

ORIGINAL RESEARCH REPORT

Utilization of insecticide treated nets (ITNs) among male students of a tertiary institution in Lagos State, Nigeria

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ABSTRACT

Background: Malaria is an eminently preventable, treatable and curable disease. Proven effective options to reduce morbidity and mortality include early diagnosis, combined with prompt effective therapy and malaria prevention through reduction of human-vector contact, emphasizing the use of insecticide-treated nets (ITNs). The aim of this study was to determine the knowledge, attitude and utilization of malaria preventive methods among the students residing in Mariere Hostel of the University of Lagos, Akoka. **Materials and Methods:** The study design was a cross-sectional descriptive study. Simple random sampling method was used to select the respondents. Pre-tested, structured, open and close-ended self administered questionnaires were used for data collection. Data analysis was done using Epi info version 3.5.1 statistical software package. The study was carried out in February 2012. **Results:** A total of 221 out of the administered 250 questionnaires were retrieved and analyzed giving a response rate of 88.4%. All the respondents were males with a mean age of 20 ± 2.8 years. The mean knowledge score (%) of the respondents was 76.5 ± 3.19 . Although, 91.0% of the respondents recommended the use of ITNs to all students, only 31.6% use ITNs. The major reason given for non-usage of ITNs being that it is uncomfortable (45.3%). There was no statistically significant relationship between socio-demographic characteristics and utilization of ITN. **Conclusion:** This study has demonstrated high level of knowledge of malaria and positive attitude towards malaria prevention but poor malaria prevention practice as evidenced by poor usage of insecticide-treated nets. There is therefore need for more enlightenment campaigns to improve and sustain the knowledge and attitude towards malaria prevention as well as improve utilization of ITNs.

Key words: Insecticide treated nets, malaria, students, utilization

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INTRODUCTION

About 3.3 billion people - half of the world's population - are at risk of malaria. Every year, this leads to about 250 million malaria cases and nearly one million deaths. People living in the poorest countries are the most vulnerable.^[1] According to the *World Malaria Report 2010*, there were 225 million cases of malaria and an estimated 781,000 deaths in 2009, a decrease from 233 million cases and 985 000 deaths in

2000.^[2] The numbers are staggering. Every 40 seconds a child dies of malaria, resulting in a daily loss of more than 2,000 young lives worldwide.^[3]

Malaria is especially a serious problem in Africa, where one in every five (20%) childhood deaths is due to the effects of the disease. An African child has on average between 1.6 and 5.4 episodes of malaria fever each year. **And every 30 seconds a child dies from malaria.**^[1] These estimates render malaria the pre-eminent tropical parasitic disease and one of the top three killers among communicable diseases.^[3]

Malaria is endemic throughout Nigeria with perennial malaria transmission. It is one of the common causes of hospital attendance in all age groups in all parts of Nigeria. Malaria impedes human development and is both a cause and consequence of under development. Every year, the nation loses several billions of naira, derived from cost of

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malaria treatment and absenteeism from work, schools and farms.^[1]

Malaria is a preventable, treatable and curable infection. Proven effective options to reduce morbidity and mortality include early diagnosis, combined with prompt effective therapy and malaria prevention through reduction of human-vector contact, emphasizing the use of insecticide-treated nets (ITNs). However, incorrect knowledge, negative attitudes and practices can interfere with the effectiveness of malaria control measures even among educated youths.^[4]

Studies have revealed that human knowledge, attitude and adoption of the various recommended applicable methods of personal and household protection against mosquito vary remarkably in different endemic regions of tropical countries.^[5] However, the problem of malaria among adolescents has largely been overshadowed by the huge burden of the disease among young children. Attention to malaria among adolescents has also been diverted by the huge burden of HIV/AIDS among adolescents. Some surveys reveal a lack of knowledge and many misconceptions about the transmission and treatment of malaria, which could adversely affect malaria control measures and antimalarial therapy. Such a knowledge gap could have an adverse effect on students, who could be used as change agents and as role models for their siblings and peers in the malaria control strategy.^[6] This study was therefore carried out to determine the knowledge, attitude and practices of malaria preventive measures among students of a tertiary institution.

MATERIALS AND METHODS

The study location

The study was conducted in the Mariere Hostel of the University of Lagos, Akoka. The hostel provided accommodation for male students of all levels (i.e. 100 level to 500 level) from different faculties of the university. This consisted of 21 two-man capacity rooms and 101 five-man capacity rooms, making a total of 122 rooms arranged in 4 wings (A to D). The hostel housed 542 students, with most final year students being housed in two-man rooms while others were housed in five-man rooms. The hostel also provided accommodation for special students (physically challenged students) who were housed in 9 of the 21 two-man rooms.

Methods

The study design was a cross-sectional descriptive study. The level of significance was set at $P \leq 0.05$, and 95% confidence interval. A minimum sample size of 210 was calculated using the formula $n_f = n/(1 + N)$ which is the statistical formula for descriptive studies when target population (N) is less than 10,000; where n is

the sample size when target population is greater than 10,000 = $z^2 pq/d^2$ and P is the prevalence of 33% of use of ITN observed in a previous study.^[5] However, a total of 250 subjects were selected to increase precision. The study population comprised all students residing in Mariere Hostel during the 2011/2012 academic session. The respondents were selected using the stratified sampling method.

Pre-tested, structured, open and close-ended self-administered questionnaires were used to collect information on socio-demographic characteristics, knowledge of malaria, attitude towards malaria prevention and practices of malaria preventive measures from the respondents. The respondents were informed about the objectives of the study before being asked for consent and to fill the questionnaire. Each correct response to the knowledge questions was scored one mark and any wrong response or non-response was scored zero. The total score of each respondent was converted to a percentage and graded as good ($\geq 50\%$) and poor ($< 50\%$). Data analysis was done using Epi info version 3.5.1 and Graphpad InStat statistical software packages. Data were presented as simple frequencies, percentages, means and standard deviations. Chi-square test was used to compare frequencies while *t*-test was used to compare means.

RESULTS

Out of the 250 questionnaires administered, two hundred and twenty one (221) were retrieved and analyzed giving a response rate of 88.4%. All the respondents were males with a mean age of 20 ± 2.8 years. Majority of the respondents were aged 15-24 years (83.2%), Christians (86%), Yoruba by tribe (69.7%), and in Faculty of Engineering (35.7%) [Table 1].

Most of the respondents (96.4%) had good knowledge of malaria. The mean knowledge score of the respondents, which suggests the depth of knowledge on the aspects of knowledge investigated, was 80.44 ± 19.64 [Table 2]. Only 44.8% of respondents correctly identified malaria as a disease caused by a protozoa or plasmodium, though the majority (96.4%) knew that it is transmitted by mosquito bites. Respondents had good knowledge of symptoms and preventive measures for malaria; however, only 42.1% know that malaria prophylaxis is a means of malaria prevention [Table 2]. There was no statistically significant association ($P > 0.05$) between socio-demographic characteristics of the respondents and their level of knowledge of malaria [Table 3].

A great majority of the respondents (91.0%) recommended the use of insecticide treated net (ITN) to all students, however, only 31.6% use it. The major reason given for non-usage of ITN was discomfort (45.3%) [Table 4]. There was no statistically significant association ($P > 0.05$) between

Table 1: Socio-demographic characteristics of respondents

Socio-demographic characteristics characteristics	Frequency (%)
Age	
15-19	94 (42.5)
20-24	90 (40.7)
25-29	33 (14.9)
30-34	4 (1.8)
Total	221 (100)
Mean±SD	20.3±2.8
Gender	
Male	221 (100)
Female	0 (0)
Total	221 (100)
Religion	
Christianity	190 (86.0)
Islam	29 (13.1)
Others	2 (0.9)
Total	221 (100)
Ethnicity	
Hausa/Fulani	1 (0.5)
Igbo	46 (20.8)
Yoruba	154 (69.7)
Others	20 (9.0)
Total	221 (100)
Faculty	
Engineering	79 (35.7)
Science	41 (18.6)
Arts	36 (16.3)
Business administration	27 (12.2)
Law	17 (7.7)
Environmental science	11 (5.0)
College of medicine	10 (4.6)
Total	221 (100)
Class/level	
100	44 (19.9)
200	64 (29.0)
300	56 (25.3)
400	41 (18.6)
500	16 (7.2)
Total	221 (100)

SD=Standard deviation

socio-demographic characteristics of the respondents and their utilization of ITNs [Table 5].

DISCUSSION

The finding that majority of the respondents (83.2%) were between the ages 15-24 years, is not surprising since this age group represents the age range for students in tertiary institutions in Nigeria. Respondents were mainly from the Yoruba ethnic group (69.7%) since the study was conducted in the South Western part of Nigeria. The finding that many of the students were from the Faculty of Engineering (35.7%) may be due to the fact that the hostel is situated very close to the Faculty of Engineering of the university.

Table 2: Respondents' knowledge of various aspects of malaria

Knowledge of malaria	Correct response (%) (n=221)
Aetiology and transmission	
Malaria is transmitted through the bite of female anopheles mosquitoes	213 (96.4)
Malaria is a disease caused by protozoa (plasmodium)	99 (44.8)
Common symptoms of malaria	
Fever	209 (94.6)
General body weakness	198 (89.6)
Loss of appetite	189 (85.5)
Head ache	187 (84.6)
Chills and shivering	184 (83.2)
Body pain	120 (54.3)
Vomiting	114 (51.6)
Measures for preventing malaria	
Clearing gutters and other sources of stagnant water	219 (99.1)
Use of insecticide treated bed nets	215 (97.2)
Indoor insecticide sprays and coils	208 (94.1)
Mosquito repellants	207 (93.7)
Clearing bushes in the surroundings	205 (92.8)
Use of door and window nets	202 (91.4)
Insecticide spraying of gutters and drainages	160 (72.4)
Malaria prophylaxis	93 (42.1)
Knowledge grade	
Good	213 (96.4)
Poor	8 (3.6)
Mean knowledge score (%)	80.44±19.64

The high level of knowledge of malaria seen in this study is similar to the results obtained from a study in Ghana where 90% of the students had a high level of knowledge of malaria transmission and prevention.^[7] The finding that only 44.8% of respondents know the causative agent of malaria to be plasmodium is not surprising since the majority of the respondents do not have a core biology science academic background. Furthermore, this is less than the result obtained in a study carried out by Okwa O and Ibidapo A in another tertiary institution in Lagos where 58.3% knew the cause of malaria.^[8] However, the finding that 96.4% of the respondents know that malaria is transmitted through the bite of an infected female anopheles mosquito is similar to results from other studies.^[7,9,10]

The proportion of students mentioning fever as the most common symptom of malaria (94.6%) was comparable to results of similar studies in Ile-Ife,^[11] but contrasts with results from Lagos where headache was the most common symptom of malaria identified.^[8]

The overall high level of knowledge observed in this study may be as a result of different ongoing campaigns through diverse electronic and print media aimed at increasing awareness towards malaria and mosquito control, especially in Lagos State. The results show that

Table 3: Relationship between respondents' socio-demographic characteristics and level of knowledge

Socio-demographic characteristics	Level of knowledge (%)		Statistics and P
	Good	Poor	
Age			
15-19	91 (41.2)	3 (37.5)	
20-24	85 (38.5)	5 (62.5)	
25-29	33 (14.9)	0 (0)	
30-34	4 (1.8)	0 (0)	
Total	213 (100)	8 (100)	
Mean±SD	20.83±3.89	20.12±2.59	t=0.51; df=219; P=0.61
Religion			
Christianity	183 (85.9)	7 (87.5)	
Islam	29 (13.6)	0 (0)	*P=0.60
Total	213 (100)	8 (100)	
Ethnicity			
Hausa/Fulani	1 (0.5)	0 (0)	
Igbo	43 (20.2)	3 (37.5)	
Yoruba	150 (70.4)	4 (50)	*P=0.28
Others	17 (8)	1 (12.5)	
Total	213 (100)	8 (100)	
Faculty			
Engineering	76 (35.7)	3 (37.5)	
Science	41 (19.2)	0 (0)	
Arts & Social sc	35 (16.4)	1 (12.5)	*P=0.39
Business administration	25 (11.7)	2 (25.0)	
Law	16 (7.5)	1 (12.5)	
Environmental sciences	11 (5.2)	0 (0)	
College of medicine	09 (4.2)	1 (12.5)	
Total	213 (100)	8 (100)	
Level			
100	43 (20.3)	1 (12.5)	
200	61 (28.8)	3 (37.5)	
300	54 (25.4)	2 (25)	*P=0.24
400	41 (19.2)	0 (0)	
500	14 (6.1)	2 (25)	
Total	213 (100)	8 (100)	

*Fisher's exact, SD=Standard deviation

Table 4: Respondents' practices of preventive measures against malaria

Practice of preventive measures against malaria	Correct response (%)
Preventive practices (n=221)	
Drain stagnant water	185 (83.7)
Use door and window nets	185 (83.7)
Clear surrounding overgrown vegetation	164 (74.2)
Rub mosquito repellent	90 (40.7)
Use malaria prophylaxis	71 (32.1)
Use of insecticide treated nets	70 (31.6)
Reasons for Non-Usage of ITNs (n=151)	
Discomfort	68 (45.0)
Unnecessary since mosquitoes bite during the day	23 (15.2)
Don't know where to get one	20 (13.2)
Not affordable	10 (6.6)
It does not work	5 (3.3)

ITNs=Insecticide treated nets

Table 5: Relationship between respondents' socio-demographic characteristics and their usage of insecticide treated nets

Socio-demographic characteristics	ITN usage (%)		Statistics and P
	Yes freq	No freq	
Age			
15-19	30 (42.9)	64 (42.4)	
20-24	33 (47.1)	57 (37.8)	
25-29	5 (7.1)	28 (18.5)	
30-34	2 (2.9)	2 (1.3)	
Total	70 (100)	151 (100)	
Mean±SD	20.5±3.65	20.94±3.94	t=0.79;df=219;P=0.43
Religion			
Christianity	60 (85.7)	129 (86)	
Islam	10 (14.3)	22 (12.7)	*P=0.83
Total	70 (100)	151 (100)	
Ethnicity			
Hausa/Fulani	0 (0)	1 (0.6)	
Igbo	13 (18.6)	33 (22)	
Yoruba	51 (72.9)	103 (68)	
Others	5 (7.1)	13 (8.7)	*P=0.87
Total	70 (100)	151 (100)	
Faculty			
Engineering	24 (34.3)	56 (37.1)	
Science	16 (22.9)	25 (16.6)	
Arts	13 (18.6)	23 (15.2)	*P=0.14
Law	07 (10)	10 (6.6)	
College of medicine	05 (7.1)	05 (3.3)	
Business administration	04 (5.7)	22 (14.6)	
Environmental sciences	01 (1.4)	10 (6.6)	
Total	70 (100)	151 (100)	
Level			
100	17 (24.3)	27 (18)	$\chi^2=2.18$
200	18 (25.7)	46 (30)	df=4
300	18 (25.7)	38 (25.3)	P=0.68
400	11 (15.7)	30 (20)	
500	6 (8.6)	9 (6)	
Total	70 (100)	151 (100)	

*Fisher's exact, SD=Standard deviation, ITN=Insecticide treated net

the socio-demographic characteristics of the respondents did not in any way significantly affect their knowledge of malaria.

A large majority (91%) of the respondents recommended the use of ITN as a preventive measure against malaria infection. This can be seen as an improvement when compared to the report of the study in Oyo state, Nigeria which showed that only 3.3% of respondents showed a preference for use of insecticide impregnated nets for malaria prevention.^[10]

Although, current international efforts at malaria control are targeted towards the use of insecticide-treated nets (ITNs) for prevention via vector control,^[10-12] only 31.6% of respondents in this study use it as a preventive method, whereas 97.2% identified it as a means of preventing malaria. This shows variable comparison with similar studies.^[5-7,10,11]

CONCLUSION

In conclusion, this study has identified that the level of knowledge of malaria was high, most of the respondents had positive attitude towards the use of ITNs for prevention of malaria, however, the level of practice was quite unsatisfactory as only a small percentage currently used insecticide treated bed nets, and this is quite worrisome. There is therefore need for proper health education and health promotion campaigns on the use of ITNs for prevention of malaria among students of tertiary institutions.

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