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Acceptance and Utilization of Long-Lasting Insecticide Treated Nets among Pregnant Women and Nursing Mothers in Ado-Ekiti, Ekiti State

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Abstract:

This study assessed the knowledge, attitudes, and utilization of long-lasting insecticide-treated nets (LLITNs) among pregnant women and nursing mothers in Ado-Ekiti, Ekiti State. The objectives were to determine the level of knowledge regarding LLITNs, evaluate attitudes toward their use, measure utilization rates, and identify perceived barriers and enablers influencing their adoption. A descriptive cross-sectional design was employed, targeting 237 respondents selected through simple random sampling from two primary healthcare facilities, Oke Ila and Okesa Health Centers. Data were collected using a validated, self-administered questionnaire and analyzed with SPSS version 26 using descriptive and inferential statistics. Findings revealed high awareness of LLITNs, with 96.2% of respondents knowledgeable about their purpose and proper use. Attitudinal assessment showed that most respondents practiced appropriate installation and care, although routine maintenance, such as washing and seasonal retreatment, varied. Utilization patterns indicated that 95.8% of participants owned at least one LLITN, with 62.0% reporting consistent nightly use, while usage during dry seasons remained lower. Perceived barriers included difficulty in hanging nets, heat discomfort, and irregular distribution, whereas enablers encompassed access through health facilities and educational awareness. Significant associations were observed between respondents' knowledge, attitudes, and perceived barriers with socio-demographic factors such as age, education, marital status, and ethnicity. The study concludes that maternal awareness, education, and practical guidance are critical in promoting consistent LLITN use. Interventions addressing perceived barriers and enhancing knowledge can strengthen malaria prevention efforts among pregnant women and nursing mothers in the study area.

Keywords: Knowledge, Attitude, Utilization, Barriers, Long-Lasting Insecticide-Treated Nets,

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Introduction

Malaria remains one of the most significant public health challenges globally, particularly in tropical regions, with sub-Saharan Africa bearing the highest burden of the disease. The World Health Organization (WHO) estimates that in 2017 alone, there were approximately 219 million cases of malaria worldwide, resulting in 435,000 deaths, with Africa accounting for the majority of cases and deaths (Chidebe et al., 2020). Nigeria, in particular, has the highest burden of malaria in the world, contributing to 25% of malaria cases and 19% of deaths globally (WHO, 2018). Malaria transmission in Nigeria follows a seasonal pattern, peaking during the rainy season from April to October and declining during the dry season from November to March (Yakubu et al., 2019).

Pregnant women and their unborn children are among the most vulnerable populations to malaria due to physiological changes that increase susceptibility. Malaria in pregnancy is a leading cause of maternal anaemia, low birth weight, miscarriage, stillbirth, premature delivery, and neonatal deaths (Bauserman et al., 2019; Ankomah et al., 2021). Globally, the Anopheles gambiae complex is the primary vector responsible for malaria transmission, while Plasmodium falciparum, predominant in Africa, is the most virulent species, often resulting in severe disease and mortality (CDC, 2018). These risks highlight the urgent need for effective malaria prevention strategies, particularly for pregnant women and nursing mothers.

Among the key strategies for malaria prevention is the use of Long-Lasting Insecticide-Treated Nets (LLITNs). LLITNs are factory-treated mosquito nets designed to maintain their insecticidal efficacy for at least 20 WHO-standard washes or three years of use under field conditions (Sonibare et al., 2020). They are the preferred method of insecticide-treated nets in public health programs due to their effectiveness and cost-efficiency, especially when provided free of charge to populations at risk (Ayiisi, 2017; Goshu & Yitayew, 2019). LLITNs have been shown to significantly reduce parasitaemia, anaemia, stillbirths, and improve birth weight outcomes among pregnant women, underscoring their public health importance (Gbenga-Epebinu et al., 2023).

Despite widespread awareness campaigns and distribution programs, utilization of LLITNs among pregnant women remains suboptimal. Studies have identified several barriers to consistent use, including discomfort due to heat, unpleasant odor, difficulty in hanging the nets, perceived seasonal risk, and lack of access during free distribution campaigns (Manu et al., 2017; Chidebe et al., 2020). Socio-demographic factors such as education level, parity, marital status, social class, and place of residence also influence net usage, with rural residents and less-educated women often demonstrating lower utilization rates. Additionally, limited knowledge regarding malaria transmission, prevention, and the correct use of LLITNs contributes to inadequate use, even among women who own nets (Sonibare et al., 2020).

Empirical evidence from various studies highlights both high awareness and low utilization patterns of LLITNs. In Ghana, Asumah (2021) found that although 99.7% of pregnant women were aware of mosquito nets, actual usage was affected by factors such as cost, inadequate public education, and access difficulties. Similarly, Anikwe (2021) reported that while over 90% of pregnant women in Abakaliki, Nigeria, were aware of LLITNs, only 37.5% reported using them consistently, with discomfort and chemical concerns cited as key deterrents. In Osun State, Nigeria, Sonibare et al. (2020) demonstrated that knowledge levels about LLITNs were low prior to intervention but could be significantly improved through health education. Likewise, studies in Enugu Urban indicated that although 90% of pregnant women had adequate knowledge of ITN use, consistent use was influenced by age, education, marital

status, and number of children (Ilo et al., 2020). These findings suggest that knowledge alone does not guarantee consistent utilization; behavioral, social, and structural factors must also be addressed.

The persistent high incidence of malaria among pregnant women and nursing mothers in endemic regions like Ado-Ekiti, Ekiti State, underscores the need for targeted interventions that promote both acceptance and effective use of LLITNs. Limited awareness, socio-cultural beliefs, perceived discomfort, and accessibility challenges remain barriers that hinder optimal coverage and undermine national malaria prevention efforts (**Gbenga-Epebinu,** et al., 2023; Manu et al., 2017). Given that maternal and neonatal health outcomes are directly influenced by malaria prevention practices, understanding the knowledge, attitudes, and utilization patterns of LLITNs among this vulnerable population is critical for public health planning and intervention. Therefore, this study seeks to assess the acceptance and utilization of LLITNs among pregnant women and nursing mothers in Ado-Ekiti, with the aim of identifying barriers to usage, evaluating awareness levels, and providing evidence-based recommendations to enhance malaria prevention efforts in the community. By focusing on this high-risk population, the study contributes to the broader goal of reducing malaria-related morbidity and mortality among mothers and infants in Nigeria.

The aim of this study is to assess the knowledge, attitude and use of long lasting insecticide treated nets among pregnant women and nursing mothers in Ado-Ekiti, Ekiti State. The purposes were to:

1. assess the level of knowledge of pregnant women and nursing mothers on the use of LLITNs;
2. determine the attitude of pregnant women and nursing mothers toward the use of LLITNs;
3. determine the utilization rate of LLITNs among pregnant women and nursing mothers; and
4. identify the perceived barriers and enablers to the use of LLITNs among pregnant women and nursing mothers.

Methods and Materials

The study employed a descriptive cross-sectional design to assess the acceptance and utilization of long-lasting insecticide-treated nets among pregnant women and nursing mothers in Ado-Ekiti, Ekiti State. This design was chosen to provide a snapshot of the population at a specific point in time, allowing for the measurement of the levels of knowledge, attitudes, and usage patterns of LLITNs among the target group. The study focused on pregnant women attending antenatal clinics and nursing mothers in two primary healthcare facilities, Oke Ila Health Center and Okesa Health Center. This approach facilitated the collection of data from individuals who were directly exposed to malaria prevention programs and interventions, making it possible to evaluate both ownership and practical use of LLITNs within the context of maternal and child health services.

The target population consisted of all pregnant women attending antenatal clinics and nursing mothers at the two selected health centers. Monthly attendance records indicated an average of 197 women at Oke Ila Health Center and 111 women at Okesa Health Center. Using Cochran's formula at a 95% confidence level, the calculated sample size was 216, and after adjusting for a 10% attrition rate, the final sample size was 237. Participants were selected using a simple random sampling technique, ensuring that every eligible individual had an equal chance of inclusion. This method enabled the researcher to access respondents efficiently and reduced potential selection bias. Data were collected using a standardized, self-

administered questionnaire adapted from previous studies and designed to capture demographic information, knowledge about LLITNs, attitudes toward their use, actual utilization practices, and perceived barriers or facilitators to usage. Prior to data collection, the instrument was reviewed and validated by the project supervisor, ensuring content and construct validity, while reliability was confirmed through a pilot study with 10% of the sample, yielding a Cronbach's alpha of 0.821.

Data collection involved distributing the questionnaires in person to participants who met the inclusion criteria and provided consent. Letters of introduction were obtained from the selected health centers, and each respondent received an explanation of the study objectives, the importance of honest responses, and assurance of confidentiality. Respondents completed the questionnaires on-site, and the completed forms were retrieved immediately to ensure accuracy and completeness. Data collection spanned four weeks to allow full participation from the selected sample. The collected data were analyzed using the Statistical Package for Social Sciences (SPSS) version 26. Descriptive statistics, including frequencies, percentages, and means, were computed to summarize the demographic characteristics, knowledge, attitudes, and utilization patterns. Findings were presented in tables and charts to facilitate interpretation, with results used to draw conclusions and make recommendations regarding the acceptance and utilization of LLITNs among pregnant women and nursing mothers in Ado-Ekiti.

Results

Table 1: Socio-Demographic Characteristics of the respondents

Variables	Characteristics	Frequency (n= 237)	Percentage (%)
Age	18 – 24	42	17.7
	25 – 31	104	43.9
	32 – 38	67	28.3
	39 - 45	24	10.1
Parity	0	22	9.3
	1	67	28.3
	2	88	37.1
	3	53	22.4
	4	7	3.0
Marital status	Single	51	21.5
	Married	186	78.5
Level of education	No formal education	6	2.5
	Primary	66	27.8
	Secondary	57	24.1
	Tertiary	108	45.6
Residence	Rural	94	39.7
	Urban	143	60.3
Ethnicity	Yoruba	147	62.0
	Igbo	50	21.1
	Hausa	2	0.8
	Others	38	16.0
Religion	Christian	193	81.4
	Muslim	44	18.6

Occupation	Civil servant	96	40.5
	Trader	95	40.1
	Student	40	16.9
	Housewife	6	2.5
Husband's Occupation	Skilled	155	65.4
	Semi-skilled	70	29.5
	Non- skilled	12	5.1

Table 1 depicts the sociodemographic data of the respondents. The mean age of the respondents was 30.03 ± 5.80 years and majority age range were 25 - 31 years (43.9%). About one-third, 37.1% parity was 3 while 28.3% were one. Majority of the respondents, 78.5% were married and 21.5% were single. About 45.6% attained tertiary education level was tertiary, 27.8% attained primary education, 24.1% attained secondary education and 2.5% had no formal education. More than half, 60.3% resides in the urban area while 39.7% resides in rural area. About two-third, 62.0% were from Yoruba tribe, 21.1% were from Igbo tribe, 0.8% were from Hausa tribe and 16.0% were from other tribes. Most of the respondents, 81.4% were Christians while 18.6% were practicing Islam. Less than half, 40.5% were civil servant, 40.1% were traders, 16.9% were students and 2.5% were housewives.

Table 2: Level of knowledge on the use of long lasting insecticide treated nets

| Variables	Characteristics	Frequency (n = 237)	Percentage (%)
Are you aware of long-lasting insecticide treated nets?	Yes	228	96.2
	No	9	3.8
Do you think mosquitoes can be prevented with the use of LLITNs?	Yes	237	100
	No	0	0
What is the source of information?	Radio	43	18.1
	Television	43	18.1
	Church	9	3.8
	Hospital	59	24.9
	Antenatal clinic	83	35.0
Frequency of use	Always	47	19.8
	Often	78	32.9
	Sometimes	112	47.3
When did you start using LLITNs?	Before pregnancy	188	70.0
	During 1st trimester	18	7.6
	During 2nd trimester	20	8.4
	During 3rd trimester	33	13.9
Pregnant women must sleep under LLITNs?	Yes	203	85.7
	No	34	14.3
LLITNs must be washed frequently	Yes	206	86.9
	No	31	13.1
LLITNs are manufactured with	Yes	223	94.1

insecticides to last longer:	No	14	5.9
Where did you get your LLITN?	Pharmacy	97	40.9
	Public health	28	11.8
	facility	112	47.3
	Free of charge		

Table 2 shows the knowledge on the use of long lasting insecticide treated nets. Most of the respondents, 96.2% are aware of long lasting insecticide treated nets. All the respondents think mosquitoes can be prevented with the use of long lasting insecticide treated nets (100%). Their source of information was from Antenatal clinic (35.0%), Hospital (24.9%), Television (18.1%), Radio (18.1%) and church (3.8%). Majority of the respondents, 70.0% started using long lasting insecticide treated nets before pregnancy, 13.9% started during their 3rd trimester, 8.4% started during 2nd trimester and 7.6% started during 1st trimester. Majority of the respondents, 85.7% knows that pregnant women must sleep under long lasting insecticide treated nets, 86.9% knows that long lasting insecticide treated nets must be washed frequently and 94.1% are aware that long lasting insecticide treated nets are manufactured with insecticide to last longer. About 47.3% got their long lasting insecticide treated nets free of charge, 40.9% got theirs from pharmacy and 11.8% from public health facility.

Table 3 Overall Knowledge of the Respondents

Variables	Frequency	Percentage
Poor	18	7.6
Good	219	92.4
Total	**237**	**100**
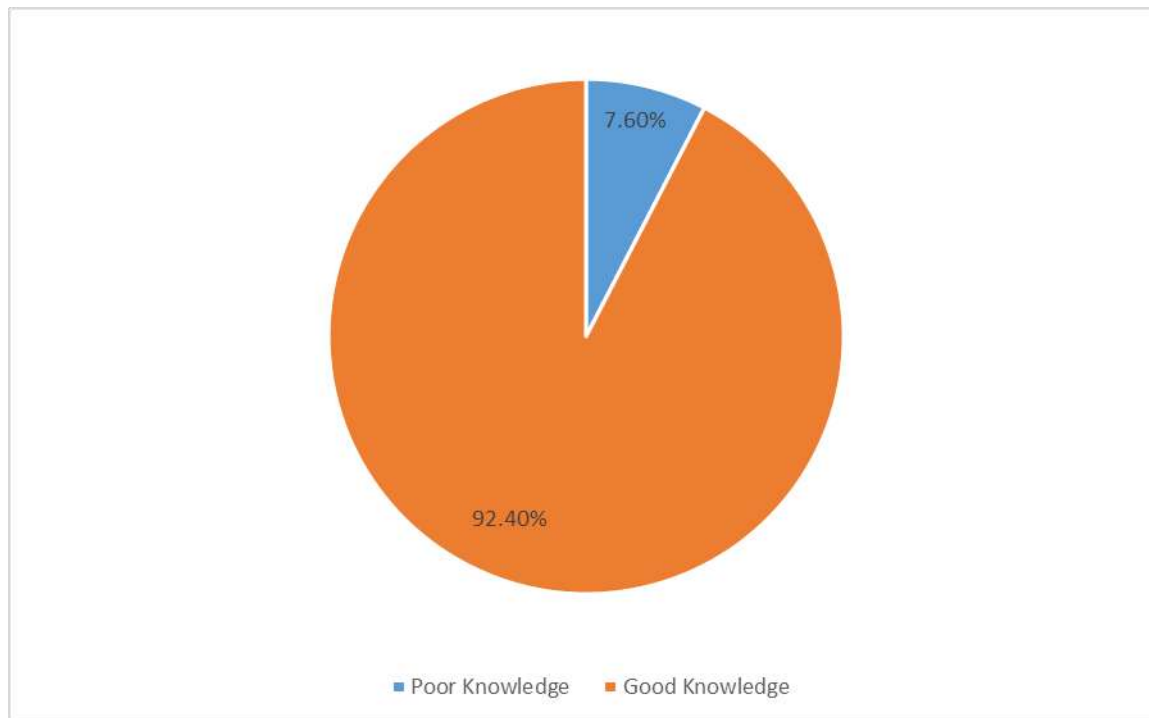
Figure 1: Knowledge on the use of long lasting insecticide treated net

Table 4: Attitude of pregnant women and nursing mothers toward the use of long-lasting insecticide treated nets (LLITNs)

Variables	YES n (%)	NO n (%)
Do you hang it over the windows and doors of your room?	170 (71.7)	67 (28.3)
Do you hang it over the bed while there is no contact with the skin when sleeping?	187 (78.9)	50 (21.1)
Do you hang it at one corner of the room?	168 (70.9)	69 (29.1)
Do you hang it over the bed and sleep under it after tucking it under the bed?	204 (86.1)	33 (13.9)
Do you wash them often?	115 (48.5)	122 (51.5)
Do you use fire near the net?	94 (39.7)	143 (60.3)
Do you dry them in the sun for long?	96 (40.5)	141 (59.5)
Do you retreat the nets with insecticide before the rainy season?	194 (81.9)	43 (18.1)
Do you take proper care of your nets or you just neglect them?	186 (78.5)	51 (21.5)

Table 4 shows the attitude towards the use of long lasting insecticide treated nets among pregnant women. Majority of the respondents, 71.7% hang LLITNs over the windows and doors of your room, 78.9% hang it over the bed while there is no contact with the skin when sleeping and 70.9% hang it at one corner of the room. Less than half, 48.5% wash LLITNs often while 51.5% don't wash them often. More than half of the respondents, 60.3% do not use fire near the net while 40.5% dry LLITNs in the sun for long. Majority of the respondents, 81.9% retreat the nets with insecticide before the rainy season and 78.5% take proper care of your nets.

Table 5: Utilization of long lasting insecticide treated nets (LLINs)

Variables	YES n (%)	NO n (%)
Do you own at least one?	227 (95.8)	10 (4.2)
Were LLITNs readily available for you?	149 (62.9)	88 (37.1)
Did you utilize LLITNS last night?	132 (55.7)	105 (44.3)
Do you only utilize LLITNs during rainy season?	142 (59.9)	95 (40.1)
Do you only utilize LLITNs during dry season?	114 (48.1)	123 (51.9)
Do you utilize LLITNs every night?	147 (62.0)	90 (38.0)

Table 5 describes the utilization of long lasting insecticide treated nets. Most of the respondents, 95.8% own at least one LLITNs. About two-third, 62.9% ticked LLITNs readily available for you while 37.11% ticked NO to were LLITNs readily available for you. More than half, 55.7% utilize LLITNs last night and 59.9% only utilize LLITNs during rainy season. Less than half, 48.1% only utilize LLITNs during dry season. About two-third, 62.0% utilize LLITNs every night.

Table 6: Perceived barriers and enablers to the use of long lasting insecticide treated nets (LLITNs).

Variables	YES n (%)	NO n (%)
It reduces airflow causing excessive heat	150 (63.3)	87 (36.7)
It is too costly; I cannot afford it	94 (39.7)	143 (60.3)
I don't know how to hang it	192 (81.0)	45 (19.0)
I cannot use it when the weather is hot	159 (67.1)	78 (32.9)
The routine of raising it after using it every morning is discouraging	188 (79.3)	49 (20.7)
I did not get it when it was freely distributed	134 (56.5)	103 (43.5)
It traps mosquitoes when tucked in	112 (47.3)	125 (52.7)
It has negative effect to the baby in the womb	88 (37.1)	149 (62.9)
There is no facility to hang it in my room	121 (51.1)	116 (48.9)
It causes breathing difficulties and discomfort	89 (37.6)	148 (62.4)

Table 6 identified the perceived barriers and enablers to the use of long lasting insecticide treated nets. The identified perceived barriers and enablers are I don't know how to hang it (81.0%), the routine of raising it after using it every morning is discouraging (79.3%), I cannot use it when the weather is hot (67.1%), it reduces airflow causing excessive heat (63.3%) and I did not get it when it was freely distributed (56.5%). Other identified perceived barriers and enablers are there is no facility to hang it in my room (51.1%), it traps mosquitoes when tucked in (47.3%) and it is too costly; I cannot afford it (39.7%).

Table 7: Relationship between respondents' profiles and knowledge of LLITNs

Socio-demographic characteristics	Knowledge level		Test of significance	Interpretation
	Poor	Good		
Age				
18 – 24	8	34	Df = 3	
25 – 31	1	103	X^2 = 19.596	Significant
32 – 38	9	58	P= 0.000	
39 – 50	0	24		
Marital status			Df = 1	
Single	11	40	X^2 = 18.080	Significant
Married	7	179	P= 0.000	
Level of education				
No formal	4	2	Df = 3	Significant
education	8	58	X^2 = 38.716	
Primary	5	52	P= 0.000	
Secondary	1	107		
Tertiary				
Ethnicity				
Yoruba	13	134	Df = 3	Not
Igbo	4	46	X^2 = 1.836	significant
Hausa	0	2	P= 0.607	
Others	1	37		

Religion			Df = 1	Not
Christianity	17	176	X^2 = 2.181	significant
Islam	1	43	P= 0.095	

The analysis of the relationship between respondents' socio-demographic characteristics and their knowledge of LLITNs indicates that age, marital status, and level of education were significantly associated with knowledge levels. Specifically, younger respondents (18–24) and older respondents (32–38) showed variation in knowledge, and married participants demonstrated higher knowledge compared to single participants. Additionally, respondents with secondary and tertiary education exhibited greater knowledge of LLITNs than those with no formal or primary education. Conversely, ethnicity and religion did not show a significant relationship with knowledge, indicating that these factors did not influence respondents' understanding of LLITNs in this study. Overall, the findings suggest that demographic factors related to age, marital status, and educational attainment are key determinants of knowledge on LLITNs, while cultural or religious affiliations appear less influential.

Table 8: Relationship between respondents' profiles and attitude towards the use of LLINs.

Socio-demographic characteristics	Attitude		Test of significance	Interpretation
	No	Yes		
Age				
18 – 24	11	31	Df = 3	
25 – 31	19	85	X^2 = 7.224	Significant
32 – 38	13	54	P= 0.010	
39 – 50	0	24		
Marital status			Df = 1	Not
Single	14	37	X^2 = 3.791	Significant
Married	29	157	P= 0.052	
Level of education				
No formal	4	2	Df = 3	Significant
education	15	51	X^2 = 11.899	
Primary	8	49	P= 0.008	
Secondary	16	92		
Tertiary				
Ethnicity				
Yoruba	28	119	Df = 3	Not
Igbo	5	45	X^2 = 4.466	significant
Hausa	0	2	P= 0.215	
Others	10	28		
Religion			Df = 1	
Christianity	26	167	X^2 = 15.278	Significant
Islam	17	27	P= 0.000	

The analysis of the relationship between respondents' socio-demographic characteristics and their attitude towards the use of LLINs revealed that age, level of education, and religion were significantly associated with attitude, while marital status and ethnicity were not. Specifically,

the chi-square test indicated a significant relationship between age and attitude (χ^2 = 7.224, df = 3, p = 0.010), showing that older respondents were more likely to have a positive attitude towards LLIN use. Similarly, educational level significantly influenced attitude (χ^2 = 11.899, df = 3, p = 0.008), with respondents possessing higher education demonstrating more positive attitudes. Religious affiliation also showed a strong association (χ^2 = 15.278, df = 1, p = 0.000), suggesting that respondents' attitudes varied by religion. In contrast, marital status (χ^2 = 3.791, df = 1, p = 0.052) and ethnicity (χ^2 = 4.466, df = 3, p = 0.215) did not significantly influence attitude, indicating that being single or married, or belonging to a particular ethnic group, did not meaningfully affect respondents' perspectives on LLIN use. Overall, the findings suggest that age, education, and religion are important determinants of attitudes towards malaria prevention through LLINs in this population.

Table 9: Relationship between respondents' profiles and perceived barriers and enablers to the use of LLITNs

Socio-demographic characteristics	Perceived barriers and enablers to use		Test of significance	Interpretation
	No	Yes		
Age				
18 – 24	18	24	Df = 3	
25 – 31	44	60	X^2 = 8.573	Not
32 – 38	22	45	P= 0.036	Significant
39 – 50	3	21		
Marital status			Df = 1	
Single	12	39	X^2 = 4.858	Significant
Married	75	111	P= 0.028	
Level of education				
No formal	0	6	Df = 3	Significant
education	7	59	X^2 = 32.993	
Primary	26	31	P= 0.000	
Secondary	54	54		
Tertiary				
Ethnicity				
Yoruba	44	103	Df = 3	Significant
Igbo	17	33	X^2 = 20.672	
Hausa	0	2	P= 0.000	
Others	26	12		
Religion			Df = 1	
Christianity	70	123	X^2 = 0.086	Not
Islam	17	27	P= 0.769	Significant

The analysis of the relationship between respondents' socio-demographic characteristics and perceived barriers and enablers to the use of LLITNs revealed that age and religion were not significantly associated with respondents' perceptions (P = 0.036 and P = 0.769, respectively), indicating that these factors did not strongly influence how barriers or facilitators to LLITN use were viewed. In contrast, marital status, level of education, and ethnicity showed statistically significant relationships with perceived barriers and enablers (P = 0.028, P = 0.000, and P = 0.000, respectively), suggesting that married respondents, those with higher educational attainment, and particular ethnic groups were more likely to identify or experience factors that either hindered or facilitated LLITN utilization. These findings imply

that social and educational factors, as well as cultural background, play a crucial role in shaping perceptions toward LLITN use, whereas age and religious affiliation appear less influential.

Discussion of Findings

The findings of this study revealed a high level of knowledge among pregnant women and nursing mothers regarding the use of long-lasting insecticide-treated nets (LLITNs). Most respondents (96.2%) were aware of LLITNs and recognized their role in preventing mosquito bites and malaria, reflecting similar patterns observed in previous studies where awareness was nearly universal (Asumah, 2021). Sources of information varied, with the majority obtaining knowledge from antenatal clinics (35%), hospitals (24.9%), television (18.1%), and radio (18.1%), while a small proportion received information from church (3.8%), which contrasts with other reports where radio and television were the predominant sources (Ilo et al., 2020). The majority of respondents (70%) had started using LLITNs even before pregnancy, while others began during the different trimesters, aligning with earlier findings that most women commence net use prior to conception or early in pregnancy (Ilo et al., 2020 Amasie et al., 2018). Additionally, respondents demonstrated awareness of proper practices, with 85.7% knowing that pregnant women must sleep under LLITNs, 86.9% recognizing the need for regular washing, and 94.1% understanding that the nets are manufactured to last longer. Distribution patterns showed that 47.3% obtained their nets free of charge, 40.9% purchased them from pharmacies, and 11.8% received them from public health facilities, consistent with prior studies highlighting health facilities as major sources of LLITNs (Asumah, 2021).

The study also explored attitudes toward LLITN use, showing that the majority of respondents practiced proper installation and handling. About 78.9% hung the nets over beds without skin contact during sleep, 71.7% over windows and doors, and 70.9% in one corner of the room, supporting findings from Sonibare et al. (2020) regarding correct net placement. However, less than half (48.5%) washed LLITNs regularly, with 51.5% not adhering to frequent washing, contrasting with previous reports where only 18.4% washed nets when dirty (Ilo et al., 2020). Proper care measures were largely observed, with 60.3% avoiding fire near nets, 40.5% refraining from prolonged sun drying, and a majority (81.9%) retreating nets with insecticide before the rainy season, similar to findings where most participants retreated nets seasonally (Okafor et al., 2019). Furthermore, 78.5% reported taking proper care of the nets, indicating a generally positive attitude toward maintenance and usability.

Utilization patterns indicated that LLITN ownership and usage were high among respondents, with 95.8% owning at least one net, reflecting trends reported in other studies (Sonibare et al., 2020). While two-thirds (62%) reported using nets every night, more than half (55.7%) had used LLITNs the previous night, and 59.9% reported using them primarily during the rainy season, with 48.1% using them during the dry season. These patterns mirror previous research where consistent nightly usage was observed but often influenced by seasonal perceptions of mosquito risk (Ilo et al., 2020). Availability was generally satisfactory, with 62.9% indicating that LLITNs were readily accessible, although 37.1% reported limited access. Overall, the findings suggest that while ownership is high, utilization remains variable, influenced by both convenience and perception of mosquito risk.

Several perceived barriers and enablers influenced LLITN use among respondents. Major barriers included difficulty in hanging the nets (81%), discouragement from raising them daily (79.3%), discomfort during hot weather (67.1%), reduced airflow causing heat (63.3%), and missed opportunity during free distributions (56.5%). Other reported barriers were lack

of hanging facilities (51.1%), improper trapping of mosquitoes when tucked in (47.3%), and cost constraints (39.7%). These findings align with previous studies reporting affordability, inadequate public education, and practical challenges as significant deterrents to net use (Asumah, 2021). Collectively, these results indicate that although knowledge and ownership of LLITNs are high, proper utilization is influenced by both structural and personal factors, highlighting the need for targeted interventions to address barriers, reinforce positive attitudes, and enhance consistent use of LLITNs among pregnant women and nursing mothers.

Conclusion

The study successfully assessed the knowledge, attitudes, and utilization of long-lasting insecticide-treated nets among pregnant women and nursing mothers in Ado-Ekiti, Ekiti State. Findings revealed that respondents demonstrated good knowledge of LLITNs and their proper use, while patterns of utilization and the perceived barriers and enablers to their use were clearly identified. The study highlights that enhancing maternal awareness and understanding of the importance of LLITNs can significantly contribute to increased and consistent utilization, ultimately supporting malaria prevention efforts among pregnant women and nursing mothers.

Recommendations

1. Health facilities should implement regular education and awareness campaigns targeting pregnant women and nursing mothers to improve understanding of the benefits and proper use of LLITNs.

2. Public health authorities should develop strategies to mitigate common barriers, such as providing guidance on proper net installation, minimizing discomfort during hot weather, and ensuring easy access to nets.

3. Government and non-governmental organizations should expand free or subsidized distribution of LLITNs, especially in maternal and child health clinics, to ensure all pregnant women and nursing mothers can obtain them.

4. Health workers should provide practical demonstrations on the correct care, maintenance, and seasonal retreatment of LLITNs to encourage consistent nightly use and prolong net effectiveness.

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