

Use of Insecticide Treated Nets and Malaria Burden among Adults in Owerri/West L.G.A, Imo State, Nigeria

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ABSTRACT:

Use of insecticide treated nets and malaria burden among adults in Owerri West L.G.A, Imo State, Nigeria was conducted between March to July 2021. A rapid malaria test was conducted with an interview using a structured questionnaire, with both open and closed ended options which designed to obtain data. A total of 540 questionnaires were self administered while conducting the test and was all retrieved a total of 252 respondents use ITNS while 288 do not use ITNS. In all, 42.5% of the users were infected and 57.5% uninfected. Female respondents were more infected than male respondents. However from the observation of the study an effective education and enlightenment campaigns as well as one on one conviction were recommended as a means to enable people appreciate the need to own and use ITNS.

Keywords: *Insecticide Treated Nets, Malaria, Adult, Owerri West*

INTRODUCTION:

Malaria burden is one of the most serious vector born-diseases affecting millions of people, mainly tropics (Williams et al., 2002). It is caused by parasites belonging to the genus Plasmodium, which are transmitted by the female Anopheles mosquito. Out of four species of Plasmodium (*p.falciparum*, *p.ovale*, *p.malattiae* and *p.vivax*) which affect human, falciparum causes the most severe form of malaria and death throughout the world (Herman et al., 2001) (World Malaria report 2008).

In Sub-Saharan Africa, malaria remains a major public health problem. It is estimated that malaria costs Africa more than 2 billion us dollars every year, with each family spending an estimated 25% of hospital admissions (FMOH, 2004). Aside impact on health malaria adversely affects the socio-economic wellbeing of families and small communities by the costs caused by being ill and or by losing family members. It also leads to absenteeism or poor attendance to school and work (Lengeler et al 2007). The World Health Organization's roll back malaria (RBM) initiative aims to decrease the burden of malaria through three proven interventions; which includes prompt management of presumed malaria years, there has consistent effort to control malaria through the use of insecticides treated bed nets. Consequently, there has been increased attempt to distribute insecticide treated bed nets through development of commercial markets, social marketing intervention, campaigns, and through

health facilities. However, the extent to which these diverse interventions have achieved their aim among adults in Owerri West Imo State Nigeria has not been verified. A recent review on community acceptance of bed nets has shown that various factors influence the use of bed nets including cultural behavioral and demographic factors, accessibility, gender relations and seasonality of malaria. In this model two main factors influence the likelihood that a person will adopt a recommended preventive action. First, a person must feel susceptible and threatened by the disease, with perceived serious consequences. Secondly the person must belief that the benefits of practicing prevention. Since insecticide treated nets (ITNS) has been found to be an effective malaria vector control strategy. As a result, during the Africa summit on RBM held in Abuja Nigeria on the 25th day of April 2000. It was targeted that particularly children less than five (5) years of age and pregnant women uses ITNS. Irrespective of the adult malaria status. Therefore, this study was done to ascertain the efficacy, the use and non use, like and dislike, and information about the role of ITNS in malaria control etc in Owerri West adults. Hence, this study was carried out to primary investigate malaria status of adult in relation to use and non use of ITNS.

Insecticide treated net have been use since early times to protect people against different insects (Rozendael et al., 1997) nets are made of polyester, nylon, cotton and

polyethylene and synthetic with cotton and polythlene synthetic and cotton mixtures (FDRE, 2010) uses of insecticide treated net can reduce deaths in children in sub-sharan Africa. They have rectangular, circular wedge or other shapes and are reduced in different colour (Rozendae et al., 2000) nets are preferably treated with insecticides if not [possible, they can be used untreated. They serve as human baited traps when somebody is sleeping inside by attracting and killing mosquitoes and other biting insects (Curtis et al., 2011) insecticide treated nets (ITNS) have to be treated regularly for maximal benefit. The most common chemical used are second and third generation synthesis pyretheoid (Dark et al., 2011).

METHODOLOGY:

The Study Area:

The study was purely a survey in the issues of use and non use of ITNS (insecticides treated nets) were ascertained and malaria states of the participants were also determined. The study was carried out in Owerri, Imo State Nigeria. Owerri lies between latitude 5³²-5⁰¹⁵ and longitude 6³⁰-7^{30E}. It has an estimated population of about 175, 395 people in an area of 198km². There is high literacy level among the inhabitant, with occupation such inhabitants engage themselves in farming, trading and some odd jobs that make ends meet. The rainy season begins in April and last till October with annual rainfall varying from 1,500mm to 2m,200mm. The Average annual temperature above 27⁰C creates an annual relative humidity of 70% the dry season starts from late October and ends in early March, it has two months of harmattan beginning in December and end in January.

The vegetation of Owerri is typically rainforest but due to high population density, most of the area has been so formed and degraded that the original vegetation has disappeared Owerri has poor sanitation system, poor damage passages with heap of rubbing seen around houses schools, churches, roads gutters even in the market square constituting an ugly and unpleasant sight, which also causes flood during rainfalls. These in one way or the other contribute to breeding of mosquitoes leading to high malarias transmission rate and prevalence of 75% according to findings (WHO, 2009).

Study Design:

Five villages, five churches and two laboratories were randomly selected for the study. A structured questionnaire with both open and closed ended options was designed as a tool to obtain data from the study population and rapid test kit was used for malaria test in the study area. The overall study was carried out from March to July 2021, on arrival to the study sites, the villages were the first, I visited many house hold explaining to them the objectives of the study and asked them to comply as questionnaire is been administered and

in collection of blood sample for malaria test. After the villages, the next study sites were the churches. The priest residing in the parishes were visited and were informed about the study they gave their consents and helped me addressed the different solidarities in the churches, the questionnaires were easily administrated at solidarity meetings then randomly collected sample for the test. Also laboratory scientists were visited, the laboratory scientists were the people who helped in administering the questionnaire to the patients that come for test. They also helped in running the malaria test on people. Before the questionnaires were distributed of each study sites, group discussions were held to explain more facts and to strengthen the response of the study in questionnaire administration. In some of this areas, people who could not fill the questionnaire were engaged on personal interview while those who could fill it, did it themselves.

Data Collection:

Data collection was done by questionnaire and test method. A structured questionnaire with open and closed ended options was designed and was distributed to people at the study sites. Personal interview and test for malaria was conducted after the questionnaire must have been filled. Interview was carried out only on those who could not read or write.

Specimen Analysis:

Specimen collected from respondents were practically analysed by using rapid and microscope method.

Clean the area with alcohol pad, squeeze the end of a fingertip and pierce if using lancet, wiper out the first drop of blood with cotton wool. Collect the blood sample using pipette or micro pipette, add whole blood to the sample well, add two drops of assay buffer to the well, read the result after 20 minutes.

Microscope Method:

A drop of blood was placed on a clean dry free slide, a spreader was placed before the drop of blood, film was made by moving the spreader steadily forward along the length of slide. It was allowed to air dry at room temperature, the film was flooded with giemsa stain and was allowed to stain for about 45 minutes to achieve fixing the cell, twice, the stains volume of buffered water was added, this was allowed to stain for about 8 minutes. Film was washed with buffered water and air dried at room temperature, the stained dried film was examined microscopically, using x100 oil immersion.

RESULT:

Table 1 shows that out of 540 people examined, 259 (48.0%) were infected from the data obtained, the highest number of respondents were from Naze village with 148 out of which 74 (50.0) were infected, Umuguma village

with 141 out of which 69 (48.9) were infected and the next was from Ihiagwa village with a total of 90 respondents and 43 (48.2) were infected followed by Emekuku village with 82 respondents out of which 41 (48.2) were infected the last was Nekede village with total number of 76 and (42.1) infected. Table 2 shows that infection was high with group 30-39 i.e. 133 out of which 65 (48.9%) were infected followed by 50 years and above, with 167 respondents out of which 81 (48.5%) were infected, 40-49 with 147 and 71 (48.3%) were infected and the least was 20-29 age group with 93 respondents out of which 42 (42.2%) were infected. A chi-square analysis shows an insignificance difference in the prevalence of malaria among the age group. Table 3 shows that of the 540 respondents sampled, 250 were male and 290 were female out of the 250 which were male, 122 (48.8%) were infected and out of the 290 which were female, 137 (47.2%) were infected, which shows that males were more infected than the females. A chi-square analysis shows no significant difference in age and gender related prevalence of ITNS users. Table 4 Among 540 respondents, 25% were ITNS users, out of which 120 were male and 132 were female. The total number examined within the age group of 50 and above were 89 out of which 43 were male 20(46.5%) infected and 46 female 16(34.8%) infected. In age group 40-49 where 62 out of which 29 were male and 15(51.7%) infected and 33 female 13(39.4%) infected. In age group 40-49 where 62 out of which 29 were male and 15(51.7%) infected and 33 female 13(39.4%) infected. In age group 30-39 where 54 respondents out of which 13(50.0%) were infected in the

males and 15(53.6%) infected in the females. And in age group 20-29, 22 were male with 6(27.3%) infected and 25 female with 9(36.0%) infected. This results shows that ITNS users suffer less from malaria. Table 5 Out of the total number of respondents, 288 were non users of ITNs out of which 130 were male and 158 were female. In age group 50 years above 78 were examined out of which 34 were male with 19 (55.9%) infected and 44 were female with 26(59.1%) infected in age 40-49, 85 were examined with 37 male 19(51.4%) infected and 48 female with 24(50.0%) infected, in age 30-39 a total 79 were examined, were 38 are male with 17(44.7%) infected and 41 female with about 20 (48.8%) infected and in age group 20-29, 46 were sampled, 21 were male with about 13(61.9%) infected and 25 female with 14(56.0%) infected. It can be seen from ITNS suffers more malaria than the users of ITNS. Table 6 A total of 252 users of ITNS were examined there were about 53 traders that uses ITNS and 29(54.7%) were infected, 59 civil servant 13(22.0%) also 532 students were sampled with 23(43.4%) infected, a relative number of 52 were sampled in others with about 25(48.1%) infected and the farmers with a total number of 35 with about 17(48.6%) infected. Table 7 A total of 288 respondents were non users of ITNS of which 66 were traders with 32(56.1%) infected, 45 civil servants with 19(42.2%) infected, 59 students with 32(54.2%) infected and others which comprised of labourers, pensioners, drivers etc. Were 71 respondents infected, 59 students with 32(54.2%) infected and others which comprised of labourers, pensioners, driver etc. Were 71 respondents which 39 (54.9%) were infected.

Table 1: The study site and corresponding number of respondents

Study site	No Examined	No infected	Prevalence (%)
Nekede village	76	32	(42.1%)
Emekuku village	85	41	(48.2%)
Ihiagwa village	90	43	(47.8%)
Umuguma village	141	69	(48.9%)
Naze village	148	74	(50.0%)
Total	540	259	

Table 2: Age related prevalence in Owerri West

Age (Years)	No Exam	No infected	Infected uninfected
20-29	93	42(45.2)	51(54.8)
30-39	133	65(48.9)	68(51.1)
40-49	147	71(48.3)	76(51.7)
50 - >	167	81(48.5)	86(51.5)
Total	540	259	281

Table 3: Age and gender related prevalence of use and non us of ITNS

Age	Male		No infected	Female		Total infected	Total uninfected
	No Examine	No Examine		No Examine	No Examine		
20-29	93	43	19(44.2)	50	23(46.0)	42(45.2)	51(54.8)
30-39	133	64	30(46.9)	69	35(50.7)	65(48.9)	68(51.1)
40-49	47	66	34(51.5)	81	37(35.7)	71(48.3)	76(51.7)
50 ->	167	77	39(50.9)	90	42(46.7)	81(48.5)	86(51.5)
Total	540	250	122	290	137	259	281

Table 4: Age and gender related prevalence of ITNS users

Age	Male		No infected	Female		Total infected	Total uninfected
	No Examine	No Examine		No Examine	No Examine		
20-29	47	22	6(27.3)	25	9(36.0)	15(31.9)	32(68.1)
30-39	54	26	13(50.0)	28	15(53.6)	28(51.9)	26(48.1)
40-49	62	29	15(51.7)	33	13(39.4)	28(45.2)	34(54.8)
50 ->	89	43	20(46.5)	46	16(34.8)	36(40.4)	53(59.6)
Total	252	120	54	132	53	107	145

Table 5: Age and gender related prevalence of ITNS non users

Age	Male		No infected	Female		Total infected	Total uninfected
	No Examine	No Examine		No Examine	No Examine		
20-29	46	21	13(61.9)	25	14(56.0)	27(58.7)	19(41.3)
30-39	79	38	17(44.7)	41	20(48.8)	37(46.8)	42(53.8)
40-49	85	37	19(51.4)	48	24(50.0)	43(50.6)	42(49.4)
50 ->	78	34	19(55.9)	44	26(59.1)	45(57.7)	33(42.3)
Total	288	130	68	158	84	152	136

Table 6: Occupation distribution of ITNS users related prevalence

Occupation	No infected	No infected (%)	No uninfected
Traders	53	29(54.7)	24(45.3)
Civil Servants	59	13(22.0)	46(78.0)
Students	53	23(43.4)	30(56.6)
Farmers	35	17(48.1)	18(51.9)
Others	52	25(48.1)	27(51.9)
Total	252	107	145

Table 7: Occupational distribution prevalence of ITNS non-use

Occupation	No infected	No infected (%)	No uninfected
Traders	66	37(56.1)	29(43.9)
Civil servants	45	19(42.2)	26(57.8)

Students	59	32(54.2)	27(45.8)
Farmers	47	25(54.2)	22(46.8)
Others	71	39(54.9)	32(45.1)
Total	288	157	136

DISCUSSION:

The prevention and control of malaria rest on radical mosquito control programme. To embark on total eradication, it really comes into mind to control and eradicate mosquito vector. The use of ITNS is one of the Vector control measure ad needs to increasily receive attention to stem the rising tide of malaria (WHO, TDR 2003). The potential epidemiological usefulness and public health benefit of ITNS for protection against malaria was reconsidered in the 1980 with the advent of photosynthetic pyrethroids. The current WHO initiate in malaria control as roll back malaria (RBM) emphasizes on the use of ITNS and environmental management to reduce the rector population as key strategies for malaria prevention and control in sub-Saharan Africa (UNICEF, 1999).

The most promising and yet most tasking of the WHO strategies for malaria control is the provision and use of ITNS which has been described as an important and popular tool for malaria control programme. They are therefore seen as one of the main tools of achieving RBM'S objective of controlling the world malaria burden. It also calls for a 30 folds increase, suggests that ITNS have proved efficacious in controlling malaria.

However, factors among others have been identified to hamper ITNS uses. They include high cost of availability, lack of information, lack of interest and liability to fade easily.

However, the present study recorded 46.7% use of ITNS, which differs from 19.4% reported by Anyersodor (2006) studies on the use of ITNS in rural communities in Nigeria. The disparity may be as a result of high level of awareness and exposure from people in urban area such as Owerri through media. And it could also be the time frame at which both studies were carried out. There is general belief that as time progresses, people's awareness and knowledge develops. As a result studies carried out recently should show high use of ITNS almost half (46.7%) of the respondents were using or have heard about ITNS while the other half or more than half (53.3%) were not using more than half (53.3%) were not using ITNS. From observations and personal interviews; it was as a result of illiteracy and lack of interest on the use of ITNS. Other reasons given by non users were; expensive, lack of interest, don't feel comfortable using it, trapping of dust, impair breathing, heat and skin reaction.

In the study on the use of ITNS and malaria burden among adults in Owerri, presently recorded 42.5% infected and 57.5% uninfected users of ITNS and the non users of

ITNS recorded 52.8% infected and 47.2% uninfected. Therefore, from the observation and tests carried out to determine the malaria status, ITNS and other measures are related in being rector control measures of malaria as confirmed by the respondents. Also, the respondents confirmed that the use of ITNS alone cannot achieve 100% eradication of malaria, they pointed out other measures such as cleaning and clearing the environment, using preventive drugs, spraying of breeding site etc, as measures used in synergy with ITNS to control malaria. The use of ITNS as a strategy for malaria prevention and control is on exciting development. The scientific evidence for their effectiveness is a malaria control strategy abound.

However, this current intervention is facing a challenge of non-compliance to use a stated in this work. As malaria scourage is still a very serious health problem in the country. There is need for increased public awareness campaigns through information, education and communication (IEC) by poster, leaflet etc

Therefore, while we work towards ensuring better ITNS use rate, other malaria control measures must be adopted with special attention being given to environmental management to actualize the desired aim of malaria eradication.

Finally, there is need to ensure efficient and effective distribution network for easy access and all members of the health care should be educated more about ITNS and be in the position to encourage them accordingly.

CONCLUSION:

The present study revealed that malaria infection remains a significant public health problem among adults in Owerri West Local Government Area, Imo State, Nigeria. The findings showed that respondents who did not use insecticide-treated nets (ITNs) had a higher prevalence of malaria infection compared to ITN users, indicating that the use of ITNs contributes significantly to malaria prevention and control. The study also showed that factors such as lack of awareness, discomfort, poor interest, and inadequate environmental sanitation affected the effective utilization of ITNs among the respondents. Therefore, there is need for continuous public health education and awareness campaigns on the importance of regular use of insecticide-treated nets. Government and health agencies should also ensure adequate distribution of affordable ITNs and encourage proper environmental sanitation practices to reduce mosquito breeding sites. The combined use of ITNs with other malaria control

measures such as environmental management and prompt treatment of infected individuals will greatly help in reducing malaria burden in the study area.

Ethical approval:

Ethical approval for this study was obtained from the Department of Animal and Environmental Biology, Imo State University, Owerri, Nigeria. Informed consent was obtained from all participants before sample collection.

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