

## Awareness and Utilization of Insecticide Treated Mosquito Nets Among Pregnant Mothers at a Tertiary Health Institution in North-Western Nigeria

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### Abstract

**Introduction:** Malaria in pregnancy is a formidable misery in Africa and contributes significantly to maternal death in Nigeria. The use of Insecticide treated mosquito bed nets is one of the strategies of the Roll Back Malaria initiative. It is a form of vector control measure but there exists discordance between awareness and utilization of insecticide treated nets in Nigeria. This study set out to assess the level of awareness and utilization of insecticide treated nets among pregnant mothers attending antenatal clinic.

**Methods:** Using a structured questionnaire, a cross sectional study of 250 consecutive pregnant mothers attending antenatal booking clinic in Usmanu Danfodiyo University Teaching Hospital Sokoto between January and March 2008 was conducted.

**Results:** Seventy four percent of the clients were aware of Insecticide treated nets. Awareness of insecticide treated nets was significantly higher in clients with post primary education (66.8%) compared to those with at most primary education (33.2%);  $p < 0.05$ . Thirteen percent of the clients were using insecticide treated nets while 67.6% were not. The main reason for non-utilization of insecticide treated nets were non availability of the nets (58.8%) and inconvenience of the barrier to the clients (29.4%).

**Conclusion:** There is high level of awareness of insecticide treated nets among the study population but very low utilization largely due to non availability. For Nigeria to achieve the Millennium development goal target in combating the menace of malaria in pregnancy, more effort is required to increase the availability of insecticide treated nets. In addition, proper education on the benefits of insecticide treated nets may increase its utilization.

**Key words:** Awareness, Utilization, ITNs, North Western Nigeria.

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### Introduction

Prevention of malaria in pregnancy is a major public health challenge and a priority for the Roll Back Malaria (RBM) partnership. Sub Saharan Africa is worst affected with 80-90% of world malaria cases and 19-24 million women at the risk of malaria and its adverse consequences during pregnancy.<sup>1,2</sup> Nigeria is plagued by a high maternal mortality ratio of 704 deaths per 100,000 live births<sup>3</sup> and malaria in pregnancy is responsible for 11% of those maternal deaths.<sup>4</sup> In Sokoto state, North Western Nigeria, malaria was identified as the commonest cause of anaemia in pregnancy and overall commonest cause of morbidity and mortality during the year 2001.<sup>5</sup>

The World Health Organization (WHO) had echoed that programmes of controlling malaria were indispensable in areas where eradication appears impracticable such as sub Saharan Africa.<sup>6</sup> In endemic regions such as North Western Nigeria, pregnant mothers may have malaria without reporting clinical symptoms and hence, strategies that rely solely upon early diagnosis and prompt treatment of symptomatic disease may be unrealistic.<sup>7</sup>

Insecticide treated nets (ITNs) are made of a suitable material with fine mesh to act as a mechanical barrier to the entry of mosquitoes. They are subsequently impregnated with an insecticide, commonly permethrin, a chemical substance that is lethal to mosquitoes but harmless to man. A net once installed around beds or mats to cover up all available spaces can be used indefinitely while the insecticide need to be reapplied according to manufacture's specification. The Nigerian Government in a bid to attaining the 80% coverage of vulnerable groups (pregnant women and under five children) by the year 2015 had subsidized the price of ITNs to \$5 per net while some state government have in turn made it free to pregnant mothers. The cost effectiveness of ITNs in preventing child and maternal mortality have been demonstrated by various workers<sup>8,9</sup>. However, reports from south eastern and south western Nigeria revealed moderate awareness and very

low utilization of ITNs.<sup>10,11,12</sup> There is paucity of data about the awareness and utilization of ITNs among pregnant clients in North Western Nigeria. This study therefore aimed at ascertaining the awareness and utilization of ITNs among antenatal clients at Usmanu Danfodiyo University Teaching Hospital, Sokoto, North Western Nigeria.

## Materials and Methods

This was an antenatal clinic based cross sectional study. Pregnant women attending the antenatal clinic for booking at Usmanu Danfodiyo University Teaching Hospital (UDUTH) Sokoto between January and March, 2008 were consecutively recruited into the study after obtaining consent. Exclusion criteria were failure to give consent to the study. Data were collected from each client using an interviewer administered questionnaire. Relevant information such as socio demographic data, awareness and utilization of ITNs were collected and documented. Information obtained was analyzed using the Statistical Program for the Social Sciences (SPSS) soft ware. Frequency tables were used to display categorical data while the chi-square test was used to test for association and a p value of less than 5% was considered statistically significant. Ethical permission for the study was obtained from the Ethical and Scientific Committee of Usmanu Danfodiyo University Teaching Hospital, Sokoto.

## Results

A total of 250 (80.6%) out of the 310 pregnant mothers that came for antenatal booking gave consent for the study and were thus interviewed using the study proforma. The modal age group was 20-29 years (Table 1) while the mean age of the respondents was  $26.9 \pm 5.3$  years.

One hundred and sixty seven respondents (66.8%) had a minimum of secondary education while the rest (33.2%) had primary or no formal education. Fifty six percent of the respondents were housewives while 34.6% were civil servants and traders (Table I).

Seventy four percent of the clients had heard about ITNs. Their main sources of information as shown in table II were Friends / Relations (40.3%) and Radio / Television (25.8%). Awareness was significantly higher in respondents with post Primary education (73.1%) compared to those with at most Primary or no formal education (26.9%);  $p < 0.05$  as shown in Table III. The age of the clients did not affect awareness ( $p > 0.05$ ). Regarding utilization of mosquito bed nets, only 13.2% of the clients sleep under ITNs while 67.6% of respondents

do not use any form of bed nets. The most common reason cited for not sleeping under ITNs was unavailability of the net (58.8%). Cost was cited as reason for non utilization by 4.6% of the clients. Other reasons included inconvenience (29.9%) and no bed (7.2%).

**Table I: Socio demographic characteristics of the Clients (n = 250)**

Variable	Frequency (n)	Percentage (%)
<b>Age group (Years)</b>		
< 20	19	7.6
20-29	150	60.0
30-39	77	30.8
40-49	4	1.6
<b>Education</b>		
No formal Education	58	23.2
Primary	25	10.0
Secondary	78	31.2
Post Secondary	89	35.6
<b>Occupation</b>		
House Wife	139	55.6
Civil Servant	53	21.2
Trading	33	13.2
Others	25	10.0

**Table II: Awareness and Source of information about ITNs**

Variable	Frequency (n)	Percentage (%)
<b>Awareness of ITNs</b>		
YES	186	74.4
NO	64	25.6
Total	250	100.0
<b>Source of information (n=186)</b>		
Friend/Relative	75	40.3
Radio/Television	48	25.8
Television only	26	14.0
Hospitals	25	13.4
Radio only	12	6.5
<b>Use of mosquito Bed nets</b>		
Ordinary bed nets	48	19.2
ITNs	33	13.2
No nets	169	67.6
Total	250	100.0

**Table III: Awareness / Utilization of ITNs and Associated factors.**

Variable	Awareness of ITNs		X <sup>2</sup>	P
	YES (%)	NO (%)		
<b>Age(Years)</b>				
< 20	14 (7.5)	5 (7.8)		
20-29	110 (59.1)	40 (62.5)	0.380	> 0.05
30-39	58 (31.2)	19 (29.7)		
40-49	4 (2.2)	0 (0)		
<b>Educational status</b>				
No formal education	31 (16.7)	27 (42.2)		
Primary	19 (10.2)	6 (9.4)		
Secondary	58 (31.2)	20 (31.3)	13.67	<0.05
Tertiary	78 (41.9)	11 (17.1)		
	<b>Utilization of ITNs</b>			
<b>Age (Years)</b>				
< 20	3 (9.1)	11 (7.2)		
20-29	20 (60.6)	90 (58.8)	0.166	> 0.05
30-39	10 (30.3)	48 (31.4)		
40-49	0 (0)	4 (2.6)		
<b>Educational Status</b>				
No formal education	4 (12.1)	27 (17.6)		
Primary	4 (12.1)	15 (9.8)		
Secondary	11 (33.3)	47 (30.7)	0.19	>0.05
Tertiary	14 (42.5)	64 (41.9)		

**Table IV: Respondents reasons for their non utilization of ITNs**

Reasons for non- utilization of ITNs (n= 153)*	Number of Respondents	Percentage (%)
Cannot get to buy	90	58.8
Inconvenient	45	29.4
Do not sleep on a bed	11	7.2
Too costly	7	4.6
Total	153	100.0

\* Respondents aware of ITNs but not sleeping under them

## Discussion

The awareness of ITNs of 74.4% obtained in this study is higher than 41.1% reported by Adeyemi<sup>10</sup> among pregnant clients in South Western Nigeria as well as 51.4% and 7% reported among general population in the same region.<sup>11, 12</sup> This may have been due to the recent campaign in the region via the electronic media on the benefits of ITNs and polio vaccination. The major sources

of clients' information about ITNs in this study (Friends / Relation and Radio / Television) were similar to the findings in the south western Nigeria and The Gambia.<sup>10, 13</sup> There was no significant relationship between the clients' age and awareness of ITNs in this study. This finding is at variance with a study in Uganda<sup>14</sup> where age less than 30 years favoured awareness and usage of ITNs. The level of awareness of ITNs in this data increases with higher level of client's education. This association is similar to Abiona's observation.<sup>11</sup> This may be because people with lower education may not understand English language which is the main source of communication in media houses and health posts.

Very few respondents sleep under bed nets (13.2% for ITNs and 19.2% for other types). This observation is similar with the report from South western Nigeria<sup>10, 11</sup> and South Eastern Nigeria.<sup>15</sup> The degree of utilization of bed nets observed in this study is however, very low compared with the finding from The Gambia<sup>16</sup> where 86% of the population sleeps under Ordinary bed nets. In Zimbabwe, researchers found the rate of ITNs usage to be between 4.4% and 16%<sup>17</sup>, slightly higher than in Nigeria.

The main reason why clients who were aware of ITNs, were not sleeping under them was unavailability of the nets. This underscores the need for proper distribution of ITNs across the country, as similar observations have been made in Southern Nigeria.<sup>10, 11, 12</sup> Other reasons included inconvenience associated with the use of ITNs particularly during "hot weather". This finding is in keeping with reports from South Western Nigeria and the Kenya study.<sup>18</sup> "Hot weather" in the North western region has a protracted course from February to May, little wonder therefore that it constitutes a reason for non utilization of ITNs in this study. Seven percent of the respondents attributed the non use of ITNs to lack of beds in their homes. This is a pointer to poor understanding about the use of these nets as they could be tucked under a mat. Only 4.6% of the study clients were not using ITNs due to cost. This is at variance with the reports from Osogbo<sup>10</sup>, South Western Nigeria and Enugu, South Eastern Nigeria.<sup>12</sup> In the report from Enugu, 60% of those interviewed said they were not using ITNs because they could not afford to buy them, similar to 58.3% reported from Zimbabwe.<sup>18</sup> Similarly, cost was the main reason for not using ITNs in Ghana.<sup>8</sup> In conclusion, there was high awareness of ITNs among the pregnant women attending the antenatal clinic but very poor utilization largely due to unavailability. We recommend that for Nigeria to

achieve its millennium development goal on reducing the burden of malaria in pregnancy, ITNs should be made available in major markets across the country at affordable prices. In addition, proper education on the benefits of ITNs may increase its utilization.

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### References

1. Guyatt HL, Snow RW. The epidemiology and burden of plasmodium falciparum related anaemia among pregnant women in sub-Saharan Africa. *Am J Trop Med Hyg* 2001; 55 (1 Supp): 1-106.
2. Steketee RW, Wirima JJ, Slutsker L, Hymann Dland Breman JG. The problem of malaria and malaria control in pregnancy in sub-Saharan Africa. *Am J Trop Med Hyg* 1996; 55 (Supp 1): 2-7.
3. Multiple Indicator Cluster Survey, Nigeria 1999
4. Child survival, Protection and Development in Nigeria: Key Social Statistics, 1998. National Planning Commission Abuja and UNICEF Lagos.
5. Roll back malaria implementation. Revised 2004 desk top review of implementation in Sokoto state, Nigeria. 3:3.1-3.2
6. Rolling Back Malaria. *WHO Report* 1999; 49-63.
7. Sowunmi A, Salako LA, Oduola AMJ, Walker O, Akindele JA, Ogundahunsi OAT. Neuropsychiatric side effects of mefloquine in Africans. *Trans R Soc Trop med Hyg* 1993; 87: 462-463.
8. Binka FN, Adongo P. Acceptability and use of insecticides impregnated bed nets in Northern Ghana. *Trop Med Int Health*. 1997;2:499-507.
9. Viseman V, Hawley WA, Ter Kuile FO. The cost effectiveness of permethrin treated bed nets in an area of intense malaria transmission in Western Kenya. *Am J Trop Med Hyg*. 2003;68(Suppl):161-167.
10. Adeyemi SA, Adekanle DA, Akinola SE. Use prevalence of Insecticide- Treated Mosquito Bed Nets among pregnant population in Osogbo, Nigeria. *Niger Med Pract* 2007; 52: 29-32.
11. Abiona TC, Adasofunjo MO, Onayade AA, Afolabi OT, Asaolu SO. Awareness and utilization of insecticide treated bed nets in Ile-Ife, South-Western Nigeria. *Nig Med J* 2005; 46: 76-79.
12. Executive summary: NETMARK base line survey on Insecticide treated materials in Nigeria. 2000; 11-12
13. D'Alessandro U, Aikins MK. Nationwide survey of bed net use in rural Gambia. *Bulletin of the WHO* 1994; 72: 391-4.
14. NUwaha F. Factors influencing the use of bed nets in Mbarara municipality of Uganda. *Am J Trop Med Hyg* 2001; 65: 877-82.
15. Onwujekwe OE, Akpala CO, Ghasi S, Shu EN, Okonkwo PO. How do rural household perceive and prioritize malaria and mosquito nets? A case study in five communities in Nigeria. *Public Health* 2000; 114: 407-10.
16. Aikins MK, Pikering H, Alonzo PL. A malaria control trial using insecticide treated bed nets and targeted chemoprophylaxis in a rural area of The Gambia, West Africa. Perception of the causes of malaria and of its treatment and prevention in the study area. *Trans R Soc Trop Med Hyg* 1993;87: 25-30.
17. Tsuyuoka, Midzi SM, Dziva P, Makunike B. The acceptability of ITNS among community members in Zimbabwe. *Central African Journal of Medicine* 2002; 48: 87-91.
18. Alaii JA, Hawkey WA, Kolezak MS. Factors affecting use of permethrin treated bed nets during a randomized control trial in Western Kenya. *Am J Trop Med Hyg* 2003; 68:137-141.