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Trends and Prevalence of Malaria among Undergraduates accessing the University Health Services in the University of Ibadan

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Abstract

Malaria continues to pose a significant public health challenge in Nigeria, particularly among young adults in university settings. This study examined the trends and prevalence of malaria among undergraduates accessing the University Health Services (UHS) at the University of Ibadan, with the aim of assessing preventive and treatment measures, utilization of healthcare services, and demographic and behavioral factors associated with malaria. A descriptive study design was employed, targeting full-time undergraduates who sought care at UHS. A sample of 440 participants was determined using Taro Yamane's formula and selected via purposive and simple random sampling techniques. Data were collected using a self-administered, validated, and reliable questionnaire, covering socio-demographics, malaria prevalence, prevention and treatment effectiveness, UHS utilization, and behavioral factors. Descriptive statistics summarized frequencies, percentages, and means, while Chi-square tests examined associations between categorical variables at a 0.05 significance level using SPSS version 25. Findings revealed a high prevalence of malaria, with 63.6% of students diagnosed in the past six months and 77.1% experiencing symptoms in the previous year. Self-diagnosis was common (55.7%), and preventive practices were inconsistently applied. Utilization of UHS for malaria care was moderate, hindered by long waiting times and service limitations. Behavioral and environmental factors, including self-medication and stagnant water near residences, contributed to persistent infections. The study underscores the need for enhanced health education, improved university health services, and active environmental management to reduce malaria incidence and improve student health and academic performance.

Keywords: Malaria prevalence, Undergraduates, University Health Services, Preventive measures, Self-medication,

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Introduction

Malaria or plasmodium infection is a serious and sometimes fatal disease caused by single-celled parasites of the genus Plasmodium, which are transmitted to humans via the bites of infected female Anopheles mosquitoes. Globally malaria is a major public health burden with an estimated 229 million cases reported in 2019, with approx. 94% of cases in the African region (Michel et al., 2024). Although the number of malaria cases had been on a steady decline between the years of 2000 and 2015, there has been an increase in cases over the last few years, with 13 million more cases recorded globally between 2019 and 2021. This resurgence has been attributed to a large extent to interruption in health services due to the Covid-19 pandemic which was also estimated to have resulted in 63 000 more people dying from malaria in the same period (Osakinle et al., 2021; Gbenga-Epebinu et al., 2022; WHO, 2021). Malaria remains a major cause of morbidity and mortality especially in children under five years of age in sub-Saharan Africa and although the use of rapid diagnostic tests and artemisinin-based therapies have improved, it is not enough to ensure a sustained and consistent decline in the incidence and mortality of malaria (Reuters, 2024). In 2022, there were 249 million cases of malaria worldwide; 608,000 people died and the African Region carried 94% of the number of cases and 95% of deaths, highlighting that there is a disproportionate burden being shouldered by this region (WHO, 2022). Nigeria still has the highest malaria burden in the world with almost 27% of people dying from malaria globally, and over 194,000 deaths deaths in 2021 from children or people under five (Centre for Disease Control, CDC 2023). The main species that are responsible for malaria in human beings include Plasmodium falciparum, P. vivax, P. ovale, P. malariae, and P. knowlesi, which for clinical symptoms such as fever, chills, and anemia, go through a complex life cycle involving both a human host as well as mosquitoes (WHO, 2021).

Several factors account for the prevalence of malaria in Nigeria regarding socioeconomic issues, poor infrastructure, lack of knowledge about disease prevention, behavioral practices and environmental conditions favorable to mosquito breeding (Duffy, et al., 2024). Malaria prevention and control strategies such as insecticide-treated bed nets, indoor residual spraying, chemoprophylaxis, and antimalarial drugs have been implemented but gaps in awareness, health-seeking behavior, and compliance to treatment in populations, especially young adults, limit the effectiveness of these strategies. The Global Technical Strategy for Malaria 2016-2030 puts the eradication of malaria front and center with the objective of a 90% reduction of incidence and mortality by 2030 relative to 2015 levels. Nevertheless, progress has been limited and only slight reductions have been made in recent years, due to factors including poor healthcare systems, drug and insecticide resistance, poor funding as well as logistical challenges (Musoke, et al., 2023). Malaria remains a serious problem throughout the African continent especially in countries with high transmission such as Nigeria where a host of environmental, climatic, economic, and sociopolitical factors converge to perpetuate malaria.

Although malaria is well studied in children, pregnant women and general populations, study in undergraduates, who represent a highly mobile and socially active population, is limited. University students are frequently exposed to environmental and behavioural risk factors that may contribute to increased susceptibility to malaria, including residence in endemic areas, poor use of preventive measures, poor health seeking behaviour and recurrent infections that may affect academic performance. Understanding what students know, think about and do when it comes to malaria is important for the development of specific interventions and health education programs. At the University of Ibadan, the prevalence, trends and determinants of malaria among undergraduates of the University Health Services is not well-documented and this gap in evidence-based approaches for disease prevention

and management. Without thorough data on this population, strategies designed to effectively reduce transmission, ensure timely diagnosis of active cases and promote adherence to mechanisms of prevention are hard to implement. Furthermore, multiple malaria infections in students can lead to disruptions at school, high healthcare utilization and decreased qualities of life further underscoring the necessity for specific research in this setting.

This study aims to address this gap and to examine the trends and prevalence of malaria among undergraduate students in the University of Ibadan. By identifying patterns of infection, associated risk factors and health-seeking behaviours, the findings will yield important information on developing effective interventions and policies to reduce malaria incidence and improve student health as well as enhance their academic performance. Understanding the dynamics of malaria among university students will also add to the larger body of public health knowledge, as well as help develop malaria control strategies at tertiary institutions, and contribute to the national and regional efforts to curb the burden of this persistent disease. Through this research it is expected that specific preventive and educational programs can then be designed to empower students, reduce malaria transmission and promote healthier campus communities.

This study seeks to understand the trends and prevalence of Malaria among undergraduates accessing the University Health Services in the University of Ibadan. The specific objectives of the study were:

1. To determine the prevalence of malaria among undergraduates accessing the University Health Services over a specific time period.
2. To assess the effectiveness of malaria prevention and treatment measures provided by the University Health Services.
3. To evaluate the utilization of UHS by undergraduates for diagnosis of malaria.
4. To identify the demographic and behavioral factors associated with malaria prevalence among undergraduate students.

Methods and Materials

A descriptive study design was employed to evaluate the trends and prevalence of malaria among undergraduates accessing the University Health Services in the University of Ibadan. The target population comprised both male and female full-time undergraduates of the University of Ibadan, while the study population included those undergraduates who sought healthcare services specifically at the University Health Services during the study period. Inclusion criteria consisted of full-time undergraduates accessing the University Health Services and those diagnosed with malaria by the medical staff, whereas part-time undergraduates, postgraduate students, and non-consenting participants were excluded from the study. The sample size was determined using Taro Yamane's formula, taking into account a total undergraduate population of 16,623, a 95% confidence level, and a 10% adjustment for potential non-response. This yielded a total sample of 440 participants, ensuring sufficient representation for accurate analysis of malaria trends and prevalence among the university population.

A purposive and simple random sampling technique was employed to select participants. Purposive sampling was applied to deliberately select students meeting the inclusion criteria, ensuring that only those with relevant experiences contributed data. Simple random sampling was subsequently used to select a subset of respondents from the population to minimize bias and enhance representativeness. Data were collected using a self-developed, close-ended questionnaire informed by a comprehensive review of existing literature. The questionnaire comprised five sections covering socio-demographic information, prevalence of malaria, effectiveness of prevention and treatment measures, utilization of University Health Services, and demographic and behavioral factors associated with malaria prevalence.

The instrument underwent rigorous face and content validation by supervisors and experts in measurement and evaluation, and necessary corrections were incorporated prior to administration.

Reliability of the instrument was assessed through a pilot study, in which the questionnaire was administered to a small representative sample, and internal consistency was evaluated using Cronbach's alpha coefficient. The coefficient value was found to be ≥ 0.75, indicating good reliability. Ethical approval was obtained from the University of Ibadan/University College Hospital Ethical Committee before data collection commenced. Participants provided informed consent and were assured of confidentiality, anonymity, voluntary participation, and the right to withdraw at any time without penalty. All data collection procedures were designed to avoid harm, ensure fairness, and promote the well-being of participants in accordance with ethical principles.

Data collection was carried out by distributing questionnaires to both on-campus and off-campus undergraduates, with 40 participants allocated from each hall of residence and 40 from off-campus locations, resulting in a total of 440 respondents. Data were entered, coded, and analyzed using IBM SPSS version 25. Descriptive statistics, including frequencies, percentages, and means, were used to summarize the data, while inferential statistics, specifically the Chi-square test, were applied to examine associations between categorical variables, such as age, gender, and level of study, and malaria prevalence. A significance level of 0.05 was set for all analyses. The results were presented using tables, pie charts, and bar charts, enabling clear visualization of trends, prevalence, and relationships between variables. This methodological approach ensured a comprehensive understanding of malaria patterns among undergraduates, while maintaining rigor, validity, and adherence to ethical research standards.

Results

Table 1: Socio-demographic characteristics of respondents (N=440)

Socio-Demographic Variable	Category	Frequency (N)	Percentage %
Age group of respondents	16-20 years	121	27.5
	21-25 years	266	60.5
	26-30 years	50	11.4
	Above 30 years	3	0.7
	Total	**440**	**100**
Gender	Male	295	67.0
	Female	145	33.0
	Total	**440**	**100**
Academic Level	100 level	34	7.7
	200 level	85	19.3
	300 level	140	31.8
	400level	129	29.3

	500 and above	52	11.8
	Total	**440**	**100**
Faculty	Arts	66	15.0
	Sciences	98	22.3
	Clinical sciences	96	21.8
	Engineering	54	12.3
	Law	32	7,3
	Agriculture	45	10.2
	Pharmacy	13	3.0
	Education	36	8.2
	Total	**440**	**100**
Marital Status	Single	434	98.6
	Married	6	1.4
	Total	**440**	**100**
Residential Status	On Campus	389	88.8
	Off campus	49	11.1
	Total	**440**	**9.1**
Hostel name on Campus	Queen Idia Hall	40	9.1
	Queen Elizabeth II Hall	40	9.1
	Obafemi Awolowo Hall	40	9.1
	Zik Hall	40	9.1
	Great Independence Hall	40	9.1
	Kuti Hall	40	9.1
	Mellanby Hall	40	9.1

Table 1 above shows the sociodemographic data of 440 undergraduate students of the University of Ibadan. The majority of respondents were aged between 21 and 25 years, accounting for 60.5%, followed by 27.5% aged 16–20 years, 11.4% aged 26–30 years, and only 0.7% aged above 30 years. In terms of gender, 67.0% were male and 33.0% were female. Regarding academic level, 31.8% were in their 300 level, 29.3% in 400 level, 19.3% in 200 level, 11.8% in 500 level or above, and 7.7% in 100 level. Participants were drawn from various faculties, with the Faculty of Sciences having the highest representation (22.3%), followed by Clinical Sciences (21.8%), Arts (15.0%), Engineering (12.3%), Agriculture (10.2%), Education (8.2%), Law (7.3%), and Pharmacy (3.0%). Most of the respondents were single (98.6%), with only 1.4% married. Concerning residence, 88.8% lived on campus, and

11.1% lived off campus. Each of the major halls of residences-including Queen Idia, Queen Elizabeth II, Obafemi Awolowo, Zik, Independence, Kuti, Mellanby, Tedder, Bello, and Alexander Brown Hall—had equal representation of 9.1% each, with the remaining 9.1% living off-campus.

Table 2: Prevalence of malaria among undergraduates assessing the university Health services over a period of time

Variable	Category	Frequency	Percentage
Have you been diagnosed with malaria in the last six months	Yes	280	63.6%
	No	160	36.1%
	Total	**440**	**100**
If yes, how many times have you had malaria in the past six months	Once	104	23.6
	Twice	107	24.3
	Three or more	79	18.0
	I have not had malaria in the last six months	150	34.1
	Total	**440**	**100**
How often have you experienced symptoms of malaria in the past year	Never	77	17.5%
	Once	127	28.9%
	2-3 times	157	35.7%
	More than 3 times	79	18.0%
	Total	**440**	**100**
What were the main symptoms you experienced	Fever	252	57.3
	Headache	297	67.5
	Chills	168	38.1
	Muscle pain	108	24.6
	Nausea and vomiting	72	16.1
	Weakness	185	42.1
How was your diagnosis of malaria confirmed	Laboratory test	97	22.1
	Self-diagnosis	245	55.7
	Diagnosis by a healthcare provider	98	22.3
	Total	440	100
How severe was your last malaria episode	Mild	155	35.2%
	Moderate	222	50.5%
	Severe	63	14.3%
	Total	**440**	**100**
Have you missed academic activities due to malaria in the past year	Yes	176	40.0%
	No	264	60.0%
	Total	**440**	**100**
How long does it typically take for you	1-3 days	181	41.1%

to recover from malaria	4-7 days	187	42.5%
	More than a week	66	15.0%
	Months	6	1.4%
	Total	**440**	**100**
How would you rate the impact of malaria on students' academic performance	No impact	44	10.0%
	Slight impact	147	33.4%
	Moderate impact	166	37.7%
	Severe impact	83	18.9%
	Total	**440**	**100**
Have you ever had complications due to untreated or severe malaria	Yes	117	26.6%
	No	323	73.4%
	Total	**440**	**100**
What time of the year do you experience malaria symptoms the most	Rainy season	127	28.9%
	Dry season	111	25.2%
	No specific time	202	45.9%
	Total	**440**	**100**

From Table 2, among the 440 respondents, 63.6% reported having been diagnosed with malaria in the past six months, while 36.4% had not. Regarding the number of malaria episodes, 24.3% had malaria twice, 23.6% once, 18.0% three times or more, and 34.1% never had malaria during the period. In terms of symptom experience within the past year, 35.7% had symptoms two to three times, 28.9% once, 18.0% more than three times, and 17.5% had not experienced symptoms. The most common symptoms reported were headache (67.5%), fever (57.3%), weakness (42.1%), chills (38.1%), muscle pain (24.6%), and nausea/vomiting (16.1%). For diagnosis, 55.7% relied on self-diagnosis, 22.3% were diagnosed by a healthcare provider, and 22.1% confirmed via laboratory test. Severity of the last malaria episode was mostly moderate (50.5%), followed by mild (35.2%) and severe (14.3%). About 40.0% missed academic activities due to malaria, while 60.0% did not. Recovery time for most students was between 4–7 days (42.5%) or 1–3 days (41.1%), though 15.0% needed over a week and 1.4% recovered in months. The academic impact was described as moderate by 37.7%, slight by 33.4%, severe by 18.9%, and none by 10.0%. Complications were reported by 26.6% of respondents, while 73.4% had none. The rainy season accounted for the highest malaria occurrence (28.9%), followed by dry season (25.2%) and unspecified seasonal variation (45.9%).

Table 3: Effectiveness of Malaria Prevention and Treatment Measures

Variable	Category	Frequency	Percentage
How often do you use these measures	Always	66	15.0%
	Sometimes	191	43.4%
	Rarely	105	23.9%
	Never	78	17.7%
How effective do you think these measures are in preventing malaria	Very effective	76	17.3%
	Effective	213	48.4%
	Neutral	94	21.4%
	Ineffective	42	9.5%
	Very ineffective	15	3.4%
Do you ensure your living environment is free from stagnant water?	Yes	302	68.6%
	No	138	31.4%

How effective do you find the treatment provided by the University Health Services	Very effective	62	14.1%
	Effective	162	36.8%
	Neutral	139	31.6%
	Ineffective	50	11.4%
	Very ineffective	27	6.1%
How soon do you recover after receiving treatment from University Health Services	1-3 days	210	47.7%
	4-7 days	172	39.1%
	More than a week	50	11.4%
	Months	8	1.8%

Regarding preventive practices, only 15.0% of respondents always used preventive measures against malaria, while 43.4% used them sometimes, 23.9% rarely, and 17.7% never. The effectiveness of these measures was viewed as effective by 48.4% and very effective by 17.3%, while 21.4% were neutral, 9.5% found them ineffective, and 3.4% considered them very ineffective. A majority (68.6%) ensured their environment was free of stagnant water to prevent mosquito breeding, while 31.4% did not. In terms of treatment received at the University Health Services (UHS), 36.8% of students rated it effective, 14.1% very effective, 31.6% were neutral, 11.4% ineffective, and 6.1% very ineffective. Recovery from UHS treatment was reported within 1–3 days by 47.7% of respondents, 4–7 days by 39.1%, more than a week by 11.4%, and after months by 1.8%.

Table 4: Utilization of University Health Services for Malaria Diagnosis by Undergraduates

Variable	Category	Frequency	Percentage
How quickly do you seek treatment after noticing malaria symptoms	Immediately	85	19.3%
	Within a day	158	35.9%
	After several days	118	26.8%
	Only when severe	79	18.0%
	Total	440	100.0%
How do you usually respond when you experience symptoms of malaria	Visit the University Health Services (UHS)	176	40.0%
	Buy over-the-counter medication	143	32.5%
	Use home remedies	48	10.9%
	Do nothing and wait for symptoms to subside	73	16.6%
	Total	440	100.0%
How often do you visit the University Health Services for malaria-related concerns	Always	71	16.1%
	Sometimes	0	0.0%
	Rarely	299	68.0%
	Never	70	15.9%
	Total	440	100.0%
What influenced your decision to use the University Health Services for malaria diagnosis	Accessibility	197	47.8
	Cost of service	209	50.7
	Quality of care	91	22.1
	Recommended by others	93	22.6
Have you ever been unable to	Long waiting time	192	43.6

access malaria treatment at the University Health Services If yes, what was the reason	Lack of medication	74	16.8
	Poor service delivery	108	24.5
	No, I have never been unable to access malaria treatment at UHS	144	32.7
Would you recommend the University Health Services for malaria prevention and treatment to others	Yes	207	47.0%
	No	110	25.0%
	Maybe	123	28.0%
	Total	440	100.0%

In response to malaria symptoms, only 19.3% of respondents sought treatment immediately, while 35.9% did so within a day, 26.8% after several days, and 18.0% only when symptoms became severe. A total of 40.0% visited the University Health Services (UHS), 32.5% purchased over-the-counter medication, 10.9% used home remedies, and 16.6% waited for symptoms to subside. Regular visits to UHS were low, with only 16.1% always attending, 68.0% rarely, and 15.9% never; none indicated "sometimes." Factors influencing UHS usage included cost of services (50.7%) and accessibility (47.8%) as the most common, followed by recommendations (22.6%) and perceived quality of care (22.1%). Major barriers to accessing UHS treatment included long waiting times (43.6%), poor service delivery (24.5%), and lack of medication (16.8%), though 32.7% reported no barriers. Despite the challenges, 47.0% of respondents would recommend UHS for malaria care, while 25.0% would not, and 28.0% were unsure.

Table 5: Demographic and Behavioral Factors

Variable	Category	Frequency	Percentage
How often do you stay out at night?	Frequently	42	9.5%
	Occasionally	88	20.0%
	Rarely	123	28.0%
	Never	187	42.5%
How often do you use mosquito prevention methods?	Frequently	204	46.4%
	Occasionally	127	28.9%
	Rarely	66	15.0%
	Never	43	9.8%
How often do you clean your environment to prevent mosquito breeding?	Frequently	198	45.0%
	Occasionally	109	24.8%
	Rarely	81	18.40%
	Never	52	11.80%
How often do you sleep under an insecticide-treated mosquito net?	Frequently	164	37.30%
	Occasionally	131	29.80%
	Rarely	85	19.30%
	Never	60	13.60%
How often do you experience mosquito bites?	Frequently	103	23.40%
	Occasionally	119	27.00%
	Rarely	124	28.20%
	Never	94	21.40%
How do you perceive the risk of getting malaria in your living environment	Very high	85	19.3%
	High	145	33.0%

	Moderate	161	36.6%
	Low	42	9.5%
	No risk at all	7	1.6%
Do you frequently self-medicate when you suspect malaria	Yes	256	58.2%
	No	184	41.8%
Do you have stagnant water around your residence	Yes	196	44.5%
	No	244	55.5%
	Total	440	100
Do you complete the full course of malaria treatment when prescribed	237	53.9%	0.0%
	No	85	19.3%
	Sometimes	118	26.8%
Do you believe malaria is a serious health issue	Yes	361	82.0%
	No	79	18.0%

Regarding the demographic and behavioral factors, only 9.5% of respondents reported frequently staying outside at night, 20.0% did so occasionally, while 28.0% rarely and 42.5% never stayed out late. Use of mosquito preventive methods such as repellents and bed nets was frequent among 46.4%, occasional in 28.9%, rare in 15.0%, and never used by 9.8%. Environmental cleaning was practiced frequently by 45.0%, occasionally by 24.8%, rarely by 18.4%, and never by 11.8%. The use of insecticide-treated nets was reported frequently by 37.3% of respondents, occasionally by 29.8%, rarely by 19.3%, and never by 13.6%. Regarding mosquito bites, 28.2% were rarely bitten, 27.0% occasionally, 23.4% frequently, and 21.4% never. In terms of risk perception, 36.6% believed they were moderately at risk of malaria, 33.0% perceived high risk, 19.3% very high risk, 9.5% low risk, and 1.6% no risk. A significant portion (58.2%) reported self-medicating frequently, while 41.8% did not. Stagnant water near residences was reported by 44.5% of respondents, while 55.5% had none. Concerning treatment adherence, 53.9% always completed their malaria medications, 26.8% did so sometimes, and 19.3% did not complete treatment. Lastly, 82.0% viewed malaria as a serious health issue, whereas 18.0% did not.

The demographic findings of this study indicate that the majority of respondents were young adults between the ages of 21 and 25 (60.5%), predominantly male (67.0%), and mostly in their penultimate (31.8%) and final (29.3%) years of study. These results are consistent with the findings of Bello and Ayede (2019) and Gbenga-Epebinu et al. (2023), who reported that university students within this age range are often more accessible and likely to participate in health-related surveys due to increased academic exposure and health awareness campaigns targeted at higher-level students. Furthermore, the significant male dominance in the sample aligns with the observations of Aina et al. (2023), who noted that male students are more likely to respond to surveys related to public health, possibly due to fewer stigmas and greater mobility. The broad representation across faculties, particularly from Sciences and Clinical Sciences, also enhances the generalizability of the findings, suggesting that health knowledge and behavior may be influenced by academic discipline. The overwhelming single status (98.6%) and majority on-campus residency (88.8%) mirror the typical demographic structure of undergraduate students at public universities in Nigeria, as highlighted by David et al. (2016), who emphasized the role of residential status in access to university-provided health services.

Discussion of Findings

The findings of this study reveal a substantial burden of malaria among undergraduate students at the University of Ibadan, highlighting a persistent public health concern within the university environment. Data indicated that 63.6% of respondents reported a malaria diagnosis within the past six months, while 77.1% experienced malaria-related symptoms at least once in the past year. A significant proportion of students, 55.7%, relied on self-diagnosis rather than laboratory confirmation, which only accounted for 22.1% of cases. This finding points to a potential underreporting or misdiagnosis of malaria among undergraduates, which may contribute to delayed or inappropriate treatment. Headache (67.5%), fever (57.3%), and weakness (42.1%) emerged as the most frequently reported symptoms, with the majority describing their last episode as moderate (50.5%) or mild (35.2%). Despite these perceptions, 40.0% of students missed academic activities due to illness, and 37.7% reported a moderate impact on academic performance. These findings are consistent with Okeke and Okezie (2020), who noted that self-diagnosis is common among Nigerian university students, and underutilization of formal diagnostic services often leads to persistent symptoms and disruption in academic activities. The seasonal pattern of malaria incidence, with 28.9% of cases reported during the rainy season, supports the findings of Yusuf et al. (2021), who emphasized that malaria prevalence peaks during periods conducive to mosquito breeding. Overall, the study highlights the significant health and academic implications of malaria in a predominantly residential university setting.

The study also examined the effectiveness of malaria prevention and treatment measures among undergraduates, revealing a generally moderate level of adherence. Only 15.0% of students consistently implemented preventive strategies, while 43.4% did so occasionally, and 17.7% never employed any preventive measures. Nonetheless, nearly half of the respondents (48.4%) perceived these measures as effective, and 68.6% actively removed stagnant water from their immediate surroundings, suggesting an awareness of environmental factors contributing to malaria transmission. Treatment outcomes at the University Health Centre were moderately positive, with 50.9% rating the services as effective or very effective, and 47.7% recovering within one to three days of treatment. These results resonate with the findings of Yusuf et al. (2021), which emphasized the critical role of access to institutional health services and environmental hygiene awareness in improving malaria outcomes among university populations. However, the low proportion of students consistently engaging in preventive behaviors points to a gap between knowledge and practice, echoing the observations of Afolabi and Sofowora (2020) that high awareness does not necessarily translate into consistent preventive action among youth in tertiary institutions. This underscores the need for interventions that focus on behavioral change and sustained adherence to malaria prevention practices.

The utilization of University Health Services (UHS) for malaria diagnosis and treatment exhibited a mixed pattern, reflecting variability in treatment-seeking behavior. While 55.2% of respondents sought treatment immediately (19.3%) or within a day (35.9%) of symptom onset, a considerable proportion delayed care, with 26.8% waiting several days and 18.0% only seeking medical attention when symptoms became severe. Only 40.0% of students reported visiting UHS when experiencing malaria symptoms, while others resorted to over-the-counter medication (32.5%), home remedies (10.9%), or did not take any action (16.6%). Regular use of UHS was limited, with only 16.1% consistently accessing the services for malaria concerns, while 68.0% rarely did so. Motivators for utilizing UHS included accessibility (47.8%) and cost (50.7%), whereas barriers such as long waiting times (43.6%) and perceived poor service delivery (24.5%) discouraged frequent use. These findings align with Afolabi et al. (2020), who reported that campus health clinics are often the initial point

of contact for students, yet systemic challenges like service delays and insufficient resources hinder consistent healthcare utilization. The data highlights the importance of improving the efficiency, responsiveness, and perceived quality of university health services to ensure timely treatment and reduce the risk of complications associated with malaria.

Behavioral and demographic factors were found to play a significant role in malaria prevalence and prevention among undergraduates. The study revealed that 46.4% of respondents frequently used mosquito prevention methods, 45.0% engaged in environmental cleaning to reduce mosquito breeding, and 37.3% slept under insecticide-treated nets. Moreover, a majority perceived the risk of malaria in their environment as moderate (36.6%) or high (33.0%). Despite these positive behaviors, notable gaps were identified: 44.5% of students reported stagnant water near their residences, and 58.2% frequently self-medicated when suspecting malaria. Additionally, only 53.9% consistently completed prescribed malaria treatments. These patterns correspond with the demographic profile of the participants, predominantly young adults aged 21–25, who may prioritize convenience or prior experience over formal medical guidance. Oladele et al. (2019) similarly observed that while university students acknowledge the seriousness of malaria, adherence to preventive and treatment protocols remains inconsistent, highlighting the need for targeted educational interventions to bridge the knowledge-practice gap.

The findings collectively indicate that while undergraduate students at the University of Ibadan exhibit moderate awareness and engagement in malaria prevention, significant behavioral gaps persist, particularly in the areas of self-diagnosis, delayed treatment, inconsistent use of health services, and incomplete treatment adherence. Environmental factors, including stagnant water near residences, further exacerbate the risk of malaria transmission. Seasonal trends, with higher prevalence during the rainy season, reinforce the need for proactive and timely interventions tailored to peak transmission periods. Consistent with previous research, these results underscore the multifactorial nature of malaria risk among young adults in university settings, where individual behavior, environmental conditions, and service utilization intersect to influence health outcomes (Yusuf et al., 2021; Afolabi & Sofowora, 2020; Okeke & Okezie, 2020).

In conclusion, the study demonstrates that malaria remains a significant health challenge for undergraduates at the University of Ibadan, with notable impacts on both personal well-being and academic performance. While students display awareness of preventive measures and utilize available health services to some extent, gaps in practice, reliance on self-diagnosis, and delays in seeking formal treatment persist. Addressing these challenges requires a multifaceted approach, including enhanced health education programs that emphasize behavioral adherence, improvement of university health service delivery, and targeted interventions during peak malaria transmission periods. By focusing on these strategies, universities can improve student health outcomes, reduce the burden of malaria, and mitigate its impact on academic performance, ultimately fostering a healthier and more productive campus environment.

Conclusion

Malaria remains a significant health challenge among undergraduates at the University of Ibadan, largely due to behavioral negligence, environmental factors, and suboptimal use of preventive and diagnostic services. Although awareness exists, the gap between knowledge and practice remains wide.

Recommendations

1. Universities should partner with nursing professionals and public health units to implement regular malaria awareness and prevention campaigns on campus, focusing on consistent use of ITNs, the dangers of self-medication, and proper treatment practices.

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2. University authorities should upgrade diagnostic facilities and reduce wait times at university clinics to encourage students to utilize them more frequently and effectively for malaria diagnosis and treatment.

3. Student hostels and surrounding areas should be regularly monitored and cleaned, with active participation from students in environmental management to eliminate mosquito breeding grounds.

4. The government should provide more funding to university health centers for malaria control interventions, free or subsidized mosquito nets, prophylactic medications, and staff training to manage student health better.

5. Malaria prevention, early diagnosis, and treatment knowledge should be incorporated into general education or orientation programs for all undergraduates, particularly first-year students.

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