



## Knowledge and Treatment Seeking Behaviour for Malaria Among Some Undergraduate Students of the University of Jos

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A – research concept and design; B – collection and/or assembly of data; C – data analysis and interpretation; D – writing the article; E – critical revision of the article; F – final approval of article.

### Abstract

**Background:** Malaria remains a major public health problem in Nigeria. Information on clients' knowledge and treatment seeking behaviour might improve or sustain the rational management of the disease and treatment outcome.

**Objectives:** This study assessed the knowledge and treatment seeking behaviour for the disease among undergraduate students of two Faculties of the University of Jos.

**Materials and Method:** The study employed a cross-sectional strategy in which a self-administered questionnaire was administered to two hundred and two (202) four hundred (400) and five hundred (500) levels Veterinary Medicine and Pharmaceutical sciences Faculty students of the University. The collected data was analyzed using IBM-SPSS<sup>®</sup> version 23 software.

**Results:** The total possible maximum correct knowledge score of the respondents was 10, and their mean ( $\pm$  SD) knowledge score was 7.77 ( $\pm$  1.27), with majority (59.9%) having good knowledge of malaria and its management. Most of them either had moderate (38.1%) or good (36.1%) treatment seeking behaviour for the disease. Some factors including religion, level of education, patronage of healthcare facilities, and knowledge of the disease and its management were significant predictors of students' treatment seeking behaviour for malaria.

**Conclusion:** Despite the fact that a high proportion of the students had good knowledge, their treatment seeking attitudes for the disease were not correspondingly high, implying the existence of a possible gap between the students' theoretical knowledge on the disease and actual treatment seeking behaviour for the disease.

**Keywords:** Knowledge, Treatment seeking behaviour, Malaria, Undergraduate students

### INTRODUCTION

Malaria remains a major public health problem despite decades of control and prevention efforts. It remains a major cause of morbidity and mortality in the tropical regions of the world (World Health Organisation (WHO), 2021). Globally, there were approximately 241 million cases, and 627,000 deaths due to malaria in 2020. About 95% of these cases and

96% of deaths occurred in Africa which was 99% due to *Plasmodium falciparum*, affecting predominantly children and pregnant women (WHO, 2021). The report further indicated Nigeria had the highest burden of the disease, accounting for 27% of global malaria cases and deaths.

The cause of this high prevalence of the malaria disease in Nigeria could be due to many factors, which might be medically-related (drug efficacy and effectiveness, treatment-seeking behaviours of the clients, access to treatment of the disease, or socio-economic conditions of the patients), or non-medically related factors including temperature, humidity, and rainfall (Edet-Utan *et al.*, 2016). This devastating disease affect the country's economic productivity, resulting in an estimated monetary loss of approximately 132 billion naira (equivalent to 700 million USD), in treatment costs, prevention, and other indirect costs (WHO, 2015; Dawaki *et al.*, 2016).

The realization and sustenance of malaria control can only be achieved through sound community understanding and knowledge of the disease given that it requires a focus on malaria transmission at local levels (Klein *et al.*, 1995; Thanabouasy *et al.*, 2009; Hlongwana *et al.*, 2009).

Treatment of malaria requires not only the availability of medicines but also the ability of an individual to seek appropriate and timely care for themselves and for others. Information about where mosquito breed, how infection occurs and the symptoms and treatment of malaria must be widely disseminated especially among the rural areas

## **METHODOLOGY**

### **Study Settings**

The study area for this work was at University of Jos main campus, Bauchi Ring road. University of Jos was established in November 1971 from the satellite campus of the University of Ibadan. It was latter established as a separate institution in October 1975 and classes commenced in October 1976 with 575 students spread across four faculties (Arts and Social Sciences, Education, Natural Sciences and Medical Sciences). Currently, the University has fifteen (15) faculties with over forty one thousand (41,000) students (Information Department, 2020).

### **Study Design**

The study was a cross-sectional study conducted among University of Jos undergraduate students.

### **Study Population**

The study population consisted of adolescent students from the age of 16 years old and above, in Veterinary Medicine and Pharmaceutical Sciences Faculties.

including riverine communities where there is poor knowledge about malaria. Illness behaviour by definition consists of those actions people take when they feel unwell in order to determine the nature of their sickness and to seek for help. It is largely determined by patient's perception of causes of disease and its symptoms and regards to the diagnosis, acceptance of treatment, adherence to the treatment and financial cost implication of treatment (Alegana *et al.*, 2017).

Despite many studies and interventions on malaria via health education, indoor residual spraying and the use of mosquito net as a means of prevention, the morbidity rate is still on the increase(Federal Ministry of Health and Roll Back Malaria (FMOH& RBM), 2014; Lutala *et al.*, 2011; World Bank, 2016), and very little is known about the disease and treatment seeking behaviour among undergraduate student of University of Jos. A study to understand undergraduate students' knowledge and treatment seeking behaviour for malaria management could serve as significant contributions toward solving the malaria pandemic in the country. Hence the aim of this study was to assess University of Jos undergraduate students' knowledge and treatment seeking behaviour for malaria.

### **Sample Size Calculation**

The estimated minimum sample size for the study was based on the number of students admitted each year in the two faculties which were obtained from the student affairs section of the University.

### **Inclusion and Exclusion**

Undergraduate students of both genders who were within the age group of 16 and above in 400 and 500 levels studying Veterinary Medicine and Pharmaceutical Science were included in the study. Excluded from the study were students below the age of 16 years old, in other levels of studies, postgraduate and non-degree students.

### **Data Collection**

A study instrument containing items that measured respondents' socio-demographic characteristics, knowledge and treatment seeking behaviours were

self-administered to the respondents who filled and returned for statistical analysis.

### Data Analysis

The quantitative data generated from the study were manually sorted and entered into Microsoft Excel<sup>®</sup> software based on coded formats and transferred into the International Business Machines Corporation (IBM<sup>®</sup>) Statistical Package for Social Sciences (SPSS<sup>®</sup>) (IBM-SPSS<sup>®</sup>) version 23 software on a secured laptop for analyses. Descriptive statistics including frequency and percentage distributions of both categorical and continuous variables were presented in addition to the mean, standard deviation (SD), and median values for continuous variables.

The knowledge categorisation was based on the levels of correct response of the respondents to the 10 items used for knowledge assessment which was assessed using 'yes', 'not sure' or 'no' options. Their responses were dichotomised by assigning 1 point to those who ticked the correct answer (yes), and 0 point to those who picked the wrong option (no, or not sure). In all, there was a total possible maximum correct knowledge score of 10. Respondents that answered between 8 and 10 items correctly had scores of between 8 and 10, and were categorised as having good knowledge, while those that got between 5 and 7 items right were allocated score of between 5 and 7 points, and were considered to have moderate knowledge. Similarly, those who got less than 5 of the items correctly had total scores of between less than 5 and were categorised as having a poor

knowledge on uncomplicated malaria and its management (Jimam and Ismail, 2019). Treatment seeking behaviour of respondents was categorised as good, moderate, or poor as described by Ugo *et al.* (2016):

i. Respondents who sought for treatment from right source (hospital or pharmacy shop), within 24 hours of noticing signs and symptoms of the disease, and also knew that they were supposed to take their complete medication until recovery from the sickness according to the treatment guideline were classified as having good treatment seeking behaviour (100% correct).

ii. Those that scored two (2) out of the above three (3) treatment seeking behaviour items correctly were considered as possessing moderate treatment seeking behaviour (50% correct).

iii. While respondents who either got one (1) or known of the attributes correctly were classified as having poor treatment seeking behaviour characteristics (less than 50% correct).

The test for statistically significant difference in the respondents' treatment seeking behaviours for malaria across their independent variables were conducted using non-parametric approach such as Mann-Whitney test for independent variables that were in two subgroups and Kruskal-Wallis analysis test for categorical variables which had three or more subgroups, and all the analyses were carried out at  $p < 0.05$  levels of significance. Regression analysis to assess predictors of treatment seeking behaviour of the respondents was also carried out.

## RESULTS

### Response Rate

All the two hundred and two (202) participants properly completed and returned the questionnaires representing a hundred percentage responses (100%).

### Respondents' Demographic Characteristics

**Table 1** showed 63.37% of respondents were from the Faculty of Pharmaceutical Science and 36.63% from Veterinary Medicine with the majority as males (52%) while 48% were female. Majority of the respondents (75.7%) fall within the age range of 18 – 27 years old, followed by those in the age range of 28 – 37 years old (22.8%), while the least were between the age group of 38 – 47 (0.5%). Based on their

levels of education, 44.1% were 400 level students, while 55.9% were 500 level students. Furthermore, 91.6% of the respondents were Christians, with 8.4% been Muslim. In term of their marital status, many of them (95.5%) were single, with only 4.5% married.

### Descriptive Analysis for Undergraduate Students' Knowledge on Malaria

#### 1. Frequency distributions of undergraduate students' knowledge on malaria

The respondents' percentage of correct responses to mosquitoes as the main vector for transmission of the disease was 99.5%, with 79.7% of them who stated

that they have suffered from malaria or fever attack in the past 3 months (**Table 2**). Many of the respondents (95.0%) also knew that children and pregnant women were at higher risk of developing the disease. In term of signs and symptoms of the disease, 97.5% and 98.5% respectively knew that rise in body temperature and body weakness were symptom of malaria. Furthermore, majority of them (91.1%) knew that ACT was the recommended drug of choice for uncomplicated malaria.

## **2. Undergraduate Students' Knowledge Descriptive Statistics Summary and Scores Categorisation**

With an overall mean ( $\pm$  SD) knowledge score of 7.77 ( $\pm$  1.27), majority of the respondents (59.9%) scored between 8 and 10 points and were categorised as having good knowledge of malaria and its management, followed by 39.1% of them with score of between 5 and 7 points and were considered as having moderate knowledge (**Table 2**).

**Table 1:** Demographic characteristics of the respondents (N =202)

<b>Variables</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Faculties</b>		
Pharmaceutical Science	128	63.37
Veterinary Medicine	74	36.63
<b>Gender</b>		
Male	105	52
Female	97	48
<b>Age (Years)</b>		
<18	2	1
18-27	153	75.7
28-37	46	22.8
38-47	1	0.5
<b>Levels of Education</b>		
400 level	89	44.1
500 level	113	55.9
<b>Religion</b>		
Christianity	185	91.6
Islam	17	8.4
<b>Marital Status</b>		
Single	193	95.5
Married	9	4.5
Widowed	0	0
Divorced	0	0

**Table 2:** Undergraduate students’ knowledge on malaria and medication, summary of descriptive statistics and scores categorisation (N = 202)

<b>Knowledge statements</b>	<b>Yes n (%)</b>	<b>Not sure n (%)</b>	<b>No n (%)</b>
Malaria is transmitted by mosquitoes’ bite.	201 (99.5)*	0 (0.0)	1 (0.5)
I have suffered from malaria or fever attack in the past 3 months	161 (79.7)	6 (3.0)	35 (17.3)
Children and pregnant women are at higher risk of developing malaria.	192 (95.0)*	7 (3.5)	3 (1.5)
My assessment of the severity of your disease and its symptoms	Slight 53 (26.2)	Average 117 (57.9)	Severe 32 (15.8)
Rise in body temperature is a symptom of malaria.	197 (97.5)*	3 (1.5)	2 (1.0)
Body weakness is a symptom of malaria.	199 (98.5)*	2 (1.0)	1 (0.5)
I have attempted to treat my illness before now.	185 (91.6)	2 (1.0)	15 (7.4)
Artemisinin-based Combination Therapy (ACT) is the recommended anti-malarial drug for uncomplicated malaria in Nigeria.	184 (91.1)*	14 (6.9)	4 (2.0)
Sulphadoxime- Pyrimethemine is the recommended anti-malarial drug for uncomplicated malaria in Nigeria.	90 (44.6)*	32 (15.8)	80 (39.6)
Chloroquine is the recommended anti-malarial drug for uncomplicated malaria in Nigeria.	108 (53.5)*	28 (13.9)	66 (32.7)
<b>Knowledge categorization</b>	<b>Scores</b>	<b>n (%)</b>	<b>Descriptive statistics</b>
Mean ( $\pm$ SD)			7.77 ( $\pm$ 1.27)
Median			8.00
Minimum – maximum			3.00 – 10.00
Poor	1 – 4	2 (1.0)	
Moderate	5 – 7	79 (39.1)	
Good	8 – 10	121 (59.9)	
Total	10	202 (100)	

\* = correct responses, SD = standard deviation

### Descriptive Analysis for Students’ Treatment Seeking Behaviour for Malaria

#### 1. Frequency distributions of undergraduate students’ treatment seeking behaviour for malaria

**Table 3** indicated that majority (50%) sought for treatment in the Hospital, while 31.7% of them said Pharmacy shops were facilities they seek for malaria treatment when need arises. Regarding when to seek for treatment, many of the respondents (42.6%) indicated within 24 hours, while 21.8% said the next day, and 27.2% said the next two days; with majority of them (84.2%) knowing that the main reason for completion of treatment was to recover from the illness.

#### 2. Undergraduate students’ treatment seeking behaviour for malaria descriptive statistics summary and scores categorisation

With overall mean ( $\pm$  SD) treatment seeking behaviour score of 1.99 ( $\pm$ 0.98), majority of the respondents (38.1%) scored 2 out of the 3 treatment seeking behaviour items correctly and were categorised as having moderate treatment seeking behaviour attitude for malaria, followed by 36.1% of them scoring all the 3 items right and were considered as having good treatment seeking behaviour attitude (**Table 3**).

Regarding the availability of healthcare facilities and patronage by students in the University, almost all of the study participants (98%) agreed that healthcare facility were available in the school, but only 19.8% of them mentioned that they patronize the available

facilities for malaria treatment. When asked for the reason for poor patronage of the available facilities in the University, majority of them (35.1%) considered it as a time wasting, and some of them (11.9%) complaining of far distance, while others (11.4%) had no reasons with only 1.0% mentioning possible absence of medical personnel at the facilities. With-

respect-to the preventive measures carried out by the students to prevent mosquito bite, most of them (51.5%) used bed-net, followed by 27.2% who used insecticide spray / aerosol, with 9.9% using mosquito coil while 10.9% not using any of the preventive measures.

**Table 3:** Treatment seeking behaviour for malaria among students, summary of descriptive statistics and scores categorisation (N = 202)

Variables	Frequency (n)	Percentage (%)
<b>Where to seek for treatment in the first step</b>		
Hospital	101	50.0
Pharmacy shop	64	31.7
Self-treatment	32	15.8
Patent medicines shop	3	1.5
Others	2	1.0
<b>When to seek treatment from a healthcare provider</b>		
Within 24 hours	86	42.6
the next day	44	21.8
two days later	55	27.2
<b>Reason for completion of treatment according to healthcare provider' opinion</b>		
To recover	170	84.2
To relieve the symptoms	24	11.9
Do not complete my course of treatment	8	4.0
<b>Treatment seeking behaviour categorisation</b>		
	<b>Scores</b>	<b>n (%)</b>
Mean (± SD)		
Median		
Minimum – maximum		
Poor	≤ 1	52 (25.8)
Moderate	2	77 (38.1)
Good	3	73 (36.1)
Total	3	202 (100)
		<b>Descriptive statistics</b>
		1.99 (±0.98)
		2.00
		0.00 – 3.00

SD = standard deviation

**Respondents' treatment seeking behaviour scores distributions across independent variables**

The respondents' Treatment Seeking Behaviour scores were distributed across the independent variables (Table 4). The Mann-Whitney test indicated insignificant difference in the treatment seeking behaviour (Z-statistic = - 2.203, p = 0.332) among males and females. Kruskal-Wallis test showed significant differences in the respondents' treatment seeking behaviour ( $\chi^2 = 28.834$ , p = 0.000\*\*) based on their ages (years old). The differences in treatment seeking behaviour ( $\chi^2 = 15.344$ , p = 0.004\*\*) were also statistically significant across the students' patronage of healthcare facilities for treatment. There were also statistical significant differences in the respondents' treatment seeking behaviour based on their reason for

poor patronage of healthcare facilities ( $\chi^2 = 14.718$ , p = 0.023\*). Similarly, the differences in treatment seeking behaviours of respondents based on their knowledge about the disease and management was statistically significant ( $\chi^2 = 31.785$ , p = 0.000\*\*) (Table 4).

**Relationships of Treatment Seeking behaviour Scores with Independent Variables (Multinomial Logistic Regressions)**

The results of multinomial logistic regression showed the strength of prediction of treatment seeking behaviour scores by the independent variables (potential predictors) (Kutner et al., 2005). The -2 log-likelihood (-2LL) test was used to compare the null models with the full model. The results showed

values of 128.376 ( $\chi^2 = 89.490$ ,  $df = 38$ ,  $p = 0.000$ ) for the final regression model for treatment seeking behaviour containing their respective predictors, implying that the models could significantly predict the dependent variable. Furthermore, the Chi-square goodness-of-fit test at  $p < 0.05$  for the model ( $\chi^2 = 100.147$ ,  $p = 0.926$ ) indicated p-values was greater than 0.05, which implied that the models fit the data well.

Similarly, the pseudo-R-square values of 0.529 (Cox and Snell) which is an adjusted form of Nagelkerke confirmed that the model could explain 52.9% of the students' treatment seeking behaviour variance that could be predicted from their independent variables. **Table 5** showed religion, Level of education, patronage of healthcare facilities for treatment by student, reasons for poor patronage of healthcare facilities, and knowledge as significant predictors of students' treatment seeking behaviour for malaria.

**Table 4:**Treatment seeking behaviours scores categorisation and comparison across independent variables (N = 202)

Variables	Poor n (%)	Moderate n (%)	Good n (%)	Total n (%)
<b>Gender</b>	(Z-statistic = - 2.203, p = 0.332 )			
Male	28 (13.9)	32 (15.8)	37 (18.3)	97 (48.0)
Female	24 (11.9)	45 (22.3)	36 (17.8)	105 (52.0)
<b>Age (years old)</b>	$(\chi^2 = 28.834, p = 0.000^{**})$			
< 18	0 (0.0)	0 (0.0)	2 (1.0)	2 (1.0)
18 – 27	45 (22.3)	68 (33.7)	40 (19.8)	153 (75.7)
28 – 37	7 (3.5)	9 (4.5)	30 (14.9)	46 (22.8)
38 – 47	0 (0.0)	0 (0.0)	1 (0.5)	1 (0.5)
≥ 48	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
<b>Marital status</b>	$(\chi^2 = 0.815, p = 0.665)$			
Single	49 (24.3)	73 (36.1)	71 (35.1)	193 (95.5)
Married	3 (1.5)	4 (2.0)	2 (1.0)	9 (4.5)
Widowed	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Divorced	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Others	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
<b>Level of Education</b>	$(\chi^2 = 9.884, p = 0.130)$			
400 Level	19 (9.4)	39 (19.3)	32 (15.8)	90 (44.6)
500 Level	30 (14.9)	36 (17.8)	41 (20.3)	107 (53.0)
Others	3 (1.5)	2 (1.0)	0 (0.0)	5 (2.0)
<b>Religion</b>	$(\chi^2 = 5.236, p = 0.073)$			
Christianity	47 (23.3)	67 (33.2)	71 (35.1)	185 (91.6)
Islam	5 (2.5)	10 (5.0)	2 (1.0)	17 (8.4)
Others	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
<b>Availability of healthcare facility in school</b>	$(\chi^2 = 7.132, p = 0.129)$			
Yes	49 (24.3)	76 (37.6)	73 (36.1)	198 (98.0)
No	2 (1.0)	0 (0.0)	0 (0.0)	2 (1.0)
Not sure	1 (0.5)	1 (0.5)	0 (0.0)	2 (1.0)
<b>Patronage of healthcare facilities for treatment by student</b>	$(\chi^2 = 15.344, p = 0.004^{**})$			
Yes	14 (7.0)	14 (7.0)	12 (6.0)	40 (20.0)
No	19 (9.5)	53 (26.5)	44 (22.0)	116 (58.0)
Sometimes	18 (9.0)	9 (4.5)	17 (8.5)	44 (22.0)
<b>Reasons for poor patronage of healthcare facilities</b>	$(\chi^2 = 14.718, p = 0.023^*)$			
Time wasting	9 (7.5)	39 (32.5)	23 (19.2)	71 (59.2)
Far distance	9 (7.5)	7 (5.8)	8 (6.7)	24 (20.0)
No medical personnel will be	1 (0.8)	1 (0.8)	0 (0.0)	2 (1.7)

Variables	Poor n (%)	Moderate n (%)	Good n (%)	Total n (%)
available				
No reason	10 (8.3)	9 (7.5)	4 (3.3)	23 (19.2)
<b>Knowledge</b>	$(\chi^2 = 31.785, p = 0.000^{**})$			
Poor	2 (1.0)	0 (0.0)	0 (0.0)	2 (1.0)
Moderate	31 (15.3)	35 (17.3)	13 (6.4)	79 (39.1)
Good	19 (9.4)	42 (20.8)	60 (29.7)	121 (59.9)

\* = statistically significant at  $p < 0.05$ ; \*\* = statistically significant at  $p < 0.005$ ;  $\chi^2$  = Chi-square

**Table 5:** Multinomial logistic regression between students' independent variables and treatment seeking behaviours scores (N = 202)

Effect	Model Fitting Criteria		Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square ( $\chi^2$ )	Df	p-value	
Intercept	128.376	0.000	0	.	
Gender	130.409	2.033	2	0.362	
Age (years old)	134.404	6.028	6	0.420	
Religion	136.629	8.253	2	<b>0.016*</b>	
Marital status	129.019	0.643	2	0.725	
Level of Education	145.162	16.786	6	<b>0.010*</b>	
Availability of healthcare facility in school	131.935	3.559	2	0.169	
Patronage of healthcare facilities for treatment by student	153.107	24.731	4	<b>0.000**</b>	
Reasons for poor patronage of healthcare facilities	142.665	14.289	6	<b>0.027*</b>	
Knowledge category	143.224	14.848	4	<b>0.005**</b>	

\* = statistically significant at  $p < 0.05$ ; \*\* = statistically significant at  $p < 0.005$

## DISCUSSION

The majority of the respondents (52%) were male students and this might be indirectly linked to the ratio of high males to the females in the two faculties in which the former seem to be more compared to the later. The observed high percentage (75.5%) of the age groups of between 18-27 years old that participated in the study was not a surprise as this is the rightful age of youth for undergraduate studies. Furthermore, almost all of the respondents (99.5%) knew that mosquitoes bite was the main means of malaria transmission. The result was consistent with report of similar study conducted in South-West Nigeria (Adetola *et al.*, 2014), and better than outcomes of similar studies conducted in North-Western Nigeria and Jaisalmer district of India whereby about 55.10% and 69.30% of the respondents, respectively, recognised mosquitoes as the main means of transmitting the disease (Singh *et al.*, 2014; Yadav *et al.*, 2013). Similarly, the results showed 95% of the participants were aware that children and pregnant women were at higher risk of developing the disease, and this was similar to results of related studies conducted in Ethiopia whereby 94.5% of the respondents understood that these

vulnerable populations where at higher risk of being affected by the disease (Fuge *et al.*, 2015). With respect to the respondents' understanding on malaria and its management, the observed good knowledge score by majority of the respondents (59.9%) about malaria and its management was consistent with similar study conducted in Primary Healthcare facilities of Plateau state (Jimam and Ismail, 2019). The reported statistically significant differences in respondents' treatment seeking behaviours across age group of the respondents was in agreement with the outcome of a similar study conducted in Kenya (Nyamongo, 2002), although, age was not a statistically significant predictor of the students' treatment seeking behaviours. Furthermore, Level of education and knowledge of the respondents were also significant predictors of the students' treatment seeking behaviours for malaria. The respondents' reported good knowledge score on malaria disease and its management might be a contributory reason for the observed high proportion of them exhibiting moderate to good treatment seeking behaviours as observed from their patronage of healthcare facilities for treatment. Dida *et al.* (2015) had earlier reported



that patient who had good overall knowledge on malaria were more likely to seek for treatment within 24 hours of fever onset than those with poor knowledge about the disease. A study conducted in Nigeria had also revealed that knowledge of the cause of malaria had significant influence on health seeking behaviour (Lawal et al., 2014). Similar findings in Tanzania regarding participant experience of previous malaria illness have documented that those who had history of malaria seem to visit healthcare facilities earlier compared to those who had no history of the disease (Adinan et al., 2017). This may be due to the fact that previous malaria history might have helped them to know malaria symptoms and seek treatment early. This is possible since treatment-seeking behaviour is largely determined by patient's perception of causes of

disease and its symptoms and regards to the diagnosis, acceptance of treatment, adherence to the treatment as well as the financial cost implication of treatment (Alegana et al., 2017; Ugo et al., 2016).

However, the observed reasons for poor patronage of the healthcare facilities for malaria management by some of the respondents might be linked to their perception on such activities as time wastage and distance from the healthcare facilities based on their responses to items in **Table 4**. This was consistent with reports of previous study conducted in Primary Healthcare facilities of Plateau state (Jimam et al., 2021). It was similarly reported by Getahun et al. (2010) in South-Western Ethiopia that patient who were 3km or more away from a healthcare facility were more likely to delay treatment for malaria compared to those who were within 3km.

## CONCLUSION

The outcome of the study showed majority of the respondents had good knowledge of malaria and its management, with many of them either having moderate or good treatment seeking behaviour for the disease. The statistically significant predictors of the respondents' treatment seeking behaviour for malaria included religion, Level of education, patronage of healthcare facilities for treatment by student, reasons for poor patronage of healthcare facilities, and knowledge.

The study had some limitations. The survey was conducted only in two faculties of the University, and

this might not be a true representation of all students from other faculties considering possible influences of the course of study by the students among other factors. For instance, those having science background might possibly have better knowledge on the disease and treatment seeking behaviours for the disease than their counterparts in Arts or Technical sections. Biasness in findings due to "hawthorne" effect was possible because some of the respondents might perform and answer better when they knew that their responses were under evaluation.

## ETHICAL APPROVAL AND RESPONDENTS' CONSENT

A proposal for the study was presented to the Research Ethics Committee of Plateau State Specialist Hospital and approval for the study was granted through approval letter with reference number NHREC/09/23/2010b. The main purpose of the study was then explained to the study participants and they were informed that participation in the study

was voluntary. The benefits of the study were also explained to them. In addition, they were informed that they may refuse to take part in the study or may withdraw themselves from participation in the study at any time without penalty. Respondents who consented to participate in the study filled appropriate consent forms prior to the data collection.

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