

Practices of Malaria Prevention among School Adolescent within Calabar Metropolis, Southern Nigeria

Eko Jimmy E.¹, Osonwa Kalu O.², Abeshi, S. E.³, Offiong Dominic A.¹

1. Department of Public Health, College of Medical Sciences, University of Calabar, Calabar, Nigeria.
2. Department of Sociology, Faculty of Social Sciences, University of Calabar, Calabar, Nigeria.
3. Department of Obstetrics & Gynecology, University of Calabar, Calabar, Nigeria

Corresponding authors address: Dr. O. K. Osonwa, Department of Sociology, Faculty of Social Sciences, University of Calabar Calabar, Nigeria-emekusi@yahoo.com

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Abstract: This study examines the practices of Malaria prevention among school adolescent within Calabar Metropolis, Southern Nigeria. Stratified and systematic sampling technique was used to select four hundred (400) respondents used as the sample for the study. Questionnaire was administered to the respondents. Data collected were analyzed by the use of frequency tables, graphs, means, and standard deviation. Chi-square was used to compare proportions and associations between variables. It was discovered that respondents who have heard of malaria 400 (100%) are also aware of Insecticide Treated Nets (ITN), 394 (98.5%) but the use of ITN was substantially average among them. Stagnant water and over grown weeds were identified as breeding site for Anopheles mosquito. Health workers, followed by media were the major sources of information on malaria prevention. It is recommended that school teachers should be empowered with information about the causes of malaria and prevention strategies.

Keywords: Malaria prevention, School adolescent, Calabar Metropolis, Nigeria

1. Introduction

Malaria is a life-threatening disease caused by parasites that are transmitted to people through the bites of infective female Anopheles mosquitoes. According to the latest estimates, there were about 219 million cases of malaria in 2010 (with an uncertainty range of 154

million to 289 million) and an estimated 660 000 deaths (with an uncertainty range of 490 000 to 836 000). Malaria mortality rates have fallen by more than 25% globally since 2000 and by 33% in the WHO African Region. Most deaths occur among children living in sub-saharan Africa where a child dies every minute from malaria. Country-level burden estimates available for 2010 show that an estimated 80% of malaria deaths occur in just 14 countries and about 80% of cases occur in 17 countries (WHO, 2013). Together, the Democratic Republic of the Congo and Nigeria account for over 40% of the estimated total of malaria deaths globally (WHO, 2013).

In Nigeria, malaria ranks among the five commonest cause of childhood deaths and also represent 25 to 30% of deaths of children under five (WHO, 1999). It is the commonest cause of outpatient visit in Nigeria and also the commonest cause of school and work absenteeism (Salako, 2001). Najera and Hempel (2006) reported that school absenteeism due to malaria was as high as 70%. Leighton and Foster (1993) reported that in Kenya, 11% primary school students and 4.3% secondary school students missed school days per year due to malaria. They also reported that Nigerian school children missed an estimated 3-12 school days per year (2.6%). Fernando *et al.* (2003) observed that there was significant adverse impact of repeated malaria attacks on school performance of children. Lallo (2004) stated that malaria is an important cause of adolescents' hospital admission in many sub-Saharan African countries.

Among school adolescents, malaria is responsible for school absenteeism, poor performance in school, examination failures, school dropouts and even death. The problem of malaria among adolescents has largely been overshadowed by the huge burden of HIV/AIDS among this younger age group (Lallo, Olukoya & Olliaro, 2006). The younger age group has been identified as bearing half of the burden of HIV worldwide (Arowojolu, Ilesanmi, Roberts & Okunola, 2002). As much as 60% of school children's learning may be impaired by malaria (Howard & kulie, 1994; Booth & Maclean, 2001; Ekanem et al, 1998; Chukuezi, 1995; WHO, 1998).

In Cross River State in south-eastern Nigeria, malaria is such a significant problem among school children that the state government decided to involve them fully in the implementation of the RBM programme (Ugot, 2003). According to (Ugot, 2003), this is because school children are known to easily imbibe and implement new knowledge and can, therefore easily act as change agents and as role models for their siblings and peers.

1.1 Objective of the Study

The general objective of this study is to determine the practices of malaria prevention among school adolescent in Calabar metropolis, southern Nigeria.

1. Materials and Methods

2.1 Study Setting

The study area is Calabar metropolis. It is situated in the southern part of Nigeria. Calabar metropolis is made up of two local government areas, Calabar Municipality and Calabar South local government area with an estimated population of 196,630 for Calabar South and 176,218 for Calabar Municipality (NPC, 2006). Calabar Municipal council has 10 political wards while Calabar South has 12 political wards making a total of 22 political wards. The Calabar Municipality has a land mass of 141,33 square kilometer while the South which lies in the coastal area empty into the Atlantic ocean and located between latitude 4055 and 8030 East of the Green Meridian, it has a land mass of 181,42. The metropolis is bounded by Calabar river to the west, Akpabuyo local government area to the east, Odukpani local government area to the north and Atlantic ocean to the south. It is a cosmopolitan city which embraces all ethnic groups in Nigeria. The three dominant ethnic groups are the Efiks, Quas and the Efuts which share common culture and religion. English and Efik are the languages widely spoken. The metropolis is predominantly a Christian city with few Muslims and traditional religious groups and mainly occupied by civil servants, businessmen and traders. It also has industries and establishments such as airport, export processing zone, Naval and Army base, Tinapa, NNPC depot, cement factory etc. The metropolis has three levels of health care facilities, 41 primary health facilities, 2 secondary health facilities with 56 private health facilities. Calabar are famous for their rich cultural heritage, warm hospitality and peace-loving disposition.

2.2 Study Population

The study population comprised of school adolescent in Calabar metropolis, Southern Nigeria.

2.3 Study Design

A descriptive cross-sectional study was employed to determine the practices of malaria prevention among school adolescent in Calabar metropolis, Southern Nigeria from April to May 2013.

2.4 Sampling Technique

Stratified and systematic sampling technique was used in the selection of respondents for the study. The procedure is described as follows.

1. Calabar metropolis is divided into two strata i.e. Calabar south and Calabar municipal.
2. In each stratum, 3 government secondary schools were selected and employed in the study giving a total of 6 secondary schools.
3. In each school, systematic random sampling technique was employed in the selection of students. Class register was obtained from class teachers and students whose name appeared on the register with even numbers were selected for the study. The procedure continued until 400 students were selected to partake in the study (that is, 200 students from each stratum and 67 students from each school).

2.5 Data Collection Tool

A structured questionnaire was designed to generate quantitative data from respondents. The questionnaires were self-administered to respondents with both open and closed ended questions. The questionnaire comprised of 32 items and 4 sections with attention on socio-demographic characteristics, knowledge of malaria, attitude towards malaria and practices of malaria prevention among respondents.

2.6 Data Analysis

The questionnaires were manually sorted out and analyze using Statistical Package for Social Science (SPSS, version 15.0) and Microsoft excel 2007. Data was summarized using frequency tables, graphs, means and standard deviations. Chi-square test was used to compare proportions and associations between variables.

2.7 Ethical Consideration

Approval was obtained from principals of selected schools. Informed consent was also obtained from students who participated in the study. Confidentiality of information elicited was assured and participation was strictly voluntary.

3. Results:

All 400 administered questionnaires were returned, giving a response rate of 100%. Of the respondents, 190 (47.5%) were male while 210 (52.5%) were female. The ages of the respondents ranged from 11 to 20 years with a mean age of 14.8 ± 4.2 standard deviation. Most respondents were predominantly Christians 393 (98.3%) and in senior secondary classes. About 310 (77.5%) of the respondents reported living with both parents while 75 (18.8%) reported staying with a single parent (Table 1).

Table 1: Socio-Demographic Characteristics of Respondents (n=400)

VARIABLE	FREQUENCY	PERCENTAGE
Age group (in years)		
11	10	2.5
12	20	5.0
13	65	16.3
14	79	19.8
15	124	31.0
16	46	11.5
17	37	9.2
18	10	2.5
19	5	1.2
20	4	1.0
Religion		
Christianity	393	98.3
Islam	5	1.2

Traditional Religion	2	0.5
Sex		
Male	190	47.5
Female	210	52.5
Class		
SS1	190	47.5
SS2	140	35
SS3	34	8.5
JS1	13	3.3
JS2	17	4.3
JS3	6	1.5
Currently staying with		
Both parents	310	77.5
Single parent (Father or mother)	75	18.8
Guardian	15	3.8
Peers	-	-

In table 2, virtually all respondents reported that they have heard of malaria before 400 (100%) with health workers as their major source of information 152 (38.0%). About 332 (83%) of the respondents reported suffering from a malaria attack one time or the other with at least one bout within the last 12 months 131 (39.5%). In defining malaria, most respondents subscribed to the fact that malaria is a non-communicable disease 200 (50%) while about 137 (34.3%) defined malaria as a communicable disease. Most respondents were knowledgeable about the symptoms of malaria with fever 145 (32.0%), yellow urine 119 (26.3%) and Headache 98 (21.6%) recording highest. A Gargantuan proportion of the respondents held a belief that everyone is at risk of suffering from malaria 173 (43.3%) though children were also seen as high risk group for malaria infection 103 (25.8%). About 340 (85%) reported that mosquito bite is the cause of malaria infection but contrarily, most respondents felt malaria cannot be passed from one person to another 340 (85%). Fifty five (91.7%) say malaria is majorly transmitted via mosquito bite. Most respondents agreed that there are ways one can avoid getting malaria 396 (99%) with the usage of insecticide treated net being the most known method 160 (41.9%). About 392 (98%) of the respondents believed that malaria can be cured with high knowledge of Amalar 150 (38.3%) and Atermisinin Combination Therapy 103 (26.3%) as effective anti-malaria drugs.

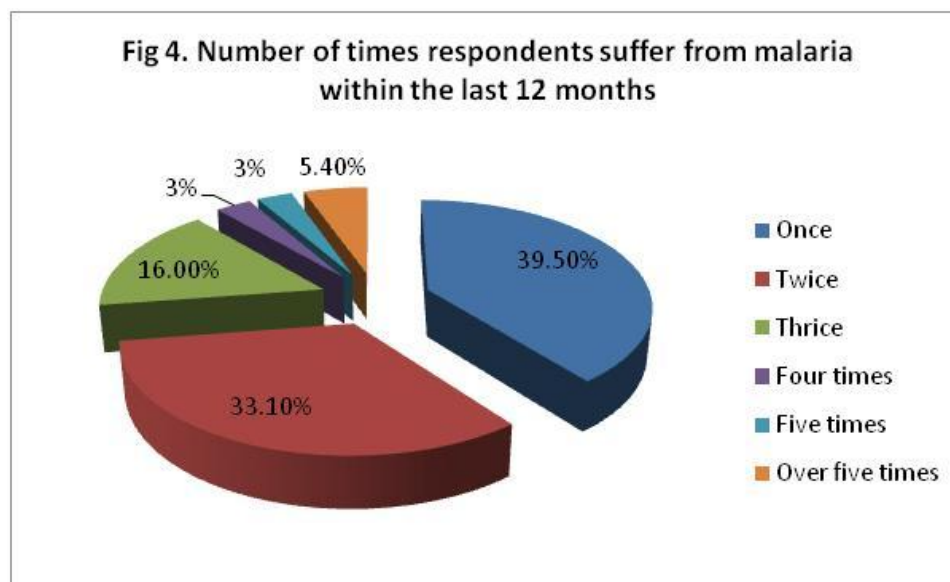


Table 2: Knowledge of Malaria among School Adolescent

VARIABLES	FREQUENCY	PERCENTAGE
Heard of malaria before (n=400)		
Yes	400	100
No	-	-
Source of information (n=400)		
Parents	25	6.3
Teachers	47	11.8
Radio/TV	144	36.0
Friend	13	3.2
Health worker/Doctor	152	38.0
Church	5	1.2
Market	5	1.2
Others	3	0.8
No response	6	1.5
Ever suffered from malaria attack before (n=400)		
Yes	332	83.0
No	68	17.0
Number of times respondents had suffered from malaria attack (n=332)		
Once	131	39.5
Twice	110	33.1
Thrice	53	16.0
Four times	10	3.0
Five times	10	3.0

Over five times	18	5.4
What is malaria (n=400)		
Communicable disease	137	34.3
Non-communicable disease	200	50.0
Name of a plant	4	1.0
A parasite	28	7
No idea	31	7.8
Knowledge symptoms of malaria (n=453)		
Fever	145	32.0
Chills	15	3.3
Headaches	98	21.6
Vomiting	21	4.6
Weakness	39	8.6
Yellow urine	119	26.3
Poor appetite	15	3.3
Others	1	0.2
Age group of people likely to suffer from malaria attack (n=400)		
Children	103	25.8
Teenagers	77	19.2
Pregnant women	35	8.7
Everyone	173	43.3
Adult	-	-
Elderly	-	-
No idea	12	3.0
What causes malaria (n=400)		
Dirty water	24	6.0
Drinking of Alcohol	-	-
Eating Certain Food	30	7.5
Mosquito bite	340	85.0
Playing too much	-	-
No idea	6	1.5
Can malaria be passed from one person to another (n=400)		
Yes	60	15.0
No	340	85.0
How can a person get malaria (n=60)		
Mosquito bite	55	91.7
Sexual intercourse	-	-
Blood transfusion	-	-
Mother to child	-	-
Kissing someone with malaria	-	-
No idea	5	8.3
Are there ways to avoid getting malaria (n=400)		
Yes	396	99.0

No	4	1.0
Ways a person can avoid getting malaria (n=382)		
Sleeping under ITNs	160	41.9
Using anti-malarial drugs	77	20.2
Using mosquito coil	22	5.8
Use of insecticide spray	21	5.5
Keep window and door closed	10	2.6
Keep surrounding clean	84	22.0
Use of Insect repellent	-	-
No idea	4	1.0
Others	4	1.0
Can malaria be cured (n=400)		
Yes	392	98.0
No	8	2.0
Drugs used to treat malaria (n=392)		
Atermisinin Combination Therapy	103	26.3
Quinine	29	7.4
Amalar	150	38.3
Maloxine	15	3.8
Pandol/Paracetamol	30	7.6
Herbal/Traditional medicine	12	3.1
No idea	45	11.5
Others	8	2.0

While majority of the respondents strongly agreed to the fact that malaria is a disease that kills 140 (35.0%), adolescent should go to the nearest hospital in the event of malaria attack 205 (51.2%) and prevention of malaria is better than curing or treating malaria 310 (77.5%), majority of the respondents strongly disagreed that delay in malaria treated is good 200 (50%) and disagreed that only the use of Insecticide treated net can prevent one from getting malaria 120 (30.0%) (Table 3).

Table 3: Attitude of Respondents towards Malaria (n=400)

VARIABLES	FREQUENCY (PERCENTAGE %)				
	Strongly Agreed	Agreed	Not Sure	Strongly Disagreed	Disagreed
Malaria is a disease that kills	140(35.0)	99(24.8)	81(20.2)	50(12.5)	30(7.5)
Adolescent should go to the nearest hospital in the event of malaria attack	205(51.2)	150(37.5)	20(5.0)	20(5.0)	5(1.3)
Only the use of Insecticide Treated Net can prevent a person from getting malaria	98(24.5)	60(15.0)	45(11.3)	77(19.2)	120(30.0)
Delay in malaria treatment is good	15(3.7)	5(1.3)	30(7.5)	200(50.0)	150(37.5)
Prevention of malaria is better than curing/treating malaria	310(77.5)	40(10.0)	28(7.0)	16(4.0)	6(1.5)

In table 4, majority of the respondents say they will go to the hospital first if they suffer a malaria attack 320 (80.4%). However, a larger proportion of the respondents claimed to have heard of Insecticide treated net 394 (98.5%) with health workers as their major source of information 177 (45.2%). About 333 (84.7%) of the respondents reported to have used an Insecticide Treated net before but only 175 (54.7%) of the respondents are currently using it. Reasons for non-usage was largely due to the fact that Insecticide treated nets causes heat 102 (37.6%) whereas 52 (19.2%) say they don't have an Insecticide treated net. The hospital/clinic was largely recognized by the respondents as the place where one can get or buy an Insecticide treated net 340 (85.9%). A larger proportion of the respondents reported that removing stagnant water from the environment 124 (33.3%), using anti-malarial drugs 96 (25.8%) and bush clearing around houses 54 (14.5%) were the current method in use to avoid getting malaria.

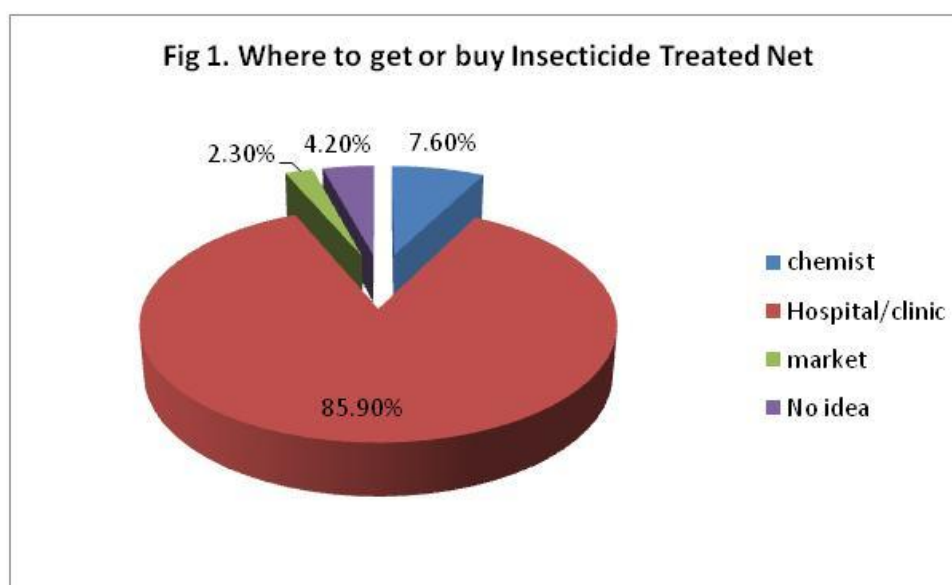


Fig3. Respondents currently using Insecticide Treated Net

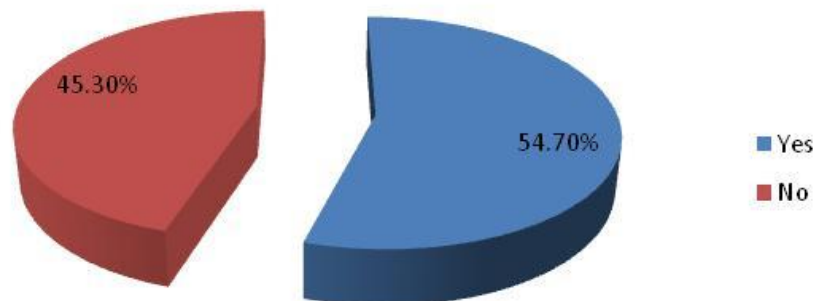
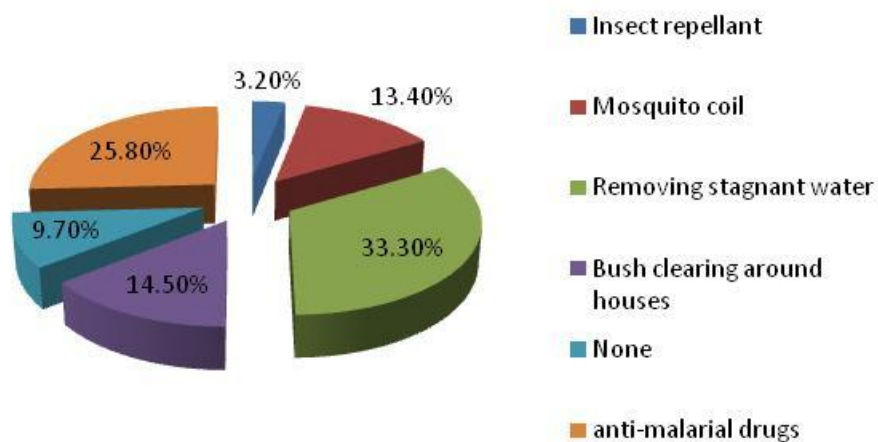


Fig 2. Methods currently in use to avoid getting malaria



VARIABLE	FREQUENCY	PERCENTAGE
What you will do first in an event of a malaria attack (n=398)		
Consult herbalist/use local herbs	56	14.1
Go to the Hospital	320	80.4
Just pray/Take spiritual water for cured	8	2.0
Ignore the signs	6	1.5
No idea	8	2.0
Others	-	-
Ever heard of Insecticide Treated Net (n=400)		
Yes	394	98.5
No	6	1.5
Source of Information		
Parents	30	7.7
Teachers	25	6.4
Radio/TV	150	38.3
Peers	6	1.5
Health workers	177	45.2
Church	3	0.8
Market	-	-
Others	1	0.2
Ever used an Insecticide Treated Net Before (n=393)		
Yes	333	84.7
No	60	15.3
Currently using Insecticide Treated Net (n=320)		
Yes	175	54.7
No	145	45.3
Reasons for not using Insecticide Treated Net (n=271)		
Contain poisonous chemical	35	12.9
Can't afford to buy one	23	8.5
Causes heat	102	37.6
Don't know where to get it	17	6.3
Don't have it	52	19.2
No reason	33	12.2
Others reasons	9	3.3
Where to get or buy an Insecticide Treated Net (n=396)		
Chemist	30	7.6
Hospital/clinic	340	85.9
Market	9	2.3
No idea	17	4.2
Other methods currently in used to avoid getting malaria (n=372)		
Anti-malarial drugs	96	25.8
Insect repellent	12	3.2
Mosquito coil	50	13.4
Removing stagnant water	124	33.3
Bush clearing around houses	54	14.5
None	36	9.7

Table 4: Practices of Malaria Prevention among Respondents

4. Discussion

This study showed a high knowledge gap in malaria transmission. About half of the respondents 200 (50%) stated that malaria is a non-communicable disease whereas only 137 (34.3%) defined malaria as a communicable disease. This finding is consistent with others studies carried out within and outside Nigeria. For instance, a cross-sectional survey carried out in a coastal community in Calabar revealed that only nine (2.25%) respondents were able to give a fairly acceptable definition of malaria as an infectious disease caused by the parasitic infection of red blood cells by Plasmodium, which is transmitted by the bite of an infected female mosquito (Udonwa, Gyuse & Etokidem, 2010). This may be due to the fact that teachers in schools lack adequate knowledge of malaria infectious disease and it also indicates inadequacy in health education curriculum. Most respondents reported to have suffered malaria at least one bout within the last 12 months 131 (39.5%). This is evidence to the fact that malaria is highly endemic in Calabar and Nigeria in general.

The major source of information about malaria in this study is via health workers 152 (38.0%). This finding disagrees with other studies where the media (Radio & TV) was the major source of information about malaria (Dambhare, Nimgade & Dudhe, 2012). This is evidence to the fact that health workers in Calabar metropolis are consistently involved in the campaign against combating malaria in order to enhance the achievement of Millennium Developing Goal target by 2015. Fever 145 (32%) followed by yellow urine 119 (26.3%) then headaches 98 (21.6%) were the response on symptoms on malaria infection. This finding is similar to a study carried out among school adolescent in Wardha district Central India where fever was the most highly recognized symptom of malaria (Dambhare, Nimgade & Dudhe, 2012, Okwa, Bello and Olundegun, 2011). Two-third of the respondents knew that mosquito bite was the major cause of malaria. This finding corroborates with a study carried out by Udonwa *et al*, 2010 and Muula & Chimalizeni, 2004. Only 60 (15%) of the respondents knew that malaria can pass from one person to another whereas a substantial proportion of the respondents 340 (85%) disagreed with the fact that malaria can pass from one person to another. This finding corroborates with a cross-sectional study carried out in Calabar where school adolescent exhibited poor knowledge level of malaria transmission (Udonwa *et al*, 2010). This may be due to low capacity of teachers and deficiency in health education curriculum. Most respondents subscribed to the fact that malaria can be avoided majorly by sleeping under Insecticide Treated net 160 (41.9%) and keeping surrounding clean 84 (22.0%). This is evidence to the effectiveness of malaria campaigns on keeping the surrounding clean and the use of insecticide treated net through the media and poster/billboards in the fight against malaria in Calabar Metropolis. About 392 (98.0%) believed that malaria can be cured and 150 (38.3%) felt Amalar was the drug that could be used to treat malaria. Reasons may be that Amalar is widely advertisement, affordable and effective.

A reasonable proportion of school adolescent had favourable attitude towards malaria. About 140 (35.0%) respondents strongly agreed that malaria is a disease that kills, adolescent should go to the nearest hospital in the event of malaria attack 205 (51.2%) and prevention of

malaria is better than treating or curing it 310 (77.5%). This finding indicates that malaria campaigns have been very effective in Calabar metropolis, Nigeria.

Virtually 320 (80.4%) of the respondents would decide to go to the nearest hospital in the event of a malaria attack. This may probably be due to easy accessibility to health facilities since Calabar metropolis is an urban setting. Free treatment of school adolescent cover under the National Health Insurance Scheme may be another reason for using the health facilities. A substantial proportion of the respondents claimed to have heard of Insecticide Treated Net (ITN) 394 (98.5%) with health workers as their major source of information 177 (45.2%). This shows that health workers in Calabar metropolis have been constantly involved in the distribution of Insecticide Treated Nets to households intermittently. The media can also be a second prolific means where school adolescent would be constantly reminded on the need to use ITN always to prevent malaria. Teachers were a source of information on malaria prevention for only about one-tenth of the adolescents. This low percentage corroborates with a cross-sectional study carried out in Calabar coastal community (Udonwa, Gyuse & Etokidem, 2010). About 333 (84.7%) respondents said they have use ITN but, only 175 (54.7%) of the respondents are currently using ITN. On the contrary, other studies reported low ITN use among school adolescent (Udonwa, Gyuse & Etokidem, 2010; Edson & Kayombo, 2007; Dressa, Ali & Enquosellasi, 2000). Reasons for non-usage is that ITN causes heat 102 (37.6%) and contains poisonous chemicals 35 (12.9%). Although, 52 (19.2) reported that they don't have an Insecticide Treated Net (ITNs). These perceived disadvantages of ITNs have no scientific basis and can easily be overcome through health education (Salako, 1993). A large proportion of respondents 340 (85.9%) knew that Insecticide Treated Net (ITN) can be sold or gotten from the hospital/clinics. This may be probably because Insecticide Treated nets are perceived to be given free of charge in divergent health facilities and most patients visit the hospital for malaria treatment. Malaria preventive measures adopted by school adolescent in this survey recorded removal of stagnant water from the environment 124 (33.3%), use of anti-malarial drugs 96 (25.8%) and bush clearing around houses 54 (14.5%). School adolescent knew that stagnant water and over grown weeds or grasses serve as breeding sites for mosquitoes to live and proliferates around where they domicile thereby increasing their susceptibility to malaria infection. Malaria prophylaxis is not recommended for the general population in Nigeria, except for vulnerable groups such as those with sickle cell anaemia and non-exposed expatriates (National Anti-malarial Treatment Guidelines, 2005). Hence, the public health system should intensify campaign on ITN use while discouraging the use of chemoprophylaxis among adolescent for malaria prevention.

4. Conclusion and Recommendations

Despite the high awareness level of malaria among school adolescent in Calabar metropolis, Nigeria, understanding of how malaria is transmitted, treated and prevented is relatively low. Health workers and the media constituted their major source of information on malaria prevention. On the contrary, source of malaria prevention information among teachers was low as compared to the two sources previously mentioned. Prevalence of ITN

use was average among school adolescent with knowledge of getting it free of charge from any health facilities. Hence, the following recommendations were made in this study;

1. Teachers should be involved in routine malaria prevention campaigns for the purpose of attitudinal change and increase in knowledge about malaria so that learners in schools would be upgraded with requisite knowledge about malaria transmission, treatment and prevention.
2. The government should establish ITN distribution centers in schools thereby making ITNs easily accessible to school adolescent especially for those who don't have any.
3. Health workers should be empowered to facilitate the distribution of ITN to households at regular interval. This will also enhance its use.
4. Rollback malaria club should be established in schools as a medium to effectively deliver malaria campaign in schools. This would unarguably serve as a panacea to the actualization of Millennium Development Goal target by 2015.

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