HIV POST-EXPOSURE PROPHYLAXIS:

EXPERIENCES OF CLINICAL-YEAR MEDICAL STUDENTS

AT THE UNIVERSITY OF BENIN, BENIN CITY, NIGERIA.

BY

EMMANUEL OHIOLE WILLIAMS MED1807506

CHRISTABEL SOPHIA UWECHI MED1807505

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DECLARATION

We hereby declare that this project work titled "**HIV POST-EXPOSURE PROPHYLAXIS: EXPERIENCES OF CLINICAL-YEAR MEDICAL STUDENTS AT THE UNIVERSITY OF BENIN, BENIN CITY, NIGERIA.**" was conducted under the supervision of PROF O. A. ADELEYE and has not been submitted anywhere else for the award of a degree or certificate.

EMMANUEL OHIOLE WILLIAMS

MED1807506

+2349030405501

marvelwills2018@gmail.com

CHRISTABEL SOPHIA UWECHI

MED1807505

+2349025299782

sophiauwechi26@gmail.com

CERTIFICATION

This is to certify that this research work titled **"HIV POST-EXPOSURE PROPHYLAXIS: EXPERIENCES OF CLINICAL-YEAR MEDICAL STUDENTS AT THE UNIVERSITY OF BENIN, BENIN CITY, NIGERIA."** was carried out by **EMMANUEL OHIOLE WILLIAMS** with matriculation number **MED1807506** and **CHRISTABEL SOPHIA UWECHI** with matriculation number **MED1807505** under the supervision of PROF O. A. ADELEYE in the Department of Community Health, College of Medicine, University of Benin as part of the requirements for the award of Bachelor of Medicine, Bachelor of Surgery (MBBS).

PROF O. A. ADELEYE

MBBS, FWACP

Professor/Consultant (Project Supervisor),

Department of Public Health and

Community Medicine,

School of Medicine,

College of Medicine,

University of Benin,

Benin City, Edo State, Nigeria.

.

Dr. (Mrs.) O. E. OBARISIAGBON

MBBS; MPH; FMCPH

Head of Department,

Associate Professor/Consultant,

Department of Public Health and

Community Medicine,

School of Medicine,

College of Medicine,

University of Benin,

Benin City, Edo State, Nigeria.

DEDICATION

This work is first and foremost dedicated to God Almighty, whose grace and guidance have sustained us throughout our journey toward becoming medical doctors. We also dedicate this project to our families, our unwavering pillars of support, whose immense contributions and sacrifices over the years have made this achievement possible. This work is also dedicated to our teacher who guided us throughout the course of this project, Prof. O. A. ADELEYE.

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LIST OF ABBREVIATIONS

AOR:	Adjusted Odds Ratio
ARV:	Antiretroviral
BBF:	Blood and Body Fluid
CI:	Confidence Interval
HIV:	Human Immunodeficiency Virus
KAP:	Knowledge, Attitude, and Practice
PEP:	Post-Exposure Prophylaxis
PrEP:	Pre-Exposure Prophylaxis
SPSS:	Statistical Package for Social Sciences
UNAIDS:	Joint United Nations Programme on HIV/AIDS
WHO:	World Health Organisation

DEFINITION OF TERMS

Attitude: The prevailing perceptions, beliefs, or feelings held by clinical-year medical students toward the use of PEP, including concerns regarding medication side effects, stigma, or its perceived necessity.

Clinical-Year: The advanced phase of the undergraduate Medicine and Surgery (MBBS) program, specifically encompassing the 400L, 500L, and 600L levels of study. This phase is characterized by hands-on hospital ward rotations and direct patient care.

Human Immunodeficiency Virus (HIV): A virus that attacks the body's immune system and remains a major global public health concern.

Knowledge: The level of awareness and understanding possessed by students regarding HIV PEP, including its definition, correct timing of initiation, duration of treatment, and high-risk body fluids.

Occupational Exposure: Accidental contact with potentially infected blood or body fluids through needle-stick injuries, cuts from sharp instruments, or splashes onto mucosal surfaces during clinical training.

Post-Exposure Prophylaxis (PEP): The use of antiretroviral medications initiated preferably within 72 hours of potential exposure to HIV to prevent infection, typically taken for a 28-day course.

Practice: The actions taken by students following potential exposure, such as reporting incidents, seeking medical advice, and adhering to the prescribed PEP regimen.

ABSTRACT

Background: Human Immunodeficiency Virus (HIV) remains a critical public health burden, particularly in high-prevalence settings like Nigeria. Within this environment, clinical-year medical students represent a highly vulnerable demographic; their transition into hands-on patient care and the accompanying steep clinical learning curve frequently expose them to occupational hazards such as needle-stick injuries and mucosal splashes. Although Post-Exposure Prophylaxis (PEP) can reduce the transmission risk by over 80% if initiated within the critical 72-hour window, its clinical effectiveness is heavily contingent upon the trainees' underlying awareness, positive attitudes, and prompt health-seeking behaviours. Assessing the Knowledge, Attitude, and Practice (KAP) of these students is therefore vital for identifying hidden educational deficits and designing targeted, student-centred institutional safety interventions.

Objective: The objective of this study was to explore the experiences of clinical-year medical students at the University of Benin regarding HIV post-exposure prophylaxis, specifically by evaluating their knowledge, attitude, practice, and the barriers limiting its utilisation.

Methodology: A quantitative descriptive cross-sectional study design was employed. The study was conducted among clinical-year (400, 500, and 600-level) medical students at the University of Benin, Edo State, Nigeria. A multistage sampling technique was used to select 313 respondents. Data were collected via a pretested, self-administered online questionnaire

(Google Forms). Responses were scored to formally categorize participants' knowledge, attitude, and practice into specific tiers (e.g., poor, fair, good). Data were analysed using IBM SPSS version 27.0, with statistical significance determined through Chi-square tests, Fisher's exact tests, and binary logistic regression.

Result: A total of 313 students participated (100% response rate), with a mean age of 23.03±2.40 years and a male majority (62.9%). While a high proportion (89.1%) were aware of PEP, detailed knowledge was grossly inadequate: 41.2% had poor knowledge, 43.8% had fair knowledge, and only 15.0% possessed good knowledge. Prior HIV testing emerged as the sole independent predictor of good knowledge ($p < 0.001$). Conversely, an overwhelming majority (90.4%) demonstrated a positive attitude toward PEP, which was significantly predicted by having a higher knowledge score ($p = 0.007$). Regarding practice, 8.3% reported a history of occupational exposure, but only 23.1% of those exposed actually initiated PEP, resulting in an overall poor practice rate of 88.5%. Major barriers to utilisation included a lack of knowledge regarding reporting protocols (86.6%), uncertainty about exposure risk (74.4%), and fear of stigma (74.1%).

Conclusion: The study reveals a critical gap between high theoretical awareness and positive attitudes versus severely deficient practical knowledge and poor utilisation of HIV PEP among clinical-year medical students. Individual demographic factors did not significantly improve practice, indicating that the low utilisation is heavily driven by structural and informational barriers. To mitigate these occupational hazards, institutions must integrate formal PEP protocol training into the clinical curriculum, guarantee confidential reporting pathways, and ensure unrestricted 24-hour access to prophylaxis services.

Keywords: HIV, Post-Exposure Prophylaxis, Clinical-year Medical Students, Occupational Exposure, Knowledge Attitude and Practice, University of Benin, Nigeria.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Human Immunodeficiency Virus (HIV) remains a major global public health concern, particularly in Sub-Saharan Africa, where the burden of infection is disproportionately high. According to the Joint United Nations Programme on HIV/AIDS (UNAIDS), approximately 39.9 million people globally were living with HIV in 2023, with Sub-Saharan Africa accounting for more than half of these cases.[1] Despite significant progress in prevention and treatment, millions of new infections continue to occur annually. One of the key preventive measures following potential exposure to HIV is the use of Post-Exposure Prophylaxis (PEP).

Post-Exposure Prophylaxis refers to the use of antiretroviral medications after potential exposure to HIV in order to prevent infection. When initiated promptly—preferably within 72 hours of exposure—and taken for the recommended 28-day course, PEP can reduce the risk of HIV transmission by over 80%.[2] The World Health Organisation (WHO) has established clear guidelines recommending PEP for both occupational and non-occupational exposures.[3]

Clinical-year medical students represent a population with an increased risk of occupational exposure to HIV. During clinical rotations, students frequently handle needles and sharp instruments; studies indicate that needle-stick injuries are common among trainees in African teaching hospitals, yet reporting rates remain low.[4] These exposures make it essential for clinical students to possess adequate knowledge about PEP and maintain a positive attitude toward its use.

Despite the effectiveness of PEP, several studies among healthcare workers and students in Nigeria have reported suboptimal knowledge and poor utilisation of services.[5] Factors such as lack of awareness, fear of stigma, and concerns about drug side effects have been identified as significant barriers.[6] This study, therefore, seeks to assess the knowledge, attitude, and practice regarding HIV PEP among clinical-year medical students at the University of Benin.

The College of Medicine, University of Benin trains a large number of clinical-year students who are regularly exposed to hospital environments and patient care activities. Given the occupational risks associated with clinical training, it is important to evaluate how well these students understand PEP, how they perceive its importance, and whether they follow appropriate procedures after potential exposure.

Assessing the knowledge, attitude, and practice (KAP) of clinical-year medical students regarding HIV post-exposure prophylaxis is therefore essential for identifying gaps in awareness and behaviour. Such information will help guide interventions aimed at improving occupational safety, strengthening infection prevention measures, and ensuring that students are adequately protected during their clinical training.

The gap between the theoretical availability of PEP and its suboptimal utilisation in high-burden settings such as Nigeria underscores the need to comprehensively evaluate PEP-related knowledge, attitudes, and practices among clinical trainees in Nigerian teaching hospitals.

1.2 STATEMENT OF PROBLEM

During clinical postings, medical students transition from theoretical learning to hands-on patient care, participating in invasive procedures such as phlebotomy, suturing, and assisting in surgeries. This phase of training is characterised by a steep learning curve, where

developing manual dexterity and high-stress environments significantly elevate the risk of accidental needle-stick injuries (NSIs) and mucous membrane splashes.[7,8] Occupational exposure to blood-borne pathogens, specifically the Human Immunodeficiency Virus (HIV), remains a critical professional hazard for healthcare trainees globally.[7]

The problem is particularly pronounced in high-burden, resource-constrained settings like Nigerian teaching hospitals, where the baseline prevalence of HIV in the patient population increases the statistical likelihood that an exposure event will be high-risk.[9,10]

Despite this heightened risk, several compounding factors exacerbate the vulnerability of clinical students:

- **High Incidence with Limited Experience:** Research indicates that clinical trainees, such as interns and final-year medical students, experience high rates of percutaneous injuries precisely because they are practicing new skills, often under suboptimal supervision or in emergency settings.[8,11]
- **Knowledge-Practice Gap:** While theoretical awareness of standard precautions may exist, practical adherence is frequently compromised by a lack of access to proper personal protective equipment (PPE) or unsafe practices like two-handed needle recapping and improper disposal into overflowing sharp bins.[11]
- **Underreporting and Delayed Intervention:** A significant number of occupational exposures among students go unreported due to fear of stigma, ignorance of institutional reporting protocols, or an underestimation of the exposure risk. Consequently, students miss the critical 72-hour window for initiating Post-Exposure Prophylaxis (PEP), putting themselves at risk of irreversible seroconversion.[6,10]

- **Suboptimal PEP Knowledge:** Even when injuries occur, studies reveal that a large proportion of healthcare trainees in Nigeria lack comprehensive knowledge regarding the specific antiretroviral regimens, correct initiation times, and duration required for effective HIV PEP.[6,10]

Studies conducted among healthcare trainees in sub-Saharan Africa have demonstrated that factors such as age, gender, and level of training significantly influence knowledge, attitudes, and practices regarding HIV post-exposure prophylaxis (PEP), with higher levels of training and prior exposure to infection control education being associated with better knowledge and safer practices, while negative attitudes and inadequate training correlate with poor PEP utilisation following occupational exposure.[15] This highlights the need to examine how these variables interact among clinical students in Nigerian teaching hospitals to inform targeted interventions that improve both knowledge and adherence to recommended PEP protocols.

Therefore, there is an urgent need to evaluate the prevalence of occupational exposures and the current level of PEP knowledge specifically among clinical students in Nigerian teaching hospitals. Identifying these gaps is crucial for developing targeted, student-centered safety policies and ensuring that trainees can confidently navigate their clinical education without compromising their long-term health.

1.3 JUSTIFICATION OF THE STUDY

Nigeria continues to carry a significant burden of HIV infection, with an estimated 1.9 million people currently living with the virus, making it one of the highest HIV burdens globally.[12] Clinical students in medical schools represent an intensely vulnerable subgroup within this high-prevalence environment. As they are in the foundational phases of their clinical education, actively acquiring new psychomotor skills while managing the pressures

of ward rounds and emergency postings, they face frequent occupational exposure to blood and body fluids.[10] Ensuring that these students possess adequate knowledge and appropriate practices regarding HIV prevention is therefore essential for their safety and for the protection of their patients.

Post-exposure prophylaxis (PEP) is a highly effective secondary preventive strategy that can drastically reduce the risk of HIV seroconversion if initiated promptly, ideally within 72 hours of exposure.[13] However, the clinical effectiveness of PEP depends entirely on an individual's Knowledge, Attitude, and Practice (KAP). Trainees must be able to accurately identify high-risk exposures, harbor a positive attitude toward reporting the incident without fear of academic penalty, and practice timely health-seeking behaviour to access and complete the standard 28-day antiretroviral regimen.[13]

Despite the critical importance of PEP in preventing occupational HIV transmission, existing literature reveals a concerning gap. While numerous studies have evaluated KAP among fully qualified healthcare workers, often revealing suboptimal practices despite high theoretical knowledge,[6,13] there is limited recent data specifically examining clinical students in southern Nigerian medical schools. Studies from other regions indicate that over a quarter of medical and allied health students experience accidental BBF exposures, yet only a fraction successfully initiate PEP due to poor practical knowledge, fear of stigma, and a lack of clear institutional guidelines tailored specifically to students rather than staff.[10]

Findings from this study will provide evidence-based insights that can assist the School of Medicine University of Benin, the University of Benin Teaching Hospital (UBTH) management, and public health stakeholders in designing targeted educational interventions,

strengthening institutional infection prevention protocols, and dismantling barriers to accessing PEP services for students.

1.4 RESEARCH QUESTIONS

This study aims to answer the following questions as regards clinical-year medical students of the University of Benin:

1. What is their level of knowledge on HIV post-exposure prophylaxis?
2. What are their common sources of information about HIV post-exposure prophylaxis?
3. What are their prevailing attitudes toward the use of post-exposure prophylaxis following potential exposure to HIV?
4. What proportion of students are aware of the recommended time-frame for initiating post-exposure prophylaxis?
5. What proportion of them have ever experienced occupational exposure to situations requiring post-exposure prophylaxis, and how did they respond?
6. What are the common barriers they face while accessing or using post-exposure prophylaxis?
7. What are the factors associated with the practice of HIV post-exposure prophylaxis among the students?

1.5 GENERAL OBJECTIVE

To explore the experiences of clinical-year medical students at the University of Benin, Benin City, Nigeria regarding HIV post-exposure prophylaxis, specifically by evaluating their knowledge, attitude, and practice.

1.6 SPECIFIC OBJECTIVES

- To assess their level of knowledge of HIV post-exposure prophylaxis.
- To examine their attitudes toward the use of HIV post-exposure prophylaxis (PEP) following potential exposure.
- To evaluate their practice of HIV post-exposure prophylaxis (PEP) after possible occupational exposure to HIV.
- To determine the factors associated with the practice of HIV post-exposure prophylaxis (PEP).
- To identify barriers to the use of HIV post-exposure prophylaxis.

CHAPTER TWO

LITERATURE REVIEW

The global burden of Human Immunodeficiency Virus (HIV) infection remains a significant public health concern, particularly in sub-Saharan Africa, where the prevalence is highest.[14] Post-exposure prophylaxis (PEP) has emerged as an important medical intervention created to reduce the risk of HIV infection following potential exposure, especially among populations at increased risk.

Understanding the knowledge, attitude, and practice (KAP) of PEP is essential for developing effective educational and preventive strategies to mitigate the spread of HIV within these vulnerable groups.

Despite the availability and proven efficacy of PEP, several studies have highlighted gaps in awareness, misconceptions, and sub-optimal utilisation of this intervention among students.[6,10,15]

This literature review examines existing research on the Knowledge, Attitude and Practice of PEP, with a focus on university students, to provide a contextual foundation for understanding the current state of knowledge and to identify areas requiring targeted interventions within the UNIBEN student population.

2.1 KNOWLEDGE OF HIV POST-EXPOSURE PROPHYLAXIS

A descriptive cross-sectional study was conducted in 2015 at the University of Gondar Comprehensive Specialized Hospital (UOGCSH) in North-western Ethiopia, with the aim to determine the knowledge, attitudes, and practices of medical and health science students on antiretroviral based HIV post-exposure prophylaxis (PEP). The study used a structured self-administered questionnaire that was adopted from previous literature and modified to suit the study setting. The questionnaire consisted of 31 items divided into four sections: socio-demographic characteristics (5 items), knowledge statements about HIV PEP (17 items), attitude statements (5 items), and practice questions (4 items).

The final sample size was drawn using a stratified random sampling technique. The study participants were 220 medical and health science graduating students in UOGCSH. These students were selected due to their active involvement in patient care, which places them at a higher risk of acquiring blood-borne infections in the clinical setting. The population included students from Medicine (38.6%), Health Officer (16.8%), Nursing (15.9%), Midwifery (15.0%), Laboratory (7.7%), and Anaesthesia (5.9%) departments.

The study found that the majority of the respondents had poor knowledge regarding HIV PEP. Overall, 70% of the respondents showed poor knowledge towards HIV PEP. To be specific, only sixty-five (29.5%) of the 220 study participants had adequate knowledge about HIV PEP. Adequate knowledge was defined as correctly answering more than 70% of the knowledge questions. Almost all of the respondents (97%) were aware of HIV PEP. Awareness of its use was also high, with 94.5% knowing the use of PEP.

A high percentage of respondents (91.8%) knew that PEP reduces the likelihood of HIV infection. Almost all respondents (98.8%) strongly agreed that PEP can reduce the probability of HIV transmission, reflecting a positive attitude closely related to knowledge of efficacy.

Students primarily ranked classroom lectures (50.9%) as their major source of information regarding HIV PEP, followed by formal training and seminars. However, despite receiving information from these sources, participants failed to demonstrate adequate knowledge.

Regarding the effectiveness of HIV PEP, 43.2% of participants answered correctly. Less than 50% of participants believed that HIV PEP is effective in preventing HIV transmission.

A significant knowledge gap was identified regarding high-risk body fluids for HIV transmission. Only 20 out of 220 respondents (9.1%) correctly identified blood fluids as a high-risk source. More than 90% of respondents were unable to identify potentially high-risk body fluids.

Nearly 60% of participants were unaware of the availability of PEP guidelines. Only 40.9% had information about available PEP guidelines.

While three-quarter (75.5%) of study subjects knew the best time to initiate PEP regimens for HIV (within 72 hours), only 30.5% were able to mention the drugs given for HIV PEP. Only 34.5% mentioned at least two drugs given for PEP.

Several shortcomings were identified with this study. Firstly, as a cross-sectional study conducted in a single institution in Ethiopia, the results cannot be generalized to other hospitals in Ethiopia. Secondly, the data collection relied solely on a self-administered questionnaire, meaning the results highly depend on the honesty and accuracy of self-reporting by respondents.

Furthermore, despite high awareness of PEP and a largely positive attitude towards it, the actual knowledge level remained poor for the majority of participants (70%). The discrepancy between awareness/attitude and adequate knowledge suggests that while students

know of PEP and its importance, their detailed understanding of crucial aspects like risky fluids, guidelines, or specific drugs is insufficient.[16]

In 2019, a cross-sectional study aimed to assess the knowledge, attitude, and practice (KAP) of post-exposure prophylaxis (PEP) for fifth year dental students at a private Egyptian university.[17] The study was conducted on dental students registered in the fifth year at October University for Modern Sciences and Arts (MSA). Data collection was via a self-administered, anonymous structured questionnaire based on a previously validated instrument, data were gathered from 404 students via a convenience consecutive sampling procedure during their practical sessions, covering a study population of fifth year dental students irrespective of age and sex.

The findings indicated that the students' level of knowledge was generally unsatisfactory. The total mean knowledge score among participants was low, recorded at (0.45 ± 0.50). Specifically, only 6 students, representing a mere 1.5% of the participants, were considered to have adequate knowledge, defined as correctly answering at least 75% of the knowledge questions. While a majority of participants, 77.2%, reported having heard about PEP, their primary sources of information were clinical training (29.5%) and friends (22.7%), suggesting informal or limited educational avenues. Although a large proportion (70.4%) correctly identified that PEP is preferably taken within an hour of exposure, less than half demonstrated positive knowledge regarding the correct length of time to take PEP. A significant gap in formal knowledge was also apparent, as 89.3% reported not having attended any training about PEP, and 79.1% were unaware of PEP guidelines. Overall, the study concluded that the knowledge of fifth year dental students at this private Egyptian university toward post-exposure prophylaxis is not satisfactory.

The study had several limitations including the potential for social desirability bias, where students might respond in a way they perceive as more competent. Additionally, the study relied on participants' ability to recall previous information, introducing the possibility of recall bias. Practical limitations during questionnaire distribution were also noted, such as the inability to follow up with absent students and some students refusing or not returning the questionnaire due to time constraints or the voluntary nature of participation. These factors could potentially influence the reported knowledge levels.[17]

A cross-sectional analytical study conducted by Matos et al. and published in Revista Gaúcha de Enfermagem in 2021 aimed to evaluate the knowledge of nursing and medical students at a public university in Teresina, Piauí, Brazil, concerning prophylaxis before and after exposure to HIV/AIDS (PrEP and PEP).[18] The study population comprised students from the nursing and medicine courses who had already studied infectious diseases and were actively enrolled, with a final sample size of 168 students selected via accidental sampling.

Data collection was via a self-administered questionnaire, specifically developed for the study based on an exhaustive literature review and validated for appearance and content, was used, consisting of 20 multiple-choice items. Regarding the level of knowledge specifically about post-exposure prophylaxis (PEP) for HIV infection among the students, the findings indicated a generally high level of awareness. A significant majority, 94.0%, reported having heard of PEP and knowing what it is. Similarly, 87.5% knew where to find PEP, predominantly identifying Health Care Services as the correct location. The students demonstrated strong knowledge concerning the situations where PEP is recommended, with high percentages correctly identifying occupational accidents (93.5%), sexual violence (95.2%), and unprotected sexual intercourse (82.1%). A large proportion (73.2%) also correctly knew that PEP should preferably be started within the first two hours and at most 72

hours after exposure, and that it should be taken for 28 uninterrupted days (72.0%). Many were aware of common side effects like gastrointestinal effects (71.4%) and headache (56.0%). However, knowledge gaps were identified, particularly regarding the duration of health monitoring required for people using PEP, with a notable proportion being unsure or only correctly identifying it depends on the situation rather than a specific time-frame.

Several limitations were inherent in the study design and data collection method. For example, the information was self-reported and collected remotely without direct researcher supervision, which, while convenient, also implies the accuracy relies solely on the participants' reporting and recall. The use of accidental sampling, where participants were included based on returning the questionnaire successively until the required sample size was reached, might introduce selection bias, as it does not guarantee a truly representative sample of the eligible student population. The study was conducted at a single public university with specific health courses (nursing and medicine), which means the findings might not be broadly applicable to students in other fields or at different types of institutions.[18]

An observational cross-sectional study conducted in November 2014 by Aminde et al. at the Faculty of Health Sciences of the University of Buea, in the Southwest Region of Cameroon, specifically aimed to assess the knowledge and practices of clinical medical students on PEP for HIV, as well as determinants of good knowledge.[15] The study population comprised 154 consecutively recruited clinical medical students enrolled in their 4th, 5th, or 6th years of undergraduate training. Data were collected using a structured self-administered questionnaire adapted from published studies, which included 25 questions to assess knowledge and 12 questions on practices. Knowledge was categorized as good (20 or more correct answers), moderate (13–19), or poor (12 or fewer) based on the number of correct responses out of 25.

Regarding the level of knowledge about PEP for HIV among these clinical medical students, the findings indicated that the majority had non-optimal understanding. While a significant proportion (89%) had heard about PEP, the overall level of knowledge was predominantly moderate (61.7%) and poor (32.5%), with only a small minority (5.8%) demonstrating good knowledge. The mean knowledge score was 13.7 ± 4.1 out of a possible 25. Knowledge scores generally increased with the student's level of study. Specific knowledge deficits were noted; for instance, only 31.2% knew the correct proportion of needle prick injuries resulting in HIV transmission (3/1000), and less than half (43.5%) correctly answered that PEP should be started within 1 hour after a needle prick. Furthermore, only 26.6% identified the expanded three-drug regimen as the ideal PEP regimen following a needle stick injury, and only 35.1% knew the accurate duration of PEP treatment was 28 days. The main source of information about PEP reported by the students was ward rounds (73.7%), with only a small percentage (6.5%) reporting having received previous formal training on PEP.

Critiques of the Aminde et al. study highlight several limitations that may impact the findings. The study relied on self-reported data collection using a questionnaire, which carries a high risk of recall bias given its retrospective nature. The sampling method involved consecutively recruiting students who were present during a specific period, which may not be fully representative of the entire clinical medical student population at the university and could introduce selection bias. Additionally, the study was conducted at a single medical institution in Cameroon, limiting the generalizability of the findings to other universities or regions within the country or elsewhere.[15]

A cross-sectional study was conducted between February and April 2018 at two universities in Nigeria, specifically Nasarawa State University and the University of Ilorin, which were chosen due to their locations in states with high and low HIV prevalence, respectively.[19] The

study aimed to examine the levels of awareness and use of both pre-exposure prophylaxis (PrEP) and postexposure prophylaxis (PEP) among Nigerian university students. Participants were selected using stratified random sampling by sex, year of study, and faculty, with an intended sample size of 800 students. Data collection was done using an interviewer-administered, pretested questionnaire with structured close-ended and open-ended questions, and analysis was conducted on 784 complete responses.

Focusing on the objective of assessing the level of knowledge regarding post-exposure prophylaxis (PEP), the study primarily reported on awareness, finding that only a quarter of the surveyed students, 25.4%, were aware of PEP. Awareness of PEP did not show a significant association with the students' sex or age. However, the study identified several independent determinants of PEP awareness in the adjusted analysis. These factors included having ever tested for HIV, which made students one and a half times more likely to be aware of PEP compared to those who had not (AOR: 1.50). Knowledge of a partner's HIV status also increased the likelihood of PEP awareness (AOR: 1.55). Furthermore, students who reported having ever used condoms were 1.65 times more likely to be aware of PEP (AOR: 1.65), and those who had engaged in nude exchanges were 1.62 times more likely to be aware (AOR: 1.62).

Beyond general awareness, the study presented limited data on specific knowledge aspects related to obtaining PEP. Only a small percentage, 10%, of the students knew where to get either PrEP or PEP. Even fewer knew the cost, had seen the drugs, or had ever used them. The authors concluded that there is a low level of awareness, knowledge, and use of PEP among the Nigerian university students studied, noting that this is particularly concerning given that this sample cohort had a higher educational level compared to the general population in Nigeria.

The study had several limitations. The cross-sectional design prevents drawing conclusions about causality. The sampling method, while aiming for representativeness through stratification and random selection, is noted by the authors as potentially leading to volunteer bias because only those willing to participate were included. Finally, the study participants, being university students, are a highly educated group compared to the broader Nigerian youth population, which limits the generalisability of the findings to the overall youth population in the country.[19]

A cross-sectional study was conducted between June and September 2020 at Bayero University Kano and its affiliate teaching hospital, the Aminu Kano Teaching Hospital, located in northern Nigeria.[10] The study aimed to determine the prevalence and predictors of blood and body fluid (BBF) exposure and knowledge about post-exposure prophylaxis (PEP) among medical and allied health students.

The study population consisted of undergraduate clinical and allied health students in their 4th through 6th years of study. Participants were selected using a multistage sampling technique, which involved stratification by faculty and year of study, followed by systematic sampling. Data collection was performed using a structured self-administered questionnaire adapted from previous studies. The questionnaire included sections on socio-demographic characteristics, knowledge about PEP using 25 items, prevalence and response to accidental exposure, and attitude toward PEP using a 5-point Likert scale. Correct knowledge responses were scored, and total scores were categorized as "inadequate" (0–12) or "adequate" (13–25). The questionnaire was pre-tested for clarity and cultural sensitivity, and content validity and reliability were assessed. Questionnaires were provided and retrieved by trained research assistants.

Regarding the level of knowledge about PEP for HIV infection among students, the study found that the majority of respondents, 98.2%, had heard about PEP. However, only 68.5% correctly defined the term PEP as prophylactic antiretroviral medication for exposed seronegative individuals. Based on total knowledge scores, only 26.0% (71 out of 273 respondents) had adequate knowledge about PEP, while 74.0% had inadequate knowledge. Students most commonly reported hearing about PEP from lectures (81.0%), followed by ward rounds (25.3%) and textbooks (19.4%). While a substantial majority correctly identified blood (100%) and breast milk (86.1%) as high-risk body fluids, a notable proportion (28.2%) incorrectly identified saliva as high-risk. Most correctly identified needle-stick injury (93.0%) and rape (93.8%) as indications for PEP, but fewer correctly identified HIV-exposed infants (81.7%) or blood/body fluid splash on mucosal surfaces (76.2%) as indications. Specific knowledge about the practical aspects of PEP was lower; only 43.2% correctly stated that PEP should be commenced within an hour, 41.8% mentioned the 3-drug regimen, and 36.6% reported the correct 4-week duration.

The study identified several independent predictors of having adequate knowledge of PEP. Students without prior PEP training were significantly less likely to have adequate knowledge compared to those who had received training (adjusted odds ratio [aOR] 0.43, 95% confidence interval [CI] 0.23 to 0.80). Knowledge also increased with the year of study, with 6th-year students having significantly greater odds of adequate knowledge compared to 4th-year students (aOR 4.10, 95% CI 1.60 to 10.47). Allied health students were found to be significantly more likely to have adequate knowledge than clinical medical students (aOR 4.69, 95% CI 2.06 to 10.68). Religion was also a predictor, with non-Muslim students having significantly higher odds of adequate knowledge compared to Muslim students (aOR 5.39, 95% CI 1.40 to 20.71).

Despite the high level of awareness about PEP, the study concluded that the knowledge of PEP among the clinical students was suboptimal, with only one in four possessing adequate knowledge. Critiques of the study include the limitation of being conducted at a single institution, which may limit the generalizability of the findings despite the similar curriculum in Nigerian health training institutions. Furthermore, data on exposure incidents were based on student recall rather than a documented surveillance system, introducing the potential for recall bias. Finally, reports regarding PEP uptake could be subject to social desirability bias, where students might provide responses they believe are viewed favorably.[10]

2.2 ATTITUDE TOWARDS HIV POST-EXPOSURE PROPHYLAXIS

Attitude toward HIV post-exposure prophylaxis (PEP) plays an important role in determining whether individuals seek appropriate care following potential exposure. Even when awareness of PEP exists, negative perceptions, fear, stigma, or misconceptions may discourage its use. Understanding students' attitudes toward PEP is therefore essential for improving occupational safety and HIV prevention practices among healthcare trainees.

A descriptive cross-sectional study conducted in 2015 among medical and health science students at the University of Gondar Comprehensive Specialized Hospital in Ethiopia found that the majority of respondents had a generally positive attitude toward HIV PEP. Over 90% of the students agreed that PEP is important in preventing HIV infection after occupational exposure and expressed willingness to use PEP if necessary. Despite this positive perception, actual utilisation and adherence to PEP were relatively low, suggesting that favourable attitudes alone may not translate into appropriate practice.[16]

Similarly, a descriptive cross-sectional study conducted in 2019 among fifth-year dental students at October University for Modern Sciences and Arts in Egypt assessed students'

attitudes toward HIV PEP. The findings indicated that a large proportion of the participants recognised the importance of PEP in preventing HIV infection, with approximately 94% agreeing that PEP is a necessary intervention following exposure. However, only about 30% of the respondents demonstrated an overall positive attitude score when assessed using standardized attitude scales. The authors suggested that although many students acknowledge the value of PEP, concerns about medication side effects, inadequate training, and lack of clear protocols may influence their overall attitude toward seeking PEP services.[17]

Another study assessing healthcare professionals' attitudes toward PEP in the Harari region of Eastern Ethiopia reported that attitude toward PEP was an important determinant of knowledge and preventive behaviour. Health workers who had positive attitudes toward PEP were significantly more likely to demonstrate better knowledge and willingness to initiate PEP following occupational exposure. The study also reported that occupational exposure to blood and body fluids was relatively common, but the practice of initiating PEP remained low among many respondents despite their awareness of its benefits.[20]

In Nigeria, research examining awareness and utilisation of HIV preventive strategies among university students also highlights attitudinal factors affecting the use of PEP. Although many students reported awareness of HIV prevention measures, the willingness to seek or utilize prophylactic interventions was limited by concerns about stigma, lack of confidentiality, and inadequate information about where to obtain PEP services. These attitudinal barriers may discourage students from seeking timely medical attention after exposure.[19]

Overall, evidence from multiple studies suggests that while university and health science students often demonstrate moderate to positive attitudes toward HIV PEP, these attitudes do not always translate into appropriate utilisation. Educational interventions, improved

institutional policies, and clear reporting systems may help strengthen positive attitudes and encourage timely use of PEP among students exposed to HIV risk.

2.3 PRACTICE OF HIV POST-EXPOSURE PROPHYLAXIS

Practice of HIV PEP refers to the actions taken by individuals following potential exposure to HIV, including reporting the exposure, seeking medical evaluation, initiating prophylactic treatment, and completing the recommended 28-day antiretroviral regimen. Among healthcare students, appropriate practice is essential because they frequently encounter occupational risks during clinical training.

A descriptive cross-sectional study conducted in 2015 among medical and health science students at the University of Gondar Comprehensive Specialized Hospital in Ethiopia revealed that although some students experienced occupational exposure to HIV-risk situations, the proportion who actually initiated PEP was relatively low. Among respondents who reported exposure requiring prophylaxis, only about 48.6% initiated PEP. Furthermore, only half of those who began treatment completed the full 28-day regimen. The most commonly cited reason for discontinuing treatment was intolerance to the side effects of antiretroviral medications.[16]

Similar findings have been reported in other studies involving healthcare workers and trainees. For instance, a study assessing knowledge, attitude, and utilisation of PEP among healthcare workers in a teaching hospital in Enugu State, Nigeria, found that although a large proportion of respondents were aware of PEP, only a small number actually practiced appropriate post-exposure management. Approximately 42.5% of the respondents had experienced needle-stick injuries, yet only 39% reported the exposure and just 21% went on

to take PEP. This indicates a substantial gap between awareness and actual practice of recommended preventive measures.[21]

Among university students in Nigeria, the practice of using HIV preventive interventions such as PEP is also reported to be very low. A cross-sectional survey involving students from two Nigerian universities found that only 25.4% of respondents were aware of PEP and even fewer had ever seen or used prophylactic medication. Only about 1.5% of the surveyed students reported ever using PEP. The study emphasized the need for improved education and awareness programs to increase uptake of HIV prevention services among university students.[19]

Other studies among health professional students have similarly reported inadequate PEP practices despite moderate knowledge and awareness levels. Poor reporting of needle-stick injuries, delayed initiation of prophylaxis, and failure to complete the treatment regimen are common challenges identified in these studies. Factors contributing to poor practice include lack of training on PEP protocols, fear of stigma, uncertainty about reporting procedures, and limited access to prophylactic services within healthcare institutions.[22,23,24]

These findings indicate that while healthcare students may possess some knowledge about HIV PEP, appropriate practice remains suboptimal in many settings. Strengthening institutional reporting systems, improving access to PEP services, and providing targeted training during clinical education may help improve the practice of PEP among clinical students.

2.4 FACTORS ASSOCIATED WITH THE PRACTICE OF HIV PEP

Several cross-sectional studies have identified socio-demographic variables such as age, sex, level of education, and years of clinical exposure as key determinants of knowledge and

practice of HIV PEP. For instance, a descriptive cross-sectional study conducted in April, 2019 among health professionals in Eastern Ethiopia found that sex, educational qualification, and attitude were significantly associated with knowledge of PEP ($p < 0.05$), highlighting the role of demographic and professional background in shaping awareness levels.[20] Similarly, younger professionals and those with fewer years of experience were more likely to demonstrate inadequate knowledge and suboptimal practice, suggesting that exposure and training are modifiers.

Knowledge has consistently been shown to have a direct and positive association with PEP practice. In a study among healthcare workers in Addis Ababa, over half of respondents exhibited poor knowledge (51.6%) and poor practice (63.6%), indicating a strong correlation between insufficient knowledge and low utilisation of PEP services.[30] This relationship is further supported by findings among medical students in Ethiopia, where only 30% had adequate knowledge, and less than half of those exposed to risk actually initiated PEP.[16] These findings imply that improving knowledge is a necessary precondition for improving PEP uptake.

Attitude also plays a mediating role between knowledge and practice. Despite relatively high levels of positive attitude reported in several studies, this does not always translate into appropriate practice. For example, while over 90% of students in one study had a favourable attitude toward PEP, actual utilisation and completion rates remained low.[16] This discrepancy suggests that attitude alone is insufficient without adequate knowledge and structural support, such as access to PEP services and training.

Furthermore, studies assessing “associated factors” using multivariate logistic regression have demonstrated that knowledge and attitude are independent predictors of PEP practice.

Individuals with good knowledge and favourable attitudes are significantly more likely to initiate and complete PEP following exposure.[20]

In the Nigerian context, although data specifically among students are limited, studies among healthcare workers have similarly shown that higher knowledge levels are associated with better preventive practices, including PEP utilisation.[6] This suggests that the observed associations are consistent across different populations and settings.

2.5 BARRIERS TO THE USE OF HIV POST-EXPOSURE PROPHYLAXIS

Several studies have identified barriers that prevent healthcare workers and students from utilizing HIV post-exposure prophylaxis after potential exposure.[22,24,25] These barriers may be related to individual perceptions, institutional policies, or structural limitations within healthcare systems.

A descriptive cross-sectional study to assess the knowledge, attitude and practices of antiretroviral-based HIV post-exposure prophylaxis conducted in 2015 among medical and health science students in a university in Ethiopia revealed that one commonly reported barrier is lack of adequate knowledge about PEP protocols, including the appropriate time to initiate treatment and the duration of therapy. In many settings, students are aware that PEP exists but do not fully understand the specific procedures to follow after exposure. In addition, misconceptions about the effectiveness of PEP or concerns about medication side effects may discourage individuals from initiating treatment.[16]

Fear of stigma and concerns about confidentiality have also been identified as significant barriers to PEP utilisation.[26,27] Some healthcare students and clinical trainees may be reluctant to report occupational exposures because they fear negative judgment, professional labeling, or breaches of privacy from colleagues or supervisors.[24] This reluctance can lead to

dangerous delays in seeking care or a complete failure to report incidents altogether, effectively causing trainees to miss the critical 72-hour window required to initiate prophylaxis.[24,26,27]

Institutional barriers may also contribute to poor utilisation of PEP. These include a lack of clear reporting systems, inadequate training on occupational exposure management, and the limited availability or centralization of PEP services within some healthcare facilities.[22,24] Research indicates that when clinical trainees are uncertain about where to obtain PEP, whom to officially report exposures to, or how to navigate inefficient institutional protocols, they frequently fail to seek timely medical assistance, thereby missing the critical window for prophylaxis.[24] Studies conducted among Nigerian university students further highlight structural barriers such as limited awareness of PEP availability, inadequate HIV prevention education, and lack of access to preventive services. These factors collectively contribute to the low level of PEP utilisation observed among students despite the presence of potential occupational risks.[19]

Addressing these barriers requires comprehensive, multi-level interventions.[24] Primary among these is the need for improved education on occupational exposure management and the formal integration of PEP training into undergraduate medical and healthcare curricula, ensuring trainees develop practical competence before entering high-risk clinical environments.[17] Furthermore, teaching hospitals must actively strengthen their institutional systems for reporting and managing exposure incidents.[22,24] Evidence strongly suggests that guaranteeing strict confidentiality, establishing non-punitive reporting channels, and providing 24-hour, barrier-free access to PEP services within healthcare institutions are critical structural changes that significantly encourage students to seek timely care after a potential exposure.[22,24]

CHAPTER THREE

METHODOLOGY

3.1 STUDY AREA

This study was conducted at the University of Benin (UNIBEN), Benin City, Edo State, Nigeria. UNIBEN is a federal university with a large and diverse undergraduate population across multiple faculties and departments. Access to HIV post-exposure prophylaxis (PEP) services within the study environment was obtainable through the ARV clinic, University of Benin Teaching Hospital (UBTH). The University of Benin Teaching Hospital is a tertiary healthcare institution situated at a geographical coordinate of 6.3903° North of the Equator and 5.6118° East of the prime meridian. Founded on the 12th of May, 1973, it is a federal tertiary hospital with an 860-bed capacity.[28]

3.2 STUDY DESIGN

This study employed a quantitative observational descriptive cross-sectional study design to assess the knowledge, attitude, and practice (KAP) of HIV post-exposure prophylaxis (PEP) among clinical-year medical students of the University of Benin.

A quantitative approach was used because the study involved the collection and analysis of numerical data obtained through structured questionnaires administered to respondents. The study was observational since no intervention or manipulation of variables was carried out by the researchers.

The cross-sectional design involved collecting data from the study population at a single point in time in order to evaluate the level of knowledge, attitudes, and practices regarding HIV post-exposure prophylaxis among medical students undergoing clinical training. This

design is appropriate for KAP studies because it allows the assessment of existing levels of awareness, perceptions, and behaviours within a defined population.

3.3 STUDY POPULATION

The study population comprised all clinical-year medical students at the University of Benin in the 400, 500, and 600 levels undergoing clinical training during the study period.

3.4 SELECTION CRITERIA

3.4.1 Inclusion Criteria

1. All medical students of the University of Benin (UNIBEN) in clinical classes during the study period and who provided informed consent.

3.4.2 Exclusion Criteria

1. Students who declined consent

2. Respondents who submitted grossly incomplete questionnaires.

3.5 SAMPLE SIZE DETERMINATION

The minimum sample size (n) was calculated using the Cochrane formula for a cross-sectional study with design effect factored in, using the multistage sampling technique as the sampling method.

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

Where:

n = Minimum Sample Size.

Z = Standard normal deviation set at 95% confidence interval (1.96).

p = proportion of respondents who had knowledge of HIV post-exposure prophylaxis in a study carried out among health workers in a tertiary health institution in South-East Nigeria (86% = 0.86).[29]

q = 1 p = 1-0.86 = 0.14

d = Degree of precision set at 0.05

Hence:

$$n = \frac{(1.96)^2 \times 0.86 \times 0.14}{(0.05)^2}$$

$$n = \frac{0.4621}{0.0025}$$

n = 184.84 ≈ 185

To account for non-response, 10% non-response rate was added to the minimum sample size, utilizing the formula for non-response rate.

$$ns = \frac{n}{1-nr}$$

n = Minimum sample size = 185

n_r = Non-response rate = 10% = 0.10

n_s = Final minimum sample size

$$= \frac{185}{1-0.1}$$

= 205.5 ≈ 206

A design effect of 1.5 was used.

= 206 x 1.5 = 309

Thus, the final minimum sample size for this study was 309.

3.6 SAMPLING METHOD

A multistage sampling technique was employed to select respondents for this study.

Stage One: Stratification of the Study Population

The study population consisted of all clinical-year medical students at the University of Benin. These students are organised according to their level of study into 400 level, 500 level, and 600 level classes. Each level constituted a stratum to ensure adequate representation of students at different stages of clinical training.

Stage Two: Determination of Proportional Allocation

The total minimum sample size of 309 students was proportionally allocated to each clinical level based on the number of students in each class relative to the total population of clinical-year medical students. This ensured that each class contributed respondents according to its size within the study population.

The proportional allocation was calculated using the formula:

$$n_i = \frac{N_i}{N} \times n$$

Where:

n_i = number of students selected from each level

N_i = total number of students in each level

N = total number of clinical-year medical students

n = total sample size (309)

Stage Three: Selection of Participants

Within each clinical-year level, a simple random sampling method was used to select participants. A list of all registered students in each class obtained from the class representatives served as the sampling frame.

The sampling interval (K) was determined using the formula:

$K = N / n$

Where:

K_{th} = sampling interval

N = Population of each level

n = Allocated sample size for that level

After the k_{th} value was obtained, a random starting number between 1 and k_{th} was first selected by balloting, after which every k_{th} student on the class list will be selected until the required number of respondents for each academic level is obtained.

In cases where a selected student declines participation or is unavailable during data collection, the next eligible student on the list will be selected to maintain the required sample size.

Only students who met the inclusion criteria and gave informed consent were included in the study.

This sampling approach ensured that every eligible clinical student had an equal probability of selection while maintaining adequate representation across all clinical levels.

3.7 DATA MANAGEMENT

3.7.1 TOOLS FOR DATA COLLECTION

Data for this study were collected using a structured questionnaire designed to obtain information relevant to the objectives of the study. The questionnaire was developed in digital format using Google Forms to allow respondents complete it electronically.

The questionnaire began with a section on the socio-demographic characteristics of respondents, including variables such as age, sex, and level of study. Subsequent sections of the questionnaire corresponded with the specific objectives of the study and assessed the knowledge, attitude, practice and barriers to the use of HIV post-exposure prophylaxis (PEP) among clinical-year medical students.

The questionnaire consisted of the following sections:

Section A: Socio-demographic characteristics of respondents

Section B: Knowledge of HIV post-exposure prophylaxis

Section C: Attitudes toward HIV post-exposure prophylaxis

Section D: Practice of HIV post-exposure prophylaxis

Section E: Barriers to the use of HIV post-exposure prophylaxis

The questions consisted mainly of structured close-ended items, with some questions allowing multiple responses where appropriate.

Prior to the main study, the questionnaire was pretested among a small group of students who were not part of the study population in order to assess clarity, relevance, and ease of understanding. Necessary adjustments were made based on feedback obtained during the pre-test.

A copy of the questionnaire is provided in **Appendix I**.

3.7.2 QUESTIONNAIRE ADMINISTRATION

The questionnaire was self-administered by the respondents. The questionnaire link was distributed to selected participants through individual messages.

At the beginning of the questionnaire, respondents were presented with an informed consent statement, and only those who provided consent proceeded to complete the questionnaire.

Following ethical approval, selected respondents were contacted through departmental platforms, class platforms and by direct messaging with the study information. Informed consent was embedded at the beginning of the Google Form, and only respondents who consented proceeded to complete the questionnaire. No personal identifiers such as names, matric numbers, or phone numbers were collected. Completed responses were automatically stored in the Google Forms database.

Where necessary, research assistants assisted in circulating the questionnaire link and reminding selected participants to complete the survey. These assistants were students familiar with the academic environment and received brief orientation on the purpose of the study and the importance of maintaining confidentiality and voluntary participation.

The online format allowed respondents to complete the questionnaire at their convenience while ensuring anonymity and minimizing interviewer bias.

3.7.3 DATA COLLATION

Completed questionnaires were automatically stored in the Google Forms database. The collected data were subsequently exported into Microsoft Excel for initial cleaning and organisation.

Data cleaning involved checking responses for completeness, consistency, and possible duplication. Questionnaires that were grossly incomplete were excluded in accordance with the study exclusion criteria.

A structured data entry template was developed to ensure uniform coding of variables prior to statistical analysis. The cleaned dataset was then imported into the IBM Statistical Package for Social Sciences (SPSS) version 27.0 for further processing and analysis.

3.7.4 DATA PRESENTATION

Results from the study were presented using both numerical and graphical methods.

Independent variables: age, sex, marital status, level of study, duration of clinical exposure, religion, prior HIV testing, prior awareness of HIV PEP.

Dependent variables: knowledge level of PEP, attitude towards PEP, practice of PEP, and perceived barriers to PEP use.

Numerical presentation included frequency tables and percentages for categorical variables such as sex, level of study, awareness of PEP, and exposure history. Measures of central tendency and dispersion such as means and standard deviations were used for continuous variables where applicable.

Graphical presentations such as bar charts and pie charts were used to illustrate the distribution of socio-demographic characteristics, levels of knowledge, attitudes toward PEP, and reported practices related to PEP use.

Knowledge, attitude, and practice scores derived from questionnaire responses were also summarized and presented using appropriate tables and charts to facilitate interpretation.

3.7.5 SCORING OF VARIABLES

The scoring system used to categorize the respondents' knowledge, attitude, and practice regarding HIV post-exposure prophylaxis was adopted and modified from a previous study by Onuoha and Omosivie.[30]

Knowledge Scoring: Knowledge of HIV PEP was assessed using eight specific questions. A score of 1 was assigned to each correctly answered question, while incorrect or "I don't know" responses were scored as 0. The maximum obtainable score was 8. Based on the total scores achieved, respondents' knowledge levels were categorized into three tiers:

- Poor Knowledge: Total score of ≤ 3.
- Fair Knowledge: Total score of 4 to 5.
- Good Knowledge: Total score of 6 to 8.

Attitude Scoring: Attitude toward HIV PEP was evaluated using eight statements on a 5-point Likert scale ranging from "Strongly Agree" to "Strongly Disagree." Responses were scored based on their appropriateness regarding occupational safety and PEP guidelines. For statements reflecting a positive or correct disposition, responses of "Strongly Agree" and "Agree" were deemed appropriate and assigned a score of 1. Conversely, for statements reflecting a negative or incorrect disposition (such as fear of stigma or hesitancy to report), responses of "Disagree" and "Strongly Disagree" were deemed appropriate and assigned a score of 1. Any inappropriate response, as well as all "Neutral" responses, were assigned a score of 0. The maximum obtainable attitude score per respondent was 8. Based on the aggregate scores, attitude was categorized into two tiers:

- Negative Attitude: Total score of ≤ 4.
- Positive Attitude: Total score of ≥ 5.

Practice Scoring: The practice (utilisation) of HIV PEP was evaluated among the subset of respondents who had a history of occupational exposure. A score of 1 was assigned for each correct or appropriate post-exposure action taken (e.g., reporting the exposure, initiating PEP within 72 hours, completing the 28-day regimen, and performing a follow-up test). The maximum obtainable practice score was 5. Based on the aggregate scores, practice was categorized as:

- Poor Practice (Utilisation): Total score of ≤ 3.
- Good Practice (Utilisation): Total score of 4 to 5.

The detailed answer key used to evaluate the correctness of the respondents' knowledge and appropriate attitudinal responses is provided in **Appendix II**

3.7.6 DATA ANALYSIS

Data were exported from Google Forms into Microsoft Excel for cleaning and then imported into **IBM SPSS Statistics version 27.0** for analysis.

Descriptive statistics (frequencies, percentages, means and standard deviations as appropriate) were computed to summarize variables. Inferential statistics were performed using the Chi-square test (and Fisher's exact test where necessary) to test associations, specifically to determine the factors associated with the practice of HIV PEP. Where applicable, binary logistic regression was performed to identify predictors of good knowledge and good practice. Statistical significance was set at $p \leq 0.05$.

For bivariate and multivariate analyses specifically, clinical exposure duration was dichotomised into less than one year (<1 year) and one year or more (≥1 year) to ensure adequate cell sizes and analytical power.

3.8 ETHICAL CONSIDERATIONS

Ethical approval for this study was obtained from the University of Benin Teaching Hospital Health Research Ethics Committee (UBTH HREC) before data collection commenced, in accordance with the guidelines of the National Health Research Ethics Committee (NHREC) of Nigeria.

Institutional permission to conduct the study among clinical students was obtained through the appropriate authorities of the School of Medicine, University of Benin.

Participation was voluntary. An informed consent statement was included at the beginning of the online questionnaire explaining the purpose of the study and the rights of participants. Only respondents who provided consent were allowed to proceed, and participants were free to decline or withdraw at any stage without consequences.

Confidentiality and anonymity were maintained throughout the study. The questionnaire did not collect personal identifiers such as names or matriculation numbers. Responses were collected anonymously through Google Forms and stored in a secure database accessible only to the research team. Data obtained were used strictly for academic purposes.

Because the topic involves HIV exposure and post-exposure prophylaxis, responses were reported only in aggregate form to prevent identification of individual participants. Respondents who indicated possible occupational exposure were advised to seek appropriate medical care at the University of Benin Teaching Hospital (UBTH), where HIV testing and PEP services are available.

3.9 LIMITATIONS OF THE METHODOLOGY

Despite careful planning and the use of a multistage sampling technique, the study had some limitations:

1. Self-reported responses: Data were obtained using a self-administered questionnaire, and responses regarding exposure history, reporting behaviour, and PEP use relied on participants' recollection and honesty. This introduces the possibility of recall bias as well as social desirability bias, particularly because issues related to HIV exposure and preventive practices may be sensitive.

2. Online data collection constraint: Data were collected using a Google Forms questionnaire, which required internet access and a compatible digital device. Students with limited internet connectivity or those who were less active on online platforms may have been less likely to participate, thereby introducing the possibility of selection bias.

3. Cross-sectional design: The study employed a cross-sectional design, which involved collecting data from respondents at a single point in time. While this design is appropriate for assessing knowledge, attitudes, and practices within a population, it does not allow for the establishment of causal relationships between variables but only associations.

4. Single-institution study setting: The research was conducted among clinical-year medical students of the University of Benin only. Differences in training environments, institutional policies, and access to HIV post-exposure prophylaxis services across other medical schools may limit the generalizability of the findings to students in other institutions or regions.

5. Sensitive nature of the topic: Questions relating to HIV exposure and the use of post-exposure prophylaxis are sensitive and may lead to underreporting of exposure incidents or non-use of PEP by some respondents despite the assurance of anonymity. This may affect the accuracy of the reported practice data.

3.10 STUDY STRENGTHS

This study has several strengths that enhance the credibility and relevance of its findings. First, the use of a multistage sampling technique with proportional allocation ensured that students from all clinical levels (400, 500, and 600) were represented, improving the internal representativeness of the sample.

Second, the structured, pretested, and validated questionnaire allowed systematic collection of data on knowledge, attitude, and practice, reducing measurement error and enhancing the reliability of the findings. The pre-test also enabled refinement of ambiguous questions, ensuring clarity and cultural appropriateness.

Third, anonymous online data collection minimized social desirability bias and encouraged honest reporting, particularly for sensitive information regarding HIV exposure and PEP use.

Fourth, the study captured data on multiple dimensions of HIV PEP, including awareness, attitudes, actual practices, and barriers to utilisation, providing a comprehensive understanding of the factors influencing preventive behaviour among clinical students.

Finally, conducting the study within the University of Benin Medical School, which has direct access to tertiary healthcare services, allows the findings to be actionable. Insights from this research can directly inform interventions, training programs, and institutional policies to strengthen occupational safety and HIV prevention among clinical trainees.

CHAPTER FOUR

RESULTS

A total of 313 respondents participated in the study with 100% response rate. The results are presented in the following sections in line with the specific objectives.

SECTION A: Socio-demographic characteristics of respondents.

SECTION B: Knowledge of HIV PEP among clinical-year medical students at the University of Benin.

SECTION C: Attitude of clinical-year medical students of the University of Benin toward the use of HIV PEP.

SECTION D: Practice of HIV PEP among clinical-year medical students at the University of Benin.

SECTION E: Factors associated with HIV PEP Practice among clinical-year medical students at the University of Benin.

SECTION F: Barriers to the use of HIV PEP among clinical-year medical students at the University of Benin.

SECTION A:

SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Table 1: Socio-demographic Characteristics of Respondents

Variables	Frequency (n = 313)	Percent
Age (Years)		
18–24	253	80.8
25–29	54	17.3
30–37	6	1.9
Mean ± SD	**23.03 ± 2.40**	
Sex		
Male	197	62.9
Female	116	37.1
Marital status		
Single	307	98.1
Married	6	1.9
Level of study		
400 level	129	41.2
500 level	65	20.8
600 level	119	38.0
Clinical exposure duration		
More than 1 year	193	61.7
Less than 6 months	61	19.5
6 months to 1 year	59	18.8
Religion		
Christianity	307	98.1
Islam	6	1.9
Prior HIV testing		
Yes	104	33.2
No	209	66.8

The study recruited 313 respondents. The mean age was 23.03 ± 2.40 years, reflecting a predominantly young sample. The 18–24-year age group accounted for the largest proportion

of participants (80.8%), followed by the 25–29-year group (17.3%), while respondents aged 30–37 years represented 1.9%.

Male respondents constituted the majority (62.9%), with females accounting for 37.1% of the sample. Nearly all participants were single (98.1%), with married respondents comprising a marginal 1.9%.

Regarding academic level, 400-level students formed the largest subgroup (41.2%), followed by 600-level (38.0%) and 500-level students (20.8%). In terms of clinical exposure, the majority of respondents had accumulated more than one year of clinical experience (61.7%), while 19.5% had less than six months of exposure and 18.8% had between six months and one year.

Christianity was the predominant religion among participants (98.1%), with Islam accounting for the remaining 1.9%. With respect to HIV testing history, a substantial proportion of respondents (66.8%) had never undergone HIV testing, whereas 33.2% reported prior HIV testing.

SECTION B:

KNOWLEDGE OF HIV PEP AMONG CLINICAL-YEAR MEDICAL STUDENTS AT THE UNIVERSITY OF BENIN

Table 2: Awareness of HIV PEP among Respondents

Variables	Frequency (n = 313)	Percent
Have you heard of PEP		
Yes	279	89.1
No	34	10.9
Source of information (n=279)		
Classroom lectures/Training	195	69.9
Media (Internet/TV)	45	16.1
Textbooks/Journals	21	7.5
Colleague/Friend	18	6.5

The majority of respondents (89.1%) reported having heard of post-exposure prophylaxis (PEP), while 10.9% had no prior awareness of the intervention.

Among those who were aware of PEP (n = 279), classroom lectures and formal training constituted the predominant source of information (69.9%). This was followed distantly by media sources, including the internet and television (16.1%), textbooks and journals (7.5%), and colleagues or friends (6.5%).

Table 3: Questions Assessing Knowledge of HIV PEP among Respondents

Variables	Frequency (n = 313)	Percent
What is HIV PEP?		
A short-term course of antiretroviral drugs taken after potential exposure to prevent HIV infection	272	86.9
I don't know	33	10.5
Preventive medication taken before exposure to HIV	4	1.3
A vaccine used to provide long-term immunity against HIV	3	1.0
Treatment given to cure HIV infection after symptoms appear	1	0.3
WHO recommended regimen?		
I don't know	206	65.8
3 drugs	49	15.7
2 drugs	39	12.5
1 drug	19	6.1
Baseline HIV test required?		
Yes	116	37.1
No	102	32.6
I don't know	95	30.4
Maximum time to start PEP?		
I don't know	127	40.6
72 hours	115	36.7
24 hours	62	19.8
2 hours	9	2.9
Duration of PEP?		
I don't know	184	58.8
28 days	57	18.2
14 days	36	11.5
3 months	36	11.5
Is there a National PEP guideline?		
I don't know	183	58.5
Yes	116	37.1
No	14	4.5
PEP is effective?		
True	244	78.0
I don't know	60	19.2
False	9	2.9
Which exposure requires HIV PEP?*		
Needle stick exposure	279	89.1
Unprotected sex exposure	284	90.7
Blood on broken skin exposure	279	89.1
Sharing utensils exposure	38	12.1

*** = Multiple response question, α=0.644**

Regarding the definition of HIV PEP, the majority of respondents (86.9%) identified it as a short-term course of antiretroviral drugs taken after potential exposure to prevent HIV infection. A minority (10.5%) indicated no knowledge of the term, while small proportions identified PEP as preventive medication taken before exposure (1.3%), a vaccine providing long-term immunity (1.0%), or treatment administered after symptoms appear (0.3%).

With respect to the WHO-recommended PEP regimen, the largest proportion of respondents did not know the recommended regimen (65.8%), followed by those who indicated three drugs (15.7%), two drugs (12.5%), and one drug (6.1%).

Concerning the requirement for a baseline HIV test prior to initiating PEP, 37.1% of respondents answered yes, 32.6% answered no, and 30.4% reported not knowing.

Regarding the maximum time window for initiating PEP, the largest proportion of respondents did not know (40.6%), while 36.7% indicated 72 hours, 19.8% indicated 24 hours, and 2.9% indicated 2 hours.

With respect to the recommended duration of PEP, the majority of respondents were unable to provide a response (58.8%), while 18.2% indicated 28 days, and 11.5% each indicated 14 days and 3 months.

Concerning awareness of a national PEP guideline, 58.5% of respondents did not know, 37.1% indicated yes, and 4.5% indicated no.

Regarding PEP efficacy, 78.0% of respondents indicated that PEP is effective, 19.2% were uncertain, and 2.9% indicated it was not effective.

Exposure types warranting HIV PEP were assessed as a multiple-response question. Unprotected sexual exposure was most frequently selected (90.7%), followed by needlestick

injury and blood contact with broken skin, each selected by 89.1% of respondents. Sharing utensils was selected by 12.1% of respondents.

Table 4: Correctness of Responses to Knowledge Questions on HIV PEP

Variables	Responses (n=313)	
	Correct (%)	Incorrect (%)
What is HIV PEP?	272 (86.9)	41 (13.1)
WHO recommended regimen?	49 (15.7)	264 (84.3)
Baseline HIV test required?	116 (37.1)	197 (62.9)
Maximum time to start PEP?	115 (36.7)	198 (63.3)
Duration of PEP?	57 (18.2)	256 (81.8)
Is there a National PEP guideline?	116 (37.1)	197 (62.9)
PEP is effective?	244 (78.0)	69 (22.0)
Which exposure requires HIV PEP?	216 (69.0)	97 (31.0)

α=0.644

Assessment of knowledge of HIV PEP revealed variable performance across the eight items evaluated (α = 0.644). The highest proportion of correct responses was recorded for the question on definition of HIV PEP (86.9%) followed by the question on PEP efficacy (78.0%), and identification of exposures requiring PEP (69.0%).

In contrast, knowledge of the WHO-recommended regimen returned the lowest proportion of correct responses (15.7%), followed by the duration of PEP (18.2%), the maximum time to initiate PEP (36.7%), the requirement for a baseline HIV test (37.1%), and awareness of a national PEP guideline (37.1%).

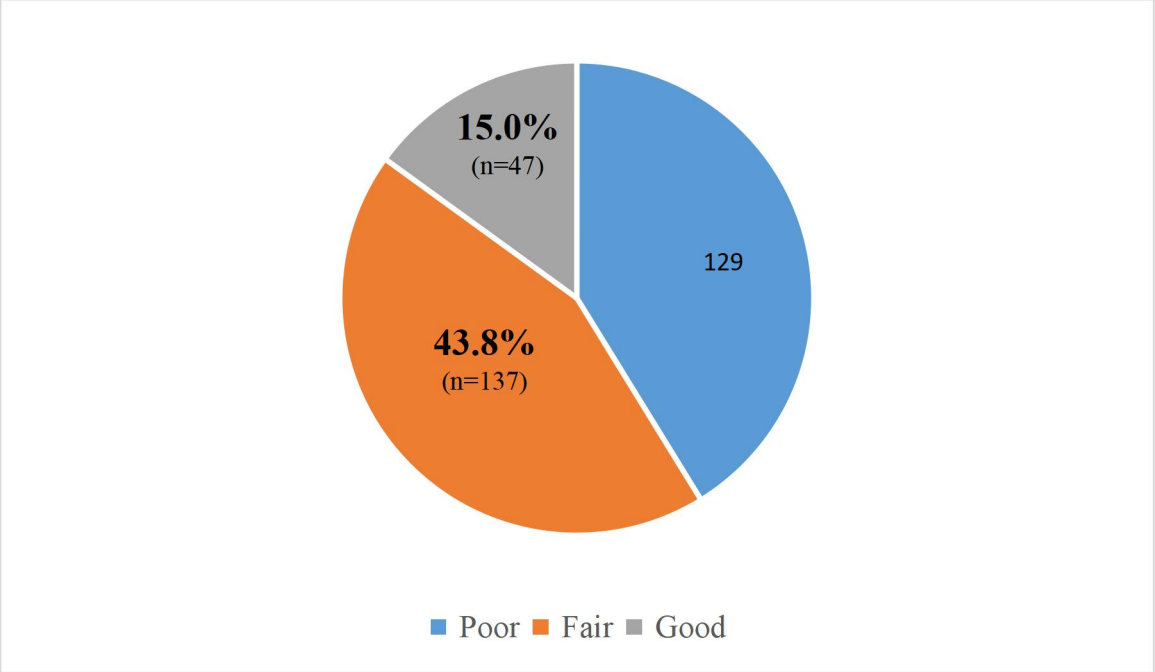

Figure 1: Knowledge level of HIV PEP among the Respondents

Less than half (43.8%) of the respondents had fair knowledge of HIV PEP, while more than two-fifths (41.2%) had poor knowledge. Less than one-fifth (15.0%) of the respondents had good knowledge of HIV PEP.

Table 5: Socio-demographic Characteristics and Knowledge of HIV PEP

Variables	Knowledge of HIV PEP			Test statistic χ^2	p-value
	Poor (n=129) (%)	Fair (n=137) (%)	Good (n=47) (%)		
Age (years)					
18–24	112 (44.3)	106 (41.9)	35 (13.8)	6.287	**0**.179
25–29	16 (29.6)	28 (51.9)	10 (18.5)		
Sex					
Male	91 (46.2)	83 (42.1)	23 (11.7)	7.474	**0.024**
Female	38 (32.8)	54 (46.6)	24 (20.7)		
Marital status					
Single	127 (41.4)	134 (43.6)	46 (15.0)	0.158*	0.924
Married	2 (33.3)	3 (50.0)	1 (16.7)		
Level of study					
400 level	69 (53.5)	54 (41.9)	6 (4.7)	28.464	**<0.001**
500 level	28 (43.1)	24 (36.9)	13 (20.0)		
600 level	32 (26.9)	59 (49.6)	28 (23.5)		
Clinical exposure duration					
<1 year	63 (52.5)	51 (42.5)	6 (5.0)	19.088	**<0.001**
≥1 year	66 (34.2)	86 (44.6)	41 (21.2)		
Religion					
Christianity	128 (41.7)	134 (43.6)	45 (14.7)	2.316*	0.314
Islam	1 (16.7)	3 (50.0)	2 (33.3)		
Prior HIV testing					
Yes	32 (30.8)	42 (40.4)	30 (28.8)	24.370	**<0.001**
No	97 (46.4)	95 (45.5)	17 (8.1)		

***Fisher's exact test**

A total of 313 respondents were assessed for their knowledge of HIV PEP, categorized as poor (n = 129), fair (n = 137), or good (n = 47).

Regarding age, the proportion of respondents with good knowledge was higher among those in the 25–29 years age group (10, 18.5%) compared to the 18–24 years age group (35, 13.8%). Similarly, the 25–29 years age group recorded a higher proportion of fair knowledge responses (28, 51.9%) compared to the 18–24 years age group (106, 41.9%). Conversely, poor knowledge was more prevalent among the 18–24 years age group (112, 44.3%) than the 25–29 years age group (16, 29.6%). The association between age and knowledge of HIV PEP was not statistically significant ($\chi^2 = 6.287$, $p = 0.179$).

In terms of sex, a higher proportion of females demonstrated good knowledge (24, 20.7%) compared to males (23, 11.7%). The association between sex and knowledge was statistically significant ($\chi^2 = 7.474$, $p = 0.024$).

Marital status showed no significant association with knowledge of HIV PEP (Fisher's Exact Test, $\chi^2 = 0.158$, $p = 0.924$). The proportion with good knowledge was 46 (15.0%) among single respondents and 1 (16.7%) among married respondents.

Level of study was significantly associated with knowledge of HIV PEP ($\chi^2 = 28.464$, $p < 0.001$). The highest proportion of good knowledge was recorded among 600-level students (28, 23.5%), followed by 500-level students (13, 20.0%) and 400-level students (6, 4.7%).

Clinical exposure duration was also significantly associated with knowledge ($\chi^2 = 19.088$, $p < 0.001$). Respondents with one year or more of clinical exposure recorded a higher proportion of good knowledge (41, 21.2%) compared to those with less than one year of exposure (6, 5.0%).

Religion showed no significant association with knowledge of HIV PEP (Fisher's Exact Test, $\chi^2 = 2.316$, $p = 0.314$), with good knowledge recorded among 45 Christians (14.7%) and 2 Muslims (33.3%).

Finally, HIV testing history was significantly associated with knowledge of HIV PEP (χ^2 = 24.370, $p < 0.001$). Respondents who had previously been tested for HIV recorded a substantially higher proportion of good knowledge (30, 28.8%) compared to those who had never been tested (17, 8.1%).

Table 6: Predictors of Knowledge of HIV PEP

Predictors	β	Odds ratio	95% CI for OR		p-value
			Lower	Upper	
Age	0.003	1.003	0.831	1.211	0.973
Sex					
Male*		1			
Female	0.595	1.813	0.888	3.703	0.102
Marital status					
Single*		1			
Married	-0.650	0.522	0.046	5.939	0.600
Level of study					
400 level*		1			
500 level	0.870	2.386	0.618	9.221	0.406
600 level	0.895	2.448	0.630	9.507	
Clinical exposure duration					
<1 year*		1			
≥1 year	0.866	2.377	0.674	8.384	0.178
Religion					
Christianity*		1			
Islam	1.091	2.977	0.378	23.438	0.300
Prior HIV testing					
Yes*		1			
No	-1.249	0.287	0.143	0.573	**<0.001**

CI = Confidence interval; **OR** = Odds ratio; *reference category

A multivariate logistic regression was conducted to identify independent predictors of good knowledge of HIV PEP. For each additional year of age, the odds of good knowledge remained virtually unchanged (OR = 1.003, 95% CI = 0.831–1.211, p = 0.973), and this association was not statistically significant.

With respect to sex, females had higher odds of good knowledge relative to males (OR = 1.813, 95% CI = 0.888–3.703, p = 0.102), but this difference was not statistically significant.

Regarding marital status, married respondents had lower odds of good knowledge relative to single respondents (OR = 0.522, 95% CI = 0.046–5.939, p = 0.600), and this association was not statistically significant.

In terms of level of study, both 500-level (OR = 2.386, 95% CI = 0.618–9.221, p = 0.406) and 600-level students (OR = 2.448, 95% CI = 0.630–9.507) had higher odds of good knowledge relative to 400-level students; neither association was statistically significant.

Concerning clinical exposure duration, respondents with one year or more of exposure had higher odds of good knowledge relative to those with less than one year (OR = 2.377, 95% CI = 0.674–8.384, p = 0.178), but this difference was not statistically significant.

With regard to religion, Muslims had higher odds of good knowledge relative to Christians (OR = 2.977, 95% CI = 0.378–23.438, p = 0.300), but this association was not statistically significant.

Finally, HIV testing history was the only statistically significant predictor. Respondents who had never been tested for HIV had significantly lower odds of good knowledge relative to those who had previously been tested (OR = 0.287, 95% CI = 0.143–0.573, p < 0.001).

SECTION C:

ATTITUDE OF CLINICAL-YEAR MEDICAL STUDENTS OF THE UNIVERSITY OF BENIN TOWARD THE USE OF HIV PEP.

Table 7: Attitude of Respondents toward the use of HIV PEP

Variables	SA (n=313) Freq (%)	A (n=313) Freq (%)	N(n=313) Freq (%)	D (n=313) Freq (%)	SD (n=313) Freq (%)
HIV PEP is important in preventing HIV infection after exposure.	179 (57.2)	109 (34.8)	20 (6.4)	3 (1.0)	2 (0.6)
I would take HIV PEP if I had high-risk occupational exposure.	199 (63.6)	94 (30.0)	17 (5.4)	2 (0.6)	1 (0.3)
HIV PEP should be easily accessible at the ARV clinic/UBTH.	197 (62.9)	87 (27.8)	22 (7.0)	6 (1.9)	1 (0.3)
Formal HIV PEP training for students is necessary for safety.	188 (60.1)	107 (34.2)	16 (5.1)	1 (0.3)	1 (0.3)
I would encourage my colleagues to use HIV PEP after possible exposure	183 (58.5)	105 (33.5)	22 (7.0)	3 (1.0)	0 (0.0)
I may hesitate to report an occupational exposure	21 (6.7)	39 (12.5)	53 (16.9)	117 (37.4)	83 (26.5)
I feel embarrassed or fear stigma if I have to seek HIV PEP	27 (8.6)	75 (24.0)	68 (21.7)	81 (25.9)	62 (19.8)
I believe HIV PEP is only necessary if the source patient is known HIV+.	21 (6.7)	49 (15.7)	66 (21.1)	119 (38.0)	58 (18.5)

***SA=Strongly Agree, A = Agree, N = Neutral, D = Disagree, SD = Strongly Disagree; α= 0.685**

Attitude toward HIV PEP was assessed across eight items using a five-point Likert scale (α = 0.685). Responses were categorized as strongly agree, agree, neutral, disagree, and strongly disagree.

Regarding the importance of HIV PEP in preventing HIV infection after exposure, the majority of respondents strongly agreed (179, 57.2%), with a further 109 (34.8%) agreeing.

Similarly, the majority indicated they would take HIV PEP following high-risk occupational exposure, with 199 (63.6%) strongly agreeing and 94 (30.0%) agreeing.

With respect to accessibility, the majority strongly agreed that HIV PEP should be easily accessible at the ARV clinic or UBTH (197, 62.9%), while 87 (27.8%) agreed. Concerning the necessity of formal HIV PEP training for student safety, 188 (60.1%) strongly agreed and 107 (34.2%) agreed. In terms of encouraging colleagues to use HIV PEP after possible exposure, 183 (58.5%) strongly agreed and 105 (33.5%) agreed.

Regarding hesitancy to report occupational exposure, the majority of respondents disagreed (117, 37.4%) or strongly disagreed (83, 26.5%), while 53 (16.9%) were neutral and 60 (19.2%) agreed or strongly agreed. Similarly, concerning embarrassment or fear of stigma in seeking HIV PEP, responses were more distributed, with 81 (25.9%) disagreeing and 62 (19.8%) strongly disagreeing, while 75 (24.0%) agreed and 27 (8.6%) strongly agreed.

Finally, with regard to the belief that HIV PEP is only necessary when the source patient is known to be HIV-positive, the majority disagreed (119, 38.0%) or strongly disagreed (58, 18.5%), while 49 (15.7%) agreed and 21 (6.7%) strongly agreed.

Table 8: Appropriateness of Responses to Attitudinal Questions on HIV PEP

Variables	Appropriate Freq(%)	Inappropriate Freq(%)
HIV PEP is important in preventing HIV infection after exposure.	288 (92.0)	25 (8.0)
I would take HIV PEP if I had high-risk occupational exposure.	293 (93.6)	20 (6.4)
HIV PEP should be easily accessible at the ARV clinic/UBTH.	284 (90.7)	29 (9.3)
Formal HIV PEP training for students is necessary for safety.	295 (94.2)	18 (5.8)
I would encourage my colleagues to use HIV PEP after possible exposure	288 (92.0)	25 (8.0)
I may hesitate to report an occupational exposure	200 (63.9)	113 (36.1)
I feel embarrassed or fear stigma if I have to seek HIV PEP	143 (45.7)	170 (54.3)
I believe HIV PEP is only necessary if the source patient is known HIV+.	177 (56.5)	136 (43.5)

Cronbach alpha=0.685

Assessment of the appropriateness of attitudinal responses across eight questions revealed generally favorable attitudes toward HIV PEP, with variable proportions across questions ($\alpha = 0.685$).

The highest proportion of appropriate responses was recorded for the necessity of formal HIV PEP training for student safety (295, 94.2%), followed by willingness to take HIV PEP after high-risk occupational exposure (293, 93.6%), the importance of HIV PEP in preventing HIV infection (288, 92.0%), and encouragement of colleagues to use HIV PEP after possible

exposure (288, 92.0%). Accessibility of HIV PEP at the ARV clinic or UBTH also returned a high proportion of appropriate responses (284, 90.7%).

In contrast, lower proportions of appropriate responses were observed for the remaining questions. Less than two-thirds of respondents responded appropriately regarding hesitancy to report occupational exposure (200, 63.9%), while slightly more than half responded appropriately concerning the belief that HIV PEP is only necessary when the source patient is known to be HIV-positive (177, 56.5%). The lowest proportion of appropriate responses was recorded for embarrassment or fear of stigma in seeking HIV PEP, where less than half of respondents responded appropriately (143, 45.7%).

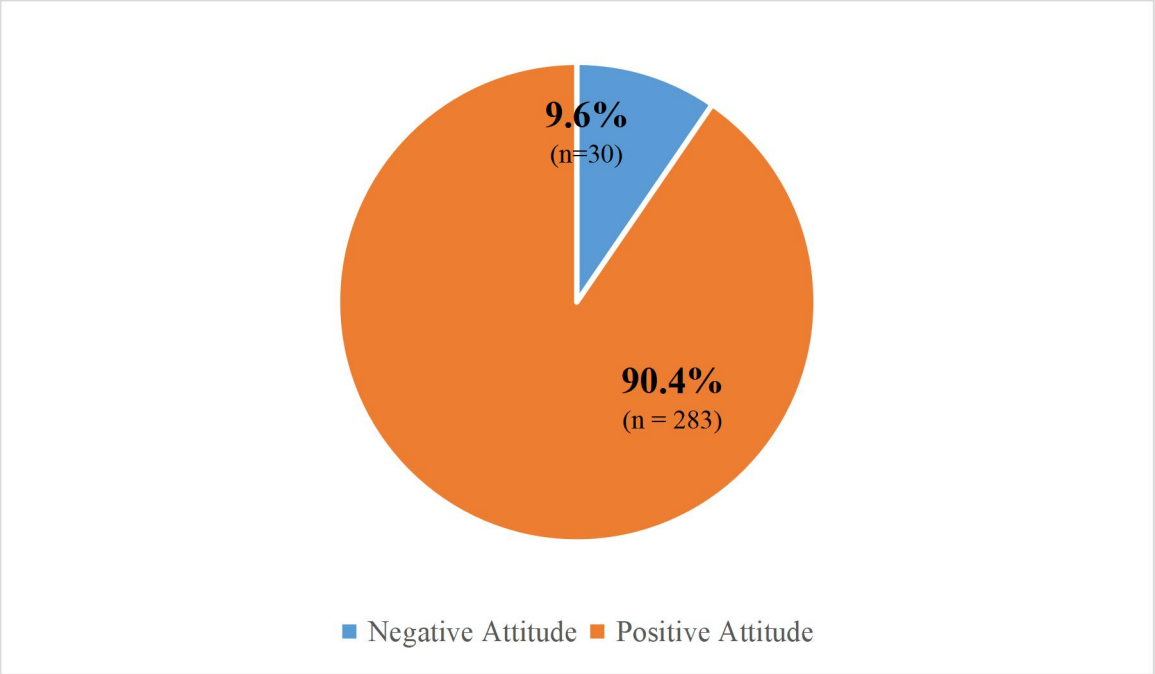

Figure 2: Attitude towards HIV PEP among the Respondents

More than nine-tenths (90.4%) of the respondents had a positive attitude toward HIV PEP, while less than one-tenth (9.6%) had a negative attitude.

Table 9: Socio-demographic Characteristics and Attitude towards HIV PEP

Variables	Attitude		Test statistic	p-value
	Positive (n=283) Freq(%)	Negative (n=30) Freq(%)	χ^2	
Age (years)				
18–24	225 (88.9)	28 (11.1)	3.433	0.180
25–29	52 (96.3)	2 (3.7)		
Sex				
Male	173 (87.8)	24 (12.2)	4.140	**0.042**
Female	110 (94.8)	6 (5.2)		
Marital status				
Single	277 (90.2)	30 (9.8)	0.648*	>0.999
Married	6 (100.0)	0 (0.0)		
Level of study				
400 level	108 (83.7)	21 (16.3)	13.532	**0.001**
500 level	59 (90.8)	6 (9.2)		
600 level	116 (97.5)	3 (2.5)		
Clinical exposure Duration				
<1 year	101 (84.2)	19 (15.8)	8.768	**0.003**
≥1 year	182 (94.3)	11 (5.7)		
Religion				
Christianity	277 (90.2)	30 (9.8)	0.648*	>0.999
Islam	6 (100.0)	0 (0.0)		
Prior HIV testing				
Yes	98 (94.2)	6 (5.8)	2.616	0.106
No	185 (88.5)	24 (11.5)		
Knowledge level				
Poor	105 (81.4)	24 (18.6)	20.674	**<0.001**
Fair	133 (97.1)	4 (2.9)		
Good	45 (95.7)	2 (4.3)		

*Fisher's exact test

A total of 313 respondents were assessed for their attitude toward HIV PEP, categorized as positive (n = 283) or negative (n = 30).

When evaluating the specified age brackets, a higher proportion of students in the 25–29 years age group demonstrated a positive attitude (52, 96.3%) compared to those in the 18–24

years age group (225, 88.9%). The association between age and attitude toward HIV PEP was not statistically significant ($\chi^2 = 3.433$, $p = 0.180$).

In terms of sex, a higher proportion of females demonstrated a positive attitude (110, 94.8%) compared to males (173, 87.8%), and this association was statistically significant ($\chi^2 = 4.140$, $p = 0.042$).

Marital status showed no significant association with attitude toward HIV PEP (Fisher's Exact Test, $p > 0.999$), with positive attitudes recorded among 277 single respondents (90.2%) and all six married respondents (100.0%).

Level of study was significantly associated with attitude toward HIV PEP ($\chi^2 = 13.532$, $p = 0.001$). The highest proportion of positive attitude was recorded among 600-level students (116, 97.5%), followed by 500-level students (59, 90.8%) and 400-level students (108, 83.7%).

Clinical exposure duration was also significantly associated with attitude ($\chi^2 = 8.768$, $p = 0.003$). Respondents with one year or more of clinical exposure recorded a higher proportion of positive attitude (182, 94.3%) compared to those with less than one year of exposure (101, 84.2%).

Religion showed no significant association with attitude toward HIV PEP (Fisher's Exact Test, $p > 0.999$), with positive attitudes recorded among 277 Christians (90.2%) and all six Muslim respondents (100.0%).

HIV testing history showed no significant association with attitude toward HIV PEP ($\chi^2 = 2.616$, $p = 0.106$), with positive attitudes recorded among 98 respondents who had previously been tested (94.2%) and 185 respondents who had never been tested (88.5%).

Finally, knowledge level was significantly associated with attitude toward HIV PEP (χ^2 = 20.674, $p < 0.001$). Respondents with fair knowledge recorded the highest proportion of positive attitude (133, 97.1%), followed by those with good knowledge (45, 95.7%) and those with poor knowledge (105, 81.4%).

Table 10: Predictors of Attitude towards HIV PEP

Predictors	β	Odds ratio	95% CI for OR		p-value
			Lower	Upper	
Age	0.020	1.021	0.816	1.276	0.858
Sex					
Male*		1			
Female	0.654	1.923	0.701	5.275	0.204
Marital status					
Single*		1			
Married	17.588	43505882.980	<0.001	.	0.999
Level of study					
400 level*		1			
500 level	0.334	1.396	0.353	5.517	0.288
600 level	1.313	3.716	0.685	20.158	
Clinical exposure duration					
<1 year*		1			
≥1 year	0.252	1.287	0.391	4.236	0.678
Religion					
Christianity*		1			
Islam	18.185	79008371.340	<0.001	.	0.999
Prior HIV testing					
Yes*		1			
No	-0.203	0.816	0.297	2.239	0.693
Knowledge level					
Poor*		1			
Fair	1.743	5.713	1.873	17.425	**0.007**
Good	0.871	2.388	0.491	11.607	

CI = Confidence interval; **OR** = Odds ratio; *reference category

A multivariate logistic regression was conducted to identify independent predictors of positive attitude toward HIV PEP. For each additional year of age, the odds of a positive

attitude remained virtually unchanged (OR = 1.021, 95% CI = 0.816–1.276, p = 0.858), and this association was not statistically significant.

With respect to sex, females had higher odds of a positive attitude relative to males (OR = 1.923, 95% CI = 0.701–5.275, p = 0.204), but this difference was not statistically significant.

Regarding marital status, the odds ratio for married respondents relative to single respondents was extremely large (OR = 43,505,882.980, p = 0.999), reflecting perfect separation in the data due to the absence of negative attitude responses among married respondents; this association was not statistically significant.

In terms of level of study, both 500-level (OR = 1.396, 95% CI = 0.353–5.517, p = 0.288) and 600-level students (OR = 3.716, 95% CI = 0.685–20.158) had higher odds of a positive attitude relative to 400-level students; neither association was statistically significant.

Concerning clinical exposure duration, respondents with one year or more of exposure had higher odds of a positive attitude relative to those with less than one year (OR = 1.287, 95% CI = 0.391–4.236, p = 0.678), but this difference was not statistically significant.

With regard to religion, similar to marital status, the odds ratio for Muslims relative to Christians was extremely large (OR = 79,008,371.340, p = 0.999), reflecting perfect separation due to the absence of negative attitude responses among Muslim respondents; this association was not statistically significant.

Regarding HIV testing history, respondents who had never been tested had lower odds of a positive attitude relative to those who had previously been tested (OR = 0.816, 95% CI = 0.297–2.239, p = 0.693), but this association was not statistically significant.

Finally, knowledge level was the only statistically significant predictor of attitude toward HIV PEP. Respondents with fair knowledge had significantly higher odds of a positive attitude relative to those with poor knowledge (OR = 5.713, 95% CI = 1.873–17.425, p = 0.007). Respondents with good knowledge also had higher odds relative to those with poor knowledge (OR = 2.388, 95% CI = 0.491–11.607), but this association was not statistically significant.

SECTION D:

PRACTICE OF HIV PEP AMONG CLINICAL-YEAR MEDICAL STUDENTS AT THE UNIVERSITY OF BENIN.

Table 11: Practice of HIV PEP among Respondents

Variables	Frequency (n = 313)	Percent
History of occupational exposure		
No	287	91.7
Yes	26	8.3
Took PEP after exposure (n = 26)		
No	20	76.9
Yes	6	23.1
Time of PEP initiation (n = 6)		
Within 1–24 hours	3	50.0
Within 24–72 hours	3	50.0
Completed 28-day PEP course (n = 6)		
Yes	5	83.3
No	1	16.7
Follow-up HIV test done (n = 6)		
Yes	3	50.0
No	3	50.0
Exposure reported (n = 26)		
No	21	80.8
Yes	5	19.2
Reasons for not taking PEP (n = 20)		
Did not think it was serious	11	55.0
Unavailability	4	20.0
Fear of stigma	4	20.0
Fear of side effects/Toxicity	1	5.0

Regarding history of occupational exposure, the majority of respondents had no prior occupational exposure (287, 91.7%), while 26 (8.3%) reported at least one occupational exposure incident.

Among those who reported occupational exposure (n = 26), the majority did not take HIV PEP following the exposure (20, 76.9%), while less than one-quarter initiated PEP (6, 23.1%). With respect to exposure reporting, the majority also did not report their exposure (21, 80.8%), with only 5 (19.2%) having done so.

Among the six respondents who initiated PEP, time of initiation was equally distributed between within 1–24 hours (3, 50.0%) and within 24–72 hours (3, 50.0%). The majority completed the 28-day PEP course (5, 83.3%), while one respondent (16.7%) did not. Regarding follow-up HIV testing, responses were equally distributed, with half of the respondents completing a follow-up HIV test (3, 50.0%) and half not doing so (3, 50.0%).

Concerning reasons for not taking PEP among those who did not initiate it (n = 20), the predominant reason was not considering the exposure serious enough (11, 55.0%), followed equally by unavailability of PEP and fear of stigma (4, 20.0% each). Fear of side effects or toxicity was the least frequently cited reason (1, 5.0%).

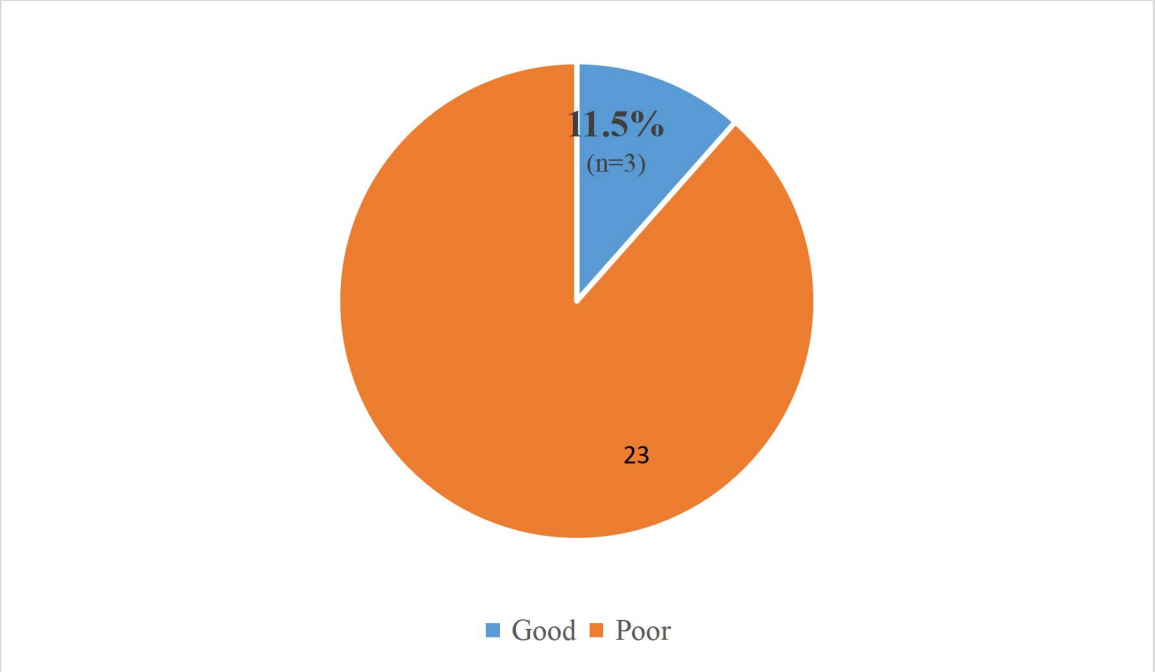

Figure 3: Practice of HIV PEP among the Respondents

Among the 26 respondents (8.3%) who reported occupational exposure and were evaluated for practice, the majority (23, 88.5%) demonstrated poor practice of HIV PEP, while less than one-fifth (11.5%) had good practice.

SECTION E:

FACTORS ASSOCIATED WITH HIV PEP PRACTICE AMONG CLINICAL-YEAR MEDICAL STUDENTS AT THE UNIVERSITY OF BENIN.

Table 12: Sociodemographic Characteristics and Practice of HIV PEP

Variables	Practice of HIV PEP		Test statistic	p-value
	Good (n=3)	Poor (n=23)	χ^2	
	Freq(%)	Freq(%)		
Age (years)				
18–24	2 (10.5)	17 (88.9)	3.570	0.168
25-29	0 (0.0)	5 (100.0)		
Sex				
Male	2 (13.3)	13 (86.7)	0.112*	>0.999
Female	1 (9.1)	10 (90.9)		
Level of study				
400 level	1 (16.7)	5 (83.3)	1.041*	0.594
500 level	0 (0.0)	6 (100.0)		
600 level	2 (14.3)	12 (85.7)		
Clinical exposure duration				
<1 year	0 (0.0)	5 (100.0)	0.807*	>0.999
≥1 year	3 (14.3)	18 (85.7)		
Religion				
Christianity	3 (12.0)	22 (88.0)	0.136*	>0.999
Islam	0 (0.0)	1 (100.0)		
Prior HIV testing				
Yes	1 (7.1)	13 (92.9)	0.574*	0.580
No	2 (16.7)	10 (83.3)		
Knowledge level				
Poor	2 (18.2)	9 (81.8)	0.925*	0.630
Fair	1 (7.7)	12 (92.3)		
Good	0 (0.0)	2 (100.0)		
Attitude level				
Positive	3 (100.0)	23 (100.0)	-	-
Negative	0 (0.0%)	0 (0.0%)	-	-

- = No statistics were computed because the attitude category is a constant.

Among the 26 respondents who reported occupational exposure, practice of HIV PEP was categorized as good (n = 3) or poor (n = 23).

Regarding age, the proportion of respondents with good practice was higher among those in the 18–24 years age group (2, 10.5%) compared to the 25–29 years age group (0, 0.0%), where all exposed students demonstrated poor practice. The association between age and practice of HIV PEP was not statistically significant ($\chi^2 = 3.570$, $p = 0.168$).

In terms of sex, a slightly higher proportion of males demonstrated good practice (2, 13.3%) compared to females (1, 9.1%), and this association was not statistically significant (Fisher's Exact Test, $p = 1.000$).

Regarding marital status, all respondents with occupational exposure were single, precluding statistical comparison across marital status categories.

With respect to level of study, good practice was recorded among 400-level (1, 16.7%) and 600-level students (2, 14.3%), while no 500-level student demonstrated good practice. This association was not statistically significant (Fisher's Exact Test, $p = 0.594$).

Concerning clinical exposure duration, all respondents with good practice had one year or more of clinical exposure (3, 14.3%), while no respondent with less than one year of exposure demonstrated good practice. This association was not statistically significant (Fisher's Exact Test, $p = 1.000$).

With regard to religion, good practice was recorded among 3 Christians (12.0%), while the sole Muslim respondent did not demonstrate good practice. This association was not statistically significant (Fisher's Exact Test, $p = 1.000$).

Regarding HIV testing history, a higher proportion of respondents who had never been tested demonstrated good practice (2, 16.7%) compared to those who had previously been tested (1, 7.1%), and this association was not statistically significant (Fisher's Exact Test, $p = 0.580$).

In terms of knowledge level, good practice was recorded among respondents with poor knowledge (2, 18.2%) and fair knowledge (1, 7.7%), while no respondent with good knowledge demonstrated good practice. This association was not statistically significant (Fisher's Exact Test, $p = 0.630$).

Finally, regarding attitude category, all respondents with occupational exposure demonstrated a positive attitude, precluding statistical comparison across attitude categories.

Table 13: Predictors of Practice of HIV PEP

Predictors	β	Odds ratio	95% CI for OR		p-value
			Lower	Upper	
Age	0.227	1.254	0.508	3.099	0.624
Sex					
Male*		1			
Female	-0.427	0.652	0.017	24.535	0.818
Level of study					
400 level*		1			
500 level	-40.054	<0.001	<0.001	.	>0.999
600 level	-22.026	<0.001	<0.001	.	
Clinical exposure duration					
<1 year*		1			
≥1 year	41.408	961764183204983300.000	<0.001	.	0.998
Religion					
Christianity*		1			
Islam	-20.033	<0.001	<0.001	.	>0.999
Prior HIV testing					
Yes*		1			
No	0.591	1.805	0.029	111.545	0.779
Knowledge level					
Poor*		1			
Fair	-21.007	<0.001	<0.001	.	>0.999
Good	-18.772	<0.001	<0.001	.	

CI = Confidence interval; **OR** = Odds ratio; *reference category

For each additional year of age, the odds of good practice were slightly higher (OR = 1.254, 95% CI = 0.508–3.099, p = 0.624), but this association was not statistically significant.

With respect to sex, females had lower odds of good practice relative to males (OR = 0.652, 95% CI = 0.017–24.535, p = 0.818), but this difference was not statistically significant.

In terms of level of study, both 500-level and 600-level students exhibited extreme separation, with odds ratios approaching zero relative to 400-level students; neither association was statistically significant (p > 0.999).

Concerning clinical exposure duration, respondents with one year or more of exposure exhibited an extremely large odds ratio relative to those with less than one year, reflecting perfect separation due to the absence of good practice among respondents with less than one year of exposure; this association was not statistically significant (p = 0.998).

With regard to religion, Muslim respondents exhibited complete separation, with odds ratios approaching zero relative to Christians; this association was not statistically significant (p > 0.999).

Regarding HIV testing history, respondents who had never been tested had higher odds of good practice relative to those who had previously been tested (OR = 1.805, 95% CI = 0.029–111.545, p = 0.779), but this association was not statistically significant.

Finally, with respect to knowledge level, both fair and good knowledge categories exhibited complete separation relative to poor knowledge, with odds ratios approaching zero; neither association was statistically significant (p > 0.999).

SECTION F:

BARRIERS TO THE USE OF HIV PEP AMONG CLINICAL-YEAR MEDICAL STUDENTS AT THE UNIVERSITY OF BENIN.

Table 14: Barriers to the Use of HIV PEP among Respondents

Variable	Frequency (n=313)	Percent
Lack of knowledge of PEP protocol	271	86.6
Uncertainty about exposure risk	233	74.4
Fear of stigma and confidentiality concerns	232	74.1
Fear of side effects	194	62.0
Lack of 24-hour access to PEP services	181	57.8
Drug unavailability	173	55.3
Lack of supervisor support	163	52.1
Reporting process is tedious	146	46.6

Regarding barriers to the use of HIV PEP, the majority of respondents identified lack of knowledge of PEP protocol (271, 86.6%), uncertainty about exposure risk (233, 74.4%), and fear of stigma and confidentiality concerns (232, 74.1%).

More than three-fifths identified fear of side effects (194, 62.0%), while slightly more than half cited lack of 24-hour access to PEP services (181, 57.8%), drug unavailability (173, 55.3%), and lack of supervisor support (163, 52.1%). Less than half of respondents identified the tedious reporting process as a barrier (146, 46.6%).

CHAPTER FIVE

5.1 DISCUSSION

This study found that although a large majority of the clinical-year medical students had heard about HIV post-exposure prophylaxis (PEP), less than one-fifth had good knowledge, while most had either fair or poor knowledge. Respondents demonstrated good understanding of the definition and effectiveness of HIV PEP; however, knowledge of the WHO-recommended regimen, duration of therapy, timing of initiation, and availability of national guidelines was poor. This suggests that awareness of HIV PEP is high among the students, but detailed and practical knowledge remains inadequate. This may be attributed to the fact that most respondents obtained their information from classroom lectures, where emphasis may be placed on theoretical concepts rather than practical application of PEP protocols.

This finding is similar to that reported in a study conducted at the University of Gondar Comprehensive Specialized Hospital in North-western Ethiopia, where most students were aware of HIV PEP but only a minority had adequate knowledge.[16] It is also in agreement with findings from a study conducted among dental students in Egypt, which reported generally unsatisfactory knowledge of PEP.[17] Similarly, a study conducted among clinical medical students in Cameroon found that only a small proportion had good knowledge.[15] In Nigeria, a study conducted in Kano also reported high awareness but low level of adequate knowledge among students.[10] However, a study conducted in Brazil reported relatively higher knowledge levels, possibly due to differences in curriculum structure and emphasis on clinical training.[18]

This study further revealed that sex, level of study, duration of clinical exposure, and prior HIV testing were significantly associated with knowledge of HIV PEP. Good knowledge was more common among older students, females, those in higher levels of study, those with longer clinical exposure, and those who had previously tested for HIV. However, after

controlling for other variables, only prior HIV testing remained an independent predictor of knowledge. This suggests that medical students who have undergone HIV testing may have benefited from counselling and exposure to HIV-related information, thereby improving their understanding of PEP. Similar findings have been reported in studies conducted in Nigeria, where engagement with HIV testing services was associated with improved awareness of HIV prevention strategies.[19]

On attitude toward HIV PEP, this study found that the substantial majority of the respondents demonstrated a positive attitude. A large proportion agreed that HIV PEP is important in preventing infection, that they would take PEP following high-risk exposure, that PEP should be readily accessible, and that formal training is necessary for healthcare workers. This indicates a generally favourable perception of HIV PEP among the respondents. However, some respondents expressed fear of stigma, embarrassment, and hesitancy in reporting exposure, suggesting that negative perceptions still exist.

This finding is similar to that reported in a study conducted in North-western Ethiopia, where most respondents had a positive attitude toward HIV PEP.[16] It also corroborates findings from a study conducted in Enugu State, South-East Nigeria, where healthcare workers demonstrated favourable attitudes toward PEP.[21] Similarly, a study conducted in the Harari region of Eastern Ethiopia reported that positive attitudes toward PEP were common among healthcare workers.[20] However, the persistence of stigma-related concerns in this study is in agreement with findings among university students in Nigeria, where fear of stigma and lack of confidentiality were identified as barriers to seeking PEP services.[19]

This study also showed that sex, level of study, duration of clinical exposure, and knowledge level were significantly associated with attitude toward HIV PEP. Females, senior students, those with longer clinical exposure, and those with better knowledge were more likely to

have a positive attitude. However, after adjusting for other factors, only knowledge level remained an independent predictor of attitude. This indicates that improved knowledge of HIV PEP may positively influence perception and acceptance of the intervention. This finding is in agreement with a study conducted in Eastern Ethiopia, where better knowledge was associated with more positive attitudes toward PEP.[20]

On practice of HIV PEP, this study revealed a generally poor level of utilisation. Only a few of the respondents who had experienced occupational exposure took PEP, and most did not report the exposure. The commonest reason for not taking PEP was that the exposure was not considered serious, while other reasons included unavailability of PEP, fear of stigma, and fear of side effects. This suggests that poor risk perception, inadequate reporting practices, and institutional barriers contributed to the low utilisation of PEP.

This finding is similar to that reported in a study conducted in North-western Ethiopia, where utilisation of PEP was low despite high awareness.[16] It also agrees with findings from a study conducted in Enugu State, Nigeria, where many healthcare workers failed to report exposure or initiate PEP.[21] Similarly, studies among university students in Nigeria reported very low utilisation of PEP services.[19] Other studies conducted in Southern Africa and Pakistan have also reported poor uptake of PEP among healthcare workers and trainees.[22,23]

This study further revealed that none of the evaluated factors, including age, sex, level of study, clinical exposure, HIV testing history, and knowledge level, were significantly associated with the practice of HIV PEP. In addition, no independent predictor of practice was identified. This indicates that even though some respondents had better knowledge and more positive attitudes, these did not translate into improved practice. This suggests that practice of HIV PEP may be more strongly influenced by structural and institutional barriers than by individual characteristics.

The barriers identified in this study, including lack of knowledge of PEP protocol, uncertainty about exposure risk, fear of stigma, lack of 24-hour access to services, drug unavailability, and lack of supervisor support, are consistent with findings from studies conducted in Southern Africa and globally, where similar barriers were reported.[22,24] Similarly, studies conducted in Ethiopia reported that stigma and lack of clear reporting systems contributed to poor utilisation of PEP.[26]

Overall, the findings of this study suggest that although awareness and attitude toward HIV PEP are relatively good, knowledge remains suboptimal and practice is poor. The observed relationship between HIV testing and knowledge, and between knowledge and attitude, highlights the importance of education. However, the absence of a significant relationship between knowledge and practice indicates that improving knowledge alone is insufficient. Therefore, comprehensive interventions including structured training on PEP protocols, improved access to PEP services, establishment of confidential and efficient reporting systems, and strengthening of institutional support are necessary to improve the utilisation of HIV PEP among clinical-year medical students.

5.2 CONCLUSION

Regarding knowledge, more than two-fifths of respondents had poor knowledge of HIV post-exposure prophylaxis, while a similar proportion had fair knowledge, and only a small proportion had good knowledge. Although most were aware of HIV PEP, gaps existed in knowledge of regimen, duration, timing, and guidelines.

With respect to attitude, the majority had a positive attitude, with most recognizing the importance of PEP and expressing willingness to use it, although some reported concerns about stigma and reporting exposure.

Concerning predictors, knowledge was significantly associated with attitude, as respondents with better knowledge were more likely to have a positive attitude. Prior HIV testing was also associated with better knowledge.

In terms of practice, more than four-fifths had poor practice, and among those exposed, only a minority took PEP, with most exposures not reported.

Finally, lack of knowledge, uncertainty of risk, stigma, and limited access to services were the major barriers to PEP utilisation.

5.3 RECOMMENDATIONS

Recommendations to the Government

1. The Federal and State Ministries of Health should ensure the availability and accessibility of HIV post-exposure prophylaxis services in all teaching hospitals for use by clinical students.
2. The government should support targeted awareness programs on HIV PEP for medical students through relevant health and educational agencies.
3. National HIV PEP guidelines should be widely disseminated and made easily accessible within teaching institutions.
4. Adequate resources should be provided to ensure uninterrupted supply of PEP drugs in teaching hospitals.

Recommendations to the Medical and Dental Council of Nigeria (MDCN)

1. Medical and Dental Council of Nigeria should incorporate comprehensive HIV post-exposure prophylaxis training into the undergraduate medical curriculum.

2. The Council should mandate the inclusion of practical training on occupational exposure management during clinical postings.

3. The Council should ensure that accreditation standards for medical schools include availability of HIV PEP guidelines and training for students.

Recommendations to the University of Benin Medical School

1. The School of Medicine, University of Benin should strengthen teaching on HIV PEP, with emphasis on timing, regimen, duration, and reporting procedures.

2. Practical and case-based learning should be incorporated during clinical postings to improve students' response to occupational exposure.

3. Regular academic sessions should be organised to reinforce knowledge of HIV PEP and address identified gaps.

4. The School should ensure that students are familiar with access points and reporting pathways for HIV PEP within the teaching hospital.

5. Routine HIV testing and counselling should be encouraged among medical students to improve awareness of HIV prevention strategies.

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APPENDIX I

QUESTIONNAIRE

TITLE:

HIV POST-EXPOSURE PROPHYLAXIS: EXPERIENCES OF CLINICAL-YEAR MEDICAL STUDENTS AT THE UNIVERSITY OF BENIN, BENIN CITY, NIGERIA.

INTRODUCTION

Dear Respondent,

I am conducting a study on the HIV POST-EXPOSURE PROPHYLAXIS: EXPERIENCES OF CLINICAL-YEAR MEDICAL STUDENTS AT THE UNIVERSITY OF BENIN, BENIN CITY, NIGERIA. This questionnaire is strictly for academic purposes. Your responses will remain anonymous and confidential. Participation is voluntary, and you may withdraw at any time.

Kindly tick (✓) the most appropriate option.

Thank you for your participation.

SECTION A: Socio-Demographic Characteristics

1. Age (in years) [Short Answer]

2. Sex [Single Choice]

- [ ] Male
- [ ] Female

3. Marital Status [Single Choice]

- [ ] Single

- [ ] Married
- [ ] Other

4. Current Level of Study [Single Choice]

- [ ] 400L (MED220)
- [ ] 400L (MED210)
- [ ] 500L (MED200)
- [ ] 600L (MED190)
- [ ] 600L (MED180)

4b. What is your duration of clinical exposure so far in medical school? [Single Choice]

- [ ] < 6 months
- [ ] 6 months to 1 year
- [ ] > 1 year

5. Religion [Single Choice]

- [ ] Christianity
- [ ] Islam
- [ ] Traditional
- [ ] Other

6. Have you ever been tested for HIV? [Single Choice]

- [ ] Yes

- [ ] No

SECTION B: Knowledge of HIV Post-Exposure Prophylaxis

7. Have you ever heard of HIV Post-Exposure Prophylaxis (PEP)? [Single Choice]

- [ ] Yes
- [ ] No

8. What is HIV Post-Exposure Prophylaxis (PEP)? [Single Choice]

- [ ] A short-term course of antiretroviral drugs taken after potential exposure to prevent HIV infection
- [ ] Treatment given to cure HIV infection after symptoms appear
- [ ] Preventive medication taken before exposure to HIV
- [ ] A vaccine used to provide long-term immunity against HIV
- [ ] I don't know

9. What is your primary source of information on HIV Post-Exposure Prophylaxis?

[Single Choice]

- [ ] Classroom lectures / Training
- [ ] Colleague / Friend
- [ ] Textbooks / Journals
- [ ] Media (Internet / TV)
- [ ] I have never heard of HIV PEP

10. Which is the WHO recommended HIV Post-Exposure Prophylaxis drug regimen? [Single Choice]

- [ ] 1 drug
- [ ] 2 drugs
- [ ] 3 drugs
- [ ] I don't know

11. Are you required to do a baseline HIV test before starting HIV Post-Exposure Prophylaxis? [Single Choice]

- [ ] Yes
- [ ] No
- [ ] I don't know

12. The maximum time after exposure that HIV Post-Exposure Prophylaxis should be initiated is: [Single Choice]

- [ ] 2 hours
- [ ] 24 hours
- [ ] 72 hours
- [ ] I don't know

13. For how long is the recommended course of HIV Post-Exposure Prophylaxis medication taken? [Single Choice]

- [ ] 14 days

- [ ] 28 days
- [ ] 3 months
- [ ] I don't know

14. In your knowledge, is there a National Guideline for HIV Post-Exposure Prophylaxis in Nigeria? [Single Choice]

- [ ] Yes
- [ ] No
- [ ] I don't know

15. HIV Post-Exposure Prophylaxis is effective in reducing the risk of HIV infection if taken correctly? [Single Choice]

- [ ] True
- [ ] False
- [ ] I don't know

16. Which of these exposures warrant HIV Post-Exposure Prophylaxis? (Tick all that apply) [Checkboxes]

- [ ] Needle-stick injury
- [ ] Unprotected sexual intercourse
- [ ] Blood contact with broken skin
- [ ] Sharing eating utensils

SECTION C: Attitudes Toward HIV Post-Exposure Prophylaxis

Please rate each statement using the following scale:

SA = Strongly Agree | A = Agree | N = Neutral | D = Disagree | SD = Strongly Disagree

[Grid / Likert Scale]

17. HIV Post-Exposure Prophylaxis is important in preventing HIV infection after exposure.

[ ] SA [ ] A [ ] N [ ] D [ ] SD

18. I would take HIV Post-Exposure Prophylaxis if I had a high-risk occupational exposure.

[ ] SA [ ] A [ ] N [ ] D [ ] SD

19. HIV Post-Exposure Prophylaxis should be easily accessible at the ARV clinic / UBTH.

[ ] SA [ ] A [ ] N [ ] D [ ] SD

20. Formal HIV Post-Exposure Prophylaxis training for students is necessary for safety.

[ ] SA [ ] A [ ] N [ ] D [ ] SD

21. I would encourage my colleagues to use HIV Post-Exposure Prophylaxis after possible exposure.

[ ] SA [ ] A [ ] N [ ] D [ ] SD

22. I may hesitate to report an occupational exposure.

[ ] SA [ ] A [ ] N [ ] D [ ] SD

23. I may feel embarrassed or fear stigma if I have to seek HIV Post-Exposure Prophylaxis.

[ ] SA [ ] A [ ] N [ ] D [ ] SD

24. I believe HIV Post-Exposure Prophylaxis is only necessary if the source patient is known HIV positive.

[ ] SA [ ] A [ ] N [ ] D [ ] SD

SECTION D: Practice of HIV Post-Exposure Prophylaxis

25. Have you ever had a possible occupational HIV exposure (e.g., needle prick, sexual assault)? [Single Choice]

(If No, skip to SECTION E)

- [ ] Yes
- [ ] No

26. Did you take HIV Post-Exposure Prophylaxis after that specific exposure? [Single Choice]

(If No, skip to question 31)

- [ ] Yes
- [ ] No

27. If you took HIV Post-Exposure Prophylaxis, how soon did you start? [Single Choice]

- [ ] Within 1–24 hours

- [ ] Within 24–72 hours
- [ ] After 72 hours

28. Did you complete the full 28-day course? [Single Choice]

- [ ] Yes
- [ ] No

28b. If No, please state the reason for not completing the full course: [Paragraph/Short Answer]

29. Did you perform a follow-up HIV test after completing the dosage? [Single Choice]

- [ ] Yes
- [ ] No

30. Did you officially report the exposure incident to the hospital's infection control unit or your supervisor? [Single Choice]

- [ ] Yes
- [ ] No

31. If you did NOT take HIV Post-Exposure Prophylaxis after exposure, what was the main reason? [Single Choice]

- [ ] Unavailability
- [ ] Fear of side effects / Toxicity
- [ ] Fear of stigma
- [ ] Did not think it was serious

SECTION E: Barriers to the Use of HIV Post-Exposure Prophylaxis

Please indicate how much you agree that the following factors act as barriers to the use of HIV PEP among clinical students.

SA = Strongly Agree | A = Agree | N = Neutral | D = Disagree | SD = Strongly Disagree

[Grid / Likert Scale]

32. Lack of knowledge about the hospital's official HIV Post-Exposure Prophylaxis reporting protocol.

[ ] SA [ ] A [ ] N [ ] D [ ] SD

33. Fear of the side effects or toxicity of the antiretroviral drugs.

[ ] SA [ ] A [ ] N [ ] D [ ] SD

34. Fear of stigma, discrimination, or breach of confidentiality if colleagues / supervisors find out.

[ ] SA [ ] A [ ] N [ ] D [ ] SD

35. The reporting process is too tedious, intimidating, or time-consuming.

[ ] SA [ ] A [ ] N [ ] D [ ] SD

36. Unavailability of HIV Post-Exposure Prophylaxis drugs or frequent stock-outs at the ARV clinic / pharmacy.

[ ] SA [ ] A [ ] N [ ] D [ ] SD

37. Lack of support or dismissive attitudes from senior colleagues / supervisors after an exposure.

[ ] SA [ ] A [ ] N [ ] D [ ] SD

38. Uncertainty about whether a specific exposure is risky enough to warrant HIV post-exposure prophylaxis.

[ ] SA [ ] A [ ] N [ ] D [ ] SD

39. Unavailability of HIV post-exposure prophylaxis services during night shifts, weekends, or emergencies (lack of 24-hour access).

[ ] SA [ ] A [ ] N [ ] D [ ] SD

APPENDIX II

SCORING GUIDE AND ANSWER KEY

This appendix details the correct clinical responses and appropriate attitudinal dispositions used to grade the respondents' Knowledge, Attitude, and Practice regarding HIV Post-Exposure Prophylaxis (PEP).

SECTION B: KNOWLEDGE OF HIV PEP

Scoring Logic: Correct response = 1 point. Incorrect or "I don't know" responses = 0 points. (Maximum score = 8)

Q/N	Knowledge Question	Correct Answer (Score = 1)
8	What is HIV Post-Exposure Prophylaxis (PEP)?	A short-term course of antiretroviral drugs taken after potential exposure to prevent HIV infection
10	Which is the WHO recommended HIV Post-Exposure Prophylaxis drug regimen?	3 drugs
11	Are you required to do a baseline HIV test before starting HIV Post-Exposure Prophylaxis?	Yes

Q/N	Knowledge Question	Correct Answer (Score = 1)
12	The maximum time after exposure that HIV Post-Exposure Prophylaxis should be initiated is:	72 hours
13	For how long is the recommended course of HIV Post-Exposure Prophylaxis medication taken?	28 days
14	In your knowledge, is there a National Guideline for HIV Post-Exposure Prophylaxis in Nigeria?	Yes
15	HIV Post-Exposure Prophylaxis is effective in reducing the risk of HIV infection if taken correctly?	True
16	Which of these exposures warrant HIV Post-Exposure Prophylaxis? *(Multiple Response)*	Needle-stick injury, Unprotected sexual intercourse, Blood contact with broken skin *(Note: Selecting 'Sharing eating utensils' invalidates the score)*

SECTION C: ATTITUDES TOWARD HIV PEP

Scoring Logic: Appropriate disposition = 1 point. Inappropriate or "Neutral" disposition = 0 points. (Maximum score = 8)

Q/N	Attitudinal Statement	Appropriate Response (Score = 1)	Statement Type
17	HIV Post-Exposure Prophylaxis is important in preventing HIV infection after exposure.	Strongly Agree (SA) / Agree (A)	Positive
18	I would take HIV Post-Exposure Prophylaxis if I had a high-risk occupational exposure.	Strongly Agree (SA) / Agree (A)	Positive
19	HIV Post-Exposure Prophylaxis should be easily accessible at the ARV clinic / UBTH.	Strongly Agree (SA) / Agree (A)	Positive
20	Formal HIV Post-Exposure Prophylaxis training for students is necessary for safety.	Strongly Agree (SA) / Agree (A)	Positive
21	I would encourage my colleagues to use HIV Post-Exposure Prophylaxis after possible exposure.	Strongly Agree (SA) / Agree (A)	Positive

Q/N	Attitudinal Statement	Appropriate Response (Score = 1)	Statement Type
22	I may hesitate to report an occupational exposure.	Disagree (D) / Strongly Disagree (SD)	Negative
23	I may feel embarrassed or fear stigma if I have to seek HIV Post-Exposure Prophylaxis.	Disagree (D) / Strongly Disagree (SD)	Negative
24	I believe HIV Post-Exposure Prophylaxis is only necessary if the source patient is known HIV positive.	Disagree (D) / Strongly Disagree (SD)	Negative

SECTION D: PRACTICE OF HIV PEP

Scoring Logic: Evaluated only for respondents who answered "Yes" to Question 25 (History of occupational exposure). Appropriate post-exposure action = 1 point. Inappropriate action = 0 points. (Maximum score = 5)

Q/N	Practice Parameter	Appropriate Action (Score = 1)
26	Did you take HIV Post-Exposure Prophylaxis after that specific exposure?	Yes
27	If you took HIV Post-Exposure Prophylaxis, how soon did you start?	Within 1–24 hours **OR** Within 24–72 hours
28	Did you complete the full 28-day course?	Yes
29	Did you perform a follow-up HIV test after completing the dosage?	Yes
30	Did you officially report the exposure incident to the hospital's infection control unit or your supervisor?	Yes

APPENDIX III

INFORMED CONSENT FORM

HIV POST-EXPOSURE PROPHYLAXIS: EXPERIENCES OF CLINICAL-YEAR MEDICAL STUDENTS AT THE UNIVERSITY OF BENIN, BENIN CITY, NIGERIA.

NAMES AND AFFILIATIONS OF INVESTIGATORS:

EMMANUEL OHIOLE WILLIAMS

CHRISTABEL SOPHIA UWECHI

Department of Public Health and Community Medicine,

University of Benin Teaching Hospital,

PMB 111 Ugbowo, Benin-Lagos Express Road,

Benin City, Edo State.

Email: marvelwills2018@gmail.com

sophiauwechi26@gmail.com

PURPOSE OF RESEARCH: To explore the experiences of clinical-year medical students at the University of Benin regarding HIV post-exposure prophylaxis, by assessing their knowledge, attitude, and practice.

PROCEDURES INVOLVED IN THE STUDY: In this study, questions will be asked to assess their level of knowledge on HIV post-exposure prophylaxis, the attitude to it and the

practice of HIV post-exposure prophylaxis among clinical-year medical students of the University of Benin Medical School

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

FINANCIAL COMPENSATION: There shall be no monetary compensation for participation

in this study.

VOLUNTARY PARTICIPATION: Your participation in this study is entirely voluntary. If

you desire to withdraw from this study at any time, no punitive measures will be meted against you for your withdrawal. Your refusal to participate or withdraw from the study will not involve any negative consequences or loss of benefits to which you are otherwise entitled.

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

BENEFIT: The study will help to assess the Knowledge, Attitude and Practice of HIV post-exposure prophylaxis among clinical-year medical students at the University of Benin.

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

The investigators listed below may be contacted in case you have any clarifications to make.

EMMANUEL OHIOLE WILLIAMS

CHRISTABEL SOPHIA UWECHI

Department of Public Health and Community Medicine,

PMB 111 Ugbowo, Benin-Lagos Express Road,

Benin City, Edo State.

Email: marvelwills2018@gmail.com

sophiauwechi26@gmail.com

Cell: +2349025299782 and +2349030405501

OR

Ethics and Research Committee,

University of Benin Teaching Hospital

Phone Number: +234 706 333 1337

CERTIFICATION OF CONSENT

I,_____ having full capacity to consent for myself do thereby consent to my participation in the research study.

The methods and means by which the study will be conducted have been explained to me by Ethical Committee. I have been given the opportunity to ask questions concerning this investigational study, and any such questions have been answered to my full and complete satisfaction.

I understand that I may at any time during the course of this study revoke this consent and withdraw myself from the study without prejudice.

Participant's Signature:_____

Date:_____

APPENDIX IV

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
CHAIRMAN Prof. (Mrs.) Antoinette N. Ofili

HREC OFFICE:
Committee email: ubthresearchethics@gmail.com
Registration Number: NHREC/UBTH/HREC/24/02/2020B

PROTOCOL NUMBER: ADM/E 22/A/VOL. VII/1486[illegible]

PROPOSAL TITLE: "KNOWLEDGE, ATTITUDE AND PRACTICE (KAP) OF HIV POST-EXPOSURE PROPHYLAXIS AMONG CLINICAL STUDENTS OF THE UNIVERSITY OF BENIN MEDICAL SCHOOL."

PRINCIPAL INVESTIGATOR(S): WILLIAMS EMMANUEL OHIOLE, UWECHI CHRISTABEL SOPHIA

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

DATE CONSIDERED: MARCH 18TH, 2026

DECISION OF THE COMMITTEE: APPROVED

THIS APPROVAL DATES 18/03/2026 TO 17/03/2027. 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: Sign..... Date 18/3/2026

SUPERVISOR (S): PROF. O.A. ADELEYE

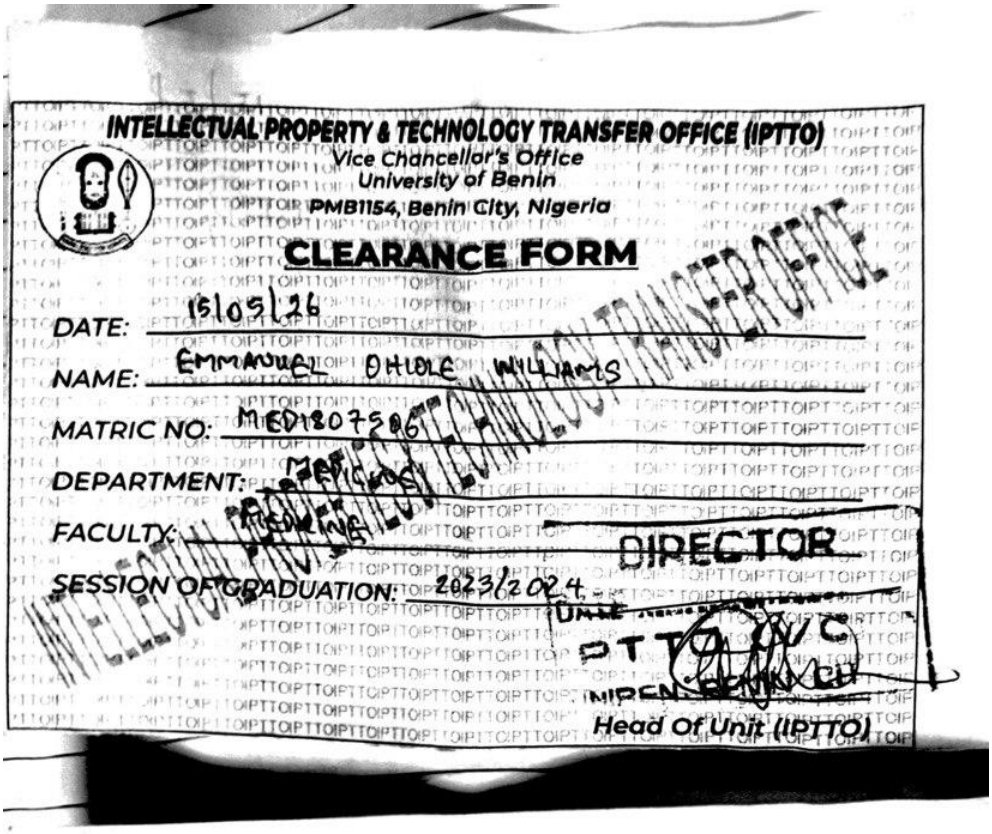
UNIVERSITY OF BENIN ETHICS & RESEARCH COMMITTEE BENIN CITY P.M.B. 1111

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..... 08/04/26

APPENDIX V

PLAGIARISM TEST

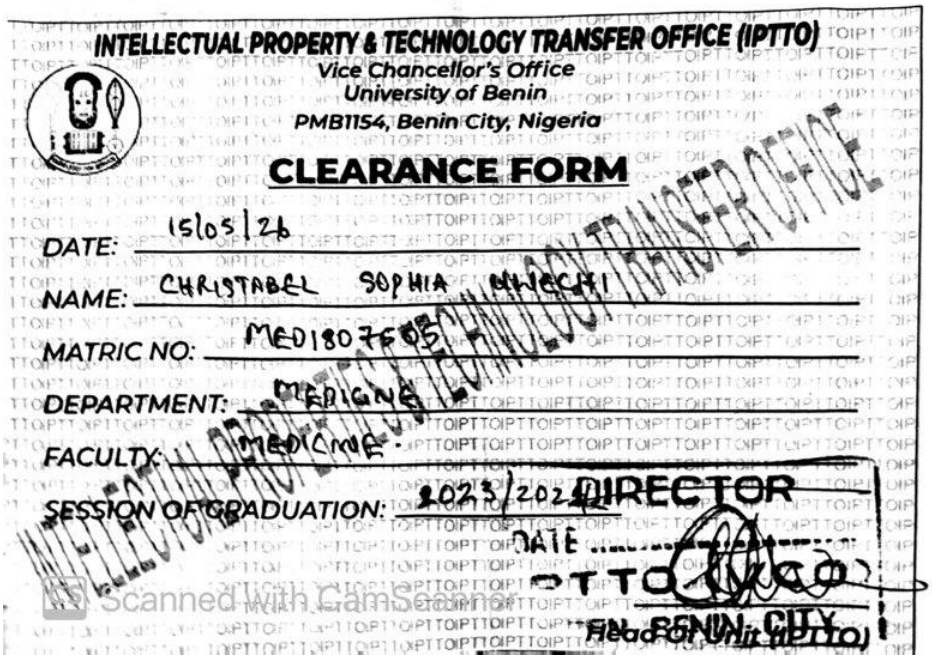


INTELLECTUAL PROPERTY & TECHNOLOGY TRANSFER OFFICE (IPTTO)
Vice Chancellor's Office
University of Benin
PMB1154, Benin City, Nigeria

CLEARANCE FORM

DATE: 15/05/26
NAME: EMMANUEL OHIOLE WILLIAMS
MATRIC NO: MED180750[illegible]
DEPARTMENT: MEDICINE
FACULTY: MEDICINE
SESSION OF GRADUATION: 2023/2024

DIRECTOR
DATE
IPTTO
Head Of Unit (IPTTO)



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

CLEARANCE FORM

DATE: 15/05/26
NAME: CHRISTABEL SOPHIA NWECHI
MATRIC NO: MED180760[illegible]
DEPARTMENT: MEDICINE
FACULTY: MEDICINE
SESSION OF GRADUATION: 2023/2024

DIRECTOR
DATE
IPTTO
BENIN CITY
Head Of Unit (IPTTO)