217 \approx 49$

**Nursing Students (n = 203):**

300 level - $\frac{216}{602} \times 203 \approx 73$

400 level - $\frac{216}{602} \times 203 \approx 73$

500 level - $\frac{170}{602} \times 203 \approx 57$

**Stage 3: Final selection of respondents**

The determined number of respondents per level in each department was subsequently selected using a simple random sampling technique to ensure equal chances of being included in the study.

## 3.8 DATA MANAGEMENT

### 3.8.1 METHOD OF DATA COLLECTION

The study utilised a quantitative method of data collection using a pre-tested, structured, self-administered questionnaire available in both online and printed formats.

### 3.8.2 TOOLS FOR DATA COLLECTION

Data was obtained with the aid of a structured, self-administered online questionnaire with close-ended and open-ended questions designed to collect information relevant to the study objectives. The questionnaire is a modified instrument adapted from three validated tools: the World Health Organization (WHO) Medical School Curriculum Guide for Patient Safety Education developed at the University of Aberdeen, the Attitudes to Patient Safety Questionnaire III (APSQ-III) and the study by Oyediran et al. on knowledge and attitude toward patient safety among clinical students. The instrument has been validated for use in the local study environment[43,54-55]. The questionnaire was divided into four sections as follows:

Section A: Socio-demographic characteristics of respondents

This section consists of 9 questions aimed at determining the demographic factors that significantly influence knowledge and perception of patient safety.

Section B: Knowledge of patient safety

This section of the questionnaire consists of 17 questions adapted from WHO Patient Safety Curriculum Guide 2011.

Section C: Perception of patient safety

This section of the questionnaire consists of 20 questions adapted and modified from the Attitudes to Patient Safety Questionnaire III (APSQ-III) and the study by Oyediran et al. on knowledge and attitude toward patient safety among clinical students.

Section D: Determinants of patient safety knowledge and perception

This section of the questionnaire consists of 5 questions to elicit determinants of students' knowledge and perception.

### 3.8.3 PRETESTING

To minimize ambiguity in the questionnaire, pretesting was done using 10% of the minimum sample size. It was carried out among medical and nursing students in Benson Idahosa University, Benin City, Edo state.

## 3.9 DATA ANALYSIS

Data collected from the online questionnaire was cleaned and exported into the IBM SPSS (Statistical Package for Scientific Solutions) version 27.0 software. Descriptive statistics such as frequencies, percentages, means, and standard deviations was used to summarize students' knowledge and perceptions of patient safety. Chi-square test was applied to examine associations between sociodemographic variables and key patient-safety outcomes. Determinants of patient

safety was further explored using multivariable analysis. The level of statistical significance was set at $p < 0.05$. Results were presented in tables, charts and prose in line with the specific objectives of the study.

## MEASUREMENT OF VARIABLES AND SCORING

### Knowledge of patient safety

There were 15 questions used to assess the knowledge of patient safety. Each question in the section was scored based on correctness, with each correct answer scoring one point and incorrect answers scored zero points with a total attainable score of 15.

Questions 12 – 26

True = 1 point

False = 0 points

I don't know = 0 points

The total score for each respondent was converted to percentage. Respondents were categorized into two groups based on their score.

I. Good knowledge of patient safety: ≥50% (8 -15 points)

II. Poor knowledge of patient safety: <50% (0 - 7 points)

### Perception towards patient safety

There were 20 5-point Likert scale questions designed to assess the perception towards patient safety. Positive Likert scale questions (27, 28, 29, 30, 32, 33, 35, 36, 37, 42, 43, 46) were scored as follows; Strongly agree – 5, Agree – 4, Undecided – 3, Disagree – 2, Strongly disagree – 1.

Negative Likert scale questions (31, 34, 38, 39, 40, 41, 44, 45) were scored in reverse order as follows; Strongly agree – 1, Agree – 2, Undecided – 3, Disagree – 4, Strongly disagree – 5. The cumulative scores were obtained, with the maximum score being 100 and the minimum score being 20. A score of 60 represents the exact midpoint corresponding to the overall neutral perception toward patient safety. Respondents who had a score of 60 and above were categorized as having good perception, whereas those who scored below 60 were classified as having poor perception towards patient safety.

### 3.10 ETHICAL CONSIDERATION

Ethical approval was obtained from the Research and Ethics Committee of the University of Benin Teaching Hospital. Written informed consent was also obtained from the respondents before administering the questionnaires. Confidentiality was maintained throughout the study and participants reserved their rights to voluntarily withdraw from the study at any point in time.

### 3.11 LIMITATION OF STUDY

The study relied on self-reported data, which may have been influenced by respondents providing socially desirable answers, affecting the accuracy of the findings. To overcome this bias, all questionnaires were completed anonymously and confidentially.

# CHAPTER FOUR

## RESULTS

A total of 420 undergraduate students in the University of Benin, Benin City, Edo State, participated in this study. The response rate was 100%.

The results are divided into the following sections:

SECTION A: Sociodemographic characteristics of the respondents.

SECTION B: Knowledge of patient safety

SECTION C: Perception of patient safety

SECTION D: Determinants of patient safety knowledge and perception

**SECTION A: Sociodemographic characteristics of the respondents.**

**Table 4.1: Socio-demographic Characteristics of Respondents**

| Variable | Frequency (n=420) | Percent (%) |
|---|---|---|
| **Age Group (years)** | | |
| 15–24 | 351 | 83.6 |
| 25–34 | 69 | 16.4 |
| **Mean ± Sd Age (years)** | **22.2 ± 2.6** | |
| **Gender** | | |
| Male | 151 | 36.0 |
| Female | 269 | 64.0 |
| **Ethnicity** | | |
| Benin | 142 | 33.8 |
| Igbo | 73 | 17.4 |
| Esan | 59 | 14.0 |
| Yoruba | 51 | 12.1 |
| Afemai | 30 | 7.1 |
| Urhobo | 25 | 6.0 |
| Akwa Ibom Ethnicities | 16 | 3.8 |
| Bayelsa | 9 | 2.1 |
| Hausa | 8 | 2.0 |
| Igala | 4 | 1.0 |
| Others# | 3 | 0.7 |
| **Religion** | | |
| Christian | 412 | 98.1 |
| Islam | 6 | 1.4 |
| Others* | 2 | 0.5 |
| **Marital Status** | | |
| Single | 413 | 98.3 |
| Married | 7 | 1.7 |
| **Residence** | | |
| School hostel | 237 | 56.4 |
| Off-campus | 175 | 41.7 |
| Staff quarters | 8 | 1.9 |

| | | |
|---|---|---|
| **Sponsor of Education** | | |
| Parents | 374 | 89.0 |
| Self | 25 | 6.0 |
| Guardian | 20 | 4.8 |
| Scholarship | 1 | 0.2 |

**Others#: Tiv, Ikpe Others*: Olumba, Eckankar**

**Table 4.2 Academic Characteristics of Respondents**

Deleted[Mide 02]:

| Variable | Frequency (n=420) | Percent (%) |
|---|---|---|
| **Department** | | |
| Medicine | 216 | 51.4 |
| Nursing | 204 | 48.6 |
| **Level** | | |
| 300 level | 76 | 18.1 |
| 400 level | 125 | 29.8 |
| 500 level | 118 | 28.1 |
| 600 level | 51 | 12.1 |
| Final year | 50 | 11.9 |

Deleted[Mide 02]:

The mean age of respondents was 22.2 years (±2.6). The majority were aged 15–24 years 351 (83.6%), while 69 (16.4%) were aged 25–34 years.

Most respondents were female 269 (64.0%), while 151 (36.0%) were male. The majority were single 413 (98.3%), while only 7 (1.7%) were married.

The largest ethnic group was Benin 142 (33.8%), followed by Igbo 73 (17.4%), Esan 59 (14.0%), Yoruba 51 (12.1%), and Afemai 30 (7.1%). Other ethnic groups included Urhobo 25 (6.0%), Akwa Ibom ethnicities 16 (3.8%), Bayelsa 9 (2.1%), Hausa 8 (2.0%), Igala 4 (1.0%), and 3 (0.7%) from other groups such as Tiv and Ikpe.

Christianity was the predominant religion 412 (98.1%), followed by Islam 6 (1.4%), and other religions such as Olumba and Eckankar 2 (0.5%).

By department, slightly more respondents were from Medicine 216 (51.4%), compared to Nursing 204 (48.6%).

Regarding level of study, the highest proportion of respondents were in 400 level 125 (29.8%), followed by 500 level 118 (28.1%), 300 level 76 (18.1%), 600 level 51 (12.1%), and final year 50 (11.9%).

Most respondents resided in the school hostel 237 (56.4%), followed by off-campus 175 (41.7%), while 8 (1.9%) lived in staff quarters.

The majority of respondents were sponsored by their parents 374 (89.0%), while 25 (6.0%) sponsored themselves, 20 (4.8%) were supported by guardians, and 1 (0.2%) was on scholarship.

**SECTION B: Knowledge of patient safety**

**Table 4.3: Awareness and Sources of Patient Safety among Respondents**

| Variable | Frequency (n) | Percent (%) |
|---|---|---|
| **Heard of Patient Safety (n = 420)** | | |
| Yes | 383 | 91.2 |
| No | 37 | 8.8 |
| **Sources of Information*** | | |
| Lectures | 298 | 71.0 |
| Clinical posting | 273 | 65.0 |
| Books | 130 | 31.0 |
| Media (TV/radio) | 119 | 28.3 |
| Family | 63 | 15.0 |
| Internet | 133 | 31.7 |
| Friends/peers | 45 | 10.7 |
| Health professionals | 169 | 40.2 |

***Multiple responses**

Awareness of patient safety among respondents was high. A total of 383 (91.2%) reported that they had heard of patient safety, while 37 (8.8%) had not.

Regarding sources of information (multiple responses), the most common source was lectures 298 (71.0%), followed by clinical postings 273 (65.0%) and health professionals 169 (40.2%). Other sources included the internet 133 (31.7%), books 130 (31.0%), and media such as

TV/radio 119 (28.3%). Less common sources were family 63 (15.0%) and friends/peers 45 (10.7%).

**Table 4.4: Knowledge of Patient Safety among Respondents Aware of Patient Safety**

| Knowledge Statement (n=420) | True n (%) | False n (%) | I don't know n (%) |
|---|---|---|---|
| **Patient safety refers to prevention of avoidable harm** | 403 (96.0) | 4 (1.0) | 13 (3.1) |
| **Errors result from system failures rather than negligence** | 215 (51.2) | 116 (27.6) | 89 (21.2) |
| **Medication errors are a major cause of harm** | 367 (87.4) | 15 (3.6) | 38 (9.0) |
| **Unsafe injection practices transmit infections** | 392 (93.3) | 12 (2.9) | 16 (3.8) |
| **Unsafe surgical procedures can complicate patients** | 366 (87.1) | 5 (1.2) | 49 (11.7) |
| **Diagnostic errors occur in about 5% of adults** | 301 (71.7) | 7 (1.7) | 112 (26.7) |
| **Unsafe blood transfusion can spread infections** | 361 (86.0) | 1 (0.2) | 58 (13.8) |
| **Radiation errors include wrong patient/site** | 351 (83.6) | 1 (0.2) | 68 (16.2) |
| **Venous thromboembolism is a common avoidable injury** | 263 (62.6) | 33 (7.9) | 124 (29.5) |
| **Patient safety is a central principle in healthcare** | 375 (89.3) | 0 (0.0) | 45 (10.7) |
| **Proper identification requires ≥2 identifiers** | 391 (93.1) | 6 (1.4) | 23 (5.5) |
| **Hand hygiene prevents infections** | 376 (89.5) | 29 (6.9) | 15 (3.6) |
| **Near miss is an event prevented before harm** | 366 (87.1) | 13 (3.1) | 41 (9.8) |
| **Patient involvement improves safety** | 397 (94.5) | 6 (1.4) | 17 (4.0) |

| | | | |
|---|---|---|---|
| **Informed consent is essential** | 402 (95.7) | 5 (1.2) | 13 (3.1) |

Knowledge of patient safety among respondents was generally high across most statements. The majority correctly identified that patient safety refers to the prevention of avoidable harm to patients during healthcare 403 (96.0%), while only 4 (1.0%) answered incorrectly and 13 (3.1%) did not know.

Just over half of the respondents 215 (51.2%) correctly agreed that most medical errors result from system failures rather than individual negligence, while 116 (27.6%) answered incorrectly and 89 (21.2%) did not know.

A large proportion recognized that medication errors are important patient safety issues, with 367 (87.4%) answering correctly, while 15 (3.6%) answered incorrectly and 38 (9.0%) did not know. Similarly, most respondents correctly identified that unsafe injection practices can transmit infections such as HIV and hepatitis B and C, with 392 (93.3%) responding correctly.

Regarding unsafe surgical procedures, 366 (87.1%) correctly acknowledged that they are patient safety challenges capable of causing complications, while 49 (11.7%) did not know. Most respondents also correctly recognized that diagnostic errors are patient safety issues, with 301 (71.7%) answering correctly, although 112 (26.7%) were unsure.

Unsafe blood transfusion practices were correctly identified as patient safety risks by 361 (86.0%) of respondents, while 58 (13.8%) did not know. Similarly, 351 (83.6%) correctly recognized that radiation errors include overexposure and wrong-patient or wrong-site identification.

Knowledge of venous thromboembolism as a preventable cause of patient injury was comparatively lower, as only 263 (62.6%) answered correctly, while 33 (7.9%) answered incorrectly and 124 (29.5%) did not know.

Most respondents agreed that patient safety is a central principle of healthcare requiring actions to prevent adverse events, with 375 (89.3%) answering correctly. Similarly, 391 (93.1%) correctly identified that proper patient identification requires at least two identifiers, while 376 (89.5%) recognized hand hygiene as the single most effective measure for preventing healthcare-associated infections.

A large proportion also correctly understood the concept of a near miss, with 366 (87.1%) responding correctly. Furthermore, 397 (94.5%) agreed that encouraging patients to ask questions and participate in decisions enhances patient safety, while 402 (95.7%) correctly identified informed consent as an essential component of patient safety.

Overall, the findings indicate that respondents demonstrated good knowledge of patient safety principles, particularly regarding prevention of avoidable harm, infection prevention, patient identification, informed consent, and patient involvement. However, knowledge gaps were observed in areas related to system-based causes of medical errors and venous thromboembolism.

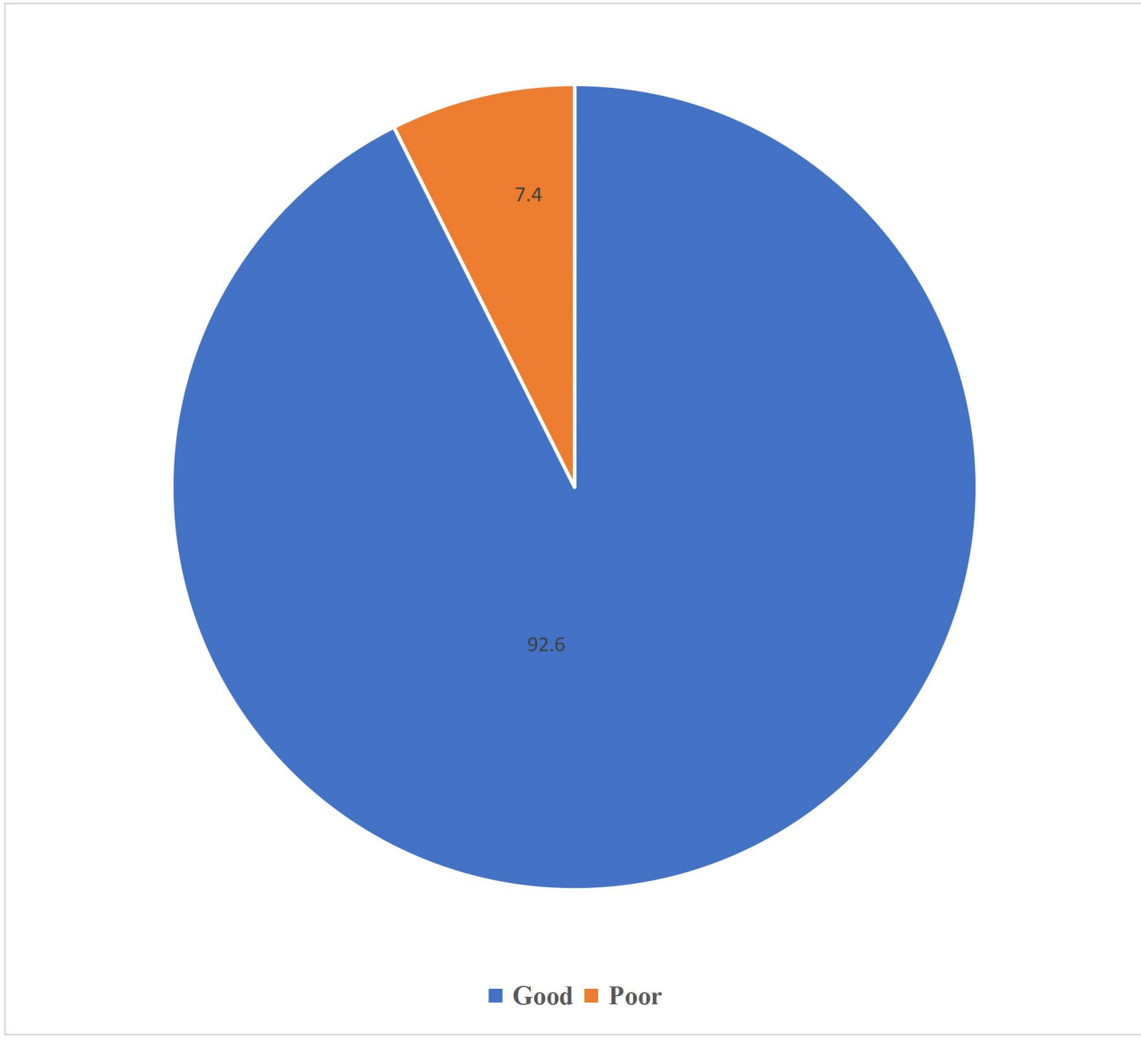



**Figure 4.1 Overall Knowledge level of Respondents**

The overall knowledge level of respondents on patient safety was high. The majority had good knowledge 389 (92.6%), while only 31 (7.4%) had poor knowledge.

**Table 4.5a: Socio-demographic Characteristics and Knowledge of Patient Safety among Respondents**

| Category | Knowledge of Patient Safety (n = 420) | | Test Statistics | p-value |
|---|---|---|---|---|
| | Poor (n=31) Freq (%) | Good (n=389) Freq (%) | | |
| **Age Group (years)** | | | | |
| 15–24 | 28 (90.3) | 323 (83.0) | $\chi^2$ =1.111 | 0.292 |
| 25–34 | 3 (9.7) | 66 (17.0) | | |
| **Gender** | | | | |
| Male | 18 (58.1) | 133 (34.2) | $\chi^2$ =7.107 | 0.008* |
| Female | 13 (41.9) | 256 (65.8) | | |
| **Department** | | | | |
| Medicine | 20 (64.5) | 196 (50.4) | $\chi^2$ =2.295 | 0.130 |
| Nursing | 11 (35.5) | 193 (49.6) | | |
| **Level** | | | | |
| 300 level | 2 (6.5) | 74 (19.0) | $\chi^2$ =13.774 | 0.008* |
| 400 level | 11 (35.5) | 114 (29.3) | | |
| 500 level | 16 (51.6) | 102 (26.2) | | |
| 600 level | 1 (3.2) | 50 (12.9) | | |
| Final year | 1 (3.2) | 49 (12.6) | | |
| **Marital Status** | | | | |
| Single | 31 (100.0) | 382 (98.2) | $\chi^2$ =0.567 | 0.451 |
| Married | 0 (0.0) | 7 (1.8) | | |
| **Awareness of Patient Safety** | | | | |
| Yes | 19 (61.3) | 363 (93.3) | $\chi^2$ =35.786 | <0.001* |

| | | |
|---|---|---|
| No | 12 (38.7) | 26 (6.7) |

***Statistically Significant (p<0.05)**

**Table 4.5b: Socio-demographic Characteristics and Knowledge of Patient Safety among Respondents**

| | Knowledge level of Patient Safety (n=420) | | | |
|---|---|---|---|---|
| **Category** | **Poor (n=31) Freq (%)** | **Good (n=389) Freq (%)** | **Test Statistics** | **p-value** |
| **Residence** | | | | |
| School hostel | 9 (29.0) | 228 (58.6) | $\chi^2$ =10.220 | 0.006* |
| Staff quarters | 1 (3.2) | 7 (1.8) | | |
| Off-campus | 21 (67.7) | 154 (39.6) | | |
| **Sponsor of Education** | | | | |
| Self | 1 (3.2) | 24 (6.2) | $\chi^2$ =13.181 | 0.004* |
| Parents | 27 (87.1) | 347 (89.2) | | |
| Guardian | 2 (6.5) | 18 (4.6) | | |
| Scholarship | 1 (3.2) | 0 (0.0) | | |

***Statistically Significant (p<0.05)**

Deleted[ndudoc]: <sp>

The association between sociodemographic characteristics and knowledge of patient safety among respondents is presented in Tables 4.5a and 4.5b.

There was no statistically significant association between age group and knowledge level ($\chi^2$ = 1.111, p = 0.292). Among respondents with poor knowledge, 28 (90.3%) were aged 15–24 years while 3 (9.7%) were aged 25–34 years. Among those with good knowledge, 323 (83.0%) were aged 15–24 years and 66 (17.0%) were aged 25–34 years.

However, there was a statistically significant association between gender and knowledge level ($\chi^2$ = 7.107, p = 0.008). Among respondents with poor knowledge, 18 (58.1%) were male and 13 (41.9%) were female, whereas among those with good knowledge, 133 (34.2%) were male and 256 (65.8%) were female. This suggests that females had better knowledge of patient safety compared to males.

Department was not significantly associated with knowledge level ($\chi^2$ = 2.295, p = 0.130). Among respondents with poor knowledge, 20 (64.5%) were in Medicine while 11 (35.5%) were in Nursing. Among those with good knowledge, 196 (50.4%) were in Medicine and 193 (49.6%) were in Nursing.

There was a statistically significant association between level of study and knowledge level ($\chi^2$ = 13.774, p = 0.008). Respondents with poor knowledge were more commonly found in the 500 level 16 (51.6%) and 400 level 11 (35.5%), while respondents with good knowledge were distributed across all levels, particularly 400 level 114 (29.3%), 500 level 102 (26.2%), and 300 level 74 (19.0%).

Marital status showed no statistically significant association with knowledge level ($\chi^2$ = 0.567, p = 0.451). All respondents with poor knowledge were single 31 (100.0%), while among those with good knowledge, 382 (98.2%) were single and 7 (1.8%) were married.

Awareness of patient safety was significantly associated with knowledge level ($\chi^2$ = 35.786, p < 0.001). Among respondents with poor knowledge, 19 (61.3%) had heard of patient safety while 12 (38.7%) had not. In contrast, among those with good knowledge, 363 (93.3%) had heard of patient safety and only 26 (6.7%) had not, indicating that awareness was strongly associated with better knowledge.

Residence was also significantly associated with knowledge level ($\chi^2 = 10.220$, $p = 0.006$). Among respondents with poor knowledge, the majority lived off-campus 21 (67.7%), while 9 (29.0%) resided in the school hostel and 1 (3.2%) in university staff quarters. Among respondents with good knowledge, 228 (58.6%) resided in the school hostel, 154 (39.6%) lived off-campus, and 7 (1.8%) lived in staff quarters.

Similarly, sponsor of education was significantly associated with knowledge level ($\chi^2 = 13.181$, $p = 0.004$). Among respondents with poor knowledge, most were sponsored by their parents 27 (87.1%), while 2 (6.5%) were sponsored by guardians, 1 (3.2%) sponsored themselves, and 1 (3.2%) was on scholarship. Among those with good knowledge, 347 (89.2%) were sponsored by parents, 24 (6.2%) sponsored themselves, and 18 (4.6%) were sponsored by guardians.

Overall, the findings indicate that gender, level of study, awareness of patient safety, residence, and sponsor of education were significantly associated with knowledge of patient safety, while age group, department, and marital status showed no significant association.

**Table 4.6: Predictors of Knowledge of Patient Safety among Respondents**

| Variable | B (Coefficient) | Odds Ratio (Exp(B)) | 95% CI Lower | 95% CI Upper | p-value |
|---|---|---|---|---|---|
| **Age (years)** | 0.155 | 1.167 | 0.930 | 1.465 | 0.182 |
| **Gender** | | | | | |
| Male * | | 1 | | | |
| Female | 0.802 | 2.230 | 0.855 | 5.819 | 0.101 |
| **Marital status** | | | | | |
| Single * | | 1 | | | |
| Married | 17.729 | 50080079.793 | 0.000 | - | 0.999 |
| **Department** | | | | | |
| Medicine* | | 1 | | | |
| Nursing | 0.245 | 1.278 | 0.455 | 3.592 | 0.642 |
| **Level** | | | | | 0.047* |
| 300 level* | | 1 | | | |
| 400 level | -0.268 | 0.765 | 0.123 | 4.744 | 0.773 |
| 500 level | -1.306 | 0.271 | 0.043 | 1.705 | 0.164 |
| 600 level | 1.048 | 2.851 | 0.170 | 47.812 | 0.466 |
| Final year | 0.560 | 1.751 | 0.091 | 33.523 | 0.710 |
| **Sponsor of Education** | | | | | 0.805 |
| Self * | | 1 | | | |
| Parents | -0.248 | 0.780 | 0.090 | 6.795 | 0.822 |
| Guardian | -1.050 | 0.350 | 0.026 | 4.753 | 0.430 |
| Scholarship | -22.896 | 0.000 | 0.000 | - | 1.000 |
| **Residence** | | | | | 0.121 |
| School hostel* | | 1 | | | |
| Staff quarters | -1.262 | 0.283 | 0.026 | 3.096 | 0.301 |
| Off-campus | -0.979 | 0.376 | 0.145 | 0.974 | 0.044* |

Formatted Table[Mide 02]

| | | | | | |
|---|---|---|---|---|---|
| **Awareness of Patient Safety** | | | | | |
| Yes* | | 1 | | | |
| No | -2.511 | 0.081 | 0.029 | 0.227 | <0.001* |

***Reference Category** **$R^2$ =12.8 - 31.2%**

The logistic regression analysis of predictors of knowledge of patient safety among respondents is presented in Table 4.6.

Age was not a statistically significant predictor of knowledge of patient safety (B = 0.155, OR = 1.167, 95% CI: 0.930–1.465, p = 0.182), indicating that increasing age did not significantly influence respondents' knowledge level.

Similarly, gender was not significantly associated with knowledge level (OR = 2.230, 95% CI: 0.855–5.819, p = 0.101), although female respondents had higher odds of good knowledge compared to males.

Marital status was also not a significant predictor (p = 0.999). The extremely large odds ratio observed among married respondents is likely due to the very small number of married respondents in the study.

Department showed no statistically significant association with knowledge level (OR = 1.278, 95% CI: 0.455–3.592, p = 0.642), indicating that respondents in Nursing had similar odds of good knowledge compared to those in Medicine.

Although the overall test for level of study was statistically significant (p = 0.047), none of the individual study levels showed a statistically significant association when compared with 300 level. Respondents in 400 level (OR = 0.765, p = 0.773), 500 level (OR = 0.271, p = 0.164), 600 level (OR = 2.851, p = 0.466), and final year (OR = 1.751, p = 0.710) did not significantly differ in their likelihood of having good knowledge.

Sponsor of education was not significantly associated with knowledge level (overall p = 0.805). Respondents sponsored by parents (OR = 0.780, p = 0.822), guardians (OR = 0.350, p = 0.430), or scholarship (p = 1.000) did not significantly differ from those who sponsored themselves.

Residence showed a borderline significant association overall (p = 0.121), but respondents residing off-campus were significantly less likely to have good knowledge of patient safety compared to those living in the school hostel (B = -0.979, OR = 0.376, 95% CI: 0.145–0.974, p = 0.044). This implies that respondents living off-campus were about 62.4% less likely to have good knowledge of patient safety. Residence in staff quarters was not significantly associated with knowledge level (OR = 0.283, p = 0.301).

Awareness of patient safety was a strong and statistically significant predictor of knowledge level. Respondents who had not heard of patient safety were significantly less likely to have good knowledge compared to those who were aware of patient safety (B = -2.511, OR = 0.081, 95% CI: 0.029–0.227, p < 0.001). This indicates that respondents without awareness were about 92% less likely to have good knowledge of patient safety.

Overall, the findings indicate that awareness of patient safety and residence off-campus were significant predictors of knowledge of patient safety, while age, gender, marital status, department, level of study, and sponsor of education were not significant predictors.

**SECTION C: Perception of patient safety**

**Table 4.7a: Perception of Patient Safety Among Respondents (n = 420)**

| Statement | Strongly Agree n (%) | Agree n (%) | Neutral n (%) | Disagree n (%) | Strongly Disagree n (%) |
|---|---|---|---|---|---|
| **Patient safety is a global issue** | 250 (59.5) | 138 (32.9) | 31 (7.4) | 0 (0.0) | 1 (0.2) |
| **Most clinical errors are preventable** | 178 (42.4) | 211 (50.2) | 28 (6.7) | 3 (0.7) | 0 (0.0) |
| **Most healthcare staff make errors** | 78 (18.6) | 165 (39.3) | 135 (32.1) | 37 (8.8) | 5 (1.2) |
| **Comfortable reporting errors** | 75 (17.9) | 188 (44.8) | 132 (31.4) | 21 (5.0) | 4 (1.0) |
| **Errors are out of staff control** | 26 (6.2) | 103 (24.5) | 142 (33.8) | 137 (32.6) | 12 (2.9) |
| **Accepting faults is part of the job** | 162 (38.6) | 216 (51.4) | 38 (9.0) | 2 (0.5) | 2 (0.5) |
| **Learning from mistakes prevents incidents** | 197 (46.9) | 187 (44.5) | 22 (5.2) | 8 (1.9) | 6 (1.4) |
| **Blame easier than fixing errors** | 53 (12.6) | 145 (34.5) | 94 (22.4) | 84 (20.0) | 44 (10.5) |
| **Can challenge unsafe colleagues** | 99 (23.6) | 193 (46.0) | 111 (26.4) | 15 (3.6) | 2 (0.5) |
| **Experienced staff also make errors** | 121 (28.8) | 244 (58.1) | 50 (11.9) | 4 (1.0) | 1 (0.2) |

| | | | | | |
|---|---|---|---|---|---|
| **Documentation improves safety** | 201 (47.9) | 184 (43.8) | 33 (7.9) | 2 (0.5) | 0 (0.0) |
| **Job target more important than safety** | 30 (7.1) | 29 (6.9) | 49 (11.7) | 177 (42.1) | 135 (32.1) |

**Table 4.7b: Perception of Patient Safety Among Respondents (n = 420)**

| Statement | Strongly Agree n (%) | Agree n (%) | Neutral n (%) | Disagree n (%) | Strongly Disagree |
|---|---|---|---|---|---|
| **Errors due to careless nurses** | 48 (11.4) | 103 (24.5) | 145 (34.5) | 101 (24.0) | 23 (5.5) |
| **Errors due to careless doctors** | 48 (11.4) | 114 (27.1) | 160 (38.1) | 85 (20.2) | 13 (3.1) |
| **No need to report harmless errors** | 20 (4.8) | 36 (8.6) | 81 (19.3) | 189 (45.0) | 94 (22.4) |
| **Teamwork reduces errors** | 188 (44.8) | 185 (44.0) | 38 (9.0) | 6 (1.4) | 3 (0.7) |
| **Patient involvement reduces errors** | 198 (47.1) | 194 (46.2) | 25 (6.0) | 1 (0.2) | 2 (0.5) |
| **Patient safety not important** | 23 (5.5) | 25 (6.0) | 25 (6.0) | 135 (32.1) | 212 (50.5) |
| **Patient safety cannot be taught** | 28 (6.7) | 39 (9.3) | 62 (14.8) | 190 (45.2) | 101 (24.0) |
| **Learning improves effectiveness** | 218 (51.9) | 159 (37.9) | 32 (7.6) | 3 (0.7) | 8 (1.9) |

Perception of patient safety among respondents was largely positive across most statements.

Deleted[Mide 02]:

A majority of respondents strongly agreed 250 (59.5%) and agreed 138 (32.9%) that patient safety is a global issue, while only 31 (7.4%) were neutral and very few disagreed. Similarly, most respondents agreed that clinical errors are preventable, with 211 (50.2%) agreeing and 178 (42.4%) strongly agreeing.

Regarding occurrence of errors, 165 (39.3%) agreed and 78 (18.6%) strongly agreed that most healthcare staff make errors, although 135 (32.1%) were neutral. Most respondents also expressed comfort in reporting errors, with 188 (44.8%) agreeing and 75 (17.9%) strongly agreeing.

On whether errors are beyond staff control, the majority either disagreed 137 (32.6%) or were neutral 142 (33.8%), suggesting that respondents generally believe errors can be prevented. Most also agreed that accepting faults is part of their job, with 216 (51.4%) agreeing and 162 (38.6%) strongly agreeing.

Learning was strongly emphasized, as 197 (46.9%) strongly agreed and 187 (44.5%) agreed that learning from mistakes can avert incidents. However, opinions were mixed regarding blame, with 145 (34.5%) agreeing that it is easier to blame someone than address the source of errors, while 84 (20.0%) disagreed and 94 (22.4%) were neutral.

Most respondents felt confident to challenge unsafe practices, with 193 (46.0%) agreeing and 99 (23.6%) strongly agreeing. In addition, a large proportion agreed that even experienced professionals make errors, with 244 (58.1%) agreeing and 121 (28.8%) strongly agreeing.

Documentation and safety practices were highly valued, as 201 (47.9%) strongly agreed and 184 (43.8%) agreed that proper documentation improves patient safety. The majority also disagreed

that job targets are more important than safety, with 177 (42.1%) disagreeing and 135 (32.1%) strongly disagreeing.

Regarding causes of errors, most respondents were neutral or disagreed that errors result from careless nurses or doctors. For nurses, 145 (34.5%) were neutral and 101 (24.0%) disagreed, while for doctors, 160 (38.1%) were neutral and 85 (20.2%) disagreed.

Most respondents disagreed that it is unnecessary to report harmless errors, with 189 (45.0%) disagreeing and 94 (22.4%) strongly disagreeing. Teamwork and patient involvement were strongly endorsed, with 188 (44.8%) and 198 (47.1%) strongly agreeing respectively, alongside similar proportions agreeing.

The majority also rejected negative perceptions, as 212 (50.5%) strongly disagreed and 135 (32.1%) disagreed that patient safety is not important. Similarly, most disagreed that patient safety cannot be taught, with 190 (45.2%) disagreeing and 101 (24.0%) strongly disagreeing.

Finally, most respondents agreed that learning about patient safety before qualification improves effectiveness, with 218 (51.9%) strongly agreeing and 159 (37.9%) agreeing.

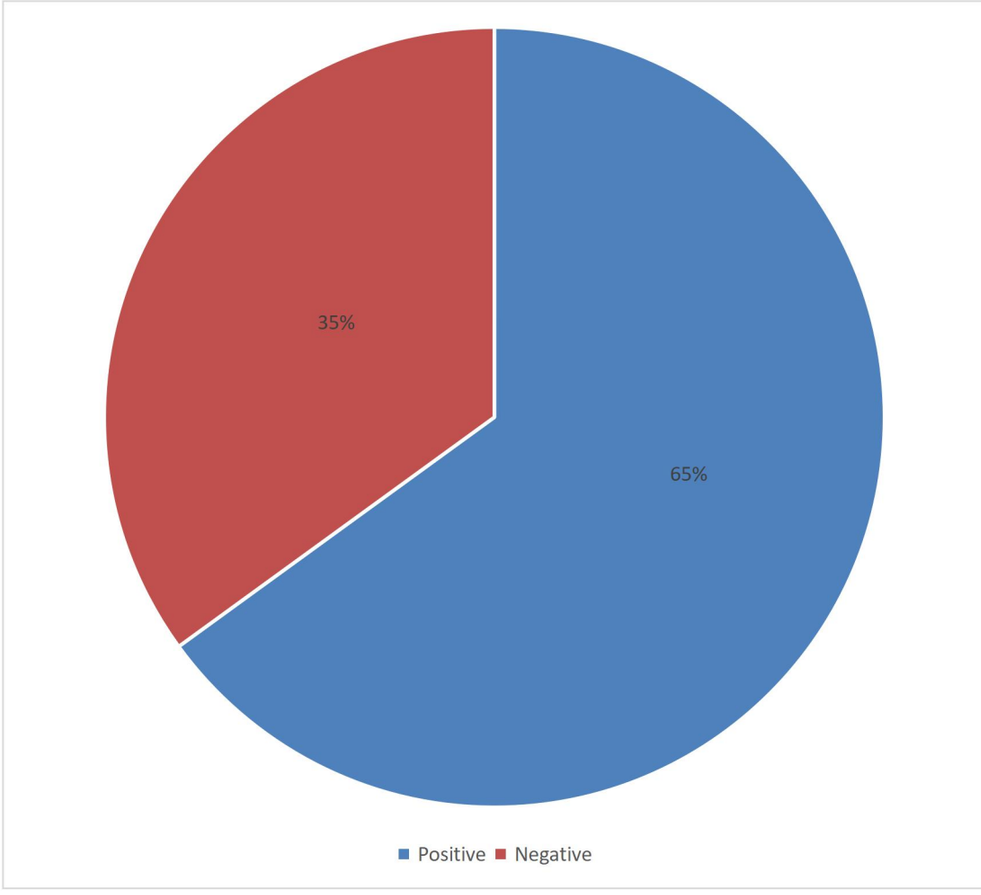



**Figure 4. 2 Overall Perception level of Respondents**

The overall perception of patient safety among respondents was largely positive. The majority had a positive perception 273 (65%), while a smaller proportion 147 (35%) had a negative perception.

Deleted[Mide 02]:

**Table 4.8a: Sociodemographic Characteristics and Perception of Patient Safety among Respondents**

| | Perception of Patient Safety (n=420) | | | |
|---|---|---|---|---|
| **Category** | **Negative (n=147) Freq (%)** | **Positive (n=273) Freq (%)** | **Test Statistic** | **p-value** |
| **Age group (years)** | | | | |
| 15–24 | 121 (34.5) | 230 (65.5) | $\chi^2 = 0.261$ | 0.610 |
| 25–34 | 26 (37.7) | 43 (62.3) | | |
| **Sex** | | | | |
| Male | 56 (37.1) | 95 (62.9) | $\chi^2 = 0.451$ | 0.502 |
| Female | 91 (33.8) | 178 (66.2) | | |
| **Marital status** | | | | |
| Single | 143 (34.6) | 270 (65.4) | $\chi^2 = 1.534$ | 0.215 |
| Married | 4 (57.1) | 3 (42.9) | | |
| **Level** | | | | |
| 300 level | 23 (30.3) | 53 (69.7) | $\chi^2 = 1.241$ | 0.871 |
| 400 level | 43 (34.4) | 82 (65.6) | | |
| 500 level | 44 (37.3) | 74 (62.7) | | |
| 600 level | 18 (35.3) | 33 (64.7) | | |
| Final year | 19 (38.0) | 31 (62.0) | | |
| **Department** | | | | |
| Medicine | 81 (37.5) | 135 (62.5) | $\chi^2 = 1.222$ | 0.269 |
| Nursing | 66 (32.4) | 138 (67.6) | | |

**Table 4.8b: Sociodemographic Characteristics and Perception of Patient Safety among Respondents**

| Category | Perception Level of Patient Safety | | Test Statistic | p-value |
|---|---|---|---|---|
| | Negative (n=147) Freq (%) | Positive (n=273) Freq (%) | | |
| **Sponsor of education** | | | | |
| Self | 15 (60.0) | 10 (40.0) | $\chi^2 = 10.535$ | **0.015*** |
| Parents | 122 (32.6) | 252 (67.4) | | |
| Guardian | 9 (45.0) | 11 (55.0) | | |
| Scholarship | 1 (100.0) | 0 (0.0) | | |
| **Residence** | | | | |
| School Hostel | 83 (35.0) | 154 (65.0) | $\chi^2 = 0.831$ | 0.660 |
| Staff Quarters | 4 (50.0) | 4 (50.0) | | |
| Off Campus | 60 (34.3) | 115 (65.7) | | |

***Statistically Significant p<0.05**

The association between perception level of patient safety and sociodemographic characteristics is presented in Tables 4.8a and 4.8b.

There was no statistically significant association between age group and perception level ($\chi^2 = 0.261$, $p = 0.610$). Among respondents aged 15–24 years, 121 (34.5%) had negative perception while 230 (65.5%) had positive perception. Similarly, among those aged 25–34 years, 26 (37.7%) had negative perception and 43 (62.3%) had positive perception.

Gender was also not significantly associated with perception level ($\chi^2 = 0.451$, $p = 0.502$). Among males, 56 (37.1%) had negative perception while 95 (62.9%) had positive perception, compared to 91 (33.8%) negative and 178 (66.2%) positive among females.

Marital status was not significantly associated ($\chi^2 = 1.534$, $p = 0.215$). Among single respondents, 143 (34.6%) had negative perception while 270 (65.4%) had positive perception, while among married respondents, 4 (57.1%) had negative perception and 3 (42.9%) had positive perception.

Similarly, level of study was not significantly associated with perception level ($\chi^2 = 1.241$, $p = 0.871$). Across all levels, the majority of respondents had positive perception, including 300 level 53 (69.7%), 400 level 82 (65.6%), 500 level 74 (62.7%), 600 level 33 (64.7%), and final year 31 (62.0%).

Department was also not significantly associated ($\chi^2 = 1.222$, $p = 0.269$). Among respondents in Medicine, 81 (37.5%) had negative perception while 135 (62.5%) had positive perception, compared to 66 (32.4%) negative and 138 (67.6%) positive among those in Nursing.

However, there was a statistically significant association between sponsor of education and perception level ($\chi^2 = 10.535$, $p = 0.015$). Respondents who sponsored themselves had a higher proportion of negative perception 15 (60.0%), and those on scholarship 1 (100.0%) also showed negative perception, compared to those sponsored by parents 122 (32.6%) and guardians 9 (45.0%).

Residence was not significantly associated with perception level ($\chi^2 = 0.831$, $p = 0.660$). Negative perception was slightly higher among respondents in staff quarters 4 (50.0%), followed by those living off-campus 60 (34.3%), and those in the school hostel 83 (35.0%), but these differences were not statistically significant.

Overall, the findings indicate that sponsor of education was the only sociodemographic factor significantly associated with perception level, while age group, sex, marital status, level of study, department, and residence showed no significant association.

**Table 4.9: Predictors of Perception of Patient Safety among Respondents**

| Variable | B (Coefficient) | Odds Ratio (Exp(B)) | 95% CI Lower | 95% CI Upper | p-value |
|---|---|---|---|---|---|
| **Age (years)** | 0.020 | 1.021 | 0.917 | 1.136 | 0.710 |
| **Gender** | | | | | |
| Male * | | 1 | | | |
| Female | -0.004 | 0.996 | 0.606 | 1.638 | 0.988 |
| **Marital status** | | | | | |
| Single * | | 1 | | | |
| Married | -0.652 | 0.521 | 0.103 | 2.626 | 0.430 |
| **Department** | | | | | |
| Medicine* | | 1 | | | |
| Nursing | 0.222 | 1.248 | 0.707 | 2.204 | 0.445 |
| **Level of study** | | | | | |
| 300 level * | | 1 | | | |
| 400 level | -0.057 | 0.944 | 0.459 | 1.941 | 0.876 |
| 500 level | -0.188 | 0.828 | 0.377 | 1.820 | 0.639 |
| 600 level | 0.037 | 1.037 | 0.367 | 2.934 | 0.945 |
| Final year | 0.050 | 1.051 | 0.346 | 3.198 | 0.929 |
| **Residence** | | | | | |
| School hostel * | | 1 | | | |
| University staff quarters | -0.531 | 0.588 | 0.135 | 2.557 | 0.479 |
| Off-campus | 0.219 | 1.245 | 0.785 | 1.973 | 0.352 |
| **Sponsor of education** | | | | | |
| Self* | | 1 | | | |
| Parents | 1.193 | 3.296 | 1.325 | 8.194 | **0.010**[#] |
| Guardian | 0.553 | 1.738 | 0.506 | 5.966 | 0.380 |
| Scholarship | -20.680 | 0.000 | 0.000 | - | 1.000 |

**#Statistically significant p < 0.05 *Reference Category $R^2$ = 3.3 - 4.5%**

The logistic regression analysis of factors associated with the outcome is presented in the table above.

Age was not a statistically significant predictor of the outcome (B = 0.020, OR = 1.021, 95% CI: 0.917–1.136, p = 0.710), indicating that increasing age did not significantly influence the outcome.

Similarly, gender was not significantly associated with the outcome (OR = 0.996, 95% CI: 0.606–1.638, p = 0.988). Female respondents had nearly the same odds of the outcome compared to males.

Marital status was also not a significant predictor (OR = 0.521, 95% CI: 0.103–2.626, p = 0.430), although married respondents had lower odds compared to single respondents.

Department showed no statistically significant association with the outcome (OR = 1.248, 95% CI: 0.707–2.204, p = 0.445), indicating that Nursing students had similar odds compared to Medicine students.

Level of study was also not significantly associated with the outcome, as none of the categories (400 level, 500 level, 600 level, and final year) showed significant differences compared to 300 level (all $p > 0.05$).

Residence was not a significant predictor. Respondents living in staff quarters (OR = 0.588, p = 0.479) and those living off-campus (OR = 1.245, p = 0.352) did not differ significantly from those residing in the school hostel.

However, sponsor of education was a statistically significant predictor of the outcome. Respondents sponsored by parents were about 3.3 times more likely to have the outcome

compared to those who sponsored themselves (B = 1.193, OR = 3.296, 95% CI: 1.325–8.194, p = 0.010). Sponsorship by guardians was not statistically significant (p = 0.380), and scholarship showed no meaningful association (p = 1.000).

Deleted[Mide 02]:

**SECTION D: Determinants of Patient Safety Knowledge and Perception**

**Table 4.10: Determinants of Patient Safety Among Respondents**

| Statement | True n (%) | False n (%) |
|---|---|---|
| **Supervisors emphasize patient safety** | 406 (96.7) | 14 (3.3) |
| **Safety concepts integrated into lectures and training** | 366 (87.1) | 54 (12.9) |
| **Adequate training during clinical postings** | 301 (71.7) | 119 (28.3) |
| **More practical teaching improves performance** | 410 (97.9) | 9 (2.1) |
| **Personal motivation influences safety practice** | 364 (86.7) | 56 (13.3) |

Deleted[Mide 02]:

Determinants of patient safety among respondents showed strong positive perceptions across all measured factors. The majority reported that supervisors emphasize patient safety 406 (96.7%), while only 14 (3.3%) disagreed.

A large proportion also agreed that patient safety concepts are integrated into lectures and training 366 (87.1%), while 54 (12.9%) disagreed. Similarly, 301 (71.7%) reported receiving adequate training during clinical postings, although a notable proportion 119 (28.3%) felt otherwise.

Majority of the respondents agreed that more practical teaching improves performance 410 (97.9%), with only 9 (2.1%) disagreeing. In addition, 364 (86.7%) indicated that personal motivation influences safety practice, while 56 (13.3%) disagreed.

# CHAPTER FIVE

## 5.1 DISCUSSION

This study assessed the knowledge, perception and determinants of patient safety among medical and nursing students in the University of Benin, Benin City, Edo State. The study population consisted predominantly of young adults, with the majority of respondents aged 15–24 years.

The findings of this study showed that the majority of respondents demonstrated good knowledge of patient safety. Most respondents were aware of patient safety concepts and correctly identified key patient safety practices such as hand hygiene, proper patient identification, informed consent, medication safety and infection prevention. Despite the generally high level of knowledge observed, some deficiencies were identified in areas relating to system-based causes of medical errors and the prevention of venous thromboembolism.

Furthermore, the study revealed that respondents generally had a positive perception of patient safety. Most participants acknowledged that patient safety is an essential component of quality healthcare delivery and recognized that many clinical errors are preventable. Positive attitudes were also demonstrated toward teamwork, patient involvement, learning from mistakes and accountability for errors. However, a proportion of respondents expressed uncertainty regarding error reporting and the willingness to challenge unsafe practices among colleagues.

In addition, the study identified several factors associated with respondents' knowledge and perception of patient safety. Variables such as awareness of patient safety, residence, gender and level of study were associated with knowledge level, while sponsor of education significantly influenced respondents' perception of patient safety. These findings suggest that both educational

exposure and sociodemographic factors play important roles in shaping students' understanding and attitudes toward patient safety.

The findings of this study showed that the majority of respondents had good knowledge of patient safety. Prior awareness of patient safety was also high, with lectures and clinical postings identified as the major sources of information. Respondents demonstrated particularly high knowledge regarding prevention of avoidable harm, medication safety, hand hygiene, informed consent, patient identification, patient involvement and infection prevention. However, some deficiencies were identified in areas relating to system-based causes of medical errors and prevention of venous thromboembolism.

The high level of knowledge observed in this study suggests that most respondents possessed adequate understanding of fundamental patient safety principles and safe clinical practices. This finding indicates that patient safety concepts are gradually being integrated into undergraduate healthcare training within the University of Benin. The result may also reflect increasing global and national emphasis on patient safety education within healthcare institutions. Exposure to clinical postings likely contributed to this finding, as students in clinical years are more frequently exposed to real-life healthcare situations where patient safety principles are applied in practice.

The findings of this study are higher than those reported among undergraduate health science students in Southwest Ethiopia, where only 43.2% of respondents demonstrated good knowledge of patient safety[36]. Similarly, a study conducted among nursing students in Malaysia reported that 59.5% had good knowledge of patient safety[41]. The present finding is also slightly higher than the 68.7% reported among clinical students at Obafemi Awolowo University, Nigeria[43]. However, the finding is comparable to the study conducted among physiotherapy students in Ghana, where

97.5% demonstrated moderate knowledge of patient safety[42]. The differences observed between these studies may be related to variations in study populations, curriculum structure, institutional emphasis on patient safety training and methods used for knowledge assessment.

Despite the generally good knowledge level observed, important gaps remained in some domains, particularly regarding system-based causes of medical errors. Only about half of the respondents correctly identified that most medical errors result from failures within healthcare systems rather than individual negligence. This finding suggests that many respondents still adopt a person-focused approach to medical errors rather than a systems-based approach. It further indicates that although students may understand basic patient safety concepts, they may lack deeper conceptual understanding of healthcare systems, human factors and error prevention strategies.

The study also revealed significant associations between knowledge level and sociodemographic variables such as gender, level of study, awareness of patient safety, residence and sponsor of education. Female respondents demonstrated better knowledge compared to males. This may reflect greater academic engagement, attentiveness to patient-centered care issues or increased compliance with learning activities among female students. Respondents in higher academic levels also demonstrated relatively better knowledge, likely due to increased clinical exposure and academic experience gained during training.

Similarly, respondents who had prior awareness of patient safety were significantly more likely to possess good knowledge, emphasizing the important role of educational exposure in shaping patient safety understanding. Students residing off-campus were less likely to demonstrate good knowledge compared to those living in school hostels. This may be because students residing within the school environment have greater access to peer-learning opportunities, academic discussions, tutorials and institutional learning activities.

The high knowledge level observed in this study can largely be attributed to structured academic exposure. Since the study population consisted exclusively of students in the clinical phase of training, respondents were more likely to have been exposed to patient safety principles through hospital-based learning experiences. In addition, increasing access to online educational materials, seminars, workshops and institutional emphasis on safe clinical practice may have further contributed to the high awareness and knowledge levels observed.

However, the comparatively weaker performance in system-based concepts may be due to limitations in current teaching approaches. Traditional lecture-based methods often focus more on factual knowledge and individual responsibilities while giving less attention to systems thinking, human factors and root cause analysis. Consequently, students may develop adequate knowledge of basic patient safety concepts without fully understanding the underlying mechanisms through which healthcare systems contribute to medical errors. This may explain why many respondents attributed medical errors primarily to individual negligence rather than failures within healthcare systems.

Adequate knowledge of patient safety among future healthcare professionals is essential for reducing medical errors, improving quality of care and minimizing preventable morbidity and mortality. Healthcare students with good patient safety knowledge are more likely to adhere to infection prevention measures, practice effective communication, ensure proper documentation and contribute to safer healthcare delivery. The high level of knowledge observed in this study is therefore encouraging, as it suggests that future healthcare professionals are acquiring essential patient safety competencies required for clinical practice.

Nevertheless, the identified gaps in system-based knowledge have important implications for healthcare delivery. Inadequate understanding of system-related causes of medical errors may

limit the ability of future healthcare providers to identify latent errors, participate in quality improvement initiatives and effectively prevent adverse events. In resource-constrained settings such as Nigeria, where healthcare systems already face challenges related to inadequate staffing, poor infrastructure and limited resources, weak systems thinking among healthcare professionals may further compromise patient safety outcomes.

Based on these findings, there is a need to strengthen patient safety education within undergraduate medical and nursing curricula. Educational approaches should move beyond traditional didactic teaching toward more competency-based and experiential learning methods. Simulation-based training, case-based discussions, problem-solving exercises and interprofessional learning should be incorporated to improve students' understanding of systems thinking and real-world application of patient safety principles. Furthermore, dedicated modules on human factors, root cause analysis, quality improvement and incident reporting should be included within healthcare training programs to enhance patient safety competence among future healthcare professionals.

This study also revealed that respondents generally had a positive perception of patient safety. The majority of respondents agreed that patient safety is a global issue, that most clinical errors are preventable, and that learning from mistakes can help prevent future incidents. Respondents also demonstrated positive attitudes toward teamwork, patient involvement, documentation, error reporting and continuous learning as important measures for improving patient safety. However, some respondents expressed uncertainty regarding error reporting, attribution of blame and challenging unsafe practices among colleagues.

The generally positive perception observed in this study suggests that respondents recognized the importance of patient safety in healthcare delivery and appreciated the need for preventive

strategies to minimize patient harm. The finding indicates that respondents understood that patient safety extends beyond individual competence to include communication, teamwork, accountability and continuous learning. The strong agreement regarding learning from mistakes and teamwork further reflects an emerging systems-based understanding of patient safety among the respondents.

Additionally, most respondents rejected negative notions such as prioritizing job targets over patient safety or considering patient safety unimportant. This finding demonstrates a favorable orientation toward safe clinical practice and suggests that respondents value patient welfare and quality healthcare delivery. The finding may also indicate increasing awareness of global patient safety initiatives and growing institutional emphasis on safe healthcare practices within healthcare training institutions.

Furthermore, many respondents indicated that they were comfortable reporting errors and challenging unsafe practices among colleagues. This is an encouraging finding because willingness to report errors and speak up about unsafe practices are essential components of a positive patient safety culture. Open communication and transparency are critical for identifying system weaknesses, preventing adverse events and improving healthcare quality.

The findings of this study are consistent with studies conducted among medical students in Jordan, Tunisia and Malaysia, where respondents demonstrated generally positive attitudes toward patient safety. The Jordanian study reported positive attitudes particularly in domains relating to teamwork and working hours as contributors to medical errors[45]. Similarly, studies conducted in Tunisia and Malaysia also found positive perceptions regarding teamwork, communication and patient safety practices among healthcare students[46,47]. The findings are also comparable to the study conducted at the University of Nigeria Teaching Hospital, Enugu, where

most respondents expressed willingness to receive additional patient safety training and demonstrated positive attitudes toward reporting medical errors[44].

However, this finding contrasts with the study conducted at Obafemi Awolowo University, Nigeria, where a majority (64.1%) of respondents demonstrated negative attitudes toward patient safety[43]. The better perception observed in the present study may reflect increasing awareness, improved curricular integration of patient safety concepts and greater exposure to patient safety education over time.

Despite the generally positive perception observed in this study, some degree of uncertainty and ambivalence remained in certain domains. A notable proportion of respondents expressed neutral views regarding error reporting, attribution of blame and whether errors are within the control of healthcare professionals. Similarly, mixed responses were observed concerning whether healthcare providers feel comfortable reporting errors and whether blame is easier than addressing systemic issues. These findings suggest that although respondents conceptually support patient safety principles, they may be less confident regarding sensitive and practice-oriented aspects of patient safety culture.

The study further revealed that sponsor of education was the only sociodemographic variable significantly associated with perception of patient safety. Respondents sponsored by parents demonstrated more positive perceptions compared to self-sponsored respondents. This finding may be explained by the fact that self-sponsored students may experience greater financial stress, academic burden and psychological pressure, which could negatively influence their attitudes toward learning professional issues such as patient safety. In contrast, students receiving parental support may have relatively more stable learning conditions that positively influence academic engagement and perception.

The positive perception demonstrated by respondents may largely be attributed to increasing emphasis on patient safety globally and within healthcare training institutions. Over the years, patient safety has become a major component of healthcare quality improvement initiatives worldwide, leading to its gradual integration into medical and nursing curricula. Clinical exposure and supervision likely also contributed significantly to shaping respondents' perceptions. During clinical postings, students encounter real-life healthcare situations where they observe both safe practices and the consequences of medical errors. Such experiences reinforce the importance of patient safety beyond theoretical classroom learning.

However, the neutrality observed in some domains, particularly regarding error reporting and blame, may reflect the influence of the hidden curriculum within clinical environments. While formal teaching promotes openness, accountability and systems thinking, students may encounter healthcare settings characterized by hierarchy, fear of criticism and punitive responses to errors. Furthermore, cultural factors particularly in low- and middle-income countries may reinforce authority gradients and discourage open communication. This may discourage students from fully embracing practices such as error reporting or challenging unsafe behavior, thereby contributing to uncertainty in these areas.

Positive perception of patient safety among healthcare students is essential for promoting safe healthcare practices, improving teamwork and communication, encouraging error reporting and reducing preventable patient harm. Healthcare students who possess positive safety attitudes are more likely to develop professional behaviors that support quality healthcare delivery and contribute to stronger patient safety culture within healthcare institutions.

Nevertheless, positive perception alone may not necessarily translate into safe practice if students remain hesitant to report errors or challenge unsafe practices. The uncertainty observed

regarding blame and error reporting may contribute to underreporting of adverse events, persistence of unsafe practices and missed opportunities for system improvement. In resource-constrained healthcare systems such as Nigeria's, where challenges relating to infrastructure, staffing and funding already exist, weak safety culture may further compromise patient outcomes.

Based on these findings, healthcare training institutions should strengthen efforts to promote a supportive and non-punitive patient safety culture. Interprofessional education involving medical and nursing students should also be encouraged to strengthen teamwork and collaborative practice. In addition, institutions should actively address the hidden curriculum by promoting positive role modeling among clinical instructors and creating supportive learning environments where students can openly discuss errors and patient safety concerns without fear of humiliation or punishment. Emphasis should also be placed on systems thinking, professionalism, accountability and development of a culture that prioritizes learning and improvement rather than blame.

Determinants influencing respondents' knowledge and perception of patient safety were identified. Most respondents agreed that their clinical supervisors emphasize patient safety and its importance during training and that patient safety concepts are integrated into lectures and skills training. Respondents also acknowledged that personal motivation influenced adherence to patient safety protocols. In addition, awareness of patient safety and residence were found to be significant predictors of knowledge, while sponsor of education significantly influenced respondents' perception of patient safety.

The findings suggest that educational exposure, learning environment, clinical supervision and personal motivation play important roles in shaping students' understanding and perception of patient safety. The study further indicates that institutional and educational factors significantly

influence the development of patient safety culture among healthcare students. Students who are consistently exposed to patient safety concepts through formal teaching and clinical experiences are more likely to develop adequate knowledge and positive attitudes toward safe healthcare practices.

The finding that practical patient safety teaching improves students' performance may be related to the effectiveness of experiential learning methods. Simulation exercises, bedside demonstrations, supervised procedures and case-based discussions may help students translate theoretical knowledge into practical skills and improve their ability to recognize, prevent and respond appropriately to medical errors. Practical exposure may also improve students' confidence and competence in applying patient safety principles in real clinical settings.

Furthermore, personal motivation was identified as an important determinant of patient safety practices. Students who are personally motivated may be more willing to comply with safety guidelines, seek additional knowledge and actively participate in activities that promote safe patient care. Motivation may also influence students' level of attentiveness, responsibility and commitment to professional standards during clinical practice.

The findings of this study are consistent with previous studies which reported that curriculum integration, simulation-based learning and positive clinical learning environments improve patient safety knowledge and attitudes among healthcare students[29,32]. Previous studies also emphasized that mentorship and exposure to positive role models contribute significantly to the development of professional behaviors that support patient safety practices[29]. Similarly, studies on healthcare education have shown that supportive and non-punitive learning environments encourage students to ask questions, report mistakes and participate more actively in patient safety activities.

The significant association between awareness of patient safety and knowledge suggests that increased exposure to patient safety information may improve students' understanding of safe healthcare practices. The influence of residence and sponsor of education on knowledge and perception may indicate disparities in access to educational resources, academic support and learning opportunities among students, which may contribute to inconsistent application of patient safety principles in healthcare settings and negatively affect patient outcomes.

Identifying determinants of patient safety knowledge and perception is important because it provides evidence that can guide educational interventions, curriculum reforms and institutional policies aimed at strengthening patient safety culture among future healthcare professionals. Adequate patient safety knowledge and positive attitudes among healthcare students are essential for reducing medical errors, improving quality of care and promoting patient-centered healthcare delivery. Conversely, poor educational support, inadequate supervision and limited practical exposure may negatively affect students' preparedness to practice safely and may increase the risk of preventable errors in healthcare settings.

Based on these findings, there is a need for healthcare training institutions to improve practical teaching methods such as simulation training, mentorship programs and promote supportive learning environments that encourage open communication, teamwork and learning from mistakes. In addition, improving access to digital learning platforms and academic resources may help reduce disparities in learning opportunities.

## 5.2 CONCLUSION

The study showed that the majority of respondents possessed adequate knowledge of fundamental patient safety principles, particularly in areas such as infection prevention, medication safety, informed consent, patient identification and patient involvement.

The study also found that respondents generally had positive perceptions towards patient safety. Most respondents acknowledged patient safety as essential component of quality healthcare delivery and the importance of teamwork, communication, patient involvement, documentation, learning from mistakes and accountability in improving patient safety. Although, some uncertainty remained regarding sensitive aspects of patient safety culture, particularly error reporting, attribution of blame and challenging unsafe practices.

Furthermore, the study identified educational exposure, clinical supervision, practical teaching methods and personal motivation as important determinants influencing respondents' knowledge and perception of patient safety.

Overall, the findings revealed that respondents generally demonstrated good knowledge and positive perception of patient safety, reflecting increasing awareness and growing integration of patient safety concepts into healthcare training which will ultimately improve healthcare quality and promote safer healthcare systems in Nigeria.

## 5.3 RECOMMENDATIONS

### To the Federal Ministry of Health

1. Increased funding should be provided for healthcare training to support simulation laboratories, skills acquisition centers and modern teaching facilities to strengthen practical patient safety training.
2. National patient safety policies and incident reporting systems should be strengthened and incorporated into healthcare training institutions.

### To Universities and Training Institutions

1. Patient safety concepts should be integrated across all levels of medical and nursing curricula using structured and standardized modules.
2. Teaching methods should incorporate simulation-based learning, case-based discussions and practical clinical exercises to improve systems thinking and application of patient safety principles.
3. Institutions should promote supportive and non-punitive learning environments that encourage open communication and error reporting without fear of punishment.
4. Interprofessional learning involving medical and nursing students should be encouraged to strengthen teamwork and communication skills.

**To Medical and Nursing Students**

1. Students should actively seek additional knowledge on patient safety through seminars, workshops, online resources and professional development programs.
2. Students should cultivate good communication skills, teamwork, proper documentation and adherence to standard patient safety practices during clinical training.
3. Students should develop confidence in reporting unsafe practices and participating actively in patient safety improvement activities.

## REFERENCES


1. World Health Organization. Patient safety [Internet]. Geneva: World Health Organization; 2020. Available from: https://www.who.int/news-room/fact-sheets/detail/patient-safety
2. Niv Y, Tal Y. Errors in medication administration. In: Patient safety and risk management in medicine: from theory to practice. Cham: Springer Nature Switzerland; 2024. p. 87–93.
3. Rahman Z, Parvin R. Medication errors associated with look-alike/sound-alike drugs: a brief review. J Enam Med Coll. 2015;5(2):110–7.
4. Singh H, Schiff GD, Graber ML, Onakpoya I, Thompson MJ. The global burden of diagnostic errors in primary care. BMJ Qual Saf. 2017;26(6):484–94.
5. Newman-Toker DE, Peterson SM, Badihian S, et al. Diagnostic errors in the emergency department: a systematic review [Internet]. Rockville (MD): Agency for Healthcare Research and Quality; 2022 [cited 2026 Jan 27]. Available from: https://pubmed.ncbi.nlm.nih.gov/36574484.
6. Magill SS, Edwards JR, Bamberg W, Beldavs ZG, Dumyati G, Kainer MA, et al. Multistate point-prevalence survey of health care–associated infections. N Engl J Med. 2014;370(13):1198–208.
7. Sokol-Hessner L, Folcarelli PH, Sands KE. Emotional harm from disrespect: the neglected preventable harm. BMJ Qual Saf. 2015;24(9):550–3.
8. World Health Organization. Global patient safety report 2024. Geneva: World Health Organization; 2024.
9. Leape LL. Making healthcare safe: the story of the patient safety movement. Cham: Springer Nature; 2021.


Formatted[Mide 02]: Justified

10. Bates DW, Singh H. Two decades since To err is human: an assessment of progress and emerging priorities in patient safety. Health Aff (Millwood). 2018;37(11):1736–43.
11. Ephraim-Emmanuel BC, Adigwe A, Oyeghe R, Ogaji DS. Quality of health care in Nigeria: a myth or a reality. Int J Res Med Sci. 2018;6:2875–81.
12. Carver N, Gupta V, Hipskind JE. Medical error. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022.
13. Tamuno-Opubo AT, Uthman TJ, Ojuope AV, Adeleke AB, Oluwasegun JO, Tuwleh L. Patient safety initiatives and practices in Nigerian healthcare settings: a comprehensive analysis of current knowledge, challenges, and barriers. Glob J Health Sci Res. 2024;2:70–81. doi:10.25259/GJHSR_75_2023.
14. Hoffman RM, et al. Building a culture of safety in healthcare: a review of the literature. BMJ Qual Saf. 2018;27(12):1006–12.
15. Fletcher GC, et al. Simulation-based training in healthcare: a systematic review. BMJ Simul Technol Enhanc Learn. 2017;3(1):1–12.
16. Poon EG, et al. Effect of electronic medication reconciliation on adverse drug events in hospitalized patients. JAMA Intern Med. 2016;176(3):352–9. doi:10.1001/jamainternmed.2015.7944.
17. Haynes AB, et al. A surgical safety checklist to reduce morbidity and mortality in a global population. N Engl J Med. 2009;360(5):491–9.
18. Ting WH, Peng FS, Lin HH, Hsiao SM. The impact of SBAR on safety attitudes in the obstetrics department. Taiwan J Obstet Gynecol. 2017;56(2):171–4.

19. Coulter A, Ellins J. Patient engagement in improving safety and quality: what do we know and what do we need to know? BMJ Qual Saf. 2018;27(4):246–50. doi:10.1136/bmjqs-2017-006668.

20. World Health Organization. Global patient safety action plan 2021–2030. Geneva: World Health Organization; 2017.

21. Sarkar U, Gupta K. Patient safety in outpatient care. In: Patient safety: a case-based innovative playbook for safer care. Cham: Springer International Publishing; 2023. p. 303–19.

22. Adebiyi AO, et al. Patient safety in Nigeria: challenges and prospects. Niger J Clin Pract. 2019;22(4):487–91. doi:10.4103/njcp.njcp_245_18.

23. Otobo DD, Ekoja ME, Ugwu NP, Palmer OH, Adefila J, Chukwu OB, et al. Knowledge and application of the WHO safe surgical checklist amongst clinical medical students in Nigeria. Int J Surg Sci. 2023;7(4):5–12.

24. Walton M, Barraclough B. Patient safety—ten years on: a review. Aust Health Rev. 2020;44(1):53–60.

25. Usher K, Woods C, Parmenter G, Hutchinson M, Mannix J, Power T, et al. Self-reported confidence in patient safety knowledge among Australian nursing students. Nurse Educ Today. 2017;57:75–9.

26. Madigosky WS, Headrick LA, Nelson K, Cox KR, Anderson T. Changing and sustaining medical students' knowledge, skills, and attitudes about patient safety. Acad Med. 2016;91(5):718–26.

27. Tang FI, Sheu SJ, Yu S, Wei IL, Chen CH. Nurses relate the contributing factors involved in medication errors. J Clin Nurs. 2017;26(1–2):206–13.

28. Raemer DB, Hannenberg AA, Mullen A. Simulation and patient safety: real or imagined improvement? Simul Healthc. 2016;11(6):328–36.
29. Kumbi M, Hiko D, Buta E. Patient safety culture among undergraduate healthcare students in Ethiopia. J Nurs Educ Pract. 2023;13(4):46–54.
30. Abdrabou MS, El-Sayed HA. Effect of a patient safety educational program on a blame-free culture. J Nurs Res. 2021;29(5):e163.
31. Dunn AS, Bogo M, D'Angelo D, et al. Patient safety education interventions for medical students: a systematic review. J Clin Nurs. 2020;29(13–14):2056–68.
32. Foronda CL, Fernandez-Burgos M, Nadeau C, Kelley CN, Henry MN. Simulation in nursing education and practice. J Patient Saf. 2019;15(4):e61–8.
33. Kim J, An K, Kim MK, Yoon SH. Effects of simulation-based education on nursing students. Nurs Educ Today. 2018;62:130–6.
34. Usher K, Woods C, Conway J, et al. The hidden curriculum of patient safety. BMC Med Educ. 2021;21(1):339.
35. Sexton JB, et al. Safety culture and patient safety: a systematic review. BMJ Qual Saf. 2018;27(4):263–71. doi:10.1136/bmjqs-2016-005874.
36. Mohammed T, Woldearegay E, Kedir S, Ahmed K, Getnet M, Gudina EK. Patient safety knowledge among health science students in Ethiopia. Front Public Health. 2023;10:106489. doi:10.3389/fpubh.2022.106489.
37. Mansour M. Current assessment of patient safety education. Br J Nurs. 2021;30(11):648–54.
38. Ayub F, Afzal N, Ali W, et al. Medical and nursing students' perceptions about a patient safety course. BMC Med Educ. 2024;24(1):452.

39. Olowu AO, et al. Challenges of implementing patient safety initiatives in Nigerian hospitals. BMC Health Serv Res. 2018;18:652. doi:10.1186/s12913-018-3472-4.

40. Levett-Jones T, Andersen P, Bogossian F, et al. Nursing students' patient safety knowledge. Nurse Educ Today [Internet]. 2020;88:104372. Available from: https://doi.org/10.1016/j.nedt.2020.104372

41. Ghosh J, Panduragan SL, Said FM, Salleh ANBM, Bhaumik A. Nursing students' knowledge of patient safety. Malays J Nurs. 2024;16(2):118–25. doi:10.31674/mjn.2024.v16i02.012.

42. Atakora SJS, Quartey J, Kwakye SK. Patient safety knowledge among physiotherapy students in Ghana. S Afr J Physiother. 2021;77(1). doi:10.4102/sajp.v77i1.1499.

43. Oyediran OO, Ofor HC, Ayandiran EO, Ojo IO. Knowledge and attitude toward patient safety among clinical students. J Patient Saf Qual Improv. 2021;9(2):99–107. doi:10.22038/psj.2021.53753.1298.

44. Ogbonna BO, Njideka EL, Chinwendu A. Patient safety practices among final year medical students in Nigeria [Internet]. 2025. Available from: https://www.researchgate.net/publication/395107763

45. Al-Sawalha I, Jaloudi N, Zaben S, et al. Attitudes of undergraduate medical students toward patient safety in Jordan. BMC Med Educ. 2023;23(1):695. doi:10.1186/s12909-023-04672-9.

46. Nadarajan SP, Karuthan SR, Rajasingam J, Chinna K. Attitudes toward patient safety among medical students in Malaysia. Int J Environ Res Public Health. 2020;17(21):7721. doi:10.3390/ijerph17217721.

47. Ezzi O, Mahjoub M, Omri N, et al. Patient safety in medical education: Tunisian students' attitudes. Libyan J Med. 2022;17(1). doi:10.1080/19932820.2022.2122159.

48. Alshahrani S, Alswaidan A, Alkharaan A, et al. Medical students' insights towards patient safety. Sultan Qaboos Univ Med J. 2021;21(2):e253–9. doi:10.18295/squmj.2021.21.02.014.

49. Ogbeifun DE, Archibong UD, Chiedu IE, Ikpe EE. Assessment of borehole water quality in Benin City, Nigeria. Chem Sci Int J. 2019;28(2):1–13. doi:10.9734/csji/2019/v28i230133.

50. Enoma S. Understanding our roots: a historical-cultural perspective of Edo State people of Nigeria [presentation]. Edo Day Celebration; 2024 Aug 31; Perth, Australia. 2024.

51. University of Benin. Student handbook [Internet]. Benin City (Nigeria): University of Benin; date unknown [cited 2025 Oct 10]. Available from: https://uniben.edu/STUDENTHANDBOOK.pdf

52. The Nation. The transformation of UNIBEN's campus [Internet]. Benin City (Nigeria); 2021 Apr 8 [cited 2025 Nov 14]. Available from: https://thenationonlineng.net/the-transformation-of-unibens-campus/

53. University of Benin Teaching Hospital. General information [Internet]. Benin City (Nigeria): UBTH; 2023 [cited 2025 Oct 10]. Available from: https://ubth.org/general-info/

54. Patey R, Flin R, Ross S, Parker S, Cleland J, Jackson J, Moffat M, Thomson A. WHO patient safety curriculum guide for medical schools evaluation study. Aberdeen: University of Aberdeen. 2011 Aug. Retrieved from https: / / www. who.int/ patientsafety/ education/ curriculum/PSP_Eval_Study_Report-2011_ March-2012.pdf

55. Kaveh O, Sharif-Nia H, Hosseini Z, et al. Psychometric evaluation of the Persian version of the Attitudes toward Patient Safety Questionnaire (APSQ-III) in nursing students. BMC Med Educ. 2024;24:1419. doi:10.1186/s12909-024-06318-w.

## APPENDIX I

## INFORMED CONSENT FORM

**TITLE OF RESEARCH: KNOWLEDGE, PERCEPTION AND DETERMINANTS OF PATIENT SAFETY AMONG MEDICAL AND NURSING STUDENTS IN THE UNIVERSITY OF BENIN**

**NAMES AND AFFILIATIONS OF INVESTIGATORS**:

Osasuyi Louisa Osaguona

Department of Public Health and Community Medicine,

University of Benin Teaching Hospital,

PMB 111,

Benin City,

Edo State.

Email: suyi.osaguona@gmail.com

**PURPOSE OF RESEARCH:** To assess the knowledge, perception and determinants of patient safety among medical and nursing students in the university of Benin (UNIBEN) with a view to improve patient safety culture in healthcare.

**PROCEDURES INVOLVED IN THE STUDY**: In this study, questions will be asked regarding the knowledge, perception and factors influencing the knowledge and perception of patient safety among medical and nursing students in UBTH.

**CONFIDENTIALITY**: All data collected will be treated with utmost confidentiality. Students who volunteer to participate in this study will be given a unique study number, and data will be collected. Participants' information will be stored safely secured by codes in computers using only the study identification number. All those handling data will not at any time reveal participants' identity.

**FINANCIAL COMPENSATION**: There shall be no monetary compensation for participation in this study.

**VOLUNTARY PARTICIPATION**: Your participation in this study is entirely voluntary. If you desire to withdraw from this study at any time, no punitive measures will be meted against you for your withdrawal. Your refusal to participate or withdraw from the study will not involve any negative consequences or loss of benefits to which you are otherwise entitled.

**RISK**: It is not expected that any harm will come to you because of your participation in this study. The study does not entail any activity that would harm you.

**BENEFIT**: The study will help to assess the knowledge, perception and determinants of patient safety among medical and nursing students in the university of Benin (UNIBEN).

**FINANCIAL SPONSORSHIP**: This study will be sponsored by the principal investigator.

The under-listed may be contacted in case you have any clarifications to make.

Osasuyi Louisa Osaguona

Department of Public Health and Community Medicine,

P. M. B. 1111,

Benin City,

Nigeria.

Email: suyi.osaguona@gmail.com

Cell: +234 907 693 9110

OR

Ethics and Research Committee,

University of Benin Teaching Hospital

Phone Number: +234 706 333 1337

## APPENDIX II

## QUESTIONNAIRE

**ASSESSMENT OF THE KNOWLEDGE, PERCEPTION AND DETERMINANTS OF PATIENT SAFETY AMONG MEDICAL AND NURSING STUDENTS IN THE UNIVERSITY OF BENIN (UNIBEN), BENIN CITY, EDO STATE**

**S/N** _____

Formatted[Mide 02]: Font: 1 pt

I am a 600-level medical student at the University of Benin, Benin City. This questionnaire is designed to assess the knowledge, perception and determinants of patient safety among medical and nursing students in the University of Benin. **All information given will be treated as confidential**. Kindly answer all questions as best as you can. Please mark and fill in any areas as appropriate. Thank you.

### SECTION A: SOCIO-DEMOGRAPHIC DATA

1. Age in years (as at last birthday) _____
2. Gender _____
3. Ethnic group: Benin ( ) Yoruba ( ) Igbo ( ) Hausa ( ) Others (specify)_____
4. Religion: Christian ( ) Islam ( ) African Traditional religion ( ) Others (specify)_____
5. Marital status: Single ( ) Married ( ) Co-habiting ( ) Separated ( ) Divorced ( ) Widowed ( )
6. Department: _____

7. level: _____

8. residence: school hostel ( ) university staff quarters ( ) Off-campus ( )

9. Who sponsors your education: self ( ) parents ( ) guardian ( ) scholarship ( )

**SECTION B: KNOWLEDGE OF PATIENT SAFETY**

10. Have you heard of patient safety? Yes [ ] No [ ] **If**

11. If yes, what is the source of your information? (**Tick all that apply**) Lecture [ ] Clinical posting [ ] Books [ ] Media (TV, newspaper, radio) [ ] Family [ ] Internet [ ] Friends/peers [ ] Health professionals [ ] Others (specify) _____ Instructions:

For each statement, tick: True, False, or I Don't Know.

12. Patient safety refers to the prevention of avoidable harm to patients during healthcare. True [ ] False [ ] I don't know [ ]

13. Most medical errors result from system failures rather than individual negligence. True [ ] False [ ] I don't know [ ]

14. Medication errors are patient safety issue and are one of the leading causes of injury and avoidable harm in healthcare systems. True [ ] False [ ] I don't know [ ]

15. Unsafe injections practices are component of patient safety in health care settings and can transmit infections, including HIV and hepatitis B and C. True [ ] False [ ] I don't know [ ]

16. Unsafe surgical care procedures are patient safety challenge and can complicate up to 25% of patients. True [ ] False [ ] I don't know [ ]

17. Diagnostic errors can occur in up five percent of adults in outpatient environment and are patient safety issue.

18. Unsafe blood transfusion practices put patients at risk of adverse blood transfusion reactions and the spread of infections.

19. Radiation mistakes include overexposure to radiation and incidence of wrong-patient and wrong-site identification.

20. One of the very common and avoidable causes of patient injury in our hospitals is Venous thromboembolism

21. Patient safety is a central principle and significant actions must be taken to avoid any adverse events.

22. Proper patient identification requires using at least two identifiers (e.g., name and hospital number). True [ ] False [ ] I don't know [ ]
23. Hand hygiene is considered the single most effective measure in preventing healthcare-associated infections. True [ ] False [ ] I don't know [ ]
24. A "near miss" is an event that could have caused harm but was prevented before affecting the patient. True [ ] False [ ] I don't know [ ]
25. Encouraging patients to ask questions and participate in decisions can enhance their safety. True [ ] False [ ] I don't know [ ]
26. Informed consent is an essential part of patient safety. True [ ] False [ ] I don't know [ ]

**SECTION C: PERCEPTION OF PATIENT SAFETY**

For each statement, tick: Strongly agree, Agree, Neutral, Disagree, Strongly disagree.

| S/N | | Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
|---|---|---|---|---|---|---|
| | **Safety Training** | | | | | |
| 27. | Patient safety is a global issue. | | | | | |
| 28. | Most clinical errors are preventable. | | | | | |
| 29. | Most health care staff make errors. | | | | | |
| 30. | I would feel comfortable reporting any errors I had made, no matter how serious the outcome had been for the patient | | | | | |
| 31. | Most errors are out of staff control. | | | | | |
| 32. | Accepting and dealing with my faults will be a significant part of my job. | | | | | |
| 33. | If I continue to learn from my mistakes, I can avert incidents. | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 34. | It is easy to find somebody to fault rather than concentrating on the sources of the mistake. | | | | | |
| 35. | I am bold in speaking to my colleague who is displaying a lack of concern for a patient's safety. | | | | | |
| 36. | Even the most experienced and competent health professionals make errors | | | | | |
| 37. | I believe that completing documentation forms will help to advance patient safety. | | | | | |
| 38. | Meeting the target of my job is more important than patient safety. | | | | | |
| 39. | Most medical errors result from careless nurses | | | | | |
| 40. | Most medical errors result from careless doctors | | | | | |
| 41. | It is not necessary to report errors which do not result in adverse outcomes for the patient | | | | | |
| 42. | Better multi-disciplinary teamwork will reduce medical errors | | | | | |
| 43. | Encouraging patients to be more involved in their care can help to reduce the risk of medical errors occurring | | | | | |
| 44. | Patient safety is not an important concern for my profession. | | | | | |
| 45. | Patient safety issues cannot be taught and can only be learned by clinical experience when qualified | | | | | |
| 46. | Learning about patient safety issues before I qualify will enable me to become a more effective health professional | | | | | |

**SECTION D: DETERMINANTS OF PATIENT SAFETY**

For each statement, tick: True or False.

47. My clinical supervisors clearly emphasize the importance of patient safety. True [ ] False [ ]
48. Patient safety concepts are well integrated into my lectures and skills training. True [ ] False [ ]
49. I have received adequate training on patient safety during my clinical postings. True [ ] False [ ]
50. I believe that more practical patient safety teaching would improve my performance True [ ] False [ ]
51. My personal motivation influences how strictly I follow patient safety protocols. True [ ] False [ ]

Thank you for your time and patience. Please state any other determinants of patient safety knowledge and perception in the box below.

## APPENDIX III

## ETHICAL CLEARANCE APPROVAL LETTER

**HEALTH RESEARCH ETHICS COMMITTEE (HREC)**

**UNIVERSITY OF BENIN TEACHING HOSPITAL**

P.M.B. 1111 BENIN CITY NIGERIA Telephone: 052-600418 Website: ubth.org

**CHIEF MEDICAL DIRECTOR** Prof. (Mrs) I.N Ize-Iyamu

**DIRECTOR OF ADMINISTRATION** Jim Uwadie, Esq

**CHAIRMAN** Prof. (Mrs.) Antoinette N. Ofili

***HREC OFFICE:***
**Committee email: ubthresearchethics@gmail.com**
***Registration Number:***
**NHREC-UBTH-HREC/24/12/2022B**

PROTOCOL NUMBER: ADM/E 22/A/VOL. VII/1486549127280

PROPOSAL TITLE: "KNOWLEDGE, PERCEPTION AND DETERMINANTS OF PATIENT SAFETY AMONG MEDICAL AND NURSING STUDENTS IN THE UNIVERSITY OF BENIN (UNIBEN), BENIN CITY, EDO STATE"

PRINCIPAL INVESTIGATOR(S): OSASUYI LOUISA OSAGUONA

DEPARTMENT/INSTITUTION: DEPARTMENT OF PUBLIC HEALTH AND COMMUNITY MEDICINE, SCHOOL OF MEDICINE, UNIVERSITY OF BENIN, BENIN CITY, EDO STATE, NIGERIA

DATE CONSIDERED: FEBRUARY 23RD, 2026

DECISION OF THE COMMITTEE: APPROVED

*THIS APPROVAL DATES 23/02/2026 TO 22/01/2027. IF THERE IS DELAY IN STARTING THE RESEARCH, PLEASE INFORM THE HREC SO THAT THE DATES OF APPROVAL CAN BE ADJUSTED ACCORDINGLY*
REMARK:

CHAIRMAN: PROF. (MRS) A.N. OFILI SIGNATURE & DATE..... 23/2/2026

SUPERVISOR (S): PROF OBEHI OKOJIE, DR. NDUBUISI MOKOGWU

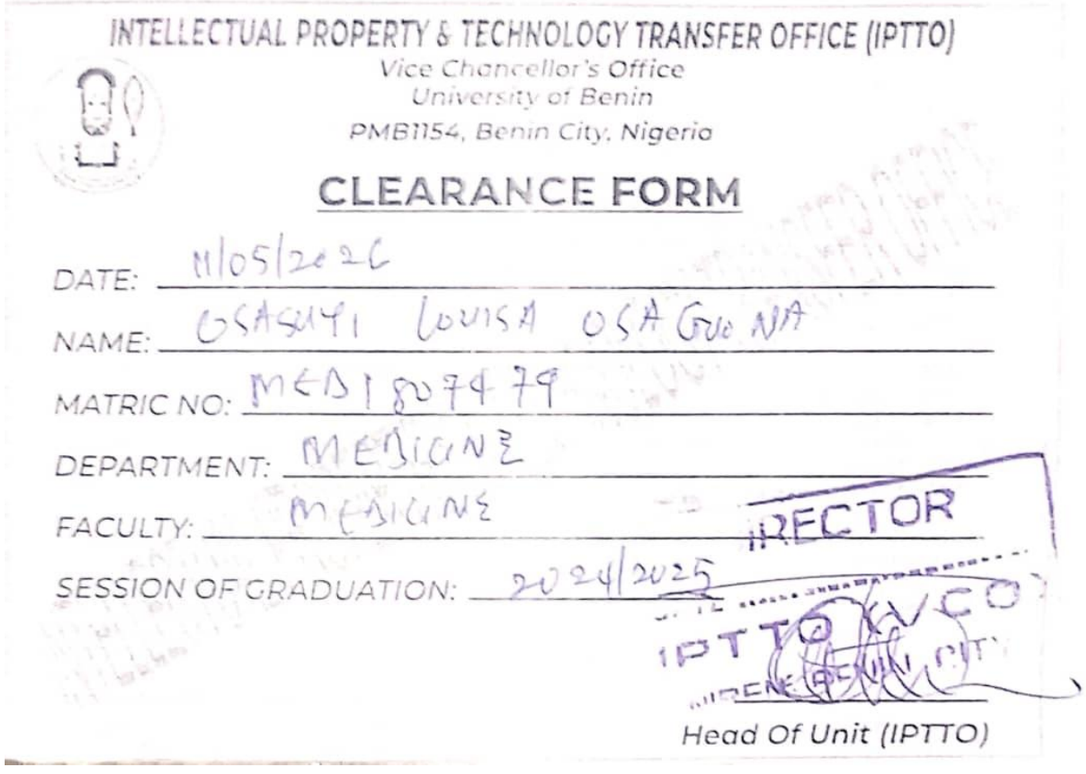
DECLARATION BY INVESTIGATOR(S):
PROTOCOL NUMBER (please quote in all enquiries)
Note that no participant accrual or activity related to this research may be conducted outside of these dates and **you are to furnish the committee with the research activities at the completion of the study.** All informed consent forms used in this study must carry the HREC assigned number and duration of HREC approval of the study. In multiyear research, endeavor to submit your annual report to the HREC early in order to obtain renewal of your approval and avoid disruption of your research. No changes are permitted in the research without prior approval by the HREC except in circumstances outlined in the Code. The HREC reserves the right to conduct compliance visit your research site without previous notification.

Signature & Date.....

ubthresearchethics@gmail.com **Registration Number: NHREC/24/01/2020**

**APPENDIX IV**

**PLAGIARISM CHECK RECEIPT**



INTELLECTUAL PROPERTY & TECHNOLOGY TRANSFER OFFICE (IPTTO)

Vice Chancellor's Office
University of Benin
PMB1154, Benin City, Nigeria

CLEARANCE FORM

DATE: 11/05/2026

NAME: OSAGIYI LOUISA OSAGUONA

MATRIC NO: MED/807479

DEPARTMENT: MEDICINE

FACULTY: MEDICINE

SESSION OF GRADUATION: 2024/2025

DIRECTOR

IPTTO, UVCO

Head Of Unit (IPTTO)