ASSESSMENT OF KNOWLEDGE AND ATTITUDES OF PATIENT SAFETY AND EVALUATION OF PATIENT SAFETY CULTURE AMONG CLINICAL STUDENTS AT UNIVERSITY OF BENIN TEACHING HOSPITAL, BENIN CITY

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

MAY 2026

DECLARATION

I hereby declare that this project work titled "**ASSESSMENT OF KNOWLEDGE AND ATTITUDES OF PATIENT SAFETY CULTURE AMONG CLINICAL STUDENTS AT UNIVERSITY OF BENIN TEACHING HOSPITAL, BENIN CITY"** will be conducted under supervision and has not been submitted in part or in full for any purpose.

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DOGHOR JOVITA AGHOGHO **DATE**

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CERTIFICATION

This is to certify that this research study titled "**ASSESSMENT OF KNOWLEDGE AND ATTITUDES OF PATIENT SAFETY CULTURE AMONG CLINICAL STUDENTS AT UNIVERSITY OF BENIN TEACHING HOSPITAL, BENIN CITY"** will be conducted by **DOGHOR JOVITA AGHOGHO** with matriculation number **MED1708999** under the supervision of **PROF. E.O OGBOGHODO** in the Department of Public Health and Community Medicine, College of Medical Sciences, University of Benin as part of the requirements for the award of Bachelor of Medicine, Bachelor of Surgery (MBBS) degree.

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DEDICATION

This project is dedicated first and foremost to God Almighty, by whose grace, strength, and infinite mercy I was sustained throughout this rigorous journey.

To my beloved parents, Comrade Johnson Doghor and Mrs. Regina Doghor, for your unwavering love, sacrifices, and belief in my dreams. Your prayers and endless support have been the foundation of my success.

To my dear siblings, Michael Doghor and Austin Doghor, thank you for always being my pillars of strength and encouraging me every step of the way.

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To my closest friends, Dr. Otasowie Omoigberale and Dr. Osasuyi Okaundia, for walking this demanding path with me, keeping me grounded, and sharing in both the challenges and victories of medical school.

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LIST OF ABBREVIATIONS

AHRQ: Agency for Healthcare Research and Quality

FDGs: Focused Group Discussions

HAIs: Healthcare-Associated Infections

HSOPSC: Hospital Survey on Patient Safety Culture

HCPs: Healthcare Professionals

KIIs: Key Informant Interviews

LMICs: Low-and-Middle-Income Countries

PSC: Patient Safety Culture

SAQ: Safety Attitudes Questionnaire

UBTH: University of Benin Teaching Hospital

USA: United States of America

WHO: World Health Organization

DEFINITION OF TERMS

Attitude: an individual's feelings, beliefs, and predispositions towards a particular concept or practice, which influence their behavior.

Adverse events: an injury or harm to a patient that results from medical care or healthcare management rather than from the patient's underlying disease or condition.

Clinical student: a student in his/her fourth year and beyond who is gaining practical experience in a clinical setting under the supervision of medical professionals.

Knowledge: The awareness and understanding of patient safety principles and practices.

Patient: an individual who receives or is registered to receive healthcare services from a health care professional, facility, or system, whether for diagnosis, treatment, preventive care or health advice.

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

Patient safety culture: shared values, beliefs, attitudes and behaviours of healthcare workers that determines the organization commitment to, and proficiency in, patient safety.

Patient safety culture grade: a summary measure that reflects the overall perception or evaluation of safety culture within a unit, department or hospital.

ABSTRACT

Background: Patient safety is a fundamental pillar of healthcare quality, yet preventable adverse events contribute significantly to global morbidity and mortality, particularly in resource-limited settings. Clinical students actively participate in patient care, making their understanding and practice of safety principles critical to preventing institutional errors.

Objective: This study assessed the knowledge and attitudes regarding patient safety and evaluated the patient safety culture (PSC) practices among clinical students at the University of Benin Teaching Hospital (UBTH), Benin City, Nigeria.

Methodology: A cross-sectional, mixed-methods study was conducted between April 2025 and April 2026 among 637 clinical students across five disciplines (Medicine, Nursing, Medical Laboratory Science, Physiotherapy, and Paramedics) selected via stratified random sampling. Quantitative data were collected using a modified questionnaire adapted from the World Health Organization (WHO) and the Agency for Healthcare Research and Quality (AHRQ), while qualitative data were gathered via Focus Group Discussions (FGDs). Quantitative data were analyzed using IBM SPSS version 27.0, employing descriptive statistics, bivariate analysis, and binary logistic regression. Qualitative transcripts underwent thematic analysis.

Results: The mean age of the respondents was 23.41 \pm 2.08 years, with a slight female predominance (52.1%). A significant majority (75.0%) possessed good overall knowledge of patient safety principles, with the highest domain scores in the systems view of errors (84.3%). Moving to the senior 600 level (AOR: 2.370, p = 0.045) and receiving prior formal

safety training (AOR: 1.850, p = 0.004) were independent predictors of good knowledge. Conversely, spending >12 hours a day in the hospital nearly halved the odds of maintaining good knowledge (AOR: 0.534, p = 0.031). Attitudes were overwhelmingly favorable, with 91.2% demonstrating a positive mindset, which strongly associated with higher cognitive scores (p = 0.004).

However, actual patient safety culture practice fell dramatically short, with 73.8% of participants exhibiting poor overall practice. Only 19.5% had ever filed a formal incident report. Among the 513 students who never filed a report, the primary barriers identified were fear of victimization or blame (58.0%), strict institutional hierarchies (44.3%), and high workloads (42.0%). Key curricular and experiential gaps identified included an absolute lack of formal instruction in root cause analysis (59.0%) and incident reporting protocols (49.3%).

Conclusion: Clinical students at UBTH display robust theoretical knowledge and highly positive attitudes toward patient safety responsibilities, but institutional, systemic, and cultural barriers significantly impede the translation of these attributes into safe clinical practices. Addressing this disconnect requires aggressive educational reforms, such as integrating simulation-based learning into clinical rotations, and structural interventions by hospital management to establish a accessible, transparent, and non-punitive incident reporting environment.

Keywords: Patient Safety, Safety Culture, Incident Reporting, Clinical Students, Teaching Hospital, Nigeria.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Patient safety, widely recognized as a central pillar of quality healthcare, is the prevention of avoidable harm to patients during the delivery of health services. Over the past two decades, awareness of patient-safety issues has grown significantly, driven by increasing evidence that many adverse events in hospitals are preventable. The World Health Organization (WHO) estimates that one in every ten patients globally experiences some form of harm while receiving healthcare, with almost half of these events being preventable.[1] These events range from medication errors, hospital-acquired infections, and diagnostic delays to communication breakdowns and unsafe clinical procedures. The burden of unsafe care is particularly pronounced in low- and middle-income countries (LMICs), where the WHO reports that approximately 134 million adverse events and 2.6 million deaths occur annually as a result of unsafe practices in hospital settings.[2] These figures highlight the global scale of the problem and have prompted health systems, educational institutions, and policymakers worldwide to strengthen efforts aimed at embedding safety principles within healthcare practice.

A major turning point in global attention to patient safety followed the publication of the Institute of Medicine's landmark report To Err is Human in 1999, which revealed that tens of thousands of deaths occurred each year in the United States due to preventable medical errors.[3] This report shifted the focus from blaming individuals for mistakes to examining how weaknesses in healthcare systems contribute to unsafe care. In response, many health organizations introduced new standards, improved reporting mechanisms, and placed greater emphasis on teamwork, communication, and organizational learning. Within this broader movement, the concept of patient safety culture emerged as a key element in shaping how

healthcare workers perceive, prioritize, and act on safety issues. Patient safety culture refers to the shared values, beliefs, norms, and practices within an organization that influence attitudes, and behaviours relating to patient safety.[4] A strong safety culture encourages open communication, supports teamwork, promotes learning from errors, and creates an environment where individuals feel comfortable speaking up when safety concerns arise.

The need for patient safety education has been recognised worldwide, with global initiatives emphasizing its integration into healthcare curricula. The WHO developed a Patient Safety Curriculum Guide to assist institutions in incorporating safety principles into undergraduate and postgraduate programmes. This curriculum addresses topics such as error prevention, teamwork, risk management, and reporting mechanisms, and it emphasizes the importance of instilling a positive safety culture early in healthcare training.[5]

Patient safety culture (PSC) encompasses shared values, beliefs, attitudes, and behaviours of healthcare workers that determine the organization's commitment to, and proficiency in, patient safety.[6] It comprises core dimensions on communication openness, non-punitive response to error, organizational learning, leadership support, and error reporting, among others.[7] Attitudes toward PSC are particularly important, as they determine whether students feel empowered to speak up, report errors, and engage actively in safety practices. In both developing and developed countries, some studies have reported relatively high perceptions of PSC among students; knowledge and attitudes often remain suboptimal, indicating gaps in training and reinforcement of safety concepts.[8,-10] These findings highlight the importance of assessing PSC among students within specific institutional contexts, as variations in educational structure, supervision, and organizational culture may influence outcomes.

Various tools and frameworks have been developed to assess patient safety culture and identify areas requiring improvement. Among the most widely used are the Hospital Survey

on Patient Safety Culture (HSOPSC) developed by the Agency for Healthcare Research and Quality (AHRQ) and the Safety Attitudes Questionnaire (SAQ), both of which measure dimensions such as teamwork, communication openness, leadership support for safety, and responses to error .[11] These tools have been applied in many countries to understand the strengths and weaknesses of patient safety culture within healthcare institutions. In 2021, WHO further advanced global efforts by launching the Global Patient Safety Action Plan 2021–2030, which emphasizes the importance of building resilient systems, strengthening learning, and integrating patient-safety training into all levels of professional education.[12] According to this framework, early exposure to patient-safety concepts during undergraduate and postgraduate training is essential for developing competent and safety-conscious healthcare professionals.

In low-and-middle-income countries (LMICs), including Nigeria, patient safety challenges are compounded by limited resources, infrastructure deficits, workforce shortages, and underdeveloped reporting systems.[13,14] These systemic limitations not only affect practicing professionals but also influence the training environment for clinical students. Resource limitations may lead to a high patient-provider ratio, increased workload, and reduced supervision time, which can compromise both patient safety and quality of clinical training. In such contexts, fostering a strong safety culture among students becomes even more critical, as they must learn to navigate complex systems while maintaining high standards of care.

Clinical students occupy a unique position within the healthcare system. Although they are learners, they actively participate in patient care through tasks such as history taking, physical examinations, medication preparation, wound care, documentation, and carrying out basic clinical procedures. These responsibilities expose students to both the technical and interpersonal aspects of patient care, making them potential contributors to patient safety but

also placing them at risk of making errors if they lack adequate knowledge or support. The clinical environment in which they train has a strong influence on their understanding of safety principles. Students often form their behaviours by observing clinical staff, absorbing unit routines, and adapting to the local culture of communication and supervision.[1] Positive experiences, such as clear supervision, open communication, and adherence to safety protocols, reinforce safe practices, while environments characterized by uncertainty, inconsistent practices, or unclear expectations can weaken the development of appropriate safety habits.

1.2 STATEMENT OF THE PROBLEM

Unsafe healthcare remains a major and persistent global public-health challenge. Current evidence emphasizes not only its occurrence but its magnitude and consequences: an estimated 8.6 million deaths annually in low- and middle-income countries (LMICs) are amenable to health care, with approximately 5.0 million attributable to poor-quality care, underscoring the critical role of safety and quality in determining health outcomes.[15,17] LMICs bear a disproportionate share of this burden, with systematic reviews demonstrating significantly higher rates of healthcare-associated infections prevalence ranging from 5.7% to 19.1%, compared to 3.5%–12% in high-income countries.[16] These avoidable harms result in loss of life, severe harm, long-term disability, and substantial economic costs; globally, the cost of unsafe care is estimated to exceed US$1 trillion annually, contributing significantly to erosion of public confidence in healthcare systems.[1,17,18]

In sub-Saharan Africa and in Nigeria in particular, empirical studies repeatedly document gaps in core safety processes. In Northern Nigeria, point-prevalence surveys have reported HAI rates of approximately 14–20% among hospitalized patients, indicating a substantial burden of preventable infections.[19] In Katsina public hospitals, over 60% of nurses reported

poor patient-safety culture, particularly in domains such as staffing adequacy, non-punitive response to error, and frequency of incident reporting.[20] In Enugu, only 38.8% of surgeons were aware of institutional safety protocols, while just 11.3% consistently practiced them, reflecting low adherence to essential safety standards.[21] These system-level failings create environments in which errors and near misses are more likely to occur and remain under-detected and under-reported.[20,21]

Clinical students, medical, nursing, and allied health learners who provide supervised direct patient care as part of their training, are an important but still under-examined component of the patient safety ecosystem. Globally, over 50% of undergraduate medical curricula lack structured patient safety training, despite the availability of frameworks such as the World Health Organization Patient Safety Curriculum Guide. During clinical placements, students perform tasks such as history-taking, medication preparation, and assisting in procedures; these activities are central to learning, but they also place students in situations where unsafe actions can affect patient outcomes directly or indirectly.[22,23]

Available studies suggest a consistent pattern: many students demonstrate some factual awareness of patient safety, but gaps remain in error disclosure, systems thinking, and confidence to speak up when care is unsafe.[23-25] Studies indicate that although over 60% of students report good theoretical knowledge of patient safety, fewer than 40% demonstrate positive attitudes toward error reporting and disclosure.[24] Furthermore, up to 70% of healthcare workers report reluctance to speak up about safety concerns, primarily due to fear of negative consequences, conflict with senior staff, or concerns about professional image.[25] This disconnect knowledge, without consistent attitudes and behaviours, is a critical vulnerability, because it allows unsafe practices to persist during training and later in professional practice.[23-25]

The clinical training environment strongly shapes how students translate knowledge into practice. Where supervision is inconsistent, workloads are heavy, and safety procedures are weakly enforced, students rely heavily on observational learning and role modelling. Evidence shows that in settings with poor safety culture, up to 50–80% of adverse events go unreported, largely due to fear of blame and punitive responses.[25,26] The concept of psychological safety is central here: it refers to a shared belief that it is safe to take interpersonal risks such as asking questions, admitting mistakes, or voicing concerns. In healthcare, low psychological safety is closely tied to poor speaking-up behaviour and missed learning opportunities, while fear of blame, criticism, or retaliation discourages reporting and weakens patient safety culture.[26]

A further challenge is the inconsistent integration of patient safety into undergraduate curricula. Despite established frameworks such as the World Health Organization Patient Safety Curriculum Guide, evidence shows that less than 50% of medical schools globally have formal, structured patient safety training programmes, with even lower coverage reported in LMICs. Studies indicate that a significant proportion of students up to 60–70 report learning patient safety informally through clinical exposure rather than structured teaching, leading to variability in knowledge acquisition and competency development. Consequently, even where curricula mention patient safety, students' exposure, depth of learning, and practice opportunities often differ widely.[22,23]

The consequences of these combined gaps are substantial and measurable. Globally, it is estimated that 134 million adverse events occur annually in hospitals in LMICs, contributing to approximately 2.6 million deaths, highlighting the scale of preventable harm.[18] In addition, healthcare-associated infections affect 7–10% of hospitalised patients worldwide, with significantly higher rates in developing countries.[16] In Nigeria, studies have reported persistently poor patient safety culture, with over 50% of healthcare workers demonstrating

negative safety attitudes and low reporting practices.[20,21] Because clinical students rotate across departments and institutions, the safety practices they acquire, whether safe or unsafe, are highly transferable. This makes clinical training both a risk for perpetuating unsafe norms and a strategic opportunity to instil safe practices early in professional development, thereby improving long-term patient safety outcomes.[22-26]

1.3 JUSTIFICATION

Strengthening patient safety among clinical students is an upstream, high-leverage investment in health systems. Pre-service education is a formative period during which professional identity and habits are established; embedding systems thinking, teamwork, open communication, and safe procedural skills into training increases the probability that graduates will routinely practice safely and promote safety culture in their workplaces.[5] By contrast, tolerating fragmented or informal safety education risks perpetuating behaviours that contribute to preventable harm.

There is an important gap in the literature; while facility-level studies and national reports document serious safety challenges in many LMIC hospitals, evidence focused specifically on clinical students, their preparedness, their willingness to raise concerns, and the degree to which curricula and supervision build competence is limited. The studies that do exist (including multi-country and country-level investigations) frequently show the same pattern: reasonable factual knowledge but less favourable attitudes or low speaking-up confidence, and inconsistent curricular coverage of patient safety domains.[25,29,30] Without routine, comparable data on student safety competencies and training-environment characteristics, educational reforms cannot be prioritized or evaluated efficiently.

From a policy perspective, actionable evidence about students' readiness for safe practice will inform regulators and training institutions in several ways: targeted curriculum revision around WHO-recommended patient-safety competencies; development of supervised, simulation-based learning opportunities that bridge the gap between knowledge and behaviour; faculty development to improve role modelling and create psychological safety; and institutionally appropriate reporting mechanisms that include protected, educational debriefing for students who report near misses.[1,15,16,19] These measures are relatively low cost and high value compared with system-wide infrastructure investments, and they are directly actionable by training institutions and ministries of health/education.

The study's findings have system-level relevance; improving student competency in patient safety supports long-term workforce quality, reduces the incidence of preventable adverse events, lowers avoidable healthcare expenditure, and strengthens public trust. Given WHO's global agenda and the African regional priorities on patient safety, locally generated evidence on students' safety competencies is timely and policy-relevant.[1,15,27] This study therefore fills an important evidence gap and provides a foundation for practical, measurable interventions that can be scaled across LMIC teaching hospitals.

1.4 RESEARCH QUESTIONS

1. What is the level of knowledge regarding patient safety culture principles among clinical students at UBTH?

2. What are the attitudes of clinical students towards patient safety culture responsibilities at UBTH?

3. What is the safety culture perceived within clinical training environments by clinical students at UBTH?

4. What gaps exist in the patient safety curriculum and experiential learning for clinical students at UBTH?

1.5 AIMS AND OBJECTIVES

General Objective:

To access the knowledge, and attitudes of clinical students regarding patient safety and evaluation of their patient safety culture at the University of Benin Teaching Hospital, Benin City.

Specific Objectives:

1. To assess the level of knowledge regarding patient safety culture principles among clinical students at UBTH.

2. To evaluate students attitudes towards patient safety culture responsibilities at UBTH.

3. To evaluate the safety culture within clinical training environments at UBTH.

4. To identify gaps in patient safety curriculum and experiential learning at UBTH.

CHAPTER TWO

LITERATURE REVIEW

2.1 CONCEPTUAL FRAMEWORK

The conceptual framework for this study is based on the premise that attitudes toward patient safety culture among clinical students are shaped by the interaction between individual characteristics and the clinical training environment. This framework is adapted from established theoretical models, including Social Learning Theory, Theory of Planned Behavior, and the Donabedian Model.[31-33]

Social Learning Theory posits that learning occurs through observation, imitation, and interaction with others within a social context.[31] In clinical settings, students are exposed to behaviours, norms, and practices demonstrated by senior clinicians and other healthcare professionals. These observed behaviours, whether safe or unsafe, play a critical role in shaping students' internalization of patient safety principles. Evidence shows that role modelling significantly influences professional behaviour and safety-related decision-making among trainees.[25]

The Theory of Planned Behavior provides a behavioural lens for understanding how knowledge translates into action.[32] According to this theory, knowledge influences attitudes, which in turn shape behavioural intentions and practices. However, research indicates that knowledge alone is insufficient to ensure safe practice, as attitudes toward error reporting,

communication, and responsibility for patient safety are strongly influenced by contextual and social factors.[23,24]

The Donabedian Model further strengthens this framework by emphasizing the role of healthcare system factors in determining outcome.[3]

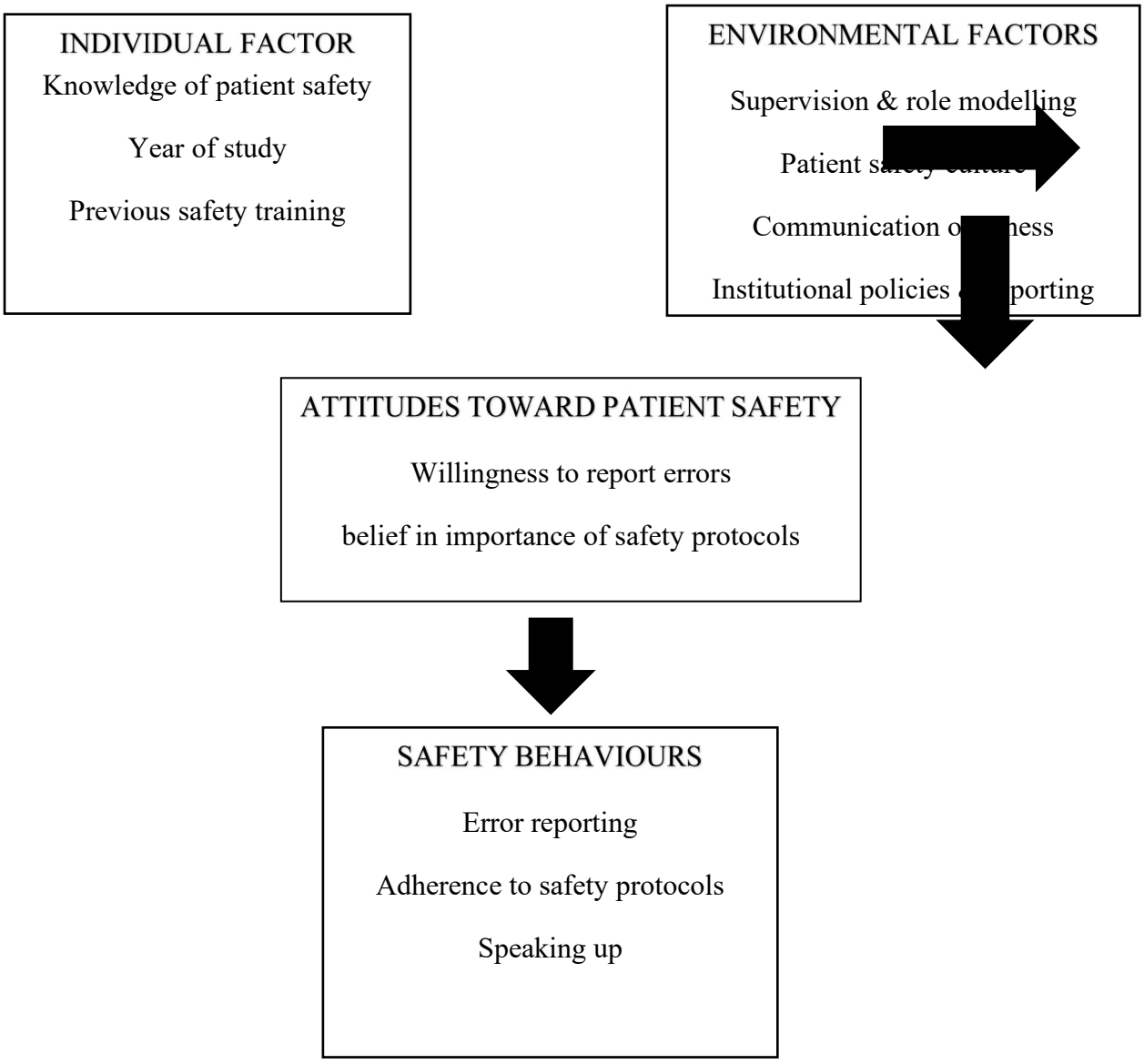

Figure 1: Conceptual framework illustrating the relationship between individual factors, clinical environment, and attitudes toward patient safety culture among clinical students (Adapted from Social Learning Theory, Theory of Planned Behavior, and Donabedian Model).[31-33]

It highlights how structural elements such as institutional policies, supervision, and organizational culture influence care processes, which ultimately affect outcomes. In the context of this study, the clinical learning environment represents a critical structural component that shapes students' experiences and attitudes toward patient safety.

Together, these theories provide a comprehensive explanation of how clinical students develop attitudes toward patient safety culture. Individual factors such as knowledge and prior training interact with environmental influences such as supervision, organisational culture, and communication patterns to shape students' perceptions and responses to patient safety issues. These attitudes, in turn, influence safety-related behaviours and future professional practice.

This integrated framework provides a structured basis for examining the determinants of attitudes toward patient safety culture among clinical students and highlights the importance of both educational interventions and supportive clinical environments in improving patient safety outcomes

2.2 Knowledge regarding patient safety culture

In 2021, a descriptive cross-sectional study was carried out among third and fourth grade nursing and midwifery students attending a state university in Samsun, Turkiye. It aimed to assess the students' patient safety knowledge and competencies in the classroom and clinical

setting, as well as its determinants. A total of 318 students were recruited for the study using convenience sampling technique. Data were collected from respondents using a self-administered questionnaire. Results showed that patient safety knowledge among the students were above average with nursing and midwifery students having a mean score of 6.76±1.63 and 6.64±1.60 respectively.[34] This study possesses the strength of a relatively large sample size, however, the use of non-probability sampling and fewer items on the data collection tool reduces the statistical validity of findings.

An institution-based cross-sectional study was conducted at Jimma University Institute of Health, in Addis Ababa, Ethiopia in 2021. The study had the objective of assessing the knowledge, attitude, practice, and factors influencing patient safety practice among undergraduates in health sciences at the university. Six hundred and seventy-eight (678) students participated in the study and were recruited using stratified sampling technique. A structured, self-administered questionnaire was used to collect data. Findings were that 43.2% of the respondents had good knowledge while the remaining 56.8% had poor knowledge.[35] A major strength in this article is the substantial sample size and the use of probability sampling technique while a single-centre approach limits its generalizability.

A descriptive cross-sectional study was conducted in 2025 among final-year physiotherapy students in two universities (Thomas Adewumi University and University of Ilorin) in Kwara State, Nigeria. The objective of the study was to assess the knowledge, perception, and attitude of these students towards patient safety. A total of 195 students participated in the study and were selected using stratified sampling technique. Data collection was done with the use of a self-administered questionnaire. Findings showed that majority of respondents had moderate knowledge on patient safety, with 39% on human errors that can be made in patient care, 37.4% on factors contributing to such errors, and 37.9% on methods of notifying errors among others.[36] The research article stands out in that it used more than one institution

and employed a probability sampling technique allowing for sufficient randomization. Also, the article is very recent and therefore provides highly contemporary data. A weakness in the study is the use of students from only a department in medical sciences.

In 2021, a descriptive cross-sectional study was carried in Ibadan, Nigeria, among clinical students attending Obafemi Awolowo University. The study aimed to assess the level of knowledge, sources of knowledge, and the relationship between knowledge and attitude towards patients' safety among the study population. The sample size consisted of 281 clinical students who were recruited using convenient sampling technique. Data were collected through a structured, self-administered questionnaire. Results were that about 68% had good knowledge of patient safety, 19.6% had fair knowledge and 11.7% had poor knowledge.[28] The strengths of the literature are that it utilized a moderately large sample size and included students from the various departments in medical sciences (nursing sciences, medicine, pharmacy, dentistry and medical rehabilitation). However, the use of convenience sampling does not provide room for randomization of the sample and reduces the generalizability of findings.

A mixed-methods, descriptive cross-sectional study was carried out in 2016 among health care providers and managers at Nnamdi Azikiwe University Teaching Hospital, Nnewi, Nigeria. It aimed to determine the awareness, knowledge, attitude and practice of PSC in a tertiary hospital. The sample size consisted of 281 medical personnel for the quantitative part, selected via stratified sampling technique, and 27 personnel for the qualitative part who were recruited using convenience sampling technique. Quantitative data were collected through a structured, self-administered questionnaire while qualitative data were collected through focused group discussions (FGDs) and key informant interviews (KIIs). Results showed that knowledge of PSC among the respondents was a mean of 54.5%±16.4 which was slightly above the cut-off of 54%.[37] Utilization of a mixed-methods approach helps to improve

comprehension of data, nonetheless, there was no transparency or sufficient presentation of findings in regards to knowledge, attitude, and practice outcomes.

In 2018, a quasi-experimental study was conducted which employed a pre-test and a post-test intervention design on two groups of 400 level nursing students from Babcock University, Ogun State and Afe Babalola University, Ekiti State, Nigeria. It aimed to investigate the influence of an educational intervention on the knowledge of nursing students in regards to PSC. A total of 113 students took part in the study and a multistage sampling technique was employed. Data were compiled using a self-developed questionnaire which was filled in by the respondents and returned. Findings were that moderate knowledge on PSC was prevalent in 90.91% of the control group and 81.25% of the experimental group, pre-intervention. After the intervention, 96.2% of the experimental group had high knowledge while a majority of the control group remained at moderate knowledge.[38] The strength of the literature lies in the adoption of a quasi-experimental study design which provides stronger evidence than observational studies, nonetheless, the use of a non-standardized questionnaire reduces the validity and comparability of findings with other studies.

2.3 Attitudes towards patient safety culture

In 2024, a descriptive cross-sectional study was carried out among medical students and interns at King Abdulaziz University, Jeddah, Saudi Arabia. Its objective was to investigate the attitude of the study population towards patient safety. A total of 493 respondents who were above the third grade were recruited by convenience sampling. A validated, self-administered questionnaire was used to collect data from respondents. Findings showed that respondents mean scores on the various domains on attitude were mostly below four (4), which translated to negative attitudes to patient safety.[39] The strengths of this literature are

that it had a large sample size, recruited only students in clinical rotations, and used a validated data collection tool which allows for comparability across other similar studies. The study however, did not include students from other departments of medical sciences thus, narrowing the use of findings to only medical students.

A descriptive cross-sectional study was conducted in 2020 among medical practitioners across three (3) hospitals and twenty-five (25) clinics in Pretoria, South Africa. It had the aim of evaluating the extent of PSC among public hospitals in the region. Three hundred and nineteen (319) respondents took part in the study after being recruited by convenience sampling technique. A validated, self-administered questionnaire was used to collect data from respondents. Results showed that most respondents had positive attitudes in all PSC domains, giving an overall positive attitude of 59.9% and a negative attitude of 40.1%.[40] The major strength of the article is the adoption of a multicentre model, enhancing generalization of results. Conversely, the non-probability method employed reduces the representativeness of the sample.

In 2025, descriptive cross-sectional study was conducted among physiotherapy students in two (a private and a public) universities in Kwara State, Nigeria. The objective of the study was to evaluate the knowledge, perception, and attitude of these students towards PSC. A total of 195 students participated in the study and were selected using stratified sampling technique. Data collection was done with the use of a self-administered questionnaire. Results showed that majority of the respondents demonstrated overall positive attitudes, with the highest and lowest in 'acknowledging and dealing with errors at the end of training' (82.6%); and 'concentrating on the cause of incident contributing to patient safety' (65.1%), respectively.[36] The inclusion of both public and private universities increases diversity and allow for generalization of findings. However, in regards to the presentation of results on most outcomes, there were no categorization to aid interpretability.

In 2022, a descriptive cross-sectional study was carried out among pharmacy personnel in seven (7) selected healthcare facilities in Delta State, Nigeria. The objective of the study was to assess PSC in the study area. A total of 90 respondents took part in the study and were selected by purposive sampling technique. A structured, self-administered questionnaire was used in data collection. It was found that respondents demonstrated satisfactory attitudes towards PSC, with the attitude towards 'documenting mistakes' being the highest.[7] The article is strengthened by the multicenre approach but the use of non-probability sampling technique undermines randomization.

In 2021, a descriptive cross-sectional study was carried in Ibadan, Nigeria, among clinical students attending a public university. The study's objective was to assess knowledge and its relationship with attitude towards patients' safety among the study population. The sample size consisted of 281 students who were enrolled using convenient sampling technique. Data collection was done through a structured, self-administered questionnaire. Results demonstrated that negative attitude towards PSC was predominant (64.1%) while only 35.9% had positive attitudes.[28] This literature work is strengthened by the multiple outcomes it assessed, allowing for identification of interrelationships between them. However, the non-probability sampling used introduces sampling bias.

A comparative cross-sectional study was done in 2018, in Federal Medical Centre, Yenagoa, and twelve (12) primary health centres in Rivers State, Nigeria. It aimed to compare and assess the determinants of PSC among clinical personnel in the south-south region of the country. The sample size consisted of 436 clinical staff which were recruited using multistage sampling technique. A validated, self-administered questionnaire was used for data collection. It was revealed that positive attitude towards PSC among the respondents was generally low across domains, with a weighted mean of 41.7%. Teamwork and job satisfaction were the only domains in which majority of respondents (about 81%)

demonstrated positive attitudes.[4] The strengths are the use of multiple centres and a corresponding large sample size thus, increasing statistical power. However, the proportion of tertiary facility to primary facility may cause findings to be screwed towards the latter giving less weight to tertiary level data.

2.4 Patient safety culture in clinical settings

A descriptive cross-sectional study was done in 2014, across medical universities in Heilongjiang province, China. Its objective entailed assessing medical students' perception, identifying educational gaps and providing important text for integration into school curriculum. The sample size comprised 2498 medical students from all grades in medical school, and were selected using systematic random sampling technique. Data were collected using a validated, self-administered questionnaire. Overall, majority of the respondents had positive perceptions regarding PSC. Though they had not undergone any formal training in that regard from the universities, 84.9% reported having received some form of training.[41] The enormous sample size and the multi-institution approach provide solid representativeness of the sample but the inclusion of all levels of medical students dampens the reliability of the results as those not yet in clinical practice also took part in the study. Likewise, the usefulness of findings from the study is undermined because it is dated.

In 2017, a descriptive cross-sectional study was carried out among clinical staff in three hospitals in the Upper East region of Ghana. It was aimed at assessing health care practitioners' perceptions of PSC in the study area. The sample size comprised 384 respondents who were selected using multistage sampling technique. A standardized self-administered questionnaire was utilised for data collection. In regards to the findings on PSC grade, 7.0% of respondents perceived patient safety in their unit as excellent, 43.8%

perceived it as very good, 35% perceived it as acceptable, 13.8% perceived it as poor and 1.0% perceived it as failing.[6] The literature is strengthened by the large sample size and the multicentre model which increases external validity. It is however, compromised because of its age, which may cause findings to be less applicable in recent times.

In 2023, a descriptive cross-sectional study was carried out among pharmacy personnel in Obafemi Awolowo University Teaching Hospital Complex in Ile-Ife, Osun State, Nigeria. Its objective was to assess the PSC, recognizing areas of strengths and weaknesses, for improvement in the facility. The study recruited 82 pharmacy personnel who were directly involved in patient care (pharmacists, interns, and technicians), using convenience sampling technique. Data were collected using a validated, self-administered questionnaire. The overall PSC in the facility was 62.2%, with more positive responses from patient counselling (81.0%), teamwork (66.7%), perception of patient safety (61.0%) and organizational learning (56.1%) dimensions when compared to staffing, work pressure and pace (26.8%), and communication of prescription among shifts (40.7%) dimensions.[9] The literature is augmented by the use of a validated data collection tool (Agency for Healthcare Research and Quality (AHRQ) pharmacy safety questionnaire) which allows for comparability of findings across similar studies. The use of a non-probability sampling however, reduces randomization. Likewise, focusing on only pharmacy personnel narrows the generalizability.

A descriptive cross-sectional study conducted in 2023 among healthcare professionals in four (4) public hospitals in Kaduna State, Nigeria, aimed to assess the perceptions of PSC in these facilities. The sample size was 358 and respondents were selected using multistage sampling technique. A validated, self-administered questionnaire was used for data collection. Findings highlighted that the overall PSC in the hospitals was 55.6%. Also, in regards to the PSC grade, 10.6% of respondents reported that the hospital in which they worked had excellent PSC, 31.8% reported ‘very good’, 39.1% reported ‘acceptable’ while 9.5% and 0.6% reported

'poor' and 'failing' respectively.[14] The use of multiple centres, diverse professional representation, a large sample size and a probability sampling technique solidifies the findings in this article, but prioritizing a single outcome (perception) limits analytical depth.

A descriptive cross-sectional study was done in 2023 among health care workers in primary and secondary healthcare facilities in Oyo State, Nigeria. It was aimed at assessing PSC in the study population. The sample size consisted of 271 healthcare workers who were recruited using multistage sampling technique. A validated self-administered questionnaire was used in gathering data from respondents. The findings showed that the overall perception of PSC in these facilities was 72.1%, with teamwork (88.5%) and reporting patient safety events domains (47.4%) contributing the highest and lowest responses respectively.[8] The article excels in that it adopted a multicentre approach and a moderate sample size which increase sample diversity and inclusivity. The focus on a single outcome in contrast, weakens the generalisation of findings.

In 2023, a descriptive cross-sectional study was carried out among pharmacy staff at UBTH and Central hospital in Benin City, Edo State, Nigeria. The study had the aim of assessing PSC practice in the study population. A total of 101 pharmacy staff participated in the study and were recruited using census sampling technique. A structured, validated self-administered questionnaire was used for data collection. It was revealed that the overall patient safety grading was 58% for UBTH and 75% for Central hospital, with 44% and 70% of respondents in UBTH and Central hospital respectively, reporting their facilities to have 'very good' PSC pratice.[10] The use of census sampling technique in this article, eliminates sampling error and a provides a more accurate representation. Nevertheless, it focused on a single outcome (perception) without considering other outcomes like attitude and knowledge which may influence perception findings.

2.5 Gaps in patient safety culture in clinical settings

A qualitive, descriptive cross-sectional study was conducted in 2018 among nurses in four (4) hospitals in southeast Iran. The study's objective was to evaluate the experience of nurses regarding challenges faced in integrating a positive PSC. Twenty-three (23) nurses were enrolled using purposive sampling. Semi-structured, face-to-face, in-depth interviews were used to collect data from respondents. The study identified inadequate organisation infrastructure, weak leadership, and insufficient effort in complying with national benchmarks as gaps in PSC in these facilities.[42] Adopting a qualitative approach enhances understanding of individual experiences, conversely, this limits generalisbility because of its small sample size.

In 2024, a descriptive, cross-sectional study was conducted among healthcare professionals in five public hospitals in Eastern Ethiopia. The study strived to assess the perceptions of PSC and investigate potential disparities across units in the selected hospitals. About 580 respondents were enrolled using multistage sampling technique. Data were compiled using a validated, self-administered questionnaire. Findings highlighted lack of patient safety incident/accident reporting system, insufficient resources, lack of awareness regarding patient safety, and poor organisational support, as the major gaps in the effective practice of PSC.[43] The literature portrayed some degree of analytical depth by investigating disparities in outcomes encountered between units. Also, the large sample size enhances the diversity of the sample. In contrast, the use of only public hospitals limits external validity.

A systematic review was conducted in 2023 to provide a comprehensive descriptive analysis to current knowledge, challenges and barriers related to PSC in Nigerian healthcare settings. Published studies from 2015-2023 were identified through a structured search of various databases using predefined keywords. Twelve (12) studies were purposively selected within

the systematic review framework. A structured data extraction spreadsheet (Microsoft Excel) was used for collecting data and findings highlighted multiple gaps in PSC. These gaps were evident both at organizational and professional levels, encompassing inadequate institutional support for safety (poor infrastructure, limited resources, and staffing shortages), weak communication climate and rigid hierarchy which discourage open discussion of errors, absence of an anonymous, non-punitive reporting system, and insufficient practical training.[44] This work is methodologically rigorous, transparent, and provides a comprehensive descriptive synthesis of PSC in Nigerian healthcare settings. However, its reliance on existing studies, potential publication bias, and heterogeneity of included studies limit its ability to establish casual relationships.

A descriptive cross-sectional design was employed in a 2017 study done among medical practitioners in Abia State, Nigeria. It was aimed at evaluating the experience, drivers, barriers and preventive steps for patient safety incidents among doctors who attended the Continuing Development Programme (CDP) of same year. It consisted of 185 respondents selected using consecutive sampling technique. A pretested, self-administered questionnaire was used to collect data. Findings revealed significant gaps in PSC existed in the study setting despite a functioning reporting system, as 61% of the respondents had committed a patient safety incident/accident in the previous one year with the most reported type being medication errors. Also, 100% of the doctors attributed such errors to poor communication, stress and burnout, highlighting understaffing and patient overload as important intervention niches.[45] The strength of the study is in the assessment of multiple outcomes which improves construct validity. However, recruiting doctors based on participation in a programme introduces sampling bias and reduces representativeness.

In 2016, a mixed-methods, descriptive cross-sectional study was carried out among medical professionals in Nnamdi Azikiwe University Teaching Hospital, Nnewi, Nigeria. It aimed to

identify the gaps towards practicing PSC at the facility. The sample size consisted of 281 medical personnel for the quantitative aspect, selected via stratified sampling technique, and 27 personnel for the qualitative part who were recruited using convenience sampling technique. Quantitative data were collected through a structured, self-administered questionnaire while qualitative data were collected through FGDs and KIIs. The gaps in patient safety identified from the study were lack of a patient safety unit, an active patient safety committee, patient safety guidelines, policies and training programmes.[46] This research work is strengthened by the use of a mixed methods thus, providing a comprehensive supply of data from respondents. However, it is limited because of its age.

In 2015, a comparative, cross-sectional study using secondary data from a previous survey in three private hospitals in Lagos State, Nigeria, was carried out. It was aimed at assessing the perception of PSC and patient satisfaction among employees and patients, and comparing these data to AHRQ standards from Critical Care Access Hospitals in the United States (U.S). The secondary data were retrieved through an electronic format from a 2013 survey which recruited 156 employees by convenience sampling and collected primary data with a structured questionnaire. Findings were that PSC in Lagos State hospitals had low levels of communication openness, ineffective handoffs/transitions and less constructive feedback about errors when compared to the United States hospitals.[47] The strength of the article is that the primary data used validated tools and multiple health facilities which increases the diversity of respondents. However, the use of non-probability sampling introduces selection bias and limits representativeness.

CHAPTER THREE

METHODOLOGY

3.1 STUDY AREA

This study will be conducted at the University of Benin Teaching Hospital (UBTH), located in Ugbowo, a community in Egor Local Government Area(LGA) of Edo State, Nigeria. Established in 1973, UBTH serves as a primary tertiary referral center for Edo State and the surrounding South-South geopolitical zone of Nigeria.[48,49] The hospital is an 850-bed facility that provides a wide range of specialized medical services and serves as the clinical training base for students from the University of Benin.[50]

UBTH functions as a major clinical training centre for several institutions, most notably the University of Benin (UNIBEN), and also accommodates clinical postings for students from Benson Idahosa University (BIU) and Wellspring University. As such, the hospital serves as a central hub for the clinical education of medical, nursing, and allied health students drawn from multiple academic institutions within the region.[50,51]

The hospital is structured into several clinical and diagnostic departments that facilitate the training of clinical students. Core clinical departments include Internal Medicine, Surgery, Obstetrics and Gynaecology, Paediatrics, and Mental Health.[51] Additionally, the hospital houses specialized sub-units such as the Intensive Care Unit (ICU), the Special Care Baby Unit (SCBU), the Accident and Emergency department, and various surgical theaters where students rotate for experiential learning.[48,49] These students are integrated into multidisciplinary teams where they observe and participate in the management of high patient volumes, which is characteristic of the institution's role as a regional referral hub.[52] This setting provides a comprehensive environment for evaluating the safety culture, reflected in communication patterns, supervision, and teamwork, as it shapes the professional identity and safety-related behaviors of students during their clinical training.

3.2 STUDY DESIGN

A descriptive cross-sectional study design will be utilized for this study.

3.3 STUDY POPULATION

The study population will be conducted among clinical students at UBTH. This includes students in their clinical years (typically 400 to 600 levels) from the following disciplines:

I. Medicine and Surgery (MBBS)
II. Nursing Science
III. Medical Laboratory Science
IV. Physiotherapy
V. Paramedics

Selection Criteria

3.3.1 Inclusion criteria

I. Clinical students that have spent > 6weeks of clinical rotation in UBTH.

3.3.2 Exclusion criteria

I. Clinical students on prolonged leave (>1 month) or external placements not contactable.

3.4 STUDY DURATION

The study will be carried out from April 2025 till April 2026

3.5 SAMPLE SIZE DETERMINATION

Stage 1: Selection of Departments

The first stage involves the inclusion of all key clinical departments that utilize UBTH as their primary training site for undergraduate and Sample size will be calculated using Cochran's formula for cross-sectional studies:

Where:

- n = required sample size
- Z = 1.96 at 95% confidence level
- p = Prevalence/proportion of students with good knowledge of patient safety (e.g., 58.4% or 0.584 from previous Nigerian studies)[11]
- q =1 - p (0.416)
- d= margin of error= 0.05

Substituting:

Adjust for design effect (DE = 1.5) to allow for clustering by department/rotation:

Adjust for 10% non-response:

Hence the minimum sample size will be 623 respondents.

3.6 SAMPLE TECHNIQUE

A stratified random sampling technique will be utilized for this study to ensure fair and proportionate representation across the various clinical disciplines. The total population will first be stratified into distinct subgroups (strata) based on their department of study: Medicine and Surgery, Nursing Science, Medical Laboratory Science, Physiotherapy, and Paramedics. Within each stratum, simple random sampling (or convenient sampling, if random selection is unfeasible) will be used to select the final participants until the required sample size for each group is met.

3.7 DATA MANAGEMENT

3.7.1 Tools for Data Collection

Data will be collected using a structured, self-administered questionnaire adapted from established and validated instruments, including the World Health Organization Patient Safety Curriculum Guide and the Agency for Healthcare Research and Quality Hospital Survey on Patient Safety Culture (HSOPSC).[53] In addition, qualitative data will be collected using a Focus Group Discussion (FGD) guide developed based on relevant patient safety domains, including communication, error reporting, teamwork, and supervision, to explore in-depth perceptions and experiences of clinical students within the training environment.[54,55] The questionnaire will be modified to suit the study population while maintaining the original meaning of the items. The questionnaire will consist of five sections:

Section A: Socio-demographic data

This section requires answers regarding the respondent's age, gender, department (e.g., Medicine, Nursing, Physiotherapy), level of study, and previous exposure to safety training.

Section B: Knowledge of Patient Safety Principles

This section will assess respondents' knowledge of key patient safety concepts, including definitions, types of clinical errors, infection prevention practices (e.g., hand hygiene), medication safety, communication, and incident reporting. Questions will be structured as multiple-choice and true/false items and scored objectively.

Section C: Attitudes towards Patient Safety Responsibilities

This section will assess students' attitudes toward patient safety culture within their clinical training environment. It will include items adapted from the HSOPSC and the Attitudes to Patient Safety Questionnaire (APSQ).

Domains assessed will include:

- Teamwork and collaboration
- Communication openness
- Non-punitive response to errors
- Feedback and communication about errors
- Willingness to report errors and speak up
- Perceived responsibility for patient safety

Perceptions of safety culture will be treated as components of attitude in this study.

Section D: Psychological Safety and Speaking-Up Behaviour

This section will assess students' confidence in raising concerns and reporting errors using items adapted from established psychological safety scales and speaking-up literature. It will explore perceived barriers such as fear of blame, hierarchy, and lack of support.

Section E: Gaps in Patient Safety Training and Experience

This section will explore perceived gaps in formal patient safety education, exposure to simulation-based learning, and the extent to which students learn safety practices informally through observation during clinical rotations.

3.7.2 Method of Data Collection

Data will be collected using the pretested, structured, self-administered questionnaire. The questionnaires will be distributed to eligible clinical students in their various departments and rotation sites within UBTH. Respondents will be allowed to complete the questionnaire in private at their preferred location within a reasonable timeframe to ensure their privacy and comfort. Research assistants will be available to clarify any questions the respondents may have without influencing their responses. Informed consent will be obtained beforehand, and respondents will be assured of total confidentiality. Informed consent will be obtained beforehand, and respondents will be assured of total confidentiality.

3.7.3 Training of Research Assistants

Research assistants will be trained for three (3) days for the purpose of this study. The training will include an overview of the patient safety topic, the specific research objectives, and other essential skills such as research ethics, interpersonal skills, and effective communication. This training ensures that the administration of the tool is standardized and that data collation is carried out accurately.

3.7.4 Pretesting

The questionnaires will be pre-tested at a neighboring tertiary institution (e.g., Edo specialist Hospital) to determine the validity, comprehension, and sensitivity of the data tool. Ten percent (10%) of the calculated sample size for this study will be used to pretest and observe errors in the tool, which will be corrected before the main study is conducted at UBTH.

3.8 DATA ANALYSIS

The filled questionnaires will be thoroughly checked for any inconsistencies. Data coding and cleaning will be done. Data will be analyzed using the IBM SPSS (Statistical Package for Social Sciences) version 27.0 software to determine the frequency, percentage, and mean of the parameters.

Descriptive statistics will be used to summarise the data.

- Categorical variables (e.g., sex, discipline, level of study) will be presented as frequencies and percentages.
- Continuous variables will be presented as means and standard deviations (SD**)** if normally distributed, or medians and interquartile ranges (IQR) if skewed.

Univariate analysis will be conducted to assess the distribution of variables.

Bivariate analysis will be used to assess the association between socio-demographic variables and key outcome variables (knowledge and attitudes toward patient safety culture).

- Chi-square test or Fisher's exact test will be used to assess associations between categorical variables
- Student's t-test will be used for comparison of means between two groups for normally distributed data
- Mann–Whitney U test will be used for non-normally distributed data

Multivariate analysis will be conducted using binary logistic regression to identify independent predictors of:

- Poor knowledge of patient safety
- Unfavourable attitudes toward patient safety culture

Variables with $p < 0.20$ at the bivariate level will be included in the regression model. Results will be presented as adjusted odds ratios (AORs) with 95% confidence intervals.

Statistical significance will be set at $p < 0.05$.

3.9 SCORING SYSTEM

KNOWLEDGE SCORE

The knowledge of patient safety culture among respondents will be assessed using 8 questions addressing all knowledge domains.

For Yes/No questions, coding will be: 1 =Correct answer, 0 = Incorrect answer.

For multiple-choice questions, coding will be: 1 = Correct answer, 0 = Incorrect answer.

The total knowledge score will be calculated by summing up all correct responses. Knowledge will be categorized as:

Good knowledge: score ≥ 50% of maximum possible score

Poor knowledge: score < 50% of maximum possible score

ATTITUDES

Attitudes toward patient safety culture (including perceptions of the clinical environment) will be assessed using Likert-scale questions.

Domains assessed will include:

- Personal responsibility for patient safety
- Willingness to report errors
- Communication openness
- Teamwork and collaboration
- Perceived response to errors (punitive vs non-punitive)

Responses will be scored and aggregated. Higher scores will indicate more favourable attitudes toward patient safety culture.

For analysis:

- Responses may be categorised into positive and negative attitudes based on predefined cut-off points
- Proportions of respondents demonstrating favourable attitudes will be reported

Perception variables are incorporated into this section as components of overall attitude toward patient safety culture.

Patient Safety Culture (HSOPSC)

Scores will be expressed as **percent positive responses** per domain according to Agency for Healthcare Research and Quality guidelines.

Composite Outcome (Preparedness for Safe Practice)

A composite index will be created by standardizing (z-scores) and combining knowledge, attitude, and self-reported behaviour scores. Participants scoring at or above the 75th percentile will be classified as "prepared," and sensitivity analysis will be conducted to test this threshold.

GAPS

Gaps in curriculum and experiential learning will be assessed by analyzing the distribution of responses regarding formal vs. informal learning and the presence of simulation-based training. These will be expressed as the proportion of respondents who identify specific deficiencies in their patient safety training.

3.10 ETHICAL CONSIDERATION

Ethical clearance will be obtained from the Research Ethics Committee of the University of Benin Teaching Hospital (UBTH). Informed consent will be obtained from all respondents. Participants' confidentiality and privacy will be maintained throughout the study. All data collected will be stored securely and will only be accessible to the research team. Respondents will be informed that they have the right to withdraw from the study at any time without any consequences. No personal identifiers will be collected or recorded on the questionnaires to ensure anonymity.

3.11 LIMITATION OF THE STUDY

The cross-sectional design limits causal inference and temporal sequencing. Self-reported measures are susceptible to recall and social desirability bias; these are mitigated by objective audits and anonymised response modes. Single-institution scope limits generalizability; however, UBTH is a large tertiary teaching hospital and findings will be informative for

similar LMIC teaching hospitals. Recommendations will stress replication and longitudinal evaluation.

CHAPTER 4

RESULTS

A total of 637 respondents participated in the study; the response rate was 100%. The results are presented in the following sections in line with the specific objectives of the study.

SECTION A: Socio-demographic characteristics of respondents

SECTION B: Knowledge of patient safety principles

SECTION C: Attitudes towards patient safety responsibilities

SECTION D: Practice of safety culture within clinical environment

SECTION E: Gaps in patient safety curriculum and experiential learning

SECTION A

SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Table 1: Socio-demographic Characteristics of Respondents

Variables	Frequency (n=637)	Percent
Age Group (years)		
< 20	3	0.5
20-24	453	71.1
>24	181	28.4
Mean Age ± SD (years)	**23.41 ± 2.084**	
Gender		
Female	332	52.1
Male	305	47.9
Religion		
Christianity	607	95.3
Islam	30	4.7
Tribe		
Benin	205	32.2
Esan	130	20.4
Igbo	97	15.2
Yoruba	62	9.7
Urhobo	54	8.5
Isoko	30	4.7
Ijaw	25	3.9
Etsako	21	3.3
Calabar	8	1.3
Hausa	5	0.8

A total of 637 respondents participated in the study. The age distribution reveals that the vast majority, 453 (71.1%), of participants, fell within the 20 to 24 years age bracket. This was followed by 181 (28.4%) respondents aged 24 years or older, while only 3 (0.5%) were younger than 20 years, resulting in a mean age of 23.41 ± 2.084 years. Regarding gender, there was a slight female predominance, with 332 (52.1%) females compared to 305 (47.9%) males. The religious affiliation of the respondents was predominantly Christianity, accounting for 607 (95.3%) of the sample, whereas Islam accounted for 30 (4.7%) respondents. An analysis of tribal distribution shows that the Benin tribe was the most represented with 205 (32.2%) participants, followed by Esan with 130 (20.4%), Igbo with 97 (15.2%), Yoruba with 62 (9.7%), Urhobo with 54 (8.5%), Isoko with 30 (4.7%), Ijaw with 25 (3.9%), Etsako with 21 (3.3%), Calabar with 8 (1.3%), and Hausa being the least represented with 5 (0.8%).

Table 2: Academic Characteristics of Respondents

Variables	Frequency (n=637)	Percent
Institution		
UNIBEN	463	72.7
UBTH	147	23.1
Wellspring University	27	4.2
Department		
Medicine	216	33.9
Nursing	147	23.1
Medical Labouratory Science	110	17.3
Physiotherapy	86	13.5
Paramedic	78	12.2
Level		
400	298	46.8
500	269	42.2
600	70	11.0
Current Clinical Rotation		
Surgery	165	25.9
Medicine	147	23.1
Subspecialty	108	17.0
Pathology	108	17.0
Emergency	76	11.9
Pediatrics	19	3.0
Obstetrics & Gynaecology	14	2.2
Average hours spent in hospital/day		
<8	199	31.2
8 - 12	345	54.2
>12	93	14.6
Ever Received Formal Training On Patient Safety		
Yes	440	69.1
No	197	30.9

The majority of the respondents, 463 (72.7%), were drawn from UNIBEN, followed by 147 (23.1%) from UBTH, and 27 (4.2%) from Wellspring University. Departmental representation showed Medicine contributing the highest number of students at 216 (33.9%), followed closely by Nursing at 147 (23.1%). Medical Laboratory Science accounted for 110 (17.3%), Physiotherapy for 86 (13.5%), and Paramedic students for 78 (12.2%). Academically, 298 students (46.8%) were at the 400 level, 269 (42.2%) were at the 500 level, and 70 (11.0%) had advanced to their senior 600-level clinical postings. Regarding current clinical rotations, Surgery had the highest engagement with 165 (25.9%), followed by

Medicine with 147 (23.1%). Subspecialty and Pathology rotations each accounted for 108 students (17.0%), while Emergency had 76 (11.9%), Pediatrics had 19 (3.0%), and Obstetrics & Gynaecology recorded 14 (2.2%). When evaluating the average hours spent in the hospital per day, more than half of the students, 345 (54.2%), reported spending 8 to 12 hours. A further 199 (31.2%) spent less than 8 hours, and 93 (14.6%) engaged in heavy clinical workloads exceeding 12 hours daily. Finally, 440 (69.1%) confirmed they had received formal training on patient safety, while 197 (30.9%) had not.

SECTION B

KNOWLEDGE OF PATIENT SAFETY PRINCIPLES

Table 3: Knowledge of Patient Safety among Respondents (n=637)

Knowledge Domain	Frequency	Percent
Medication Safety practices		
Follow "five rights" (patient, drug, dose, route, time)	540	84.8
Rely on memory for high-risk doses (false)	474	74.4
Verify allergies and indications before administering	457	71.7
Double-check or use barcode for high-risk meds	431	67.7
Never document omissions or near-misses (false)	465	73.0
Error reporting and learning systems		
Near-misses should be reported for learning	500	78.5
A non-punitive reporting culture encourages reporting	415	65.1
Reports should be secret and not used to change systems(false)	496	77.9
Root-cause analysis helps identify system fixes	439	68.9
Feedback to reporters increases reporting	343	53.8
Infection Prevention and Control Practices		
Hand hygiene at WHO "five moments"	533	83.7
Use single-use items or proper sterilisation when indicated	465	73.0
Skipping aseptic technique is acceptable if patient is low risk (false)	481	75.5
Use antibiotic prophylaxis only when indicated	393	61.7
Correct waste segregation and surface cleaning	408	64.1
Understanding of Vaccination Principles		
Stimulates immune response to prevent disease	538	84.5
Permanently cures current infections (false)	416	65.3
Contains weakened/inactivated pathogen components	418	65.6
Used mainly to treat symptoms once disease occurs (false)	434	68.1
Used to develop immunity before exposure	404	63.4
Systems-based Approach to Medical Errors		
Errors often come from system failures (not individual only)	515	80.8
Workload, communication and device design can cause errors	450	70.6
Blaming individuals is the best error reduction method (false)	544	85.4
Checklists and standard protocols reduce system vulnerability	434	68.1
Training alone eliminates systemic design problems (false)	434	68.1

Respondents' knowledge across specific patient safety domains varied significantly. In safe medication practices, 540 (84.8%) correctly identified following the "five rights," while 474 (74.4%) correctly identified that relying on memory for high-risk doses is false. Verifying allergies and indications was recognized by 457 (71.7%), double-checking high-risk meds by 431 (67.7%), and 465 (73.0%) correctly noted that the statement to never document omissions is false. Within the reporting and learning domain, 500 (78.5%) agreed near-misses should be reported, 415 (65.1%) recognized non-punitive cultures encourage reporting, and 496 (77.9%) correctly identified the falsehood of keeping reports secret. Root-cause analysis utility was understood by 439 (68.9%), and feedback increasing reporting was noted by 343 (53.8%). For healthcare-associated infections, 533 (83.7%) knew the WHO "five moments" of hand hygiene, 465 (73.0%) recognized single-use/sterilization protocols, 481 (75.5%) correctly rejected skipping aseptic techniques for low-risk patients, 393 (61.7%) understood antibiotic prophylaxis indications, and 408 (64.1%) knew correct waste segregation. Regarding vaccines, 538 (84.5%) knew they stimulate immune responses, 416 (65.3%) correctly rejected that they permanently cure current infections, 418 (65.6%) knew they contain weakened pathogens, 434 (68.1%) knew they are not primarily to treat symptoms, and 404 (63.4%) recognized their role in developing immunity before exposure. Lastly, in the systems view of errors, 515 (80.8%) knew errors stem from system failures, 450 (70.6%) identified workload/device design as causes, 544 (85.4%) correctly rejected blaming individuals as the best reduction method, 434 (68.1%) recognized checklists reduce vulnerability, and 434 (68.1%) correctly identified that training alone does not eliminate design problems.

Table 4: Knowledge Domain Scores among Respondents

Domain	Frequency(n=637)	Percent
Safe medication practices	535	84.0
Reporting & learning	478	75.0
Which reduce healthcare-associated infection	486	76.3
Which describe a vaccine and its purpose	494	77.6
Systems view of errors	537	84.3

Overall domain scores reveals good knowledge was highest in the systems view of errors domain, with 537 (84.3%) respondents, closely followed by safe medication practices, with 535 (84.0%). The domain describing a vaccine and its purpose saw 494 (77.6%) respondents scoring good knowledge, while domains reducing healthcare-associated infection and reporting & learning recorded 486 (76.3%) and 478 (75.0%) good scores, respectively.

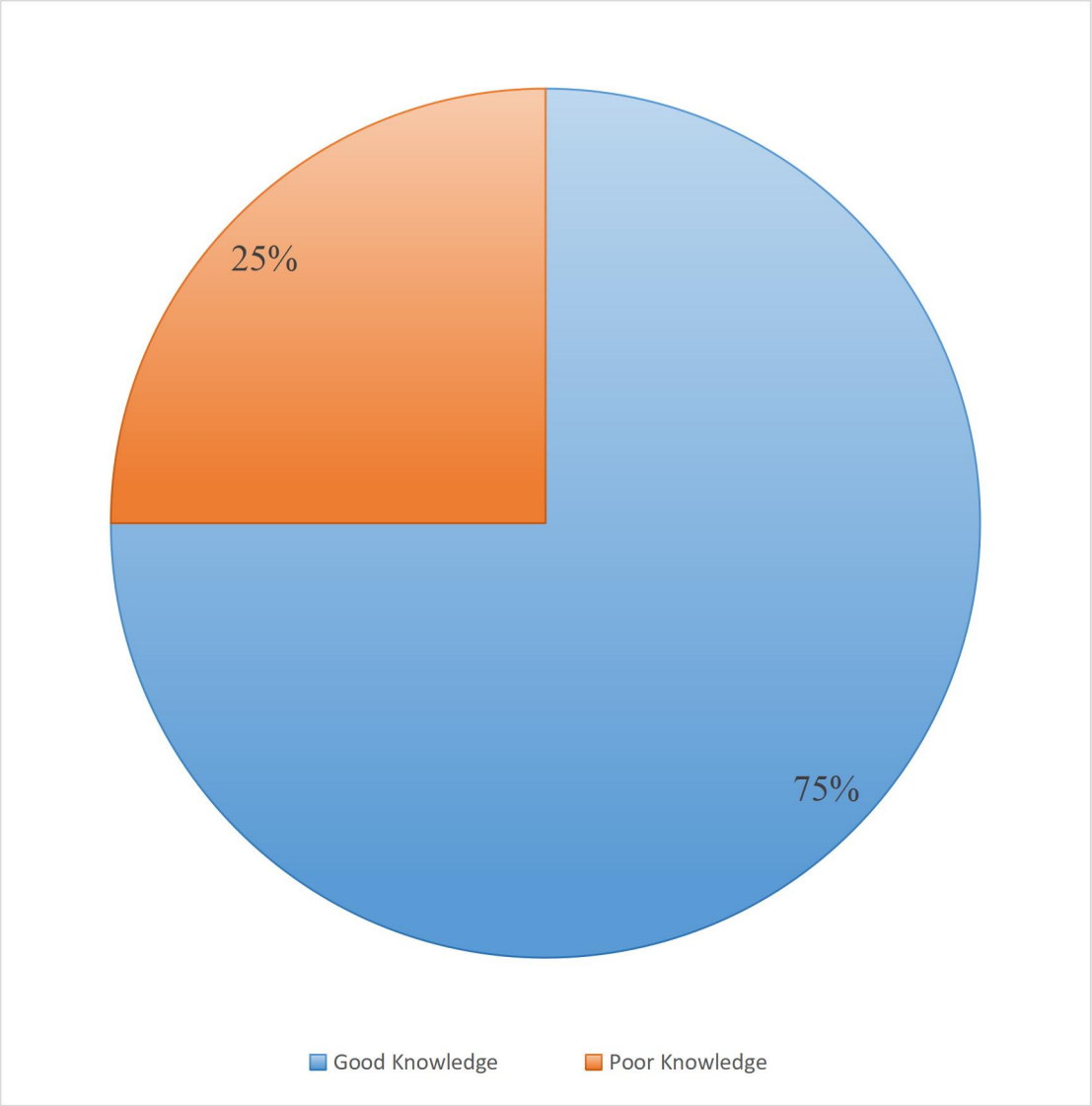

Figure 1: Overall Level of Knowledge of Patient Safety Principles among Respondents

Overall level of knowledge regarding patient safety principles among the 637 respondents. The data reveals a strong foundational understanding within the cohort. A significant majority, comprising 478 (75.0%), were assessed as having good knowledge of patient safety. Conversely, 159 (25.0%) of the study population, were categorized as having poor overall knowledge.

Table 5: Sources of Patient Safety Knowledge

Mode of patient safety knowledge acquisition	Frequency (n=637)	Percent
Mix	240	37.7
Informal means	237	37.2
Formal means	160	25.1

A mix of formal and informal training was the most prevalent mode of knowledge acquisition, reported by 240 (37.7%) respondents. Informal means were reported by 237 (37.2%) respondents, while formal education accounted for the remaining 160 (25.1%) respondents.

Table 6: Socio-Demographic, Academic Characteristics and Knowledge of Patient Safety Principles among Respondents

Variable	Knowledge		χ^2 Value	p-value
	Good n=478 (%)	Poor n=159 (%)		
Age Group (years)				
< 20	3 (100.0)	0 (0.0)	1.083	0.582
20-24	338 (74.6)	115 (25.4)		
> 24	137 (75.7)	44 (24.3)		
Gender				
Female	253 (76.2)	79 (23.8)	0.503	0.478
Male	225 (73.8)	80 (26.2)		
Department				
Medicine	170 (78.7)	46 (21.3)	13.146	**0.011**
Nursing	106 (72.1)	41 (27.9)		
Paramedic	47 (60.3)	31 (39.7)		
Physiotherapy	67 (77.9)	19 (22.1)		
Medical Labouratory Science	88 (80.0)	22 (20.0)		
Academic Level				
400	216 (72.5)	82 (27.5)	6.529	**0.038**
500	201 (74.7)	68 (25.3)		
600	61 (87.1)	9 (12.9)		
Current Clinical Rotation				
Surgery	127 (77.0)	38 (23.0)	12.860	**0.045**
Medicine	114 (77.6)	33 (22.4)		
Subspecialty	81 (75.0)	27 (25.0)		
Pathology	87 (80.6)	21 (19.4)		
Emergency	45 (59.2)	31 (40.8)		
Pediatrics	14 (73.7)	5 (26.3)		
Obstetrics & Gynaecology	10 (71.4)	4 (28.6)		
Average hours spent in hospital/day				
<8	149 (74.9)	50 (25.1)	8.594	**0.014**
8 - 12	270 (78.3)	75 (21.7)		
>12	59 (63.4)	34 (36.6)		
Ever Received Formal Training On Patient Safety				
Yes	344 (78.2)	96 (21.8)	7.502	**0.006**
No	134 (68.0)	63 (32.0)		

**Significant at p < 0.05*

Respondents aged > 24 years demonstrated higher good knowledge, with 137 (75.7%) having good knowledge compared with 338 (74.6%) respondents aged 20 – 24 years and 3 (100.0%) respondents aged < 20 years, suggesting that increasing age was not majorly associated with better knowledge. This association between age group and knowledge of patient safety principles was not statistically significant (p = 0.582). Male respondents demonstrated lower good knowledge, with 225 (73.8%) having good knowledge compared with 253 (76.2%) female respondents, indicating that female respondents were more likely to demonstrate good knowledge of patient safety principles than males. This association between sex and knowledge of patient safety principles was not statistically significant (p = 0.478).

Medical Laboratory Science respondents demonstrated the highest good knowledge, with 88 (80.0%) having good knowledge compared with 170 (78.7%) Medicine respondents, 67 (77.9%) Physiotherapy respondents, 106 (72.1%) Nursing respondents, and 47 (60.3%) Paramedic respondents, suggesting that department of study was associated with variation in knowledge levels. This association between academic department and knowledge of patient safety principles was statistically significant (p = 0.011). Respondents in 600 level demonstrated higher good knowledge, with 61 (87.1%) having good knowledge compared with 201 (74.7%) 500 level respondents and 216 (72.5%) 400 level respondents, suggesting that higher educational attainment and clinical level was associated with better knowledge of patient safety principles. This association between academic level and knowledge of patient safety principles was statistically significant (p = 0.038).

Respondents currently in Pathology rotation demonstrated higher good knowledge, with 87 (80.6%) having good knowledge compared with 114 (77.6%) Medicine respondents, 127 (77.0%) Surgery respondents, 81 (75.0%) Subspecialty respondents, 14 (73.7%) Pediatrics respondents, 10 (71.4%) Obstetrics & Gynaecology respondents, and 45 (59.2%) Emergency respondents, suggesting that current rotation type influenced knowledge levels. This

association between current clinical rotation and knowledge of patient safety principles was statistically significant ($p = 0.045$). Respondents spending 8 – 12 hours daily in the hospital demonstrated higher good knowledge, with 270 (78.3%) having good knowledge compared with 149 (74.9%) respondents spending < 8 hours and 59 (63.4%) respondents spending > 12 hours, suggesting that optimal daily hospital hours were associated with better knowledge. This association between average hours spent in hospital daily and knowledge of patient safety principles was statistically significant ($p = 0.014$). Finally, respondents who had received formal training demonstrated higher good knowledge, with 344 (78.2%) having good knowledge compared with 134 (68.0%) respondents who had not received formal training, indicating that prior formal training was associated with better knowledge of patient safety principles. This association between formal training receipt and knowledge of patient safety principles was statistically significant ($p = 0.006$).

Table 7: Patient Safety Knowledge Acquisition Methods and Knowledge Outcome

Mode of Patient Safety Knowledge Acquisition	Knowledge		χ^2 Value	p-value
	Good n=478 (%)	Poor n=159 (%)		
Equal mix	183 (76.3)	57 (23.8)	11.088	**0.004**
Informal	190 (80.2)	47 (19.8)		
Formal	105 (65.6)	55 (34.4)		

**Significant at p < 0.05*

The mode of knowledge acquisition proved to be a significant determinant of overall knowledge (p = 0.004). Interestingly, the trend indicates that students who acquired knowledge "Mostly informally" achieved the highest proportion of good knowledge at 190 (80.2%), followed by those with an "Equal mix" at 183 (76.3%). Those relying entirely on "Mostly formal" methods had the lowest proportion of good knowledge at 105 (65.6%.

Table 8: Predictors of Good Patient Safety Knowledge

Variables	B	AOR	95% C.I.		p-value
			Lower	Upper	
Department					
Medicine	-	1.00	-	-	-
Nursing	-0.361	0.697	0.373	1.303	0.258
Paramedic	0.555	1.742	0.163	18.566	0.646
Physiotherapy	0.127	1.135	0.568	2.269	0.720
Medical Laboratory Science	-0.877	0.416	0.025	6.967	0.542
Current Clinical Rotation					
Pathology	-	1.00	-	-	-
Emergency	-2.470	0.085	0.002	3.390	0.190
Medicine	-1.106	0.331	0.019	5.754	0.448
Surgery	-1.114	0.328	0.018	5.840	0.448
Subspecialty	-1.321	0.267	0.015	4.641	0.365
Obstetrics & Gynaecology	-1.222	0.295	0.013	6.485	0.438
Pediatrics	-1.412	0.244	0.012	5.131	0.364
Academic Level					
400	-	1.00	-	-	-
500	0.105	1.111	0.725	1.703	0.629
600	0.863	2.370	1.018	5.517	**0.045**
Average hours spent in hospital/day					
<8	-	1.00	-	-	-
8 - 12	0.102	1.107	0.712	1.722	0.650
>12	-0.628	0.534	0.301	0.946	**0.031**
Ever Received Formal Training On Patient Safety					
No	-	1.00	-	-	-
Yes	0.615	1.850	1.222	2.800	**0.004**
Mode of Patient Safety Knowledge Acquisition					
Equal mix	-	1.00			
Mostly formal	-0.429	0.651	0.409	1.038	0.071
Mostly informal	0.301	1.351	0.853	2.138	0.200

**Significant at $p < 0.05$, Nagelkerke $R^2=0.104$*

This table showed that advancing to 600 level significantly increased the odds of having good knowledge of patient safety principles (AOR = 2.370, 95% CI: 1.018–5.517, p = 0.045). Respondents who had ever received formal training on patient safety were also more likely to have good knowledge compared with those who had received no training (AOR = 1.850, 95% CI: 1.222–2.800, p = 0.004), while respondents who spent >12 hours in the hospital per day were less likely to demonstrate good knowledge compared with those spending <8 hours (AOR = 0.534, 95% CI: 0.301–0.946, p = 0.031).

The trend suggests that higher academic level and the receipt of formal training on patient safety improved the likelihood of good knowledge of patient safety principles, whereas spending excessive hours (>12 hours) daily in the hospital reduced the likelihood of good knowledge.

There was a statistically significant predictive association between academic level and knowledge (p = 0.045), ever received formal training and knowledge (p = 0.004), and average hours spent in hospital/day and knowledge (p = 0.031). However, Nursing department (p = 0.258), Paramedic department (p = 0.646), Physiotherapy department (p = 0.720), Medical Laboratory Science department (p = 0.542), 500 level (p = 0.629), 8 - 12 hours spent in hospital/day (p = 0.650), Emergency rotation (p = 0.190), Medicine rotation (p = 0.448), Surgery rotation (p = 0.448), Subspecialty rotation (p = 0.365), Obstetrics & Gynaecology rotation (p = 0.438), Pediatrics rotation (p = 0.364), mostly formal knowledge acquisition (p = 0.071), and mostly informal knowledge acquisition (p = 0.200) were not significant predictors of knowledge.

SECTION C

ATTITUDES TOWARDS PATIENT SAFETY RESPONSIBILITIES

Table 9: Respondents' Attitude Towards Patient Safety Responsibilities (n=637)

Variable	SA n(%)	A n(%)	N n(%)	D n(%)	SD n(%)
I feel personally responsible for patient safety	312 (49.0)	212 (33.3)	64 (10.0)	40 (6.3)	9 (1.4)
I am comfortable reporting patient safety errors	143 (22.5)	327 (51.3)	103 (16.2)	46 (7.2)	18 (2.8)
It is difficult to report or talk about errors	87 (13.7)	204 (32.0)	203 (31.9)	101 (15.8)	42 (6.6)
Reporting errors is important even if no harm occurred	200 (31.4)	242 (38.0)	88 (13.8)	85 (13.3)	22 (3.5)
Following safety procedures slows down work	92 (14.4)	131 (20.6)	142 (22.3)	206 (32.3)	66 (10.4)
I trust supervisors will support me if I report a near-miss	106 (16.6)	217 (34.1)	199 (31.2)	80 (12.6)	35 (5.5)
Patient safety is best learned informally	100 (15.7)	196 (30.8)	120 (18.8)	166 (26.1)	55 (8.6)
Teamwork is essential for patient safety	152 (23.9)	287 (45.1)	92 (14.4)	85 (13.3)	21 (3.3)
My training environment encourages reporting	94 (14.8)	223 (35.0)	161 (25.3)	122 (19.1)	37 (5.8)
Response to error is non-punitive in my training area	98 (15.4)	196 (30.8)	225 (35.3)	99 (15.5)	19 (3.0)
Effective communication is critical for safety	117 (18.4)	287 (45.0)	98 (15.4)	97 (15.2)	38 (6.0)
There is sufficient staffing to deliver safe care in my rotations	109 (17.1)	243 (38.2)	104 (16.3)	119 (18.7)	62 (9.7)

Attitudinal responses varied widely across the assessed metrics. A strong sense of personal responsibility was evident, with 312 (49.0%) strongly agreeing and 212 (33.3%) agreeing that they feel personally responsible for patient safety; only 40 (6.3%) disagreed and 9 (1.4%) strongly disagreed. Regarding comfort in reporting errors, 143 (22.5%) strongly agreed and 327 (51.3%) agreed, while 46 (7.2%) disagreed and 18 (2.8%) strongly disagreed. However, the difficulty of talking about errors was acknowledged, with 87 (13.7%) strongly agreeing and 204 (32.0%) agreeing that it is difficult, contrasted by 101 (15.8%) who disagreed and 42 (6.6%) who strongly disagreed. The importance of reporting near-misses (no harm occurred) saw 200 (31.4%) strongly agree and 242 (38.0%) agree.

Conversely, the perception that following safety procedures slows down work was met with agreement by 92 (14.4%) strongly agreeing and 131 (20.6%) agreeing, while a larger portion, 206 (32.3%), disagreed. Trust in supervisory support for reporting near-misses was moderate, with 106 (16.6%) strongly agreeing and 217 (34.1%) agreeing. Only 100 (15.7%) strongly agreed that safety is best learned informally, while 166 (26.1%) disagreed. Teamwork was highly valued, with 152 (23.9%) strongly agreeing and 287 (45.1%) agreeing on its essential nature. Regarding the training environment encouraging reporting, 94 (14.8%) strongly agreed and 223 (35.0%) agreed, while views on non-punitive responses showed 98 (15.4%) strongly agreeing and 196 (30.8%) agreeing. Effective communication was recognized as critical by 117 (18.4%) who strongly agreed and 287 (45.0%) who agreed. Finally, regarding sufficient staffing for safe care, 109 (17.1%) strongly agreed and 243 (38.2%) agreed. Throughout the table, neutral responses ("N") ranged from 64 (10.0%) to 225 (35.3%) across the different prompts.

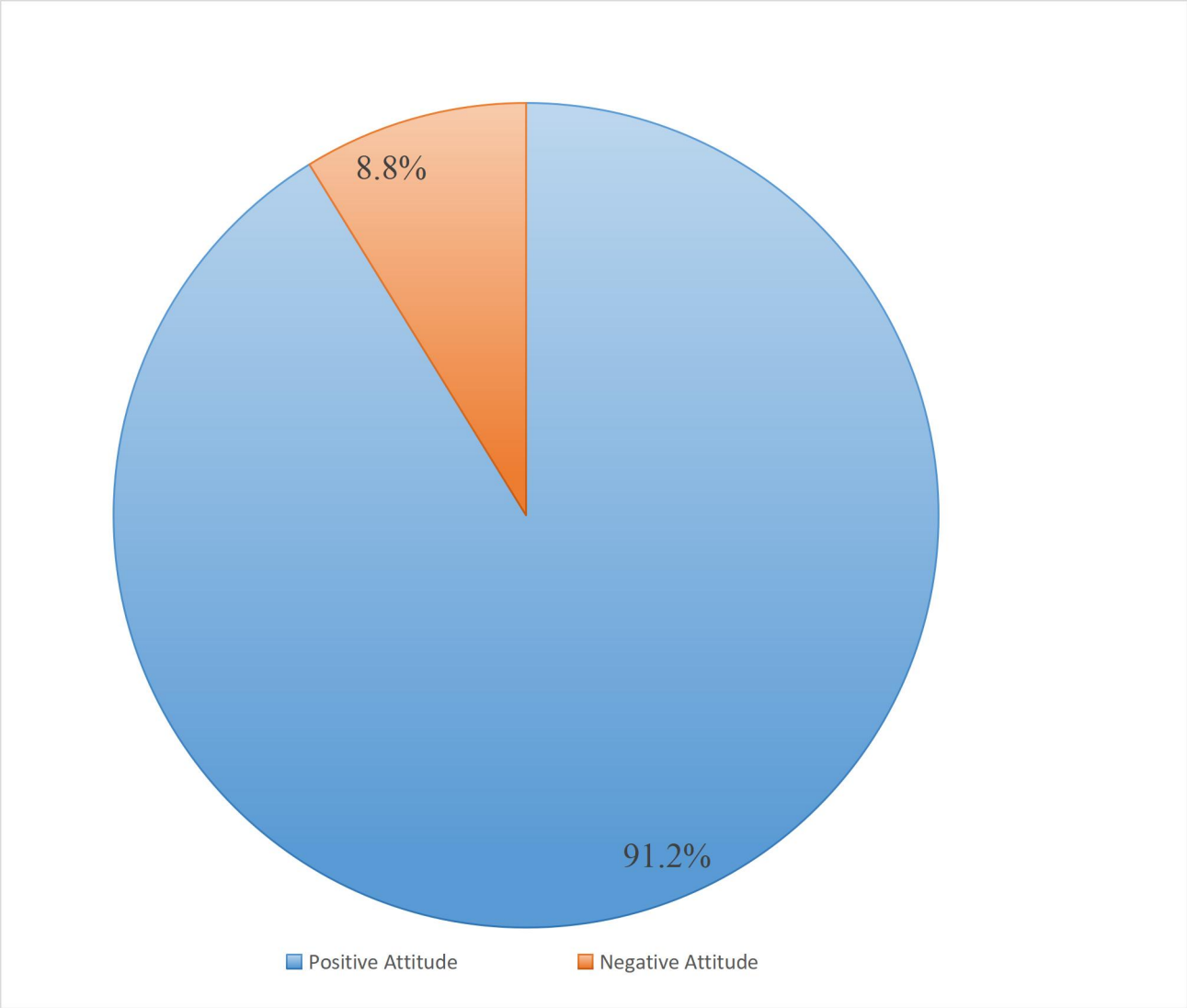

Figure 2: Overall Level of Attitude Towards Patient Safety

Overall attitude towards patient safety responsibilities. The chart highlights an overwhelmingly favourable disposition among the students. An impressive 581 respondents, making up 91.2% of the total sample, exhibited a positive attitude. Only a small minority of 56 students, accounting for the remaining 8.8%, displayed a negative attitude towards the subject.

Table 10: Socio-demographic, Academic Characteristics and Attitude Towards Patient Safety

Variable	Attitude		χ^2 Value	p-value
	Positive n=581(%)	Negative n=56 (%)		
Age Group (years)				
< 20	2(66.7)	1 (33.3)	2.773	0.250
20-24	416 (91.8)	37 (8.2)		
> 24	163 (90.1)	18 (9.9)		
Gender				
Female	302 (91.0)	30 (9.0)	0.052	0.820
Male	279 (91.5)	26 (8.5)		
Department				
Medicine	200 (92.6)	16 (7.4)	4.898	0.298
Nursing	135 (91.8)	12 (8.2)		
Paramedic	67 (85.9)	11 (14.1)		
Physiotherapy	81 (94.2)	5 (5.8)		
Medical Labouratory Science	98 (89.1)	12 (10.9)		
Academic Level				
400	268 (89.9)	30 (10.1)	2.397	0.302
500	246 (91.4)	23 (8.6)		
600	67 (95.7)	3 (4.3)		
Current Clinical Rotation				
Surgery	148 (89.7)	17 (10.3)	12.662	**0.243**
Medicine	142 (96.6)	5 (3.4)		
Subspecialty	100 (92.6)	8 (7.4)		
Pathology	96 (88.9)	10 (11.1)		
Emergency	66 (86.8)	10 (13.2)		
Pediatrics	16 (84.2)	3 (15.8)		
Obstetrics & Gynaecology	13 (92.9)	1 (7.1)		
Average hours spent in hospital/day				
<8	179 (89.9)	20 (10.1)	2.490	0.288
8 - 12	320 (92.8)	25 (7.2)		
>12	82 (88.2)	11 (11.8)		
Ever Received Formal Training On Patient Safety				
Yes	399 (90.7)	41 (9.3)	0.493	0.483
No	182 (92.4)	15 (7.6)		

**Significant at p < 0.05*

Respondents aged 20 – 24 years demonstrated higher positive attitude, with 416 (91.8%) having positive attitude compared with 163 (90.1%) respondents aged > 24 years and 2 (66.7%) respondents aged < 20 years, suggesting that age group was not associated with variation in mindset. This association between age group and attitude towards patient safety was not statistically significant (p = 0.250). Male respondents demonstrated higher positive attitude, with 279 (91.5%) having positive attitude compared with 302 (91.0%) female respondents, indicating that male respondents were more likely to demonstrate positive attitude towards patient safety than females. This association between sex and attitude towards patient safety was not statistically significant (p = 0.820).

Physiotherapy respondents demonstrated the highest positive attitude, with 81 (94.2%) having positive attitude compared with 200 (92.6%) Medicine respondents, 135 (91.8%) Nursing respondents, 98 (89.1%) Medical Laboratory Science respondents, and 67 (85.9%) Paramedic respondents, suggesting that department of study was not associated with differences in outlook. This association between academic department and attitude towards patient safety was not statistically significant (p = 0.298). Respondents in 600 level demonstrated higher positive attitude, with 67 (95.7%) having positive attitude compared with 246 (91.4%) 500 level respondents and 268 (89.9%) 400 level respondents, suggesting that higher educational attainment and clinical level was associated with slightly better attitudes. This association between academic level and attitude towards patient safety was not statistically significant (p = 0.302).

Respondents currently in Medicine rotation demonstrated higher positive attitude, with 142 (96.6%) having positive attitude compared with 13 (92.9%) Obstetrics & Gynaecology respondents, 100 (92.6%) Subspecialty respondents, 148 (89.7%) Surgery respondents, 96 (88.9%) Pathology respondents, 66 (86.8%) Emergency respondents, and 16 (84.2%) Pediatrics respondents, suggesting that current clinical rotation did not substantially change

safety attitudes. This association between current clinical rotation and attitude towards patient safety was not statistically significant ($p = 0.243$). Respondents spending 8 – 12 hours daily in the hospital demonstrated higher positive attitude, with 320 (92.8%) having positive attitude compared with 179 (89.9%) respondents spending < 8 hours and 82 (88.2%) respondents spending > 12 hours, suggesting that moderate daily hospital hours were associated with better attitudes. This association between average hours spent in hospital daily and attitude towards patient safety was not statistically significant ($p = 0.288$). Finally, respondents who had not received formal training demonstrated higher positive attitude, with 182 (92.4%) having positive attitude compared with 399 (90.7%) respondents who had received training, indicating that formal training did not significantly influence safety mindsets. This association between formal training receipt and attitude towards patient safety was not statistically significant ($p = 0.483$).

Table 11: Level of Knowledge and Attitude Toward Patient Safety

Level of Knowledge	Attitude		χ^2 Value	p-value
	Positive n=581 (%)	Negative n=56 (%)		
Good Knowledge	445 (93.1)	33 (6.9)	8.508	**0.004**
Poor Knowledge	136 (85.5)	23 (14.5)		

**Significant at $p < 0.05$*

There is, however, a significant, positive trend between a student's cognitive knowledge base and their overall attitude ($p = 0.004$). Among students who demonstrated "Good Knowledge," an overwhelming 445 (93.1%) also displayed a positive attitude. While students with "Poor Knowledge" still maintained a generally positive outlook, the proportion dropped significantly to 136 (85.5%), indicating that better educational outcomes directly translate to healthier professional mindsets regarding safety culture.

SECTION D:

EVALUATION OF SAFETY CULTURE WITHIN CLINICAL ENVIRONMENT

Table 12: Patient Safety Culture and Clinical Experience among Respondents

Variables	Frequency (n=637)	Percent
Access to an incident reporting system		
Yes	274	43.0
No	363	57.0
Experience with near-misses		
Yes	402	63.1
No	235	36.9
Reporting Near-misses (n=402)*		
Observed a near-miss that was reported	182	45.3
Observed a near-miss not reported	271	67.4
Involved in a near-miss that was reported	125	31.1
Involved in a near-miss not reported	242	60.2
Filed a formal incident or near-miss report		
Yes	124	19.5
No	513	80.5

*Multiple Response

Practical engagement with safety systems highlights an experiential gap. Less than half of the students, 274 (43.0%), reported having access to an incident reporting system, while 363 (57.0%) did not. Despite this, a majority of 402 respondents (63.1%) reported experiencing a near-miss. Among these 402 students, multiple experiences were reported: 182 (45.3%) observed a near-miss that was reported, but a staggering 271 (67.4%) observed a near-miss that went unreported. Furthermore, 125 (31.1%) were personally involved in a near-miss that was reported, while 242 (60.2%) were involved in one that was not. Ultimately, across the entire sample, only 124 students (19.5%) had actually filed a formal incident or near-miss report, leaving 513 (80.5%) who had never formally reported an event.

Table 13: Patient Safety Culture among Respondents

Variables	Frequency (n=637)	Percent
Received orientation prior to entering the clinical setting	463	72.7
Participated in simulation-based patient safety training	292	45.8
Curriculum sufficiently prepares students to manage patient safety risk	283	44.4
Filed a formal incident or near-miss report	124	19.5

Regarding patient safety culture, 463 (72.7%) affirmed they received orientation prior to entering the clinical setting. Simulation-based patient safety training was attended by 292 (45.8%). Interestingly, less than half the cohort, 283 (44.4%), felt that the current curriculum sufficiently prepares them to manage patient safety risks. As reiterated from previous data, only 124 (19.5%) had actively filed a formal report.

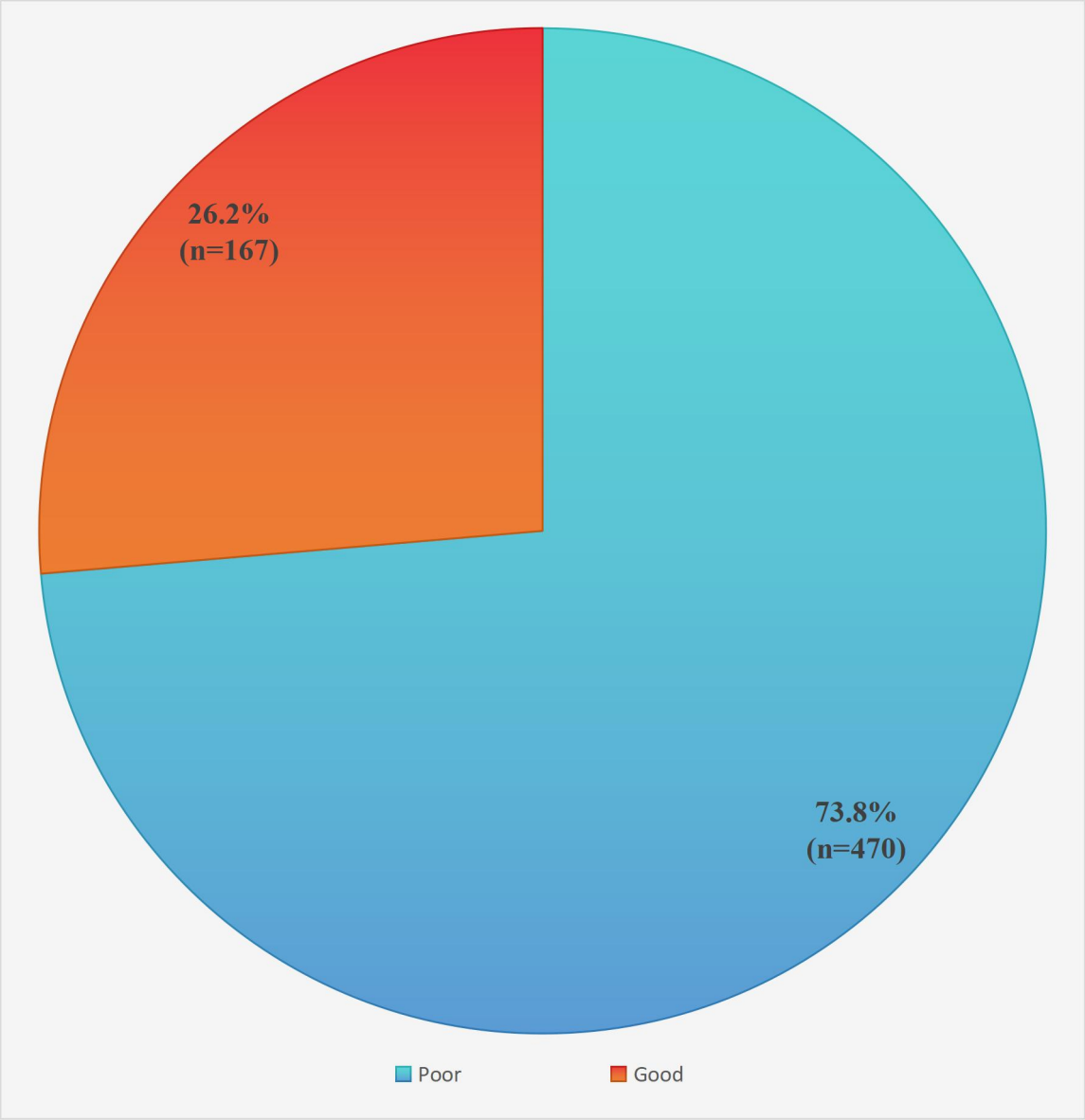

Figure 3: Overall Patient Safety Culture

Overall evaluation of patient safety culture practices implemented by the respondents within the clinical environment. In stark contrast to the highly positive cognitive knowledge and attitudinal score, the practical application falls significantly short. The vast majority, encompassing 470 (73.8%), had poor patient safety culture. Only 167 (26.2%), demonstrated good overall practice.

Table 14: Knowledge, Attitude and Overall Patient Safety Culture

Variable	Overall Patient Safety Culture		χ^2 Value	p-value
	Good n=167 (%)	Poor n=470 (%)		
Level of Knowledge				
Good	134 (28.0)	344 (72.0)	3.268	0.071
Poor	33 (20.8)	126 (79.2)		
Overall Attitude				
Positive	156 (26.9)	425 (73.1)	1.372	0.242
Negative	11 (19.6)	45 (80.4)		

When cross-tabulating overall culture (Good vs. Poor) against foundational Knowledge and Attitude, no statistically significant relationships emerged. Having good knowledge did not significantly translate into better overall practice ($p = 0.071$), nor did maintaining a positive attitude ($p = 0.242$). This lack of trend suggests that actual clinical practice is heavily mediated by systemic and environmental barriers rather than internal cognitive or attitudinal deficits.

Table 15: Perceived Barriers to Reporting Patient Safety Incidents

Barrier to Reporting*	Frequency (n=513)	Percent
Fear of victimization or blame	233	58.0
Lack of time/high workload	169	42.0
Strict hierarchy or fear of superiors	178	44.3
Do not know the reporting procedures	104	25.9
Belief that nothing will be done/no feedback	42	10.4

**Multiple response question*

Among the 513 students who have not filed formal reports, multiple barriers were identified. The most prominent obstacle is the fear of victimization or blame, reported by 233 (58%). This is followed closely by a strict hierarchy or fear of superiors, cited by 178 (44.3%), and a lack of time due to high workload, cited by 169 (42%). A quarter of this subgroup, 104 (25.9%), simply do not know the reporting procedures, while 42 (10.4%) harbour the belief that nothing will be done or no feedback will be provided even if they do report.

SECTION E:

GAPS IN PATIENT SAFETY CURRICULUM AND EXPERIENTIAL LEARNING

Table 16: Identified Gaps in Patient Safety Curriculum and Experiential Learning

Gaps	Frequency (n=637)	Percent
Patient safety topics perceived as inadequately covered in the current curriculum*		
Root cause analysis	376	59.0
Incident reporting	314	49.3
Error disclosure to patients	273	42.9
Teamwork and communication	258	40.5
Major obstacles to learning about patient safety*		
Heavy clinical workload and time constraints	322	50.5
Lack of formal lectures	298	46.8
Lack of adequate clinical oversight	189	29.7

**Multiple response question*

Respondents were allowed to select multiple areas where they felt the current academic curriculum fell short. Root cause analysis was the most frequently identified gap, noted by 376 (59.0%). This was followed by incident reporting protocols, flagged by 314 (49.3%), error disclosure to patients by 273 (42.9%), and teamwork and communication by 258 (40.5%). When identifying major obstacles to experiential learning in the wards, heavy clinical workload and time constraints were the leading issue for 322 (50.5%). The lack of formal lectures on the topic was cited by 298 (46.8%), and a lack of adequate clinical oversight was identified as a barrier by 189 (29.7%).

CHAPTER 5

DISCUSSION

This study assessed the knowledge and attitudes of clinical students regarding patient safety and evaluated patient safety culture among clinical students at the University of Benin Teaching Hospital, Benin City, Edo State. The discussion is presented in line with the study's specific objectives and interpreted within the context of the conceptual framework, which explains that patient safety behaviour is influenced by both individual and environmental factors, such as supervision, openness in communication, institutional support, and organisational culture.[31-33]

The respondents in this study were clinical students drawn from different disciplines, including Medicine and Surgery, Nursing Science, Physiotherapy, Medical Laboratory Science, and Paramedics. Most respondents had previously received some form of patient safety orientation or training before participating in clinical activities.

This finding may be explained by the increasing emphasis on patient safety education within clinical training programmes and the role of UBTH as a major tertiary teaching hospital where students are routinely exposed to patient care activities. Clinical students at higher levels of study are also more likely to encounter discussions of infection prevention, medication safety, adverse events, and healthcare quality during ward rounds and bedside teaching. These findings are similar to those from studies in Ibadan and Kwara State, which also reported high awareness of and prior exposure to patient safety information among clinical and physiotherapy students.[28,36] A study from Ethiopia similarly found that exposure to patient safety concepts is becoming substantial among undergraduate health science students.[35] This high awareness matters because clinical exposure alone may improve awareness of patient safety concepts, but it may not necessarily translate into safe clinical behaviour unless supported by structured teaching, supervision, and institutional

reinforcement. It also shows that teaching hospitals should therefore strengthen structured patient safety systems, as clinical rotations are a key source of practical education for trainees.

The study found that most respondents demonstrated good knowledge regarding patient safety principles. Respondents showed a relatively good understanding of medication safety, infection prevention, and systems thinking, whereas knowledge regarding reporting and learning systems was slightly lower. This finding may be related to previous patient safety orientation, increasing integration of safety concepts into undergraduate curricula, and repeated exposure to clinical environments where patient safety practices are discussed. Students in clinical years are more likely to observe healthcare-associated infections, medication errors, and adverse events during clinical rotations, thereby improving their awareness of safety principles. The study found that advancing to senior clinical postings and receiving formal safety training were the strongest independent positive predictors of good knowledge. Conversely, excessive daily hospital workloads were a strong independent negative predictor, drastically reducing a student's odds of retaining strong safety knowledge.

This high level of good knowledge observed is similar to findings from a study in Ibadan, which noted that most medical and health science students possessed a strong grasp of safety concepts.[28] However, this finding contrasts with a study in Ethiopia, where more than half of respondents demonstrated poor knowledge regarding patient safety. [35] Furthermore, the finding that excessive hours degrade knowledge retention supports conclusions from research in Southeastern Nigeria, which demonstrated that structural time constraints and provider burnout serve as major environmental hazards that undermine professional cognitive capabilities. The public health implications of this finding are important because clinical students actively participate in patient care and may contribute to either the prevention or occurrence of medical errors. Good knowledge of patient safety among students can contribute to reduced healthcare-associated harm, improved healthcare quality, and safer

patient outcomes. Medical schools and teaching hospitals should therefore strengthen formal patient safety teaching using simulation exercises, case discussions, and practical demonstrations during clinical postings.

The study also found that respondents generally demonstrated positive attitudes toward patient safety responsibilities. Most respondents believed that healthcare professionals have a responsibility to protect patients from harm, supported teamwork and communication, and agreed that errors should be reported and discussed to improve patient care. This finding may be explained by growing awareness regarding patient-centred care, increased exposure to healthcare quality discussions, and institutional emphasis on professionalism during clinical training. Students who have received prior safety orientation may also be more likely to appreciate the importance of communication, teamwork, and accountability in preventing patient harm. Despite this positive mindset, a clear undercurrent of cultural friction emerged, as a substantial portion of respondents admitted that it is very difficult to discuss or report errors in their clinical training environments openly.

This finding is consistent with a study in Pretoria, South Africa, in which most respondents reported positive attitudes toward patient safety culture across several domains.[40] Similarly, a study in Kwara State, Nigeria, found that respondents generally demonstrated positive attitudes toward acknowledging and managing patient safety incidents.[36]

However, this finding contrasts with a study conducted among clinical students in Ibadan, Nigeria, in which negative attitudes toward patient safety culture were more prevalent despite fair levels of knowledge.[28] Similarly, a study conducted in Saudi Arabia reported generally poor attitudes across several patient safety domains.[39] These differences may be due to variations in institutional culture, educational exposure, workload, and supervision practices across study settings. Positive attitudes toward patient safety are important because attitudes

influence future professional behaviour, willingness to report errors, and adherence to safety protocols. Students with favourable attitudes toward patient safety may be more likely to practice safely and contribute to safer healthcare systems after graduation. Teaching institutions should therefore continue to reinforce positive safety attitudes through continuous professional mentorship, interprofessional learning, teamwork exercises, and patient safety campaigns during undergraduate training.

The study found that overall patient safety culture practice among respondents was poor despite relatively good knowledge and positive attitudes. Incident reporting practices were low, and many students reported barriers such as fear of blame, hierarchy, victimisation, workload, and a lack of awareness of reporting procedures. This finding may be explained by weak institutional reporting systems, punitive clinical environments, limited psychological safety, and inadequate student involvement in formal patient safety activities. In many clinical environments, students may fear criticism, embarrassment, or punishment when reporting errors or near misses, especially within rigid hierarchical healthcare systems. This finding is consistent with a study conducted in Kaduna State, Nigeria, which identified weaknesses in communication, openness and error-reporting culture despite acceptable overall perceptions of patient safety. [14] Similarly, a study in Oyo State, Nigeria, reported that although teamwork scores were relatively high, reporting of patient safety incidents remained poor.[8] However, this finding contrasts with a study conducted in Ghana, where many respondents perceived patient safety culture within their facilities as good or very good.[6]The finding that good knowledge and positive attitudes did not necessarily translate into better patient safety practices highlights the importance of environmental and institutional factors in shaping behaviour. This aligns with the conceptual framework underpinning this study, which emphasises that safe practice is influenced not only by individual knowledge, but also by supervision, organisational culture, communication systems, and institutional support.[31-33]

The public health importance of this finding is substantial because poor patient safety culture contributes to preventable medical errors, healthcare-associated infections, increased healthcare costs, reduced patient trust, and avoidable morbidity and mortality. Teaching hospitals should therefore establish non-punitive reporting systems, strengthen supportive supervision, encourage open communication, and promote psychological safety within clinical learning environments.

The study identified several gaps in patient safety curriculum and experiential learning, particularly in areas such as incident reporting, root cause analysis, teamwork, communication, and error disclosure. Many respondents also reported that workload, inadequate supervision, and limited formal teaching reduced opportunities for patient safety learning during clinical postings. This finding may be explained by inconsistent integration of patient safety into undergraduate curricula and overreliance on informal ward-based learning. In many resource-limited settings, patient safety teaching may occur incidentally during clinical exposure rather than through structured educational programmes. This finding aligns with a study conducted in Anambra State, Nigeria, which identified the absence of patient safety units, weak institutional structures, inadequate training programmes, and a lack of patient safety policies as key barriers to implementing patient safety. [46] Similarly, a study conducted in Eastern Ethiopia identified inadequate organizational support, insufficient resources, and poor patient safety awareness as major gaps affecting safety culture practices.[43] However, studies conducted in some higher-resource settings have reported more structured patient safety integration into undergraduate curricula, including simulation-based learning and formal incident review systems. The differences may reflect disparities in funding, educational infrastructure, staffing, and institutional prioritisation of patient safety. The public health implication of this finding is that inadequate patient safety training during undergraduate education may contribute to the persistence of unsafe clinical practices after

graduation. Strengthening patient safety teaching during training is therefore essential for producing competent healthcare professionals capable of delivering safer care. Medical schools and teaching hospitals should incorporate structured patient safety modules, simulation-based learning, interdisciplinary teamwork exercises, and supervised incident-review discussions into undergraduate training programmes.

CONCLUSION

This study found that clinical students at the University of Benin Teaching Hospital generally demonstrated good knowledge regarding patient safety principles and positive attitudes toward patient safety responsibilities. However, patient safety culture practices in the clinical environment were poor, particularly in incident reporting, openness in communication, and speaking up about errors.

The study also identified important gaps in the patient safety curriculum and experiential learning, including inadequate formal instruction in root cause analysis, error disclosure, teamwork, and incident reporting systems. Fear of blame, rigid hierarchy, workload, and inadequate institutional support were major barriers affecting patient safety culture practices among respondents.

Overall, the findings suggest that although clinical students possess relatively good theoretical understanding of patient safety, institutional and environmental barriers continue to limit translation of knowledge and attitudes into safe clinical practice. Strengthening patient safety culture within teaching hospitals, therefore, requires both educational reforms and supportive organisational systems.

RECOMMENDATIONS

The University of Benin Teaching Hospital and affiliated training institutions should strengthen formal patient safety education within undergraduate curricula, particularly in areas such as incident reporting, root cause analysis, communication, teamwork, and error disclosure.

Simulation-based patient safety training and practical case-based learning should be incorporated into clinical postings to improve translation of theoretical knowledge into practice.

Hospital management should establish accessible, confidential, and non-punitive incident reporting systems that encourage students and healthcare workers to report errors and near misses without fear of punishment or victimization.

Clinical supervisors and healthcare professionals should promote supportive supervision, positive role modelling, and open communication within clinical learning environments.

Institutional leaders should improve psychological safety within clinical settings by reducing hierarchical barriers and encouraging students to speak up about patient safety concerns.

Further multicentre studies should be conducted among clinical students in other teaching hospitals across Nigeria to provide broader evidence regarding patient safety culture among healthcare trainees.

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APPENDICES

APPENDIX A: QUESTIONNAIRE

DEPARTMENT OF PUBLIC HEALTH AND COMMUNITY MEDICINE

UNIVERSITY OF BENIN, BENIN CITY.

ASSESSMENT OF KNOWLEDGE AND ATTITUDES OF PATIENT SAFETY AND THE EVALUATION OF PATIENT SAFETY CULTURE, AMONG CLINICAL STUDENTS AT UNIVERSITY OF BENIN TEACHING HOSPITAL, BENIN CITY.

SECTION A: SOCIODEMOGRAPHIC DATA

1. Age (completed years): _____
2. Sex: [ ] Male [ ] Female [ ]
3. Ethnic Group: _____
4. Religion: Christianity [ ] Islam [ ] African traditional religion [ ] Others [ ]
5. Department: [ ] Medicine [ ] Nursing [ ] Pharmacy [ ] Medical Laboratory Science [ ] Physiotherapy [ ] Other: _____
6. Level: [ ] 400L [ ] 500L [ ] 600L
7. Current clinical rotation (most recent): _____
8. Average hours in hospital/day: [ ] <8 [ ] 8–12 [ ] >12
9. Have you ever received formal training on patient safety? [ ] Yes [ ] No
10. Ever filed/attempted to file an incident/near-miss report? [ ] Yes [ ] No

SECTION B: KNOWLEDGE OF PATIENT SAFETY PRINCIPLES

Instructions (read): For each item tick all options that are correct

1. Which describe a vaccine and its purpose? (tick all that apply)

   [ ] Stimulates immune response to prevent disease

   [ ] Permanently cures current infections

   [ ] Contains weakened/inactivated pathogen components

   [ ] Used mainly to treat symptoms once disease occurs

   [ ] Used to develop immunity before exposure

2. Systems view of errors — which are correct? (tick all)

   [ ] Errors often come from system failures (not individual only)

   [ ] Workload, communication and device design can cause errors

   [ ] Blaming individuals is the best error reduction method

   [ ] Checklists and standard protocols reduce system vulnerability

   [ ] Training alone eliminates systemic design problems

3. Which reduce healthcare-associated infection? (tick all)

   [ ] Hand hygiene at WHO “five moments”

   [ ] Use single-use items or proper sterilisation when indicated

   [ ] Skipping aseptic technique is acceptable if patient is low risk

   [ ] Use antibiotic prophylaxis only when indicated

   [ ] Correct waste segregation and surface cleaning

4. Safe medication practices (tick all)

   [ ] Follow “five rights” (patient, drug, dose, route, time)

   [ ] Rely on memory for high-risk doses

   [ ] Verify allergies and indications before administering

[ ] Double-check or use barcode for high-risk meds

[ ] Never document omissions or near-misses

5. Reporting & learning — which are correct? (tick all)

[ ] Near-misses should be reported for learning

[ ] Non-punitive reporting culture encourages reporting

[ ] Reports should be secret and not used to change systems

[ ] Root-cause analysis helps identify system fixes

[ ] Feedback to reporters increases reporting

SECTION C: ATTITUDE TOWARDS PATIENTS SAFETY RESPONSIBILITIES

Rate your level of agreement: Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), Strongly Disagree (SD).Strongly Disagree (SD).

S/N	Item	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	I feel responsible for patients' safety.					
2.	I am comfortable raising concerns about unsafe care.					
3.	It is difficult to question senior staff even if I suspect an error.					
4.	Reporting incidents is important even if no					

	harm occurred.					
5.	Safety procedures (checklists) slow clinical work unnecessarily.					
6.	I trust supervisors will support me if I report a near-miss.					
S/N	Item	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
7.	Patient safety is best learned informally on the ward (rather than formally).					
8.	Staff work as a team to ensure safety.					
9.	Supervisors encourage reporting of errors/near-misses.					
10.	Response to error is non-punitive in my training areas.					
11.	Communication across					

	shifts/departments is effective.					
12.	There is sufficient staffing to deliver safe care in my rotations.					

SECTION D: PRATICE OF SAFETY CULTURE WITHIN CLINICAL ENVIRRONMENT

1. Which best describes your experience in this rotation? (tick one)

   [ ]Observed a near-miss that was reported

   [ ]Observed a near-miss not reported

   [ ] Involved in a near-miss that was reported

   [ ] Involved in a near-miss not reported

   [ ] No near-miss observed/involved

2. Ever filed a formal incident/near-miss report? [ ] Yes [ ] No
3. What stops you from speaking up? (tick all)

   [ ] Fear of victimization

   [ ] Hierarchy/seniority

   [ ] Lack of time

   [ ] Don't know how to report

   [ ] Nothing

4. Simulation-based patient-safety training participated? [ ] Yes [ ] No
5. Access to incident reporting system? [ ] Yes [ ] No

SECTION E: GAPS IN CURRICULUM AND EXPERIENTIAL LEARNING

1. Did you receive any form of orientation before entering the clinical setting? [ ] Yes [ ] No
2. How much of your patient safety knowledge was acquired informally (observation) vs. formally (lectures)?

   [ ] Mostly Informal

   [ ] Mostly Formal

   [ ] Equal Mix

   [ ] None
3. Have you ever participated in a simulation-based training session regarding patient safety? [ ] Yes [ ] No
4. .Do you feel your current curriculum adequately prepares you to manage patient safety risks? [ ] Yes [ ] No
5. Which of the following topics have NOT been covered in your training? (Select all that apply)

   [ ] Error reporting systems

   [ ] Root cause analysis

   [ ] Teamwork and communication

   [ ] Disclosure of errors to patients
6. What is the major barrier to learning about patient safety at UBTH?

   [ ] lack of formal lectures

   [ ] Poor supervision by senior staff

   [ ] High workload/No time

   [ ] Fear of victimization

APPENDIX B: SAMPLYING TECHNIGUE

Respondents will be selected using stratified sampling as follows: STEP 1: STRATIFICATION

DISCIPLINE

- Medicine (UNIBEN)
- Nursing (UNIBEN + UBTH)
- Medical Laboratory Science (UNIBEN + Wellspring)
- Physiotherapy (UNIBEN)
- Paramedics (UBTH)

LEVEL OF STUDY

- 400, 500, 600

STEP 2: COMPUTATION OF THE SAMPLING FRACTION.

Where:

= Sampling fraction.

nf = Final minimum sample size.

N = Total population size.

Thus:STEP 3:

PROPORTIONAL ALLOCATION

DISCIPLINE	LEVEL	INSTITUTION	POPULATION	SAMPLE SIZE (
MEDICINE	400	UNIBEN	166	55

MEDICINE	500A	UNIBEN	161	54
MEDICINE	500B	UNIBEN	167	56
MEDICINE	600	UNIBEN	136	45
NURSING	400	UNIBEN	128	43
NURSING	500	UNIBEN	88	29
NURSING	400	UBTH	116	39
NURSING	500	UBTH	110	37
MLS	400	UNIBEN	132	44
MLS	500	UNIBEN	110	37
MLS	400	WELLSPING	67	22
PHYSIOTHERAPHY	400	UNIBEN	123	41
PHYSIOTHERAPHY	500	UNIBEN	132	44
PARAMEDICS	400	UBTH	125	42
PARAMEDICS	500	UBTH	106	35
TOTAL	----	----	1867	623

Sampling will be conducted in each level proportionate to its size based on the male-to-female ratio.STEP 4: SELECTION OF THE PARTICIPANTS.Within each stratum, participants will be selected using simple random sampling.

APPENDIX C: INFORMED CONSENT FORM

TITLE OF RESEARCH: ASSESSMENT OF KNOWLEDGE AND ATTITUDES OF PATIENT SAFETY AND EVALUATION OF PATIENT SAFETY CULTURE AMONG CLINICAL STUDENTS AT UNIVERSITY OF BENIN TEACHING HOSPITAL, BENIN CITY

NAME AND AFFILIATION OF INVESTIGATOR:

Doghor Jovita Aghogho

Department of Public Health and Community Medicine,

University of Benin Teaching Hospital,

PMB 111 Ugbowo, Benin-Lagos Express Road,

Benin City, Edo State.

Email: Jovita.doghor@med.uniben.edu

PURPOSE OF RESEARCH: The purpose of this research is to assess the level of knowledge, and attitudes of clinical students regarding patient safety and evaluation of their patient safety culture at the University of Benin Teaching Hospital, Benin City.

PROCEDURES INVOLVED IN THE STUDY: In this study, questions will be asked regarding the knowledge and attitudes of clinical students regarding patient safety and evaluation of their patient safety culture at the University of Benin Teaching Hospital, Benin City.

CONFIDENTIALITY: All data collected will be treated with utmost confidentiality. Patients 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. 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 findings from this study will help identify gaps in students' knowledge and attitudes toward patient safety.**

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

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

Doghor Jovita Aghogho

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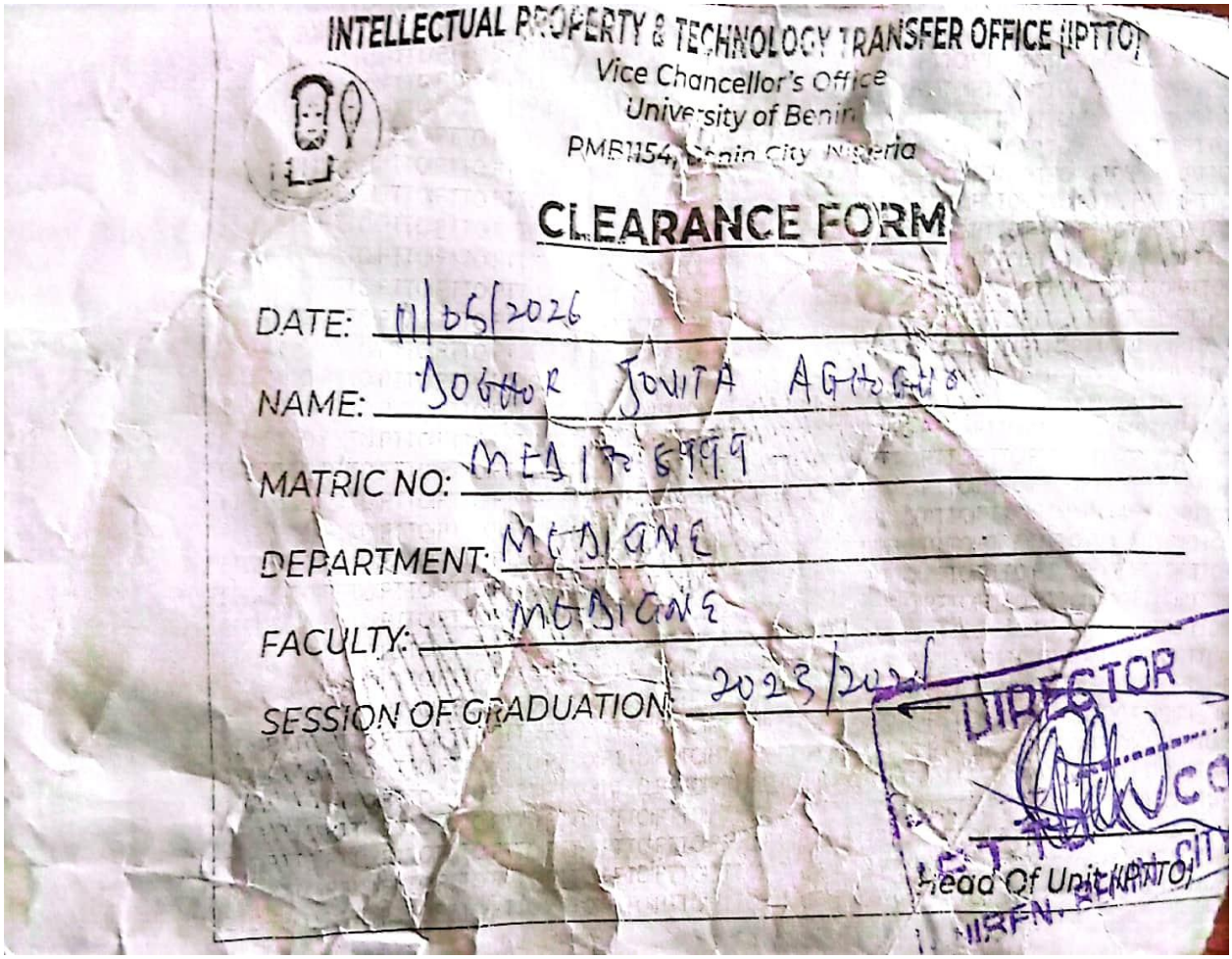
OR

Ethics and Research Committee,

University of Benin Teaching Hospital,

Phone Number: +234-706-333-1337

APPENDIX D: PLAGARISM SLIP



INTELLECTUAL PROPERTY & TECHNOLOGY TRANSFER OFFICE (IPTTO)
Vice Chancellor's Office
University of Benin
PMB1154, Benin City, Nigeria

CLEARANCE FORM

DATE: 11/05/2026
NAME: Doctor Jovita Agbonkhese
MATRIC NO: MEA/17/6999
DEPARTMENT: MEDICINE
FACULTY: MEDICINE
SESSION OF GRADUATION: 2023/2024

DIRECTOR
Head Of Unit (IPTTO)

APPENDIX E: ETHICAL CLEARANCE

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

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Registration Number:
NHREC-UBTH-HREC/24/12/2022B

PROTOCOL NUMBER: ADM/E 22/A/VOL. VII/14865491272129

PROPOSAL TITLE: "ASSESSMENT OF KNOWLEDGE AND ATTITUDES OF PATIENT SAFETY AND EVALUATION OF PATIENT CULTURE AMONG CLINICAL STUDENTS AT UNIVERSITY OF BENIN TEACHING HOSPITAL, BENIN CITY"

PRINCIPAL INVESTIGATOR(S): DOGHOR JOVITA AGHOGHO

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

DATE CONSIDERED: MARCH 31ST, 2026

DECISION OF THE COMMITTEE: APPROVED

THIS APPROVAL DATES 31/03/2026 TO 19/03/2027. 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 31/3/2026

SUPERVISOR (S): PROF. E.O. OGBOGHODO

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 31/3/2026