A Survey of Household Ownership and Utilization of Long Lasting Insecticide Treated Net (LLITN) in Bori, Rivers State, Nigeria

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***Abstract*:- A survey of household ownership and utilization of long lasting insecticide treated nets (LLITN) was conducted in Bori, Rivers State, Nigeria. A structured questionnaire of World Health Organization (WHO) and specification were used. A total of 484 out of 500 administered were retrieved and data was analysed based on this. The results revealed that 376 (77.7%) used the bed nets as a control measure of mosquito bites; 306 (63.2%) received the bed nets from the Rivers State Government, 284 (58.6%) used them as prescribed (bed net for sleeping); 294 (60.8%) were educated on the reason and use of the bed nets; 100 (20.0%) used them for other purposes other than sleeping, while 284 (57.9%) used and noticed significant reduction in mosquito bites and malaria attack. It could therefore be concluded that LLITN in Bori is positively utilized and should be practiced by other communities in the State.**

I. INTRODUCTION

It is impossible to measure the full impact of insects and other arthropods on human health and welfare. These organisms have the capacity to inflict injury, disease, discomfort, or distress on man and livestock. They can be a direct cause of illness, pain and suffering through bites and stings, infest wounds, or cause allergic reactions. They feed on blood or body tissues and they may transmit deadly pathogens or parasites in such feedings. Economic losses associated with these pests are borne not only by the affected individuals and their families but also by human society in general (Meyer, 2015).

Most insects have symbiotic relationship with certain diseases causing parasitic protozoans. These parasites live on the insects and are usually transmitted to the body of humans and livestock through the insects' bites causing infections (Mullen and Durden, 2000). Despite the effect of modern medicine spread of arthropod borne diseases is still one of the most serious concerns facing public health officials and the medical community in general. The World Health Organization (WHO, 2012) estimates that as many as 4 million people die each year from the consequences of arthropod borne diseases. Obviously the problem is most severe in under-developed countries where access to good medical care is limited (Meyer, 2015).

As far as human health is concerned, the two most important classes of arthropods of economic significance are the insects and arachnids. For instance, scabies is caused by infection with a parasitic mite, (*Sarcoptes* spp)(arachnid) that burrow under the skin, and may result in severe itch especially at night. House Dust mites *(Dermatophago idespteromyssinus)* can be important respiratory sensitizers and thus contribute to asthma morbidity.

Various species of mosquitoes (insects) are estimated to transmit various types of disease to more than 700 million people annually in Africa, South America, Central America, Mexico, Russia and much of Asia, with millions of resultant deaths. At least two million people die annually of these diseases, and the morbidity rates are many times higher (George *et al.*, 2014). Mosquitoes can act as vectors for many disease causing viruses and parasites. Infected mosquitoes carry these organisms from person to person without exhibiting symptoms themselves. Mosquito-borne diseases include: Malaria caused by *Plasmodium*spp; Deague fever, caused by dengue virus; viral diseases such as yellow fever and Chukungunya etc. are caused by *Aedes* mosquitoes. Other diseases are lymphatic filariasis, West Nile virus, Eastern equine encephalitis virus, Tuleremia etc. (Depinay *et al.*, 2006; Schneider *et al.*, 2014).

In Nigeria, malaria accounts for 30% of childhood mortality (Olukosi *et al.*, 2005) and poor families spend up to 25% of their annual income on direct malaria prevention and treatment (Onwujekwe *et al.*, 2000). Many measures have been tried for mosquito control, including elimination of breeding sites, biological control with parasites such as fungi, nematodes, and predators such as fish and copepods, dragonfly nuaphs and adults and spme species of lizard and gecko. Other methods include introduction of large numbers of sterile males. Genetics, including cytoplasmic incompatibility, chromosomal translocations, sex distortion and gene replacement have been employed (Grimaldi and Engel, 2005). World Health Organization (WHO) has recommended different control methods to be used in areas where malaria cases are reported to be endemic, for example, Bori, in Rivers State. The use of long lasting insecticidal treated net as a vector control method has been in use. The nets were distributed to residents in the area to be used. To this effect, the effective use of the nets in the area needs to be monitored.

Mosquito net treated with insecticides known as insecticide treated net (ITNs) or bet net was developed in the 1980s for malaria prevention. Insecticidal nets are estimated to be twice as effective as untreated nets (Hull, 2006). It offers greater than 70% protection compared with no net (Bachou *et al*, 2006). These nets are chip-treated using a synthetic pyrethroid insecticides such as deltamethrin or permethrin which are double the protection over a non-treated net by killing and repelling mosquitoes.

Presently, long-lasting insecticidal nets (LLINs) have replaced the ITNs in most countries including Nigeria (BMC International Health and Human Right).

Long-lasting insecticidal nets are nets treated in the net fabric which make the insecticide last at least 20 washes in a standard laboratory testing and three years of recommended use order field conditions. With long lasting insecticidal nets, therefore, the consuming method of retreating old nets is no longer necessary. Presently, there are three types of LLIN recommended as eligible for public sector procurement (WHO, 2001).these are: Olyset Net (20% permetrin incorporated into the polyethylene fibres); Perma Net (55mg/m^2 deltamethrine to coat fibres) and Interceptor Net (200mg alpha-cypermethrin per square metre polyester netting).

Despite the aforementioned gains, mosquito net ownership is far from being universally accepted. Ownership rates remain low in many malaria prone regions or amongst particular groups (Eisele *et al.*, 2009). The use of treated net has been known to reduce, number of infective mosquito bites by 70 – 90% (Stekete *et al.*, 2001). Is this report the same for Bori, Rivers State, Nigeria? Hence this research to ascertain the net ownership, effective use, acceptability and/or problems associated with the use of LLINs, for effective, affordable malaria vector control.

II. METHODOLOGY

Study Area

Bori is the capital city in Khana Local Government Area of Rivers State. Bori is located on the coordinate of latitude $4^0 40^1$ 22^0N and extend to 4.67^0N and on longitude 7^0 22^1 13^0E and extended to 7.37^0E. The study area has a government owned general hospital and several private clinics. There is also primary health care centre which was involved in the distribution of the insecticidal treated net as directed by the World Health Organization (WHO). The study population comprised five communities which were randomly selected, viz: Mayor, Dorgbam, Nwiikabaari, Nortem and Yoo-yoo.

Sampling

Pre-survey visits were made to identify the Health Centre, houses and people to interact with to obtain useful information and consent to participate. A total of 500 questionnaires were produced and administered randomly in the study area already mentioned.The family heads (males and females), students, business men and women etc. were involved. In cases where the individual could not read, it was interpreted in the local dialect. A total of 484 questionnaires were retrieved and used for the analysis.

A well structure, standard questionnaire was used for the study. items covered in the questionnaire included demographic information of the households including number of persons per household; men, women, children, number of bed nets owned and utility, sources of net, whether purchased or not etc.

Data Analysis

Data collected was analysed using Simple Percentage and Frequencies.

III. RESULT

Out of the 484 household interviewed, for net ownerships, source and utilization and so on 306 (63.2%) were aware of malaria disease in the area (Table 1). Also, 376 (77.7%) used mosquito nets as a measure to prevent mosquito bites. The total of 306 (63.2%) mosquito nets encountered, were from government source. Average number distributed were all very low below 30% in the range of 1 – 8. The average number of inmates in households was 3 – 4 (20 – 41.7%). The total number of persons that effectively use the net to sleep was 280 (58.6%).

The number of persons in the household studied received education on reasons and utilization of LLTNs, 294 (60.1) while 39.3% had no education. 322 (66.5%) of individuals spread the net outside for days before use, while 163 (33.7%) use the nets for window/door curtains (Table 2)

Table 1 Net Ownership, Source, Utilization and Malaria Disease Awareness

S/N	Description	Number of Respondents (484)	Percentage (%)
1.	Malaria: A major problem in the area?		
	Yes	306	63.2
	No	178	36.8
2.	Use of mosquito nets as one of the measure to prevent mosquito bites.		
	Yes	376	77.7
	No	106	22.1
3.	Ownership of Net through Government source?		
	Yes	306	63.2
	No	176	36.8
4.	Number of people per household.		
	1 – 2	140	28.9
	3 – 4	201	41.7
	5 – 6	97	20.0

	7 – 8	34	6.6
	9 – 10	12	2.3
5.	Number of nets given per household.		
	1 – 2 nets	69	14.0
	3 – 4 nets	128	24.8
	5 – 6 nets	58	12.0
	7 – 8 nets	51	10.5
6.	Nets used for sleeping.		
	Yes	284	58.6
	No	200	41.2

Table 2 Education on Reasons and Usage of Nets

S/N	Description	Number of Respondents (484)	Percentage (%)
1.	Government agents educated on reasons and usage.		
	Yes	294	60.1
	No	190	39.3
2.	Spread the net outside for days before use.		
	Yes	322	66.5
	No	162	33.5
3.	Other uses of net by recipients.		
	Fishing	100	20.7
	Animal traps	77	15.9
	Window/Door Curtains	163	33.7
	Others	44	9.1

Table 3 Effective Control of Mosquitoes

S/N	Description	Number of Respondents (484)	Percentage (%)
1.	Significant reduction of mosquito bites and malaria reports.		
	Yes	284	57.9
	No	200	41.3

Table 4 Problems Associated with the Use of Nets

S/N	Description	Number of Respondents (484)	Percentage (%)
1.	Effects felt on usage		
	• Heat	164	33.9
	• Irritation and Discomfort	100	20.7
	• Smell of chemicals	9	1.9
	• None of the above	11	2.3
2.	Refusal to use because of:		
	• Heat	100	20.2
	• Irritation and Discomfort	70	14.6
	• Smell of chemicals	26	4.4
	• Fear of being caged	4	0.8

Table 3, summarizes the effective of mosquito. 284 (57.9%) of individuals in household attested to significant reduction of mosquito bites and incidence of malaria disease in the area by effectively sleeping with LLTNs. Despite the utilization, very low percentages of individuals experienced the following while using the nets as shown in Table 4. Heat, 20.2%; Irritation and discomfort 14.6%; Smell of chemicals 4.4% and some refused the continued use because of heat (20.2%), irritation (14.6%), smell of chemical (4.4%) and phobia of enclosure (0.8%).

IV. DISCUSSION

The highlights of the result revealed that majority of individuals in the study population used LLITNs for malaria vector (mosquito) control and they were well educated on the use of the nets. Government's effort in this regard is commendable because more than 60% of individuals received the nets from government agents. This result differed in Makurdi. Omudu, and Omobhund (2015) reported that despite the vigorous campaigns to promote the use of bed nets for malaria control, the number of household who owned mosquito nets was still low (21.9%) with slight improvement of records in 2003 and 2008. They mentioned further that barriers to mosquito net utilization were cost of the nets, availability and weather conditions. Only about 20.0% of households who owned nets were beneficiaries of free distribution. This is contrary to this findings.Effective use of the nets was evident, over 60% followed the correct procedure before use and at bed time. However, a negligible percentage used their nets for fishing, window/door curtains etc. This attitude is common in the African sub-region as a whole.Pultard *et al.* (2011) reported that in Uganda, the mosquito nets were used as ant traps; drying fish etc. In Zambia, they were used as bridal veils and also for protecting dead bodies against flies invasion before burial arrangements. On the whole the research showed that the use of mosquito bed nets reduced the rate of mosquito bites and subsequently malaria attacks.This findings agrees with Stekete *et al*.(2001). They reported significant reduction of malaria incidence particularly in pregnant women with the use of LLITN. The side effects as a result of use such as the smell of chemical, heat, feeling of suffocation and other forms of discomfort were also reported by Gbana *et al*. (2012).

V. CONCLUSION

Malaria is one of the most common infectious diseases and a great public health problem worldwide and the state in particular. Any attempt and studies to reduce the vector

population in malaria endemic area like this research is very relevant. The use of the net is effective as in vector control measure and its use for other purposes should be discouraged by communities where the nets are distributed by government and other health agencies. There should be strategic campaigns to promote the use of LLINs for malaria control.

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