Original Article

Insecticidal net distribution channel that is rural women-friendly, in abia south, Nigeria

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Abstract

Background: Government channel for distributing free insecticidal nets stop at the health centers. About 70% of rural women who do not access this health facility fail to collect the free nets. Alternative channel for reaching these women is hereby advocated. **Materials and Methods:** An interventional study was carried out in eight randomly selected villages of Abia South. Experimental and control groups were assigned four villages each. Sample size for each group was 200 households systematically selected. Questionnaire and interview guide were instruments for data collection. Data were analyzed quantitatively. Chi-square statistic was used in testing for statistical significance. **Results:** Before intervention, ownership and utilization of treated nets in experimental group were 36.5% and 28.8%, respectively, while in the control group, it was 38% and 30.0%, respectively. Ownership and utilization of treated nets in experimental group increased by 54.5% and 46.5%, respectively, after intervention. In the control group, where there were no interventional activities carried out, ownership and utilization of treated nets showed no significant increase. **Conclusion:** Health promotion intervention, fixed-install mental payment-basis for net cost, and home-based net distribution channel scaled up net ownership and utilization by 54.5% and 46.5%, respectively, in the study area.

Key words: Abia South, Net distribution channel, Nigeria, Rural women-friendly

INTRODUCTION

In rural communities of Abia South, various methods and combination of methods are used as protective measures against mosquito bite within a household. These include aroma from burning leaves of *ocimum viridis*, indoor residual spraying, use of mosquito coil, use of untreated nets, wearing of trousers, long sleeve shirt and stockings at night, physically killing mosquitoes by hand, and most recently, use of insecticidal nets. Roll Back Malaria (RBM) strategy for protecting against mosquito bite and reducing malaria burden is by sleeping under insecticidal nets regularly.[1-5] Scarcity of insecticidal nets at grass root level has been identified as one of the factors limiting universal coverage of the country with the net.[6] Government channel through which free long-lasting insecticidal net (LLINs) get to rural communities is considered inadequate, inaccessible, and unfriendly to most rural families. The current plan in 2008-2013 reviewed RBM plan period in Nigeria is universal coverage. This means that by the year 2013, about 80% of Nigerians will be sleeping under insecticidal nets, while 100% will have access to LLINs and sustain it. Barely few months to the end of the plan period, it does appear that some rural communities in Nigeria are yet to be covered with the nets. The study aims at finding out the rate of ownership and utilization of the treated nets by women of reproductive age in the study area. It also seeks to identify a channel for purchasing and distributing the nets that will be rural women-friendly in order to complement the existing government channel.

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MATERIALS AND METHODS

A quasi-experimental study design was used. Villages rather than individuals formed the unit of allocation to experimental or control group for the purpose of introducing health promotion intervention with a channel of purchasing and distributing insecticidal nets that would be rural women-friendly. A multi-stage probability sampling method was used in selecting the study sample. From six local governments that make up Abia south senatorial zone, four were randomly selected; namely, obingwa, ugwunagbo, Ukwa East, and West local governments. From each local government selected above, two villages were randomly selected for the study. The first village selected in each local government area was assigned to the experimental group, while the second became the control group. A total of eight villages were selected. From the prepared sampling frame for each village, households that had women of reproductive age were systematically selected for interview. The study population was 2176 households gotten by enumeration of all the eight villages. Sample size was 400 determined using Lut'z formula $n = z^2pq/d^2$ as stated by Ejemot.[7] Sample sizes in experimental and control groups were 200 households respectively.

Instrument for data collection

Instruments for data collection were focus group discussion guide and questionnaire. The focus group discussion guide had ten open-ended questions that sought and obtained information on why many households did not own insecticidal nets even when it was given free at government health facilities. It also sought to find out in respondent's opinion, what could be done to make rural women own and use available treated nets. The questionnaire was used in collecting quantitative data. SECTION 'A' of the questionnaire sought and obtained information on respondent's socio-demographic and economic characteristics. SECTION 'B' captured information on ownership and utilization of insecticidal nets, while, SECTION 'C' was on factors/reasons for not owning or utilizing available nets in the homes. The questionnaire was structured, pre-tested in a pilot survey before being interviewer-administered on every woman of reproductive age within the selected households. Sixteen assistants, two from each village, were selected and trained on how to impregnate nets, hang nets properly on beds, and obtain sampling frame for each village.

Health promotion intervention activities involved

- A massive insecticidal net awareness campaign at the village council hall on the days of women meetings in the four experimental villages only.
- Health education on cause of malaria, its transmission, prevention, protection, control measures, and the benefits of insecticidal net.
- Cost-effectiveness of treated nets over all other protective measures against mosquito bite used in the communities.
- Practical participatory net hanging demonstration session.
- Re-channeling procurement and distribution of treated nets through community-based-women council leaders on a fixed-installment-payment basis (FIPB) and in the cost price recovery, if at cost. This channel of fixed-installmental-payment basis (FIPB) is their normal channel for accomplishing community development strides in the past. That is why this strategy of fixed-installment-payment is referred to as "Rural women-friendly." Not only that it made the cost of net appear affordable, but also made the net accessible at a short distance from their homes.

Data analysis

Data collected were analyzed quantitatively and qualitatively, using calculator and computer with SPSS package. Chi-square statistic was used in testing for statistical significance.

Ethical consideration

Approval to conduct the study was sought and obtained from the village head of studied villages. Personal consents of the individuals interviewed were sought and obtained before administering the questionnaire on them. Data collected were held in strict confidence.

RESULTS

The result of socio-demographic and economic characteristics of respondents indicated that the experimental and control groups were comparable [Table 1]. Ownership of treated net in the experimental group was 36.5% before and 91% after health promotion intervention (HPI). In the control group, where HPI did not take place, ownership of net was 38% before and 38.5% after HPI [Table 2]. HPI with complementary purchasing and distribution channel (CPDC) increased ownership of treated nets by 54.5% in the study area. The null hypothesis that HPI does not increase ownership of treated net was rejected ($P < 0.005$). Identified reasons for not owning the net included: Inability of most rural women to access the health facilities where insecticidal nets were given freely to women on completion of their babies' immunization schedule. Secondly, lack of home-based treated net purchasing and distribution channel that is rural women-friendly. That is to say that the net will be available and accessible at a walking distance from their homes and the price made affordable through fixed-installment-payment-basis. Other reasons are shown in Table 3, which revolved around the aforementioned two.

Utilization of available nets in the experimental group was 28.8% before HPI and 75.3% after HPI. In the control group, where the HPI did not take place, utilization of available net was 30.3% before and 32.5% after HPI [Table 4]. HPI with complementary purchasing and distribution channel (CPDC) increased utilization of treated nets by 46.5% in the study area. The null hypothesis that HPI does not increase utilization of treated nets was rejected ($P < 0.005$) [Table 4]. Identified reasons for not utilizing available treated nets before HPI are shown in Table 5. Topmost reasons were hot weather discomfort while sleeping under the net and illusory fears about the chemicals used in treating the nets. About 92.4% of those who did not make use of their own net claimed that insecticide could kill

both mosquitoes and human beings. Some respondents claimed that their skin was allergic to chemicals used in treating nets by causing rashes on both mother and baby, including fetuses in pregnant women. Other reasons adduced for not utilizing available nets included fear of suffocating under the net due to small limited air that could pass through the tiny net holes.

Table 1: Socio – Demographic and Economic characteristics of respondents

Variable	Experimental Group		Control Group	
	n	%	*n*	%
Age				
15-26 years	52	26	55	27.5
27-38 years	90	45	92	46
39-50 years	51	25.5	45	22.5
51 and above years	7	3.5	8	4
Marital status				
Single	23	11.5	22	11
Married	132	66	130	65
Divorced / separated	25	12.5	21	10.5
Widowed	20	10	27	13.5
Education				
No formal education	33	16.5	34	17
Primary education	74	37	72	36
Secondary education	70	35	69	34.5
Tertiary education	23	11.5	25	12.5
Occupation :				
No employment	22	11	24	12
Farming	101	50.5	111	55.5
Self employed	29	14.5	23	11.5
Paid employment	48	24	42	21
Monthly Income				
<₦20,000	76	38	76	38
₦20,000 - ₦29,000	80	40	82	41
₦30,000 - ₦39,000	30	15	28	14
₦40,000 and above	14	7	14	7

Some argued that they preserved their nets inside trunk boxes because they did not know how to hang them. The women who did not own a bed but slept on mud floor with mat said that using their net disturbed sexual convenience and as such, exchanged the nets for monetary reward. Some respondents converted theirs into shawls, hand gloves for ceremonial decorations. Very few respondents said that their nets were in bad condition and could not be used [Table 5].

The result of the various focus group discussions indicated that ignorance about the cause of malaria and proper protective measures against mosquito bites were major constraints in owning and using insecticidal nets in rural communities. Some people held tenaciously to the traditional belief the malaria is caused by evil men (witches and wizard), or by eating oily/ fatty foods for long time. These beliefs were handed down to them from generation to generation and could not be changed. All the focus groups identified three of the following as the cause of malaria;

(a) …"malaria is caused by plasmodium species"…
(b) …"it is mostly caused by too much oily food"
(c) …"evil forces, witches and wizards cause malaria.

Table 4: Utilization of available net before and after HPI

	Experimental Group			Control Group		
	Use	Don't use	Total	Use	Don't use	Total
Before HPI / CPDC	21 (28.8%)	52 (71.2%)	73 (100%)	23 (30.3%)	53 (69.7%)	76
After HPI / CPDC	137 (75.3%)	45 (24.7%)	182 (100%)	25 (32.5%)	52 (67.5%)	77
	Increase in utilization = 116 (46.5%)			Increase in utilization = 2 (2.2%)		
	X^2 = 47.7, 1 df, *P*<0.005			X^2 = 0.009, 1 df, *P*>0.005		

ITNs = Insecticide-treated net, LLINs = Long-lasting insecticide nets, HPI/CPDC = Health promotion intervention with complementary purchasing and distribution channel

Table 2: Ownership of treated nets before and after HPI

	Experimental Group			Control Group		
	Own ITNs	Don't own ITNs	Total	Own ITNs	Don't own ITNs	Total
Before HPI/CPDC	73 (36.5%)	127 (62.5%)	200	76 (38%)	124 (62%)	200
After HPI/CPDC	182 (91%)	18 (9%)	200	77 (38.5%)	123 (61.5%)	200
	Increase in ownership of ITNs = 109 (54.5%)			Increase in ownership = 1 (0.5%)		
	X^2 = 128.4; 1 df, *P*<0.005			X^2 = 0.011, 1 df, *P*>0.005		

ITNs = Insecticide-Treated Nets, LLINs = Long-Lasting Insecticide Nets, HPI/CPDC = Health promotion intervention with complementary purchasing and distribution channels

Table 3: Identified Reasons for not owning insecticidal nets before HPI

	Experimental Group	Control Group	Total
	n = 127 (%)	*n* = 124(%)	*n* = 251(%)
Don't access the hospitals or health centers for MCH services as to get free insecticidal nets	127 (100)	124 (100)	251 (100)
Lack of home-based net purchasing and distributing channel for easy access.	123 (96.9)	123 (99.2)	246 (98)
Lack of knowledge / awareness of insecticidal nets and its benefits.	79 (62.2)	75 (60.5)	154 (61.4)
Lack of knowledge of where to purchase the net and pay Installmentally.	126 (99.2)	123 (99.2)	249 (99.2)
Perceive cost of purchasing the net in the market as very high on cash-and -carry basis (unaffordable).	108 (85)	110 (88.7)	218 (86.9)
Perceived distance to health facilities where treated nets are given freely as far	95 (74.8)	98 (79)	193 (76.9)

HPI/CPDC = Health promotion intervention with complementary purchasing and distribution channel, Exp = Experimental, Cont = Control, MCH = Maternal and child health services, Note: Respondents could tick more than one option

Table 5: Identified reasons for not utilizing available treated nets before HPI

	Experimental Group	Control Group	Total
	n = 52 (%)	*n* = 53 (%)	*n* = 105 (%)
Hot weather discomfort	49 (94.2)	51 (96.2)	100 (95.3)
Illusory fears that the chemical used in treating the nets can kill human beings	47 (90.4)	50 (94.3)	97 (92.4)
Fear of suffocation under the net because of the tiny net opening	46 (88.5)	46 (86.8)	92 (87.6)
The body is allergic to the chemicals used in treating nets, causing rashes on the skin	9 (17.3)	8 (15.1)	17 (16.2)
Don't know how to hang the nets over the beds, so nets are preserved in trunk boxes.	34 (65.5)	39 (73.6)	73 (69.5)
Net in bad condition	3 (5.8)	2 (3.8)	5 (4.8)
Net diverted to other uses	7 (13.5)	9 (17)	16 (15.2)

HPI/CPDC = Health promoting intervention with complementary, purchasing and distribution channel, Exp = Experiment, Cont. = Control, Note: Respondents could tick more than one option

All the focus groups pointed out that "lack of money to buy net was the greatest reason for not owning a net in the homes." Some, especially the male group, said …. We can't spend our money to buy insecticidal nets; after all, how much do we get a day as income? "No job."

Suggested means of encouraging ownership and utilization of treated nets included:

(i) Distributing nets freely to women through women council leaders or health workers on house-to-house immunization programs in villages.
(ii) If at a cost, payment should be by fixed-installmental-basis.

Some male participants in the focus group discussion mentioned four ways of scaling up ownership and utilization of the nets:

(a) By communal palm fruit harvest and the proceed used in offsetting the cost of nets.
(b) Husbands should serve as reminder to their wives to sleep under their nets regularly every night.
(c) Net assistants should go round demonstrating how to hang nets over the beds.

DISCUSSION

The finding in Tables 2 and 4 that ownership and utilization of treated nets were as low as 36.5% and 28.8%, respectively, is indicative of high scarcity of the nets at the grass root level. Low level of ownership and use of treated nets found in this study is in line with earlier reports elsewhere in Africa south of Sahara, that despite the proven highly effectiveness of the net in preventing malaria and its burden, ownership and use is still very low.[1-3,8-16] The findings that rate of ownership and utilization of treated nets increased significantly after health promotion intervention with complementary purchasing and distributing channel (HPI'/CPDC) were indicative of the effectiveness of this strategy. The finding in Table 3 that unaffordability of the cost of treated nets limited ownership of the nets is in keeping with previous works done by other researchers[6,9,17,18] that purchase of net at cash-and-carry-basis appeared unaffordable to most rural families. However, Guigemde[19] argued that treated nets were affordable to many individuals in malarious endemic areas, when compared with what they spend on other, often less effective preventive methods. His view was also up-held by Enato and Okhamafe.[20] Other limiting factors to ownership of treated nets identified in the study were addressed during the interventional activities.

Ignorance about the cause of malaria, its transmission, and proper protective measures against mosquito bite was addressed using health education and health promotion intervention (HPI). HPI has been reported to be effective in bringing about behavioral change in ownership and utilization of treated nets.[9,10,21] The finding that hot weather discomfort is a major reason for not utilizing available nets in the study area [Table 5] is in keeping with the report of Offiah[15] and Salako.[22] The illusory fears identified in Table 5, as reasons for not using the available nets in homes, were similar to findings of Amajoh[23] that insecticidal smell could irritate users of treated nets as some people may be allergic to the insecticide. These fears and beliefs were due to ignorance as reported by Obionu[4] and were allayed during the HPI. Scarcity of the nets at the grass root was addressed by complementing the government distribution channel that stopped at the health facilities, with alternative channel that got to the grass root through the involvement of the local women organization council. The women council leaders were involved in the distribution of the nets and at the cost price recovery on installmental-payment-basis. Similar interventional studies elsewhere had demonstrated remarkable increase in ownership and utilization of treated nets when individuals received health promotion activities and nets made available and accessible to them.[9,10,13,14,23-26] We wish to recommend this HPI/CPDC strategy to other developing countries having similar socio-economic and cultural practices for rapid scaling up of ownership and utilization of insecticidal nets.

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