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Household Barriers to Effective Malaria Prevention and Control in a Rural Community of North-Western Nigeria.

Gobir A.A, Sambo M.N, Abubakar A.A, Idris S.H,
Department of Community Medicine, Ahmadu Bello University, Zaria, Nigeria,

KEYWORDS

Household, Barriers, Malaria, Prevention, Rural Community, Nigeria

ABSTRACT

Background: Malaria is endemic throughout Nigeria. Majority of Nigerians live in rural areas where subsistence farming is their main occupation. Most of them live below poverty line, earning less than $1.25 a day. In rural communities, many household factors constitute barriers to effective malaria prevention and control.

Objective: This study was conducted to assess the factors that constitute barriers to prevention and control of malaria in Gimba village, a rural community in Soba Local Government area of Kaduna State, Nigeria.

Methodology: A cross-sectional descriptive study conducted during community diagnosis posting of final year medical students of Ahmadu Bello University, Zaria in July 2012. An interviewer- administered questionnaire was used to collect data from the total population of household heads in the community.

Results: Of the 686 respondents, most were farmers (69.7%). In terms of malaria prevention, most of the households (81.8%) own a mosquito net, but in 40.8% of the households, no member slept under a mosquito net the night before the survey. A significant proportion of the households (32.9%) use "otapiapia", a cheap, unpatented, locally made pesticide as mosquito repellent, while 20.7% of the households do not use any method for malaria prevention. Respondents that had formal education, or with less than 5 children were more likely to use malaria preventive methods compared to those with no formal education or with more than 5 children. Regarding malaria treatment, most of the households, 73%, treated their last cases of presumptive malaria at chemist shops.

Conclusion: Some socio-demographic characteristics of respondents and household practices militate against effective malaria prevention and control in the study area. Health Education and Socioeconomic Development in rural areas are recommended for successful malaria prevention and control..

Correspondence to:
Dr Gobir A.A
Department of Community Medicine, A.B.U,
Zaria, Nigeria.
Email- aagobir@yahoo.co.uk

Introduction

Malaria is endemic throughout Nigeria, where it is one of the leading cause of morbidity and mortality.[1] It currently accounts for nearly 110 million clinically diagnosed cases per year, 60 percent of outpatient visits, and 30 percent hospitalisations in the country.[1] An estimated 300,000 children die of malaria each year. It is also believed to contribute up to 11 percent maternal mortality, 25 percent infant mortality, and 30 percent under-five mortality. In addition to the direct health impact of malaria, there are also severe social and economic burdens on communities and the country as a whole, with about 132 billion Naira lost to malaria annually in the form

of treatment costs, prevention, loss of work time, etc.[1]

Nigeria has the largest population at risk of malaria in Africa. Official estimate suggests as much as four bouts of malaria per person per year on the average.[2]

About 70% of Nigerians live in rural areas where subsistence farming and livestock rearing is the main occupation and the peak of malaria transmission coincides with the peak of planting and harvest seasons.[3] Almost 80%, live below poverty line, earning less than $1.25 a day.[4] North Western Nigeria, the geopolitical location of the study area, has the highest proportion of persons with no educationapproximately seven in ten women and half of men.[5] Because an individual's health care behavior is influenced by his/her educational and economic status, the rural dwellers have undesirable health-seeking behaviours.[6,7] Preventive and curative measures that are key to successful malaria control are jeopardized by their low socioeconomic status such as low income, poor educational level, large family size and low risk perception of malaria. The preventive measures include use of Insecticide treated bed nets, application of effective insecticides in homes, integrated vector management such as larviciding and environmental management and use of Intermittent Presumptive Therapy for pregnant women. The environmental management strategies include canalisation, draining and land filling in urban areas. Malaria control measures include prompt diagnosis and effective treatment of malaria.

This study was conducted to assess the barriers to prevention and control of malaria in a rural community in Soba Local Government area of Kaduna State, Nigeria.

Methodology

A cross-sectional descriptive study conducted as part of a community diagnosis field practical experience for final year medical students of Ahmadu Bello University, Zaria, from 25th June 2012 to 20th July 2012.

The study was conducted in Gimba community, a rural settlement in Soba Local Government area of Kaduna state, North-western Nigeria. It is located between latitude 11.00 to 11.06 N and longitude 7.54 to 7.58E.It is 30kilometres from Zaria town. The village has a total population of 4,160 people and one health facility.[8] All household heads in the community were interviewed (total population study).

Data was collected by final year medical students using a structured interviewer administered questionnaire in which household heads were asked about their socio-demographic profiles; household malaria preventive practices such as use of Insecticide Treated Nets (ITNs) and household practices regarding treatment of presumptive malaria like place of treatment and cost of treat. Repeated visits for questionnaire administration were conducted to households where the head was not met at first or previous visit. The questionnaire was pretested on 42 randomly selected household heads in Yakasai village, a community with similar characteristics with the study area.

Appropriate entry permission to conduct the study was sought from Soba Local Government Area, Kaduna State and from Gimba community leaders. An informed verbal consent was obtained from the respondents. Participation in the study was voluntary. Ethical clearance for the study was obtained from Ahmadu Bello University Teaching Hospital's ethical committee.

After the data collection, all completed questionnaires were checked properly for any error and edited. The data obtained were cleaned and analyzed using Statistical Package for Social Sciences software (SPSS), version 19. Results are presented in tabular form.

Table I: Socio-demographic profile of respondents

Variable	Frequency(n=686)	Percent (%)
Age (years)		
<20	6	0.9
20 -29	162	23.6
30 -39	220	32.1
40 -49	158	23.0
50 -59	80	11.7
60 -69	36	5.2
70 -99	24	3.5
Level of Education		
None	9	1.3
Quranic	391	57.0
Informal	16	2.3
Primary	108	15.8
Secondary	111	16.2
Tertiary	51	7.4
Number of wives		
One	385	56.1
Two	251	36.6
Three	35	5.1
Four	10	1.5
None	5	0.7
Number of children fathered		
None	54	7.9
1 -5	372	54.2
6 -10	171	24.9
11 -20	75	10.9
21 -30	12	1.8
31 and above	2	0.3
Monthly Income		
In thousand Naira		
<10	325	47.4
10 -20	252	36.7
21 -30	54	7.9
31 -40	22	3.2
41 -50	19	2.8
51 -60	6	0.9
61 -70	3	0.4
70	5	0.7
Occupation		
None	11	1.6
Farming	478	69.7
Petty trading	59	8.6
Artisan	68	9.9
Businessman	18	2.6
Civil servant	52	7.6
Marital Status		
Single	3	0.4
Married	678	98.9
Divorced	3	0.4
Widowed	2	0.3

N155=US $1

RESULTS

A total of six hundred and eighty six (686) questionnaires were returned within the period of the study, giving a response rate of 100%. The ages of the respondents ranged from 15 to above 92 years.

As shown in table I, 32.1% of the respondents were aged between 30 to 39 years. Most of the respondents (69.7%) were farmers; had only Quranic education (57%); had only one wife (56.1%) and between one to five children (54.2%). A large proportion of the respondents (47.3%) earned between N10,000.00 to N20,000.00. monthly (approximately US $64.5-US$129).

As shown in table II, majority of the households (81.8%) own an ITN. Out of this proportion, 32.6% own only one ITN while 44.6% own only two. A majority of the households received the ITNs free of charge from hospitals or NGOs .Only 13.7% purchased their ITNs from either health workers or market. Most of the households that own an ITN (66.9%) claim that a member of the household slept under an ITN the night before the survey. Other methods used in preventing malaria include use of a locally made insecticide "otapiapia" by 32.9% of the households. Only 10.6% of the households use modern insecticides, while 20.7% of the households do not use any method for malaria prevention (excluding mosquito net use).

Table II: Household Malaria preventive practices and related issues

Variable	Frequency	Percent (%)
Household possession of mosquito net(s)		
Yes	561	81.8
No	125	18.2
Number of nets owned by Household		
One	183	32.6
Two	250	44.6
Three to Six	117	20.9
Seven or more	11	1.9
Source of Mosquito Net(s)		
Purchased from health workers	54	7.9
Obtained free from hospital or NGOs	465	67.8
Purchased from market	40	5.8
Others	2	0.3
Sleeping under net by household members the night before survey		
Yes	375	66.9
No	155	27.6
Not sure	31	5.5
Other household malaria prevention practices		
Environmental sanitation	218	31.8
Local insecticide (Otapiapia)	226	32.9
Modern insecticides	73	10.6
Others	27	3.9
Nothing	142	20.7

As shown in Table III, respondents with no formal education were 0.81 times more unlikely to use malaria preventive measures compared to those with formal education. It also shows that Farmers were 1.38 times more unlikely to use malaria preventive measures compared to non-farmers. Polygamous respondents were 1.79 times more unlikely to use malaria preventive measures compared to monogamous respondents. Respondents with more than 3 children were 0.65 times more unlikely to use malaria preventive measures compared to those with less than 3 children. Households with one ITN were 1.22 times more unlikely to use malaria preventive measures compared to those with more than one ITN.

As shown in Table IV, 263 respondents (38.3%) treated their last episodes of malaria at chemist shops where they paid less than N500 (US$3.2) . Only 77 respondents (11.2 %) treated their last episodes of malaria at other places other than chemist shops, where they paid more than N500 (US$3.2).There was a statistically significant association between cost of treatment and place of seeking treatment (p = 0.029).

Table III: Bivariate analysis of Socio-demographic Characteristics of Respondents and Prevention of Malaria the night before survey

Variable	Prevented Malaria n (%)	Did not Pre vent malaria n (%)	RR (95% C.I)	p
Education				
Non-formal (RG)	119 (28.6)	297(71.4)	0.81 (0.78-1.91)	0.012
Formal(CG)	182 (67.4)	88(32.6)		
Occupation				
Non- Farming (CG)	141(67.8)	67(32.2)		
Farming (RG)	132(27.7)	346(72.3)	1.38 (0.94 - 2.23)	0.026
Type of Marriage				
Monogamy (CG)	296(76.9)	89(23.1)		
Polygamy (RG)	94 (31.8)	202(68.2)	1.79 (1.42- 2.86)	0.003
Number of Children fathered				
1 – 3 (CG)	211(71.3)	85(28.7)		
More than 3 (RG)	51(15.2)	285(84.8)	0. 65 (0.38 - 1.98)	0.021
Number of ITN(S) owned by household				
One (RG)	57(31.1)	126(68.9)	1.22 (1.01-1.63)	0.007
Two & above (CG)	165(43.6)	213(56.4)		

RR= Relative Risk. C.I = Confidence Interval. HH = Household Head
RG = Risk Group CG = Comparison Group n = Sample Size

Discussion

A large proportion of the respondents (43.2%) had no formal education. This could be attributed to the low primary school enrolment in the northern part of Nigeria. For example, as of 1975-1976 when most of the respondents were of primary school age, the proportion of primary school enrolments in the North was just 26.5%, while between 1985-1986, it was 34.3%.[9] This low level of Western education could have contributed to the poor malaria prevention and treatment practices noted among respondents. Other possible responsible factors are the low monthly income of most of the household heads, coupled with a large family size. The average number of children per household alone was 5. This puts the average household size in the community above the national figure of 4.6 for rural Nigerian communities.[5]

With regards to malaria prevention, majority of the households claim to own a mosquito net. However, in a significant proportion of the households (40.8%), no household member slept under a mosquito net the night before the survey. Some sociodemographic characteristics of respondents and their households determine the utilization of malaria preventive methods. They include type of education and occupation of household head; the number of children he fathered; the type of marriage he is into and the number of ITN(s) owned by his household. For example, considering occupation, Use of modern insecticide for mosquito control was not a common practice among farmers. Instead, the cheap, locally made, unpatented, organophosphate pesticide "otapiapia" was the most used "insecticide" among them. There was a statistically significant association between farming occupation and household use of "otapiapia" (X^2=5.696, df=3, p=0.015).The effectiveness of this mosquito repellent is questionable since its chemical constituent is unknown.[10,11] The proportion of farmers that used "otapiapia" in the study area is higher than the 10.6 % figure obtained in the urban city of Markurdi.[12]

With regards to malaria treatment in the community, the high patronage of unqualified medicine vendors for the treatment of presumptive malaria is similar to findings of Uzochukwu in South-Eastern Nigeria.[13] This practice poses a great obstacle to malaria control in the country. The chemist shops are potential sources of substandard and fake antimalarial drugs which have resulted in several treatment failures.[14,15,16] Moreover, the drug vendors know little or nothing about the correct dosage of the drugs. It is therefore not surprising that a significant proportion of patients do not complete the entire treatment course when drugs are purchased over the- counter in rural communities.[17] This poses another threat to effective malaria treatment. There was a statistically significant association between cost of treatment and place of seeking treatment (X^2=4.7957, df=1, p=0.029). However, other factors, Like educational attainment, may contribute to this behavior of patronizing drug vendors in the study area. One limitations of the study is that it relied on recall of the clients with respect to estimations of costs incurred at point of service. The estimates might be inaccurate due to poor recall. Another limitation is that it was based on the assumption that a febrile illness was due to malaria (presumptive malaria). This might not be true in all cases. Both limitations might affect the statistical significance of findings.

Conclusion

Use of cheap unpatented insecticides and treatment of presumptive malaria at drug vendor shops are some barriers to malaria prevention and control in the study area. For successful malaria control, health education and economic development in rural areas are recommended.

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CONFLICT OF INTEREST

The authors declare that they have no competing interests.

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AUTHORS' CONTRIBUTION

GAA led in the design and coordination of the study, carried out the field work and data collection, performed statistical analysis of the data collected and drafted the manuscript. SMN participated in the design and coordination of the study and reviewed the manuscript.

ISH performed statistical analysis; helped with interpretation of results and revision of the manuscript. AA carried out field work and revision of manuscript.