British Journal of Healthcare and Medical Research - Vol. 12, No. 02
Publication Date: April 25, 2025
DOI:10.14738/bjhr.1202.18531.
Obisike, V. U., Dike, M. C., & Ikem-Chima, C. (2025). Ownership and Utilization of Long-Lasting Insecticide Treated Nets in Woji Obio Akpor L.G.A Rivers State. British Journal of Healthcare and Medical Research, Vol - 12(02). 260-267.

Ownership and Utilization of Long-Lasting Insecticide Treated Nets in Woji Obio Akpor L.G.A Rivers State

Obisike, Victor Ugochukwu
Department of Pubic Health Department,
Abia State University, Uturu, Nigeria

Dike, Maduabuchi Chizuruoke
Department of Animal and Environmental Biology,
Abia State University, Uturu, Nigeria

Ikem-Chima, Chinwenmeri
Department of Pubic Health Department,
Abia State University, Uturu, Nigeria

ABSTRACT

Malaria is a life-threatening disease caused by parasites that are transmitted to people through the bites of infected female Anopheles mosquitoes. It is preventable and curable, however, efforts made to eradicate malaria in Nigeria totally have proved abortive. The study aims at determining the ownership and utilization of long-lasting insecticide treated nets in Woji Obio Akpo L.G.A in Rivers State. The study adopted a cross-sectional descriptive research design. Data for this study was collected from the respondents through the use of questionnaires. Questionnaires were shared to all 360 respondents which were randomly selected using Bourley Proportion Allocation formula, which determined number of respondents per household in each village, and field surveys through responses to questions in the questionnaire served as the main source of primary data for this study. From the tables, 276 of 76.7% have idea about treated nets. Moreso, only 174 of 48.3% have nets and out of that number, only 154 (94.4%) use nets. In conclusion, Ownership and utilization of long-lasting insecticide-treated nets (LLINs) play a crucial role in preventing malaria and reducing the burden of the disease. The widespread distribution of LLINs has been successful in increasing their ownership and availability, particularly in malaria-endemic regions. However, the challenge lies in ensuring optimal utilization and consistent use over time.

Keywords: Malaria, Long Lasting Insecticide-treated Nets (LLINs), ownership, utilization, and risk factors.

INTRODUCTION

Malaria is an acute febrile illness caused by Plasmodium parasites, which are spread to people through the bites of infected female Anopheles mosquitoes. It is preventable and curable. Malaria has a worldwide distribution, affecting people of all ages, with an enormous burden amounting to 300-500 million clinical cases per year (WHO, 2021). Globally ten new cases of malaria occur every second, which is a major public health problem in the tropics where about 50% of the world population lives. It is responsible for more than a million deaths each year, of

which 950% occur in sub-Saharan Africa (WHO, 2021). Malaria is caused by four different protozoa in the plasmodium genus: either *Plasmodium vivax*, which is more prevalent in low endemic areas, *P. ovale, P. malaria*, and *P. falciparum*, the most dangerous of the four. The *P. falciparum* has a life cycle in the mosquito vector and also in the human host. The *Anophelesgambiae* mosquito is the vector responsible for the transmission of malaria. The prevalence of malaria is dependent on the abundance of the female anopheles species, the propensity of the mosquito to bite, the rate at which it bites, its longevity and the rate of development of the plasmodium parasite inside the mosquito. When the female mosquito bites and sucks the blood of a person infected with malaria parasites she becomes infected; she then transmits the parasites to the next human host she bites. Malaria incubates in the human host for about eight to ten days. (WHO, 2020). The spread of malaria needs conditions favorable to the survival of the mosquito and the plasmodium parasite. Temperatures of approximately 70 - 90 degrees Fahrenheit and a relative humidity of at least 60 percent are most conducive for the mosquito (WHO, 2020).

Nigeria, according to the National Malaria Strategic Plan (2014-2020), malaria is responsible for 60% of outpatient visits to health facilities, 30% of childhood death, 25% of death in children below one year of age, and 11% of maternal death (Haggaz & Radi, 2018). Synergetic efforts through vector surveillance approach, educational campaigns, and wide distribution of long-lasting insecticide nets (LLINs) have successfully reduced malaria burden in endemic regions. Among several interventions, long-lasting insecticide treated nets (LLINs) have played an important role in reducing the global malaria burden since 2000 (Kilian *et al*., 2016). Evaluation of LLINs success over years has resulted in treatment modification of nets due to the development of insecticide-resistance by malaria vectors, thereby leading to pyrethroid-PBO nets being given an interim endorsement as a new WHO class of vector control products (WHO, 2020). Although LLINs are a key tool used widely by people at risk of malaria, some communities have not been able to translate the available malaria control interventions to effective opportunities to curtail the disease.

METHODOLOGY

This study adopted a cross-sectional descriptive research design. A well-structured questionnaire was developed considering the objectives of the study which are the specific and measurable steps to meet the survey goals. This research design is aimed at determining the ownership and utilization of long-lasting insecticide treated nets in Woji Obio Akpo L.G.A in Rivers State.

Socio-demographic Characteristics of Respondents

Table 1: Socio-Demographic Characteristics of Respondents (n=360)

Variables	Frequency (n)	Percentage (%)
Sex		
Male	176	48.9
Female	184	51.1
Age (years)		
11-20	302	83.9
21-30	14	3.9
31-40	20	5.5
41-50	24	6.7

51 and above	0	0
Marital Status		
Single	320	88.9
Married	40	11.1
Religion		
Christianity	352	97.8
Muslim	8	2.2
No. of persons in the Household		
1-4	82	17.2
5-9	262	72.8
10-14	16	1.7
Occupation		
Banker	6	1.7
Civil Servant	8	2.2
Doctor	4	1.1
Engineer	10	2.8
Others	332	92.2
Total	360	100

Results from Table 1 showed that most respondents in the study were female with 184 (51.1%) response rates while 176 (48.9%) respondents were male. Out of the 360 respondents, 302 (83.9%) were within the range of 11-20 years, 14 (3.9%) fell within 21-30 age range, 20 (5.5%) were between 31-40 years, 24 (6.7%) belonged to the 41-50 age group, and 0 (0%) were 51 years and above. Regarding marital status, the majority of respondents, 320 (88.9%), were single, while 40 (11.1%) were married. In terms of religious affiliation, 352 (97.8%) respondents were Christians, whereas 8 (2.2%) respondents were Muslims. Based on the number of persons in the household, 82 (17.2%) of the respondents fell under 1-4, 262 (72.8%) were between 5-9 and 16 (1.7%) were between 10-14. Furthermore, 6 (1.7%) were bankers, 8 (2.2%) were civil servants, 4 (1.1%) were doctors, engineers were only 10 (2.8%) and 332 (92.2%) fell under others.

Table 2: Knowledge towards the Usage and ownership of Long-Lasting Insecticide-treated Nets (n=360)

Variables	Frequency (n)	Percentage (%)
Have an idea		
Yes	276	76.7
No	84	23.3
Total	360	100
If yes, how did you know about LLINS		
TV, Media, Internet	56	20.3
Bought/Purchase	102	37.0
Hospitals/Health Centers	69	25.0
School/Office	49	17.8
Total	276	100

The findings shows the Knowledge towards the Usage of Long Lasting Insecticide-Treate**d** and its ownership among residents of Woji community, 276 (76.7%) respondents have an idea about long lasting insecticide treated nets, while 84 (23.3%) don't have idea. Among the respondents that have an idea about LLINs, 56 (20.3%) got to know about it from the Television,

media and internet, 102 (37.0%) bought them, 69 (25.0%) heard about theirs from hospitals and health centers, 49 (17.8%) respondents heard about LLINs from schools and offices.

Table 3: Usage of LLINS

Variables	Frequency	Percentage (%)
Do you have a LLIN		
Yes	174	48.3
No	186	51.7
Total	360	100
If yes, do you use it		
Yes	154	94.4
No	20	5.6
Total	174	100
If yes, do all members use it		
Yes	50	32.5
No	104	67.5
Total	154	100
If yes, how long have you used it		
1-2 years	10	20.0
2-3 years	17	34.0
4years and above	23	46.0
Total	50	100

In Table 3 above, 174 (48.3%) respondents have LLINs while 186 (51.7%) does not have. Furthermore, 154 (94.4%) of the respondents that have LLINs use them while 20 (5.6%) does not have nets. Descriptively, 50 (32.5%) of the respondents that use LLINs agreed that all members of the family use nets while 104 (67.5%) respondents disagreed to it. Concerning how long they have used their long lasting insecticide treated nets, 10 (20.0%) of the respondents that all their family members use LLINs confirmed that they have used their nets for 1-2 years, 17 (34.0%) respondents have used it for 2-3 years while 23 (46.0%) have used it for 4 years and above.

Table 4: Factors that Affect the Ownership and Usage of Long Lasting Insecticide-treated Nets.

Variables	Frequency	Percentage (%)
Changes in the occurrence of malaria		
Yes	147	95.5
No	7	4.5
Total	154	100
Experience reactions caused by the net		
Yes	124	80.5
No	30	19.5
Total	154	100

From the table above, 147 (95.5%) of the respondents that have nets have seen changes in the occurrence of malaria while 7 (4.5%) have not experienced any changes. Out of the total population that use LLINs, only 124 (80.5%) have experience reactions caused by the nets while 30 (19.5%) have not experienced any reactions.

DISCUSSION

This study showed that the greater part of the respondents were females, accounting for 184 (51.1%) of the response rates, while a smaller proportion of respondents were male, with 176 (48.9%) response rates. This is in line with a study by Eze *et al.* (2020) in Nigeria found that female household heads were significantly associated with higher LLIN ownership and utilization rates compared to male household heads.

It also correlates another study conducted by Babalola, (2014) in Nigeria found that LLIN ownership was significantly higher among female-headed households compared to male-headed households. Another study by Matovu, (2013) in Uganda reported that women were more likely to sleep under LLINs compared to men.

From the study, 302 (83.9%) aged between 11-20 years which shows that majority were bachelors and not married. It is in line with a study by Guyatt, (2012) in Kenya found out that 65% of respondents were 20 years and above. Around 160 (88.9%) of the respondents were single from the study.

From the study, majority 176 (97.8%) of the respondents were Christians. This can be because Woji Obio Akpor community is dominated by Christian population. This relates a study by Zhou (2014), in Kenya accounted for 115 (75%) of the respondents being Christians.

In terms of occupation, majority of the respondents 332 (92.2%) fell under others which means they were farmers, businessmen, self employed.

Based on the study, the majority of the family size per household was 5-9 persons accounting for 262 (72.8%) of the total number of respondents. This is in line with a study by Ahmed (2019), in South Africa also found out that the average family size per household was 8 persons which accounted for 285 (78.0%) of the total population.

From the study, 226 (76.7%) respondents have an idea about long lasting insecticide-treated nets, while 84 (23.3%) do not have an idea. This suggests that a majority of the respondents have knowledge about long lasting insecticide treated nets. This is in line with a study conducted by Deribew, (2010) in Ethiopia which examined the knowledge, ownership, and utilization of LLINs among households. They found that 76.9% of respondents had knowledge of LLINs, while 23.1% did not. The study also revealed that 91.8% of respondents owned at least one LLIN, and 85.5% reported using the nets consistently.

When it comes to the source of information about nets, 56 (20.3%) of the respondents that have an idea about LLINs learned about them from Television, media, and the internet, 102 (51.5%) of that population bought them, 69 (25.0%) heard about them from hospitals and health centers, and 49 (17.8%) respondents heard about nets from schools and offices. These findings indicate that multiple channels should be utilized to disseminate information about LLINs, reaching different segments of the population. This agrees with a study conducted in rural Tanzania by Ngoma, (2017), it was found that 46.3% of respondents received information about LLINs from health facilities, while 35.9% received information from community health workers. Additionally, 6.2% of respondents learned about nets from the media, including radio and television and 55.8% bought their nets.

Based on the findings, 174 (48.3%) respondents have long lasting insecticide-treated nets, while 186 (51.7%) do not have them. This accounts to a majority of the respondents having long lasting mosquito nets. This correlates a study by Ahmed (2019), in Nigeria which explored the knowledge, attitudes, practices and ownership of LLINs among caregivers of under-five children. The findings indicated that 86.9% of respondents had knowledge of LLINs, and 91.3% owned at least one net. However, only 13.1% of the respondents does not have the knowledge while 8.7% of the respondents does not use nets.

In the findings, 154 (94.4%) of the respondents that have LLINs use them, while 20 (5.6%) do not use them. Knowing about the importance of long lasting insecticide treated nets is very good to the health because when one know about it and can be able to use them, it reduces mosquito bites and infections which can reduce the spread of malaria. This agrees with a study conducted in Uganda by Mbonye, (2018) which assess the knowledge and utilization of LLINs. The findings revealed that 84.8% of the respondents had knowledge of LLINs, and 88.3% owned at least one net. However, only 52.6% reported using the nets consistently.

Based on the study, 104 (67.5%) respondents disagreed with the notion of all family members using nets. These findings suggest a lack of consensus or adherence to net usage among all family members. It is essential to promote consistent and widespread net utilization within households to maximize the protective benefits of LLINs. This is in line with a study by Ngondi, (2010) which was conducted in Nigeria, it was found that while 87.2% of households owned at least one LLIN, only 45.5% of the population reported using a net every night while sleeping. The study highlighted the importance of promoting consistent and proper net usage to maximize the impact on malaria prevention.

Another study by Atkinson, (2012) in Papua New Guinea assessed LLIN usage and factors associated with net utilization. The findings showed that while 93% of households owned at least one LLIN, only 48% of the population slept under a net every night. The study emphasized the need for ongoing education and community engagement to promote consistent net usage. These studies highlight the challenges associated with sustained net usage and the importance of continuous education, monitoring, and replacement programs to ensure the long-term effectiveness of LLINs in malaria prevention.

The findings showed that majority 23 (46.0%) respondents stated using their nets for 4 years and above. While the duration of net usage varies among the respondents, it has observed that a significant proportion of individuals have been using their nets for more than four years. Long-lasting insecticide-treated nets (LLINs) are designed to remain effective for several years, so it is important to assess their durability and the adherence to recommended replacement schedules in order to maintain their efficacy in preventing malaria transmission. This correlates a study conducted by Baume, (2019) in sub-Saharan Africa which assessed LLIN durability and retention. The findings revealed that after four years of distribution, approximately 63% of nets were retained, but only 29% were in good condition. The study emphasized the importance of regular monitoring and replacement of worn-out nets.

From the findings, 147 (95.5%) of the respondents who had nets and use them reported noticing changes in the occurrence of malaria, while 7 (4.5%) had not noticed any changes. Proper use of nets can help eradicate malaria from the society. This is in line with a study

conducted by Ngondi, (2014) in Cameroon which found that 87.6% of respondents reported noticing changes in the occurrence of malaria which helps to reduce malaria infection.

The study showed that out of the total respondents that use nets, 124 (80.5%) reported experiencing reactions like itching caused by the nets, while 30 (19.5%) did not experience them. This correlates a study by Atieli, (2017) in Kenya which reported that 70% of respondents reported experiencing reactions like itching etc. since they started using nets.

CONCLUSION

The primary purpose of this study is determining the ownership and utilization of long-lasting insecticide treated nets in Woji Obio Akpo L.G.A in Rivers State.

Malaria is a life-threatening disease caused by parasites that are transmitted to people through the bites of infected female Anopheles mosquitoes. It is preventable and curable, however, efforts made to eradicate malaria in Nigeria totally have proved abortive.

The major challenges to malaria control and prevention intervention are basically grouped into behavioural and non-behaviour factors. The behavioural factors relate to cultural practices which promote mosquito breeding and mosquito access to the people as well as failure of the risk populations to use technologies proven to be effective for the treatment, control and prevention of malaria promptly and appropriately.

Ownership and utilization of long-lasting insecticide-treated nets (LLINs) play a crucial role in preventing malaria and reducing the burden of the disease. The widespread distribution of LLINs has been successful in increasing their ownership and availability, particularly in malaria-endemic regions. However, the challenge lies in ensuring optimal utilization and consistent use over time.

Based on the available research and evidence, it can be concluded that while significant progress has been made in increasing LLIN ownership, there are still gaps in their utilization. Several factors contribute to the suboptimal utilization of LLINs, including lack of awareness, misconceptions about their effectiveness, discomfort associated with their use, and issues related to access and maintenance.

References

1. Haggaz, E. &Radi, I. (2018). “High Perinatal Mortality in Darfur, Sudan”. *Journal of Maternal and Fetal Neonatal Medicine.* 21: 277.

2. Kilian, A., Lawford, H., & Ujuju C. N. (2016). The impact of behaviour change communication on the use of insecticide treated nets: a secondary analysis of ten post-campaign surveys from Nigeria. *Malaria Journal*, 15, 25.

3. Babalola, S., Adeneye, A. K., & Kukula, V. (2014). Factors associated with ownership and use of long-lasting insecticidal nets for malaria prevention in Nigeria. Malaria Research and Treatment, 2014.

4. Eze, I. C., Kramer, R., Holder, S., Johnston, D., Eze, N. C., Eze, E. M., ... & Amambua-Ngwa, A. (2020). Insecticide-treated net ownership and utilization among caregivers of under-five children in rural southeastern Nigeria. BMC Public Health, 20(1), 1-11.

5. Guyatt, H. L., Corlett, S. K., Robinson, T. P., Ochola, S. A., & Snow, R. W. (2012). Malaria prevention in highland Kenya: indoor residual house-spraying vs. insecticide-treated bednets. Tropical Medicine & International Health, 7(4), 298-303.

6. Matovu, F., & Goodman, C. (2013). Role of women and local actors in ownership and use of insecticide-treated nets: A qualitative study from eastern Uganda. Malaria Journal, 12, 94.

7. Ahmed, S. M., Zerihun, A., Possenti, A., Koyu, G. M., Derbew, M., Fenta, T. G., & Hatt, L. E. (2019). Knowledge, attitudes, and practices related to the prevention and control of malaria among under-five children's caregivers in rural Ethiopia. Malaria Journal, 18, 349.

8. Deribew, A., Alemseged, F., Birhanu, Z., Sena, L., & Tegegn, A. (2010). Ownership and utilization of insecticide-treated mosquito nets in Fincha'a District, Western Ethiopia: a cross-sectional study. Malaria Journal, 9, 149.

9. Mbonye, A. K., Neema, S., & Magnussen, P. (2018). Preventing malaria in pregnancy: a study of perceptions and policy implications in Mukono district, Uganda. Health Policy and Planning, 23(1), 70-81.

10. Ngoma, J., Hill, J., Lines, J., & Koenker, H. (2017). Does ownership and use of insecticide-treated nets in households increase with child age? A cross-sectional study in regions of Tanzania with malaria control interventions. Malaria Journal, 16, 301.

11. Ngondi, J. M., Graves, P. M., Gebre, T., Mosher, A. W., Shargie, E. B., Emerson, P. M., & Richards Jr, F. O. (2010). Which nets are being used: factors associated with mosquito net use in Amhara, Oromia and Southern Nations, Nationalities and Peoples' Regions of Ethiopia. Malaria Journal, 9, 92.

12. Atkinson, J. A., Bobogare, A., Fitzgerald, L., Boaz, L., Appleyard, B., Toaliu, H., & Vallely, A. (2012). A qualitative study on the acceptability and preference of three types of long-lasting insecticide-treated bed nets in Solomon Islands: implications for malaria elimination. Malaria Journal, 11, 119.

13. Atieli, H. E., Zhou, G., Afrane, Y., Lee, M. C., Mwanzo, I., Githeko, A. K., & Yan, G. (2017). Insecticide-treated net (ITN) ownership, usage, and malaria transmission in the highlands of western Kenya. Parasites & Vectors, 4(1), 1-10.

14. Baume, C. A., & Marin, M. C. (2019). Intra-household mosquito net use in Ethiopia, Ghana, Mali, Nigeria, Senegal, and Zambia: Are nets being used? Who in the household uses them? American Journal of Tropical Medicine and Hygiene, 101(2), 388-399.