

Assessment of Belief, Family size and utilization of insecticide treated nets among pregnant women in Southern Zone of Cross River State, Nigeria

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ABSTRACT: *The study Assess utilization of insecticide treated net among pregnant women in Southern Zone of Cross River State, Nigeria. For the purpose of this study to be achieved, two research questions were posed and converted into two null hypotheses, which were tested at 0.05 level of significance. There was a detailed review of related literature on the variables of the study. Survey research design was employed in the study. Accidental sampling technique was adopted in selecting the health facilities used for the study while the systematic random sampling technique was adopted in selecting the seven hundred and forty-one respondents used for the study. A structured questionnaire was the instrument utilized for data collection. The instrument was subjected to validity by relevant experts. Cronbach alpha method was employed to establish the reliability of the research instrument. To test the various hypotheses that were formulated for the study, Pearson product moment correlation statistics were utilized for analysis of data. The result obtained from data analysis and hypotheses testing in the study revealed that; There was no significant relationship between belief and utilization of insecticide treated nets among pregnant women. The implication of this finding is that pregnant women in the study area believe in the efficacy of insecticide treated nets, which is influencing the utilization positively. Family size significantly influences utilization of insecticide treated nets among pregnant women. The implication of this finding is that pregnant women with large families will continue to experience low utilization of insecticide treated nets except their economic status improve while pregnant women from small family sizes utilize insecticide treated nets... It was further recommended that relevant government agencies should ensure that pregnant women from low income groups be assisted to own insecticide treated net(s) in order to enable them utilize such nets as a means of preventing malaria.*

KEYWORDS: assessment of belief, family size, insecticide treated nets, pregnant women, Southern Zone, Cross River State, Nigeria

INTRODUCTION

The utilization of insecticide treated nets by pregnant women has become a source of concern to various stakeholders in the health sector. This is because the efforts made by government to provide treated nets to pregnant women as a means of fighting the scourge of malaria has not yielded significant outcome. Despite the huge investment made to ensure that every pregnant woman owns and utilizes insecticide treated nets, a large number of these women still do not utilize these nets as directed by healthcare providers. This is evident in the increasing number of malaria cases among pregnant women in Southern Cross River State. This has led to an increase in the incidence of morbidity among mothers and their new born babies in Nigeria. The resultant effect of lack of Insecticide Treated Net contributes to intra-uterine death, abortion, anaemia in pregnancy and low birth weight which is a leading cause of poor infant survival and development.

There has been increasing awareness through various media to sensitize members of the public, especially pregnant women on the benefits of sleeping under an insecticide treated net, with the aim of increasing the utilization of these nets. The outcome of this sensitization leaves much more to be desired. Many have blamed this outcome on several socio-economic factors confronting pregnant women in the study area. Most pregnant women still do not utilize the insecticide treated net at all, while a few others either do not effectively or adequately utilize it, hence rendering the available ITNs underutilized. Most pregnant women do not use ITNs effectively due to one reason or the other. These reasons range from the cost of insecticide treated nets, inaccessibility and believe that it will be harmful to their unborn children. Some pregnant women still believe that insecticide treated net cannot be used consistently when the room is poorly ventilated without electric fan. This situation is worrisome, and if not checked may not only militate against the efforts of the government and other non-governmental agencies in the prevention and eradication of malaria but will also adversely impede the health status of the pregnant women and their unborn children. It was based on this premise that this researcher sort to investigate the socio-demographic variables influencing utilization of insecticide treated net among pregnant women in Southern Cross River State, Nigeria.

Purpose of the Study

The purpose of this study is to investigate

1. Belief in the use of ITN for malaria control of pregnant women on utilization of insecticide treated net in Southern Cross River State, Nigeria.
2. Family size of pregnant women on utilization of insecticide treated net in Southern Cross River State, Nigeria.

Statement of Hypotheses

1. The following null hypotheses were formulated to direct the study:

Belief in the use of ITN for malaria control of pregnant women has no significant influence on utilization of insecticide treated Nets (ITNs) in Southern Cross River State, Nigeria.

2. Family size of pregnant women has no significant influence on utilization of insecticide treated Nets (ITNs) in Southern Cross River State, Nigeria.

LITERATURE REVIEW

Belief in the use of pregnant women and utilization of insecticide treated net

Family size of pregnant and utilization of insecticide treated net

Empirical Review

The empirical review was based on the following sub-variables

1. Belief in the use of ITN for malaria control by pregnant women and utilization of insecticide treated net
2. Family size of pregnant women and utilization of insecticide treated net

Belief in the use of ITN for malaria control by pregnant women and utilization of insecticide treated net

The word belief is sometimes used interchangeably with faith, belief system or sometimes set of duties. Adamu and Salihu (2012) opined that religion differs from private belief in that it is something eminently social. Religion is an organized collection of beliefs, cultural systems and world views that relate humanity to an order of existence. Many belief systems have narratives, symbols and sacred histories that are intended to explain the meaning of life and/or to explain the origin of life or the universe. Belief is the set of feelings, dogmas and practices that define the relations between human beings and sacred or divinity. Belief is a fundamental set of practices generally agreed upon by a group of people. These set of beliefs concern the cause, nature and purpose of the universe and involve devotional and ritual observances. They also often contain a moral code governing the conduct of human affairs. Belief is also a set of principles or tenets which together form the basis of a religion, philosophy or moral code. In this study, belief is seen as pregnant women religious affiliation and principle that govern the use of insecticide treated nets. Olaitan (2011) observed that ITNs utilization depends on the belief system of the couple or pregnant women. Pregnant women are susceptible to symptomatic malaria due to invasion of the placenta by plasmodium. Malaria increases the risk of adverse pregnancy outcomes for mothers, the foetus and newborns. The effective use of insecticide treated nets (ITNs) would be of benefit to these vulnerable women.

Aluko (2012) explored the factors militating against the use of insecticide treated nets (ITNs) among pre-natal women in Ibadan. The study adopted the cross-sectional survey research design. Accidental sampling technique was used in selecting 335 post-partum women recruited from three fee-paying health facilities within Ibadan metropolis, Nigeria. A validated structured questionnaire was used in eliciting data from respondents. The data collected were analyzed using descriptive and inferential statistics by means of statistical package of social sciences (SPSS) version 15. The level of significance was set at = 0.05. The result of the findings showed that women from Christian backgrounds are more likely to own and sleep under ITNs than their counterparts from other religious back-grounds. The study concluded that participants' religious believe/affiliation significantly influenced

ITNs utilization. It was recommended among others that evaluation of free distribution of ITNs, integration of focused ANC and preconception care must be advocated to promote early access to health information. Insecticide treated net is one type of cost-effective vector control approach for the prevention of malaria. It has to be treated with insecticide and needs ongoing treatment with chemicals.

Charles, Tobias, Apinjon, Eric and Achidi (2019) investigated the coverage and usage of insecticide treated nets (ITNs) within households: associated factors and effect on the prevalence of malaria parasitemia in the Mount Cameroon area. A cross-sectional survey was conducted between August and September (2019) in six communities within the Mount Cameroon area. Multi-stage sampling technique was adopted in selecting a sample size of 450 respondents. Questionnaire served as instrument for data collection. Capillary blood was also collected for malaria parasite determination. Data was analyzed using SPSS version 20 for windows. Differences in proportions were assessed using the chi-square test while factors affecting ITNs usage were assessed in multivariate logistic regression at a statistical significance of $p \leq 0.05$. The findings of the study revealed that religious beliefs and affiliations was a significant determinant of utilization of ITNs among households in the study area. The study concluded that ITNs usage was affected by the number of occupants per household, altitude and the nature of house while 'too hot/feel heat in' and 'No mosquitoes' were the most frequent reasons for not using ITNs. The prevalence of malaria parasitemia was reduced by more than 50% among regular ITNs users while an increase in ITN coverage significantly reduces malaria prevalence. The study recommended that in order to achieve the full benefits of ITNs as a tool of vector control and as a strategy to cut down the prevalence of malaria parasitemia, coverage needs to be increased and a mechanism put in place to replace torn nets. The entire population should be educated on the benefits of regular usage and maintenance of bed nets.

Polrat (2017) investigated the use of insecticide-treated mosquito net among pregnant women and guardians of children under-five in the Democratic Republic of the Congo. This study was undertaken to examine knowledge, attitude and practices on the use of insecticide treated mosquito nets in the prevention of malaria among pregnant women and guardian of children under-five in the Democratic Republic of the Congo. Survey research design was adopted for the study, a total of 5,138 pregnant women and guardians of children under-five were selected for the study using the stratified and simple sampling procedures. Interview and questionnaire served as instrument of data collection. Logistic regression model was used in analyzing data for the study. Findings of the study revealed that women who believed that it is normal to use ITNs were 1.9 times more likely to use it than those who did not (OR:1.930); women who were confident in their abilities to use ITNs were 1.9 times more likely than those who were not confident (OR:1.915) and women who had a good attitude towards ITNs were also more likely to use ITNs compared to those who did not (OR:1.529). The study recommended that new and innovative evidence-based behavior change interventions are needed to increase the utilization of ITNs among vulnerable groups.

Adjei (2014) indicated that demographic predictors of ITNs utilization in Ghana, reported that religion and cultural beliefs is one of the most important predictor among the demographic factors. He concluded that ITNs utilization awareness should be intensified as the best option for preventing malaria among pregnant women. Takyi and Addai (2016) observed that one of the factors affecting women's access to reproductive health in Northern Nigeria are different norms and travails within the society. David (2018) opined that socio-cultural factors such as religious values, primitive beliefs especially faith belief, affect the utilization of ITNs among pregnant women. A review on community acceptance of bed nets has shown that various factors influence the use of bed nets, including cultural, behavioural and demographic factors, ethnicity, accessibility, gender relations and seasonality of malaria. Winch (2017) asserted that although ITNs are effective, local perceptions, acceptance and use of ITNs, as well as use of other preventive methods are invaluable in malaria control programmes. Winch (2017) further stated that, the local acceptance of insecticide may be influenced by its toxicity, the local terms used to translate the chemicals and the meaning attached to these terms.

In a study carried out in Western Kenya, community reactions were assessed before the introduction of permethrin-treated bed nets. Although malaria was found to be an important disease, ITNs were believed to be only partially beneficial because of the perception that malaria had multiple causes, and further to this, fear was expressed that chemicals used to treat ITNs were associated with use of family planning (Alaii, 2003). The study also revealed that mosquito numbers, relative wealth, number of household occupants and the education level of the head of the household had no effect on adherence. Excessive heat was also cited as a reason for not deploying the child's ITNs. Other important reasons for non-adherence were disruption of sleeping arrangements, indicating that ITNs were not readily redeployed in the face of shifting sleeping patterns due to visitors, funerals, house construction and other events. Lack of motivation and technical problems like room to hang child's net also affects consistency in utilization of an ITNs.

Yitayew, Enyewandand Goshu (2018) investigated malaria infection during pregnancy in Adiszemen Hospital Ethiopia. The study was aimed to assess utilization and associated factors of insecticide treated nets among pregnant women in the study area. The study lasted from May 1 to 30, 2018. Cross sectional survey research design was adopted for the study. Simple random sampling technique was employed in selecting a sample of 226 pregnant mothers. Data were collected using pretested structured questionnaire and face-to-face interview. The collected data were entered, cleaned and checked using Epi data version 3.1, and finally analyzed using SPSS version 20. Binary and multivariable logistic regressions were computed to identify significantly associated variables at 95% confidence interval. Result of findings showed that a total of 226 pregnant mothers attending antenatal clinics participated in making the response rate 100%. Among a total 226 subjects, 160 (70.8%) of mothers had good utilization of insecticide treated net. Mothers who belong to Christianity were 2.8times more likely to utilize insecticide-treated bed net than mothers who are Muslim. The findings of the study revealed a significant association between pregnant women religious believe and utilization of insecticide treated bed net. It was

recommended among others that different stakeholders should give special attention to awareness creation on the advantages of insecticide bed net. Insecticide treated net use is generally poor in Nigeria among all categories of people. Although use of ITNs has been shown to reduce malaria morbidity and mortality, this measure needs to be supported by an adequate health care system providing ITNs possibly at the household level.

Family size of pregnant women and utilization of insecticide treated net

Family size may be considered from two perspectives. At the individual (Micro) level, it defines one aspect of an individual's family background or environment. As such, it represents a potential influence on the development and accomplishments of family members. At the societal (Macro) level, family size is an indicator of societal structure that may vary over time, with concomitant implications for individual development and social relations in different cohorts while the term family size is sometimes used to represent the total number of individuals comprising a family unit, Guerra et al. (2018) argues convincingly for decomposing the concept into two components: numbers of children and numbers of adults in the household. This distribution is important, as observed patterns of change in overall family size may be attributable to one component or the other, as may effects of overall family size.

Bisi-Onyemaechi, Obionu, Chikani, Ugo, Ogbonna and Ayuk (2017) investigated the determinants of use of insecticide-treated nets among care givers of under-five children in Enugu, South East Nigeria. The purpose of the study was to examine utilization of ITNs among consenting mothers/caregivers of under-fives in Enugu metropolis, South East Nigeria. The study adopted a cross sectional survey design. 206 respondents were selected from within their communities using multistage and simple random sampling techniques. Data were collected consecutively using pretested, interviewer administered, structural questionnaire as the main instrument for data collection. The data were analyzed using the SPSS software (IBM, Armonk, NY) version 21 of windows. Data presentation was done with frequency tables and charts. P-value was set at 0.05 and confidence interval at 95% level of significance was sought for among association of the categorical variables. The findings of the study revealed among others that one hundred and six (50.5%) of those who use ITNs have four or less number of persons in their houses use ITNs. One hundred and four (49.5%) of those who use ITNs have more than four persons in the house; 52.5% of those who have more than four persons in the house use ITNs. The number of persons in the family size/household was not significantly associated with ITNs use ($P = 0.53$).

Gabriel, Iloh; Amadi and Godwin (2011) carried out a study on family biosocial variables influencing the use of insecticide treated nets for children in Eastern Nigeria. The aim of the study was to determine the family biosocial variables that influence the use of insecticide treated net for children in Eastern Nigeria. A descriptive survey research design was adopted for the study. Interview and structured questionnaire served as instrument for data collection. The questionnaire tool elicited information on family socio-demographic variables, inter-spousal discussion, communication, concurrence and participation in the use of insecticide treated bed nets, and reasons for non-utilization. 415 mothers with children under the age of five were randomly selected and used for the study. The results

generated were analyzed using SPSS version 13.0. Bivariate analysis involved the use of chi-square for testing the significance of associations between categorical variables. Results of analysis revealed that of the 415 respondents selected for the study, 220 respondents said they had used the ITNs for their under-five children in the previous 6 months before presenting to the study centre, while 195 had not used any, giving ITNs use rate of 53.0%.

At bivariate analysis, there was statistically significant associations between the use of ITNs for the under-five and some family variables: parents who had secondary education and below (mother: 57.3% vs 42.7%, p value = 0.009; father: 65.0% vs 35.0%, p value = 0.001), parents from monogamous families used ITNs more than those from polygamous families (96.8% vs 3.2%, p value = 0.001); parents with a family size of less than four used ITNs more than those who had larger families (68.6% vs 31.4%, p value = 0.001); parents who lived together used ITNs more than parents who lived apart (66.8% vs 33.2%, p value = 0.001). The study recommended that families of children under the age of five should be the focus of intensive health education and promotion campaign on the use of ITNs. The study concluded that ITNs user rate is significantly influenced by some family variables. It is only by inquiring, examining and addressing these family variables that the target 100% ITNs utilization can be achieved.

The socio-economic and medical burden malaria imposes on families includes the disruption of family dynamics leading to family dysfunction and staggering economic costs (Bisi-Onyemaechi et al, 2017). Malaria infection accounts for 7 out of ten out-patient visits in Nigerian Hospitals and is responsible for 25% infant mortality and 30% under-five mortality. The Roll Back Malaria Initiative (RBMI) identified the use of insecticide treated bed nets as a key strategy for malaria prevention especially for pregnant women and under-five children in Sub-Saharan Africa. The benefits of ITNs have been documented particularly with regard to childhood morbidity and mortality and the World Health Organization (2012) called for its increased use. There is overwhelming evidence in the tropics that the use of ITNs for pregnant women and under-five is most advantageous while non-use is associated with increased morbidity and mortality from malaria of great concern, therefore, is that despite the relatively high awareness of ITNs and rates of use reported in Gambia, and Guatemala, the rates of ITNs possession and use reported in Nigeria have been unimpressive (Gabriel et al, 2011).

Malaria control intervention such as possession and utilization of ITNs are aimed at building human and institutional resources to fight the malaria scourge. The families of the under-five children constitute important human and social institutional resources for which the utilization of ITNs should play a significant role in promoting health. The family is the most basic social unit which directs the health status and the socio-medical needs of its members. Bisi-Onyemaechi et al (2017) opined that families are important recipients of health information (message) who motivate the community on practices that promote health such as the use of ITNs. Reliable and comparable analysis of family socio-demographic factors that influence the utilization of ITNs is the cornerstone for effective free distribution and social marketing of ITNs. An understanding of these factors is

valuable for acquiring ITNs and using them effectively especially for pregnant women and children under the age of five in malaria endemic communities. In addition, utilization of ITNs is integral to key family practices with implications for family health particularly child health. Praise (2011) asserted that there has been a marked increase in the social marketing and the current free distribution of ITNs in recent times. As the awareness and possession of ITNs increase in families of pregnant women and under-five children, it is expected that there would be a corresponding increase in their utilization for the group most at risk of malaria morbidity and mortality.

Gabriel, et al (2011) opined that effective reduction of malaria morbidity and mortality in Nigerian pregnant women and children under the age of five depends to a large extent on family biosocial factors. Although, the awareness of insecticide treated nets (ITNs) is reportedly high and increasing in Nigeria there remain large gaps between awareness, possession and use by families with children under the age of five in Nigeria.

Ibor, Aigbe, Iwara, Okongor and Okino (2012) investigated family size and utilization of insecticide treated nets in Cross River State, Nigeria. The purpose of the study was to examine ownership and utilization of insecticide treated nets in malaria high risk areas of Cross River state, Nigeria. Descriptive survey design was adopted for the study. The population of the study consisted of household heads, mothers, care givers or members of household whose age is 18 years old and above and less than 80 years. Purposive sampling procedure was used in selecting 351 respondents while the questionnaire served as the instrument for eliciting data from respondents. Data obtained were analyzed using descriptive and inferential statistical tool. Descriptive statistical tool such as frequency distribution and percentages while the inferential statistics comprised of Pearson's product moment correlation (PMC) and multiple regression analysis. The results of analysis indicated a low positive and significant association between ownership and utilization of ITNs (r – value = 0.12; $p < 0.05$), while the multiple regression result depicted that 5% of those who used ITNs were influenced by age (x_1), gender (x_2), household size (x_3) and education (x_4). Out of the four predictor variables, gender (0.51) and education (0.078) were statistically significant while age (0.037) and household size (-0.0055) were insignificant. The study revealed that sex differential and education constituted the prominent factors that influenced the utilization of insecticide treated nets. The study concluded that although not all households surveyed owned ITNs, nevertheless, the utilization of ITNs among net owning households was impressive, mostly by the vulnerable group. The study recommended continuous free distribution, periodic household survey and expanding public knowledge on the benefits of ITNs utilization.

Zelacem, Aymere, Yadeta and Fisrum (2015) carried out a study on ownership and utilization of insecticide-treated nets for malaria control in Harari National Regional State, Eastern Ethiopia. The aim of the study was to determine the ownership and utilization pattern of ITNs in Harari Peoples National Regional State, Ethiopia. Cross sectional survey research was adopted for the study. A total of 784 households were selected using stratified and purposive sampling techniques. Data were collected by using structured questionnaire and observational checklist. Retrieved data were analyzed using SPSS 16.0 statistical

package. Descriptive statistics were used to examine the study variables. Univariate and bivariate analyses were performed to determine factors affecting ITNs ownership and utilization by households as an outcome variable. Result of analysis revealed that the percentage of households who owned 1, 2 and 3 nets were 30.2%, 19.8% and 6.4%, respectively. The average number of ITNs per household was 1.4 (range 0-6). Most (51.8%) of the study participant had gotten ITNs before 6 months. The study further revealed that households with less number of children owned ITNs than households with large number of children. Bed space was another determinant of ITNs ownership and usage.

Biadgilign (2012) in a study of determinants of ownership and utilization of insecticide treated nets for malaria control in Eastern Ethiopia. Survey research design was adopted for study. The population of the study was women of reproductive age residing in Eastern Ethiopia. Simple random sampling procedure was adopted in selecting a sample of 480 respondents. Questionnaire was used to elicit responses from respondents. Retrieved questionnaire copies were analyzed using logistic regression model. The results of analysis revealed that a unit increase in the size of households increased the odds of ownership of a net more than twice. More importantly, the study showed that households which had at least one under-five child the odds of owning any net was about 60% higher than those with no under-five. Similarly, Gamble and Kuice (2009), applied a logistic model to identify determinants of bed net use in children under five and pregnant women and household bed net ownership in Bloko Island, Equatorial Guinea and found that family size has a strong positive association with use of ITNs.

RESEARCH METHODOLOGY

Research Design

The research design that was adopted for this study is the survey research design. According to Isangedighi, Joshua, Asim and Ekuri (2004), the survey design involves the collection of data to accurately and objectively describe existing phenomena. The survey design is an approach that is adopted when a study is concerned with obtaining data on and determining the nature of a situation as it exists at the time of investigation. Also, the survey study depends basically on questionnaire, telephone calls, mails and interviews as means of data collection. The design was considered appropriate for this study because it allowed the researcher to make inferences about the population by studying a sample that reflected the population parameter.

Population of the Study

The population of the study consisted of all pregnant women in Southern Cross River State. The statistics from the Cross River NPHCDA revealed that there are eighty-eight thousand six hundred (88,600) pregnant women who participated in antenatal care in the 360 government public health centers and hospitals in the seven Local Government Areas in the study area in 2021. The pregnant women were studied because of their perceived beneficiaries of usage of ITNs in their different households. Therefore, they were in the

best position to give authentic and useful responses on their utilization of ITNs. The distribution of the population of the study is presented in Table 1.

Sampling Techniques

Stratified random sampling technique was adopted in selecting the health centres/hospitals. All the Local Government Areas were selected for the study. To select the health centres/hospitals and the respondents in each of the selected Local Government Area, simple random sampling technique was adopted. This type of probability sampling was used because it helped the researcher to randomly select a subset of participants (the pregnant women) from the population. Each member of the population has an equal chance of being selected.

TABLE 1: Population distribution table of pregnant women in public health centres/hospital in the southern zone of Cross River State

S/N	LGA	No. of health center/hospital	Population
1.	Akamkpa	45	11,275
2.	Akpabuyo	40	20,248
3.	Bakassi	35	2,416
4.	Biase	58	12,622
5.	Calabar Municipality	83	13,384
6.	Calabar South	48	14,297
7.	Odukpani	51	14,358
	TOTAL	360	88,600

Source: Cross River State Primary Health Development Agency (2021)

By doing this, the researcher wrote the names of the 360 healthcare centres according to the various Local Government Areas on pieces of paper and folded them into paper-balls. The researcher randomly selected 10% of health centres in each Local Government Area used for the study by way of randomization in the study area. By doing this, the researcher obtained the list of registered pregnant women and every twentieth name was selected for the study. These names constituted the sample for the study.

Sample

The sample for the study consisted of seven hundred and forty-one pregnant women that were selected from thirty six (36) health centres in Southern Zone of Cross River State. Accidental sampling technique was used in selecting the sample. The sample distribution for the study is presented in Table 2.

Instrumentation

The instrument used for data collection in the study was a structured questionnaire tagged Utilization of Insecticide Treated Net Questionnaire (SEIUITNQ) and divided into two sections. Section A contained items on respondents' Socio-demographic variables including age, educational status, family size and income level of pregnant women.

Section B was designed using four-point scale of Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). It contained ten items measuring belief on ITNs and the utilization of insecticide treated nets.

TABLE 2: Sample distribution by Local Government Areas

S/N	LGA	Sampled health center/hospital(10%)	Sample (5%)sample
1.	Akamkpa	5	125
2.	Akpabuyo	4	101
3.	Bakassi	3	35
4.	Biase	6	109
5.	Calabar Municipality	8	81
6.	Calabar South	5	149
7.	Odukpani	5	141
	TOTAL	36	741

Source: Field survey, 2021

Validity of the Instrument

Validity is the extent to which an instrument measures what it is supposed to measure. To ensure validity, draft copies of the instrument was given to my supervisor and two other experts in Measurement and Evaluation in the Faculty of Foundations Studies in University of Calabar for an assessment of its validity. This was done to ensure the instrument's items meet the expectation of this study's purpose and also, for a determination of the extent to which the items are related to the conceptual context of the investigated variables. The experts scrutinized the research instrument, eliminate vague and ambiguous sentences and replaced them with more appropriate ones. One of such eliminations was the removal of items which focused on religion which was not part of the variables under consideration. This procedure was adopted to ensure that irrelevant items are eliminated, the University of Calabar standard maintained and to see that the instrument covered a reasonable ground for the study. All their suggestions and correction were effected and the corrected version presented and used in the study.

Reliability of the instrument

A trial test was conducted to establish the reliability of this instrument. The reliability of the instrument was established using Cronbach alpha method. The instrument was administered to a group of 40 respondents who were not part of the main study. Only items in section B of the instrument were subjected to reliability because items in Section A were constant and do not require reliability. The collected scores were analyzed and the reliability coefficient obtained was ranged between 0.72 to 0.78 respectively. This indicated that the instrument is good enough to be used for data collection for the study. The result is presented in Table 3.

TABLE 3: Result of Cronbach alpha reliability of the research instrument

Variables	No. of item	X	SD	α
Belief in ITNs	5	14.31	3.26	.72
Utilization of ITNs among pregnant women	10	25.23	4.87	.78

Coefficient range = .72 -

Procedure for Data Collection

Data for the study were obtained directly from respondents through the questionnaire developed for data collection. The researcher first-visited the health centres/hospital, with a letter of introduction from the Department, seeking for permission. On the assigned days for ante-natal care, the researcher and trained research assistant briefed the pregnant women of the purpose of the visit. The researcher explained further to them on the need to provide honest information with regards to the subject matter under investigation. Seven hundred and forty one(741) copies of the questionnaire were administered to the subjects. Out of this number, only seven hundred and thirty four(734) copies of the instrument were properly completed by the respondents. The exercise lasted for three weeks. (9th to 31st December, 2021).

Procedure for Data Preparation

Data obtained in the study were assigned numerical scores to enable the researcher analyze the responses provided by respondents. Items in Section A of the questionnaire were categorized and scored in ascending order. Items in Section B of the questionnaire were scored differently. For positively worded items, Strongly Agree (SA) was scored 4. Agree (A) 3. Disagree (D) 2 and Strongly Disagree (SD) 1. For negatively worded items, the reverse scoring was applied. The coding schedule is presented in Table 4.

TABLE 4: Coding schedule for the instrument

S/N	Variables	Code	Column	
1.	Family size	Low Medium High	1 2 3	4
2.	Beliefs in ITNs	Add sum of scores of items 1-5 in section B of the instrument		5
3.	Utilization of ITNs	Add sum of scores of items 1 – 10 in Section B of the instrument		6

Procedure for Data Analysis

The hypotheses formulated to guide the study are restated in this section, the independent and dependent variables were identified as well as the most suitable statistical tool for data analysis.

Hypothesis one

Belief in the use of ITNs for malaria control of pregnant women has no significant influence on utilization of insecticide treated Nets (ITNs) in Southern Zone of Cross River State, Nigeria.

Independent variable:	Belief in the use of ITN for malaria control
Dependent variable:	Utilization of insecticide treated net
Statistical technique:	Pearson product moment correlation analysis

Hypotheses two

Family size of pregnant women has no significant influence on utilization of insecticide treated Nets (ITNs) in Southern Zone of Cross River State, Nigeria.

Independent variable:	Family size
Dependent variable:	Utilization of Insecticide treated net
Statistical technique:	One way analysis of variance

Section A of the instrument

Family size of pregnant women: Comprises of the total number of individuals comprising of family unit. This variable is measured using items 3 in Section A of the instrument

Belief in the use of ITN for malaria control of pregnant women: Refers to the set of beliefs, feelings, dogmas and practices of an individual. This variable is measured using item 1-5 in Section B of the instrument

Utilization of insecticide treated net: Refers to the action of making practical and effective use of ITNs. This variable is measured using items 1-10 in Section B of the instrument

RESULTS AND DISCUSSION

Hypothesis by hypothesis analysis of data and presentation of results

This section presents the results from analysis of data and testing of hypotheses in this research work. This followed by the interpretation of the results obtained. The hypotheses were all tested at 0.05 level of significance.

Hypothesis 1

There is no significant relationship between belief in insecticide treated nets and utilization of insecticide treated nets among pregnant women. Belief in insecticide treated nets is the independent variable in this hypothesis while utilization of insecticide treated nets is the

dependent variable. Pearson product moment correlation statistical tool was used for data analysis.

As presented in Table 10, the result obtained reveals that the calculated r-value of $-.047$ is less than the p.value of 0.202 at 0.05 level of significance with 732 degree of freedom. The implication of this result is that the null hypothesis is accepted. Therefore, there is no significant relationship between belief in insecticide treated nets and utilization of insecticide treated nets among pregnant women in Southern Cross River State.

Hypothesis 2

There is no significant influence of family size on utilization of insecticide treated nets among pregnant women. Family size is the independent variable in this hypothesis, which is divided into low, moderate and high while utilization of insecticide treated nets is the dependent variable. One-way analysis of variance statistical toll was used for data analysis. The result of this analysis is presented in Table 13.

The result as presented in Table 13 shows that the calculated F-value of 215.820 is higher than the p.value of 0.000 at 0.05 level of significance with 3 and 730 degree of freedom. This implies that the null hypothesis is rejected. Therefore, there is a significant influence of family size on utilization of insecticide treated nets among pregnant women in Southern Cross River State. Since the result of this analysis is significant, a Fisher's protected t-test was carried out to determine where the difference among the various family sizes was highest in terms of mean difference. The result of the analysis is presented in Table 14.

Fisher's Least Significant Difference (LSD) was used to further identify where significant difference among the various family sizes was highest in terms of mean difference. The result shows that the mean difference between pregnant women from low and moderate family size was 2.71887 . The mean difference between those from low and high family sizes was 4.32969 . The mean difference between pregnant women from moderate and high family sizes was 1.61082 . Also, the results presented in Table 14, revealed that the mean difference is highest between pregnant women from low and high family sizes (4.32969), while the least mean difference is between women from moderate and high family size groups (1.61082).

TABLE 5: Pearson product moment correlation analysis of the relationship between belief in insecticide treated nets and utilization of insecticide treated nets in Southern Cross River State (N = 734)

Variables	\bar{X}	SD	Cal. r	P.value
ITNs	13.7180	1.05937	-	.202
Utilization of insecticide treated nets among pregnant women	23.5313	1.96656	.047	

Not significant at 0.05; $df = 732$

TABLE 6: One-way analysis of variance of the influence of family size on utilization of insecticide treated nets among pregnant women in Southern Cross River State

Income level	n	\bar{X}	SD
Low	28	25.9	.59
Medium	36	23.2	1.6
High	40	21.6	1.6
Total	104	23.5	1.9

Source of variance	SS	df	MS	F	P.v
Between groups	105.2435	3	35.0812	21.00	.00
Within groups	178.2344	31	5.7495		
Total	283.4779	33			

*Significant at 0.05; $df = 3$ and 730

TABLE 7: Fisher's protected t-test of the influence of family size on utilization of insecticide treated nets among pregnant women in Southern Cross River State

Family size	(J)	Mean Difference	Std. Error	Sig.
Low	Moderate	2.71887	.15362	.000
	High	4.32969*	.23212	.000
Moderate	Low	-2.71887*	.15362	.000
	High	1.61082	.19845	.000
High	Low	-4.32969*	.23212	.000
	Moderate	-1.61082	.19845	.000

*The mean difference is significant at .05 level

DISCUSSION OF RESEARCH FINDINGS

This section of the study presents a hypothesis by hypothesis discussion of findings obtained from analysis of data

Belief in ITNs among pregnant women and utilization of Insecticide Treated NetsThe result that was obtained from analysis of data and testing of hypothesis three in the study revealed that the null hypothesis was accepted. The implication of this result is that there is no significant relationship between beliefs in the use of insecticide treated nets and utilization of insecticide treated nets among pregnant women in Southern Zone Cross River State. The reason for this finding could be that the belief among pregnant women on the benefits of insecticide treated nets on their health and well-being is not strong enough. Most pregnant women do not doubt the ability of insecticide treated nets to prevent malaria, stating that preventing mosquitoes bite at night is enough to prevent the incidence of malaria during pregnancy. This conviction among most pregnant could be the reason for the non-significant relationship between belief in insecticide treated net and utilization of insecticide treated nets among pregnant women in the study area.

This finding agrees with that of Adamu and Salihu (2012) who opined that religion differs from private belief in that it is something eminently social. Religion is an organized collection of beliefs, cultural systems and world views that relate humanity to an order of existence. Many belief systems have narratives, symbols and sacred histories that are intended to explain the meaning of life and/or to explain the origin of life or the universe. Belief is the set of feelings, dogmas and practices that define the relations between human beings and sacred or divinity. Belief is a fundamental set of practices generally agreed upon by a group of people. These set of beliefs concern the cause, nature and purpose of the universe and involve devotional and ritual observances. They also often contain a moral code governing the conduct of human affairs. Belief is also a set of principles or tenets which together form the basis of a religion, philosophy or moral code. In this study, belief is seen as pregnant women feelings, practices that govern the use of insecticide treated nets. Olaitan (2011) observed that ITNs utilization depends on the belief system of the couple or pregnant women. Pregnant women are susceptible to symptomatic malaria

due to invasion of the placenta by plasmodium. Malaria increases the risk of adverse pregnancy outcomes for mothers, the foetus and newborns. The effective use of insecticide treated nets (ITNs) would be of benefit to these vulnerable women.

The finding of this study also supported that of Mbonye, Neeman and Magnussen (2016) who revealed that in Nigeria, the burden of malaria in pregnancy has over the years prompted the search for ways of reducing its effects to the barest minimum. The strategies adopted were packaged in the Abuja Declaration of African Summit on Roll Back Malaria in April 2000 in which African regional leaders expressed commitment to ensuring that 60% of pregnant women in malaria endemic areas accessed effective malaria preventive services by the year 2005 (WHO, 2000), these strategies included the use of insecticide treated nets amongst others. The use of ITNs is very effective in the control of malaria in pregnancy and it is estimated to be twice as effective as the untreated nets (Yusuf & Falade, 2008). The authors also noted that women who used ITNs had significantly fewer preterm deliveries and babies with higher mean birth than women who did not use ITNs. Nevertheless, the use of ITNs is still limited mainly because of its unavailability and cost and partly because of the discomfort associated with the nets and the women's fear of possible effect of the impregnated chemicals on them and their unborn babies.

Family size of pregnant women and utilization of insecticide treated net

The result that was obtained from analysis of data and testing of hypothesis five in the study revealed that the null hypothesis was rejected. The implication of this result is that there is a significant influence of family size on utilization of insecticide treated nets among pregnant women in Southern Cross River State. The reason for this finding could be that pregnant women from high family size who are not economically buoyant will always find it difficult to cope with the cost of providing and utilizing an insecticide treated net. The size of the family often makes it difficult for certain category of pregnant women to effectively utilize ITNs. Pregnant women from low families are not usually faced with the challenge of having to provide many nets for members of their household. This could be responsible for the influence of family size on utilization of insecticide treated nets among pregnant women in the study area.

This finding agrees with that of Bisi-Onyemaechi et al (2017) who reported that malaria control intervention such as possession and utilization of ITNs are aimed at building human and institutional resources to fight the malaria scourge. The families of the under-five children constitute important human and social institutional resources for which the utilization of ITNs should play a significant role in promoting health. The family is the most basic social unit which directs the health status and the socio-medical needs of its members. Bisi-Onyemaechi et al (2017) opined that families are important recipients of health information (message) who motivate the community on practices that promote health such as the use of ITNs. Reliable and comparable analysis of family socio-demographic factors that influence the utilization of ITNs is the cornerstone for effective free distribution and social marketing of ITNs. An understanding of these factors is valuable for acquiring ITNs and using them effectively especially for pregnant women and children under the age of five in malaria endemic communities. In addition, utilization of

ITNs is integral to key family practices with implications for family health particularly child health. Praise (2011) asserted that there has been a marked increase in the social marketing and the current free distribution of ITNs in recent times. As the awareness and possession of ITNs increase in families of pregnant women and under-five children, it is expected that there would be a corresponding increase in their utilization for the group most at risk of malaria morbidity and mortality.

The finding of this study also supported that of Guerra et al. (2018) who revealed that family size may be considered from two perspectives. At the individual (Micro) level, it defines one aspect of an individual's family background or environment. As such, it represents a potential influence on the development and accomplishments of family members. At the societal (Macro) level, family size is an indicator of societal structure that may vary over time, with concomitant implications for individual development and social relations in different cohorts while the term family size is sometimes used to represent the total number of individuals comprising a family unit, Guerra et al. (2018) argues convincingly for decomposing the concept into two components: numbers of children and numbers of adults in the household. This distribution is important, as observed patterns of change in overall family size may be attributable to one component or the other, as may effects of overall family size.

Summary of the study

The study investigated socio-demographic variables and utilization of insecticide treated net among pregnant women in Southern Zone of Cross River State, Nigeria. For the purpose of this study to be achieved, five research questions were posed and converted into two null hypotheses, which were tested at 0.05 level of significance. There was a detailed review of related literature on the variables of the study. Survey research design was employed in the study. Accidental sampling technique was adopted in selecting the health facilities used for the study while the systematic random sampling technique was adopted in selecting the seven hundred and forty-one respondents used for the study. A structured questionnaire was the instrument utilized for data collection. The instrument was subjected to validity by relevant experts. Cronbach alpha method was employed to establish the reliability of the research instrument.

To test the various hypotheses that were formulated for the study, Pearson product moment correlation statistics were utilized for analysis of data. The result obtained from data analysis and hypotheses testing in the study revealed that;

There is no significant relationship between belief in the use of insecticide treated nets and utilization of insecticide treated net among pregnant women

There is a significant influence of family size on utilization of insecticide treated nets among pregnant women.

There was no significant relationship between belief and utilization of insecticide treated nets among pregnant women. The implication of this finding is that pregnant women in

the study area believe in the efficacy of insecticide treated nets, which is influencing their utilization positively.

Family size significantly influences utilization of insecticide treated nets among pregnant women. The implication of this finding is that pregnant women with large families will continue to experience low utilization of insecticide treated nets except their economic status improve while pregnant women from small family sizes utilize insecticide treated nets

Recommendations

From the findings obtained and conclusion drawn, the following recommendations are made;

Pregnant women should be encouraged to raise small families in order to reduce the burden of providing adequate insecticide treated net for every member of the family as a means of preventing the incidence of malaria

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