Attitudes Toward Utilization Of Insecticide-Treated Bed Nets Among Pregnant Women And Care-Takers Of Under-Five

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Abstract:

This study determined the attitudes toward utilization of insecticide-treated bed nets among pregnant women and children under-five in the Ikwerre Local Government Area (LGA) of River State, Nigeria. Questionnaires were administered to 364 pregnant women and mothers/caretakers of under five children attending clinic session at selected health centre and hospitals in the LGA. Over eighty percent (80%) of the study population had one form of a mosquito net at home. Upon observation only 27.7% of the nets could be seen in homes; of which 11.1% were hung appropriately. The main source of acquisition of the insecticide-treated nets (ITNs) was from the antenatal clinic (42%). Knowledge of the use of mosquitoes bed nets (MBNs) as a preventive measure against malaria had no significant effect on actual use of the net by the study population It is suggested that government should increase its efforts at improving the awareness of the benefits of ITNs use and ensure free distribution accompanied by participatory approach.

Introduction:

Malaria causes significant morbidity and mortality amongst pregnant women and children under 5 in Africa (The World Bank, 2006). Among the approaches for control of this disease, the use of insecticide treated bed nets (ITN) has been accredited as a cost effective methods in prevention against malaria and has been found to significantly decrease morbidity and mortality amongst these groups of individuals (“KHN Morning Briefing,” 2009.). This study determined the attitudes toward utilization of insecticide-treated bed nets among pregnant women and care takers of under-five children in the Ikwerre Local Government Area(LGA) of River State, Nigeria. Results of this research will aid governmental and non-governmental organizations to put in place proper strategies to address/promote the use of ITNs and thus reduce morbidity and mortality due to malaria; particularly among vulnerable groups, such as children and pregnant women.

Hypothesis:

The attitudes towards use of ITNs among pregnant women and for caretakers of children under five is significantly dependent on the sociocultural factors.

Materials/Methods of the interventions:

The descriptive survey was disseminated to women who are pregnant and people who are caretakers of children less than five years in the Ikwere local Government Area that were attending clinic session at selected health centre at hospitals in the LGA. An observational checklist completed by healthcare providers was also used to collect information that will complement data gotten for the questionnaire.

Results Of Data Analysis

Demographic Characteristics Participants

The majority of respondents were pregnant women (42.9%) or mothers (39.6%). The ages of the respondents ranged from 13 to 73 years with mean age being 29 years (Table 1). With regard to the level of education, a majority of the respondents (37.1%) had a Higher National Diploma (HND) or a Bachelors degree (B.Sc), and a minority of 3.3% had no formal education. Seventy-two percent of the respondents were married. Respondents were involved in very many different activities including largely, civil service duty, private jobs like businesses, manual labour including tailoring and hair dressing, and others like homemakers and students.

Table 1: Demographics of Participants

Variable	Category	N	%
Age	10-20years	36	9.9
	21-30 years	204	56.7
	31-40 years	100	27.5
	above 40	24	6.6
	Mean=29.14(SD=9.01)		
Respondents characteristics	Pregnant mothers	156	42.9
	Father	60	16.5
	Mother	144	39.6
	Others	4	1.1
Educational qualification	No Formal education	12	3.3
	First School Leaving Certificate (FSLC)	52	14.3
	General Certificate of Education (GCE)	72	19.8
	National Certificate of Education (NCE)	93	25.5
	Higher National Diploma (HND) / Bachelors degree (B.sc	135	37.1
Marital status	Married	264	72.5
	Single	60	16.5
	Widow/Widower	14	3.8
	Divorced	24	6.6
	Separated	2	0.5
Primary Occupation	Civil servant	144	72.5
	Private sector	132	16.5
	Hand works(tailoring, Hair dressing, Beading etc)	24	3.8
	House wife	52	6.6
	Others	12	0.5
Number of people in household	1-3persons	156	42.9
	4-6persons	192	52.7
	7-9 persons	14	3.8
	10 and above	2	0.5
	Median score=5 persons per house hold		
Type of housing	One-room apartment	52	14.3
	Detached	180	49.5
	Bungalow	120	33.0
	Duplex	12	3.3

Ownership and source of acquisition of Mosquito Bed Nets (MBNs)

71.2% pregnant women owned ITNs, and for children under five, 81.2% of the caretakers affirmed that the children used an ITN (Figure 1). In total, (77.2%) participants had a net while 22.8% did not.

Sources of MBNs acquisitions

The main source of ITNs were from antenatal clinics (ANC)/other hospital clinics (42%). Other sources of ITNs acquisitions to the study population were during health campaigns (21.4%), retail markets (11.4%), schools (8.5%), NGOs (8.4%) and churches (7.1%).

Knowledge of use of ITNs as a preventive measure

The respondents had a good knowledge of the utilization of ITNs as a preventive measure. Only 3% of the population said the ITNs are a bad/very bad preventive measure (Figure 1).

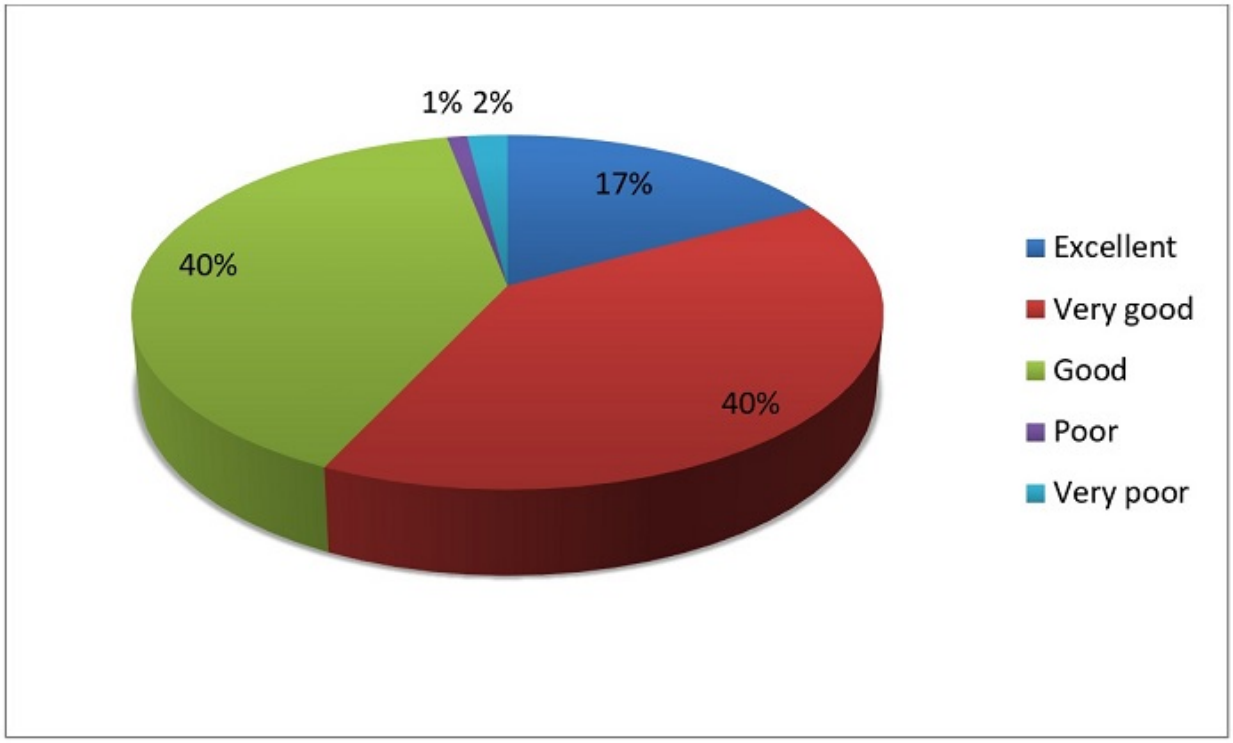

Figure 1: Notion of ITNS as a preventive measure against Malaria

The proportions of respondents having a good level of knowledge on malaria decreased with age. A total of 90% of respondents 41+ years had a good level of knowledge, and decreased to 86% for 21-40 years and 76% for 13-20 years old respondents. Eighty-three percent (83%) of respondent with zero or primary level educationhad a good level of knowledge on malaria as opposed to 91% of secondary, high school, or university-level respondents. This difference was statistically significant ($X^2 = 6.60$; $p = 0.010$). Equal proportions of females and males (88%) had a good knowledge on malaria.

Priority Household Members to sleep under MBNS

It was determined that 77.2% of the respondent were of the opinion that pregnant women and children under five

should be giving priority to sleep under ITNs (Figure 2). Approximately 11.5% of respondents said children less than are more vulnerable and should be giving priority, while 5.5% said the sick should be given the priority to sleep under the ITNs. Only 5.8% stated that only pregnant women should be given priority to sleep under an ITNS.

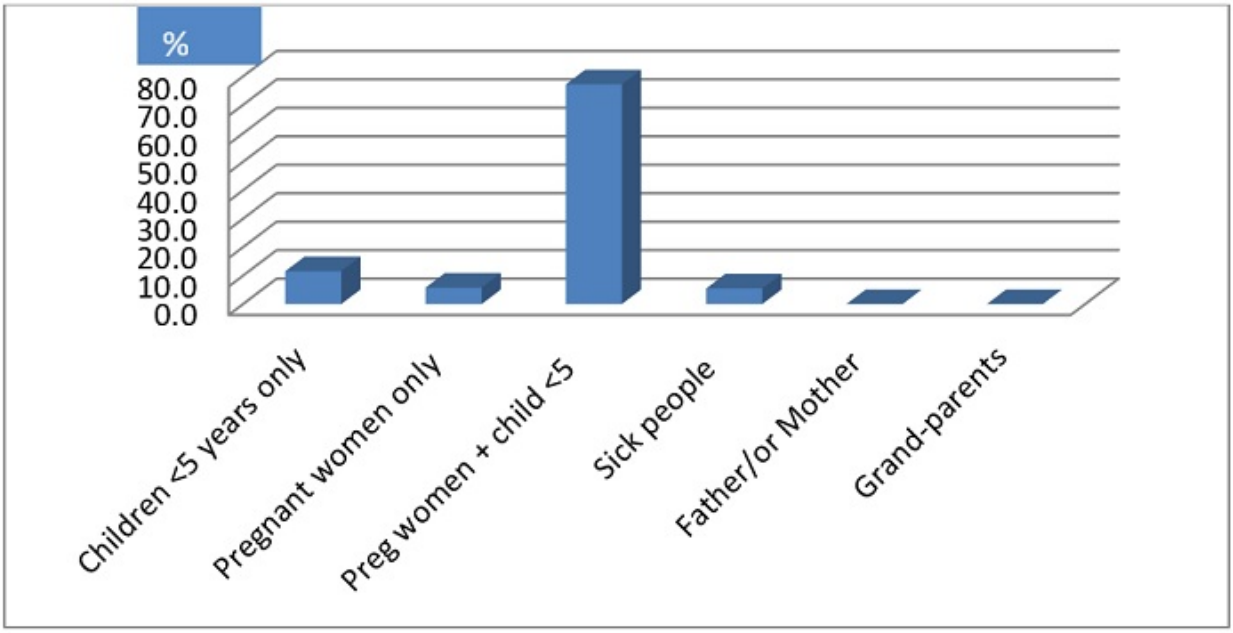

Figure 2: Priority Household Members to sleep under MBNS

Use of the ITN

Of the respondents,18.1% of respondents said they always made use of ITNs; of which 15.5% were pregnant women and 19.6% were children under five years of age. 13.2% of the population of study used the net solely in the rainy season. Fifty-eight percent of the study population had never made use of an ITNs while 10.7% used it occasionally (Table 2).

Table 2: Usage of ITN by pregnant woman/the child under five years
(N = number of respondents)

Response	Always	Rainy season	Dry season	Never	Occasionally	Total
Pregnant women	21 (15.5%)	17 (12.5%)	-	78 (57.8%)	19 (14.1%)	135 (100%)
Children<5 years	45 (19.6%)	31 (13.5%)	-	133(58.0%)	20 (8.7%)	229 (100%)
Frequency	66 (18.1%)	83 (13.2%)	-	211(58.0%)	39 (10.7%)	364 (100%)

None of the respondents used MBNs solely during the dry season. The weather was deemed too hot and the use of MBNs would increase the temperate, making it uncomfortable to sleep. Those who used bed nets only in the rainy season said mosquito density increases during this period and therefore transmission of malaria is higher. Another reason for preferring the rainy season was that instead of the discomfort from heat experienced in the dry season, they would benefit from the warmth provided by MBN during the cold nights.

Infuence of demographic factors on the utilization of mosquito bed nets among caretakers for children less than five

The only factor associated with ensuring children under five sleeping under mosquito bed nets was the age of respondent (Table 3). Interestingly, utilisation of ITNs decreased with age. The majority (59%) of respondents below 30 years made use of the bed nets. The female care takers were 8.6 times more likely to use the bed nets than the male caretakers. However, the correlation was not significant (p= 0.27, X^2=5.14). Fifty-seven percent of the urban population ensured that children made use of the ITNs. After adjusting for all other variables, children in urban settlements were two times more likely to sleep under ITNs compared to those of rural communities. Also there was no significant diference in the use of ITNs based on respondants educational background (P= 0.08, X^2=3.15).

Table 3: The utilization of mosquito bed nets among caretakers of children under 5

	Categories	Care takers of Children under five			
		N	n(%)	X^2	**p-value**
Relationship of respondents to under-five	Mother Father/Sister/Brother	144 64	72(50) 24(37.5)	5.71	0.08
Age	10-20	21	13(61.9)	2.14	0.14
	21-30 31-40	104 71	62(59.6) 20(28.2)		
	41+	12	1(8.3)		
Sex	Male Female	47 161	10(21.3) 86(53.4)	1.20	0.27
Marital status	Married Singles	163 45	56(34.4) 10(22.2)	5.49	0.02
Level of education	FSLC GCE NCE BSC	25 27 76 80	9(36) 9(33.3) 37(48.6) 41(50.6)	3.15	0.08
Profession	Civil servant Private sector Manual Labour House wife Others	87 76 11 29 5	41(41.1) 28(36.8) 7(63.6) 18(62.1) 1(20)	5.42	0.02
Settlement	Rural Urban	96 112	30(31.6) 64(57.1)	4.63	0.03

Influence of knowledge of ITNs as a preventive measure agains malaria on the utilization of mosquito bed nets among caretakers of children under five

Surprisingly, knowledge about ITNs as a preventive measure against malaria had no effect on its utilization. Only 47.1% of those who perceived it as a good preventive measure regularly used it for their children. However, this was statistically insignificant (X^2 = 9.52; p = 0.02).

Influence of demographic factors on the utilization of mosquito bed nets among pregnant women

Interestingly, only the respondents' level of education significantly affected ITNs usage among pregnant women. Use of ITNs increased with increased educational status. Those with no formal education showed a very low use rate of 8.3% (Table 4). The proportion of pregnant women who slept under ITN was slightly higher among single women (43.6%) as opposed to 32.6% among the married ($X^2 = 6.13$; $p = 0.01$). Pregnant housewives had the highest percentage (52.2%) of utilization of ITNs compared to pregnant women involved in out-of-home income generating activities. The proportion of pregnant women sleeping under MBN was highest in rural areas (38.6%).

Table 4: The utilization of mosquito bed nets among pregnant women

Demographic variable	Categories	Pregnant women			
		N	n(%)	X^2	p-value
Age	10-20	15	4(26.7)	1.09	0.29
	21-30	100	41(41)		
	31-40	29	9(31.0)		
	41+	12	3(25)		
Marital status	Married	101	33(32.6)	1.82	0.18
	Singles	55	24(43.6)		
Level of education	No Formal Education	12	1(8.3)	6.97	0.07
	FSLC	27	9(33.3)		
	WAEC/GCE	45	16(35.6)		
	OND/NCE	17	6(35.3)		
	HND./BSC	55	22(40)		
Profession	Civil servant	57	22(38.6)	2.05	0.09
	Private sector	56	14(25)		
	Hand works	13	5(38.5)		
	House wife	23	12(52.2)		
	Others	7	3(42.8)		
Settlement	Rural	106	41(38.6)	5.05	0.17
	Urban	50	14(28)		

Sociocultural factors that could affect ITNs use among respondents

The participants of the study agreed that some socioeconomic factors could influence sleeping under ITNs. In table 5, it can be seen that the participants' religious practices did not affect the use of the net. Some of the factors that negatively impacted the use of ITNs included: lack of accommodations/space, the belief that ITNs reduces airflow, increased heat when sleeping under the ITN, breathing difficulties, skin reaction to the chemical in the nets, and the inconvenience of tying the net up every day.

Table 5: Sociocultural Influence on ITN use

Socio cultural Factors	Yes	No	X^2	p value	DESCISION
Lack of accommodation	83	11	2.72	0.05	Reject null hypothesis
There are many people in my room	73	21	8.17	0.001	Reject null hypothesis
ITN reduces airflow	73	21	8.17	0.001	Reject null hypothesis
It is hotter to sleep under the ITN	62	31	0.30	0.30	Reject null hypothesis
Lack of proper ventilation	73	21	8.17	0.001	Reject null hypothesis
Breathing difficulties	62	31	0.013	1.0	Reject null hypothesis
My skin reacts to the chemical in the net	31	62	0.001	1.0	Reject null hypothesis
My religion does not permit it	-	94	0.30	0.3	Accept null hypothesis
My culture forbids sleeping under ITNs	-	94	3.15	0.05	accept null hypothesis
I doubt if ITN works	10	83	0.30	0.7	**Accept** null hypothesis
I lack the means to tie the net	31	62	0.001	1.0	Reject null hypothesis
Stress of tying the net up every day	52	42	0.302	0.7	Reject null hypothesis

Overall, providing the ITNs for free was a common reason that could compel 29.2% of the respondents who have heard about ITNs to use it more regularly. The majority of the population of study (43.1%) said they could use the net if the weather is cool. While only 7.6% of the population who have the net said hanging it was a hindrance to usage.

Household Observations

Observations made in the homes revealed the following: Of the 364 respondents, 101(27.7%) of homes actually utilized the ITNs. \Some respondents were resistant to showing the net to the researchers. Thirty-four (33.7%) of those hung over the bed had holes and tears (Figure 3). The ITNs were seen in different states of disrepair: 22(21.8%) were torn beyond effective-use, 2 (2%) were hung on the windows, 45(44.5%) were just folded and lying somewhere in the room (Figure 4a) and 20 ITNs were still sealed inside their packages (Figure 4b). Just 12 (11.8%) 0f the nets where hung properly without any fault detected. In many cases, the ITNs were being utilized for other purposes, including a drying rack for diapers (Figure 5). Most of the respondents' rooms had poor ventilation, increasing the temperature. Most of the respondents had fans /air conditioning systems in their houses, but could not make use of them because of the irregular electrical supply in the area. Some of them stated that if they had consistent electricity at night to use their fan/air-conditioner, it would have made it more comfortable to use the net; especially in the dry season when temperatures are at their highest.

Figure 3: A torn mosquito bed net
(Pictures provided from Atenchong, 2014)

Figure 4: a) Mosquito bed nets stored among clothes in wardrobe
b) MBN sealed in original packaging.
(Pictures provided from Atenchong, 2014)

Figure 5: ITNs and MBNs were often utilized for other purposes, including as a drying rack for diapers. (Pictures provided from Atenchong, 2014)

Discussion:

This study examined the attitudes toward utilization of insecticide-treated bed nets (ITNs) among pregnant women and children under five in the Ikwerre local Government area (LGA) of Nigeria. Seventy-one percent of pregnant women owned and ITNs and 81.2% of caretakers of children owned at least one ITN. Of the total respondent population, 42.1% of the pregnant women made use of the ITN and 41.8% of the caretakers of children under five made use of the ITNs. Of those who used the ITNs, only 18% of the total population reported regular use of the ITNs regularly. This indicates that although a majority of the population owned an ITN, a great proportion of the vulnerable populations of the Ikwerre LGA were not regularly protected against malaria with ITNs. This implies that the burden of malaria morbidity and mortality among the vulnerable populations of Ikwerre LGA may continue to exist. This can be confirmed by Wendy et al (2010), who stated that although there appears to be a decline in the burden of malaria incidence in Africa, reports from Nigeria indicates that there is a rise with a reported increased incidence of severe malaria.

ITNs ownership and use in Nigeria have always been reported to be lower than in many of the other countries in the sub-region (Amoran et al 2011; Afolabi et al 2009; Tobi West et al 2011, Oresanya et al 2008; Erhun et al 2005; Ehijie et al 2007). This may be related to the poor attitude and practice towards ITNs. This study identified that the attitude of pregnant women and care takers of children under five years of age to ITNs in this community was fair but upon observation, usage rate was generally very poor in spite of the good knowledge of the benefits of ITNs. Respondents viewed ITNs as a good preventive measure (80%) although less than 48.0% of them who agreed to the fact that it is a good preventive measure used the net. This agrees with Ouattara et al, *(*2011*).* 2 % of respondents used MBNS mainly in the rainy season this can be explained by the fact that the bed net provides warmth during the raining season. None of the respondent used the nets during the dry season which is in accordance with Nkessa (2012) who suggests that

utilization of ITNs will drop further during the dry season because of increased temperatures. Public health messages need to be intensified for a change of behaviour to increase the regular use of nets. The utilization of mosquito bed nets by the vulnerable populations in Ikwerre LGA was not associated with the knowledge of malaria and awareness of ITNs as a preventive measure against malaria. Other reports have also highlighted the fact that higher levels of education does not necessarily translate to use of appropriate interventions (Njoroge et al 2009). Utilization lagged far behind knowledge. This confirms the studies of **Opiyo** et al (2007), MNM (2007, 2011), and NMCP (2009). Some of the reasons for not putting the available MBNs into use included: lack of accommodation, lack of space due to number of people in the room, reduction of cooling airflow by ITNs, increased temperatures when using the ITN, lack of proper ventilation, breathing difficulties, skin irritation due to the netting, conflicts with cultural beliefs, the lack of space/resources to use the net, and the inconvenience of tying the net up every day. This reflects similar findings by IRESCO (2011), Astatkie and Feleke, (2007), Dagne et al (2008), and Ayalew et al (2007). These erroneous beliefs need to be dispelled in order to achieve greater levels of utilization. Also a lack of a consistent supply of electricity discouraged some participants to use the net especially during the dry season, as they had no energy source to poor their fans and air-conditions to make their environment cooler for use of the MBNs.

Implications of the Study:

This study identified a poor attitude and practice in use of ITNs among the pregnant women mainly because of lack of awareness. That many residents of Ikwere LGA own ITNs, given to them by the Governments (Federal, State and Local), Non-Governmental Organizations, individuals etc. Despite the level of awareness and the benefits of using ITNs, majority of the respondents could not use them. Attitude towards use is constrained by many factors, ranging from economic, and convenience, religious and cultural influences. Awareness needs to be spread to all community members. This can be achieved through concerted media campaign use of posters and other sensitization method. The federal government of Nigeria will therefore have to improve on provision of social amenities (electricity inclusive) all over the country. Health education in the clinics and infant welfare clinics should promote early and regular use of ITN in pregnancy.

Conclusions:

The level of knowledge on the transmission of malaria and the level of awareness of ITNs as a preventive measure against malaria was high among members in Ikwerre LGA The ownership of MBNs/ITNs among the vulnerable populations of Ikwerre LGA is high (87.2%). Despite the high level of knowledge on the benefit of use of ITNs, attitude towards use was only considered fair. Upon closer study, usage rate seemed lower 12 (8.4%) out of 101 observed nets. The low utilization of ITNs by children below five years old and pregnant women was due not to the lack of ITNs in households The challenges such as lack of accommodations and space, poor airflow and increased temperatures when using the ITN, ITN’s effectiveness, were important personal barriers which affected the respondents attitudes toward the utilization of available MBNs/ITNs.

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