Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol. 6 No. 3 (2025): March 2025 Issue
https://doi.org/10.51168/sjhrafrica.v6i3.1530
Original Article

FACTORS ASSOCIATED WITH MALARIA PREVALENCE AMONG UNIVERSITY STUDENTS AT LIRA UNIVERSITY TEACHING HOSPITAL, LIRA CITY. A CROSS-SECTIONAL STUDY.

Nasser Ashaba[1], Janet Mary Atai[1], Tom Murungi*[4], Florence Layet[1], Marvin Musinguzi[1], Freda Amito[3], Anne Ruth Akello[1], Eustes Kigongo[1], Marc Sam Opollo[2].

[1]Department of Environmental Health and Disease Control, Faculty of Public Health, Lira University, P.O. BOX 1035, Lira City, Uganda
[2]Department of Community Health, Faculty of Public Health, Lira University, P.O. Box 1035, Lira City, Uganda.
[3]Department of Public Health Nutrition, Faculty of Public Health, Lira University, P.O. Box 1035, Lira City, Uganda.
[4]Department of Midwifery, Faculty of Nursing and Midwifery, Lira University, P.O. Box 1035, Lira City, Uganda.

Abstract

Background

Malaria is a leading cause of death and disease in many developing countries. Lira district remains an endemic area for malaria in Uganda, greatly impacting the lives of many. The study investigated the factors associated with Malaria prevalence among Lira University students at Lira University Teaching Hospital, Lira City.

Methodology

A cross-sectional mixed methods study was conducted among 340 participants between March and April 2023. Participants were sampled by convenience sampling and data was collected using an interviewer-administered questionnaire. Data was entered and analyzed in SPSS version 26 at univariate, bivariate, and multivariate levels. Binary logistic regression both at bivariate and multivariate analysis was done. Qualitative data was collected from 16 purposively sampled participants using an in-depth interview guide and was analyzed manually through thematic content analysis.

Results

A total of 340 participants were recruited, achieving a 100% response rate. The majority 248(76.5%) of the participants were aged 18-24. Half, 165(50.9%) were males, most, 263(81.2%) were single, and 208(64.2%) were unemployed. About a third, 119(36.7%) and 121(37.3%) were Anglicans and were from the Faculty of Nursing and Midwifery respectively. **T**he prevalence of malaria among the students was 13.3% (95% CI=9.6 - 16.99). The factors associated with the malaria prevalence were; staying around bushy areas (AOR: 2.03; 95% CI: 1.05-3.92) and use of mosquito repellants (AOR: 2.09; 95% CI: 1.09-4.04). Qualitatively, most participants reported bushy environments and stagnant water to be contributing to the high prevalence.

Conclusion

The prevalence of malaria among students was 13.3%. The study starkly illustrates that mosquito repellents provide little to no protection against malaria, whereas lingering near overgrown, bushy areas significantly heightens the risk of contracting the disease.

Recommendation

There is a need for a wide-ranging and coordinated approach to malaria prevention and control, encompassing environmental management and personal protective measures.

Keywords: *Malaria, Prevalence, University Students.*
Submitted: *2025-01-25* ***Accepted:*** *2025-02-21* ***Published:*** *2025-03-20*

Corresponding Author: *Tom Murungi*
Email: *tommurungi1999@gmail.com*
Department of Midwifery, Faculty of Nursing and Midwifery, Lira University, P.O. Box 1035, Lira City, Uganda.

Background

Malaria is a disease caused by intracellular parasites of the genus Plasmodium, and 5 species namely: Plasmodium falciparum, Plasmodium vivax, Plasmodium ovale, Plasmodium malaria, and Plasmodium knowlesi (1). It is one of the most severe public health problems worldwide and a leading cause of death and disease in many developing countries (2).

Globally, according to the World Malaria Report 2023, there were 247 million cases of malaria in 2023 (uncertainty range 218–269 million) and 619,000 malaria deaths (uncertainty

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol. 6 No. 3 (2025): March 2025 Issue
https://doi.org/10.51168/sjhrafrica.v6i3.1530
Original Article

range 583–765 thousand), and 95% of all malaria cases are in WHO African Region (3). Four African countries accounted for just over half of all malaria deaths worldwide: Nigeria (27%), the Democratic Republic of Congo (12%), Uganda (5%) and Mozambique (4%)(4). The overall Ugandan prevalence is attributed to the world's highest malaria incidence rate of 478 cases per 1,000 population per year with a prevalence of 15.1% in the Lira district (5)

In institutions and schools, the government of Uganda through the MOH, in response to malaria prevention and control has put in place several interventions like giving out free insecticide-treated nets and teaching about how to prevent malaria by sleeping under bed nets, wearing long sleeves and long pants in the early mornings and evenings, and by draining mosquito breeding grounds, (6), all to ensure that malaria is addressed at all levels, on all fronts for maximum impact on the disease focusing on the integration of the most effective prevention and treatment tools. Both indoor residual spraying of insecticides (IRS) and large-scale use of long-lasting insecticide-treated nets were promoted to have the most rapid and sizable impact on the transmission of this disease. Management of malaria at the community level was attached to the availability of the most effective medicines at all levels and the use of the newest diagnostic tools including rapid diagnostic tests, to ensure proper diagnosis at lower health facilities.

Recently, there has been an increase in attention, funding, and political will to improve malaria control and prevention and the process is complemented by the National Malaria Control Strategic Plan. Within the MOH, the National Malaria Control Program (NMCP) has the mandate to reduce malaria morbidity, prevent mortality, and minimize the social effects and economic losses attributable to malaria in Uganda(15). The success of this policy will require continued close linkages and coordination between all partners to ensure we meet the common goal of malaria control and eventual elimination from Uganda and attain the vision of a "Malaria-free Uganda"(7).

In 2014, as a response to the upsurge of malaria in the Lira district, the Government of Uganda introduced In-door Residual Spraying (IRS) in the fight against malaria. Malaria morbidity records from four health facilities were reviewed, focusing on 6 months before and after the IRS intervention, and results showed that the proportion of outpatient attendance due to malaria dropped from 18.7% before spraying to 15.1% after IRS (8). Despite all the interventions put in place, In a report of August 2022, the Lango sub-region was reported to record 232000 cases in 2 months according to data obtained from health centers in the Lira district for instance the positivity rate was at 68% in Lira district(9). In 2022, at Lira University Hospital, the percentage of cases seen in the outpatient department was 26.8, whereas that of the In-Patient Department was 36.3 giving the overall total prevalence of 63.1%(10). This indicates that whereas the government has put in place interventions to reduce malaria prevalence in the Lira district, there seems to exist a gap and many limitations within the control measures.

Several factors are known to be associated with the prevalence of malaria in the Lira district for example Socio-demographic, Environmental, and others (11). However, the exact factors influencing prevalence among Lira University students are not known. Given the fact that malaria continues to be the major cause of mortality and morbidity in Uganda, yet IRS was done in the community, the prevalence of malaria is expected to decline but has not yet been fully realized. It is upon this background that this study explored factors associated with malaria prevalence among Lira University students at Lira University Teaching Hospital (LUTH).

Materials and methods

Study Design

This was a cross-sectional study that employed quantitative and qualitative methods of data collection for Lira University students in March 2023.

Study Site and Setting

This study was conducted at Lira University Teaching Hospital, located in Ayere Ward, Lira City West Division. Lira University is located on approximately 500 acres of land, off Lira Kamdini road, about 11 kilometers by road, northwest of Lira city. The coordinates of the University campus are 2015'04.0N,32049'16.0''E (Latitude: 2.25111; Longitude:32.821111). The hospital provides general and specialized medical and surgical services to both the students and the community. The student population served is about 1,285, living both in gazetted and non-gazetted hostels of the University. Medical services such as malaria testing and treatment are free and accessible to all students at the teaching hospital.

Study Population

The study recruited Lira University students who received care and treatment at Lira University Hospital, student leaders, and healthcare workers at Lira University Teaching Hospital.

Sample Size Determination

For quantitative, the sample size was determined using the Yamane (1967) formula of sample size determination as follows; **n = N / (1 + Ne^2)**

Where: n=the sample size (respondents to be interviewed), e =the precision of the study (5%), N= population size=1,104 enrolled undergraduate students (statistics from Academic registrar) from a total of 1,285 students enrolled. After considering the 10% non-response rate, the sample size was 324.

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol. 6 No. 3 (2025): March 2025 Issue
https://doi.org/10.51168/sjhrafrica.v6i3.1530
Original Article

For qualitative data, 16 participants were purposively sampled and recruited for the key informant interviews.

Sampling Procedures

Quantitative

A consecutive sampling technique was used to select the respondents whereby any student who came for a medical check-up and treatment at the hospital was interviewed.

Qualitative

The researcher purposively sampled student leaders from the hostels, class leaders, and students who were part of the university student leadership body as well as healthcare workers at LUTH.

Eligibility Criteria

Inclusion criteria.

The study included current Lira University Students who were seeking healthcare at Lira University Hospital at the time of data collection. Also, the student leaders and healthcare workers at LUTH.

Exclusion criteria

Those who were too sick to give information, and those who were unable to talk were excluded from the study.

Data collection method and instrument

Quantitative data was collected from participants who were recruited from the Outpatient Department of Lira University Teaching Hospital. The consent process involved accepting to be tested for malaria using the rapid testing kit. The researchers conducted face-to-face interviews with the participants in a separate clinical room and data was collected from them using a pre-tested, semi-structured, interviewer-administered questionnaire.

Malaria prevalence among the Lira University Students was determined by testing the students who came for treatment at Lira University Hospital and consented to be tested for malaria using the Malaria rapid diagnostic tests, CareStartTM, Malaria PAN (Pldh) Ag RDT (Access Bio, Inc.). Sample withdrawal and testing were conducted by a trained laboratory technician at Lira Teaching University's laboratory. Positive malaria diagnosis was confirmed when a test line appeared on the rapid diagnostic test strip for malaria.

Qualitative data was collected by conducting key informant interviews with student leaders from the hostels, class leaders, and students who were part of the university student leadership body. A key informant guide, which had open-ended questions was used to collect data and participant responses were audio recorded.

Quality control

Before conducting the study, the data collection tools were pretested among 34 students at Uganda Martyrs University Lira Campus. Potential confounding factors such as age, gender, and lifestyle habits were identified in advance and controlled for in the statistical analysis. Multivariable analysis techniques were used to adjust for these confounders, allowing for a clearer understanding of the true associations between factors and malaria prevalence. A comprehensive informed consent process was implemented to encourage honest and accurate responses. Participants were assured of confidentiality, which aimed to reduce social desirability bias. Additionally, all students meeting the inclusion criteria were given an equal opportunity to participate in the study.

Data management

Data from the questionnaires was entered manually into the Statistical Package for the Social Sciences (SPSS) version 26 software with the variables in the Variable View and their values in the Data View. After entering the data, the statistical command (list) under the analyze data by the SPSS software was used to identify the missing data at entry. Mistakes at the entry were identified through validation and corrected by recalling the questionnaire using its unique identifier. However, if the item was left blank or answered incorrectly, the Replace Missing Values functional SPSS under the Transform option was used to obtain a value to replace the missing data point though this was much avoided as the questionnaire was interviewer-administered.

For qualitative data, audios were transcribed verbatim and kept by the principal investigator. Participant audio files were kept on the cloud and password protected which only the members of the research team could access.

Data analysis

Data exploration was first done to visualize the general features of the data to be analyzed. At the univariate level, an analysis of descriptive statistics was carried out to obtain percentages, frequency, mean, and median to describe the study participants by socio-demographic, and behavioral factors. At the bivariate level, associations between malaria prevalence and the independent variables were determined through univariate logistic regression, and the results were presented in a table with odds ratios, corresponding 95% confidence intervals, and p-values. Variables found to have an association ($p<0.2$) were further assessed by using binary logistic regression analysis after careful examination of underlying assumptions. The backward elimination method was used to build the final model with only variables with statistically significant associations ($p<0.05$). Odds ratios, corresponding 95% confidence intervals, and p-values were reported.

Qualitative data was analyzed manually using thematic analysis after coding and summarizing the data which involved the interpretation of non-numerical data like audio,

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol. 6 No. 3 (2025): March 2025 Issue
https://doi.org/10.51168/sjhrafrica.v6i3.1530
Original Article

or images. In the analysis, 8 codes, 4 sub-themes, and 2 themes were generated. Data was presented using the explanatory sequential method.

Ethical Considerations

The study was conducted in compliance with the Helsinki Declaration. Ethical approval was obtained from the Uganda National Council of Science and Technology through the Lira University Research and Ethics Committee (LU-REC), LUREC-2022-6 approved on 25/01/2023. The Dean of Students, Lira University, and the Director, of Lira University Teaching Hospital granted permission to conduct the study. Written informed consent was sought from every participant. Confidentiality was observed throughout the study and thereafter. The participant's time was compensated at UGX 5000= (USD 1.35) after the interview.

Results

Data was obtained from 340 students at Lira University Hospital, Lira City, Northern Uganda with a 100% response rate. About 425 students were screened for eligibility, 45 did not meet eligibility criteria and 40 were not tested for malaria and thus excluded. Hence, 340 respondents who met the inclusion criteria and were tested for malaria were included in the study.

Quantitative results

Sociodemographic Characteristics of the participants

As shown in Table 1: The participants were 18 years and above and the majority, 248(76.5%) were in the 18-24 age group. Half, 165 (50.9%) of the participants were male, most, 263(81.2%) were Single, and almost two-thirds, 208(64.2%) of them were unemployed. More than a third, 119(36.7%) were Anglicans, and more than a third 121(37.3%) were from the faculty of Nursing and Midwifery

Table 1: Socio-demographic characteristics of the participants

Variable	Frequency(N=324)	Percent (%)
18-24	248	76.5
25-34	50	15.4
35 and above	26	8.0
Sex		
Male	165	50.9
Female	159	49.1
Marital status		
Single	263	81.2
Married	61	18.8
Employment status		
Formal employment	69	21.3
Self-employed	47	14.5
Un-employed	208	64.2
Religion		
Muslim	27	8.3
Anglican	119	36.7
Catholic	103	31.8
SDA	19	5.9
Born again	56	17.3
Faculty of Study		
Public Health	60	18.5
Nursing and Midwifery	121	37.3
Management sciences	40	12.3
Education	28	8.6
Medicine	29	9.0
Computing and Technology	46	14.2

Prevalence of malaria among Lira University Students

In this study, 43(13.3%) participants tested positive for malaria using the rapid diagnostic test (RDT).

Factors associated with malaria prevalence among Lira University students.

Malaria practices associated with malaria prevalence among Lira University students.

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol. 6 No. 3 (2025): March 2025 Issue
https://doi.org/10.51168/sjhrafrica.v6i3.1530
Original Article

At the Bivariate level, the practice that was significantly associated with malaria prevalence was 'use of mosquito repellants (p=0.02)'. **See Table 2**.

Table 2: Showing the relationship between malaria practices and malaria prevalence among Lira University students

Variable	Malaria status		Total	OR (95% CI)	P-value
	Positive n (%)	Negative n (%)			
Do you own an ITN					
Yes	37(86.0)	254(90.4)	291(89.8)	1.53(0.59-3.94)	0.383
No	6(14.0)	27(9.6)	33(10.2)	Ref	
Insecticide Treated mosquito net use.					
Yes	20(54.1)	133(51.6)	153(51.9)	1.74(0.63-4.78)	0.287
No	17(45.9)	125(48.4)	142(48.1)	Ref	
The current situation of the available ITN					
In good order	25(59.5)	192(70.3)	217(68.9)	2.00(0.74-5.39)	0.169
Torne	17(40.5)	81(29.7)	98(31.1)	Ref	
Is the ITN currently being used?					
Yes	36(97.3)	255(98.8)	291(98.6)	2.36(0.24-23.31)	0.462
No	1(2.7)	3(1.2)	4(1.4)	Ref	
Did you use it last night?					
Yes	31(83.8)	226(87.3)	257(86.8)	1.33(0.51-3.42)	0.560
No	6(16.2)	33(12.7)	39(13.2)	Ref	
Frequency of mosquito net use					
Always	27(73.0)	205(79.2)	232(78.4)	1.41(0.64-3.08)	0.395
Not always	10(27.0)	54(20.8)	64(21.6)	Ref	
Can you afford an ITN?					
Yes	35(81.4)	200(71.2)	235(72.5)	0.56(0.25-1.27)	0.166
No	8(18.6)	81(28.8)	89(27.5)	Ref	
Often slash tall grass from the compound.					
Yes	33(76.6)	210(74.7)	243(75.0)	0.90(0.42-1.91)	0.777
No	10(23.3)	71(25.3)	81(25.0)	Ref	
Use mosquito repellents					
Yes	21(48.8)	189(67.3)	210(64.8)	2.15(1.13-4.11)	0.020*****
No	22(51.2)	92(32.7)	114(35.2)	Ref	
Close windows at night					
Yes	43(100)	270(96.1)	313(96.6)	0.000	0.999
No	0(0.0)	11(3.9)	11(3.4)	Ref	
Room sprayed during IRS					
Yes	20(46.5)	131(46.6)	151(46.6)	1.00(0.53-1.91)	0.989
No	23(53.5)	150(53.4)	173(53.4)	Ref	

Statistically significant

Environmental factors associated with malaria prevalence among Lira University students

The environmental factor that was significantly associated with malaria prevalence was staying around a bushy environment (p=0.026) (**Table 3).**

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol. 6 No. 3 (2025): March 2025 Issue
https://doi.org/10.51168/sjhrafrica.v6i3.1530
Original Article

Table 3: Showing the relationship between Environmental factors and malaria prevalence among Lira University students

Variable	Malaria status		Total	OR(CI-95%)	P-value
	Positive n (%)	Negative n (%)			
Stay around a bushy environment.					
Yes	21(48.8)	187(66.5)	208(64.2)	2.08(1.09-3.98)	0.026*
No	22(51.2)	94(33.5)	116(35.8)	Ref	
Proximal to breeding sites: old tires, containers, and ponds					
Yes	20(46.5)	119(42.3)	139(42.9)	0.85(0.44-1.61)	0.608
No	23(53.5)	162(57.7)	185(57.1)	Ref	
Clean environment					
Yes	17(39.5)	105(37.4)	122(37.7)	0.91(0.47-1.76)	0.785
No	26(60.5)	176(62.6)	202(62.3)	Ref	
Farming activities					
Yes	8(18.6)	89(31.7)	97(29.9)	2.03(0.90-4.55)	0.086
No	35(81.4)	192(68.3)	227(70.1)	Ref	
Windows screened					
Yes	10(23.3)	53(18.9)	63(19.4)	0.77(0.36-1.65)	0.499
No	33(76.7)	228(81.1)	261(80.6)	Ref	
What is the structure of the room?					
Bottoms can be put up for hanging the nets	34(79.1)	246(87.5)	280(86.4)	1.86(0.82-4.21)	0.136
Rooms are so small there is hardly any space	9(20.9)	35(12.5)	44(13.6)	Ref	

Statistically significant

Predictors of Malaria Prevalence among Lira University Students

From multivariable analysis, two variables were significantly associated with malaria prevalence: use of mosquito repellants COR, 2.15(1.13-4.11), AOR, 2.09(1.09-4.04) and p-value=0.028; staying around bushy areas COR, 2.08(1.09-3.98), AOR, 2.03(1.05-3.92) and p-value=0.035 (**Table 4).**

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol. 6 No. 3 (2025): March 2025 Issue
https://doi.org/10.51168/sjhrafrica.v6i3.1530
Original Article

Table 4: Showing the predictors of malaria prevalence among Lira University students

Variable	Malaria status Positive n (%)	Negative n (%)	COR (95%CI)	AOR (95%CI)	P-value
Marital status					
Single	31(72.1)	232(82.6)	0.11(0.88-3.82)	1.40(0.51-3.82)	0.515
Married	12(27.9)	49(17.4)	Ref	Ref	
Employment status					
Formal	13(30.2)	56(19.9)	0.48(0.23-1.03)	0.56(0.20-1.56)	0.269
Self-	9(20.9)	38(13.5)	0.47(0.20-1.12)	0.54(0.21-1.36)	0.190
Un employed	21(48.8)	187(66.5)	Ref	Ref	
The current situation of the available ITN					
In good order	25(59.5)	192(70.3)	2.00(0.74-5.39)	0.39(0.03-5.01)	0.466
Torne	17(40.5)	81(29.7)	Ref	Ref	
Can afford an ITN					
Yes	35(81.4)	200(71.2)	0.56(0.25-1.27)	0.53(0.22-1.31)	0.168
No	8(18.6)	81(28.8)	Ref	Ref	
Use mosquito repellents					
Yes	21(48.8)	189(67.3)	2.15(1.13-4.11)	2.09(1.09-4.04)	**0.028***
No	22(51.2)	92(32.7)	Ref	Ref	
Stay around a bushy environment.					
Yes	21(48.8)	187(66.5)	2.08(1.09-3.98)	2.03(1.05-3.92)	**0.035***
No	22(51.2)	94(33.5)	Ref	Ref	
Farming activities					
Yes	8(18.6)	89(31.7)	2.028(0.904-4.550)	1.86(0.81-4.31)	0.146
No	35(81.4)	192(68.3)	Ref	Ref	

Statistically significant

Qualitative Results

Qualitative data was analyzed manually using thematic analysis after coding and summarizing the data which involved the interpretation of non-numerical data like audio, or images. In the analysis, 8 codes, 4 sub-themes, and 2 themes were generated.

Socio-demographics of the respondents

All the respondents were aged between 25-38 years of age, out of the 16 participants, 2 were laboratory technicians, 8 were nurses, 2 were clinicians and 4 were student leaders.

Theme 1: Malaria practices

From the qualitative data, most of the participants said that the prevalence of malaria is high among students because many students stay outside for so long while reading books yet some may or may not use mosquito repellants. A Majority also said that many students still attribute the cause of malaria to eating raw mangoes and walking in drizzles of rain. Some of them reported that:

"…… staying outside for long during evening hours because we even used to see students reading from Out Patient Department up to morning not until we started locking the place……". Male, Lab technician, R08, 36 years.

"Yeah, some people tell you that they got malaria when they moved under the rain, some when they eat mangoes and one said that he got malaria after being burnt by a flat iron". Female, Nurse, R10, 37 years.

Theme 2: Environmental factors

The majority of the participants said that the prevalence of malaria is high among students because most student hostels are next to bushes that harbor mosquitoes and thereby provide breeding grounds for them.

Others said that there is a lot of stagnant water in the areas where students live mostly in the rainy season and also many agreed that some of the barriers students face is that many of them are unemployed and therefore lack resources in the form of money to always go for check-ups and treatment in line with limited awareness about many prevention measures of malaria.

Lastly many complained about the shortage of drugs most times at the hospital.

This is backed up by some of the participants' views as quoted below:

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol. 6 No. 3 (2025): March 2025 Issue
https://doi.org/10.51168/sjhrafrica.v6i3.1530
Original Article

"…… staying around bushes, bushy areas, you know it favors infestation of mosquitoes, and then also ah, leaving stagnant water around the compound that is also what facilitates the spread of malaria". Male, Student leader, R01, 23 years.

"The factors are diverse and can be many bushes around hostels where students live, presence of stagnant water, and many tall types of grass around that harbor mosquitoes". Female, Nurse, R13, 37 years.

"Aah in this community, I always see bushes around the places of residence which provide breeding areas for mosquitoes, and then also see a lot of stagnant water. I think some of it comes as a result of poor draining systems from the bathrooms". Female, Student leader, R03, 24 years.

"Students face very many barriers because, for the students themselves, they lack resources in terms of money to go for health care, there are delays at the hospital which demoralizes someone from going there, then after the check-up and they prescribe a drug for them they don't have money to go and buy and so end up going to buy a pain killer yet they have malaria which worsens the situation". Female, Lab technician, R07, 32 years.

"Uhmm, not that am aware of, but I think the biggest challenge is health education and awareness creation that are provided at the hospital is not done well to the students and also re-educating them always. Then also a shortage of drugs sometimes at the facility". Male, Clinician, R09, 28years

Discussion

The prevalence of malaria among Lira University students was obtained from respondents who sought care and treatment at Lira University Hospital and were tested. The results showed that 43 (13.3%) tested positive for malaria while 281 (86.7%) tested negative for malaria. This gives the overall prevalence of 13.3 % which is less than the 63.1 % at Lira University Hospital in 2022. This could be because this study only involved students as participants and excluded community members. This prevalence could be attributed to several factors such as the non-use of mosquito repellants, students staying around bushy environments, and the non-use of mosquito nets. However, in the research done among University communities in Eastern Uganda, the prevalence was 12.9% among students which correlates with the one obtained in this study implying that students face almost similar challenges in their lives at institutions of learning as regards socio-economic and behavioral lifestyle (12).

In this study, the use of mosquito repellants was identified as the major factor contributing to malaria prevalence among the students. It was revealed that students who used mosquito repellents had significantly higher odds of being infected with malaria compared to those who did not use them. This finding may be counterintuitive since mosquito repellents are commonly regarded as a preventive measure against mosquito bites and malaria. Perhaps, students who use mosquito repellents may engage in riskier behaviors, such as staying outdoors during peak mosquito activity hours or neglecting other preventive measures though no study has yet been done to prove this implying that further research is needed to explore the reasons behind this association and to promote appropriate and effective use of mosquito repellents. Many researchers have shown the impact of repellants in protecting against mosquito bites and overall malaria prevention(13). This implies that the use of repellants should be consistently adapted alongside other prevention measures to minimize the chances of being bitten by an infected female anopheles mosquito.

Another factor that was found to be significantly associated with malaria prevalence was staying around a bushy environment. The results indicate that students who stayed around bushy environments had significantly higher odds of having malaria compared to those who did not. This finding is backed up by our qualitative results where a bushy environment was a commonly mentioned factor. The result was significant because mosquitoes tend to thrive in bushy environments thus increasing the risk of malaria transmission (15). This result conforms with a study done in Nkongho mbeng, a typical rural setting in the equatorial rainforest of the South West Region of Cameroon where the most significantly associated factor was staying around bushy areas and the presence of stagnant water(14). This provides more evidence that bushy areas and stagnant water provide breeding grounds for mosquitoes implying that more focus on those factors should be put in place by relevant authorities in addressing those challenges.

Study strengths and limitations

This study used a larger sample size of 340 respondents and used multivariate analysis to determine the significant factors making the findings generalizable to similar contexts. However, the findings might have been affected by recall bias and the rapid diagnostic tests for malaria may not have been reliable due to low specificity.

Conclusion

The prevalence of malaria among students was 13.3%. The study starkly illustrates that mosquito repellents provide little to no protection against malaria, whereas lingering near overgrown, bushy areas significantly heightens the risk of contracting the disease.

Recommendations

There is a need for a wide-ranging and coordinated approach to malaria prevention and control as well as continuous education on malaria prevention measures.

Additionally, a combination of public health interventions such as clearing bushes and provision of mosquito repellants alongside the provision of free-treated mosquito nets can

help in the prevention of malaria in public institutions and communities.

List of Abbreviations

AOR:	Adjusted Odds Ratio
CDC:	Center of Disease Control.
COR:	Crude Odds Ratio
IRS:	Indoor residual spraying.
ITNs:	Insecticide Treated Nets
LUTH:	Lira University Teaching Hospital
LLINs:	Long-Lasting Insecticide Treated Nets.
MCP:	Malaria control program.
MOH:	Ministry of Health
NMCS:	National malaria control strategy
NPHC:	National Plan and Housing Census
PMC:	Project Monitoring and Control
RDT:	Rapid Diagnostic Tests
SPSS:	Statistical Package for the Social Sciences
UNICEF:	United Nations Integrated Children's Fund
WHO:	World Health Organization

Declaration

The authors declare that they have no conflict of interest.

Consent for Publication:

Not Applicable

Author Contribution

NA, MSO, and EK conceptualized and drafted the protocol. NA, AJM, and FL participated in data collection, cleaning, and entry. NA, MSO, AJM, and EK analyzed and interpreted the data. NA, FL, TM, and MSO drafted the manuscript. MSO, FA, TM, MM, and ARA proofread and made final edits to the manuscript. All authors agreed and endorsed the manuscript for publication.

Acknowledgment

The authors acknowledge the study participants who gave in their time to provide valuable information for this research. In addition, we acknowledge our research assistants for their tireless efforts to collect the data.

Availability of Data and Materials

All the datasets used and/or analyzed during this study used in this study are available from the corresponding author upon reasonable request.

Competing interest

The authors declare that they have no conflict of interest.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

References

1. Crutcher JM, Hoffman SL. Malaria. In: Baron S, editor. Medical Microbiology [Internet]. 4th ed. Galveston (TX): University of Texas Medical Branch at Galveston; 1996 [cited 2023 Nov 9]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK8584/
2. CDC. CDC - Malaria - Malaria Worldwide - Impact of Malaria [Internet]. 2021 [cited 2023 Nov 9]. Available from: https://www.cdc.gov/malaria/malaria_worldwide/impact.html
3. WHO. World Malaria Report 2022 | Medicines for Malaria Venture [Internet]. 2022 [cited 2024 Nov 11]. Available from: https://www.mmv.org/newsroom/news-resources-search/world-malaria-report-2022?gclid=EAIaIQobChMInuD2vMHUiQMVEZhoCR3Xhzf_EAAYASAAEgJpG_D_BwE
4. WHO [Internet]. 2022 [cited 2024 Sep 14]. Available from: https://www.who.int/news-room/fact-sheets/detail/malaria
5. MOH. Weekly Malaria Report - Week 36 | MOH Knowledge Management Portal [Internet]. 2022 [cited 2023 Nov 9]. Available from: http://library.health.go.ug/communicable-disease/malaria/weekly-malaria-report-week-36
6. MoH [Internet]. How Can We End Malaria? 2021 [cited 2024 Sep 14]. Available from: https://endingmalaria.org/uganda/
7. SURMa [Internet]. 2022 [cited 2023 Sep 2]. Available from: https://www.malariaconsortium.org/projects/surma
8. Tugume A, Muneza F, Oporia F, Kiconco A, Kihembo C, Kisakye AN, et al. Effects and Factors Associated With Indoor Residual Spraying With Actellic 300 CS on Malaria Morbidity in Lira District, Northern Uganda. 2019 [cited 2022 Jul 21]; Available from: http://ir.umu.ac.ug/xmlui/handle/20.500.12280/2998. https://doi.org/10.1186/s12936-019-2681-6
9. Monitor [Internet]. 2022 [cited 2024 Sep 14]. Sketch. Available from: https://www.monitor.co.ug/uganda/news/national/malaria-lango-records-232-000-cases-in-2-months-4342812
10. Unpublished data. Lira University Hospital [Internet]. Lira university. . [cited 2024 Nov

11]. Available from: https://lirauni.ac.ug/lira-university-hospital/
11. Patrick. Monitor. 2022 [cited 2023 Nov 9]. Lira grapples with high malaria cases. Available from: https://www.monitor.co.ug/uganda/news/national/lira-grapples-with-high-malaria-cases-3872314
12. Warsame A, Ssenku J, Okurut S, Mpagi J, Iramiot J, Kudamba A, et al. Malaria Prevalence and Risk Factors in University Communities of Eastern Uganda: A Case of Islamic University in Uganda. 2021. https://doi.org/10.21203/rs.3.rs-232868/v1
13. Maia MF, Kliner M, Richardson M, Lengeler C, Moore SJ. Mosquito repellents for malaria prevention. Cochrane Database Syst Rev. 2018 Feb 6;2(2): CD011595. https://doi.org/10.1002/14651858.CD011595.pub2
14. Nyasa RB, Fotabe EL, Ndip RN. Trends in malaria prevalence and risk factors associated with the disease in Nkongho-mbeng; a typical rural setting in the equatorial rainforest of the South West Region of Cameroon. PLOS ONE. 2021 May 18;16(5):e0251380. https://doi.org/10.1371/journal.pone.0251380
15. WHO [Internet]. 2022 [cited 2024 Nov 17]. Available from: https://www.who.int/news-room/questions-and-answers/item/malaria

PUBLISHER DETAILS:

Student's Journal of Health Research (SJHR)
(ISSN 2709-9997) Online
(ISSN 3006-1059) Print
Category: Non-Governmental & Non-profit Organization
Email: studentsjournal2020@gmail.com
WhatsApp: +256 775 434 261
Location: Scholar's Summit Nakigalala, P. O. Box 701432, Entebbe Uganda, East Africa