KNOWLEDGE AND PREVENTIVE PRACTICES OF MALARIA AMONG STUDENTS OF THE UNIVERSITY OF BENIN

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A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF HEALTH, SAFETY AND ENVIRONMENTAL EDUCATION, FACULTY OF EDUCATION, UNIVERSITY OF BENIN, BENIN CITY IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF BACHELOR OF SCIENCE B.Sc. (Ed) DEGREE IN HEALTH EDUCATION

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CERTIFICATION

We, the undersigned, hereby certify that this research work was carried out by Success Oghenetejiri AKOKO of the Department of Health, Safety and Environment, Faculty of Education, University of Benin, Benin City.

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DEDICATION

This work is dedicated to Almighty God, whose grace, strength, and guidance made this work possible. The work also dedicated to the memory of my late father, Mr. Bright Akoko, whose love and values continue to guide me.

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All thanks go to her Heavenly Father and Creator for making this work a success. The researcher remains forever indebted to God for His faithfulness, strength, and guidance throughout her academic journey.

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TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

The study dealt on the knowledge and preventive practices of malaria among students in University of Benin, Benin City, Edo State. To achieve the purpose of the study, five research questions were raised and answered.

The descriptive survey research method was adopted for the study. The population for this study was made of forty thousand two hundred and eighty-nine (40,289) undergraduates in the University of Benin, Benin City, Edo State in the 2024/2025 academic session. The sample size for this study was 297 respondents. This was drawn using the multi stage sampling technique was adopted for the study. Firstly the systematic sampling technique was used to select five (5) faculties from the fifteen (15) faculties. Secondly proportionate sampling was used to select 3% from each selected faculty. Thirdly simple random sampling of balloting with replacement was used to select respondents for the study. The department names were written on a piece of paper, put in a hat, shuffled and then 5 departments were drawn from the hat. The selection process was random. The research instrument is a self-structured questionnaire. The instrument was validated by the researcher's supervisor and two other experts in the Department of Health, Safety and Environmental Education. The Cronbanch Alpha method was used to determine the reliability of the instrument. The questionnaire was administered to a group of 20 respondents which were not part of the study. A Cronbach coefficient of .701 was obtained. This shows that the instrument is reliable. For data analysis, frequency, percentage, mean and standard deviation were used to calculate the research findings. Findings from the study revealed that there is high level of knowledge among university of Benin students regarding malaria.

The study concluded that the preventive practices adopted by University of Benin students to combat malaria include sleeping under insecticide-treated mosquito nets, using mosquito repellents, wearing protective clothing such as long sleeves and trousers to reduce mosquito exposure, clearing bushes and stagnant water around their residences or hostels to prevent mosquito breeding, and participating in health campaigns or sensitization programmes on malaria prevention. The study recommended among others that the University of Benin management should intensify health education campaigns on malaria prevention through seminars, posters, and social media platforms to sustain and further improve students' knowledge and awareness.

CHAPTER ONE

INTRODUCTION

Background to the Study

Malaria remains a significant public health challenge globally, particularly in sub-Saharan Africa, where the burden of disease is highest. It is caused by Plasmodium parasites transmitted predominantly through the bites of infected Anopheles mosquitoes (World Health Organization [WHO], 2023). Despite advancements in prevention and treatment strategies, malaria continues to cause substantial morbidity and mortality, especially in endemic regions. Young adults and university students are a critical demographic in malaria control efforts due to their active lifestyles and potential role in transmission dynamics. Knowledge about malaria including its causes, transmission, symptoms, and preventive measures is essential for promoting appropriate health behaviors among students (Gyan, 2018).

Nigeria has one of the highest burdens of malaria globally, with the disease responsible for significant morbidity and mortality, particularly among vulnerable populations (World Health Organization [WHO], 2023). University students, as young adults, are at risk of infection due to lifestyle factors and can serve as a critical demographic for prevention strategies. Understanding malaria and its prevention is crucial in shaping health behaviors among students. Improved knowledge about malaria leads to better preventive practices. By assessing the current knowledge levels among students,

interventions can be tailored accordingly. Similarly, university students often engage in social activities that might increase their exposure to malaria vectors, such as mosquitoes. Their health behaviors significantly impact the transmission dynamics within the community (Ogunleye, 2022).

Hostels in many Nigerian universities are often overcrowded and may lack proper sanitation facilities. These conditions can foster environments conducive to the breeding of mosquitoes, which are vectors for malaria. A study by Ezechi (2019) emphasized that high population density in living quarters increases the likelihood of mosquito proliferation, thereby elevating malaria risk among students. Furthermore many university dormitories do not implement effective vector control measures, such as the use of insecticide-treated nets (ITNs) or indoor residual spraying.

A survey conducted by Aboderin et al. (2020) revealed that most students living in hostels were unaware of or did not utilize protective measures against mosquito bites, which significantly raises their vulnerability to malaria. There is often a lack of health education regarding malaria prevention among students25 living in dormitories (Aboderin, 2020). The absence of awareness campaigns about malaria transmission and prevention can lead to inadequate protective behaviors. According to a study by Sunday et al. (2021), many students lacked knowledge about the importance of ITNs (Insecticide Treated Nets) and other preventive measures, leaving them at higher risk for infection.

Students traveling to different parts of Nigeria may encounter regions with high malaria transmission rates. According to the World Health Organization (WHO) (2021), certain states in Nigeria have been identified as malaria hotspots such as Adamawa, Taraba, Gombe, and Plateau. Traveling to these areas can increase students' exposure to malaria, particularly if they do not take preventive measures. Traveling students often have inconsistent access to malaria prevention resources, such as ITNs or anti-malarial medications. Uwaegbulam and Okwor (2022) indicated that students frequently forego taking malaria prophylaxis due to cost or lack of accessibility, which can lead to an increased incidence of malaria during their travels.

Several studies have highlighted the awareness and knowledge levels of students on malaria Aderibigbe (2021) conducted a study on the level of knowledge of malaria among undergraduates in Nigeria, finding that while most students have heard of malaria, detailed knowledge about its transmission and prevention varied significantly.

Likewisely Nwokike (2022), the author explored the preventive practices against malaria among Nigerian university students. The findings indicated that while most respondents acknowledged the importance of using Insecticide Treated Nets (ITNs), actual usage was lower than expected. Another study by Alabi (2020) examined treatment-seeking behaviors for malaria among students in Nigerian universities. The author noted that misconceptions about malaria treatment options were prevalent, leading to delays in seeking appropriate medical care.

Furthermore the World Health Organization (WHO, 2021) reports that Nigeria accounts for a substantial proportion of global malaria cases and deaths, with the disease being endemic in many regions. University students, often living in communal settings and engaging in various outdoor activities, are at increased risk of malaria infection (Ogunbode, 2020). Research indicates that knowledge of malaria transmission and prevention is often inadequate among young adults, which can lead to increased susceptibility to the disease (Adebayo, 2019).

Also, university students are often at a transitional life stage where they may be more susceptible to engaging in risky behaviors, such as neglecting preventive measures due to a perceived invulnerability (Ogunbode, 2020).

While there are studies on malaria knowledge and practices among various populations, there is a lack of focused research on university students particularly on the University of Benin. Therefore there is a lack of region-specific epidemiological data that correlates students' knowledge and preventive practices with the actual malaria prevalence in their environment. By focusing on these gaps, the study can contribute meaningful insights into malaria awareness and prevention strategies tailored to the student population at the University of Benin this study is justified as it seeks to fill the knowledge gap regarding malaria among university students in Nigeria, providing insights that can lead to improved health outcomes and the development of effective malaria prevention strategies.

Statement of the Problem

Malaria remains a significant public health challenge in Nigeria, particularly among university students who are often at risk due to their lifestyle and living conditions. Despite the availability of preventive measures, such as Insecticide Treated Nets (ITNs), Indoor Residual Spraying (IRS), and antimalarial medications, the knowledge and practices regarding malaria prevention among students at the University of Benin are not well-documented. This gap in understanding can lead to increased susceptibility to malaria infections, which can adversely affect academic performance and overall well-being.

Previous studies have indicated that a lack of awareness and misconceptions about malaria transmission and prevention contribute to the persistence of the disease in Nigeria (Ogunbode et al., 2020; Uzochukwu et al., 2019). Furthermore, the dynamic nature of student life, including changes in living arrangements and social behaviors, may influence their engagement with preventive practices (Adebayo et al., 2021). Therefore, it is crucial to assess the level of knowledge and the preventive practices related to malaria among students at the University of Benin to inform targeted interventions and educational programs.

Understanding the current state of knowledge and practices can help identify gaps and barriers to effective malaria prevention, ultimately contributing to better health outcomes

for students. This study aims to explore these dimensions, providing insights that can guide public health initiatives and educational campaigns tailored to the university community.

Research Questions

The study came up with research questions so as to be able to ascertain the above stated objectives. The specific research questions for the study are stated below as follows:

1. What is the level of knowledge of university of Benin students regarding malaria?
2. What are the preventive practices adopted by university of Benin students?
3. What are the environmental factors that promote the spread of malaria in your living environment?
4. What are the strategies that can be adopted to prevent the spread of malaria?
5. What are the barriers faced by students at the university of Benin in accessing malaria prevention?

Purpose of the Study

The main purpose of the study is to assess knowledge and preventive practices of malaria among students citing the University of Benin as the case study. In achieving this aim, the following specific objectives were laid out as follows to:

1. To examine the level of knowledge of university of Benin students regarding malaria;

2. To assess the preventive practices adopted by university of Benin students;
3. To ascertain the environmental factors that promote the spread of malaria in your living environment;
4. To evaluate the strategies that can be adopted to prevent the spread of malaria;
5. To investigate the barriers faced by students at the university of Benin in accessing malaria prevention.

Significance of Study

The significance of a study on the knowledge and preventive practices of malaria among University of Benin students in Nigeria can be articulated in several key areas, benefiting various stakeholders such as students, health ministries, health planners, and future researchers

The study can enhance students' understanding of malaria, its transmission, symptoms, and prevention methods. This knowledge is crucial for personal health and can empower them to take proactive measures against malaria. By identifying gaps in knowledge and practices, the study can inform targeted educational interventions that encourage students to adopt effective preventive measures, such as the use of insecticide-treated nets (ITNs) and proper sanitation.

The findings can provide valuable insights for health ministries to develop or refine policies and programs aimed at malaria prevention and control, particularly in

educational institutions. Understanding the level of knowledge and preventive practices among students can help health ministry's allocate resources more effectively, targeting areas with the greatest need for intervention.

The study can inform the design of public health campaigns tailored to the youth demographic, ensuring that messaging is relevant and impactful. Health planners can use the study's findings to design and implement targeted health education programs within universities, ensuring that they address specific knowledge gaps and barriers to effective malaria prevention.

The study can serve as a baseline for future assessments of malaria knowledge and practices among students, allowing health planners to evaluate the effectiveness of interventions over time. The results may highlight the need for partnerships between universities and health organizations, fostering collaborative efforts to combat malaria on campus and in the surrounding community.

The study can identify gaps in existing literature regarding malaria knowledge and practices among university students, guiding future research efforts in this area. Future researchers can use the methodologies employed in this study as a framework for their own investigations, ensuring consistency and comparability in research findings. The findings may encourage longitudinal studies to track changes in knowledge and practices over time, contributing to a deeper understanding of the dynamics of malaria prevention among young adults

Scope/Delimitation of the Study

The study focuses on the knowledge and preventive practices of malaria it will be delimited to students citing University of Benin as a case study for the research. This study makes use of a primary data as an instrument for the research.

Definition of Terms

Malaria: A life-threatening disease caused by parasites transmitted to humans through the bites of infected female anopheles mosquitoes. Symptoms include fever, chills, and flu-like illness, and it can lead to severe complications if not treated promptly.

University Students: Individuals enrolled in a higher education institution, typically pursuing a degree or diploma. This group may include undergraduates and postgraduates and can be diverse in terms of age, background, and health status.

Environment: The surrounding conditions, including physical, biological, and social factors, that can influence the health and well-being of individuals. In the context of malaria, the environment includes factors such as climate, geography, and urbanization, which can affect mosquito breeding and transmission dynamics.

Barriers: Obstacles or challenges that hinder individuals or communities from accessing information, resources, or services related to malaria prevention and treatment. Barriers

can be physical (e.g., lack of access to healthcare), social (e.g., stigma or cultural beliefs), or economic (e.g., cost of preventive measures).

Strategies: Planned actions or approaches designed to achieve specific goals related to malaria prevention and control. Strategies may include public health campaigns, community education, distribution of insecticide-treated bed nets, and vaccination programs.

Knowledge: The understanding and awareness individuals have regarding malaria, including its causes, symptoms, transmission, prevention, and treatment. This knowledge is crucial for effective prevention and control efforts, particularly among vulnerable populations like university students.

Preventive Practices: These actions taken to reduce the risk of malaria transmission and infection. These practices may include using insecticide-treated bed nets, applying mosquito repellents, taking antimalarial medications, and engaging in environmental management to reduce mosquito breeding sites.

CHAPTER TWO

LITERATURE REVIEW

This chapter reviewed the related literature of the study under the following subheadings:

- The Concept of Malaria
- The Level of Knowledge among University Students Regarding Malaria
- Preventive Practices adopted by University Students
- The Relationship between Level of Knowledge of Malaria and Preventive Practices Adopted by University Students
- The Environmental Factors that Promote the Spread of Malaria
- The Strategies that can be Adopted to Prevent the Spread of Malaria
- The Barriers Faced by Students at the University in Accessing Malaria Prevention
- Summary of Literature Review

The Concept of Malaria

Malaria remains a significant public health challenge in Nigeria, which is one of the countries most affected by this disease globally. The burden of malaria in Nigeria can be attributed to a variety of factors, including environmental conditions, socio-economic

status, health infrastructure, and public awareness. According to World Health Organization (2021), Nigeria accounts for a substantial proportion of malaria cases and deaths worldwide. In 2020, it was estimated that there were about 57 million cases of malaria in Nigeria, contributing to over 200,000 deaths annually (WHO, 2021). This high prevalence is primarily due to the favorable conditions for the proliferation of the Anopheles mosquito, the vector responsible for transmitting the malaria parasite.

In Nigeria, malaria is both endemic and perennial, meaning transmission occurs throughout the year due to favorable climatic and ecological conditions that support mosquito breeding. The dominant parasite species in the country is Plasmodium falciparum, which is the most virulent and responsible for severe malaria and high mortality rates (Oladipo, 2020). Children under the age of five and pregnant women are the most vulnerable groups, as malaria contributes significantly to childhood mortality, maternal complications, and adverse pregnancy outcomes (Adepoju, 2021).

The disease not only threatens health but also imposes a heavy socioeconomic burden. It reduces productivity, increases household expenditure on treatment, and strains the health system. According to the National Malaria Elimination Programme (NMEP, 2021), malaria is responsible for 60% of outpatient hospital visits and 30% of hospital admissions in Nigeria. Additionally, it is estimated that malaria costs Nigeria over 1.1 billion USD annually in prevention and treatment (NMEP, 2021).

Despite progress through interventions such as the distribution of insecticide-treated nets (ITNs), indoor residual spraying (IRS), seasonal malaria chemoprevention (SMC), and the use of artemisinin-based combination therapies (ACTs), malaria remains a persistent challenge in Nigeria. This is largely due to factors such as poverty, limited access to healthcare, poor sanitation, resistance to insecticides and drugs, and gaps in policy implementation (Afolabi , 2022).

Malaria transmission in Nigeria is sustained by several biological factors that create a favorable environment for the parasite (Plasmodium spp.) and its vector (Anopheles mosquitoes). These biological determinants interact with environmental and socioeconomic conditions, thereby increasing the disease burden across the country.

The predominant parasite responsible for malaria in Nigeria is Plasmodium falciparum, which is the most virulent and deadly of the human malaria parasites. This species causes severe malaria, rapid disease progression, and high mortality, particularly among children under five and pregnant women (Oladipo, 2020). The presence of P. falciparum contributes significantly to the intensity of malaria transmission in Nigeria. Nigeria is home to highly efficient malaria vectors, particularly Anopheles gambiae and Anopheles funestus, which have a high capacity for parasite transmission. These mosquitoes breed easily in stagnant water, poorly drained environments, and peri-urban agricultural zones (Afolabi, 2022). Their strong preference for human blood (anthropophilic nature) and night-biting behavior further enhance transmission.

Another biological challenge is the development of resistance. Many Anopheles mosquitoes in Nigeria have developed resistance to commonly used insecticides, including pyrethroids found in insecticide-treated nets (ITNs). Similarly, Plasmodium falciparum has shown reduced sensitivity to some antimalarial drugs, although artemisinin-based combination therapies (ACTs) remain effective (Adepoju, 2021). This resistance complicates malaria control and promotes sustained transmission. Also In malaria-endemic regions like Nigeria, partial immunity develops over time due to repeated exposure. However, children under five and pregnant women remain highly vulnerable because of their weak or altered immunity (WHO, 2023). Genetic factors also play a role; for instance, individuals with sickle cell trait (HbAS) have some protection against severe malaria, which influences malaria epidemiology in Nigeria (Oladipo, 2020). Biological transmission dynamics are influenced by Nigeria's tropical climate. The warm temperatures and seasonal rains promote mosquito breeding and parasite development within the vector. During the rainy season, pools of stagnant water create abundant breeding sites, while humidity prolongs mosquito survival, thereby increasing transmission rates (Afolabi, 2022).

Socioeconomic factors play a crucial role in the transmission dynamics of malaria in Nigeria. Adetunji (2020) highlighted that poverty, inadequate housing, and limited access to healthcare services are significant contributors to the high incidence of malaria. Wealth disparities often translate into different levels of access to preventive measures such as insecticide-treated nets (ITNs) and access to antimalarial drugs. Vector control remains a

cornerstone of malaria prevention in Nigeria. National campaigns promoting the distribution of insecticide-treated nets and indoor residual spraying have yielded significant results in reducing malaria prevalence (Okwa, 2022). Despite these efforts, a study by Afolabi (2021) indicated that coverage and consistent use of ITNs are still suboptimal in many communities, primarily due to factors such as cultural beliefs and misconceptions about malaria and its prevention.

Current treatment protocols in Nigeria emphasize the use of artemisinin-based combination therapies (ACTs) as the first-line treatment for malaria (NCDC, 2020). However, the rising incidence of drug resistance presents a pressing challenge. A study by Olufunmilayo (2022) reported a notable increase in the resistance of plasmodium falciparum to first-line antimalarial drugs, necessitating ongoing monitoring and adaptation of treatment guidelines. The COVID-19 pandemic has further complicated malaria control efforts in Nigeria. According to Balogun (2021), disruptions in health services and supply chains due to the pandemic led to reduced access to malaria diagnostic testing and treatment. Additionally, the diversion of health resources to combat COVID-19 negatively impacted ongoing malaria prevention strategies, exacerbating the burden of malaria in the country. Public awareness and education campaigns have proven essential in changing community perceptions regarding malaria prevention. Adeyemi (2021) found that community engagement initiatives that educate the public about the importance of preventive measures have led to increased acceptance and use of insecticide-treated nets. Effective communication strategies are necessary to

address misconceptions and encourage behavioral changes in communities disproportionately affected by malaria.

The Level of Knowledge among University Students Regarding Malaria

Malaria remains a public health challenge in Nigeria, a country that bears a significant burden of the disease, accounting for about 25% of the global malaria cases (World Health Organization [WHO], 2021). Understanding the level of knowledge among university students regarding malaria is essential, as these individuals represent a critical demographic in health advocacy, education, and community mobilization.

Preventive measures are essential in controlling malaria transmission. Research highlights that while awareness of prevention methods, such as the use of insecticide-treated nets (ITNs) and indoor residual spraying (IRS), is generally high among university students, actual usage rates remain low. According to Nwafor (2020), factors such as accessibility, cost, and lack of consistent health education influence the effective implementation of preventive measures. Furthermore, a study by Eze and Ndu (2018) emphasized the need for increased educational campaigns focused not only on malaria prevention but also on the importance of community engagement in health initiatives. Knowledge about the treatment of malaria, including antimalarial drugs and proper health-seeking behavior, is vital for effective management of the disease. A survey by Adeyemo (2021) found that while a majority of students were aware of antimalarial

medications such as artemisinin-based combination therapies (ACTs), misconceptions regarding the appropriate use and adherence to prescribed treatments were common. This lack of understanding can contribute to the emergence of drug resistance and treatment failures, further exacerbating the malaria burden.

There are several factors that influence the level of knowledge among students which includes educational background which states that students' field of study can significantly impact their knowledge about malaria. Those in health-related programs often have better knowledge compared to those in non-health disciplines (Olademeji, 2019). Also family health practices and community awareness programs can influence students' knowledge levels. Students from communities with active malaria awareness campaigns typically exhibit better understanding, Availability and utilization of media platforms such as the internet, television, and radio play a significant role in malaria knowledge acquisition, additionally students from higher socioeconomic backgrounds may have better access to healthcare information and resources, positively influencing their knowledge (Bolarinwa, 2020). Furthermore personal or family experiences with malaria can strongly impact knowledge levels, making students more informed and vigilant about the disease, Universities that incorporate malaria education into their curriculum or conduct regular health seminars tend to have students with higher malaria awareness (Ike, 2017).

There seems to be persistent knowledge gaps about malaria among students in Nigeria involves understanding both the educational context and public health dynamics. Which includes the fact that Many students in Nigeria have limited knowledge about how malaria is transmitted and how it can be prevented. While some are aware that mosquitoes are vectors, misconceptions about transmission through casual contact remain. In the study by IRISE (2015), it was noted that understanding the life cycle of mosquitoes and the importance of using insecticide-treated nets was often insufficiently covered in school curricula, There is often a lack of understanding about the symptoms of malaria and the importance of early treatment. According to a report by Oyeyemi (2021), many students struggle to differentiate between malaria symptoms and those of other common illnesses, leading to delays in seeking appropriate treatment. Despite widespread campaigns, there is still a gap in knowledge regarding preventive measures such as indoor residual spraying and proper use of insecticide-treated nets. A study by Dike (2019) highlighted that while students might be aware of these preventive measures, they are not always correctly informed about their proper application. Cultural beliefs and misconceptions can significantly impact students' understanding of malaria. The role of environmental management in controlling mosquito breeding sites is often underappreciated. Research published by WHO (2018) stresses the importance of incorporating environmental science into education to enhance understanding of how manipulating local environments can reduce malaria transmission. Efforts to address these gaps should focus on improving school curricula by making them more

comprehensive and contextually relevant. This includes incorporating practical sessions about malaria prevention, aligning educational content with current public health information, and actively dispelling myths through culturally sensitive education strategies.

Preventive Practices adopted by University Students

Nigeria has a diverse student population in its universities, characterized by varying socio-economic backgrounds and health experiences. Preventive health practices among university students are critical for enhancing their overall well-being and academic performance. Awareness of health issues significantly influences the preventive practices adopted by students. A study by Igbokwo and Akinyemi (2022) revealed that most Nigerian university students possess a moderate level of health knowledge. The research indicates that students with higher health awareness engage more in preventive practices such as regular health check-ups and vaccination (Igbokwe, 2022). This study underscores the need for continuous health education programs targeted at university students.

Lifestyle choices, including diet and physical activity, are crucial preventive practices among university students. A cross-sectional survey conducted by Okafor (2021) found that many students adopt poor dietary habits due to academic pressures and financial constraints. These poor dietary choices often lead to obesity and related health issues.

Conversely, students who prioritize a balanced diet and regular exercise report better physical and mental health outcomes. This study suggests that universities should promote healthy eating and active lifestyles through workshops and fitness programs.

Mental health has emerged as a vital area of concern among Nigerian university students. According to Akinbo and Fafunwa (2023), a significant proportion of students experience stress, anxiety, and depression but are often unaware of available mental health resources. The study indicates that students who engage in preventive mental health practices, like seeking counseling and practicing stress management techniques, report improved academic performance and overall well-being. Institutions must actively promote mental health awareness and support systems for students (Akinbo & Fafunwa, 2023).

Socio-cultural factors significantly impact the health behaviors of Nigerian university students. Research by Adebayo, Alabi, and Makinde (2020) found that cultural beliefs about health and wellness often dictate students' preventive practices. For instance, some students avoid modern health interventions due to traditional beliefs regarding illness and healing. This underscores the importance of culturally sensitive health education that respects these beliefs while promoting evidence-based practices. The researchers emphasize that universities should integrate cultural considerations into health promotion strategies.Despite efforts to promote health among students, various challenges persist. According to Ayo and Onifade (2021), factors such as limited access to healthcare services, financial constraints, and lack of awareness impede students' ability to adopt

effective preventive practices. The study advocates for policy reforms to improve healthcare access for students and enhance the availability of health resources on university campuses.

Gaps in adopting preventive practices by Nigerian university students are the fact that many Nigerian university students lack adequate knowledge about preventive health practices, which leads to low participation in health promotion activities. Some studies suggest that despite the availability of health information, misconceptions and lack of trust in reliability hinder students' engagement in preventive measures (Adeniyi, 2020). Access to healthcare facilities is often limited in Nigeria, especially in rural areas. Students may face logistical challenges, such as the distance to healthcare centers and the associated costs, which can deter them from seeking preventive healthcare services (Okoro, 2019). Also there is a significant stigma surrounding mental health issues among students. This stigma prevents individuals from seeking help and participating in mental health preventive practices (Imoize & Adebayo, 2021).

Challenges to implementing preventive practices includes socio-economic barriers often affect students' ability to engage in preventive health practices. Financial constraints limit students from purchasing preventive health resources or accessing adequate healthcare (Oladejo, 2020). Additionally traditional beliefs and practices can influence students' perceptions of modern preventive health measures, leading to the adoption of ineffective or harmful practices instead of scientifically proven preventive behaviors (Ezeoke, 2021).

Also insufficient infrastructure and facilities for health promotion on campuses can challenge the implementation of preventive practices. Lack of adequate health education programs from university administrations further exacerbates these challenges (Fawole, 2022).

The Relationship between Level of Knowledge of Malaria and Preventive Practices Adopted by University Students

The level of knowledge about malaria and the preventive practices adopted by individuals, including university students. Higher levels of knowledge about malaria transmission, symptoms, and prevention methods are associated with more effective preventive practices, such as the use of insecticide-treated bed nets, indoor residual spraying, and awareness of the importance of seeking prompt treatment.

Malaria remains a significant public health challenge in Nigeria, where it is endemic and contributes to high morbidity and mortality rates. Understanding the relationship between knowledge of malaria and the preventive practices adopted by university students is crucial for developing effective health interventions. Knowledge about malaria encompasses understanding its transmission, symptoms, and prevention methods. Studies have shown that higher levels of knowledge correlate with better preventive practices.

For instance, a study by Afolabi (2020) found that university students with comprehensive knowledge of malaria were more likely to engage in preventive measures such as the use of insecticide-treated nets (ITNs) and indoor residual spraying (IRS). Socio-demographic factors such as age, gender, and socio-economic status significantly influence both knowledge and preventive practices.

According to Osei et al. (2021), female students demonstrated higher knowledge levels about malaria compared to their male counterparts, which translated into more consistent use of preventive measures. Additionally, students from higher socio-economic backgrounds were found to have better access to preventive resources, thereby enhancing their practices (Ogunjimi, 2019). Educational interventions play a critical role in enhancing knowledge and promoting preventive practices. A study by Eze (2022) highlighted the effectiveness of targeted health education programs in increasing awareness about malaria among university students. The authors noted that interactive sessions and workshops significantly improved students' understanding of malaria and encouraged them to adopt preventive measures.

Cultural beliefs and practices can either facilitate or hinder the adoption of malaria preventive measures. In some communities, traditional beliefs about illness and health can lead to the rejection of scientifically proven preventive practices. For example, a study by Nwankwo et al. (2020) found that some students preferred traditional remedies over ITNs due to cultural beliefs, which negatively impacted their preventive practices.

Access to resources, including ITNs, healthcare services, and educational materials, is a crucial factor influencing preventive practices. A study by Adebayo (2021) indicated that students with easy access to ITNs were more likely to use them consistently.

The correlation between knowledge and preventive practices among Nigerian students has been addressed in several studies. A comprehensive review by Okeke and Ijeoma (2022) indicated that improved knowledge leads to greater preventive behaviors, suggesting that educational programs tailored to university students could significantly impact malaria prevention efforts. A unique perspective was presented by Chike and Obi (2023), who analyzed the psychological and social factors influencing students' health behaviors. Their findings indicated that peer influence and social norms could either facilitate or hinder the adoption of preventive practices, regardless of knowledge levels.

Students with a better understanding of malaria are more likely to engage in preventive behaviors. For instance, students who are aware of the modes of transmission are more likely to use protective measures (Adebayo , 2020).Educational programs aimed at increasing knowledge about malaria have been effective in improving preventive practices among university students. These programs often include workshops, seminars, and distribution of informational materials (Ogunbode, 2021). Despite having knowledge, some students may still not adopt preventive practices due to various barriers, including misconceptions about malaria, lack of access to preventive tools, and socio-economic factors (Nwankwo , 2022).

The relationship between knowledge of malaria and preventive practices presents several implications for public health interventions in Nigeria and this is shown through targeted educational initiatives in universities can enhance students' knowledge and, consequently, their preventive behaviors. Integrating malaria prevention topics into the curriculum may cultivate a more significant understanding and acceptance of preventive practices (Lawan , 2021). Also utilizing peer educators can be an effective method to disseminate information about malaria. Peer influence can play a significant role in behavior change among university students (Yusuf, 2023). Also public health interventions should focus on increasing access to preventive measures such as ITNs and antimalarial drugs. Collaborating with local health authorities and NGOs to provide these resources at universities may enhance uptake (Eze, 2022). Developing tailored communication strategies that incorporate local beliefs and practices can bridge the gap between knowledge and behavior. Understanding cultural perspectives on health can guide effective intervention designs (Okeowo , 2021).Robust monitoring and evaluation frameworks should be established to assess the impact of knowledge based interventions on preventive practices and health outcomes. This data can inform future strategies and resource allocation (Kusal , 2020).

The Environmental Factors that Promote the Spread of Malaria

Malaria remains a significant public health challenge in Nigeria, where the environmental conditions are conducive to the proliferation of the disease. Climatic variations,

particularly temperature and rainfall, significantly influence the transmission dynamics of malaria (Ogundipe, 2021). The Nigerian climate is characterized by a tropical setting with distinct wet and dry seasons, creating favorable conditions for Anopheles mosquitoes, the primary vectors of malaria. Rainfall patterns affect the breeding sites of mosquitoes, with increased precipitation often leading to stagnant water that facilitates larval development (Nworu , 2020). Studies indicate that the incidence of malaria peaks during and shortly after the rainy season, highlighting the correlation between climate and malaria transmission (Chukwuma , 2019). The presence of water bodies, such as rivers, lakes, and marshes, is another critical factor influencing malaria spread (Vlassoff, 2020). In Nigeria, numerous natural and artificial water bodies provide breeding grounds for Anopheles mosquitoes. Urban areas with poor drainage systems exacerbate the situation as they create stagnant water conditions, further promoting mosquito breeding (Okwor , 2021). Recent studies have found that areas with abundant stagnant water are associated with higher malaria transmission rates (Sagna, 2021), emphasizing the need for improved urban planning and water management.

Rapid urbanization in Nigeria has created environments that are both conducive to malaria transmission and challenging for public health interventions. Urban areas often experience increased population density, which can lead to higher transmission rates due to closer human-mosquito interactions (Adedayo & Sadia, 2019). Additionally, the improper management of waste and water in these expanding urban areas contributes to the creation of mosquito breeding sites (Igbinosa , 2021). The complex relationship

between urbanization and malaria incidence is underscored by the emergence of informal settlements where residents may lack access to basic sanitation and health services (Suleiman, 2022). Deforestation and land-use changes are significant environmental factors that influence malaria transmission in Nigeria. The alteration of land for agricultural purposes and urban development disrupts natural ecosystems, potentially leading to increased mosquito populations (Kalu , 2021). Deforestation has been shown to enhance the transmission of malaria by creating suitable habitats for Anopheles mosquitoes, as they adapt to new environments (Rundgren , 2020). The displacement of wildlife and changes in land cover may also bring humans into closer contact with malaria vectors, exacerbating the risk of disease transmission (Olojede, 2019).

The Strategies that can be adopted to prevent the Spread of Malaria

Malaria remains a significant public health challenge in Nigeria, disproportionately affecting vulnerable populations, including university students. Educational interventions are vital for increasing awareness about malaria transmission and prevention. Studies have shown that knowledge about malaria symptoms, causes, and preventive measures is crucial for behavioral change among students. For instance, Uzochukwu (2020) noted that targeted educational campaigns led to an increase in students' knowledge regarding the use of insecticide-treated nets (ITNs) and the importance of seeking medical attention for malaria symptoms. The distribution and promotion of ITNs (insecticide-treated nets) among university students have been identified as effective preventive measures.

Akinbode and Olufunmilayo (2021) highlighted that the availability and regular use of ITNs significantly reduce the incidence of malaria among students, particularly in dormitory settings. Peer support programs that encourage the use of ITNs have also shown promise in increasing compliance. Community participation plays a crucial role in malaria prevention strategies. Engaging students in community health initiatives can enhance their commitment to malaria control measures. A study by Ogbuoji (2018) found that community-led interventions, including clean-up campaigns and public education on malaria, were effective in reducing mosquito breeding sites near university campuses.

The use of chemoprophylaxis has been investigated as a strategy to prevent malaria among high-risk groups, including students. A systematic review by Eziefula (2019) indicated that administering preventive antimalarial treatments during high transmission seasons could effectively reduce malaria incidence among university populations.

The strategies adopted in malaria prevention includes distribution and use of ITNs is one of the most effective malaria prevention tools. Sleeping under ITNs can significantly reduce malaria transmission by protecting against mosquito bites, which occur mostly at night. Large-scale distribution campaigns have been conducted by the Nigerian Ministry of Health with support from organizations like the Global Fund. Also indoor residual spraying involves spraying the inside walls of homes with insecticides to kill mosquitoes that come into contact with these surfaces. IRS is often used in targeted areas or in conjunction with ITNs to boost malaria prevention.

Larval source management focuses on reducing mosquito populations by targeting the larval habitats through environmental management and larviciding. Administering antimalarial drugs at regular intervals to vulnerable groups such as pregnant women (IPTp) and infants (IPTi) to prevent malaria infection. Intermittent Preventive Treatment with sulfadoxine-pyrimethamine is recommended by WHO and has been associated with improved maternal and neonatal health outcomes (Kayentao, 2021).

Additionally the RTS,S/AS01 vaccine, known as Mosquirix, has been piloted in several African countries and shows promise in reducing malaria cases among children. Though not yet widely available, the vaccines represents a promising addition to malaria control strategies. Also engaging communities through education campaigns to promote the use of preventive measures such as ITNs, IRS, and early treatment seeking behavior.

Ensuring the availability of rapid diagnostic tests (RDTs) and Artemisinin-based combination therapies (ACTs) to promptly diagnose and treat malaria cases. Early diagnosis and treatment are critical in reducing malaria-related morbidity and mortality (WHO, 2015, Guidelines for the Treatment of Malaria).

Addressing malaria prevention in Nigerian universities is crucial, given the high burden of malaria in the country. However, several challenges and gaps hinder the effective adoption of preventative strategies. Which includes the fact that many students and staff may not have adequate knowledge about malaria transmission and prevention methods. Educational programs on malaria often lack specificity and are not integrated into the

university curriculum. Also universities often face budget constraints, which limit their ability to implement comprehensive malaria prevention strategies such as insecticide-treated nets (ITNs) distribution, fumigation of hostels, or awareness campaigns. Many university campuses lack basic infrastructure such as proper waste management systems and adequate housing, which can contribute to mosquito breeding and increased malaria transmission. Certain cultural beliefs and practices may impede the acceptance of effective malaria prevention strategies. For example, some individuals might rely on traditional remedies instead of proven preventive measures. Also the increasing resistance of malaria-carrying mosquitoes to commonly used insecticides complicates malaria prevention strategies. This resistance can undermine efforts such as ITNs and indoor residual spraying (IRS).Furthermore poor collaboration among health stakeholders, university administration, and local health authorities can lead to fragmented malaria control efforts and inefficient resource use. Students may have limited access to healthcare services, especially in rural universities, which can affect early diagnosis and treatment of malaria, thereby hindering preventive measures.

The Barriers Faced by Students at the University in Accessing Malaria Prevention

Malaria remains a significant public health concern in Nigeria, where the burden of the disease is among the highest globally (World Health Organization [WHO], 2021). University students, as a key demographic typically at risk due to communal living and high mobility, face various barriers in accessing effective malaria prevention. One of the

primary barriers to malaria prevention among Nigerian university students is a lack of adequate knowledge regarding preventive measures. Several studies have highlighted that although students are generally aware of malaria transmission, there is often a significant gap in understanding effective prevention strategies such as the use of insecticide-treated nets (ITNs) and indoor residual spraying (IRS) (Nwafor , 2020). According to Eze and Ndu (2018), misconceptions about how malaria is transmitted and treated can lead to negligence in implementing preventive measures.

Economic factors also significantly impact students' ability to access malaria prevention resources. Many Nigerian university students experience financial constraints that limit their capacity to purchase essential preventive tools such as ITNs, mosquito repellents, and antimalarial medications (Aliyu, 2019). For instance, a study by Olufemi (2020) indicated that the high cost of these preventive measures, compounded by the students' limited income sources, greatly impairs their ability to effectively protect themselves against malaria. Economic barriers can lead to a reliance on often ineffective or inadequate alternatives, increasing susceptibility to infection.

Socio-cultural beliefs and practices also play a crucial role in influencing malaria prevention behaviors among students. Some students hold traditional beliefs about health and illness that may conflict with scientifically validated preventive measures, leading to the rejection of evidence-based interventions (Ogbene & Idisi, 2021). According to Adeyemo et al. (2021), societal norms and peer influence can either encourage or

discourage the adoption of malaria prevention practices. For instance, students who perceive malaria as a minor illness might not prioritize prevention, assuming that treatment is readily available and effective when needed.

Universities themselves can contribute to the barriers faced by students in accessing malaria prevention. Many institutions lack adequate health services or information dissemination regarding malaria prevention, which can leave students without the necessary resources and support. A study by Nnanna (2021) found that health services on campuses frequently lack the supplies and staff required to provide effective malaria prevention education and services. Additionally, the absence of comprehensive health policies related to malaria prevention in universities further exacerbates this issue (Eyerusalem 2021).

Environmental factors also impact malaria prevention among university students. The increase in stagnant water bodies and poor waste management practices around campuses can create conducive breeding grounds for mosquitoes, thereby increasing the risk of malaria transmission (Nwankwo, 2020). According to Afolabi (2020), the physical environment and infrastructure surrounding universities play a significant role in students' exposure to malaria, as inadequate sanitation and drainage systems are often prevalent in and around campus areas.

Access to effective malaria prevention strategies is often hindered by inadequate health facilities within and around university campuses. Many universities lack on-site health

services that provide essential malaria prevention measures, such as distribution of insecticide-treated nets (ITNs), malaria diagnostic testing, and treatment options. According to Okoronkwo (2019), "the absence of well-equipped health facilities in universities contributes to low access rates of preventive interventions among students".

Educational institutions play a vital role in raising awareness about malaria prevention. However, there is often a lack of comprehensive health education on malaria within university curricula. As noted by Sanyaolu et al. (2020), many students "are not sufficiently informed about malaria preventive measures, thereby leading to poor health-seeking behaviors". Without proper education, students may underestimate their risk of malaria and neglect prevention measures. Institutional barriers, such as limited availability and distribution of preventive tools like ITNs and anti-malarial medications, pose challenges to students. Adebayo (2021) indicates that "students often struggle to access preventive materials due to irregular supply and high costs". This lack of access can significantly diminish students' ability to implement effective malaria prevention strategies.

The bureaucratic processes involved in obtaining malaria prevention resources can further complicate access. Institutional red tape sometimes creates delays in the provision of health services and prevention materials. According to Eze (2022), excessive bureaucratic procedures within health systems can delay the effective dissemination of malaria prevention initiatives targeted at university students. The inefficiency of health

administration often leads to disillusionment among students, discouraging them from seeking available resources.

Financial constraints within the public health sector significantly impact the availability and accessibility of malaria prevention programs. Funding for university healthcare services can be limited, which affects the ability to provide adequate preventive measures. As highlighted by Imoize et al. (2019), "lack of sufficient funding leads to inadequate procurement of essential health resources, worsening the burden of malaria". This situation disproportionately affects students who rely on public health services.

The shortage of trained healthcare personnel in public health facilities is another crucial barrier. Universities often face difficulties in recruiting and retaining qualified health workers to address students' health needs, including malaria prevention. According to Nwankwo et al. (2023), "the lack of qualified healthcare professionals limits the capacity of universities to adequately address students' health challenges". This shortage impacts the quality and availability of health education and preventive services provided to students.

The barriers encountered by university students in Nigeria when accessing malaria prevention have significant implications for their health outcomes, academic performance, and overall well-being. The most direct implication of the barriers to accessing malaria prevention is the increased incidence of malaria among university students. Inadequate access to preventive measures such as insecticide-treated nets (ITNs) and affordable

antimalarial medications can lead to higher morbidity and mortality rates in this population. According to Abeku (2019), "students who lack access to malaria prevention resources are at an elevated risk of contracting the disease, which can result in severe health complications and, in extreme cases, mortality. The resultant health issues can have cascading effects on students' physical and mental well-being, leading to stress and anxiety regarding their health status (Eze, 2021).

Malaria significantly impacts students' academic performance. Frequent illness due to malaria can lead to increased absenteeism, lower engagement in academic activities, and hindered academic success. A study by Agbaji (2020) found that "students who suffer malaria are more likely to miss classes and exams, resulting in lower academic performance and diminished educational outcomes". Consequently, this not only affects individual students but can also impact the overall academic environment and reputation of the university.

The psychological impact of malaria and its prevention barriers cannot be overlooked. Students who experience repeated bouts of malaria may develop concerns about their health, contributing to mental health issues such as anxiety and depression. As highlighted by Omenka (2022), "the uncertainty surrounding malaria infection and the challenges in accessing prevention and treatment contribute to stress, affecting students' mental health and academic performance''. This mental health burden can lead to

reduced cognitive function and motivation to pursue academic and extracurricular activities.

The barriers faced by students in accessing malaria prevention underscore the need for comprehensive policy responses at both institutional and governmental levels. Effective policies should focus on improving health infrastructure within universities, increasing the availability of malaria prevention resources, and integrating health education into university curricula. As stated by Eze (2021), "enhancing collaboration between educational institutions and public health agencies can facilitate better resource allocation and improve students' access to preventive measures".

Summary of Literature Review

Malaria remains a significant public health challenge in Nigeria, particularly among vulnerable populations such as students. Understanding the level of knowledge and preventive practices regarding malaria is crucial for developing effective interventions.

Several studies have assessed the knowledge of malaria among Nigerian students. For instance,

Afolabi (2017) assessed the knowledge, attitudes, and preventive practices regarding malaria among university students in Southwestern Nigeria. The population of the study was centered around university students in Ogun State, Nigeria. The ample of the study comprises of 300 students randomly selected from various faculties at the university. A

cross-sectional survey was conducted using structured questionnaires. Descriptive statistics and Chi-square tests were employed for data analysis. The study revealed that the majority of the students had good knowledge of malaria transmission and prevention; however, only a small percentage practiced preventive measures consistently, such as the use of insecticide-treated nets (ITNs) and regular use of antimalarial medications.

Okwa (2019) evaluated the level of knowledge and preventive practices towards malaria among undergraduate students in Enugu State. The study centered on undergraduate students in Enugu State University. 400 students were randomly selected. A descriptive cross-sectional survey was conducted using a structured questionnaire, followed by statistical analysis using SPSS software. The study found that while knowledge about malaria was generally high, 60% of students reported inadequate preventive practices, attributing this to factors like cost and availability of preventive measures such as ITNs and antimalarials.

Gidado (2020) assessed the knowledge, attitude, and practices regarding malaria prevention among university students in the North-Central region of Nigeria. The population centered on university students across different faculties in Abuja, Nigeria. About 250 students were selected through stratified random sampling. A cross-sectional study using a semi-structured questionnaire. Data were analyzed using descriptive statistics and correlation analysis. The study indicated that although the students had a good understanding of malaria transmission, only 45% reported using preventive

measures consistently, mainly due to ignorance and lack of awareness about the importance of preventive methods.

Ofoegbu (2021) investigated the knowledge, attitudes, and preventive practices of malaria among students of a Nigerian university. The study centered on undergraduates from the University of Port Harcourt. 350 students were selected through simple random sampling. Questionnaires was distributed and analyzed using both qualitative and quantitative methods, including the use of descriptive statistics. The results showed that while knowledge about malaria was satisfactory, preventive practices such as the use of ITNs were low (35%). Factors affecting this included a lack of financial resources and comprehension of malaria's health impacts.

Mohammed (2022) assessed the knowledge, attitude, and practice towards malaria prevention among students in a Nigerian University. The study focused on students at Ahmadu Bello University, Zaria. The sample size comprises of 500 students participated in the study. A cross-sectional survey using a structured questionnaire and analyzed with descriptive statistics and logistic regression. Although knowledge of malaria prevention was high (78%), only 40% practiced preventive measures regularly, mainly due to inadequate access to preventive tools and a perception of low risk.

Adejo (2021) assessed the knowledge and preventive practices of malaria among undergraduate students at the University of Nigeria, Nsukka. The population of the study focused on undergraduate students at the University of Nigeria. 400 students were

randomly selected from various departments. A cross-sectional survey using self-administered questionnaires was distributed to students, gathering data on knowledge and preventive practices related to malaria. The study found that while 85% of students had a good understanding of malaria transmission, only 50% practiced preventive measures consistently. The lack of resources and awareness of preventive strategies were significant barriers.

Bassey (2020) evaluated the effectiveness of malaria prevention education campaigns among university students in Cross River State. The population focused on university students in Cross River State. The sample of the study was 250 students from two different universities in cross river. A quasi-experimental design was used, with one group receiving educational intervention while the control group did not. Data were collected through pre- and post-test questionnaires. The study indicated that students exposed to educational campaigns showed a 40% increase in knowledge and a 30% increase in the use of preventive measures, such as the use of insecticide-treated nets.

Chukwu (2022) determined the level of awareness and preventive practices regarding malaria among medical students in a Nigerian university. The study focused on medical students at the University of Lagos. The sample of the study were 300 medical students in their second to final years. A descriptive cross-sectional study design was employed, using a structured questionnaire and focus group discussions to gather qualitative data. The results showed that 90% of medical students had a high level of awareness about

malaria, but only 60% adhered to preventive practices like taking antimalarial medications during the rainy season.

Udeh (2023) assessed the relationship between socio-economic status and malaria prevention practices among university students in Enugu State. The population comprises of students from three universities in Enugu State. 500 students were selected using the stratified sampling technique. A correlational study design using a structured questionnaire to measure knowledge and practices regarding malaria prevention. The study revealed that higher socio-economic status was positively correlated with better malaria prevention practices, particularly in the use of preventive medications and standard treatment protocols.

Abubakar (2021) To explore the impact of cultural beliefs on malaria prevention practices among students in a northern Nigerian university. The study focused on female students at Ahmadu Bello University. 200 female students were selected through convenience sampling. Phenomenological research design through in-depth interviews to gather detailed information about cultural beliefs and practices. The findings highlighted significant cultural beliefs influencing perceptions of malaria, leading to inconsistent preventive practices. Many students believed in traditional remedies over modern interventions.

Adebayo et al. (2020) conducted a cross-sectional study among university students in Lagos and found that while 85% of participants could identify malaria symptoms, only

60% were aware of its transmission routes. This gap in knowledge highlights the need for targeted educational programs to enhance awareness about malaria transmission and prevention.

Similarly, Okeke and Nwankwo (2021) reported that misconceptions about malaria, such as the belief that it can be transmitted through casual contact, were prevalent among secondary school students in Enugu. Their findings suggest that misinformation may hinder effective preventive practices, emphasizing the importance of accurate health education.

Akinbami (2020) assessed the knowledge and preventive practices regarding malaria among secondary school students in Lagos State, Nigeria. The study focused on selected secondary school students in Lagos State. The sample consisted of 400 students from four different secondary schools. A cross-sectional descriptive study design using a structured questionnaire to gather data on knowledge and preventive practices. Data were analyzed using descriptive statistics and chi-square tests. The study found that 64% of the students had good knowledge of malaria transmission and prevention, but only 40% practiced preventive measures consistently, such as sleeping under mosquito nets.

Onah (2021) evaluated the effectiveness of health education on the knowledge and preventive practices of malaria among students in Enugu State, Nigeria. The population consisted of secondary school students in Enugu State.300 students were selected using stratified sampling. Pre-test/post-test quasi-experimental design. A structured

questionnaire was used to assess students' knowledge and practices before and after health education intervention. The intervention significantly improved students' knowledge and preventive practices ($p < 0.05$), with an increase from 50% to 85% in students using preventive measures post-intervention.

Olusegun (2022) assessed the level of awareness and preventive measures against malaria among secondary school adolescents in Ibadan, Nigeria. The population comprised of secondary school adolescents in Ibadan. 500 students from ten secondary schools were selected.Descriptive cross-sectional study utilizing questionnaires to gather quantitative data. Results were analyzed using both descriptive and inferential statistics. The study concluded that while awareness was high (72%), only 52% practiced preventive measures. Factors including parental guidance and school health programs were noted to influence practices.

Nduka (2023) explored the knowledge and attitudes towards malaria prevention methods among secondary school students in Port Harcourt, Nigeria. The population consisted of secondary school students in Port Harcourt. 350 students were selected using simple random sampling. A cross-sectional study with a structured questionnaire assessing knowledge levels and attitudes towards malaria prevention. Data were analyzed using statistical software for frequency distributions and correlations. Knowledge levels were satisfactory (78%), but misconceptions about malaria prevention were common.

Approximately 45% of students reported using preventive methods such as insecticide-treated nets.

Tambo (2015) assessed the knowledge and preventive practices regarding malaria among university students in Cameroon. The population comprises of university students in Cameroon. The sample size comprises of 400 students from different faculties. A cross-sectional survey using a structured questionnaire. Data were analyzed using descriptive statistics and chi-square tests. The study found that while students had a moderate level of knowledge about malaria transmission and symptoms, only 45% practiced preventive measures consistently. Factors such as gender and academic year significantly influenced knowledge levels.

Addeh (2018) evaluates the knowledge and preventive measures against malaria among undergraduate students in Nigeria. The population comprised of undergraduate students in Niger universities. The sample consists of 500 students. A descriptive cross-sectional study using self-administered questionnaires, analyzed via SPSS for frequency and percentages. Knowledge about malaria was high (85%), yet the practice of preventive measures, including the use of insecticide-treated nets (ITNs), was low (32%). Misconceptions about malaria transmission were prevalent.

Nnadi (2019) examined the awareness and preventive practices related to malaria among university students in Ghana. The population consisted of university students in Ghana. The sample size consisted of about 100 students across various disciplines. A cross-

sectional study conducted via online questionnaires and analyzed using descriptive and inferential statistics. The participants demonstrated high awareness of malaria; however, practical preventive measures were limited, with only 40% using ITNs. The study underscored the need for increased health education initiatives.

Chima (2021) analyzed the knowledge, attitudes, and practices concerning malaria prevention among students in Eastern Uganda. The population comprises of students from various universities in Eastern Uganda. 50 students were selected for the study. Quantitative cross-sectional survey utilizing a structured questionnaire and analyzed using statistical software. The study documented a substantial knowledge base about malaria symptoms but identified gaps in preventive practices. Only 30% of students reported using preventive methods regularly, indicating a need for greater public health initiatives.

Mwenda (2022) determined the knowledge and preventive practices regarding malaria among medical students in Tanzania. The study centered around medical students in Tanzania. 250 medical students were selected for the purpose of this study. A descriptive cross-sectional study using an online questionnaire, data analyzed through descriptive statistics. The study found that while knowledge of malaria was high (90%), adherence to preventive practices was low (25%), suggesting a disparity between knowledge and practice among medical students.

Preventive practices are essential in controlling malaria transmission. A study by Ibrahim et al. (2019) revealed that only 40% of students regularly used insecticide-treated nets (ITNs), despite their availability. The authors noted that factors such as lack of awareness about the benefits of ITNs and cultural beliefs influenced the low usage rates. This finding aligns with the work of Eze et al. (2022), who found that students who received malaria education were more likely to adopt preventive measures, including the use of ITNs and indoor residual spraying.

Furthermore, a qualitative study by Nwosu (2023) highlighted the role of peer influence in shaping students' preventive behaviors. The researchers found that students who engaged in discussions about malaria prevention with their peers were more likely to adopt protective measures, such as using repellents and seeking prompt treatment for malaria symptoms.

Also according to Okwuashi (2020), most university students demonstrate a fair understanding of malaria transmission, primarily identifying female Anopheles mosquitoes as the primary vector. However, misconceptions still prevail, with some students erroneously believing that malaria can be contracted through casual contact or contaminated food (Eze, 2021).

The symptoms of malaria are also recognized by many students, with common symptoms such as fever, chills, and headaches being frequently mentioned. A study by Adeyemo (2021) revealed that while students were generally aware of the typical symptoms, their

knowledge of severe complications of malaria, such as cerebral malaria and anemia, was lacking. This gap underscores the need for enhanced educational efforts to improve awareness of both the disease's presentation and its potential severity.

Nwafor (2020) found that a significant number of students were aware of the importance of insecticide-treated nets (ITNs), insect sprays, and environmental sanitation in malaria prevention. However, the usage of these preventive measures was disturbingly low, primarily due to factors such as cost, accessibility issues, and lack of consistent health education. Moreover, the practice of seeking prompt medical attention upon exhibiting symptoms of malaria is critical. Research conducted by Eze and Ndu (2018) indicated that while most students acknowledged the need for treatment, many delayed seeking intervention due to misconceptions about self-medication and financial constraints. This behavior can exacerbate the disease's impact, leading to severe health issues.

CHAPTER THREE

METHODOLOGY

The methods and procedures used in this study are outlined as follows

- Design of the study
- Population of the Study
- Sample and Sampling Technique
- Research Instrument
- Validity of the Instrument
- Reliability of the Instrument
- Method of Data Collection
- Method of Data Analysis

Design of the study

The study adopts the descriptive survey research design, which is centered on students in the university of Benin. Survey research method is considered appropriate for research because it is a formal method of obtaining the same or similar information for various sized groups of persons mainly through questionnaire a personal interview.

Population of the Study

The population of this study is forty thousand two hundred and eighty nine (40,289) undergraduates in the University of Benin, Benin City, Edo State in the 2024/2025 academic session. This was shown was shown in table one below.

Table 1: Population of undergraduates in the University of Benin

S/N	Faculty	Undergraduates
1	**Arts**	**1077**
2	**Agriculture**	1895
3	**Dentistry**	1500
4	**Education**	1659
5	**Engineering**	1789
6	**Environmental Sciences**	1500
7	**Law**	3786
8	**Life Science**	1439
9	**Management science**	4578
10	**Pharmacy**	3567

11	**Physical Science**	2578
12	**Social Science**	2945
13	**School of medical sciences**	4009
14	**College of medicine**	3789
15	**Veterinary Medicine**	1600
	Total	**40289**

Source: University of Benin Registry (2025)

Sample and Sampling Technique

The sample size for this study was 297 respondents. This was drawn using the multi stage sampling technique was adopted for the study. Firstly the systematic sampling technique was used to select five (5) faculties from the fifteen (15) faculties. Secondly proportionate sampling was used to select 3% from each selected faculty. Thirdly simple random sampling of balloting with replacement was used to select respondents for the study. The department names were written on a piece of paper, put in a hat, shuffled and then 5 departments were drawn from the hat. The selection process was truly random.

Table 2: Sample size of undergraduates in the University of Benin

S/N	Name of Faculty	Population of each Sample	Sample Size
1	**Arts**	1077/14098x3=0.21	0.21x100=21
2	**Education**	1656/14098x3=0.35	0.35x100=35

3	**Law**	3786/14098x3=0.80	0.80x100=80
4	**Pharmacy**	3567/14098x3=0.76	0.76x100=76
5	**School of Medical Sciences**	4009/14098x3=0.85	0.85x100=85
	TOTAL	**14098**	**297**

Research Instrument

The research instrument is a self-structured questionnaire with two sections, Section A&B, Section A will seek to elicit responses from the respondents on their socio demographic characteristics. While Section B will seek to elicit responses from respondents on the knowledge and preventive practices of malaria

Validity of the Instrument

The instrument was validated by the researcher's supervisor and two other experts in the department of health, safety and environmental education. Their corrections and criticisms will be used in drafting the first document.

Reliability of the Instrument

The split-half method of reliability was used to determine the reliability of the instrument. The questionnaire was administered to a group of 20 respondents which were not part of the study. It was then numbered 1-20; the odd numbers were separated from the even

numbers. Then the two data were subjected to cronbanch alpha statistics which yielded a significance of 0.701. This indicated that the instrument is reliable.

Method of data collection

The instrument was administered by the researchers with the aid of two research assistants after a careful explanation of the objectives of the study. The instrument was retrieved immediately upon completion to ensure 100% return rate

Method of Data Analysis

Data was analyzed using frequency count, percentages, mean and standard deviation. The mean benchmark was 2.50.

CHAPTER FOUR

PRESENTATION OF RESULTS AND DISCUSSION OF FINDINGS

The data used for the analysis of this study are presented using tables as the statistical tool. The data collected for this study are carefully analyzed in simple percentage and frequency in the tables.

Presentation of Data

Table 3: Distribution of Demographic Characteristics

Characteristics	Frequency	Percentage (%)
Age		
18-25	137	46.12
26-35	112	37.7
35-35	44	14.8
46 and above	4	1.3
Gender		
Male	136	45.8
Female	161	54.2
Department		

Arts	21	7.07
Education	35	11.8
Law	80	26.9
Pharmacy	76	25.6
School of Medical Sciences	85	28.6
Marital Status		
Married	45	15.1
Divorce	-	-
Widowed	-	-
Single	245	82.4

Source: Field survey data (2025)

The table presents section A of the questionnaire, which details the demographic information of the respondents. It highlights the age distribution, showing that the largest group is made up of individuals aged 18 to 25, totaling 137 respondents. In contrast, the smallest group consists of those aged 46 and above, with 4 respondents, indicating that majority of the participants are relatively young. Additionally, the table reveals information about the departments of the respondents. The highest number of respondents representing education department, totaling 85 students, while the lowest number of respondents 21 represents arts department This suggests that a large majority of the respondents are well-educated. Additionally the table reveals the gender representation of the respondents. Male respondents were 136 while female respondents were 161. Furthermore the table reveals information about the marital status of the respondents. The highest number of single respondents were 245 while 45 respondents are married there were no divorce and widowed. Which indicates that majority of the respondents are single.

DATA ANALYSIS

The following section using inferential statistics to analyze the data within the questionnaire

Research Questions One

What is the level of knowledge among university of Benin students regarding malaria?

Table 4: **The level of knowledge among university of Benin students regarding malaria**

Level of Knowledge	Frequency	Percentage (%)
High	197	66.3
Moderate	97	32.7
Low	3	1.0

Total	**297**	**100**

Scale: low(0-2) moderate (3-4) high (5-6)

Table 4 above indicate that the knowledge of respondents regarding malaria is high with 197 respondents representing (66.3%), while 97 respondents representing (32.7%) possessed moderate level of knowledge regarding malaria and 3 respondents representing (1.01%) possessed low level of knowledge about malaria. This therefore implies that there is high level of knowledge among university of Benin students regarding malaria.

Research Question Two

What are the preventive practices adopted by university of Benin students?

Table 5: The preventive practices adopted by university of Benin students

S/N	The preventive practices adopted by university of Benin students	ALWAYS		SOMETIMES		NEVER		Decision
		F	%	F	%	F	%	
7	I regularly sleep under insecticide-treated mosquito nets to prevent malaria	92	30.9	171	57.6	34	11.4	Accepted
8	I make use of mosquito repellents as a preventive measure	206	69.4	74	24.9	17	5.7	Accepted
9	I wear protective clothing (long	87	29.2	153	51.5	57	19.2	Accepted

	sleeves, trousers) to reduce mosquito exposure							
10	I clear bushes or stagnant water around my residence/hostel to prevent mosquito breeding	101	34.1	169	56.9	27	9.1	Accepted
11	I participate in health campaigns or sensitization programs on malaria prevention	17	5.7	97	32.7	183	61.6	Accepted

Item 7 in Table 5 showed that 30.9% always sleep under insecticide-treated mosquito nets to prevent malaria, while 57.6% sometimes engage, and 11.4% never engage. Furthermore, Item 8 indicated that 69.4% always make use of mosquito repellents as a preventive measure, 24.9% sometimes engage, and 5.7% never engage. Also, Item 9 revealed that 29.2% always wear protective clothing such as long sleeves and trousers to reduce mosquito exposure, 51.5% sometimes engage, and 19.2% never engage. Additionally, Item 10 showed that 34.1% always clear bushes or stagnant water around their residences or hostels to prevent mosquito breeding, 56.9% sometimes engage, and 9.1% never engage. Finally, Item 11 indicated that 5.7% always participate in health campaigns or sensitization programs on malaria prevention, 32.7% sometimes engage, and 61.6% never engage.

The analysis of data in the above table therefore implies that the preventive practices adopted by University of Benin students to combat malaria include sleeping under

insecticide-treated mosquito nets, using mosquito repellents, wearing protective clothing such as long sleeves and trousers to reduce mosquito exposure, clearing bushes and stagnant water around their residences or hostels to prevent mosquito breeding, and participating in health campaigns or sensitization programmes on malaria prevention.

Research Question Three

What are the environmental factors that promote the spread of malaria in your living environment?

Table 6: Environmental Factors Promoting Spread of Malaria

S/N	ITEM	SA	%	A	%	SD	%	D	%	Mean	Remark
12	Stagnant water around the environment contributes to the spread of mosquitoes on campus	107	36.0	144	48.5	27	9.1	19	6.4	3.14	Accepted
13	Poor drainage systems within the university environment encourage	119	40.1	143	48.1	16	5.4	19	6.4	3.22	Accepted

	mosquito breeding										
14	Accumulation of refuse and poor waste disposal in the university increases malaria risk	118	39.7	149	50.2	18	6.1	12	4.0	3.26	Accepted
15	Overgrown grasses and bushes around lecture halls and hostels promote mosquito breeding	113	38.0	153	51.5	19	6.4	12	4.0	3.24	Accepted
16	Poor sanitation facilities on campus contribute to the spread of malaria	103	34.7	147	49.5	39	13.1	8	2.7	3.16	Accepted
							Cluster Mean			**3.20**	

Criterion Mean = 2.50

Table 6 revealed the responses of the respondents on all the items presented at a mean score of 3.14, 3.22, 3.26, 3.24 and 3.16 respectively. The cluster mean of 3.20 is above the criterion mean score of 2.50 which implies that the environmental factors that promote the spread of malaria include stagnant water around the environment, poor drainage systems, accumulation of refuse and poor waste disposal, overgrown grasses and bushes around lecture halls and hostels, as well as poor sanitation facilities.

Research Question Four

What are the strategies that can be adopted to prevent the spread of malaria?

Table 7: The strategies that can be adopted to prevent the spread of malaria

S/N	ITEM	SA	%	A	%	SD	%	D	%	Mean	Remark
17	Regular use of insecticide-treated mosquito nets is an effective strategy for	121	40.7	141	47.5	19	6.4	16	5.4	3.23	Accepted

	preventing malaria										
18	Consistent use of mosquito repellents (sprays, creams, coils) can reduce the spread of malaria	125	42.1	137	46.1	16	5.4	19	6.4	3.24	Accepted
19	Regular cleaning and removal of stagnant water around hostels and classrooms help prevent malaria	119	40.1	148	49.8	18	6.1	12	4.0	3.26	Accepted
20	Proper waste disposal and sanitation are essential strategies for reducing mosquito breeding	112	37.7	155	52.2	18	6.1	12	4.0	3.23	Accepted
21	Regular fumigation of the university environment is an effective way to prevent malaria	97	32.7	152	51.2	40	13.5	8	2.7	3.14	Accepted
						Cluster Mean				**3.22**	

Criterion Mean = 2.50

Table 7 revealed the responses of the respondents on all the items presented at a mean score of 3.23, 3.24, 3.26, 3.23 and 3.14 respectively. The cluster mean of 3.22 is above the criterion mean score of 2.50 which implies that the strategies that can be adopted to prevent the spread of malaria include regular use of insecticide-treated mosquito nets, consistent use of mosquito repellents such as sprays, creams, and coils, regular cleaning and removal of stagnant water around hostels and classrooms, proper waste disposal and sanitation to reduce mosquito breeding, and regular fumigation of the university environment.

Research Question Five

What are the barriers faced by students at the university of Benin in accessing malaria prevention?

Table 8: barriers faced by students at the university of Benin in accessing malaria prevention

S/N	ITEM	SA	%	A	%	SD	%	D	%	Mean	Remark
22	The cost of insecticide-treated mosquito nets is a barrier to my use of them	102	34.3	89	30.0	62	20.9	44	14.8	2.84	Accepted
23	Limited availability of mosquito nets on campus prevents me from using them regularly	115	38.7	102	34.3	51	17.2	29	9.8	3.02	Accepted
24	Lack of access to affordable mosquito repellents makes it difficult to prevent malaria	129	43.4	104	35.0	47	15.8	17	5.7	3.16	Accepted
25	Limited access to university health services for malaria prevention is a major barrier	121	40.7	119	40.1	45	15.2	12	4.0	3.17	Accepted
26	Financial constraints prevent many students from seeking early medical treatment for malaria	118	39.7	132	44.4	39	13.1	8	2.7	3.21	Accepted
						Cluster Mean				**3.08**	

Table 8 revealed the responses of the respondents on all the items presented at a mean score of 2.84, 3.02, 3.16, 3.17 and 3.21 respectively. The cluster mean of 3.08 is above the criterion mean score of 2.50 which implies that the barriers faced by students at the

university of Benin in accessing malaria prevention include high cost of insecticide-treated mosquito nets, limited availability of mosquito nets on campus, lack of access to affordable mosquito repellents, limited access to university health services for malaria prevention and financial constraints.

Discussion of Findings

Findings from the study in research question one shows that there is high level of knowledge among university of Benin students regarding malaria. The finding that University of Benin students possess a high level of knowledge regarding malaria can be attributed to the widespread health education initiatives, public awareness campaigns, and accessibility of information through formal education and digital platforms. Being in a tertiary institution, students are generally more exposed to scientific knowledge, public health discussions, and preventive health measures promoted by both governmental and non-governmental organisations. Additionally, the endemic nature of malaria in Nigeria may have heightened students' awareness and understanding of its causes, symptoms, and prevention strategies, as part of their everyday health consciousness and academic exposure. This aligns with the work of Akinbo (2020), who found that Nigerian university students demonstrated strong awareness of malaria transmission and preventive measures, largely due to public health sensitization programs and academic exposure. Similarly, Adebayo, Akinyemi, and Cadmus (2019) reported that students in higher institutions in Southwest Nigeria exhibited comprehensive knowledge about

malaria, particularly regarding mosquito bites as the main transmission route and the importance of insecticide-treated nets.

Findings from the study in research question two revealed that the preventive practices adopted by University of Benin students to combat malaria include sleeping under insecticide-treated mosquito nets, using mosquito repellents, wearing protective clothing such as long sleeves and trousers to reduce mosquito exposure, clearing bushes and stagnant water around their residences or hostels to prevent mosquito breeding, and participating in health campaigns or sensitization programmes on malaria prevention. The finding can be explained by their high level of health awareness and exposure to public health education on malaria prevention. The combination of formal instruction, campus-based sensitization programmes, and media campaigns has likely influenced students to engage in proactive behaviours such as using insecticide-treated nets, repellents, and maintaining environmental cleanliness. Moreover, the university environment often encourages participation in health-related initiatives and promotes preventive habits as part of student well-being. This finding is in line with Akinbo, Omoregie, and Igbinosa (2020), who reported that Nigerian university students frequently engaged in malaria prevention by maintaining clean surroundings and using mosquito nets. Similarly, Obieche and Odibo (2021) observed that undergraduates in a Nigerian university employed multiple preventive methods, with insecticide-treated nets use being a major strategy.

Findings from the study in research question three shows that the environmental factors that promote the spread of malaria include stagnant water around the environment, poor drainage systems, accumulation of refuse and poor waste disposal, overgrown grasses and bushes around lecture halls and hostels, as well as poor sanitation facilities. The finding can be attributed to the role of these environmental factors in creating ideal breeding conditions for mosquitoes. These conditions are common in many urban and semi-urban areas, including parts of university environments where maintenance may be irregular. When water stagnates or waste accumulates, it provides favourable habitats for mosquito larvae, thereby increasing mosquito density and the risk of malaria transmission. This finding is consistent with the work of Okwa (2020), who emphasized that urbanization without proper environmental management often creates mosquito breeding habitats, particularly through clogged gutters, refuse accumulation, and unplanned housing. Similarly, Obieche and Odibo (2021) reported that Nigerian university environments with poor sanitation and waterlogging experienced higher incidences of mosquito infestation, thereby increasing malaria risk.

Findings from the study in research question four indicated that the strategies that can be adopted to prevent the spread of malaria include regular use of insecticide-treated mosquito nets, consistent use of mosquito repellents such as sprays, creams, and coils, regular cleaning and removal of stagnant water around hostels and classrooms, proper waste disposal and sanitation to reduce mosquito breeding, and regular fumigation of the university environment. These practices directly target both the mosquito population and

human exposure, thereby reducing infection rates. In a university setting like the University of Benin, consistent implementation of these measures, combined with environmental management and awareness programmes can significantly enhance malaria control. Such strategies align with public health recommendations by agencies like the World Health Organization, which emphasise integrated vector management and personal protection as key approaches to malaria prevention. In support of the findings, Akinyemi, and Cadmus (2018) who reported that insecticide-treated nets remain one of the most cost-effective and widely recommended interventions against malaria in Nigeria

Findings from the study in research question five shows that the barriers faced by students at the university of Benin in accessing malaria prevention include high cost of insecticide-treated mosquito nets, limited availability of mosquito nets on campus, lack of access to affordable mosquito repellents, limited access to university health services for malaria prevention and financial constraints. The findings can be attributed to the fact that Many students operate on limited budgets. inadequate distribution of malaria prevention resources within the university and insufficient institutional support reduce accessibility. These barriers reflect broader systemic issues such as underfunded campus health programmes and inconsistent public health interventions, which hinder students' ability to adopt and sustain effective malaria prevention practices. This corroborates the findings of Oloruntoba (2018), who noted that behavioral and lifestyle preferences often reduce adherence to ITN use among young people, despite widespread awareness of its benefits

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter discuss the summary of the study, the conclusions drawn, results obtained and recommendations offered.

Summary

The study assesses the knowledge and preventive practices of malaria among University of Benin undergraduates. To achieve the purpose of the study, five research questions were raised and answered. Literature related to the study were reviewed. The study adopts the descriptive survey research design. The population for this study was made of forty thousand two hundred and eighty-nine (40,289) undergraduates in the University of Benin, Benin City, Edo State. The sample size for the study was made up of 297 respondents. This was drawn using the multi stage sampling technique was adopted for the study. Firstly the systematic sampling technique was used to select five (5) faculties from the fifteen (15) faculties. Secondly proportionate sampling was used to select 3% from each selected faculty. Thirdly simple random sampling of balloting with replacement was used to select respondents for the study.

The instrument that was used for the data collection was a structured questionnaire. The constructed questionnaire for the study was presented to three (3) experts in the Department of Health, Safety and Environmental Education. To establish the reliability, a split half method was used and subjected to Cronbanch Alpha statistics which yield a coefficient of .701. The instrument was administered by the researcher and

data was analysed using frequency, percentage, mean and standard deviation. The following were the findings.

Findings of the research

Findings from the study include:

1. That there is high level of knowledge among university of Benin students regarding malaria.
2. That the preventive practices adopted by University of Benin students to combat malaria include sleeping under insecticide-treated mosquito nets, using mosquito repellents, wearing protective clothing such as long sleeves and trousers to reduce mosquito exposure, clearing bushes and stagnant water around their residences or hostels to prevent mosquito breeding, and participating in health campaigns or sensitization programmes on malaria prevention.
3. That the environmental factors that promote the spread of malaria include stagnant water around the environment, poor drainage systems, accumulation of refuse and poor waste disposal, overgrown grasses and bushes around lecture halls and hostels, as well as poor sanitation facilities.
4. That the strategies that can be adopted to prevent the spread of malaria include regular use of insecticide-treated mosquito nets, consistent use of mosquito repellents such as sprays, creams, and coils, regular cleaning and removal of stagnant water around hostels and classrooms, proper waste disposal and

sanitation to reduce mosquito breeding, and regular fumigation of the university environment.

5. That the barriers faced by students at the university of Benin in accessing malaria prevention include high cost of insecticide-treated mosquito nets, limited availability of mosquito nets on campus, lack of access to affordable mosquito repellents, limited access to university health services for malaria prevention and financial constraints.

Conclusion

This study assessed the knowledge and preventive practices of malaria among students of the University of Benin. The findings revealed that the level of knowledge regarding malaria among students is high, indicating that most respondents possess a sound understanding of the causes, symptoms, transmission, and health implications of the disease. This high level of awareness can be attributed to increased access to health information through campaigns, educational programs, and digital media. Despite this, the study also highlighted that the persistence of malaria on campus is influenced by environmental factors such as poor drainage systems, stagnant water, and improper waste disposal, which provide favorable breeding sites for mosquitoes. These findings underscore the importance of environmental management as a critical component in malaria prevention, complementing individual knowledge and preventive efforts.

Furthermore, the study concluded that while students of the University of Benin generally engage in preventive practices such as using insecticide-treated nets and mosquito repellents, several barriers still hinder consistent adoption. These include the cost and limited availability of mosquito control products, as well as inadequate access to effective preventive facilities within the campus environment. The study also emphasized the need for continuous sensitization and the implementation of effective strategies to curb malaria spread, including environmental sanitation and increased access to affordable preventive tools. Overall, the research established that knowledge alone is not sufficient to eliminate malaria risk; sustained preventive practices supported by conducive environmental and institutional factors are essential for long-term malaria control among university students.

Recommendations

Based on the conclusion drawn, the following recommendations were put forward:

1. The University of Benin management should intensify health education campaigns on malaria prevention through seminars, posters, and social media platforms to sustain and further improve students' knowledge and awareness.
2. The university health services should ensure regular distribution of insecticide-treated mosquito nets and affordable mosquito repellents to students, particularly those residing in hostels and nearby communities.

3. Environmental sanitation exercises should be carried out regularly within and around the university premises to eliminate stagnant water, clogged drains, and waste dumps that serve as breeding sites for mosquitoes.
4. Collaboration between the university health department and relevant public health agencies, such as the Edo State Ministry of Health, should be strengthened to implement integrated malaria control programs on campus.
5. Students should be encouraged to take personal responsibility for maintaining clean surroundings and consistently adopting preventive practices, including sleeping under treated nets and using mosquito repellents, to reduce malaria incidence.

Suggestions for Further Studies

1. Future research could examine the relationship between students' socioeconomic status and their ability to adopt malaria preventive measures within higher institutions.
2. Further studies may investigate the effectiveness of various malaria awareness programs and campaigns conducted on university campuses in influencing behavioural change among students.
3. Subsequent research could explore comparative studies on malaria knowledge and preventive practices among students in different tertiary institutions across Edo State or Nigeria to identify regional variations and trends.

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APPENDIX

DEPARTMENT OF HEALTH SAFETY AND ENVIRONMENTAL EDUCATION

FACULTY OF EDUCATION

UNIVERSITY OF BENIN

QUESTIONNAIRE

ON

KNOWLEDGE AND PREVENTIVE PRACTICES OF MALARIA AMONG STUDENTS OF THE UNIVERSITY OF BENIN

Dear Respondents

I am a 400 level undergraduate of the above department carrying out a study on the Knowledge and Preventive Practices of Malaria among Students of the University of Benin

You are therefore requested to kindly help as much as possible to supply the needed information. Your responses shall be treated with outmost confidence.

Please read the questions carefully and tick [√] in the box provided that corresponds to the answer of your choice. At the right hand column there are options labeled yes or no. Indicate your response to the statements by ticking the appropriate column labeled.

SECTION A (DEMOGRAPHIC)

Instruction: Please tick [√] option that best suit your opinion

Age of the respondents: 18 - 25 [ ], 26 - 35 [ ], 35-45[ ], 46 and above [ ]

Department: Arts [ ], Education [ ], Law [ ], Pharmacy [ ], School of medical sciences [ ]

Level: 100 [ ], 200 [ ], 300 [ ], 400 [ ], Others [ ]

Gender: Male [ ] Female [ ]

Marital Status: Single [ ] Married [ ] Divorced [ ] Widowed [ ]

SECTION B: Respondents Response

Research item 1

Instruction: Please read the questions carefully and tick appropriately under any of the column as noted. Do not tick more than one option in a question in this section

The level of knowledge among university of Benin students regarding malaria

1. What is the primary cause of malaria? a) Viruses b) Bacteria c) Parasites d) Fungi e) Worms

2. How is malaria mainly transmitted to humans? a) Through drinking dirty water b) Through mosquito bites c) Through sneezing and coughing d) Through contaminated food e) Through physical contact

3. Which type of mosquito transmits malaria? a) Culex mosquito b) Aedes mosquito c) Anopheles mosquito d) Tsetse fly e) Black fly

4. Which of the following drugs is commonly used in Nigeria for malaria treatment? a) Paracetamol b) Amoxicillin c) Artemisinin-based combination therapy (ACTs) d) Aspirin e) Ibuprofen

5. Which of the following practices reduces mosquito breeding around the University of Benin campus? a) Keeping water containers uncovered b) Clearing stagnant water c) Leaving refuse dumps open d) Storing dirty clothes outside e) Sleeping with windows open without nets

6. Which of the following is NOT a common symptom of malaria? a) Fever b) Headache c) Chills d) Coughing blood e) Muscle aches

Research item 2

Instruction: Please read the questions carefully and tick appropriately under any of the column as noted. Do not tick more than one option in a question in this section

Guide: Always Sometimes Rarely

S/N	The preventive practices adopted by university of Benin students	Always	Sometimes	Rarely
7	I regularly sleep under insecticide-treated mosquito nets to prevent malaria			
8	I make use of mosquito repellents as a preventive measure			
9	I wear protective clothing (long sleeves, trousers) to reduce mosquito exposure			
10	I clear bushes or stagnant water around my residence/hostel to prevent mosquito breeding			
11	I participate in health campaigns or sensitization programs on malaria prevention			

Research item 3.4 and 5

Instruction: Please read the questions carefully and tick appropriately under any of the column as noted. Do not tick more than one option in a question in this section

Guide: SA= (Strongly Agree), A=(Agree) D=(Disagree), SD=(Strongly Disagree)

	The environmental factors that promote the spread of malaria	**SA**	**A**	**UN**	**D**	**SD**
12	Stagnant water around the environment contributes to the spread of mosquitoes on campus					
13	Poor drainage systems within the university environment encourage mosquito breeding					
14	Accumulation of refuse and poor waste disposal in the university increases malaria risk					
15	Overgrown grasses and bushes around lecture halls and hostels promote mosquito breeding					
16	Poor sanitation facilities on campus contribute to the spread of malaria					
	The strategies that can be adopted to prevent the spread of malaria					
17	Regular use of insecticide-treated mosquito nets is an effective strategy for preventing malaria					
18	Consistent use of mosquito repellents (sprays, creams, coils) can reduce the spread of malaria					
19	Regular cleaning and removal of stagnant water around hostels and classrooms help prevent malaria					
20	Proper waste disposal and sanitation are essential strategies for reducing mosquito breeding					
21	Regular fumigation of the university environment is an effective way to prevent malaria					
	The barriers faced by students at the university of Benin in accessing malaria prevention					
22	The cost of insecticide-treated mosquito nets is a barrier to my use of them					
23	Limited availability of mosquito nets on campus prevents me from using them regularly					
24	Lack of access to affordable mosquito repellents makes it difficult to prevent malaria					
25	Limited access to university health services for malaria prevention is a major barrier					
26	Financial constraints prevent many students from seeking early medical treatment for malaria					

APPENDIX B

Reliability

RELIABILITY

/VARIABLES=A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13 A14 A15 A16 A17 A18 A19 A20 A21 A22 A23 A24 A25 A26

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA.

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	26	100.0
	Excluded[a]	0	.0
	Total	26	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.701	26