RESEARCH ARTICLE

MALARIA INFECTION AMONGST STUDENTS OF THE UNIVERSITY OF BENIN, EDO STATE, NIGERIA

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ABSTRACT

Background There is a high prevalence of malaria in Nigeria thus causing high morbidity and mortality rate among individuals, families and community
Objective: To ascertain the prevalence of malaria, beliefs about predisposing factors, and treatment practices among students in University of Benin.
Materials and Methods A descriptive survey was carried out among three hundred and eighty student undergraduates of the tertiary institution in the mid- west of Nigeria. Stratified sampling technique was used to select the students. Instrument of data collection was a self administered questionnaire.
Results Respondents were primarily in the 19-24 year old age category (73.4%), male (55.3%) and those residing in school hostel (67.9%). The respondents agreed that environmental factors help breeding of mosquitoes which are malaria infection carriers, thus making the prevalence rate of malaria among students high and alarming. Lastly, majority of the respondents used combined anti-malaria drug bought from the chemists to combat malaria.
Conclusion The prevalence of malaria infection amongst students is very high and many of the students are misinformed about pre-disposing factors. These findings provide base-line information for evidence-based planning and implementation of malaria control activities in the school by the management.

INTRODUCTION

Malaria is one of the most climate sensitive vector-borne diseases which are of public health concern. It accounts for 110 million clinical cases annually[1]. Nearly half of the Nigerian population suffers from malaria and majority of out-patients attendance to health facilities can be attributed to this disease as identified by the National Malaria programme. The Fed MOH in Nigeria revealed that about N132billion is lost to the treatment and prevention of malaria. About 90 percent of the country's 167 million people are at risk of malaria infection and it has continued to remain a major public health challenge in Nigeria[2]. Chioma Amajoh, national coordinator of National Malaria Control Programme, speaking with Business Day during the commemoration of 2012 World Malaria Day in Lagos, Nigeria stated that malaria has placed enormous pressure on the already strained health system in Nigeria. Malaria is said to be responsible for about 66 percent of all clinic visits and 30 percent of hospital admissions and it is a heavy burden on Nigeria's families, communities, health system, and workforce[2]. Malaria causes about 350 to 500 infections in humans and approximately 1.3 million deaths annually, mainly in the tropics. Sub Saharan Africa accounts for 85% of these fatalities[3]. Malaria is a number one killer of children and accounting for about one million episodes

annually with 1% mortality rate[4]. Over 100 million of cases of malaria are reported annually, out of which 1million result in death[5]. Malaria is holoendermic in Nigeria[6]. Oparaocha explained that apart from malaria causing morbidity to millions of people in endemic communities and actual mortality, the disease also reduces their resistance to infection by other diseases[7]. The useful man-hours are lost leading to low productivity, loss of revenue, social and economic depression and there may be absenteeism among school children due to malaria, leading to poor academic performance and low standard of education[8].

From the above, it is sad to note that more than half the population of Nigeria is entrapped by poverty, malnutrition, low income and high mortality due to malaria. The poor are caught in vicious circle, they are sick because they are poor; they become poorer because they are sick and sicker because they are poorer[9]. Malaria disease imposes its heaviest socio-economic burden on the rural population that depends on farming for their livelihood.

Malaria infection is largely distributed throughout warmer regions of the world especially in the tropics, where the vectors of malaria are found[8]. Malaria caused by protozoan parasites of the genus *Plasmodium,* remains the most

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infectious human parasites that infects and kills higher percentage of people than any other single infectious disease. The five known species of *Plasmodium* genus that cause human malaria are *Plasmodium falciparum, Plasmodium vivax, Plasmodium ovale, Plasmodium malariae and Plasmodium knowlesi.* They are spread from one person to another through the bites of haematophagous anthropophilic female adults of mosquitoes belonging to the insect genus *Anopheles*. These adult female *Anopheles* mosquitoes are, hence said to be carriers or malaria parasites. Ezugbo et al identified the clinical symptoms of malaria as fever, headache, chills, fatique, nausea, chest and abdominal pain[6]. They further stated that there is an enlargement of spleen, kidneys and liver in malignant malaria.

Stagnant water is a factor identified to be contributing to malaria transmission. Nigeria is endemic due to non-compliance on the part of Nigerians to malaria preventive measures such as sleeping under Insecticide Treated Nets (ITNs), using Artemisinin-based Combination Therapy (ACTs) correctly, using intermittent preventive treatment of malaria in pregnancy and proper environmental sanitation[2]. Chioma Amajoh also stated that factors militating against significant success in the fight against malaria include insufficient funding, poor utilization of available health care services, weak supply chain system, inadequate strategic information network, and various infrastructural challenges. World Health Organization (WHO)[10] revealed that malaria infection has resulted in absenteeism in class, resulting to poor academic performance among students, thus this study seek to examine the prevalence of malaria infection amongst students in a tertiary institution in the mid-west.

Research question

1. What is the students' perception of predisposing factors for malaria?
2. What is the prevalence rate of malaria among students of a tertiary institution?
3. What is the treatment method used for malaria infection among students of a tertiary institution?

METHODOLOGY

Research design

The study is a descriptive survey design to assess prevalence of malaria

Research setting

This study was carried out at the University of Benin between the years 2010 and 2012. During this period, the facilitators were in contacts with the students at scheduled intervals. The University of Benin was founded in the year 1970 as an institute of management and Technology. It was converted to a University on the first of July, 1971 and was named University of Benin (UNIBEN) in 1972 and it became a federal university in the year 1975. Benin is in the tropical rain forest. The rainy season stretches from March to October and dry season from November to February. The temperature in Benin during raining season ranges between 20 to 36.5 degree celsius and in dry season between 27 to 36.5 degree celsius. The climatic, poor sanitary conditions and the trailing vegetation at certain periods of the year create a favourable breeding site for Anopheles mosquitoes which are vectors of Plasmodium parasites.

Study population

Undergraduates from a tertiary institution in the Mid-West of Nigeria.

Sampling Technique

Stratified sampling technique was used. In the first stage, the area of study was zoned according to number of faculties within the University. Secondly, five (5) faculties were randomly selected within the University (School of Basic Medical Sciences, Faculties of Law, Engineering, Life Sciences and Agriculture). The third stage and final stage involves randomly selecting departments to administer questionnaires. Completed questionnaires were then returned to the individually. On the whole, ten (10) departments were randomly selected, out of which three hundred and eighty students representative sample were selected for the study. Samples were selected from different faculties proportional to their size of the student population.

Instrument

The research instrument for this study was self-developed structured questionnaire design in line with the variables to be measured. The questionnaire had two parts i.e. Part 1 contain the demographic information and Part 2 is on questions about factors responsible for the occurrence of malaria among

Table 1 Demographic Characteristics of Respondents

	Variable	Frequency	Percentage (%)
GENDER	Male	210	55.3
	Female	170	44.7
	Total	380	100
AGE	Below 18years	37	9.7
	19- 24years	279	73.4
	25-30years	59	15.5
	31years and above	5	1.3
	Total	380	100
SCHOOL LEVEL	100	69	18.2
	200	108	28.4
	300	85	22.4
	400	85	22.4
	500	21	5.5
	600	12	3.2
	Total	380	100
RESIDENCE	School Hostel	258	67.9
	University Staff Quarters	56	14.7
	Off Campus	66	17.4
	Total	380	100

the students, prevalence of malaria infection, the methods of treatment of malaria, factors responsible for choice of treatment and preventive measures taken by the students of University of Benin to avoid being infected. Data was collected using a pre tested self-administered anonymous structured close-ended questionnaire. The questionnaire was prepared based on the available literature. Discussions conducted prior to the survey in pretested faculties were not included in this study. The questionnaire was prepared in English language

the 200 level students; next to the 300 and 400 level students, while the group with the smallest frequency are the 600 level students. The implication of this is that; at the early stage of students' entry into the university they seem to be prey to common disease and illness but the higher they go the more resistance they develop against common disease and infections.The largest percentage of students reside in the school hostel (67.9%), 17.4% reside off campus and only 17.4% reside in the staff quarters.

Table 2 The predisposing factors of malaria among students of a tertiary institution.

Statements	Always	Most of the time	May be	Never
Lack of knowledge about mosquito infection	188 (49.5)*	150 (39.5)	22 (5.8)	20 (5.3)
Exposure of body parts	166 (43.7)	183 (48.2)	18 (4.7)	13 (3.4)
Environment (residence)	172 (45.3)	162 (42.6)	19 (5.0)	27 (7.1)
Change in weather (rainy season)	204 (53.7)	111 (29.2)	48 (12.6)	17 (4.5)
Dirty, cold or raw food	211 (55.5)	106 (27.9)	34 (8.9)	29 (7.6)
Dirty un-boiled drinking water	203 (53.4)	115 (30.3)	48 (12.6)	14 (3.7)
Poor drainage system	166 (43.7)	159 (41.8)	17 (4.5)	38 (10.0)

Data analysis

Data processing and analysis were done using Epi Info version 6.04 and SPSS 10.1 statistical programs. Frequencies and percentages of the variables of interest were done to determine the magnitude of the problems.

Ethical consideration

Students who gave their consents to participate in the study received elaborated explanation on the purpose of the study and the type of questions and how to answer by trained facilitators. Adult volunteering students were used for the study.

The small population of those residing in the staff quarters maybe because none of their parents or guardian are resident or staff of the school, while the greater population of students in the hotel may be because students majority ofthe students prefer staying in the hostel because of electricity and minimal distractions.

Research Question One

What is the predisposing factor of malaria among students of a tertiary institution.? Frequency count and percentages was used to answer the research question, the result is presented in table 2.

Table 3 Prevalence of malaria among students of a tertiary institution.

Have you ever had malaria infection?		
	YES	361 (95.0)*
	NO	19 (5.0)
How often do you have malaria during the session (academic year)		
0–1 time		198 (52)
2-3times		139 (37)
4-5times		32 (8)
Above 5times		11 (3)

*indicate percentage of the frequency

RESULTS

The results are presented in the order of how the research questions were asked.
Demographic profile of respondents: Frequency count and simple percentages were used to answer the research question; the result is presented in table 1.

Table 1 shows the demographic variables of the respondents. Responses of students formed the unit of analysis, male respondents (55.3%) are more represented in the sample than females (44.7%) this may be as a result of the time of data collection and the willingness to participate in the survey, though female are underrepresented in this study because the school have a student population of 40% male and 60% females.

Respondents within the age of 19–24years formed the largest percentage (73.4%) in the sample and the least is those between the ages of 31years and above, this is a typical representation of the respondents considering the minimum number of years spent in school before having admission in their respective disciplines.

Respondents used in this survey run across first year students to final year students, the group with the highest frequency is

Table 2 shows the predisposing factors of malaria among students of a tertiary institution.. Responses of students formed the unit of analysis, a large proportion of respondents ticked always and most of the time for all the predisposing factors of malaria. This imply that, the respondents agreed that this factors, though environmentally related build good Breeding homes for mosquitoes which are malaria infection carries among students in a tertiary institution.

Research question two

What is the prevalence rate of malaria? Frequency count and simple percentage was used to answer the research question, the result is present in table 3

Table 3 presents the responses of students to prevalence of malaria. Students responses formed the unit of analysis, result from the table reveal that the prevalence rate of malaria among students of a tertiary institution is high and alarming (95%). Though all the sampled students have reported cases of malaria in the past but number of times students have malaria in a session varies, majority said they have malaria just I time per session this may be because of the type of anti-malaria used for treatment.

Table 4 Treatment method against malaria amongst Uniben students.

What do you use for the treatment of Malaria	Frequency (n=380)	Percentage (%)
I only use the doctor's prescription	46	12.0
I use Artesunate / chloroquine tablets / Lonart /Amoxyl/ fansidar / Amalar bought from chemists.	247	66.0
I use anti-malaria injections	20	5.0
I use ACT (Arthemether Lumefantrin)	18	5.0
I use mixture of drugs sold by patent medicine vendors	23	6.0
I use herbs / roots	15	3.9
I don't use drugs.	11	2.9
Total	**380**	**100**

Research question three

What is the treatment method used for malaria infection among students of a tertiary institution? Frequency count and simple percentages were used to answer this research question. The result is presented in table 4.

Table 4 shows the various treatment approach/method used to fight malaria. Respondents responses formed the unit of analysis. Majority of the respondents used combined antimalarial drug bought from the chemists to combat malaria (66%); next to this group are those that use the doctor's prescription (12%), only 2.9% don't use drug even when attached with malaria but resort to alternative treatment.

DISCUSSION

The study indicated that the male respondents are more represented in the sample than their female counterparts; this may be as a result of the time of data collection and the willingness to participate in the survey, though female are under-represented in this study. The school have a student population of 40% male and 60% females. Respondents within the age of 19–24years formed the largest percentage in the sample and the least is those between the ages of 31years and above, this is a typical representation of the respondents considering the minimum number of years spent in school before having admission in their respective disciplines.

The study revealed that the respondents agreed that environmental factors encourage breeding for mosquitoes which carries malaria infection. The present study agreed with the findings of Kalu et al[10] on the Prevalence of Malaria Parasitaemia in Umuchieze and Uturu Communities of Abia State, Nigeria; stating that both study areas have climatic factors and environmental conditions which favour breeding of vectors of malaria parasites resulting in the probable abundance of malaria vectors in the areas.

An interesting finding of this study is that the prevalence rate of malaria among students is high and alarming. This supported the study of Kalu et al[10] that revealed the high prevalent rates of malaria in Umuchieze and Uturu rural communities. Lastly, majority of the respondents used combined antimalaria drug bought from the chemists to combat malaria. The implication is that majority of students practice self-medication. This is similar to the findings of Ezugbo Nwobi et al[6] in a study on Prevalence of Malaria Among Nnamdi Azikwe University Students and Anti-malaria Drug use.

CONCLUSION

The prevalence of malaria infection amongst students is very high and many of the students are misinformed about pre-disposing factors. Environmental factors are also responsible of high rate of malaria. These findings provide base-line information for evidence-based planning and implementation of malaria control activities in the school by the management.

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