

# Appraisal of Utilization of Insecticide Treated Nets Distributed by Osun State Government for Malaria Prevention among Pregnant and Nursing Mothers in Ilesa Metropolis, Osun State, Nigeria.

ADEKUNLE Phebian Funmilayo (P.hD)<sup>1</sup>, AKINNUBI C. F. (Ph.D)<sup>2</sup>, ASEKUN-OLARINMOYE, I. O. (Ph.D)<sup>3</sup>, BABALOLA, Afeez Olayinka<sup>4</sup>

<sup>1,3,4</sup>Department of Public Health, University of Ilesa, Ilesa., Nigeria.

<sup>2</sup>Department of Kinesiology, Health Education and Recreation, Obafemi Awolowo University Ile Ife Nigeria

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## ABSTRACT

The study appraised the utilization of Insecticide Treated NETs distributed by the Osun State Government for the prevention of Malaria among pregnant and nursing mothers in Ilesa Metropolis. Three research questions were raised with their corresponding hypotheses. Data were collected from four hundred (400) respondents through a self-designed questionnaire. The instrument was validated and a reliability coefficient of 0.87 was obtained through the use of Pearson Product Moment correlation co-efficient formula at 0.05 Alpha level of significance. Findings revealed that the ITNs were effectively and correctly utilized, barriers to effective utilization were ignored. Incidence of malaria related complications in pregnancy and morbidity were greatly reduced. Data were analyzed using frequency count, percentages and inferential statistics – SPSS. Based on the findings, therefore, the following recommendations were made: Osun State Government should continue with the initiative of free distribution of ITNs across the state, sensitization campaign on the correct utilization of ITNs should be carried out through various channels – mass media, postal, jingles etc., seminars and workshops should be organized by NGOs and Government health agencies on the correct utilization of ITNs.

**Keywords:** Insecticide, Mosquito, mosquito net, malaria, utilization, parasite, transmission, complications, morbidity.

## INTRODUCTION

Africa according to Megan (2019) has a disproportionately high burden of global malaria cases. Africa is traditionally considered as a hot spot for Malaria transmission while changing climate increasingly put millions more at risk worldwide. It was reported by the World Health Organization (2022) that 219 million cases of malaria, a preventable but potentially fatal illness mainly transmitted through the bite of the female Anopheles mosquito between nightfall and the early morning hours occur yearly. Malaria is caused by plasmodium parasites which are transmitted by mosquitoes and undergo complex development cycles in both the insect vector and vertebrate hosts Oliver (2021).

Over 90% of malaria deaths occur in Africa each year. It was estimated that Malaria kills approximately 1,200 children every day. Half of the world is now at risk for contracting malaria, due to warmer temperatures and variations in rainfall. Researchers from the University of Florida postulated that Malaria

vulnerable areas will change and the total transmission zone will expand to new areas (WHO, 2023). There were an estimated 619,000 malaria deaths globally in 2019, malaria cases continue to rise between 2020 and 2021. The global tally of malaria cases reached 247 million in 2021. Infants, children under five and pregnant woman are particularly vulnerable to severe malaria illness. Malaria in pregnancy according to Adelakun, K., Uzorka B. & Agburuga (2016) and Megan (2019) stressed that malaria can lead to miscarriage, still birth, low birth weight, prematurity, congenital infections and abnormalities as well as early newborn death.

WHO (2022) reported that there is evidence connecting malaria with death, cycle of suffering, anemia, poverty, splenomegaly (enlarged Spleen), other nutrition- deficiency-related indicators, and low birth weight. It is also evident that malaria can cause permanent disability (hearing, impairment, visual impairment, epilepsy, etc.). Malaria remains a significant public health threat in Nigeria claiming the lives of thousands annually. National Malaria Elimination Programme (NMEP) Nigeria (2020) embarked on National Malaria Strategic Plan 2021 – 2025. One of the most effective and widely employed tools in the fight against malaria is the Insecticide – treated Nets (ITNs), a long-lasting insecticide-treated net is designed to remain effective for multiple years without retreatment. The WHO (2023) recommends that ITNs be distributed for free to achieve universal coverage of those at risk of malaria. ITN when correctly used provides a physical barrier between humans and mosquitoes, preventing bites and significantly reducing the risk of malaria transmission.

Osun State, located in the Southwest region with warm climate and abundance of mosquitoes creating a breeding ground for the malaria parasite. Effective utilization of ITNs will ensure significant progress in recent years in reducing malaria cases in Osun State. Recognizing the immense impact of ITNs, the Osun State Government has implemented several distribution initiatives, making these nets readily available to residents throughout the State. The malaria burden as reported in the country is on the increase in spite of numerous interventions that have been instituted. The obstacles to the success of these interventions according to Erumi (2016) are socio-cultural, economic and political in nature. Adelakun, Uzorka & Agburuga (2016), Megan (2019), Oliver (2021), WHO (2022) identified poor ventilation, heat due to lack of consistent power supply, non-availability of nets, not feeling comfortable sleeping under the net, not feeling safe under the net, forgetfulness and fear of the chemical causing other health problems as some of the barriers to effective utilization of the insecticides treated nets.

Insecticide treated nets according to Erumi (2016) are manufactured to prevent mosquito bites thereby reducing malaria parasite. The net is designed to physically block mosquitoes from contacting humans. The safe residual insecticide is to kill and repel mosquitoes that carry malaria. NMEP (2020), WHO (2020), Center for Disease Control and prevention (2023), WHO (2023). The continued intervention and preventive measures by the Government was highly applauded by Adelakun et al (2016), National Malaria Elimination Programme (2020) however, observed that the availability of ITNs may not automatically guarantee there effective utilization which depicts practical usage by individuals sleeping under the ITNs. Covering of doors and windows to prevent the mosquitoes from entering the house in addition to sleeping under the net could serve as innovative ways of utilizing the ITNs (Oliver 2021). The focus of this study, therefore, was to assess the utilization of the ITNs for effective prevention of malaria among the population studied.

## RESEARCH QUESTIONS

1. Are the insecticide Treated Nets distributed by Osun State Government effectively and correctly utilized by the pregnant and nursing mothers in Ilesa metropolis.?
2. What are the barriers to the effective and correct utilization of the nets by the target population?

3. Does the prevalence of malaria drops due to utilization of insecticide treated nets among the pregnant and nursing mothers in Ilesa metropolis?

## RESEARCH HYPOTHESES

HO1. There is no significant relationship between availability of ITNs and their utilization among the pregnant and nursing mothers in Ilesa metropolis.

HO2. There is no significant relationship between the barriers to the usage and effective utilization of the ITNs.

HO3. There is no significant relationship between utilization of ITNs and prevalence of malaria among the pregnant and nursing mothers in Ilesa metropolis.

## METHODOLOGY

The study employed a descriptive research design. Three (3) research questions were raised and three hypotheses formulated. Data were collected from four hundred (400) respondents through the use of a self-designed questionnaire which was validated and reliability co-efficient of 0.87 was obtained through the use of Peason Product Moment correlation co-efficient formula at 0.05 Alpha level of significance. Simple random sampling was used in the selection five (5) maternity centres and five (5) Primary Health care centres used for the study. The first twenty (20) women to arrive at the ante-natal and twenty (20) at the post-natal clinics in each centre were used for the study. Data were analyzed using frequency count, percentages and inferential statistics – SPSS.

## RESULTS

Table 1: Respondents’ Responses on effective and correct utilization of Insecticide Treated Nets.

S/N	ITEMS	AGREED	DISAGREED
1.	The net was suspended on my bed and used always	360 (90%)	40 (10%)
2.	The net was nailed to my windows and doors	320 (80%)	80 (20%)
3.	The net was used to fence my garden	10 (2.5%)	390 (97.5%)
4.	The net was used to cover my fish pond	15 (3.75%)	385 (96.25%)
5.	The net was suspended but I seldomly use it	30 (7.5%)	370 (92.5%)

Table 1 showed that 360 (90%) of the respondents agreed that the net was suspended on their bed and used always while 320 (80%) equally agreed that the nets were nailed to their windows and doors. Majority of the respondents with 390 (97.5%) disagreed that the nets were used to fence their gardens, a total of 385 (96.25%) respondents disagreed with using the nets to cover fish pond, a total of 370 (92.5%) respondents also disagreed that the net was suspended but I seldomly use it, while only 30 (7.5%) respondents agreed that the net was suspended but was seldomly use its.

Table 2: Respondents’ Responses on the Barriers to Effective or Correct Utilization of ITNs

S/N	ITEMS	AGREED	DISAGREED
6.	The Insecticide used in treating the net can cause other health problems	40 (10%)	360 (90%)
7.	I feel comfortable sleeping under the net	350 (87.5%)	50 (12.5%)

8.	I sometimes forget to spread the net.	100 (25%)	300 (75%)
9.	It disturbs my getting into and out of bed.	60 (15%)	340 (85%)
10	The net does not allow cross ventilation in the bedroom.	360 (90%)	40 (10%)

From table 2, it was observed that majority (90%) of the respondents disagreed that the insecticide used in treating the net could cause other health problems while 87.5% equally disagreed with not feeling comfortable sleeping under the net. Only 25% agreed that they sometimes forget to spread the net and 15% noted been disturbed getting in and out of the net. Majority (90%) however, agreed that the net does not allow cross ventilation in the bedroom.

Table 3: Respondents’ Responses on the Drop in the Prevalence of Malaria due to utilization of Insecticide Treated Nets.

S/N	ITEMS	AGREED	DISAGREED
11.	Usage of insecticide treated net have reduced the incidence of malaria cases during pregnancy.	380 (95%)	20 (5%)
12.	Usage of malaria drugs by nursing mothers have reduced drastically	370 (92%)	30 (8%)
13.	It was not the usage of the net that reduced incidence of malaria cases.	20 (5%)	380 (95%)
14.	Deaths due to malaria did not drop with the usage of ITNs.	10 (2.5%)	390 (97.5%)
15.	Complications in pregnancy and morbidity due to malaria have reduced.	390 (97.5%)	10 (2.5%)

From table 3, majority (95%) of the respondents agreed that the Insecticide Treated Nets has reduced the incidence of malaria cases during pregnancy while 92% agreed that usage of malaria drugs by nursing mothers have reduced drastically. Majority (95%) disagreed with the statement that it was not the usage of the net that reduced the incidence of malaria cases while (97.5%) equally disagreed with the statement that deaths due to malaria did not drop with utilization of ITNs, 97.5% respondents however, agreed that complications in pregnancy and morbidity due to malaria have reduced.

### Hypotheses Testing

**HO<sup>1</sup>:  $\chi^2$  Analysis on the relationship between availability of ITNs and their Utilization among the Pregnant and Nursing mother in Ilesa metropolis.**

Table 4:- Distribution of  $\chi^2$  Analysis on the relationship between availability of ITNs and their Utilization among the Pregnant and Nursing mother in Ilesa metropolis.

Tab $\chi^2$ Value	Level of significant	Df	Cal $\chi^2$ Value	Decision
9.49	0.05	4	1,346.35	Rejected

The above table showed 9.49 as the table value with the higher calculated value of 1,346.35 under the degree of freedom of 4 at 0.05 level of significance. This implies that significant relationship exists between availability of ITNs and their utilization among the pregnant and nursing mother in Ilesa metropolis in Osun state.

**HO<sup>2</sup>:  $\chi^2$  analyses on the relationship between the barriers to the usage and attitude to effective utilization of the ITNs.**

Table 5:- Distribution of  $\chi^2$  analyses on the relationship between the barriers to the usage and attitude to effective utilization of the ITNs.

Tab $\chi^2$ Value	Level of significant	Df	Cal $\chi^2$ Value	Decision
9.49	0.05	4	1,025.18	Rejected

The above table showed 9.49 as the table value with the higher calculated value of 1,346.35 under the degree of freedom of 4 at 0.05 level of significance. This indicate that significant relationship exists between the barriers to the usage and attitude to effective utilization of the ITNs.

**HO<sup>3</sup>:  $\chi^2$  analyses on the relationship between utilization of ITNs and prevalence of malaria among the pregnant and Nursing mothers in ileisa metropolis.**

Table 6:- Distribution of  $\chi^2$  analyses on the relationship between utilization of ITNs and prevalence of malaria among the pregnant and Nursing mothers in ileisa metropolis.

Tab $\chi^2$ Value	Level of significant	Df	Cal $\chi^2$ Value	Decision
9.49	0.05	4	1,177.75	Rejected

The above table showed 9.49 as the table value with the higher calculated value of 1,177.75 under the degree of freedom of 4 at 0.05 level of significance. This specified that significant relationship exists between utilization of ITNs and prevalence of malaria among the pregnant and Nursing mothers in ileisa metropolis.

**DISCUSSION OF FINDINGS**

Table one showed that majority (90%) of the respondents agreed that they suspended the ITNs on their beds and always used it while 80% equally nailed the net to their doors and windows. Majority (97.5%) of the respondents disagreed with using ITNs to fence their gardens while 96.25% disagreed with using the net to cover fish pond. Only 7.5% agreed that they seldomly use the suspended nets. These responses are in consonance with the submissions of Adelakun, Uzorka & Agburuga (1916), Erumi (1916), National Malaria Elimination Programme (NMEP) (2020), Oliver (2021) and WHO (2022) that Insecticide Treated Nets could only be effective in preventing malaria if they are correctly utilized by sleeping under the net regularly.

Table two revealed that majority (90%) of the respondents disagreed that ITNs could cause other medical problems while 90% agreed that they feel comfortable sleeping under the net. Only 25% agreed that they sometimes forget to spread the net while 15% agreed that they are disturbed getting in and out of the net. Majority (90%) of the respondents however, agreed that the net does not allow cross ventilation in bed room. The above responses are in agreement with the findings of Olivet (1916), NMEP (2020), WHO (2020), Centre for Disease Control and Prevention (2023), WHO (2023) who identified heat due to lack of consistent power supply, not feeling comfortable sleeping under the net, not feeling safe under the net, forgetfulness and fear of chemical causing other medical problems as some of the barriers to effective utilization of ITNs.

Table three showed that majority (95%) of the respondents agreed that utilization of Insecticide Treated

Nets have reduced the incidence of malaria cases during pregnancy while 92% equally agreed that usage of malaria drugs by nursing mothers have reduced drastically. Majority (95%) however, disagreed that with the statement that it was not the usage of ITNs that reduced incidence of malaria cases while 97.5% disagreed with the statement that deaths due to malaria did not drop with the utilization of ITNs. Reduction in complications during pregnancy due to malaria also attracted 97.5% positive responses. All these responses are in line with the findings of Erumi (1916), NMEP (2020), WHO (2020), Centre for Disease Control and Prevention (2032), WHO (2023) that Insecticide Treated Nets are manufactured to prevent mosquito bites by physically blocking mosquitoes from contacting humans and that the safe residual insecticide is to kill or repel mosquitoes that carry malarial parasite.

## CONCLUSION

The Osun State Government initiative of free distribution of Insecticide Treated Nets among the populace resulted into drastic reduction in the incidence of cases especially among pregnant and nursing mothers in the State.

The Insecticide Treated Nets were correctly and effectively utilized by pregnant and nursing mothers in the State.

Identified barriers to effective utilization of ITNs were ignored by the respondents.

The continued intervention and preventive measures by the Osun State Government have reduced the incidence of malaria related complications in pregnancy and morbidity.

## RECOMMENDATIONS.

1. Osun State Government should continue with the initiative of free distribution of ITNs across the state.
2. Sensitization campaign on the correct utilization of ITNs should be carried out through various channels – mass media, postal, jingles etc.
3. Seminars and workshops should be organized by NGOs and Government health agencies on the correct utilization of ITNs

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