

# Challenges With the Use of Insecticide Treated Nets Among Pregnant Women in Ife-Ijesha Zone, South Western Nigeria.

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## ABSTRACT

### Background

Malaria in pregnancy cannot be controlled if there is poor compliance with preventive strategies including use of insecticide treated nets (ITN). This study examined the use of ITN during pregnancy and also identified various factors that are associated with the use /non-use among the pregnant women.

### Methodology

This study was carried out in antenatal clinics of Obafemi Awolowo University Teaching Hospital Complex. It employed a descriptive cross sectional study design and was conducted among 320 pregnant women who gave their consent within the four weeks study period. Data was collected using facilitated self administered, pretested, semi-structured questionnaire. Univariate and bivariate analysis were done using SPSS version 16 and critical level was set at 0.05.

### Results

Majority of the respondents (88.1%) did not sleep under ITN. Reasons for non-compliance include ignorance (55.8%), unavailability of the product (52.7%), exorbitant price (24%), personal beliefs about the chemicals used (23.3%) and inconveniences associated with use (12%). Having treated malaria in the index pregnancy was significantly associated with sleeping under ITN as 21.1% of them slept under ITN compared to none among those that have not had treatment (Fishers  $p=0.001$ ). However, none of the socio-demographic variables tested had statistically significant association with the use of ITN.

### Conclusion

## INTRODUCTION

Each year, approximately 50 million women living in malaria endemic countries throughout the world become pregnant. An estimated 10,000 of these women and 200,000 of their infants die as a result of malaria during pregnancy, and severe malaria complicated by anaemia contributes to more than half of these deaths<sup>1</sup>. For instance malaria during pregnancy in sub-Saharan Africa was estimated to account for 400,000 cases of severe anaemia in pregnant

women<sup>2</sup>. In endemic areas, people of all ages have regular attacks throughout their lives, yet young children and pregnant women are mostly at risk of severe malaria and death, thus pregnant women and children under 5 have been targeted as key groups for malaria prevention. Prevention and treatment of malaria are among the major international development targets, notably the Millennium Development Goals<sup>3</sup>. For example, one of the eight goals specifically relates to malaria, AIDS

and other infectious diseases. Many other goals, including the reduction of child and maternal mortality, will be difficult to achieve in malaria-endemic countries without a substantial decrease in malaria burden. Insecticide Treated bed Nets (ITNs) are being promoted as a major tool in the fight against malaria in pregnancy. The World Health Organization advocates the use of ITN as one of the three-pronged approach for reducing the burden of malaria among pregnant women<sup>4</sup>. An insecticide-treated net is a mosquito net that repels, disables and/or kills mosquitoes coming into contact with insecticide on the netting material<sup>5</sup>. ITNs thus work in this case as a vector control intervention for reducing malaria transmission. ITNs have been shown to reduce severe disease and mortality due to malaria in endemic regions and reduce all cause mortality by approximately 20%<sup>2</sup>. The use of ITNs reduces peripheral and placental parasitaemia, increases maternal haemoglobin concentrations, increases mean birth weight, and decreases the risk of fetal loss in the women in their first to fourth pregnancies<sup>6</sup>. The effectiveness of ITN interventions in reducing the burden of malaria has been amply demonstrated in a variety of epidemiological settings and it has been shown to avert around 50% of malaria cases<sup>6</sup>. ITNs have been shown to be beneficial and should be included in strategies being promoted to reduce the adverse effects of malaria in pregnant women in endemic areas of the world.<sup>7</sup> One major aim of the Roll Back Malaria (RBM) campaign in Nigeria is to have 60% of pregnant women and children under 5 years of age covered by insecticide treated bed nets (ITN) by the year 2010<sup>4</sup>. In most malaria endemic countries in Africa the RBM goal of increasing LLINs coverage among pregnant women and children under 5 years of age to 80% by 2010 was not met. Protection with ITNs during pregnancy is widely advocated, yet in many African countries, bed net ownership and usage is low (less than 10 percent in some areas)<sup>8</sup>. Several studies have examined the effectiveness of ITNs in preventing malaria<sup>9,10</sup> and some data have reported poor compliance with its use.<sup>11</sup>

ITNs might have been identified as a relatively cheap and acceptable method of reducing the morbidity and mortality caused by malaria but the factors that determine compliance to use of ITNs must be taken into consideration so as to explore ways by which communication and advocacy activities can contribute to effective use of these nets. This study aims at assessing compliance with use of ITN during pregnancy and also to document the reported challenges for non-compliance.

#### METHODOLOGY

The study was carried out in Obafemi Awolowo University Teaching Hospital Complex which comprises of Obafemi Awolowo University teaching Hospital Ile-Ife, urban comprehensive health centre Eleyele Ile-Ife and Wesley Guild Hospital Ilesa. The complex is strategically located in and around the ancestral home of Yorubas in the South Western parts of Nigeria and in fact a famous zone (Ife-Ijesa zone) in Osun State, South Western Nigeria. The study employed a descriptive cross sectional design and sample size was calculated using Fishers formular<sup>12</sup>. Prevalence was set at 3.4% based on the proportion of pregnant women in South Western Nigeria that slept under ITN in a previous study<sup>13</sup> and level of significance was set at 95% confidence level. This gave a minimum sample size of 50. All pregnant women who gave their consent in the antenatal clinics of the selected hospitals within the study period (July, 2010) were recruited. A total of 320 respondents participated in the study to allow for adequate cell population during bivariate analysis. Data was collected using a facilitated, self administered, semi structured questionnaire which assessed socio-demographic characteristics of the respondents, use of ITN and factors responsible for poor compliance. The questionnaire was translated into Yoruba and back translated into English Language to ensure that the contents retained their meaning when translated into Yoruba language. All pregnant women that could not understand English or Yoruba were excluded

## RESULTS

Three hundred and twenty questionnaires that were properly filled were retrieved and analysed. Majority (94.7%) of the respondents were married and 260 (81.3%) of them were Christians. About two-thirds of them (69.7%) had tertiary education while 4.0% had primary level of education. The modal age group was 31-40 yrs (36.9%) but closely followed by those between 21 and 30years (33.1%). Very few (< 5%) belonged to the extremes of reproductive age group i.e pregnant teenagers and those above forty years of age respectively. About half (49.7%) of them were in the second trimester while more than one third were in the last trimester (33.1%).

Many of the respondents (88.1%) did not sleep under ITN although close to half of them lived in households with ITN (46.9%). Only 25.3% of those living in households with ITN slept under it. More than half of the respondents (55.8%) reported that ignorance about ITN was the reason why they were not

sleeping under it. Among those that are aware, television was the commonest source of information (40.1%) followed by radio (28.7%) and health workers (16.5%). Very few of them heard from internet and Journals (10.4%) while family and friends constituted the least source of information about ITN among them (4.3%). Apart from ignorance, other reasons for non-use of ITN as reported by the respondents included unavailability of the product (52.7%), prices were not affordable (24%), personal beliefs that the chemicals used in it was dangerous (23.3%), inconveniences associated with its use (12%) and various religious factors (10.8%) e.g they chose not to sleep under ITN because of their believe in divine protection against malaria.

A bivariate analysis of the results showed that having treated malaria in the index pregnancy was significantly associated with sleeping under ITN as 21.1% of them slept under ITN compared to none among those that have not had treatment (Fishers  $p=0.001$ ). However, none of the socio-demographic variables

Table 1 Socio-demographic characteristics of the Respondents.(n= 320)

Biodata	Frequency	Percentage
Age (Years)		
< 20	45	14.1
21-30	106	33.1
31-40	118	36.9
41-50	51	15.9
Marital status		
Single	17	5.3
Married	303	94.7
Religion		
Christian	260	81.3
Islam	60	18.7
Level of education		
Primary	13	4.0
Secondary	84	26.3
Tertiary	223	69.7
Estimated gestational trimester		
1 <sup>st</sup> trimester	55	17.2
2 <sup>nd</sup> trimester	159	49.7
3 <sup>rd</sup> trimester	106	33.1

Fig 1. Possession and use of ITN among the pregnant women (n= 320)

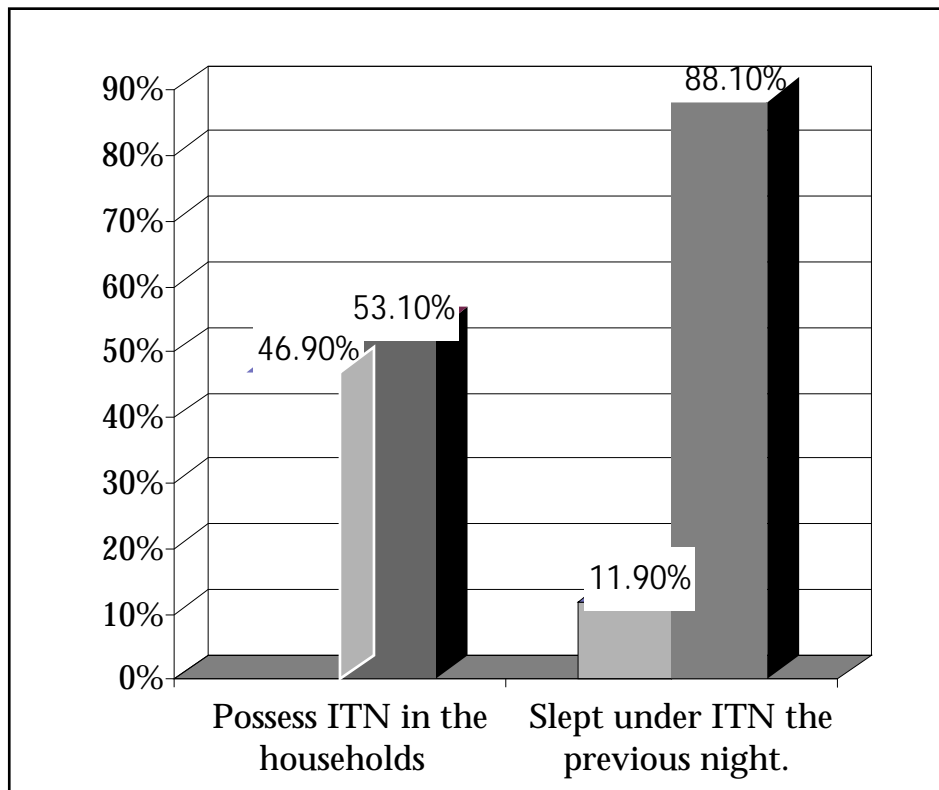


Fig. 2. Factors responsible for non use of Insecticide Treated Nets among the pregnant women that did not sleep under it (n= 282)

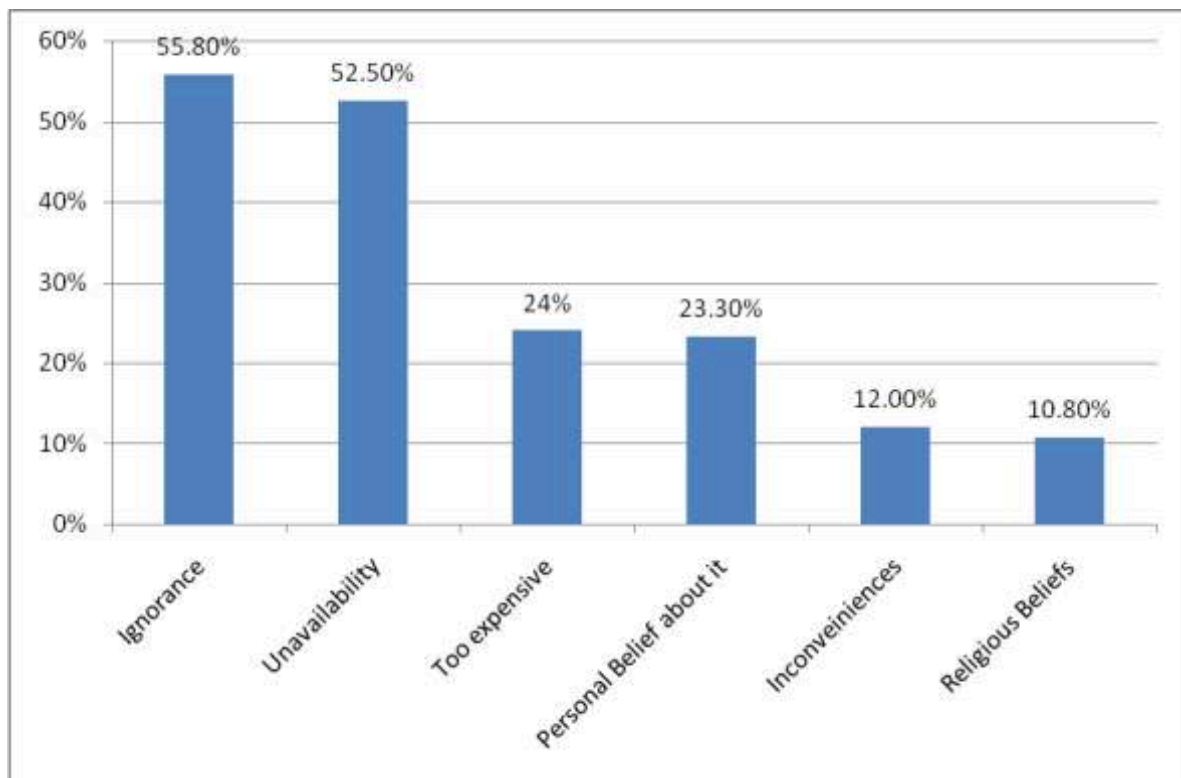


Table 2. Cross-tabulation showing association between use of ITN and selected variables.

	Slept under ITN n = 38 Freq (%)	Did not sleep under ITN n= 282 Freq (%)	X <sup>2</sup>	df	P val
Age (Years)					
< 20	6(13.3)	39(86.7)			
21-30	15(14.2)	91(85.9)			
31-40	12(10.2)	106 (89.8)		3	0.771*
> 41	5(9.8)	46(90.2)			
Level of education					
Primary	2(15.4)	11(84.6)		2	0.804*
Secondary	9(10.8)	75(89.3)			
Tertiary	27(12.1)	196(87.9)			
Marital status					
Single	1(5.9)	16(94.1)		1	0.704*
Married	37(12.2)	266(87.8)			
Number of pregnancy					
Primi	18(11.5)	135(88.5)	0.003	1	0.953
Multi	20(11.8)	147(88.2)			
Estimated gestational trimester					
1 <sup>ST</sup> trimester	8(14.6)	47(85.5)			
2 <sup>nd</sup> trimester	18(11.3)	141(88.7)	0.453	2	0.797
3 <sup>rd</sup> trimester	12(11.3)	94(88.7)			
Malaria Treatment in the index pregnancy					
Never treated	0(0.0)	140(100.0)		1	0.001*
Treated	38(21.1)	142(78.9)			

## DISCUSSION

The findings of this study indicate that majority (88.1%) of pregnant women in the study location are not sleeping under ITN. This is similar to studies conducted recently among pregnant women in Eastern and Northern parts of Nigeria where there was poor compliance with the use of ITN was reported among them<sup>14,16</sup>. The 2008 Nigerian Demographic and health survey (NDHS) documented that only 3.4% of pregnant women in South Western Nigeria slept under ITN the previous night to the survey<sup>13</sup>. The

extremely low proportion reported in the NDHS report could have been due to the fact that it was a community based study and many of them might not have had access to ITN compared with pregnant women that were interviewed in the clinics. Another study conducted in East Africa showed that 58% of the pregnant women studied were sleeping under ITN<sup>17</sup>. Although they seem to comply better with the use of ITN in that part of Africa at that time but their study was conducted about ten months after an epidemic of malaria in the study location which could

have prompted more people to use it for prevention. The statistically significant association between past treatment of malaria in the index pregnancy and sleeping under ITN in this study conducted in Osun State can imply that if the pregnant women are well educated about possible consequences and severity of malaria especially in pregnancy, they may have better compliance. This is corroborated by a study conducted in Nigeria where history of fever was a significant predictor of sleeping under ITN among under-five children.<sup>18</sup> This makes it important that people should be informed that they do not have to wait for malaria episodes before sleeping under ITN because prevention is always better than cure and a single episode of malaria may result in severe consequences.

Ignorance was the major reason reported by the respondents for non-compliance with the use of ITN. This is quite interesting because the study population comprised of pregnant women selected from antenatal clinics of tertiary health centres and its affiliated urban comprehensive health centre. Such women should have been well informed through health workers but it is not surprising because most of the supplies of ITN from governmental and non-governmental organisations usually go through the local governments and it is not impossible that primary health centres are given more priority in distribution and awareness programmes than tertiary health institutions. This is supported by the finding that only 16.5% of them heard about ITN from health workers despite the fact that they were interviewed in antenatal clinics. A study conducted recently among health workers in South Western Nigeria discovered that although 93.5% of them were aware of ITN, only 22.8% were using it, less than one-third (32.3%) indicated that ITN was available in their health facility and only about half of them (56.7%) had recommended it for patients before.<sup>19</sup>

Other reasons for non use of ITN as reported

by these pregnant women included unavailability of the product (52.7%) and similar findings were documented from other parts of the country<sup>15, 16</sup>. This makes it imperative that the nationwide routine distribution system for long lasting insecticide treated net (LLIN) through health facilities that is modelled on the modified ITN Massive Promotion and Awareness Campaign (IMPAC) system in Nigeria should be reviewed and monitored. This is because ideally, under this IMPAC system, pregnant women attending antenatal clinics should receive a LLIN at first attendance and children should receive an LLIN on completion of their third dose of the Diphtheria, Pertussis and Tetanus vaccine (DPT3). If this is routinely reviewed and effective distribution is ensured, there will be no case of unavailability. It should however be noted that ownership of ITN does not translate to sleeping under it as shown by findings from this study where only one quarter of those that poses ITN in their households sleep under it. The reports of the NDHS conducted in 2008 also showed that only 37.4% and 48.3% of pregnant women in households with an ITN in urban and rural areas respectively slept under ITN the previous night before the study<sup>13</sup>.

Some of the respondents complained that the ITN is too expensive (24%) and some of them believed that the chemicals used as the insecticide may have negative effects on the pregnancy (23.3%). Similar findings were reported in studies conducted in other parts of Nigeria<sup>14, 16</sup>. The implications of these findings include need for correction of the negative perceptions about the chemicals used for treating the net and ensuring effective distribution of the free nets. Otherwise, the cost of the available nets should be subsidized to improve access to it. Poverty alleviation and women empowerment may also be factors that will contribute to compliance with the use of ITN.

Some of the respondents reported that it is not

convenient to sleep under ITN due to factors like heat and difficulty in installation on modern day beds and/or ceilings. This calls for improvement in the technologies of hanging the net. It also buttresses the fact that improvement in power supply may encourage people to sleep under ITN because some pregnant women may actually prefer mosquito bites to the extra heat that may be generated by ITN in the absence of electricity to run fans that can cool the environment. Perhaps introduction of window nets and curtains that are impregnated with long lasting insecticides may also improve compliance because there will be less complaints about heat generated by sleeping under these nets. The belief that faith in their God will prevent malaria in pregnancy and therefore do not need any ITN calls for a need to include religious leaders/religious gatherings in the sensitization campaign and awareness programmes to promote the use of ITN during pregnancy. A qualitative study conducted recently in Niger Delta area of Nigeria identified similar reasons for lack of use of ITN. This included issues of convenience, especially net set up and dismantling, potential hazard and safety concerns, issues related to typical family composition and nature of accommodation, humid weather conditions, and perceptions of cost and effectiveness.<sup>20</sup>

In this study, none of the socio-demographic variables tested including age of the woman, parity, marital status, level of education and age of gestation had statistically significant association with the use of ITN during pregnancy. In studies conducted in Eastern and Northern parts of Nigeria, there was no significant difference in use of ITN among mothers with high educational status and those with lower educational qualification<sup>16, 18</sup>. However, findings from a study conducted in Northern Ethiopia documented that higher educational attainment played statistically significantly positive explanatory factor for the use of ITNs among pregnant women<sup>17</sup> and

similar findings were documented by the NDHS 2008 reports<sup>13</sup>.

In conclusion, this study showed that many of the pregnant women in this malaria endemic area are not sleeping under insecticide treated nets (ITN) and ignorance was the major reason for their poor compliance. Other reported reasons include unavailability of the product and inconveniences associated with its use. Non compliance with the use of ITN cuts across all the pregnant women irrespective of their chronological age, gestational age, parity, educational and marital status. Insecticide treated nets must be readily available and affordable if pregnant women will be encouraged to comply with the use and there is a need to correct some negative perceptions and involve religious leaders in sensitization and distribution programmes. All these are necessary to achieve the WHO goal of 80% compliance with use of ITN during pregnancy and ultimate improvement in maternal and child health.

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