Knowledge of Malaria Manifestation and Use of Recommended Preventive Strategies Among Undergraduate Students of Lagos State University, Nigeria

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Abstract:

Malaria has been associated with declining the quality of life. This has increased a number of hospital consultations, treatments, and hospitalization. This consistent hospital visitation often leads to low productivity and loss of incomes. In view of the aforementioned, this study investigated the knowledge of malaria manifestation and use of recommended preventive strategies among undergraduate students of Lagos State University, Lagos Nigeria. The study adopted a mixed method of quantitative and qualitative research design. A sample size of 319 students was determined using Cochran formula. Multistage sampling procedure was used to select 319 students from 100-300 levels, while the qualitative used a groups consisting of 6 participants purposely selected for the focus group transcribed through thematically sing Atlas. Result shows that most of the participant got their information from the health workers 135 (43.8%) and majority agreed that malaria breeds from the dirty stagnant water 271(88%), Also, it shows that most of the students acknowledged that elevated temperature (94.2%), dizziness (76.6%), nausea and vomiting (74%), and chills (61%) are symptoms of malaria, while hyperactivity (63%) and low blood pressure (67.9%) were not seen as symptoms of malaria by the majority. The research hypothesis shows that the calculated p-value

and r gives 0.006, < 0.05 and 0.156, < 1 which was significant. The study concluded that there is sufficient level of awareness and knowledge about malaria among the undergraduates in Lagos State Universities and they are using the common strategies to prevent themselves against infection. It is therefore recommended that materials that can be used for prevention should be provided free to all the students.

Keywords: Malaria, Manifestation, Mosquito, Preventive Strategies, Undergraduate Students,

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3

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Introduction

Malaria has been linked with declining the quality of life. This has heightened the number of hospital consultations, treatments, and admission to hospital bed. This recurrent hospital visitation often causes low productivity and loss of incomes. Globally, Malaria is one of most important public health challenges and it has become increasingly common mostly in Africa leading to illness and death in many developing countries (Ashley, et al 2018). The micro parasite of the genus Plasmodium causes Malaria, which infects red blood cells (RBC) Centres for Disease Control and Prevention (CDC, 2013, CDC, 2015). About 156 species of Plasmodium that infect many types of animals have discovered; however, only P. falciparum, P. vivax, P. ovale, P. malariae, and P. knowles are known to affect humans (CDC, 2013). Female Anopheles Mosquitoes are the dominant insects for transmitting malaria infections (Menger, et al, 2014).

The clinical manifestations of malaria are unspecific and may be present in other diverse febrile illness, and the manifestation can range from asymptomatic, mild and severe. The Symptoms of malaria includes fever, shivering, vomiting, profuse sweating, nausea, diarrhea severe headache, dehydration. When convulsions, jaundice, myalgia, acute renal failure, severe anaemia, cerebral malaria, backache, and joint pain, acute respiratory syndrome occurs in malaria, it is said to be complicated. It can also be asymptomatic (Choge, et al., 2014). According to Aluko (2017), who discovered that the symptoms of malaria infection are shown only when the malaria parasite infected the RBC which is mostly 10 to 14 days after the bite of an infected mosquito. The awareness of malaria vectors, mosquito behavioral pattern (biting and resting times) and breeding sites have been linked with the severity of malaria (Killeen 2014).

Aluko's (2017) observation on people perceptions of causes of malaria were associated with raw fruits, poor sanitation, drinking dirty water, worms, and tsetse fly, cold environment, enlarged spleen. These misconceptions definitely have implications on malaria preventive attitudes and practices. According to World Health Organization (WHO) fact sheet accessed April 2021, Malaria is a life-threatening illness. Malaria still remains the most significant cause of illness in the globe, caused by parasites that are transferred to people through the bites of infected female anopheles mosquitoes. It is curable and preventable. Subsequently, WHO (2020) submitted that there were approximately 229 million cases of malaria globally. The estimated number of malaria mortality stood at 409,000, under 5 aged Children are the most vulnerable group affected by malaria. The global mortality were 67% (274 000). 94% of the global cases of malaria occur in African region where Nigeria is located. Malaria is a major public health problem in Nigeria where it causes more morbidity and mortality than in any other country in the world. 60 % of outpatient visits to health facilities, 11 % maternal death and 30 % child death, especially among children less than 5 years is caused malaria.

There are many factors contributing to persistence of malaria infection in Nigeria such as education, income, lack of knowledge about causes and control, housing patterns, social groups, infrastructure deficiency, leadership challenge, water storage, behavioural challenge (Olusegun-Joseph, et al 2016; Aju-Ameh, 2020). The Federal Government Policy on Malaria Control in Nigeria focuses on Long Lasting Insecticide Net, Indoor Residual Spray,

Intermittent Preventive Treatment (IPT) and environmental management. Although advances in terms of new vaccines and drugs are commendable, yet eradication of malaria is still far from being achieved (Mereta, et al., 2014). Undergraduate student's knowledge towards malaria as a disease is important in understanding their health seeking behavior and use of preventive methods. Some of the studies reviewed have indicated that they now regard malaria as a dangerous disease that can kill and that in a bid to address malaria issue, the Global Strategy for Malaria Control was adopted in Amsterdam as a response to the increasing global malaria burden.

The study on knowledge and perceptions toward malaria prevention among vulnerable groups in Buea, Cameroon, reported that insecticide-treated nets (ITNs) are used mainly for protection against malaria (Nkesa, et al, 2014). Another research work in 2010 on the knowledge, attitudes, and practices about malaria and its control in rural northwest Tanzania reported a reasonable knowledge on malaria and its preventive measures among the study subjects. Mazigo et al (2010). In 2013, Iwueze, et al (2013) opined that 40.1% of respondents visited hospital for malaria treatment, 57% said malaria is caused by malaria parasite, 50.9% used ACTs in malaria treatment and 27.4% stated fever, chills, vomiting, body ache and headache as symptoms of malaria. Inadequate knowledge and misconceptions about the transmission, as well as, the use of recommended preventive strategies of malaria, have been reported among various strata of the society especially undergraduate students, with the notion that these category of people have little or no idea about this subject matter, which thus affect their malaria control measures, probably because of variation in courses offered.

Consequently, it is considered necessary to explore this area to bridge this gaps, in the light of this, the study seeks to investigate the knowledge of malaria manifestation and use of recommended preventive strategies among undergraduate students of Lagos state university. The specific objectives of the study are to:

1. assess the level of knowledge about malaria infection among undergraduate students of Lagos State University;
2. determine if undergraduate students are aware of different strategies for the prevention of malaria;
3. examine the awareness of insecticide, treated nets, indoor residual spraying and intermittent preventive treatment among undergraduate students of Lagos State University; and
4. examine the utilization of vector control measures used by undergraduate students of Lagos State University.

Research Questions

The following research questions were raised for this study:

1. What is the level of knowledge of malaria infection and manifestation among undergraduate students of Lagos State University?
2. Are undergraduate students aware of different strategies available for the prevention of malaria?
3. What is the level of utilization each vector control measures by undergraduate students of Lagos State University?

Research Hypothesis

A null hypothesis was developed that guide the study;

H_01:   There is no significant relationship between knowledge of malaria manifestation and the use of recommended preventive strategies among undergraduate students of LASU.

Methodology

The study utilizes Mixed-Methods Research (MMR) approach. MMR studies the quantitative and qualitative method, which was run concurrently. It was conducted in Lagos State University Main Campus Ojo, Lagos State University. A sample size of three hundred and Nineteenth (319) was determined by Cochran Sample size formula from a population number of one thousand and two hundred (1,200) consists of 100 level – 300 level of undergraduate students of five faculties out of eight faculties in the main campus Lagos State University Ojo.

Multistage sampling procedure was employed in the selection of samples in order to capture adequate participants for the study. This method was employed because of large target population and it is impossible to study every member of the population.

In stage one, the purposive sampling technique was adopted in selecting Lagos State University Main campus Ojo. The selection of this University for the study was based on premise that they possess the same characteristics functions working conditions and regulations which represents the features in the total population.

In stage two, five (5) faculties was chosen out of eight (8) using the balloting technique which is a simple random sampling technique.

In stage three, convenient sampling method was used to select 319 students across the five faculties. Convenience sampling is a type of non-probability sampling in which people are sampled because of convenient accessibility and proximity source of data for the researcher.

A group of students comprises of 6 participants was selected as the focused group for discussion, based on the rules of the focus group creation, which is usually comprised of six to ten participants that have knowledge of the topic.

Face and content validity of the instruments were ascertained by experts of Nursing Science. A pilot study was done to ensure the reliability of the research instrument and calculated using the Cronbach Alpha and the results were, the knowledge of malaria infections 0.721, awareness of different malaria preventive strategies 0.638, preventive measures against malaria among undergraduate students of LASU 0.753, utilization of other vector-control measures 0.732, while the reliability of the qualitative questionnaire was ascertained by using it more than once with the same sets of people under the same conditions, and it was discovered to have similar results.

Appropriate analytical techniques were used depending on the variables or the characteristics being considered. Descriptive and inferential statistical techniques were used to analyse the data using Statistical Package for Social Sciences (SPSS) Version 25. For qualitative analysis, the data obtained was transcribed verbatim and the data collected was converted to smaller, more manageable units that can be reviewed and retrieved.

Results

Research Question 1: What is the level of knowledge of malaria infection and manifestation among undergraduate students of Lagos State University?

Table 1 Level of student's knowledge about malaria

Levels of knowledge	Category of Scores	F	%	Mean ±SD
Above average	≥11	175	56.8%	
Average	6-10	133	43.2%	10.8
Below average	0-5	-	-	±1.79
Total		**308**	**100**	
Min = 6; Max = 15				

Table 1 reveals that higher proportion of the undergraduate students has above average knowledge about malaria which had help them for safeguarding themselves against been infected. Despite the students understands what malaria really is and had access to reliable source of information which is more likely to pass accurate information about the disease, the students are still lacking in applicable knowledge that should equip them enough. This could account for why more of the students are been admitted for malaria related disease because even though they are using the available strategies maybe those strategies are not used properly as required for them to prevent been infected by malaria.

Table 2: Student awareness about malaria by undergraduate students of LASU

Variables		F	%
Have you heard about malaria before?	No	14	4.5
	Yes	294	95.5
	Total	**308**	**100**
Major source of information	Health workers	135	43.8
	Radio/TV	72	23.4
	Printed media	24	7.8
	Friends	62	20.1
	Fellow students	15	4.9
	Total	**308**	**100**
Symptoms of Malaria	Elevated Temperature	290	94.2
	Low blood pressure	99	32.1
	Dizziness	236	76.6
	Nausea and Vomiting	228	74
	Chills	188	61%
	Hyperactivity	114	37%

Table 2 shows that there is high level of awareness about malaria by the students sampled as in the studies. Out of the 308 sampled students, 294 which is estimated to be

95.5% of the sample responded to have heard about malaria. To further show the knowledge of the students about malaria a student interviewed describe what malaria meant

Malaria is an effectual disease that is common among student.

(FGD1/3/19/F/LASU)

The table also reveals the sources of information where the students get their information about malaria which can then be used to determine the authenticity of the information they have gotten about malaria. The table shows that most of the got their information from the health workers 135 (43.8%) which will mean that to a large extent the students got valid information about malaria. Also, 72 (23.4%) and 24 (7.8%) got their information from radio/TV and print media respectively are also valid sources of getting information which will be authentic about malaria. However, 62 (20.1%) and 15 (4.9%) got their information from friends and fellow students respectively which might in some instance have some distortions in the details of information given. Nonetheless, most of the students got their information from reliable sources which can then mean that the information gotten by the students is a good one about malaria which will enhance their knowledge of the disease.

Research Question 2: Are undergraduate students aware of different strategies available for the prevention of malaria?

Table 3: Undergraduate student awareness of malaria preventive strategies

S/NO	Preventive strategies	YES F (%)	NO F (%)
i.	Insecticide spray	305 (99)	3 (1)
ii.	Window and door netting	289 (93.8)	19 (6.2)
iii.	Mosquito coil	293 (95.1)	15 (4.9)
iv.	Mosquito repellent	274 (89)	34 (11)
v.	Herbs	271 (70.5)	91 (29.5)
vi.	Bed net	273 (88.6)	35 (11.4)
vii.	Insecticide Treated Nets (ITNs)	296 (96.1)	12 (3.9)
viii.	Self-formulated chemical (otapiapia)	253 (82.1)	55 (17.9)
ix.	Electrical devices	166 (53.9)	142 (46.1)

Table 4: Level of student's Awareness on preventive strategies on malaria

Levels of Awareness	Category of Scores	F	%	Mean ±SD
High	≥7	258	83.8%	
Average	4-6	50	16.2%	7.6 ±1.36
Low	0-3	-	-	
Total		308	100	
Min = 4; Max = 9				

From table 4, undergraduate students' responses show that there is relatively high level of awareness of all the preventive strategies as the result shows that well above average number of students in the sample are aware of the strategies except for the use of electronic devices where just slight above average is aware of the strategy, which are most likely to be those in the field relating to medicine or through the source of their information.

Table 5: Student usage of electric devices among LASU undergraduate students

Electrical devices				
		No	**Yes**	**Total**
Faculty	Science	18	30	48
	Social science	33	27	60
	Education	34	46	80
	Management science	39	36	75
	Arts	18	27	45
Total		**142**	**166**	**308**

For further understanding of group of students who are aware of the electric device strategies table 5 shows level of awareness based on student's faculty and can be seen that those students who are even aware more of the strategy are not those who are science oriented by rather those who are in the faculty of education. Therefore, the awareness of the strategy is not depending on the field of study but many other things such as source of information and maybe exposure and other things.

Research Question 3: What is the level of utilization each vector control measures by undergraduate students of Lagos State University?

Table 6: Utilization of other Vector Control Measures among Undergraduate Students of LASU

S/NO		YES F (%)	NO F (%)
i.	Insecticide spray	288 (93.5)	20 (6.5)
ii.	Window and door netting	240 (77.9)	68 (22.1)
iii.	Mosquito coil	238 (77.3)	70 (22.7)
iv.	Mosquito repellent	243 (78.9)	65 (21.1)
v.	Herbs	129 (41.9)	179 (58.1)
vi.	Bed net	198 (64.3)	110 (35.7)
vii.	Insecticide Treated Nets (ITNs)	218 (70.8)	90 (29.2)
viii.	Self-formulated chemical (otapiapia)	195 (63.3)	113 (36.7)
ix.	Electrical devices	128 (41.6)	180 (58.4)

Table 6 shows that only herbs and electric devices are the only two strategies that is not used by more than average of undergraduate students sampled for the study which goes along with the previous research question about the usage as the result shows that less than

average of the students use electric device as a strategy to prevent themselves from been invested with malaria.

Respondents agree the strategies are effective to prevent malaria but still discourage their usage because of the danger they pose to health of people who use it. A respondent mentioned danger in mosquito coil;

> *Use of mosquito coil is effective but I would advise you to stay away when making use of it because it is dangerous to the health.* (FGD2/1/26/M/LASU)

Another respondent sound a note of warning on using mosquito repellent by saying;

> *As for mosquito repellent, I will tell someone it is a no go area, it's Very dangerous to the body* (FGD2/4/19/F/LASU).

Another respondent spoke about experience in insecticide treated net by saying;

> *Insecticide treated net is very effective but also have its own side effects when it comes in contact with the skin* (FGD2/5/22/M/LASU).

This side effects when come in contact with the body was further explained by another respondent from experience;

> *Insecticide treated nets is okay and nice but there were some reactions when I used It. Whenever I use it I experience skin itching* (FGD2/6/23/F/LASU).

The use of insecticide spray (otapiapia) is directly condemned by a respondent by saying

> *I can't prescribe such because is not good for the body and also the smell is not nice and likewise it is not meant for mosquito* (FGD1/3/19/F/LASU).

Test of Hypothesis

Hypothesis 1: There is no significant relationship between knowledge of malaria manifestation and the use of recommended preventive strategies among undergraduate students.

Table 7: Correlation between level of knowledge and preventive strategies among undergraduate students

		Preventive strategies	Decision
Level of Knowledge	Pearson correlation	**0.156****	**Reject Null hypothesis**
	Sig. (2-tailed)	**0.006**	
	N	**308**	

*. Correlation is significant at the 0.05 level (2-tailed).

The table above revealed a significant relationship between level of knowledge and the preventive measures among undergraduate students. The calculated p-value and r respectively 0.006< 0.05 and 0.156< 1 was significant at 5% (95% level of confidence interval). Therefore, the relationship between level of knowledge and preventive measures among students is statistically significant. Hence, null hypothesis was by this finding rejected.

Discussion

The finding show that undergraduate students of Lagos State University have sufficient awareness about the disease called malaria which is agreement with the work of Yewhalaw, et al (2017) who stated a fairly good level of awareness regarding malaria

meanwhile Gobena et al (2019) reported a low level of malaria awareness in university communities and the students also displayed some level of knowledge about what could cause the disease which is against the findings of Ahmed (2017) who reported that there are people living in malaria inhabited area but not aware of the disease neither do they know strategies of prevention or control. However, the finding is explained through the work of Al-Taiar et al (2008) who reported that having experience through family been infected can enhance level of knowledge of individuals. The knowledge they have about malaria can be said to be authentic enough with the fact that the source they got the information can be trusted to provide accurate information which might either be sponsored by government or relevant agencies in health sector.

The findings also show that the undergraduate students of Lagos State University are aware of various preventive strategies that can be used to guide themselves against been infected by malaria through the agent which is mosquitoes. The findings show that the students have used all the available strategies which means that the students have lesser probability of been infected with malaria. However, the result also show that higher percentage of the students does not have applicable knowledge of what should be done concerning malaria which might be reason for the consistent high records of students bed ridden for malaria related infections. Although, few students have used herbs which is majorly traditional medicine for treating malaria but the percentage seems not to be as large as portrayed by Olusegun-Joseph, et al (2016) who believes use of traditional medicine for solving problems is widely accepted. However, continuous high record of malaria among the undergraduate students means that there are other factors responsible among which is not applying the knowledge they have about malaria, another is the possibility of low efficacy of drugs used as reported by Ahmed (2017), poor quality of diagnosis and possibly some others which has not been captured in this study.

Mosquito was identified as the major cause of malaria by the Undergraduate students while the issue of stagnant water in the environment and untidy environment was also highlighted as a major cause of malaria because when an environment is not kept then mosquitoes will have opportunity to breed in such environment. Also, dizziness, headache and weakness are mentioned to be major symptoms from the experience of the undergraduates sampled.

Conclusion

The study found out that there is sufficient level of awareness and knowledge about malaria among the undergraduates in Lagos State Universities and they are also using the common strategies to prevent themselves against been infected with the disease by mosquitoes which therefore means there are likely to be other factors which makes the students get sick with malaria which is not covered in this study.   .

Recommendations

From the findings in this study, the following recommendations will be invaluable to reduce the spread of malaria disease among the undergraduate students in Lagos State University;

1. It can be observed from the research result that construction of drainage will be very important to allow for free flow of water in the hostels of students either within the campus or off-campus.
2. Also, it is important to ensure the environment should be kept tidy to avoid breeding of mosquitoes in the area which can lead to malaria spread among the students.

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