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Research Article

Distribution, Ownership and Utilization of Insecticide Treated Mosquito Net in Relation to Malaria Prevention among Pregnant Women in Irepodun Local Government Area, Osun State, Nigeria

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ABSTRACT

The study evaluated the distribution, ownership, and use of insecticide-treated mosquito nets in order to reduce malaria among pregnant women in Irepodun Local Government Area, Osun State. Malaria in pregnant women poses a significant risk to both mother and foetus, making prevention crucial. Insecticide-treated mosquito nets are a proven intervention, but their distribution, ownership, and use among pregnant women remain a challenge. A cross-sectional study was adopted using a structured questionnaire administered to 150 pregnant women from three different primary health care centres within the study area. The cluster sampling technique was used to select a sub-sample from the three communities. Results showed that 82% of respondents owned ITNs from government and health campaigns, while 65% regularly used it, particularly among pregnant women who experienced their first pregnancy. There was a strong positive correlation (r=0.73; p=0.0001) between ownership and utilization of ITNs among the pregnant women sampled in the study area. The findings showed an increase in ITN ownership and utilization among pregnant women, particularly among women who experience their first pregnancy. However, addressing socioeconomic disparities, improving distribution strategies, and promoting consistent utilization will improve ITNs' coverage and reduce malaria in pregnancy.

Keywords: Malaria; Irepodun; ITN; Ownership; Pregnant women

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INTRODUCTION

In Nigeria, malaria continues to be a serious public health issue, especially for susceptible groups like expectant mothers. About 25% of all malaria infections in Africa occur in Nigeria, according to the World Health Organization (WHO), with pregnant women being disproportionately affected (WHO, 2020). Pregnancy-related malaria can cause serious problems for both the mother and the fetus, such as low birth weight,

maternal anemia, and infant death (Desai *et al.,* 2017). One effective method of avoiding malaria, particularly in pregnant women, is to use insecticide-treated mosquito nets (ITNs) (WHO, 2019).

Pregnant women are among the vulnerable groups to whom the Nigerian government has distributed ITNs using a variety of tactics. It is unclear, nevertheless, how well these initiatives are working to guarantee fair access to ITNs and encourage their use (Adebayo, 2019). Malaria has been controlled for the past century. The usage of insecticide-treated nets (ITNs) is one of the new improved methods of controlling malaria. Mosquitoes entering the house are known to be killed by ITNs (Adedokun, 2021). They provide more than 70% protection when compared to no net and are thought to be twice as effective as untreated nets. In one-third of the nations where malaria is endemic, the incidence of the disease has decreased by 50% in the last ten years (Balogun *et al*., 2021).

These improvements were achieved by a combination of interventions, such as prompt diagnosis and treatment with trustworthy tests and anti-malarial medications, indoor application of safe insecticide, and the use of long-lasting insecticide-treated nets (LLINs) to shield people from nighttime mosquito bites (Bakare, 2021). In the malaria zone, the rate of mosquito net ownership is still low for many or for a specific population. Moreover, using a mosquito net is not the same as owning one. People who own (or have access to) mosquito nets must use them in order to realize the potential health impact. If ITNs are not used appropriately and consistently, their influence on transmission will not be reduced, particularly among populations like children and pregnant women who are susceptible to malaria morbidity and mortality (Adebimpe. 2019).

As a result, the study sought to find out how pregnant women using primary health centers in Irepodun Local Government, Osun State, Nigeria, distributed, owned, and used ITNs.

MATERIALS AND METHODS

Study Area

Irepodun Local Government Area in Osun State, Nigeria, is primarily known for agriculture and trade. The main occupation is farming, with crops like yam, cassava, maize, and cocoa being cultivated. It's Also, a hub for local trade, especially within the region. The coordinates for Irepodun LGA are approximately 7°50'N 4°29'E. **Ilobu** is a town and the administrative headquarters of Irepodun Local Government Area of Osun State, Nigeria. Ilobu is located in a sparsely forested area and is bounded in the north by Ifon-Osun, in the south by Osogbo, in the east by Oba and in the west by Erin-Osun, and is watered by Ojutu River, Erinle River, Konda River and a few other streams. The town is said to have been founded by Laarosin - powerful warrior in the Old Oyo Empire.

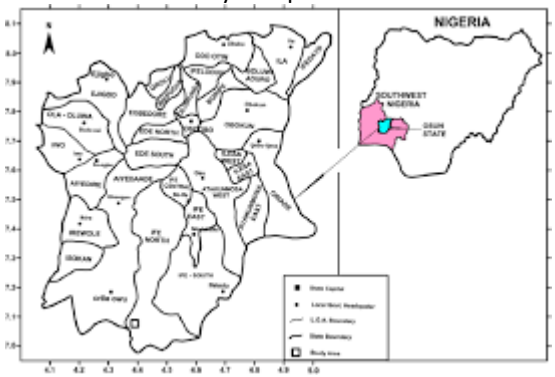

Figure 1. Map of Osun State Showing the Study Area

Sample Size and Sampling Technique

One hundred and fifty (150**)** expectant women (pregnant) were chosen from three health care communities in Osun State for a cross-sectional study. Information on demographic distribution, ownership, and usage of treated mosquito nets, as well as knowledge and practices related to malaria control, was gathered using a pre-tested questionnaire that was administered by an interviewer. Knowledge questions about treated mosquito nets were graded.

Sample size

The required sample size was calculated using the Yamane's formular (1967:886) formula to calculate sample sizes for finite population:

$$n = \frac{N}{1+N(e)^2}$$

Where: n = sample size

N = total population

e = level of significance (0.05 or 0.01)

1 = unit (constant)

The sample size was estimated at 150 pregnant women. The chosen samples were given 150 questionnaires to complete. The individuals completed the given questionnaires, which were then collected a few days later. Subsamples for the study were obtained by cluster sampling. A sub-sample of fifty subjects (from each of the three primary health care centers) was selected using simple random selection after the centers were split up into three clusters.

Data Analyses

Data generated from this study was entered, stored and analyzed using Statistical Package for Social Sciences version 21 (SPSS Version). The data entry was carried out by an experienced data operator. Association between demographic characteristics (educational status, marital status and gravidity) and

ITN ownership by respondents was tested using appropriate tests. Multiple logistic regression analysis was used to identify variables independently associated with clinical outcomes. Level of significance for all tests was at 5%.

RESULTS

The results of demography were presented in tables 1 and 2or marital status and educational status respectively. Majority of the respondents 90 (60%) were married, while least 8 (5.3%) were widows (Table1). 68 (45.3%) of the respondents attained tertiary education, while 26 (17.3%) had only secondary school certificates (Table 2).

Table 1. Prevalence values of the Marital Status of the Respondents

Marital Status	Frequency	Percent (%)
Married	90	60.0
Single	46	30.7
Divorcee	6	4.0
Widow	8	5.3
Total	**150**	**100.0**

Table 2. Educational Status of the Respondents

Educational Status	Frequency	Percent (%)
None	56	37.3
Secondary	26	17.3
Tertiary	68	45.3
Total	**150**	**100.0**

Table 3 presented the number pregnancy experienced by the respondents. Majority of the pregnant women 50 (33.3%) reported their first pregnancy, while least 27 (18%) reported third pregnancy (Table 3.).

Table 3. Number of Pregnancy of the Respondents

Number of Pregnancy	Frequency	Percentage (%)
1st	50	33.3
2nd	41	27.3
3rd	27	18.0
4th and above	32	21.3
Total	150	100.0

The Table 4 presented the result of relationship between ownership and utilization of ITNs. The result indicated a strong positive correlation (r=0.73; p=0.0001) between ownership and utilization of ITNs (Table 4.0).

Table 4. Relationship between Ownership and Utilization of ITNs

Variables	N	DF	Spearman's rho	*p-value*
Ownership of ITNs	150	149	0.73**	0.0001
Utilization of ITNs	150			

**Correlation is significant at the 0.01 level (2-tailed)

DISCUSSION

In Irepodun LGA, Osun State, the study evaluated pregnant women's distribution, ownership, and use of insecticide-treated mosquito nets (ITNs). The results showed pregnant women obtained ITNs from prenatal clinics with 82% ownership, this is similar to the study conducted in countries of Ugandan which revealed a 72% ownership of ITN by pregnant women during their most recent pregnancy Ononiode (2015). In addition, a study of ITN use among pregnant women in Sudan showed ITN coverage of 58.7 %. Sierrleone (2011). Women who were pregnant for the first time were more likely to regularly use the nets to protect both themselves and the unborn child against malaria. This finding is similar to the findings of this study which revealed that majority of pregnant women use ITN in their household to protect themselves and the unborn child.

The study found that educational level and awareness were major determinants of ITN utilization. Women who were better educated or knew more about health issues were more likely to regularly use the nets. This backs up the findings of Afolabi and Sule (2019), this is Also, similar with the findings by Amara et al (2017), who emphasized the importance of health education in encouraging pregnant women to take preventative measures where they found 80% of respondents had heard of ITNs from health professionals. During antenatal care (ANC) visits, pregnant women are educated on a variety of conditions including malaria. Those who attend ANC regularly might have heard about ITNs in the clinic. Given the varied sources of information, what was lacking is how to reach a wider coverage with information regarding ITNs and malaria prevention, therefore, there is a need to adopt multiple sources of delivery of information, so that those who may not be attending ANC regularly could still get reliable information on ITNs through radio, TV or internet. Also, among the barriers to the use of ITN household sleeping arrangements and cultural views Also, affected patterns of ownership and use Amara *et al* (2017). Some women favored other approaches, such indigenous herbs or insecticide sprays, which is consistent with research by Singh *et al* 2013), who noted comparable trends in southwest Nigeria.

The study Also, discovered that women's perceptions of ITNs were significantly influenced by the health education they received during prenatal care visits which is contrary to Ethiopian study which revealed that low educational level of women, low awareness on malaria prevention and unavailability of enough ITNs to the household members were the main barriers to ITNs use Bukari (2015). In a Nigerian study, reasons for not using ITNs were their poor conditions, unavailability of enough ITNs for the household members

Study conducted In Ugandan shows that the primary reason for not always sleeping under the net was the heat (49%) Yassin *et al* (2010).

CONCLUSION

In conclusion, the study shows 82% of the respondent owned ITNs from government and health campaign while 65% use it regularly especially women on first pregnancy. Also, there is strong correlation between ownership and utilization. However, addressing socioeconomic disparities, improving distribution strategies and promoting consistent utilization will improve ITNs coverage and reduce malaria in pregnancy. Also, some persons whose residence were hard to reach due to bad roads are often left out of the free distribution of ITNs. They are therefore compelled to buy ITNs, which they think are very expensive. To resolve this, we recommend to the Nigerian Health Service to train volunteers at local level to aid in the distributions of bed nets to pregnant women and nursing mothers.

Based on the findings, the following recommendations were made: there is need to include ITN promotion in regular prenatal care counseling to guarantee that each expectant mother receives individualized advice. Improving distribution tactics, addressing socioeconomic inequalities, and encouraging consistency will increase ITN coverage and lower pregnancy-related malaria.

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