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Full Length Research Paper

Attitude and practice of pregnant women to use of insecticide treated nets in South-West Nigeria

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Malaria remains the leading health problem in Sub-Saharan Africa. Pregnant women are the main adult group at risk of significant morbidity and mortality from this disease. A three pronged approach was advocated for its control amongst pregnant women, one of which was use of ITN as it has been found to offer protection against the morbidity arising from malaria in pregnancy. This study sets out to determine the attitude and practice of pregnant women in this area to this important protective tool. Semi-closed ended questionnaires were administered on pregnant women attending antenatal clinics at first contact over a period of three months. The questions were on their attitude and practice to bed nets in general and Insecticide Treated Nets (ITNs) in particular. Over ninety percent of the study population had one form of mosquito-net at home. However, bed net possession in the study population was 16.9% and 14.8% for Insecticide treated nets. Only 10.4% of those who had ITNs slept on them the night before. Giving it free was the main reason that could compel the respondents to use ITNs. More than two-thirds (66.1%) of them were however willing to buy the ITNs at an unspecified cost. Lack of access to information, non-availability, frequent power outages and hot weather were identified as reasons for non-possession and use of ITNs among the women. While education, marital status and awareness have significant relationship with attitude (p value=0.000), only awareness and marital status have significant relationship with practice. It is suggested that government should step up its efforts at improving the awareness of the benefits of ITNs use and make it more available and affordable for the populace. Subsidized cost as opposed to outright free distribution accompanied by participatory approach is likely to ensure sustainability of the process and likelihood that the nets will be retained and effectively used in the community. Early and regular use of ITNs in pregnancy should be a part of the Health education in the antenatal and infant welfare clinics.

Key words: Attitude, practice, insecticide treated nets, pregnant women, malaria in pregnancy.

INTRODUCTION

Malaria in Pregnancy (MiP) continues to be a source of concern especially in Sub-Saharan Africa. Close to 50 million pregnant women are exposed to Malaria each year contributing nearly 20% of low birth weight babies in endemic areas (Crawley et al., 2007), still births and maternal deaths (Desai et al., 2007). Pregnant women are the major adult risk group for malaria as pregnancy reduces the immunity against malaria (WHO publication). The scenario is even worse in areas of epidemics or low malaria transmission where adults have not acquired significant immunity against the infection. This is because acquisition of immunity to malaria is dependent on the duration of exposure and the intensity of transmission in the area (Smith et ., 1993). Pregnant women in these areas are 2-3 times more likely to develop severe malaria as their non-pregnant counterparts in the same area (WHO, 2004). In areas of stable malarial transmission however, pregnant women like other adults have acquired some immunity against the infection. Hence malaria manifestation in them may not go beyond fever, maternal anemia and poor pregnancy outcome (Sule-Odu etal., 2002, Caroline etal., 1997). McGready et al., 2012 revealed that Malaria especially in the first trimester is associated with an increased risk of miscarriage. Every year, between 75000 and 200000 infants die as a result of malaria in pregnancy in areas of stable malaria transmission (Steketee et al., 2001). In April 2000, African heads of government came to toge-

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ther and agreed that by 2005, 60% of pregnant women in the sub-region should have access to "an effective combination of community and personal protective measures.". A strategic framework of action by WHO (1993), adopted by most of the developing countries aimed at control of malaria in pregnancy through use of a three pronged approach; Intermittent Presumptive Treatment (IPT) , Insecticide Treated Nets and Case management of malarial illness and anaemia in Pregnancy.

Regular chemoprophylaxis was recommended for all pregnant women living in malaria endemic areas. Bishwarajanjan, 2009 suggested that this might not have met with too much success due to low compliance, thus necessitating the need for a more efficacious, sustainable and cost-effective control strategy.

Although mosquito nets were being used before the advent of Insecticide Treated Nets (ITNs), progressively, more success is being recorded with use of ITNs in reducing morbidity from malaria in pregnant women (Ammp-1, 1997, D'Alessandro et al 1996, Kuile et. al 2003). However the uptake of ITNs by pregnant women does not seem to have met with much success with a majority of people not even considering pregnant women as top priority groups to sleep under the ITNs (Zewdneh2011). In addition, uptake of this important malaria control strategy has been poor among the populace for which it was meant (Van Geetruydeen et al 2005).

Reviewing the changes in the burden of malaria in sub-Saharan Africa, Wendy Prudhomme et al 2010, revealed that the incidence of malaria in Ibadan,between 2000-2005was on the increase. Uptake of ITNs and Net ownership generally is low in Nigeria. Carol A Baume, (2008) had observed that reason for an increase in unused nets in Nigeria warrants further study.

Beside their clinical efficacy, the effectiveness of this intervention will depend on the attitude and practice of the people for whom the intervention is meant. Daddi Jima et al (2005) had observed that apparently useful interventions have been jettisoned because the policy makers have not tried to harmonize the local perception of the disease for which the intervention was meant. Runsewe-Abiodun et al.,(2012) in an earlier study identified that knowledge and awareness about the ITNs is low in pregnant women in the South Western part of Nigeria.

This study therefore aimed at determining the attitude and practice of a cohort of pregnant mothers to ITNs. It is expected that information from this study would assist in ensuring better uptake of ITNs in the country and other areas with similar socio-behavioural factors in the sub region as it focuses on behavioral patterns of the pregnant women towards Bed nets in general and ITNs in particular. The data was part of one collected for a KAP study on ITNs.

METHODOLOGY

Details of the methodology is as described elsewhere (Runsewe-Abiodun et al., 2012).

In this study, mosquito-nets refer to any form of net that is meant to keep away mosquito; window, door and bed. Bed-nets refer to all forms of mosquito-nets hung on beds, mats etc. ITNs refer to all forms of Insecticide Treated Nets.

Data extracted included information on socio-demographic pattern, practice and attitude of women to use of ITNs. From the available data, scores were generated for 11 questions related to attitude and eight to practice. One mark was awarded for every correct answer. Based on the number of correct answers, the average scores percent was generated for the attitude and another for the practice for each of the study subjects. A total score of less than 50% is rated as poor, up to 59% as fair, up to 75% as good and over 75% as very good for the Attitude and Practice.

Data entry, validation and analysis were done using the Epi-info-2006 software. Frequency tables were generated for all categorical variables and association between them were tested using the chi-square test. Level of significance was set at p value<0.05.

Multivariate regression analysis was done to determine the correlation and association between the variables and factors that affect attitude and practice of the pregnant women to ITNs respectively.

RESULTS

A total of 505 respondents were recruited into the study. Table 1 shows the characteristics of the study population. Majority of the respondents (81.4%) were between the ages of 21 and 35 years, less than half of them (38.0%) had some form of post-secondary school education and were mainly (88.3%) in the lower occupational cadre; junior civil servants/artisans. Over ninety percent of the respondents were married with 144 (28.5%) being Primi-gravidae and a majority in their second trimester. Number of children alive ranged between 0 and 5 in the respondents. Majority, (88.3%) of the respondents sleep on beds, with 2 people sleeping on the same bed in most of the cases. Age, education, parity, marital status and number of pregnancy were not significantly associated with number of people that sleep on a bed.

However, there is a significant relationship between marital status, how many sleep on a bed and where the respondents sleep (p value=0.0001, p value 0.0000 respectively).

More than three-quarts of the respondents (83.3%) had mosquito nets in their homes with the majority being either window or door nets. Although Mosquito-net possession improves with age as shown in Table 2, only its use is significantly associated with age (χ^2= 8.1704, p

Table 1. Characteristics of the study population.

VARIABLES	FREQUENCY*	
AGE (YEARS)	**TOTAL (n)**	
<20	031	(06.1)
21-35	411	(81.4)
36-45	063	(12.5)
Total (n)	**505**	**(100.0)**
EDUCATION		
University	052	(10.3)
Post-secondary	140	(27.7)
Secondary	186	(36.8)
Primary	116	(23.0)
Koranic/no formal	011	(02.2)
Total	**505**	**(100.0)**
OCCUPATION		
Senior civil servant	014	(02.8)
Middle civil servant	045	(08.9)
Junior civil servant/	154	(30.5)
Artisans/unemployed	246	(48.7)
Unemployed	046	(09.1)
Total	**505**	**(100.0)**
MARITAL STATUS		
Married	465	(92.1)
Single	029	(05.7)
Divorced	002	(00.4)
Cohabiting	009	(01.8)
Total	**505**	**(100.0)**
GESTATIONAL AGE (Months)		
<3months	047	(9.3)
4-6 months	351	(69.5)
7-9 months	107	(21.2)
Total	**505**	**(100.0)**
SLEEPING FURNITURE		
Bed	449	(88.9)
Couch	014	(2.8)
Foam	032	(6.3)
Mat	010	(2.0)
Total	**505**	**(100.0)**

*Figures in bracket are percentages of total “n”

value 0.02). Significantly more of the teenagers (38.7%) live in rooms without mosquito nets (p value 0.01, χ^2=14.78). Bed-net ownership in the study population was in eighty-five (16.8%) of the respondents. Less than half (36) of the respondents who own bed-nets regularly sleep under them. Sixty-eight (13.5%) of the bed-nets were ITNs.

Table 3 shows the pattern of use of bed-nets along with reasons for each of the preferences. In general, 369 (73.1%) of the respondents never slept under a bed net for the reasons shown in the table, the main ones being the fact that they either never thought of it or did not consider it important. Those who stopped did because they were probably only compelled to use bednets in boarding school. Majority of those who use Bednets regularly do so because they know it prevents malaria.

Only 10 (18.2%) of those who have bed-nets have ever treated their bed net with an insecticide. Respondents who have bed nets would wash their bed nets between weekly to once in a year. Majority (40%) would however wash twice in a year.

Table 4 reveals the Attitude of the respondents to ITNs. Although 68 of the women had ITNs, only 6 (8.8%) sleep regularly under the ITNs. The major reason for non-

Table 2. Posssession of mosquito-nets by age of study subjects.

Possession of Mosquito nets	**AGE IN YEARS**					**TOTAL**
	<20 years		21-35		36-50	
Yes	21	(67.7)	299 (72.7)		45 (71.4)	365
No	10	(32.2)	112	(27.3)	18 (28.6)	140
***TOTAL**	**31**	**(100.0)**	**411 (100.0)**		**63 (100.0)**	**505**

χ^2 = 0.6150 df 5 P value =0.987

Figures in bracket are percentages of *Total

Table 3. The pattern and reasons on use of bed nets among respondents.

Variable	**Frequency**	**Percentage**
Ever slept		
under a bed-net		
Never	369	73.1
Used to	058	11.5
Occasionally	042	8.3
Regularly	036	7.1
Total	**505**	**100.0**
Why have you never/occasionally		
slept under a bed-net?	**Frequency (n=411)**	**Percent**
Never thought of it	172	41.8
Do not consider it important	132	32.1
It isn't our culture	033	8.0
It is too hot	023	5.6
Others	021	5.1
Cannot afford it	014	3.4
Don't know where to get it	012	2.9
Cannot tuck it under mat	003	0.7
Problem with permanent space	001	0.2
Total (n)	**411**	**100.0**
Reasons for stopping use of		
a bed-net	Frequency (n=42)	Percent
Only used it in school as a child	022	52.4
It is too hot	005	12.0
Used it in hospital only	004	9.6
Do not consider it important	002	4.8
Cannot afford it	002	4.8
Others	00 2	4.8
Multiple answers	002	4.8
Not our culture	001	2.4
Never thought of it	001	2.4
May be dangerous for children to chew on	001	2.4
Total (n)	**042**	**100.0**
Reasons for regular use		
of bed-net	Frequency (n=36)	
Prevents malaria	026	72.2
Habit formed from school	006	16.7
Husband insists	004	11.1
Total (n)	**036**	**100.0**

Table 4. Attitude to ITN use by Respondents.

VARIABLES	*FREQUENCY* *PERCENTAGE	
DO YOU OWN ITN	***Frequency (n=505)***	***Percentage***
Yes	68	14.8
No	437	85.2
Total	**505**	**100**
REASONS FOR NOT HAVING ITN	***Frequency (n=437)***	***Percentage***
Never heard about it	207	47.4
Don't know where to get one	142	32.5
Don't think I need it	38	8.7
Don't know the importance	25	5.7
It is too expensive	14	3.2
No response	11	2.5
Total	**437**	**100.0**
DID YOU SLEEP UNDER AN ITN THE NIGHT BEFORE	***Frequency (n=68)***	***Percentage***
Yes	6	8.8
No	62	91.2
Total	**68**	**100.0**
+***REASONS FOR NOT SLEEPING UNDER ITN***	***Frequency (n=62)***	***Percentage***
Heat-No light	30	51.6
Only used occasionally	15	24.2
No time-too busy	10	16.1
Does not protect against malaria	9	14.5
Mosquitoes still enter them anyway	8	12.9
Total	**62**	**100.0**
WHAT CONDITION WILL MAKE YOU USE ITN More regularly	***Frequency (n=68))***	***Percentage***
If given free of charge	35	51.5
If weather is cool enough	14	20.6
If government make it compulsory	06	8.8
Not applicable	06	8.8
If proven to be useful	05	7.3
If cheaper than other products serving same purpose	02	2.9
Total	**68**	**100.0%**

n=number of respondents, *= percentage of Total, +=multiple response.

ownership of ITNs was a lack of awareness (47.4%). Other reasons given were not knowing where to procure one in 32.5% of cases and 38 (8.7%) of the respondents did not think that they need it. Heat and lack of electricity were major deterrent to regular use of ITNs among the respondent. Whilst 51.7% of the respondents realized that ITNs will prevent them and their babies from developing Malaria, only 71(14.1%) of them mentioned ITN spontaneously as a useful tool in the prevention of malaria, environmental management and use of "agbo", native concoction were mentioned by 55.9% and 3.6% respectively.

Out of the 68 respondents (13.5%) who claimed to own ITNs, more than a half (45) had not commenced using the ITNs as at the time of the study. Amongst the remaining twenty-three that indicated the time that they started using the ITNs, more than a half commenced in the second trimester of pregnancy. Education did not

Table 5. Reasons for Non-Possession of ITN by Educational level of Respondents.

EDUCATIONAL LEVEL OF RESPONDNETS	NUMBER OF RESPONDENTS WITH REASONS FOR NOT POSSESSING ITN														
	Never heard ofit		Don't know where to get it		Too Expensive		Not Applicable		Don't think I need it		Don't know its importance		No response		TOTAL n	
UNIVERSITY	6	(11.5)	14	(26.9)	3	(5.7)	10	(19.2)	11	(21.1)	4	(7.7)	4	(7.7)	52	(100.0)
POST SEC. SECONDARY	39	(27.9)	50	(35.7)	8	(5.7)	18	(12.9)	14	(10.0)	7	(5.0)	4	(2.9)	140	(100.0)
PRIMARY	75	(40.3)	60	(32.3)	4	(2.1)	24	(12.9)			9	(4.8)	5	(2.7)	7	(3.8) 186 (100.0)
NO FORMAL EDUCATION	72	(60.3)	18	(15.5)	1	(0.9)	13	(11.2)	4	(3.4)	9	(7.8)	1	(0.9)	116	(100.0)
TOTAL	8	(76.9)	0	(0.0)	0	(0.0)	3	(23.1)	0	(0.0)	0	(0.0)	0	(0.0)	11	(100.0)
(100.0)	200	(39.6)	142	(28.1)	16	(3.2)	68	(13.5)			38	(7.5)	25	(5.0)	16	(3.2) 505

X^2=110.2, df=35. p value=0.0000
Figures in bracket are percentages of the total (n)

Table 6. Attitude and practice scores of the study subjects.

ATTITUDE SCORE	**FREQUENCY**	**PERCENTAGE**
POOR	354	70.0
FAIR	81	16.1
GOOD	65	12.9
V. GOOD	5	1.0
TOTAL	**505**	**100.0**

PRACTICE SCORE	**FREQUENCY**	**PERCENTAGE**
POOR	479	94.9
FAIR	11	2.2
GOOD	14	2.8
V. GOOD	1	0.2%
TOTAL	**505**	**100.0%**

significantly affect ownership of ITNs (P value 0.5, χ^2= 21.09).

As shown in Table 5, of those who felt that they do not need ITNs, a significant number twenty-five (65.8%) had education beyond secondary level (p level=,0.000). A few of the respondents (21.2%) felt there were enough awareness in the community and fewer still (11.3%) felt it was readily available. Awareness of ITNs in this study population was 48.9%.

Giving ITN free was a reason that could compel 55.5% of the respondents who have heard about ITNs to use it more regularly. Although, age and education were significantly related to reasons why the respondents' do not have ITNs (p value=0.02, χ^2=22.03), age was not associated with the desire to have ITNs free (χ^2=3.04, p value 0.09).

Episodes of fever in the respondents ranged between none and five. Majority had had no episodes of fever (50.3%) in this pregnancy. There is no statistically significant association between onset of use of ITNs, parity and episodes of fever in this study (χ^2=10.34, p value=0.8, χ^2=38.4, p value= 0.32. respectively).

The attitude and practice scores are as indicated in Table 6 Generally the attituce and practice were poor in more than two thirds and ninety percent of the study population respectively Multiple regression analysis showed that net ownership has strong positive correlation with age, knowledge of benefit, awareness and occupation r=0.97,

however there is a negative correlation between education and net ownership.

Multivariate analysis shows that marital status, age, occupation, gestational age are positive predictive factors on attitude and practice whereas there is a negative correlation with education and parity r=-0.27 and -0.58 respectively. There is however a significant relationship between education and attitude and practice (P value 0.00, 0.03 respectively)

Though education seems to be significantly related to attitude it is not an important determinant of attitude.

DISCUSSION

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. (Wendy Prudhomme O'Meara et al,.2010).

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 to ITNs. This study identified that the attitude and practice of pregnant women to ITNs in this community was generally very poor in spite of fairly good knowledge of the benefits of ITNs. Other reports have also highlighted the fact that high level of knowledge does not necessarily translate to use of appropriate interventions (Njoroge et al 2009). It is interesting to note that even in this study where a majority realize that ITNs protect them and their babies from developing malaria, a dismal 14.1% mentioned it spontaneously as a means of preventing malaria. Runsewe-Abiodun et al had identified that majority of the pregnant women source their information from the hospital. It is possible that this aspect of the information was not given to them in the hospital.

Whilst the study population will not sleep under the ITN because they have not heard about it, the only factor that had a strong correlation with use is what type of furniture the mothers use for sleeping. The Abuja survey of 2007 reported that education and wealth index were positive predictors of net ownership and utilization.

In this study, almost 85% of those who were aware even when they know the benefit still did not use ITNs mainly due to the prevailing environment. Awareness was however significantly related to use (p value 0.02). There was also a positive correlation between awareness and use r=0.88.

It has been observed that poor knowledge of preventive measures against malaria among others may be contributory to the poor uptake and use of ITNs (Ehijie et al 2007). We found an uptake of ITN of 13.5% and a use of 8.8% amongst the pregnant women who reported ownership of ITNs. This was much lower than figures from other countries in Africa though similar to the one reported by Ehijie et al 2007. Erhun et al 2005 reporting a similar study among the same ethnic group however recorded a much lower use suggesting an upward trend in ITN use among those who have them that only needs to be further strengthened to achieve the optimal target.

A major reason for the poor uptake in this study was mainly a result of lack of awareness and information on place of access and apparent dearth of knowledge even in those who are aware.

A linear regression analysis indicated that there is a strong negative correlation between awareness and reasons for non- possession. This finding has been highlighted in another paper by Runsewe-Abiodun et al (2012).

Although Age and Education were significantly related to reasons why non-ownership, there was a positive correlation between age and non- ownership and a negative correlation between education and non - ownership. This may suggest that education is an important factor in ownership. As seen in table 5, It is interesting that a majority (65.8%) of those who felt that they didn't need ITNs were in the upper educational level.

Also, less than half of those who mentioned ITNs as a means of preventing malaria had education above the secondary school level. Attitude and Practice scores seem to improve with age and education.

Higher educational level does not seem to promote ownership of ITNs. This may be because the educated women wait to see demonstrable evidence of the usefulness of ITNs as opposed to the less educated who will own but may not necessarily use the ITNs. Other studies have also identified this trend. Ehijie et al (2007), observed that good knowledge is associated with poor attitude and practice probably because of a general disbelief in the effectiveness and use of ITNs, A Kenya study (Njoroge et al (2007) too identified that education is not associated with good practice and attitude. Belay et al (2008) also identified that 27% of the respondents in their study have the perception that nets couldn't prevent malaria

In this study, mothers who own ITNs tend to start using it very late in pregnancy. This may have contributed to the reason why there was no observable difference in incidence of fever in those who use and those who don't use ITNs in this study.

Similar to other studies (Njoroge et al (2007), low parity improves practice. It is expected that the low parity will translate to fewer people in the household, better wealth index and possibility of two people to a bed which this study finds favours use of the bednet.

Pregnant mothers in this study have definite challenges accessing information about ITNs, place of purchase and its availability. This is interesting in spite of the massive distribution of ITNs in the country. Though a good number of the mothers were willing to use ITNs, cost was

not considered in this study. Majority of the mothers volunteered that they will use more regularly if given free however.

Weather has been highlighted as a key reason that influenced ITNs use (Njoroge et al 2007), in this study, hot weather and lack of electricity appeared to be a major hindrance to use of ITNs in mothers that own them.

The Long Lasting Insecticide Treated Net (LLITN) that is currently in circulation in the country will continue to be relevant as majority of the respondents will wash their nets every 6 months.

It might be necessary to find a mid-point between mosquitoes "gaining entry anyway" and heat so that more people can use the nets. The Federal Government will need to ensure continuous power supply in the country as malaria transmission though worse during the rainy, humid season as a result of stagnation of water are also transmitted during the dry, hot seasons when it may be impracticable to sleep under the net. On the other hand, efforts might need to be expedited on the need to have insecticide treated nets in some other forms aside from bed nets e.g. window nets, door blinds, etc

It might be expedient to advocate that every family has at least 2 nets per household seeing that most of the women will share their beds with only one other person (most likely, the husband). This may leave the children vulnerable to mosquito bites.

This study will seem to suggest that use of ITNs is not protective against malaria illness in pregnant women. This lack of difference may be as a result of late onset of use and lack of regular use of ITN in those who have them. Evidence from other countries had shown that it is possible to increase ITNs use among vulnerable groups through targeted efforts. (Safari et al 2010)

A study in Mozambique has shown that participatory process as opposed to theatre approach may be more beneficial in ensuring that nets are kept and used for a much longer time. (S Quazi et al 2007)

CONCLUSION

This study identified a poor attitude and practice in use of ITNs among the pregnant women mainly because of lack of awareness, inability to access correct information on use of ITNs, availablility and an impaired social amenity-electricity. The attitude and practice of the educated mothers will be influenced by evidence of its usefullness. This can be achieved through concerted media campaign especially electronic. In addition, the campaign will have to stress places where the ITNs can be accessed. A logo can be used to indicate facilities where ITNs can be accessed.

The Federal Government will also 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

Limitation of study

1. Use was not ascertained and the confirmation of use were dependent on the respondents recalls
2. Cost which may be a barrier to access was not assayed in this study.

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