

Original Research Article

Ownership of Bed nets and use for children below 5 years in Sagamu Local Government Area of Ogun State, Nigeria

Abstract

Aim: To document the level of ITNs ownership and utilization for children within the Sagamu Local Government Area in Ogun State three years after the commencement of major distribution exercise of this simple tool.

Study Design: a descriptive cross-sectional descriptive community based study.

Place and duration of study: The Sagamu Local Government area in Nigeria. May 2009.

Methodology

131 Children with fever or a 2 day history of fever prior to the day of the meeting were consecutively enrolled following a 3 day community campaign. Pretested semistructured questionnaire was research assistants/investigators administered to obtain data on ownership of ITNs by the caregiver and their utilization for the index child and factors that may affect these variables.

Frequency tables were generated for all the categorical variables and association between them tested using the chi-square test and multivariate regression. Level of significance was set at p value < 0.05 .

Result

The mean age of the study population was 47.3 ± 50.6 months for the children and 28.8 ± 5.9 years for the mothers. Among the 128 respondents, ITNs ownership was 9.2%, utilization was 4.6%. House-types and mothers' occupation were positive predictors of use ($r=0.97$). There was a strong correlation between mother's educational level and ownership ($r=0.96$). Ownership was however limited by a combination of lack of awareness and knowledge of access point as well as cost.

Conclusion

While improving the awareness of the populace through radio jingles and social marketing as well as use of private health facilities as access points will aid in better ownership of ITNs, subsidizing the cost of ITNs rather than making it outrightly free may ensure better utilization

Key Words: Malaria, Insecticide treated net (ITNs), Community based study.

Introduction

The scourge of malaria on child health remains a major issue in Sub Saharan Africa. This is in spite of moderate attempts at Malaria Control. In 2010, malaria caused an estimated 216 million clinical episodes, and 655,000 deaths. [1] About 90 per cent of these deaths occur in sub-Saharan Africa mostly among children less than 5 years of age.

In terms of morbidity, Malaria remains the number one cause of hospital visit in the sub-region and one of the six leading causes of mortality [2]. Children and pregnant women constitute two of the vulnerable groups for malaria infestation with Malaria in pregnancy being responsible for delivery of low birth weight babies, maternal anaemia and still birth amongst pregnant women. [3,4,5]

Towards the end of the last decade it was classified as a re-emerging disease even in areas where it has been endemic [6]. This therefore led to an urgent need to look inwards at simple effective tools for the control of this disease. One of the major prongs adopted towards effective malaria control was the use of Insecticide Treated nets (ITNs) since there were enough demonstrable evidence suggesting that ITNs are useful in reducing mortality and morbidity associated with malaria in the vulnerable groups [7-11]. Hence, an increase in global production, procurement, distribution, and use of insecticide-treated bed nets (ITNs) followed. UNICEF procurement increased roughly 20-fold between 2000 and 2005 as global production more than tripled from 30 million in 2004 to 100 million in 2008. [12].

In 2006, the Government of Ogun State, Southwest Nigeria, in its bid to increase access to ITNs and improve its coverage, commenced the distribution of free ITNs using Public Health institutions as avenues to reach the target population.

This study was therefore conducted to document the level of ITNs ownership and utilization for children within the Sagamu Local Government Area in Ogun State three years after the commencement of the exercise.

Methodology

This was a part of a larger study aimed at determining the efficacy of three malaria diagnostic options (13).

Study Site

Ogun state is one of the thirty-six states of Nigeria, located in the South-Western (Rain-forest) part of the Federation, within 3⁰ East and 7⁰ North of the equator. The state consists of twenty (20) Local Government areas and has a population of about 3 million. Sagamu is one of these

Local Government areas, with an estimated area of 68.4 square km, a projected population of 177,514 and an annual population growth rate of 2.28% (14). Malaria in the region is hyper-endemic with its transmission being highest during the rainy season (May to October).

The Local Government has a Teaching Hospital, 1 General Hospital and 4 Primary Health care centres. These public Health facilities are in addition to 60 private clinics and maternity homes.

Study Design

The study was a descriptive cross-sectional community –based survey conducted in Sagamu, Ogun State. Data for ownership and use of ITNs was collected as a part of the survey that was conducted in May 2009.

Sample size

Using the formula:

$SS1 = Z^2(p)(1-p)/d^2$ [15], a total of 106 patients were estimated for recruitment for the malaria diagnostic study. However, all the children that were less than five years that were enrolled in order to attain the sample size for the main study were included for this study.

Study Technique

The authors approached the Chairman of the Local Government through the Medical officer of Health to seek his permission and cooperation to enter the community for the research activity. After this was granted, media vans of the local government were deployed into the community inviting mothers to the town hall with their children (from birth up to pre-primary school level) with fever or history of fever within the last two days prior. The campaign was for three successive days.

The research tool was pretested in a neighbouring local government and research assistants were trained to effectively administer the questionnaire.

The pre-tested semi-structured questionnaire was designed to obtain the bio-data, ownership and use of bed nets (ever treated, untreated and ITNs). It was investigators/ trained research assistants administered on each consenting mother/caregiver.

Inclusion criteria

Study subjects consisted of children less than five years. Those with fever (Axillary temperature $>37.2^{\circ}\text{C}$) or history of fever in the last two days prior to the meeting were consecutively enrolled (systematic) for the study.

Definition of terms

The following definition of terms as described by Carol A Baume et al [16] were adopted and further adapted for the purpose of this study:

Bed Net: a net that can be hung for use while sleeping regardless of whether it has ever been treated

- *Ever-treated net*: a net that has ever been treated, either when acquired (pre-treated) or since acquired, regardless of when the treatment was put on the net

- *ITNs or currently-treated net*: a bed net that is hung for use and either "permanently treated" or long lasting insecticide-treated (a LLIN), or is pre-treated and has been purchased within the last 12 months, or has had insecticide put on it up to and including the last 12 months.

121 *Mosquito Net*: refers to untreated net on window or door frames designed to protect against
122 mosquitoes.

123 124 **Data Analysis**

125 Data entry, validation and analysis were done with the Epi-info 2006 software. Frequency tables
126 were generated for all the categorical variables and association between them tested using the
127 chi-square test and multivariate regression. Level of significance was set at P value = .05.

128 129 **Result**

130 From the outreach programme 131 children were enrolled. All the children who enrolled in the
131 process of reaching the desired sample size for the larger study were included. Male: Female
132 ratio=63:68= 1:1.08.

133 Majority of the mothers who brought their children for the meeting were determined to be of the
134 lower socio-economic status [17]

135
136 Age range of the children was between 1 and 192 months, mean was 47.3 ± 50.6 months
137 Mother's ages ranged between 16 and 45 years, mean age was 28.8 ± 5.9 years.

138
139 As shown in Table 1, less than a quarter of the mothers were educated beyond the secondary
140 school level and the majority of them (95.3%) were junior civil servants/petty
141 traders/artisans/unemployed . A greater majority of the mothers (85.2%) live in room apartments.

142 TABLE 1:

143 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS

144	VARIABLES	FREQUENCY*	
145	AGE (YEARS)		
146	<20	03	(06.1)
147	21-35	96	(81.4)
148	36-45	29	(12.5)
149	Total (n)	128	(100.0)
150			
151	EDUCATION		
152	University/Post-secondary	21	(16.4)
153	Secondary	70	(54.7)

154	Primary	29	(22.7)
155	Koranic/no formal	8	(6.3)
156	Total	128	(100.0)
157			
158	OCCUPATION		
159	Senior civil servant	002	(1.6)
160	Middle civil servant	004	(3.1)
161	Junior civil servant/	017	(13.3)
162	Artisans	097	(75.8)
163	Unemployed	008	(6.3)
164	Total	128	(100.0)
165			
166	LIVING QUARTERS		
167	Flats	19	(14.8%)
168	Rooms	109	(85.2%)
169	Total	128	(100.0)

170 *Figures in bracket are percentages of total “n”

171 *Information was incomplete in 3 of the respondents

172 **Ownership and Utilization of Bed Nets**

- 173 ✓ Almost two thirds (74.6%) of the respondents had mosquito nets around their homes,
- 174 however only 24.2% (31) had bed nets.
- 175 ✓ Of those that had bed nets, 12 (38.7%) were ITNs, 11 (35.5%) were untreated and 8
- 176 (25.8%) of the mothers were not certain of the type of net.
- 177 ✓ Ownership of ITNs in the study population was 9.2%
- 178 ✓ In the 31 homes where there were bed nets, 16 children (51.6%) slept under the bed net
- 179 the day prior to the meeting.
- 180 ✓ 6 out of the 12 children (50%) slept under an ITN the night prior to the meeting.
- 181 ✓ Use of ITNs in the study population was 4.6%

182

183 TABLE 2:

184 SOCIOECONOMIC STATUS OF PARENTS AGAINST OWNERSHIP OF BEDNET

185 There is a need to explain 1-4

		OWNERSHIP OF BEDNET		CHI-SQUARE	PVALUE	Df
		YES	NO			
FATHER'S EDUCATION	1	8	18	8.2	0.32	7
	2	15	54			
	3	4	11			
	4	1	6			
FATHER'S OCCUPATION	1	4	1	9.7	0.05	4
	2	2	4			
	3	5	19			
	4	16	63			
	5	1	4			
MOTHER'S EDUCATION	1	6	13	13.81	0.087	8
	2	17	52			
	3	2	26			
	4	3	4			
MOTHER'S OCCUPATION	1	2	0	13.37	0.009	4
	2	2	1			
	3	1	15			
	4	22	73			
	5	0	3			
HOUSE TYPE	1	9	9	9.3	0.009	2
	2	20	68			
	3	2	20			

186

187 As shown in table 2, the ages of the parents, their education and father's occupation did not seem
 188 to significantly affect bed net ownership. However, the type of household and mother's
 189 occupation both significantly affect bed net ownership .

190 A statistically significant proportion ($P=.009$) of the children whose household had one form of
 191 bed net slept under it the night before the outreach. Whether they do or not is also significantly
 192 affected by the level of education of the mother ($P < .05$). Of the patients that had ITNs, 9 out of
 193 12 (75%) were given free at the hospital and the remaining 25% got theirs from other sources.
 194 Utilization of the ITNs was not significantly related to access point. ($P=0.12$)

195 For those who bought theirs, cost of bed net was between 350-2,500 Naira (2.3 - 16.7 US\$).

196 Majority (73.1%) were willing to pay up to 500 naira (US\$3) whilst the rest will rather have it
197 free.

198 For those who do not own ITNs, equal number 31(26.1%) each did not know what it is or
199 how/where to get it, 25 (20.7%) felt it was too expensive and 32(27.2%) did not own for
200 various other reasons.

201 65 (51.6%) of the children had malaria in the last 3 months.

202 Sleeping under the bed-net did not seem to offer protection against the development of malaria in
203 the children. $P=0.28$

204 Whilst House type and mothers' occupation were predictors of use $r=0.97$, mothers' educational
205 level was a predictor of ownership $r=0.96$

206 Discussion

207 This study has further buttressed the fact that ITNs ownership and use in Nigeria remain lower
208 than what obtains in other countries within the Sub-region. Ownership of ITNs in Kenya was
209 over 71% [7] and in Eastern Ethiopia it was 62.4%, [18]. In 2009, Baume et al observed that all
210 countries surveyed for ITN ownership and usage experienced considerable progress except
211 Nigeria, [16].

212 Whilst ownership in other areas ranged between 40 and 72% and usage between 30 and 40%,
213 [7,16], this study found a dismal 9.2% ownership and 4.6 % utilization among the study
214 population for children. Just as in similar studies [19], the study population recorded lower usage
215 when compared with ownership.

216 A value of 14.8% ownership of ITN was recorded amongst pregnant women in the same state
217 around the same period. [20]. In the study, utilization was 10.4%. Several studies have identified
218 that ownership does not necessarily translate to use. [19].

219 Whereas other studies reported wide gap between ownership and utilization, [16] in this study
220 about a half of those who possess the bed-nets (ITNs inclusive) used them for their children the
221 night before the study. Hence, it will appear that for an effective potential of the bed-nets to be
222 achieved, ownership has to be improved.

223 Although the WHO malaria report [21] suggested that lack of ownership is as a result of
224 inadequate number of nets to go round the vulnerable groups, this study, however revealed that
225 lack of awareness about ITNs and knowledge about where to access them in those that were
226 aware constituted the greatest barrier to ownership. A study had identified that awareness and
227 knowledge about ITNs in this state were particularly poor. [20]. In an attempt to achieve
228 universal ITN coverage, there has been a rapid scale up of ITNs distribution throughout Africa
229 [22,23,24,25] but then majority of these were probably not being used for the purpose for which
230 they are meant. [24, 26].

231 Some scholars have reported the various uses that the insecticide treated nets are subjected to.
232 These included its use as fishing nets, sponge, table covers etc. [24]

The majority of the respondents in this study got their ITNs free from the hospital. Giving it free as had been suggested in some other studies may just improve ownership and National coverage but as seen in this study, may not translate to utilisation.

Contrary to other reports where cost has been a limitation to ownership [27] majority of the respondents in this study will rather pay than have it free. Honjo Khavé opined that misuse of ITNs may be related to individual and social rationality [26]. Among the Yorubas that constituted the majority of the respondents in this study, there is a general belief that any item that is important and effective, must cost something. This may have been responsible for the low utilization recorded in this study. Although the reasons for non- utilization was not determined in this study, an earlier study in the same area documented that majority of pregnant women did not use ITNs even when they own them because of the frequent power outages that make sleeping under an ITN uncomfortable especially during the dry season [28].

It is possible that the reported protective effect of ITNs was not found in this study because of the low utilization. The gap between ownership and utilization has to be closed for the full potential of ITNs to be felt in the prevention of malaria.

Conclusion: For ownership and utilization to improve in the state, the Government will have to step up its activities in provision of awareness and knowledge on the benefits of ITNs through radio jingles, social marketing, health education in clinics and hospitals etc.. In addition, outlet through private health facilities too would have to be explored considering the fact that the State seems to have more private health facilities than public. It may also be helpful to subsidize the cost of ITNs rather than making it outrightly free. Improvement of social amenities like electric power supply may encourage mothers to use this important protective tool.

Competing Interest

We declare that there are no competing interests.

Consent

All authors declare that each consenting mother/caregiver signed or thumb-printed a written informed consent form to be enrolled into the study. A copy of the written consent form is available for review by the editorial office/ Chief Editorial Board members of this journal.

Ethical approval

Approval to conduct the study was obtained from the Scientific and Ethical Review Committee of the Olabisi Onabanjo University Teaching Hospital to which the authors are affiliated.

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