

OWNERSHIP AND UTILIZATION OF LONG-LASTING INSECTICIDE-TREATED NETS, IN NNEMERE MPAM AUTONOMOUS COMMUNITY IN AHIAZU MBAISE LOCAL GOVERNMENT AREA, IMO STATE

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ABSTRACT

Mosquito-borne diseases constitute a serious public health problem in Nigeria despite ongoing control efforts. The use of long-lasting insecticide-treated nets (LLINs) has been proven to be an effective preventive tool in controlling malaria and other mosquito- and insect-borne diseases. However, LLIN ownership and utilization remain very low. This study assessed the ownership and utilization of LLINs in Nnemere Mpam Autonomous Community, Ahiazu Mbaise L.G.A, Imo State. A cross-sectional descriptive research design was adopted, and a well-structured, self- and interviewer-administered questionnaire was used for data collection. Data were analyzed using descriptive and inferential statistics. Among the 262 households sampled, female respondents were the majority, accounting for 166 (63.5%). The most represented age group was 51 years and above, with 80 respondents (30.5%). The highest educational qualification was secondary school, with 187 respondents (71.4%). Regarding knowledge of LLINs, 259 respondents (98.9%) had heard about and were familiar with LLINs, while 3 (1.1%) had never heard of them. Despite this high awareness, only 21 households (8.0%) reported owning an LLIN, while 241 households (92.0%) did not. Furthermore, only 12 respondents (4.6%) reported regularly using LLINs. The study highlights a very low ownership and utilization of LLINs. The major barrier to ownership and usage, cited by 233 respondents (88.9%), was hot weather, while all respondents reported that LLINs had not been distributed in the community since the last free distribution. This underscores the need for continuous and sustained LLIN distribution by the government and non-governmental agencies to improve accessibility and utilization, as previous distributions were the primary means through which community members acquired LLINs.

BACKGROUND OF THE STUDY

Long-lasting insecticide-treated nets (LLINs) are a form of personal protection that has been shown to reduce malaria-related illness, severe disease, and mortality, as well as other mosquito-borne diseases such as dengue fever, yellow fever, Zika virus, lymphatic filariasis, Chagas disease, and various forms of encephalitis, including the West Nile virus. These diseases remain a significant public health concern, particularly in endemic regions such as Africa. According to the Centers for Disease Control and Prevention (CDC), community-wide trials in several African settings have demonstrated that the use of LLINs can reduce the mortality rate of children under five years by approximately 20% (CDC, 2019). LLINs are treated with insecticides that not only kill mosquitoes and other insects but also repel them, thereby reducing the number of mosquitoes that enter households and attempt to feed on people indoors. Additionally, when LLINs achieve high community coverage, they contribute to a reduction in mosquito populations and their lifespan, thereby lowering the transmission of mosquito-borne diseases (Anikwe &

Okorochukwu, 2020). The effectiveness of LLINs in preventing human contact with mosquitoes makes them a crucial intervention in malaria and other vector-borne disease prevention programs. Studies have shown that LLINs significantly reduce severe disease due to malaria and other insect vector-related diseases, leading to an approximate 20% reduction in all-cause mortality (World Health Organization, 2018).

Despite the effectiveness of LLINs, recent distribution efforts have been inadequate, with only a few local government areas benefiting from targeted campaigns in various states. Since 2009, Nigeria has implemented a nationwide strategy to distribute two LLINs per household through a series of stand-alone campaigns aimed at achieving universal coverage. In 2010, states supported by the World Bank Booster Program—such as Kano, Jigawa, Bauchi, Gombe, Anambra, Akwa Ibom, Imo, and Rivers—conducted LLIN distribution campaigns in which health workers provided free insecticide-treated nets to households. The primary goal was to promote LLIN utilization, particularly among

pregnant women and children under five. According to the Federal Ministry of Health, 57.7 million LLINs were distributed between 2009 and 2013 across various Nigerian states, covering 90.2% of the national target. This effort represented significant progress in improving LLIN ownership and utilization in the country (Irechukwu, 2020).

METHODOLOGY

This study adopted a cross-sectional descriptive research design. A well-structured questionnaire was developed based on the study objectives to assess the level of LLIN ownership and utilization in Nnemere Mpam Autonomous Community, Ahiazu Mbaize Local Government Area.

Sampling Technique

A stratified sampling technique was employed to ensure equal representation from the three villages. The total

sample size of 262 households was proportionally divided among the villages. A systematic sampling technique was then used to select households within each village.

Proportionate Stratified Sampling Calculation

The number of households sampled per village was determined using proportional allocation: thus, 87 households were sampled from each of the three villages.

Ethical Considerations

Before conducting the study, an introduction letter and ethical clearance were obtained from the university's Ethical Clearance Committee. The purpose of the research was explained to each respondent, and verbal informed consent was obtained before their participation in the study.

Table 1: Socio-Demographic Characteristics of Respondents.

Variable	Category	Frequency (n)	Percentage (%)
Age Group (Years)	18–25	20	7.6%
	26–35	75	28.6%
	36–45	80	30.5%
	46–55	50	19.1%
	56 and above	37	14.1%
Total		262	100%
Gender	Male	96	36.6%
	Female	166	63.4%
Total		262	100%
Marital Status	Single	110	42.0%
	Married	100	38.2%
	Divorced	30	11.5%
	Widowed	22	8.3%
Total		262	100%
Educational Level	No Formal Education	25	9.5%
	Primary	65	24.8%
	Secondary	95	36.3%
	Tertiary	77	29.4%
Total		262	100%
Occupation	Unemployed	35	13.4%
	Farmer	90	34.4%
	Trader	55	21.0%
	Civil Servant	60	22.9%
	Others	22	8.3%
Total		262	100%

The study involved a total of 262 respondents, with the majority being female (63.4%), while males accounted for 36.6%. This suggests that more females participated in the study compared to males. Age Distribution: The most represented age group was 36–45 years (30.5%), followed closely by 26–35 years (28.6%), indicating that most respondents were within their economically active years. Respondents aged 46–55 years made up 19.1%, while those 56 years and above constituted 14.1%, and the youngest group (18–25 years) accounted for only 7.6%. Marital Status: A significant proportion of

respondents were single (42.0%), while 38.2% were married. A smaller percentage was divorced (11.5%), and 8.3% were widowed, suggesting a mix of family structures among the study population. Educational Level: Regarding education, 36.3% of respondents had a secondary education, making it the most common educational level. About 29.4% attained tertiary education, while 24.8% had only a primary education. A smaller proportion (9.5%) had no formal education, which may indicate potential barriers to accessing health-related information. Occupation: The largest

occupational group was farmers (34.4%), reflecting an agrarian-based economy in the study area. Civil servants comprised 22.9%, while traders accounted for 21.0%. The unemployed made up 13.4%, and 8.3% of

respondents were engaged in other occupations. This distribution suggests that a significant portion of the population relies on agriculture and trading for livelihood.

Table 2: Number of Occupants per Room and Housing Pattern.

Variable	Frequency (n = 262)	Percentage (%)
Number of Occupants per Room		
One Person	64	24.4%
Two Persons	101	38.5%
Three Persons	50	19.1%
Four Persons	33	12.6%
Five or More Persons	14	5.4%
Housing Pattern		
Single Room	98	37.4%
One-Bedroom Apartment	72	27.5%
Two-Bedroom Apartment	57	21.8%
Three or More Bedrooms	35	13.4%

The distribution of respondents based on the number of occupants per room indicates that 38.5% of the respondents lived in a room shared by two people, which was the most common arrangement. A significant proportion (24.4%) had single occupancy, which suggests better living conditions in terms of personal space. However, 19.1% of the respondents lived in rooms shared by three people, while 12.6% lived in rooms with four occupants. A smaller proportion (5.4%) lived in overcrowded conditions with five or more persons per room, which could contribute to poor ventilation and increased risk of disease transmission.

rooms, which may indicate economic constraints and limited housing space. 27.5% of respondents lived in one-bedroom apartments, while 21.8% resided in two-bedroom apartments. A smaller proportion (13.4%) had more spacious housing, living in three or more-bedroom apartments, suggesting better socioeconomic status.

The overall trend suggests that a considerable portion of the population resides in small living spaces, which may contribute to overcrowding, reduced privacy, and increased health risks such as poor ventilation and higher exposure to vector-borne diseases like malaria.

Housing Pattern

The findings on the housing pattern reveal that the highest percentage (37.4%) of respondents lived in single

Table 3: Ownership and Utilization of Long-Lasting Insecticide-Treated Nets (LLINs).

Variable	Frequency (N=262)	Percentage (%)
Have you heard of LLINs before?		
Yes	259	98.9
No	3	1.1
Total	262	100
Do you own an LLIN?		
Yes	21	8.0
No	241	92.0
Total	262	100
If you own an LLIN, why do you own it?		
Because I was told that it prevents malaria	252	96.2
Because everybody is using it	10	3.8
Total	262	100
If you do not own an LLIN, why not?		
Because I don't have mosquitoes in my house	2	0.7
Because it has not been shared again after the last time it was shared in the health center	221	84.4
Because I don't like using it	27	10.3
Because I don't know where to buy it	12	4.6
Total	262	100
Do you sleep under an LLIN?		

Yes	12	4.6
No	250	95.4
Total	262	100
Did you sleep under an LLIN last night?		
Yes	10	3.8
No	252	96.2
Total	262	100
How often do you sleep under an LLIN?		
Every night	10	3.8
Once in a week	22	8.5
During Christmas only	36	13.7
During rainy season	83	31.7
Whenever I feel like	111	42.3
Total	262	100
Do you sleep under the LLIN with someone else?		
Yes	237	90.5
No	25	9.5
Total	262	100
Have you heard of any disease that can be prevented with LLINs?		
Yes	251	95.8
No	11	4.2
Total	262	100
Factors affecting the use of LLINs		
Room structure	2	0.8
Hot weather	233	88.9
Not knowing where to purchase LLINs	27	10.3
Total	262	100
Possible solutions to increase LLIN ownership and utilization		
Education on LLINs	22	8.4
Free distribution of LLINs	240	91.6
Personal purchase of LLINs	0	0.0
Total	262	100

The data reveals a high level of awareness regarding long-lasting insecticide-treated nets (LLINs) among the respondents, with 98.9% (259) having heard about them, while only 1.1% (3) reported being unaware. Despite this high awareness, ownership of LLINs remains significantly low, as only 8.0% (21) of respondents own a net, whereas 92.0% (241) do not. Among those who own an LLIN, the majority (96.2%) acquired it because they were informed that it helps prevent malaria, while a small proportion (3.8%) reported owning one simply because others were using it. Conversely, for those who do not own an LLIN, the predominant reason (84.4%) was that nets had not been distributed again since the last distribution at the health center. Additionally, 10.3% do not own one because they dislike using it, 4.6% do not know where to buy one, and a negligible 0.7% believe that mosquitoes are not a problem in their homes. Utilization of LLINs is also alarmingly low, with only 4.6% (12) of respondents reporting that they sleep under an LLIN, while 95.4% (250) do not. Even more concerning, only 3.8% (10) of respondents reported using an LLIN the previous night, compared to 96.2% (252) who did not. Regarding frequency of use, 42.3%

(111) use LLINs only when they feel like it, 31.7% (83) use them only during the rainy season, 13.7% (36) use them only during Christmas, 8.5% (22) use them once a week, and only 3.8% (10) use them every night. Among those who use LLINs, 90.5% (237) share their net with someone else, while 9.5% (25) sleep under it alone. When asked about their knowledge of the benefits of LLINs, 95.8% (251) acknowledged knowing of a disease that can be prevented using LLINs, while 4.2% (11) were unaware.

The primary factor discouraging LLIN use is hot weather, cited by 88.9% (233) of respondents. Additionally, 10.3% (27) mentioned that they do not know where to purchase an LLIN, and a small fraction (0.8%) reported that their room structure prevents its use. To improve the ownership and utilization of LLINs, the most preferred solution, as indicated by 91.6% (240) of respondents, is free distribution of nets. A smaller proportion (8.4%) suggested that education on the benefits of LLINs could enhance usage, while none of the respondents considered personal purchase as a viable solution.

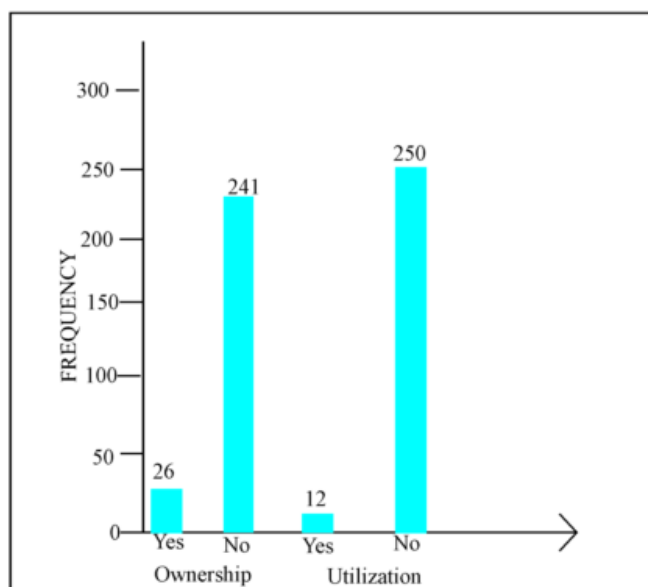


Figure 1: Ownership and Utilization of Long Lasting Insecticide-treated Nets in Nnemere Mpam.

The chart highlights that even though a small number of respondents own LLINs, their utilization is even lower. This suggests that factors such as hot weather, lack of access to LLINs, or personal preferences could be affecting net usage. The data reinforces the need for improved distribution programs and health education to enhance both ownership and regular use of LLINs for malaria prevention.

DISCUSSION

Ownership of Long-Lasting Insecticide-Treated Nets (LLINs)

The study revealed that only 21 households (8.0%) in Nnemere Mpam Autonomous Community owned long-lasting insecticide-treated nets (LLINs), while 241 households (92.0%) did not. Respondents who previously owned LLINs reported that their nets were damaged and had not been replaced, as they relied on government distribution programs to acquire them. This low ownership rate is significantly lower than findings from other studies. For instance, Akpofi (2019) conducted a study in the highlands of Western Kenya and found that LLIN ownership among caregivers of children under five was 73.8%. Similarly, Nyavor and Hohoe (2018) reported LLIN ownership rates of 81.3% and 84% among pregnant women in Central Uganda. However, our findings align with a study by Chinyere (2020) in Ihitteuboma Local Government Area of Imo State, which also reported low LLIN ownership among pregnant women. The disparity in ownership levels may be attributed to differences in LLIN distribution strategies across regions. While government and international health programs have actively provided free LLINs in Kenya and Uganda, the study community in Nnemere Mpam has not received recent distributions, leading to a decline in ownership. Additionally, lack of affordable access to LLINs through local markets further exacerbates the problem.

Utilization of Long-Lasting Insecticide-Treated Nets (LLINs)

The study found that only 12 households (4.6%) used LLINs, while 250 households (95.4%) did not. This indicates that even among the small proportion of households that own LLINs, actual usage remains significantly low. Factors contributing to low utilization include heat discomfort, small room sizes, large family sizes sharing a single room, and alternative uses of LLINs, such as covering windows, doors, and even using them as blankets or bed covers. This utilization rate is considerably lower than those reported in other studies. For instance, Anyanwu (2019) found that 50.9% of children aged 0–5 years in Abakaliki, Ebonyi State, slept under an LLIN the previous night. Similarly, Chikere (2020) reported a utilization rate of 64.1% among women of childbearing age in Umuahia, Abia State. The contrast suggests that targeted interventions in these other regions such as increased awareness, accessibility, and government-driven distribution programs may have positively influenced LLIN utilization.

Factors Affecting Utilization of LLINs

Several factors were identified as barriers to LLIN utilization in the community which include hot weather conditions as reported by 233 respondents (88.9%) as a major reason for non-use. Room structure and overcrowding as mentioned by 2 respondents (0.8%), highlighting the challenge of hanging and properly using LLINs in small or congested living spaces. Lack of access to LLINs was another factor reported by 27 respondents (10.3%), indicating that many households do not know where to buy new LLINs after their previous ones were damaged. These findings are consistent with those of Oluwatobilabo (2020), who reported that 84.3% of households in Osun State cited hot weather as a significant barrier to LLIN utilization. The similarity

suggests that environmental factors play a crucial role in LLIN adoption across different regions.

CONCLUSION

The findings of this study highlight an urgent need for government and health agencies to prioritize LLIN distribution and awareness programs in Nnemere Mpam Autonomous Community. The extremely low ownership and utilization rates expose the community to a high risk of mosquito-borne diseases, particularly malaria.

To address this challenge, the following recommendations are proposed

1. Reintroduce Free LLIN Distribution Programs: Government agencies should conduct periodic distributions to replenish old and damaged nets.
2. Increase Public Awareness on LLIN Usage: Educational campaigns should address misconceptions and provide practical guidance on overcoming barriers such as heat discomfort.
3. Improve Accessibility through Subsidized Sales: LLINs should be made available at affordable prices in local markets and health centers to encourage self-purchase.

By implementing these strategies, the ownership and utilization of LLINs in the community can improve, leading to better malaria prevention and overall health outcomes.

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