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Insecticide Treated Nets (ITNs) Ownership and Utilization among Selected Dwellers of Rural Communities in Rivers State, Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. Author BN designed the study, drafted the protocol and wrote the first draft of the manuscript. Author ND carried out survey, assembled data and performed statistical analysis. Authors SOA and UI managed the literature searches and participated in data collection. All authors read and approved the final manuscript.

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ABSTRACT

Background of Study: The evidence for the efficacy of insecticide treated nets (ITNs) in preventing malaria and its consequences among its users is strong especially in rural areas.
Aim/Objective: This was a cross sectional study designed to assess the level of ownership and utilization of insecticide treated bed nets (ITNs) among residents of selected rural Communities in Rivers State, South-South, Nigeria.
Methodology: Structured pre – tested questionnaires were administered to 250 volunteer male and female dwellers of the communities, between the ages of 17 to 40 years, to capture information on ownership and utilization of ITNs. Social demographic characteristics of

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respondents, ownership, consistent use of insecticide treated nets (ITNs) and reason behind ownership were assessed. The data obtained were subjected to statistical analysis.
Results: The study revealed that 56.4% of the studied population owned ITNs, out of which 33.6% was provided by the government, 17.2% was provided by NGOs while 5.6% was provided by others. The highest rate of utilization 16.4% fell between the age ranges of 31–40. Following the result of this study, 37.6% utilization of insecticide treated nets (ITNs) was observed. The overall ITN utilization rate among rural dwellers was 30.4% for females and 7.2% for males. Reasons for non ITNs utilization includes- chemical irritation (35.5%); heat (51.1%); laziness (7.8%) while no reason (5.7%) was given for non ITNs utilization.
Conclusion: It is concluded that the rate of possession and utilization of insecticide treated nets (ITNs) among rural dwellers as found in this study were low. Public health education needs to be intensified to create more awareness and increase ownership and utilization while making ITNs accessible.

Keywords: Insecticide treated nets; utilization; rural dwellers; South -south Nigeria.

1. INTRODUCTION

An insecticide treated net (ITN) is a net (usually a bed net) designed to block mosquitoes physically and that has been treated with safe residual insecticide for the purpose of killing and repelling mosquitoes, which carry malaria. The use of ITNs is currently considered the most cost-effective method of malaria prevention in highly endemic areas. The use of ITNs or LLINs is the main method of malaria prevention employed in Nigeria. Free LLINs are distributed through mass campaigns, public health facilities, faith-based organizations, nongovernmental organizations (NGOs), retail commercial outlets, and maternal and child health weeks with the goal of achieving universal access [1].

ITNs are known to be highly effective in reducing malaria morbidity and mortality. Insecticide treated bed nets (ITNs) have been introduced in Nigeria as an effective means of preventing mosquito bites and malaria transmission following the meeting of African Heads of States in Abuja, Nigeria in the year 2000 [2]. However, usage varies among households. Such variations in actual usage may seriously limit the potential impact of nets and cause spatial heterogeneity on malaria [3]. Insecticide treated nets (ITNs) were developed in the 1980s for malaria prevention. Insecticide Treated Nets (ITNs) are estimated to be more effective than untreated nets and offer greater than 70% protection compared with no net. Newer, longer lasting insecticide nets (LLIN) have now replaced ITNs in most countries [4].

Longer lasting insecticide nets (LLINs) have shown to be the most cost effective prevention method against malaria and are part of WHOs millennium development goals (MDGs) [5].

Its distribution appears to be beneficial in reducing mortality resulting from malaria. The WHO and Roll Back Malaria (RBM) partnership now recommend that distribution of LLINs be free or heavily subsidized to achieve greater equity of coverage [6]. A total of 83 countries, of which 39 are in the African Region, distribute ITNs free of charge [7]. The lifespan of a long-lasting ITN is currently estimated to be 3 years [8]. Nets delivered in 2008 and 2010 are therefore already due for replacement, and those delivered between 2012 and 2013 soon will be.

Failure to replace these nets could lead to a resurgence of malaria cases and deaths [5]. The best evidence for the effectiveness of ITNs distribution comes from a randomized controlled trial of insecticide treated net campaigns [9].

Although ITN users are still protected by the physical barrier of the netting, non-users could experience an increased bite rate as mosquitoes are deflected away from the non-lethal bed net users. The modeling suggests that this could increase transmission when the human population density is high or low when mosquitoes are more proficient at locating their blood meals [6].

The present study was therefore designed to assess the level of ownership and utilization of ITNs among selected residents of rural communities in Rivers State, South – south, Nigeria.

2. MATERIALS AND METHODS

2.1 Study Area

Two different rural communities (Odufor and Okwale) located in Etche and Khana Local

Government Areas of Rivers State respectively were chosen for the study. These rural communities include:

2.2.1 Odufor community

This is one of the biggest communities in Ulakwo Umuselem Clan; in Etche Local Government Area of Rivers State located within a region where Rivers Otamiri and Ogouchie meet, hence it is called a "confluence community". The community has an estimated population of about 2,600 people [10], with the predominant occupation as farming and fishing.

2.2.2 Okwale community

This is the largest Community in Khana Local Government Area of Rivers State. It has the busiest Primary Health Care Centre in the Area. It has three Primary Schools and one secondary School catering for the community with a population of approximately 3,400 people [10].

Rivers State is a major state in the South South region of Nigeria with a population of 5.2 million [10]. This makes it the sixth most populous state in Nigeria. Port Harcourt is the capital city of Rivers State, and is economically significant as the centre of Nigeria's oil industry. The state is bounded to the east by Akwa Ibom state, to the West by Bayelsa state, to the North by Abia and Imo states and to the South by Imo state.

250 volunteer male and female dwellers of the communities aged 17 to 40 years were recruited for the study between January, 2012 and March, 2015. The age range represents the age that are more prone to contracting malaria and more likely to be sensitized. To arrive at the sample size, the prevalence of ITN utilization in Southern, Nigeria (18%) as determined was used. This was substituted in the Taro Yamane formula for calculation of sample size. Sample size is 250 and is determined using the formula, $N=Z^2pq/ D2$, where, Z = 1.96 at 95% confidence limit and error of 5% tolerated, P=Proportion of those using ITNs= 18% [11], D=Sample error tolerated=5% or 0.05.

2.3 Questionnaire Administration

A pre – tested structured questionnaire was administered to the volunteer subjects to obtain information on socio - demographics, ownership and utilization of ITNs. The questionnaire was composed of five sections A to C, with section B dwelling on use of ITNs.

2.4 Statistical Analysis

Data were analyzed using Statistical Package for Social Sciences (SPSS) version 20.0. Descriptive statistics and cross tabulation was used to examine the characteristic of samples Logistic. Graphs and charts were used for data representation.

2.5 Ethical Consideration

A freely administered consent form with interpreters was given to the residents for participation in the study. Approval was obtained from heads of the different studied communities and also from the volunteer subjects. Study field approval was obtained from the University of Port Harcourt ethical committee.

3. RESULTS

A total of 250 respondents aged between 17 and 40 years participated in this study. Fig. 1 shows percentage participation of male and female rural dwellers. Of the 250 respondents, 47 (18.8%) respondents were male dwellers of Odufor community, 63 (25.2%) were male dwellers of Okwale community, 80 (32%) were female dwellers Odufor community while 60 (24%) were female dwellers of Okwale community. However, there was a significant difference among community dwellers (X^2 = 250.00, p = 0.001), depicting that 110 (44%) of the participants were males while 140 (56%) were females. There was a significant difference between the male and female dwellers (X^2 = 102.00, p = 0.000). 26.40% of the participants fell between the age ranges of 17 – 25, 41.60% between the age ranges of 26 – 30 while 32% fell between the age ranges of 31 – 40 (Fig. 2).

141 respondents representing 56.4% of the studied population (Tables 1 and 2), owned ITNs in their homes, out of which 90 respondents representing 63.8% were females from both communities, and 51 respondents representing 36.2% were males. A total of 94 respondents representing 37.6% (Table 2) utilized insecticide treated nets (ITNs), out which 76 representing 30.4% were females, while 18 representing 7.2% were males from both communities. A total of 47 respondents (18.8%) never used the nets. However, there was a significant difference in the possession of insecticide treated nets (ITNs) among both sexes (X^2 = 37.757, p = 0.001).

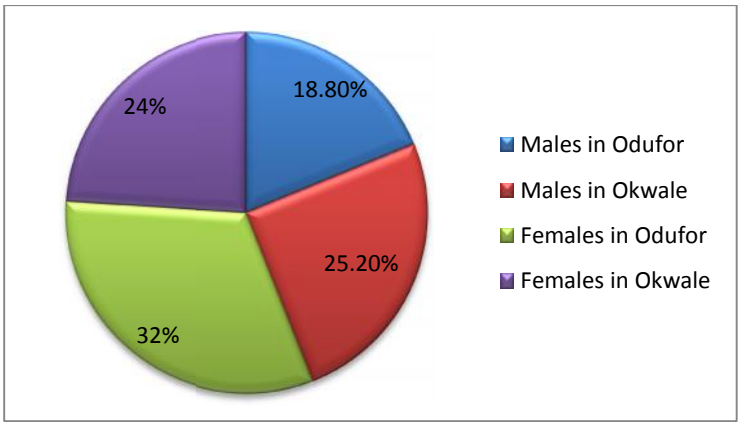

Fig. 1. Percentage of male and female volunteer subjects of the rural communities

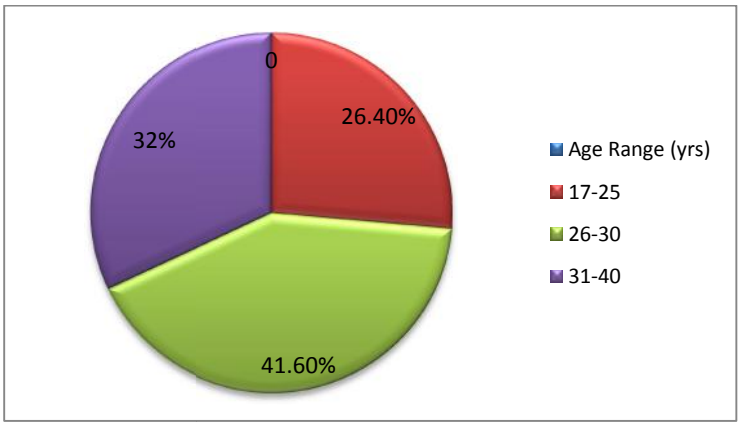

Fig. 2. Showing age range of volunteer rural dwellers

36 respondents representing 25.5% of ITN owners fell between the age ranges of 17 – 25, 56 respondents representing 40.4% of ITN owners fell between the age ranges of 26 – 30, while 48 respondents representing 34% of ITN owner fell between the age ranges of 31 – 40. This showed a non-significant difference across the age ranges (X^2 = 2.108, p = 0.118).

The result in Fig. 4 shows, 50 (35.5%) of the sample population that do not use ITNs said it was because of the chemical irritations. Also 72 (51.1%) of the sample population that do not use ITNs said it was because of the high night temperature. Laziness was the reason why 11 (7.8%) of the sample population did not make use of ITNs. While 8 (5.7%) gave no reason for not making use of ITNs.

Table 1. Insecticide treated nets (ITNs) ownership within specific demographic characteristics

Variables	ITN ownership (n=250)			
	Yes	No	X^2	P – value
	n (%)	n (%)		
Sex				
Male	51 (36.2)	47 (43.12)		
Female	90 (63.8)	62 (56.88)	37.757	0.001
Age range (Yrs)				
17-25	36 (25.5)	34 (31.19)		
26-30	57 (40.4)	39 (35.78)	2.108	0.118
31-40	48 (34)	36 (33.03)		

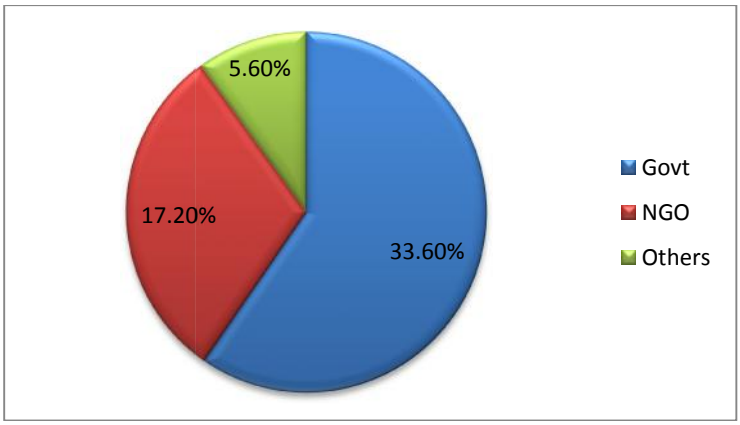

Fig. 3. Sources of insecticide treated nets (ITNs) among rural dwellers

Table 2. Insecticide treated nets (ITNs) utilization and ownership in relation to demographic characteristics

Variables	ITN utilization (n=250)			
	Yes	No	X^2	P - value
	n (%)	n (%)		
Sex				
Male	18 (7.2)	92 (36.8)		
Female	76 (30.4)	64 (25.6)	37.757	0.001
Age range (Yrs)				
17-25	15 (6)	51 (20.4)		
26-30	38 (15.2)	66 (26.4)	12.625	0.002
31-40	41 (16.4)	39 (15.6)		
ITN ownership				
- **Usage:**	141 (56.4)	109 (43.6)	12.625	0.001
	94 (37.6)			

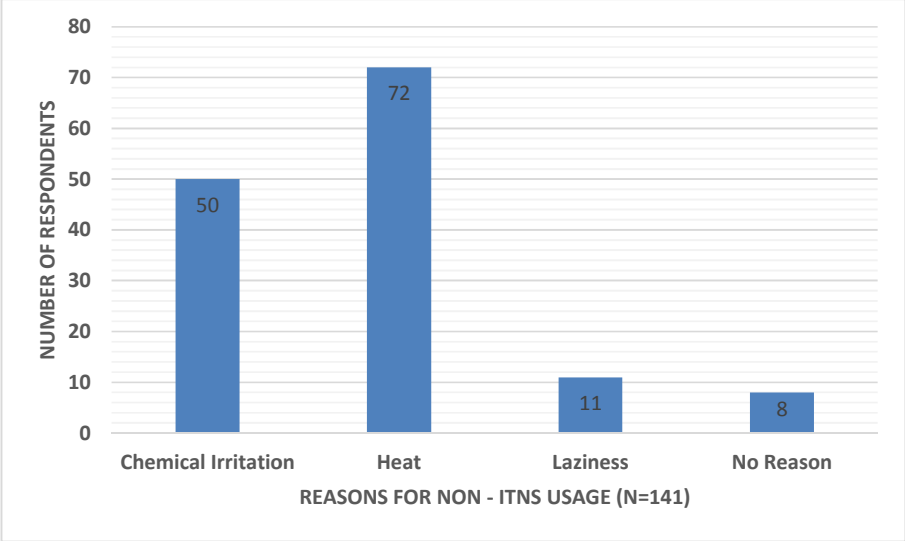

Fig. 4. Reasons for insecticide treated nets (ITNs) non- usage

Residents of rural communities of Rivers State are at risk of contracting malaria owing to the swampy nature of most localities in the region, which serves as breeding ground for mosquitoes. Insecticide treated nets (ITNs) have been shown to have multiple benefits; through protection from mosquito bites. Insecticide treated nets (ITNs), together with improved campaigns for highlighting its needs, are indicated as an important way forward to better health [9]. The total insecticide treated nets (ITNs) usage from this study was 37.6%. This is an improvement on earlier findings that 23.8% of youths use ITNs [12,13]. This study also reveals 56.4% of ITN ownership out of the studied population.

Despite the increase in the overall utilization rate of INTs observed in this study, it still shows a disappointing picture in the campaign for ITN usage. This is as against the 60% target set for ITNs utilization by African Heads of state during the Abuja declaration on malaria in 2005. However, the 2008 world Malaria Report recommended universal coverage targets of 80% by 2010 and its maintenance at this level. This study revealed that of the 56.4% of ITNs owned, 33.6% was provided by the government, 17.2% was provided by NGOs while 5.6% was provided by others. These findings are not consistent with the report that lack of a tradition of net use is commonly the most important reason given for not owning or using a net. Other commonly given reasons for not using nets include cost, lack of availability, net being too hot and uncomfortable to sleep under [14,15].

The age distribution in relation to utilization of ITN has shown in this study that the undergraduates in the age group 31 – 40 years have the highest rate of utilization 16.4%. Since this study involved a heterogenous population (Male and female rural dwellers) whose age brackets are naturally defined, this observation may not be enough to validate any conclusion. It is however interesting to note that the rate of utilization of ITNs is influenced by the level of enlightenment acquired revealing that utilization rate increases as the age range increases.

This study also revealed that 76 (30.4%) of females and 18 (7.2%) of males use insecticide treated nets (ITNs). This shows that majority of the rural dwellers do not use ITNs regularly despite the emphasis placed on the use of ITNs through the roll back malaria programme. This result is comparable to several surveys in Nigeria and Africa, where ITN use varies from 5% to 70% depending on the studied population. Its use is usually high among children and pregnant women [16-19].

This study depicts that 35.5% of the studied population were afraid of chemical irritation and was the reason for non ITN use, 51.1% was for heat as a reason for non ITNs use, laziness accounted for 7.8% reason for ITN non – usage, while 5.7% had no reason for non ITNs use.

Reasons for non-use of ITNs in this study varied among respondents and included: presence of chemicals, presence of heat, laziness and no reasons. However, there are dearth literatures to support these findings. But results shows that presence of heat represent 51.1% and presence of chemicals represents 35.5% of the reasons for non-use of ITNs.

4. CONCLUSION

In conclusion, despite a high level of awareness of ITNs found in this study, possession and utilization of insecticide treated nets (ITNs) among rural dwellers in both communities were low.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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