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Research Article

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Assessment of usage and challenges of Insecticide treated bed net in the control of Malaria in Obowo Local Government Area Imo State, Nigeria

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ABSTRACT

Insecticide treated bed nets are a form of personal protection that had repeatedly been shown to reduce severe diseases and mortality by about 20% due to malaria in endemic regions. The study was aimed to assess the use of Insecticide Treated bednet and its Challenges among people in Obowo Local Government Area, Imo State. A structured questionnaire was used to obtain data of respondents from the study area. A total of 500 questionnaire were shared and a total of 352 (70.4%) was retrieved. From the data it was revealed that 20.4% people had Primary education, *Anopheles* mosquito as cause of Malaria (56.2%), High fever as symptoms of Malaria (37.2%), Low birth weight as adverse effect of Malaria (43.7%), Environmental sanitation as preventive measures of Malaria (30.1%). It was recorded that Pregnant women as the most users of ITNs (43.1%), St. Francis Catholic Church recorded the highest number of ITNs users (8.5%). Statistical analysis shows a significant difference between Demographic of Respondents, Respondents knowledge of Malaria, preventive measures, knowledge of who uses ITNs, level of use and non use of ITNs, reasons for use and non use of ITNs. It is recommended that to ensure efficient and effective distribution network for easy access and all members of the health team should be educated more about ITNs and there is need to properly inform, educate and convince the ITNs non users to appreciate the need to own and use ITNs.

KEYWORDS: Malaria, Bednet, Usage, Challenges

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INTRODUCTION

Malaria has been part of human history for as long as anyone can remember. It is estimated by the World Health Organization that every year up to 500 million people worldwide suffer malaria attacks.

Malaria is a parasitic disease endemic to numerous tropical and subtropical regions of the globe. The parasite is transmitted by the bite of the female anopheles mosquito (Bain, 1995). Malaria is a serious disease caused by a blood parasite named *Plasmodium spp*. It affects at least 200 to 300 million people every year and causes an estimated million deaths per annum. Through the Roll Back Malaria Programme the World Health Organization has set ambitious targets of having the malaria burden. One of the important strategies used to reach this target is to promote the use of Insecticide treated bed nets (ITN). Insecticide treated bed nets are a form of personal protection that had repeatedly been shown to reduce severe diseases and mortality by about 20% due to malaria in endemic regions (WHO, 2003). The insecticides used for the treatment of this net kill mosquitoes and other insects. The insecticide also has repellant properties that reduce the number of mosquitoes that enter the house and attempt to feed. ITN has been commended to reduce malaria morbidity and mortality.

ITN reduces contact between the mosquito vector and human host. When used widely in a community to reduce the population of sporoziote-positive mosquitoes which is reflected in a reduction in the plasma antibody levels to circumsporozoite protein among the bed nets users. Even though the short- and medium-term beneficial effects of ITN are well-documented concerns have been raised about the long-term effect, since the reduction in infections, inoculations may affect both the development and the maintenance of malaria immunity (Rowland & Nosten, 2002). Malaria immunity is developed after repeated exposures to the parasite and clinical malaria immunity is acquired at a much earlier age in areas of intense malaria transmissions than in areas of more moderate transmission intensity (Riley *et al.*, 1989). Therefore the need

to inform and educate people at the community level about the effectiveness of ITN cannot be over emphasized. Indeed, there is need to empower and involve local population in the planning and implementation of ITN strategy to enhance acceptance compliance (Hamson, 2005). The aim of this study is to assess the use of insecticide treated bednet and its challenges among people in the study area.

MATERIALS AND METHODS

Study Area

This study was carried out in Obowo Local Government Area of Imo State, South East Nigeria. The geographical coordinate of the area is Latitude 5°10' - 5°5' N and Longitude 6°35' - 7°28' E. The study area has been described in detail (Iwunze *et al.*, 2022; Iwunze *et al.*, 2024). These causes flood during rainfalls and contribute to the breeding of mosquitoes leading to high malaria transmission rate and prevalence (WHO, 2009). Non-governmental Organizations in 2015 shared Long Lasting Insecticide treated Nets (LLIN) to these communities and almost 70% of the people benefited.

Ethical Considerations

Ethical approval for the study was gotten from the Post Graduate Board of the Department of Zoology, Imo State University Owerri ethics committee. Consent was sought and obtained from the village heads and Churches. Also, Informed consent was obtained from the participants. Participants were fully informed on their right to withdraw without feeling constraint. Confidentiality of the information was ensured throughout the study.

Study Population

The study populations were people residing in Obowo. Due to the difficulties in going from house to house, the study populations were grouped according to places where people from all works of life converge. The groups were people either buying or selling in the market squares and people who came to worship at churches.

Methodology

A structured questionnaire was used to obtain data from the study population. On arrival at the selected study sites, the market squares were the first, the researcher visited the chairmen of the market union (grain dealer union, provision union, patent chemist shop union and meat union) to explain the study objectives and obtain informed consent. The chairmen took us to the owners of the market stores; I explained to them the objectives of the study and asks them to comply as I administered the questionnaire. After the market squares, the next study sites were the Churches. The Priests residing in the parishes were visited and were informed about the study, they gave their consents and helped us addressed the different solidarities in the churches where I explained to them the objectives of the study and asks them to comply as I administered the questionnaires. Before the questionnaires were distributed at each sites especially in the churches, group discussion were held to explain more facts and to strengthen the response of the questionnaire. In the market squares, some 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 method. A total of five hundred 500 questionnaire was shared in the study sites of which a total three hundred and fifty two 352 was retrieved by the respondents in the study site.

Data Analysis

Data obtained from the questionnaire were analyzed using percentage and formula respectively. Values were tested using Chi-square (x2).

RESULTS

The result of the study showed that a total of 500 questionnaires were shared to people at Churches and Market Squares in Owerri Municipal. Out of which a total number of 352 (70.4%) questioneer were retried from the respondents.

The demographic of respondents (Table 1) below shows that Secondary education recorded the highest prevalence rate of 157 (34.9%) followed by Tertiary Education 123 (34.9%) and Primary Education 72 (20.4%) with the least prevalence rate. On the other hand, Traders recorded the highest prevalence of 107 (30.3%) in Vocation followed by Students 89 (25.2%), Artisants 86 (24.4) and Civil Servants with the least prevalence of 71 (20.1). on marital status Married people recorded the highest prevalence of 242 (68.7%) followed by Single 100 (28.4%) and Divorced with the least prevalence of 10 (2.8%). Also, people of the age bracket 60 and Above recordd the highest prevalence of 96 (27.2) followed by 41-50 67 (19.0), 21-30 age bracket 58 (16.4), 31-40 age bracket 49 (13.9%), 11-20 age bracket 44 (12.5%) and 51-60 age bracket with the least rate of 38 (10.7%). Chi square analysis shows a significant difference between Education, Vocation, Marital status and Age of people in the study area ($P<0.05$).

Respondents knowledge of malaria (Table 2) shows that Anopheles mosquitoe bite as a cause of malaria recorded the highest prevalence rate of 198 (56.2%) followed by Stagnant water 78 (22.1%) and with dirty environment as the least prevalence of 76 (21.5%). On the other hand high fever 131 (37.2) recorded highest as the symptoms of malaria followed by shivering 81 (23.0%), Headache 74 (21.0%) and with body pain 66 (18.7%) as the least prevalence. Also Low birth weight 154 (43.7%) recorded the highest prevalence rate as Adverse effect of malaria followed by Still birth 122 (34.6%) and Miscarriage 76 (21.5%) as the least prevalence. Chi square

Table 1: Demographic of Respondents

Characteristics	Respondents	Percentage
Education		
Primary	72	20.4
Secondary	157	44.6
Tertiary	123	34.9
Vocation		
Traders	107	30.3
Civil Servants	71	20.1
Students	89	25.2
Artisants	86	24.4
Marital Status		
Single	100	28.4
Married	242	68.7
Divorced	10	2.8
Age		
11-20	44	12.5
21-30	58	16.4
31-40	49	13.9
41-50	67	19.0
51-60	38	10.7
60-Above	96	27.2

Table 2: Respondents Knowledge of Malaria

Knowledge of Malaria	No. of Respondents	Percentage
Causes of Malaria		
Anopheles mosquito bite	198	56.2
Stagnant water	78	22.1
Dirty environment	76	21.5
Symptoms		
Body pain	66	18.7
Shivering	81	23.0
Headache	74	21.0
High fever	131	37.2
Adverse Effects		
Miscarriage	76	21.5
Still birth	122	34.6
Low birth weight	154	43.7

analysis shows a significant difference between causes, symptoms and adverse effect of malaria in the study area (P<0.05).

Respondents knowledge of the Preventive measures of malaria in the study area (Table 3) shows that Environmental Sanitation rated highest 106 (30.1) as the preventive measures of malaria followed by use of doors and windows nets 86 (24.4%), Chemotherapy 82 (23.2%) while use of mosquito coil and spray had the least 78 (22.1%). Chi square analysis shows a significant difference between knowledge of preventive measures of malaria in the study area (P<0.05).

Knowledge of who uses ITNs (Table 4) shows that pregnant women 152 (43.1%) were the people that uses ITNs most in the study area followed by All 100 (28.4%), under 5 years 56 (15.9%) with Travellers 44 (12.5%) with the least prevalence rate. Chi square analysis shows a significant difference between knowledge of who uses ITNs in the study area (P<0.05).

Level of use and non use of ITNs in the study area (Table 5) shows that Non users of ITNs had the highest rate of 199 (56.5) compared to people that uses ITNs 153 (43.4%). Chi square

Table 3: Respondents Knowledge of the Preventive Measures of Malaria

Characteristics	No. of Respondents	Percentage (%)
Prevention		
Use of mosquito coils/spray	78	22.1
Environmental sanitation	106	30.1
Doors/windows nets	86	24.4
Chemotherapy	82	23.2
Total	352	70.4

Table 4: Respondents Knowledge of Who Uses ITNs

Users of ITNs	No. of Respondents	Percentage (%)
Pregnant Women	152	43.1
Under 5 years	56	15.9
Travellers	44	12.5
All	100	28.4
Total	352	70.4

Table 5: Levels of Use/Non Use of ITNs

Study Area (S)	No. of Respondent	Use (%)	Non Use (%)
Seat of Wisdom Cath Church Umuokoro	86	30 (8.5)	56 (15.9)
St. Peters Cath Church Alike	74	4 (11.6)	33 (9.3)
All Saints Cath Church Avutu	36	22 (6.2)	14 (3.9)
CKC Umuoke	48	26 (7.3)	22 (6.2)
Ekeonuwa Market	64	21 (5.9)	43 (12.2)
Relief Market	44	13 (3.6)	31 (8.8)
Total	352	153 (43.4)	199 (56.5)

analysis shows a significant difference between levels of users and non users of ITNs in the study area (P<0.05).

The percentage of people using ITNs Always and Sometimes in the study area (Table 6) shows that people that use ITNs sometimes had the highest prevalence rate of 205 (58.2%) compared to people that uses ITNs 151 (42.8%). Chi square analysis shows a significant difference between Percentage of people using ITNs Always and Sometimes in the study area (P<0.05).

Reasons for use and non use of ITNs (Table 7) show that people that responded that the reason for non use of ITNs is because of the heat it does while inside the net recorded the highest percentage of 138 (39.2%) followed by lack of protection 123 (34.9) and with no effective 91 (25.8%) with the least prevalence rate. Percentage of people using ITNs Always and Sometimes. The Chi square analysis shows a significant difference between Reasons for use and non use of ITNs in the study area (P<0.05).

DISCUSSION

The prevention and control of malaria rest on radical mosquito control program. To embark on total eradication, it really comes into mind to control and eradicate mosquito vectors. The use of ITNs (WHO, 2003), is one of the vector control measure,

Table 6: Percentage of People Using ITNs Always and Sometimes in the Study Area

Study Area (S)	Always (%)	Sometimes (%)	Total
Seat of Wisdom Cath Church Umuokoro	37 (10.5)	49 (13.9)	86 (24.3)
St. Peters Cath Church Alike	36 (10.2)	38 (10.7)	74 (21.0)
All Saints Cath Church Avutu	18 (5.11)	18 (5.1)	36 (10.2)
CKC Umuoke	21 (5.9)	27 (7.6)	48 (13.6)
CKC Umuoke	28 (7.9)	40 (11.3)	68 (19.3)
Relief Market	11 (3.1)	33 (9.3)	44 (12.5)
TOTAL	151 (42.8)	205 (58.2)	352 (70.4)

Table 7: Respondents Reasons for Use and Non Use of ITNs

Study area (s)	Reasons		
	Heats (%)	No. effective (%)	Lack of protection (%)
Seat of Wisdom Cath Church Umuokoro	32 (9.0)	25 (7.1)	29 (8.2)
St. Peters Cath Church Alike	28 (7.9)	24 (6.8)	22 (6.2)
All Saints Cath Church Avutu	17 (4.8)	8 (2.2)	11 (3.1)
CKC Umuoke	21 (5.9)	11 (3.1)	16 (4.5)
Ekeonuwa Market	19 (5.3)	13 (3.6)	32 (9.0)
Relief Market	21 (5.9)	10 (2.8)	13 (3.6)
Total	138 (39.2)	91 (25.8)	123 (34.9)

and needs to increasingly receive attention to stem the rising tide of malaria. The potential epidemiological usefulness and public health benefit of ITNs for protection against malaria was reconsidered in the 1980s with the advent of photosynthetic pyrethroids. The current WHO initiates in malaria control as roll back malaria (RBM) emphasizes on the use of ITNs and environmental management to reduce the vector population as key strategies for malaria prevention and control in sub-Saharan Africa (WHO, 2009).

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's malaria burden.

However the present study recorded 43.4% use of ITNs, which differ from 19.4% reported by Anyasodor (2006) on studies on the use of ITNs in rural communities in Nigeria. The disparity may be because of high level of awareness and exposure from people in Urban areas such as Owerri through media. And also it could be the time frame at which both studies were carried out. There is a general belief that as time progresses people awareness and knowledge develops.

Observations on the respondents knowledge of malaria show that 56.2% of the respondents attributed that Anopheles mosquito is the main cause of malaria which is in agreement with the work done by other researchers (Nahlen *et al.*, 2003). Also on the side of the symptoms of malaria it was observed that majority of the respondent affirmed that the main symptoms of malaria is high fever which is in line with the work done by some researchers on malaria (Graves *et al.*, 1987). It was also observed that Low still birth weight was the adverse effect of malaria as affirmed by the respondents.

Also, the respondents confirmed the use of ITNs alone cannot achieve 100% eradication of malaria, they pointed out other measures such as Environmental Sanitation, use of mosquito coil and spray, Doors and window net and Chemotherapy as measures used in Synergy with ITNs to control malaria. ITNs and other measures are related in being vector control for malaria as confirmed by the respondents, though the disparity is that these measures enhances better efficacy. From the observation on the knowledge of who uses ITNs it was observed that 43.1% of respondents attributed that is Pregnant women that mainly use ITNs which is as a result that Pregnant women are more susceptible to malaria infection compared to other people (Brabin, 1983).

From the observation and personal interview, it was observed that 58.2% of people in the study area uses ITNs sometimes while 42.8% uses it Always, which was because of illiteracy and lack of interest on the use of ITNs. Other reasons given by non users were expensive, lack of interest, cannot find it etc., which agrees with earlier studies conducted in Ghana. It was also observed that the reasons for non use of ITNs in the study area by the respondents was that it does heat and makes one feel uncomfortable while in the net as it was seen that 39.2% of people in the study area affirmed to it.

CONCLUSION

The use of ITNs as strategies for malaria prevention and control is an exciting development. The scientific evidence for their effectiveness as a malaria control strategy abound. However, this current intervention is facing a challenge of non-compliance to use as stated in this work. As malaria scourge is still very serious health problem in the country, there is need for increased public awareness campaigns through information, education and communication (IEC) by poster, leaflets 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 tram should be educated more about ITNs and be in position to encourage them accordingly.

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