Texila International Journal of Nursing
ISSN: 2520-3126
DOI: 10.21522/TIJNR.2015.06.02.Art004

Perception and Utilization Status of Insecticide Treated Net among Pregnant Women Attending Antenatal Care in University of Calabar Teaching Hospital, Calabar (UCTH)

Oyira, Emilia James[1]*, Easter Chukwudi Osuchukwu[1], Margaret Mombel Opiah[1], Emeh, Augusta Nkechi[2], Awo Chinedu Godwin[2]
[1]*Department of Nursing Science, University of Calabar, Calabar*
[2]*Department of Nursing Science, Ebonyi State University*
**Corresponding Author: emioyira@yahoo.com[1]*

Abstract

Insecticide Treated Net (ITN) is use for the prevention of mosquito bites causing malaria. The study sought to investigate the perception and utilization of insecticide treated net among pregnant women attending antenatal care in University of Calabar Teaching Hospital. To successfully carry out the study, research questions and hypothesis were formulated to guide the study. Literature was reviewed based on the research variables. The research instrument used in data collection was a questionnaire designed by the researchers which was administered on 150 pregnant women in UCTH who formed the sample for the study. Their responses were analyzed using descriptive statistics of frequencies and percentages and contingency chi-square. The following results were obtained. Result of findings as presented in table 4 indicate that 93(62%) of the respondents said they have heard about ITN before while 57(38%) said they have not. 90(60%) said they have seen it while 60(40%) said they have not. 96(64%) said ITN is a major tool for prevention of malaria while 54(36%) said it was not. 98(65.3%) said ITN has health benefits while 52(34.7%) said it does not. 108(72%) said the reason for treating the nets with insecticide is to irritate and repel mosquitoes while 42(28%) said it was not. It was observed that in spite of their knowledge of ITN, pregnant women in UCTH did not utilize insecticide treated bed nets. It was recommended that ministry of health should intensify enlightenment campaign on the utilization of ITN.

Keywords: *Perception, Utilization, Insecticide treated net, pregnant women, antenatal care, UCTH.*

Introduction

Malaria is a global health priority (WHO, 2012). At present, about 99 countries in the world are considered malarious, almost half of which are in Sub-Saharan Africa. Approximately 3 billion of the world's populations are at risk of malaria infection. Approximately 80% of malaria cases and 90% of deaths resulting from malaria are estimated to occur in WHO African Region, with children under five years of age and pregnant women most severely affected. Malaria directly accounts for about 11% of all maternal deaths, and indirectly contributes to additional 11% of maternal deaths mainly by being a leading cause of anaemia in pregnancy (Federal Ministry of Health, 2009).

Plasmodium falciparum is the most common malaria species in Africa responsible for the burden of malaria infection in pregnancy. During pregnancy P. falciparum infection is estimated to cause as many as 10,000 maternal deaths each year, 8% to 14% of all low weight babies, and 3% to 8% of all infant deaths. (WHO/UNICEF; 2006, WHO, 2010 and Federal Ministry of Health, 2008) Malaria infection during pregnancy results in enormous adverse effects on both mother and fetus ranging from maternal anemia, fetal loss, premature delivery, intrauterine growth retardation, and delivery of low birth weight infants (<2.5kg or 5.5 pounds) For the prevention and control of malaria during pregnancy in Sub-Saharan Africa. Besides, if the pregnant mothers will take cognizance of their environment by keeping it tidy such as clearing the bushes around, draining stagnant water and burying cans, the environment will be free from mosquitos' bites thereby preventing malaria.

The WHO currently recommends a three-pronged approach to preventing the adverse

effects of malaria in pregnancy in areas with high levels of transmission of Plasmodium falciparum malaria.

They are: use of insecticide- treated bed net (ITN); intermittent preventive treatment (IPT) with anti-malarial drugs and febrile malaria case management. This has been adopted by Nigeria. (WHO, 2007 & Federal Ministry of Health, 2008). Following the Abuja malaria summit in 2000, the Nigerian government set a midterm target to have 65% of the population at risk, pregnant women and children under five years sleep under insecticide treated nets (ITN) by the end of 2005. This led to the initiation of the ITN massive promotion and awareness campaign (IMPAC) in 2005 with the aim of promoting awareness and improving availability and utilization of ITNs through distribution of nets to pregnant women attending antenatal clinics and mothers of children under five years old who have completed their routine immunization free of charge. Similarly, the Cross-River State government in their little ability have made provision for the distribution of ITN to the pregnant women during antenatal clinics but yet the still complain of complications such as heat, rashes especially when there is no power supply

This study intends to ascertain the perceptions and utilization of pregnant women towards ITN as this is a determining factor of their usage. Evidence based information gotten from this study which will give more insight into the reasons for poor ITNs usage among pregnant women.

Need for the study

The need for this study is to avail the pregnant women and children of free ITN on the Roll Back Malaria

It also of relevance to help the healthcare delivery system create awareness on the utilization of the Insecticide Treated Nets among Pregnant Women in University of Calabar Teaching Hospital.

The extent to which people are aware and acquire nets is not understood clearly. Interactions and rumors of not hanging nets at all, hanging nets in a wrong manner and place, deserve close examination. The knowledge and perception of the population on the role of ITNs in the prevention of malaria is still another issue. This triggered my curiosity to investigate why the pregnant women do not have or utilize insecticide treated nets. Thus, this study tries to describe the status of ITN perception and utilization among pregnant women in University of Calabar Teaching Hopsital, Calabar.

Literature Review

Perception of ITN among pregnant women

This study shows that perceived derivable benefits from ITN among respondents. Majority (84.3%) of the respondents perceived that ITN prevented malaria, 71.8% said that it prevents mosquito bites, 27.5% said it prevents bites from other insects, while 4.6% said it created warmth. It also shows that the perceived derivable harm from ITN use among respondents. Majority (78.0%) said it brings about insufficient air, 49.1% said that it causes heat, 33.9% said it causes difficulty in getting up at night, 10.2% said mosquitoes can still pass through and bite, 8.5% said the chemicals used are harmful, 5.1% said it had a bad smell and 1.7% said it caused cough. Only 26.2% of the respondents owned a net. Of which 72.5% were long lasting ITN and 27.5 % short acting ITN. Only 21.2% of the respondents used the net every night while 58.8% used it occasionally and 20.0% rarely used it (Ogbeide, Aruoture, & Wagbatsoma, 2014). The respondents show the reasons for non-ownership of ITN.

A higher proportion (43.1%) of the respondents said that the ITN was not readily available, 11.6% said their spouse did not approve of its use, 10.7% did not like it, 9.3% said it was too expensive, 8.4 claimed that poor ventilation prevents its usage, 5.8% said it caused itching and sneezing, 2.7% said theirs was old and has been thrown away and 1.8% said it was not easily accessible geographically. It also shows the association between educational status of respondents and awareness of ITN. Majority of the respondents with higher educational level were aware of ITN and this association was found to be statistically significant ($p < 0.005$). Association between perceived benefit of ITN use and ownership of an ITN was also statistically significant ($p< 0.005$) as majority (88.9%) of the respondents who did not own a net perceived the ITN as not being beneficial (Ogbeide et al, 2014).

Knowledge of ITN both in Nigeria and in Diaspora

All insecticide treated nets act as a physical barrier, preventing access by vector mosquitoes

and thus providing personal protection against malaria to the individual(s) using the net. Pyrethroid insecticide, which are used to treat nets have an excito-repellent effect that adds a chemical barrier to the physical one, further reducing human-vector contact and increasing the protective efficacy of the mosquito nets. Most commonly, the insecticide kills the malaria vectors that come to contact with the ITN. Obin & Alex Hart (2011) in the study on ITN ownership and utilization in Rivers State, before a state-wide net distribution campaign, the results revealed that of 552(68.1%) out of 811 household heads that were interviewed, only 245(335.5%) of them owned long-lasting insecticidal nets (LLINs), while the rest 169(30.6%) were in possession of untreated/ordinary nets and re-treatable nets were 138(25%) respectively. Of those with re-treatable nets, only 42(30.4%) had re-treated than in the past six months, while the rest showed their inability to re-treat their nets on lack of skills to do so (39.3%) or did not know where to get their treatment kits (31%).

According to Amoran, Senbanjo & Asagwara (2011), out of a total of 1,500 youth "Corpers" in NYSC camp in Edo State, 656 youth Corp members were interviewed, all the youth "Corpers" (100%) have heard about ITN before, but 89.6% have seen it before. Most (38.4%) of the youths had information about ITN majorly from the mass media, 10.8% had it from friends and relatives, 8.1% from health facilities, 7.2% from schools and 35.5% from other sources such as library, religious groups etc. Majority (82.6%) of ITN ever users believe that it is a very effective means of malaria prevention.

Edelu, Ikefuna, Emodi & Adimora (2010) in another study to determine the proportion of mothers using ITN for their children and reason for nonuse on consecutive mothers attending the children's outpatient clinic in UNTH, it was found that 184(80%) out of 230 mothers interviewed were knowledgeable about ITNs.

Akpan (2007) in his study on the popularity of ITN as a preventive method of malaria control among residents of Calabar Municipality, Cross River State, Nigeria, the results revealed that among 612 residents in Calabar Municipality, majority (88.9%) i.e. 554:612 claimed they had good knowledge of ITN as a preventive tool for mosquito bite.

In another study conducted by Abebe et al (2008) on the assessment of distribution, knowledge and utilization of ITN in selected malaria prone area in Ethiopia, the results on knowledge about ITN revealed that among a total number of 3131 households that were visited during the course of the one-year study. Overall, of 60.1% of the respondents had good knowledge about nets, but varied from 22.1% in Afar to 79.9% in Dire Dawa. The most importance source of information was health workers (59.1%). Health workers were the leading source of information in all the study districts except Somali, Gambella and Afar where radio took primary role. NGOs played the highest role (27.8%) in delivering education about ITNs in Afar. Radio was the next most important source of awareness (34.3%). Kebele or peasant association representative, schools, posters, newspapers and others played minor role in providing information in most regions. Most respondents (91.1%) agreed on general use of ITN, 60% to prevent mosquito bite (32.9% in Somali to 80.8% in Afar) and 39 to prevent the disease (17% in Afar and 67.1% in Somali).

Insecticide treated nets offer essential protection against mosquitoes and significantly reduce morbidity and mortality due to malaria, irrespective of this utilization remains very low in many malaria endemic areas (WHO/UNICEF, 2006). Even though ITN have gained popularity, the effectiveness of ITN against malaria will be impaired without their proper use. Many individuals possess one or two ITN but utilization at night becomes a major problem. Review of literature here shall focus on studies on the amount or proportion of global utilization of ITN.

Musa et al (2009) in their study on the awareness and use of ITNs among women attending ante-natal clinic in a northern state in Nigeria, out of 455 pregnant women, about one-third 164(36%) of the respondents were aware of ITN in malaria prevention, but less than a third 124 (27%) had ever used ITN and only 88(19%) were currently using it, while 104(23%) of the total respondents had a member of their household using ITN.

Akpan (2007) also has it that 554(88.9%) out of 612 who claimed they are aware of the use of ITN for preventing mosquito bites, only 13.2% of the respondent (72:544) owned ITNs at the time of filling the questionnaire. In another study by Ng'ang'a, Jayasinghe, Kimamani..Mutero (2009) on bed net use and associated factors in a rice farming community in central Kenya, of the total

population studied (1,776) seventy five percent (75%) of the households reported to own at least one bed net but only 46.7% reported to have slept under the net in the previous night. Among the reported nets, 62% were ITN and the remaining 38% were untreated.

Research Methods

Research design

A descriptive designed study was chosen to investigate the perception and utilization of insecticide treated net by pregnant women attending antenatal care at UCTH, Calabar.

Research setting

This study was carried out in University of Calabar Teaching Hospital, Calabar (UCTH). University of Calabar Teaching Hospital is a tertiary health institution, founded in 1979; and is located at the south-east of Calabar. The hospital is made of two (2) annexes; permanent site, and comprehensive health care Okoyong. The hospital renders the following services, clinical, man power development (teaching of nursing, paramedical and medical students) and research.

The University of Calabar Teaching Hospital is currently made up of 600 beds which are distributed among the two (2) annexes and has staff strength of about 550 nurses.

Research population

The target population was the entire pregnant women in the University of Calabar Teaching Hospital, Calabar who registered with antenatal clinic and those admitted in the ward.

Accessible population

Accessible population was drawn from pregnant women who were in the UCTH during the course of the study.

Sample and sampling technique

A simple random sampling method of balloting with replacement was used to select 150 pregnant women in the UCTH. A ballot paper indicating "Yes" and "No" was displayed on each of the study days. The pregnant women, who were present on the study days and who picked "Yes" were used for this study.

Instrument for data collection

The instrument used for data collection in this study was a questionnaire. The questionnaire was divided into four (4) sections. Section A sought to obtain information from the respondents on their socio-demographic data. Section B was meant to determine perception, Section C was meant to determine the level of knowledge and Section D was for factors influencing utilization of ITN in UCTH.

Validity of instrument

Before the instrument was used, it went through series of steps for validation. The items were first examined by the researcher for face validation. It was then shown to a lecturer who made some necessary corrections. Some items were dropped while others were added. The final draft was then shown to my supervisor who inspected it for face validity. The final copy was thereafter approved by the supervisor.

Reliability of the instrument

In order to test the reliability of the instrument, a trial test study was conducted in the study area. Here, the questionnaire was administered to ten (10) respondents and after one week, the same questionnaire was again administered on the same persons and their responses were analyzed using chi-square analysis.

Table 1. Test-retest reliability estimates of variables on the perception and utilization of insecticide treated net by pregnant women attending antenatal care at UCTH

Independent variables	No. of items	Administration	$\bar{X}$	SD	rs
Perception of pregnant women towards ITN	5	1st 2nd	13.4 12.6	2.63 2.81	0.67
Knowledge of pregnant women towards ITN	5	1st 2nd	12.93 12.86	2.48 2.65	0.77
Factors influencing ITN utilization	5	1st 2nd	12.49 12.52	2.84 2.96	0.65

Ethical consideration

Letter of introduction was collected from the Cross-River State Ethical Committee which introduced the researcher to the area of the study which permitted the researcher to proceed with the collection of the data for the study. The pregnant women were well informed by the researcher that anonymity and confidentiality would be upheld in the questionnaire.

Procedure for data analysis

Data was analyzed using descriptive statistics which uses frequencies, percentages and chi-square while inferential statistics was tested with independent t-test analysis.

Results

Socio-demographic data

The socio-demographic data of the respondents is presented as presented in table 2.

Table 2. Socio-demographic data of respondents

Variables	Frequency	Percentage
Age:		
15-20 years	21	14
21-25 years	46	30.7
26-30 years	41	27.3
31-35 years	24	16
36-40 years	18	12
	150	**100**
Marital status:		
Single	98	65.3
Married	33	22
Divorced	12	8
Widowed	7	4.7
	150	**100**
Tribe:		
Igbo	36	24
Hausa	10	6.7
Yoruba	21	14
Ibibio	34	22.7
Efik	26	17.3
Others	23	15.3
	150	100
Religion:		
Christian	124	82.7%
Muslim	14	9.3%
Others	12	8%

The socio-demographic data of respondents indicate that 21(14%) of the respondents were aged 15-20 years, 46(30.7%) were 21-25 years, 41(27.3%) were 26-30 years, 24(16%) were 31-35 years, 18(12%) were 36-40 years old. 98(65.3%) were single, 33(22%) were married, 12(8%) were divorced while 7(4.7%) were widows. Their tribes showed that 36(24%) were Igbo, 10(6.7%) were Hausa, 21(14%) were Yoruba, 34(22.7%) were Ibibios, 26(17.3%) were Christians, 14(9.3%) belonged to other tribes. 124(82.7%) were Christians, 14(9.3%) were Muslim while 12(8%) belonged to other religions.

Research question 1

What is the level of perception do pregnant women attending antenatal care in UCTH having about ITN?

Table 3. Assessing Perception of ITN among Pregnant Women

Statement	Yes	No
I feel heat while sleeping on the ITN	90 (60)	60 (40)
I have rashes after sleeping on ITN?	118 (78.7)	32 (21.3)
I feel comfortable when sleeping on the ITN?	42 (28)	108 (72)
I sweat when sleeping on the ITN?	128 (85.3)	22 (14.7)
Mosquitoes bite when sleeping on the ITN?	88 (58.7)	62 (41.3)

Note: Numbers parentheses are percentages.

Results of findings as presented in table 3 indicate that 90(60) of the total respondents said they feel heat while using ITN while 60(40) said they do not; 118(78.7) said they have rashes after sleeping on the ITN while 32(21.3) said they do not; 42(28) said they feel comfortable when sleeping on the ITN while 108(72) said they do not; 128(85.3) said they sweat when sleeping on the ITN while 22(14.7) said they do not; 88(58.7) said mosquitoes bite when sleeping on the ITN while 62(14.3) said mosquitoes do not bite.

Based on the responses as presented above, it is concluded that pregnant women attending antenatal care in UCTH have different perception towards ITN utilization.

Research question 2

What level of Knowledge do pregnant women attending antenatal care in UCTH have about ITN?

Table 4. Assessing knowledge of ITN among pregnant women

Statement	Yes	No
Have you ever heard about ITN before	93 (62)	57 (38)
If yes, have you seen it before?	90 (60)	60 (40)
ITN is a major tool for prevention of malaria	96 (64)	54 (36)
Do you think ITN has any health benefits?	98 (65.3)	52 (34.7)
Do you know insecticide is used on ITN?	88 (58.7)	62 (41.3)
The reason for treating nets with insecticide is to kill people	22 (14.7)	128 (85.3)
The reason for treating the nets with insecticide is to irritate and repel mosquitoes	108 (72)	42 (28)
ITN should be used on pregnant women and under 5 children only	32 (21.3)	118 (78.7)

Note: Numbers in parentheses are percentages

Result of findings as presented in table 4 indicate that 93(62%) of the respondents said they have heard about ITN before while 57(38%) said they have not. 90(60%) said they have seen it while 60(40%) said they have not. 96(64%) said ITN is a major tool for prevention of malaria while 54(36%) said it was not. 98(65.3%) said ITN has health benefits while 52(34.7%) said it does not 88(58.7%) said they know that insecticide is used on ITN while 62(41.3%) said they do not. 22(14.7%) said the reason for treating nets with insecticide is to kill people

while 128(85.3%) said it was not. 108(72%) said the reason for treating the nets with insecticide is to irritate and repel mosquitoes while 42(28%) said it was not. 32(21.3%) said ITN should be used on pregnant women and under 5 children only while 118(78.7%) said it should not.

Based on the responses as presented above it is concluded that pregnant women in UCTH have a good knowledge of ITN.

Hypothesis

Knowledge of ITN by pregnant women attending antenatal care in UCTH does not influence their utilization of ITN.

This hypothesis is tested using contingency chi-square analysis as presented in table 5.

Table 5. Contingency chi-square analysis of the perception and utilization of insecticide treated net by pregnant women attending antenatal care

Knowledge of ITN	Utilization of ITN			
	Pregnant women who utilized ITN	Pregnant women who do not	Total	X^2
Pregnant women who have knowledge of ITN	32 (33.5)	61 (59.5)	93	
Pregnant women who do not have knowledge of ITN	22 (20.5)	35 (36.5)	57	0.277
Total	54	96	150	

Not significant at 0.05, df=1, critical x2 = 3.84

Result of findings as presented in table 5 indicates that a calculated x2- value of 0.277 was obtained. This value when compared to the critical x2 value of 3.84, and I degree of freedom was found to be lower.

On the basis of this observation, the null hypothesis is retained, meaning that knowledge of ITN by pregnant women does not influence their utilization of ITN.

Discussion of Findings

Result of findings on the perception of pregnant women toward ITN shows that 90% of women perceived that, they feel heat, rashes, cough and insufficient air most of them did not use it.

This result is supported by Ogbeide, Aruoture, & Wagbatsoma, (2014) whose study shows that Majority (78.0%) said it brings about insufficient air, 49.1% said that it causes heat, 33.9% said it causes difficulty in getting up at night, 10.2% said mosquitoes can still pass through and bite, 8.5% said the chemicals used are harmful, 5.1% said it had a bad smell and 1.7% said it caused cough. Only 26.2% of the respondents owned a net. Of which 72.5% were long lasting ITN and 27.5 % short acting ITN. Only 21.2% of the respondents used the net every night while 58.8% used it occasionally and 20.0% rarely used it. Majority (84.3%) of the respondents perceived that ITN prevented malaria, 71.8% said that it prevents mosquito bites, 27.5% said it prevents bites from other insects, while 4.6% said it created warmth. It also shows that the perceived derivable harm from ITN use among respondents.

Result of findings on the level of knowledge pregnant women showed that the pregnant women have a good knowledge of ITN. This is evident in the fact that 93(62%) of the respondents said they have heard about ITN and 90(60%) said they have seen it.

This result is supported by Amoran, Senbanjo & Asagwara (2011) whose research showed that out of a total of 1,500 youth corpers in NYSC camp in Edo State, 656 youth corps members were interviewed, all the youth corpers (100%) have heard about ITN before, but 89.6% have seen it before. (38.4%) of the them had information about ITN from the mass media, 108% had it from friends and relatives, 8.1% from health facilities, 7.2% from schools and 35.5% from other sources. This result is also supported Edelu, Ikefunna, Emodi & Adinora (2010) whose study to determine the proportion of mothers using ITN for their children and reason for non-use showed that 184(80%) out of 230 mothers interviewed were knowledgeable about ITNs. Similarly, Akpan (2007) supports the result of this findings in his study on the popularly of ITN as a preventive method of malaria control among residents of Calabar Municipality. His results revealed that among 612 residents in

Calabar Municipality, majority (88.9%) i.e. 554:612 claimed they had good knowledge of ITN as a preventive tool for mosquito bite.

The result of findings again revealed that only 36% of the pregnant women in UCTH, utilize ITN. This result is supported by Musa et al (2009) whose study on the awareness and use of ITNs among women attending ante-natal clinic in a northern state in Nigeria, out of 455 pregnant women, about one-third 164(36%) of the respondents were aware of ITN in malaria prevention, but less than a third 124 (27%) had ever used ITN and only 88(19%) were currently using it. Amoran et al (2011) also supports this result in their study which revealed that of a total of 656 youth corpers interviewed in NYSC camp in Edo State, only 23% of them had ever used ITN before but 4.3% of the youth corpers currently used it before reporting to camp.

However, Astatkie & Feleke (2007) had contrary result in their study where they found that 454 household included in the study, 341 household's own mosquito nets, and 82.7% reported that they used their nets, 77.3% used their nets consistently throughout the years, whereas 22.7% used their nets intermittently. Fifty-nine (92.2%) of those who used their nets intermittently reported that they used their nets during or after raining season.

The result of findings once again revealed that respondents identified unavailability, inability to fit the nets in beds, ignorance of who should use it, discomfort in the net and irritation of the chemical in the net as factors that hinder the utilization of ITN.

This result is supported by Rhee et al (2005) whose study has it that at a baseline interview, none of the 132 households were using ITNs. The most common reason for not treating their nets were cost (59%), availability (23%) and lack of knowledge regarding the effectiveness of ITNs in preventing malaria (11%).

However, 93% of those who did not treat their nets during the study stated that cost was the main reason. Musa, Salaudeen & Jimoh (2009) support this result in their study on the awareness and use of ITN among women attending antenatal clinic in a northern state in Nigeria.

The result of his findings showed that about one-third 164(36%) of the respondents out of 455 pregnant women were aware of ITN in malaria prevention but 331(73%) of the respondents have never used ITN before because of lack of awareness.

Finally, the result of findings revealed that knowledge of ITN by pregnant women in UCTH does not influence their utilization of ITN. Here although most of the respondents agreed that they were aware of ITN and its importance majority of them did not use it.

Conclusion

Based on the findings of this study, it was concluded that: pregnant mothers in UCTH were aware of insecticide treated nets, 90% of the respondents had knowledge on the use of ITN but 60% of the respondents feel reluctant to use the net due to the complications such as heat and rashes.

Recommendation

Based on the findings of the study it was recommended that;

a. The ministry of health and other related agencies should intensify enlightenment campaign even in the hospital environment on the utilization of ITN.

Implications to Nursing

The use of insecticide treated net prevent the pregnant women from been susceptible to malaria infection. This implies that the frequent use of insecticide treated net will go a long way to prevent both infant and maternal death.

References

[1] Abebe, A. Teshome, G. M., Girmay, M. Meshesha, B. Seife, B. & Aklilu, S. (2008). Assessment of distribution, knowledge and utilization of insecticide treated nets in selected malaria prone areas of Ethiopia: Ethiopia journal of health development. Vol 22(3), 268-274.

[2] Abdulla, S. Armstrong, S. Nathan, R. Mukasa, O. Marchant, T., Smith, T. Tanner, M. & Ledger, C. (2009). Impact on malaria morbidity of a program supplying insecticide treated nets in children aged under 2 years in Tanzania: community cross sectional study. British medical journal, V. 332(35), 270-273.

[3] Ahorlu, C., Dunye, S., Afari, E., Koram, K. & Nkrumah, F. (2008). Malaria related belief and behaviours in southern Ghana: implications for treatment, prevention and control. Tropical medicine and international health Vol 2(5), 488-499.

[4] Akpan, S. S. (2007). The popularity of insecticide-treated bed nets as a preventive method of malaria

control among residents in Calabar Municipality, Cross River State, Nigeria: Tropical doctor Vol 37(3), 192-3.
[5] Alaii, J. Hawley, W. Kolczac, M. Ter Kuile, F. Gimning, J. & Vulvule, J. (2003). Factors affecting use of permethrin-treated mosquito nets during a randomized controlled trial western Kenya: America journal of tropical medicine and hygiene. Vol 68(4), 149-160.
[6] Alaii, J. Ven Den Borne, H. Kuchur, P. Hawley, W. Mwenesi, & Vulule, J. (2007). Perception of mosquito nets and malaria prevention before and after a randomized western Kenya: American journal of tropical medicine and hygiene Vol. 68(5), 142-148.
[7] Alaii, V. Van Den Borne, H. Kuchur, P. Shelley, K. Mwenesi, H. & Vulule, J. (2007). Community reactions to the introduction of permethrin-treated mosquito nets for malaria control during a randomized controlled trial in northern Kenya: American journal of tropical medicine and hygiene, Vol. 68(4), 128-136.
[8] Amoran, O. E., Senbanjo, I. O. & Asagwara, C. E. (2011). Determinants of insecticide treated net use among youth corps members in Edo State, Nigeria: BMC public health, Vol. 11(1), 28-30.
[9] Astatkie, A. & Feleke, A. (2009). Utilization of insecticide treated nets in Arbaminch Town and the Malaria villages of Arbminch Zuria District Southern Ethiopia. Ethiopia: Journal of health development, Vol. 24(1), 15-24.
[10] Baume, C. A. & Maria, M. C. (2007). Intra-household mosquito net use in Ethiopia, Ghana, Mali, Nigeria, Senegal and Zambia: are nets being used? Who in the household uses them? American journal of tropical medicine and hygiene, Vol. 77(7), 963-971.
[11] Brieger, N. Onyido, A. Sexton, J. Ezike, V. Bresman, J. & Ekanem, O. (2008). Monitoring community responses to malaria control using insecticide-impregnated mosquito nets, curtains and residual spray at Nsukka, Nigeria: Health Education Research, theory and practice. Vol. 11(2), 133-145.
[12] Clarke, S. E. (2009). Do untreated bed nets protect against malaria? Transactions of the society of tropical medicine and hygiene. 95:457-462.
[13] Edelu, B. O., Ikefuna, A. N., Emodi, J. I. Adimora, G. N. (2010). Awareness and use of insecticide treated bed nets among children attending clinic of UNTH Enugu-the need for an effective mobilization process. African health sciences, 10(2),1-2.
[14] Federal Ministry of Health (2006). National malaria control programme, Abuja: A 5-year strategic plan-2006-2010. available on _HYPERLINK "http://www.rollbackmalaria.org/../nigeria.pdf"_ www.rollbackmalaria.org/../nigeria.pdf_.
[15] Felema, G. (2007). Assessment of insecticide treated nets (ITNs) utilization among children under five years of age and pregnant women of Adama Woreda, Oromia Regional state Ethiopia: American journal of tropical medicine, 64(2), 85-96.
[16] Ghebreyesus, J. A., Deressa, W. Witten, K. H., Getachew, A. & Saboxa, T. (2006). Malaria, in behane, V, Hailemariam, D & Kloos, H. (eds) Epidemiology & Ecology of health and disease in Ethopia: Shama Book, Addia Ababa.
[17] Guyah, H., Ochola, S. & Snow, R. (2007). Too poor to pay: changing for insecticide treated nets in highland Kenya. Tropical medicine and international health 9(10),846-852.
[18] Korenromp, E. Miller, J., Cibulskis, R. Cham, M. Alnwick, D. & Dye, C. (2008). Monitoring mosquito net coverage for malaria control in Africa: possession vs use by children under 5 years. Tropical medicine and international health. Vol. 8(8), 693-703.
[19] Lengeler, C. (2009). Insecticide treated bed nets and curtains for preventing malaria. Available on Cochrane database systRev CD000363.
[20] Mnzara, C. C. (2007). Comparison of house spraying and insecticide treated nets for malaria control. Bulletin of the world health organization, 78(12), 1389-1307.
[21] Musa, O. I. Salaudeen, G. A. & Jimoh, R. O. (2009). Awareness and use of insecticide treated nets among women attending antenatal clinic in a northern state of Nigeria: Journal of the Pakistan medical association, 59(6), 354-8.
[22] Ndjinga, J. K. & Minakawa, N. (2010). Importance of education to increase the use of bed nets in villages outside:Kinshasa, Democratic Republic of the Congo malaria journal, 9(10), 1-10.
[23] Ng'anga, P. Jayasinghe, G., Kimoni, V. Shilitu, J. Kabutha, C. Kabuage, L. Githure, J. & Mutero, C. (2009). Bed net use and associated factors in rice farming community in central Kenya. Malaria journal, 8(6) 4-10.
[24] Nuwaha, F. (2007). Factors affecting the use of mosquito nets in mbarara municipality of western Uganda. American journal of tropical medicine and hygiene, 65(6), 877-882.
[25] Ogbeide A.O., Aruoture I., Wagbatsoma V.A. (2014). Utilization of Insecticide Treated Net Among Pregnant Women Attending Antenatal Care in Etsako East Local Government Area of Edo State. Vol.15 No.2 pp 106-116.
[26] Okrah, J. Traore, C. Pale, A. Summerfield, J. Muller, O. (2007). Community factors associated with

malaria prevention by mosquito nets an exploratory study in rural Burkina Faso: Tropical medicine and international health, 7(3)240-48.

[27] Rhee, M. Sissok, M., Perr, S. MeFarlard, W. Parsonnet, J. & Doumbo, O. (2005). Use of insecticide treated nets (ITNs) following a malaria education intervention in Piron, Mali: a control trial with systematic allocation of households. Malaria journal, 4(35), 15-29.

[28] Roll Back Malaria (2005). Global strategic plan 2005-2012. Geneva: Roll Back Malaria.

[29] Rowland, M. Bouma, M. Ducornez, D. Durrani, Rozendaal, J., Schapira, A., & Sondorp, E. (2008). Pyrethoid impregnated mosquito nets for personal protection against malaria for Afghan refugees. Transactions of the royal society of tropical medicine and hygiene, 90(1), 357-61.

[30] Schellenber, A, Abdulla, S. Minja, H. Nathan, R. Mukassa, O. & Marchant, T. (2008). KINET: A social marketing program of treated nets and net treatment for malaria control in Tanzania with evaluation of child health and long-term survival. Transactions of the royal society of tropical medicine and hygiene, 93(1), 225-231.

[31] Simon, J. Larson, B., Zusman, A. & Rosen, S. (2005). How will reduction of tariff and taxes on insecticide treated mosquito nets affect household purchases Bulletin of the World Health Organization, 80(11) 892-899.

[32] UNICEF (2006). Malaria a major cause of child death and poverty in Africa.

[33] WHO/UNICEF (2005). Africa malaria. Report 2005. World health Organization/UNICEF.

[34] WHO/UNICEF (2007), World malaria report. Available on WHO/HTM/MAL12005.1102.

[35] World Health Organization (2002). Malaria in pregnancy. Available on: RBM info sheet _HYPERLINK " http://www.rbmwho.int."_ www.rbmwho.int._. Date assessed: January 2012.

[36] World Health Organization (2006). What is malaria RBM info sheet _HYPERLINK "http://www.rbmwho.int.lastupdatejan2007"_www.rbmwho.int.lastupdatejan2007_.Date assessed: January 2012.