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# Caregivers's knowledge, attitude and practice on childhood malaria and treatment in urban and rural communities in Enugu, south-east Nigeria

T. Oguonu<sup>a,\*</sup>, H.U. Okafor<sup>a</sup>, H.A. Obu<sup>b</sup>

<sup>a</sup>Department of Paediatrics, University of Nigeria, Enugu Campus, Enugu, Nigeria

<sup>b</sup>Park Lane General Hospital, Enugu, Nigeria

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## KEYWORDS

Knowledge; Attitude;  
Practice; Malaria; Rural;  
Urban

**Summary Objective:** To ascertain caregivers's knowledge, attitude and practice regarding malaria and treatment of children in rural and urban communities in Enugu, Nigeria.

**Study design:** This was a cross-sectional study, and caregivers were selected by convenience sampling.

**Method:** In total, 224 and 184 respondents were interviewed in paediatric outpatient clinics in rural and urban areas, respectively, using structured questionnaires.

**Results:** Most respondents in rural and urban areas has heard of malaria (99% urban, 74% rural;  $P \leq 0.05$ ). Both groups were unaware of the particular susceptibility of children and pregnant women to the disease, and respondents preferred to use self-medication (urban 79%, rural 20%). The rural and urban caregivers were quite familiar with and used antimalarial drugs such as chloroquine (urban 23%, rural 15%) and sulphadoxine-pyrimethamine (urban 50%, rural 6%), although in inappropriate dosages. They were also aware of preventive measures against malaria such as insecticide-treated nets (urban 32%, rural 56%), but there was low usage in both communities (7 and 2%, respectively).

**Conclusions:** Both rural and urban communities were aware of malaria as a disease, but practices were grossly inadequate. The provision of affordable healthcare facilities and the use of health education to change knowledge, attitude and practice will help meet the target goals of the 'Roll Back Malaria' campaign in the area.

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## Introduction

The rural population in Africa is often regarded as poor and ignorant, with inadequate social

infrastructure making the people more prone to many diseases, especially malaria. Thus, many intervention measures have been directed at reduction of the morbidity and mortality rates in rural communities. The urban communities in the developing countries are consequently being sidelined from many measures to improve the quality of life of individuals in poor countries. With increasing

\*Corresponding author.

E-mail addresses: udebue@infoweb.abs.net, azunyi@yahoo.com (T. Oguonu).

urbanization, rural-to-urban migrations and community degradation, due to deteriorating economic conditions, there is now a large population in the cities who have similar characteristics (poverty and lack of knowledge) as the rural community. If measures are not taken to improve the healthcare facilities and health-seeking behaviours of urban dwellers, there may be a resultant shift in the potentials of the urban population.

Currently, one of the cardinal tools of malaria control programmes by the World Health Organization (WHO) is community participation, especially in home management of malaria<sup>1</sup>, and success depends largely on the behaviour of caregivers of young children. In order to design interventions and policies that are necessary for the implementation of enduring healthcare programmes, it is necessary to ascertain the level of knowledge and practice of the caregivers. For instance, there is the need to understand treatment-seeking behaviours that are relevant to malaria.

It becomes pertinent to determine the knowledge, attitude and practice of both urban and rural dwellers with regards to such health issues in order to formulate policies targeted at both groups. In order to fill this gap, this study set out to determine the knowledge, practice and attitude of caregivers regarding treatment of children with malaria in rural and urban communities.

## Patients and methods

### Study population

The study population comprised caregivers of children aged 6-59 months attending outpatient clinics at the University of Nigeria Teaching Hospital and Park Lane Specialist Hospital located in Enugu (urban), and those seen at the outpatient clinics of Ugwuogo Community Hospital, Enugu (rural).

### Study area

The Enugu metropolis is in south-eastern Nigeria with an area of 72.8 km<sup>2</sup>. The temperature ranges between 22.4 and 30.8 °C with an annual rainfall of 1520-2030 mm. The vegetation is tropical rain forest and there are two major seasons, namely dry (November-April) and wet (May-October). Malaria transmission in the area is stable and holo-endemic. The University of Nigeria Teaching Hospital and the Park Lane Specialist Hospital are tertiary

and secondary centres, respectively, that are located within the city. Ugwuogo-Nike Health Centre serves Ugwuogo-Nike, a rural community of six villages located 25 km from Enugu metropolis with a population of 23,000. The community is predominantly agrarian. The geographical characteristics of this community are similar to those of Enugu metropolis.

### Study design

This was a cross-sectional survey of caregivers. Caregivers were selected by convenience sampling, and interviewed at the clinics to ascertain whether they met the inclusion criteria: caregiver of a child (parent, guardian or relation who takes care of a child); and place of abode within the locality. Informed consent was obtained from those who met the criteria, and they were subsequently recruited into the study. With the use of an interviewer-administered, pre-tested structured questionnaire, relevant information such as age, sex, address, and other information on knowledge, perceptions, attitude and practice were obtained, using both closed- and open-ended questions. These were coded to facilitate analysis. The interviews were conducted in private to maintain confidentiality and to reduce the influence of relations and peers. Efforts were made to explain difficult questions without interfering with the respondent's opinion. Appropriate drug dosages were determined with the standard prescription for each drug by weight of the child.

Ethical approval was obtained from the ethical committee of the University of Nigeria Teaching Hospital and the local health and civil authorities prior to study commencement.

### Data analysis

The data obtained were entered into Epiinfo 6.04 d, Graphpad prism and Statistical Program for Social Scientists (SPSS) statistical software. Analyses of the valid outcome variables were performed as non-responders were excluded; therefore, for each category, only valid percentages of the responses were accepted. Proportions were compared using cross-tabulations. Non-parametric tests, Chi-squared test and Fischer's exact test were performed to determine associations between the answers from urban and rural caregivers for each of the outcome variables. *P* values of  $\leq 0.05$  were considered to be significant.

## Results

### Demographics

In total, 184 individuals were interviewed at the outpatient clinics of University of Nigeria Teaching Hospital and Park Lane General Hospital, and 224 individuals were interviewed at the Ugwuogo Health Centre, from January 2002 to April 2002, and July 2002 to September 2002, respectively.

### Urban

#### Knowledge

Most of the 177 urban respondents had heard of the term 'malaria' (99%), and understood that it is a serious and lethal (92 and 94%, respectively) illness. One hundred and forty-one (79.7%) caregivers associated malaria with mosquitoes alone, and eight (5%) caregivers thought that mosquitoes and other agents were responsible for malaria. Eighty-four percent of respondents thought that malaria is a common illness, and occurs more at particular times of the year (44% thought dry season, 36% thought wet season). Reasons included too much sun (61%), dust and dirt (39%) in the dry season, and too much cold (25%) and increased breeding of mosquitoes (50%) in the wet season. Eighty-seven (49%) respondents felt that everybody was at risk of severe malaria, while 13 and 12% said that pregnant females and children, respectively, were at severe risk.

With regards to malaria symptoms, fever was the most common symptom attributed to malaria (144 (81%) respondents), followed by headache (49%), weakness (36%), vomiting (23%) and loss of appetite (20%). Other symptoms mentioned were cough (9%) and body pain (9%) (Table 1).

**Table 1** Frequency of common symptoms attributed to malaria by caregivers.

Symptoms	Rural respondents (n = 174)		Urban respondents (n = 177)	
Fever	131	75%	144	81%
Weakness	105	60%	64	36%
Loss of appetite	56	32%	36	20%
Cold	36	21%	11	6%
Headache	47	27%	87	49%
Yellowness of eyes	14	8%	5	3%
Body of aches	10	6%	15	9%
Vomiting	35	20%	40	22%
Abdominal discomfort	14	8%	6	4%
Yellow urine	28	16%	8	5%
Rigor	13	8%	10	6%
Cough	23	13%	15	9%

F = 14.27, Df = 11, P < 0.001.

### Attitude/practice

This study showed that most respondents (79%) would use self-medication as the first line of treatment when malaria is suspected. If this fails, 48 and 37%, respectively, would seek care from a doctor or medical facility. The most popular drugs were the sulphadoxine-pyrimethamine antimalarials, followed by chloroquine. With regards to self-medication, 22% would take chloroquine, while 16, 15 and 18% would use Maloxine, Fansidar and other brands of sulphadoxine/pyrimethamine (S-P), respectively. In total, 50% of respondents would take an S-P antimalarial. The other respondents would use other antimalarial drugs, Halfan (14%) and quinine (11%). However, 65% of caregivers would use an incorrect dosage of antimalarials, and only 35% would administer any of the drugs correctly. In total, 57% of caregivers would administer S-P drugs correctly, but only 9% of the respondents who preferred chloroquine would use the correct dose. The majority of caregivers would seek assistance from a health facility or personnel (70%), a patent medicine shop (22%) or a herbalist (5%) on failure of initial treatment. In the course of the illness, 58% of caregivers would take other measures such as tepid sponging (63%), native medications (11%) and non-specific measures (16%) to alleviate the symptoms.

Prevention of malaria remains a popular control step taken by many caregivers: 83% use any form of measure; 76% spray insecticide aerosols in their rooms at night; 13% of the respondents use mosquito coils at night; and 65% have window and door fly screens at home. In total, 65% of respondents had not heard of insecticide-treated nets, and among the 32% who were aware of these nets, only 7% used them at home and 2% treated their nets.

### Rural

#### Knowledge

Of the 224 respondents, 165 (74%) had heard of malaria, but only 24% associated it with mosquitoes alone; 18% thought that mosquitoes and additional factors such as sun, oily food, dirt and work were responsible for malaria. Others felt that factors such as weather, and bad and oily food were the major causative factors. The majority of interviewees (95%) knew that malaria is a common illness that is serious enough to kill those afflicted, but only 9% thought that children were at the greatest risk of severe malaria. The respondents felt that malaria occurred more in the dry season (55%) than in the wet season (45%). About 80 and 16% of caregivers, respectively, thought that too much sun

and dust/dirt were the reasons for high occurrence of malaria in the dry season. The reasons given for occurrence of malaria in the wet season were too much cold (65%) and increased breeding of mosquitoes (24%).

The answers from 174 caregivers were analysed with regards to the symptoms of malaria. Fever (75%) and weakness (60%) were the dominant symptoms attributed to malaria by the majority of caregivers; other symptoms such as loss of appetite (32%), headache (27%), cold (21%), cough (13%), yellowness of the urine (16%) and yellowness of the eyes (8%) were also stated.

### Attitude/practice

If their children had malaria, 46% of rural caregivers would seek medical attention from a drug vendor, 20% would use self-medication, 11% would be treated by a herbalist, and 24% would consult a doctor. Interestingly, of the 154 respondents who took further action when the first course of action failed, 49% would seek medical attention in a hospital, 28% would seek the services of a medical doctor, and 9, 5 and 1%, respectively, would prefer the assistance of drug vendors, native doctors, nurses and divination (Table 2). With regards to additional measures they would take when their children have malaria, the caregivers would use measures such as tepid sponging (55%), exposure (12%) and native medication (9%). Fewer respondents would use antipyretics, apply palm kernel oil to the skin, and avoid oily food.

In the rural community, S-P drugs were the most popular (81%) for treatment of malaria. Of those who responded, 64% had heard of chloroquine and other antimalarial drugs, and 56% had heard of quinine. When asked about their preference of usage, 15, 13 and 6% would use chloroquine, quinine

and S-P, respectively, as single therapy, while 66% would use any of the aforementioned drugs in various combinations. However, 96% would not administer any of the drugs in appropriate dosages; of the 12% who would, the drugs that were given correctly were S-P drugs (70%). Most caregivers take measures to prevent malaria: environmental cleanliness (34%), native medication (17%), mosquito nets (0.3%), avoidance of malarial patients (0.3%), staying away from the sun and avoidance of oily food. Use of any form of insecticide was not popular (5%). In total, 56% of respondents had heard of insecticide-treated nets but only 2% have used them.

### Discussion

Knowledge about malaria was similar in both rural and urban communities in this study. There was a marked difference in understanding of the role of mosquitoes in the cause of malaria between the groups; 24% of the rural caregivers and 80% of the urban caregivers associated mosquitoes with malaria in this study. The urban and rural differences may be expected considering that the urban population is more exposed to advocacy and regular information from the media, and has a higher number of health facilities. In the rural areas, the attribution by the respondents of physical, environmental and dietary factors as causative agents of malaria underscores the need for effective intervention to improve the level of knowledge in these communities. The lack of knowledge about the role of mosquitoes in malaria will jeopardize control measures if this is not addressed appropriately. There has been a time relationship with regards to the prevalence of malaria, which asserts that malaria transmission is greater in the wet season.<sup>2,3</sup> However, this was not the view of most respondents in this study, who felt that transmission was greater in the dry season due to factors such as sunshine. Of those who believed that transmission was greater in the wet season, it was attributed to increased breeding of mosquitoes and cold weather. This notion will significantly affect malaria control efforts if not corrected by appropriate health education. The inability of both groups (rural and urban) to associate the severity of malaria with younger age is a source for concern, and poses a great danger to the campaign for prompt treatment of children suffering from malaria. Also of concern is the failure to acknowledge the danger of malaria to pregnant women, which will contribute to an increase in maternal

**Table 2** Health-seeking behaviour of caregivers.

	Rural respondents		Urban respondents	
<i>First-line activity</i> *	(n = 158)		(n = 224)	
Self-medication **	31	20%	145	79%
<i>Second-line activity</i>	(n = 154)		(n = 150)	
Hospital	76	49%	55	37%
Medical doctor	43	28%	72	48%
PMV <sup>†</sup>	14	9%	6	4%
Native doctors	11	7%	18	12%
Nurses	8	5%	0	0%
Divination	2	1%	1	1%
Others	0	0%	10	7%

\* $\chi^2 = 75.89, P < 0.001$ ; \*\* $F = 11.21, Df = 6, P = 0.0047$ ; <sup>†</sup>PMV, patent medicine vendor.

and infant mortality/morbidity. In contrast to this study, in western Nigeria, Fawole et al.<sup>4</sup> showed poor knowledge of rural dwellers about malaria, and a high level of knowledge was detected in rural communities in Tanzania and Zambia.

In this study, the rural and urban populations recognized fever as a common feature of malaria, which is a significant attribute with regards to health-seeking behaviour and treatment (Fig. 1). It is also significant to observe that rural caregivers regard cough as a symptom of malaria. This observation requires further investigation to ascertain the relevance to uncomplicated malaria, more so when there is an increasing awareness of the association of respiratory symptoms and signs with malaria.<sup>5,6</sup> This could also be attributed to comorbidity of malaria with acute respiratory infections.<sup>7</sup> None of the respondents in either of the groups associated convulsions with malaria; this suggests a dearth of knowledge and poor recognition of features of severe malaria.

In both communities, a significant number of caregivers were unaware of the first measures to take in the event of malaria in their children. Some preferred alternative medication to orthodox medical care. Self-medication was the dominant first-line approach to treatment by respondents in the urban community, and there was a lesser tendency for this among the rural community. Some studies<sup>4,8</sup> of rural communities have shown a higher tendency

towards self-medication. The difference observed in this study may be due to a variety of reasons such as the patronage of the local drug vendor and ignorance. The health-seeking behaviour among caregivers in the rural areas, in this study, is not surprising given the dearth of modern medical facilities, and underscores the need to provide accessible health facilities in these communities. In the urban centres, it emphasizes the need for health education as a veritable tool in the current concept of malaria control. In this approach, the training of both caregivers and the patent medicine vendors is advocated in order to meet the objectives of home management and early and appropriate treatment. Health-seeking behaviours differ between communities and regions; for example, the findings in this study agree with those of Thora et al.<sup>8</sup> in Mali, but differ from those of respondents from South Africa<sup>9</sup> and Zimbabwe,<sup>10</sup> where the respondents in rural areas use health facilities as first-line treatment.

The familiarity of chloroquine and S-P to the caregivers and their usage despite reports of increasing resistance to both drugs in the area are also a source of concern as the increasing number of cases of drug failure will pose a great danger to future malaria treatment.<sup>11</sup> In Togo,<sup>12</sup> up to 94% of mothers would use chloroquine at home as first-line treatment although in inappropriate dosages. The better compliance and knowledge of the use of S-P drugs observed in this study could be due to its

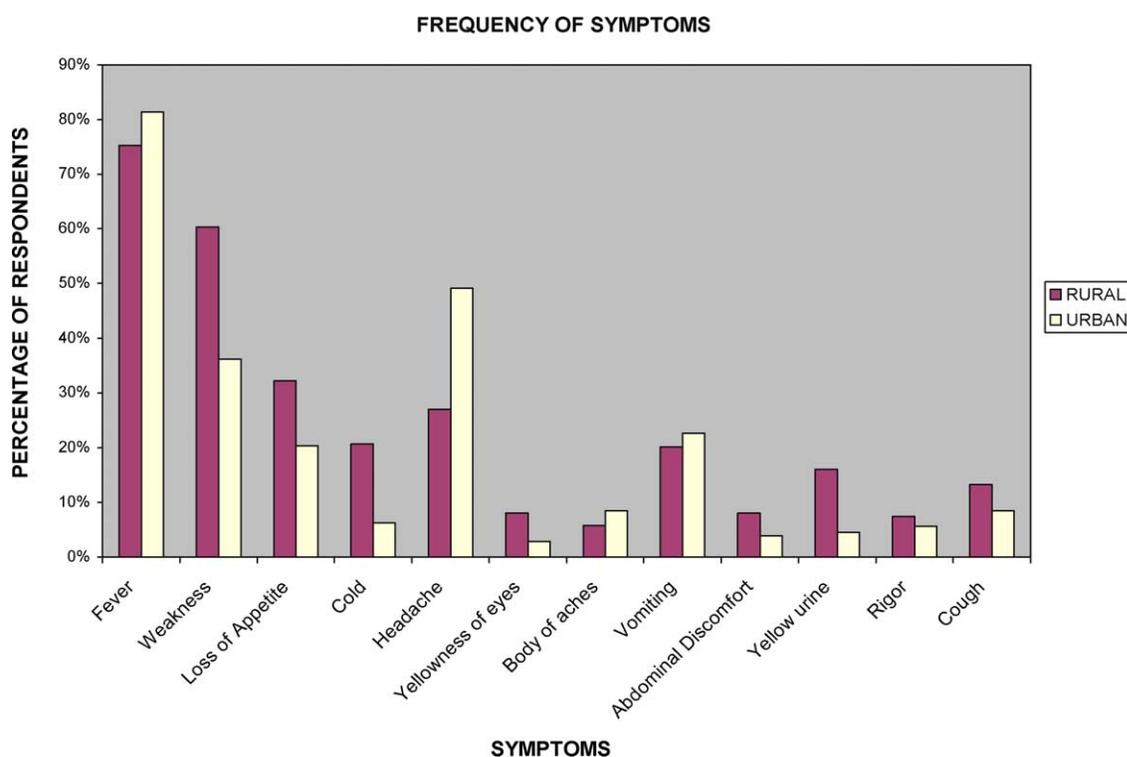


Figure. 1 Frequency of symptoms attributed to malaria by caregivers.

simplified dosage. This attribute could form the cornerstone of an intervention programme, such as early and adequate treatment of malaria which is the cardinal pillar in the programme of home treatment of malaria and intermittent preventive treatment.

A wide variety of preventive measures are practiced in both communities. While the urban caregiver will screen the abode with nets, the rural caregiver will clean the bushes and environment. These practices are probably dictated by circumstances and should be harnessed to improve malaria control measures within the communities. The current approach to malaria control with the use of insecticide-treated nets seems to be appreciated by both groups of respondents. However, very few caregivers in this study used these nets. This fact is supported by the finding of Onwujekwe et al.<sup>13</sup> in five rural communities in the region, where the use of insecticide-treated nets was variable. This further necessitates the need for an effective policy to make the materials available to all communities. The poor usage of insecticide-treated nets might be attributed to poor recognition of mosquitoes as a causative agent for malaria; Minja et al.<sup>14</sup> reported that where there was a high awareness of mosquitoes as the malaria vector, the usage of insecticide-treated nets was as high as 52%. This may not be applicable in the urban setting in Enugu since a large proportion of caregivers correctly associated malaria with mosquitoes. Therefore, factors such as non-availability and cost may be responsible for the poor usage.

This study has highlighted the similarities and differences in knowledge and attitude between urban and rural communities, and the failure or inadequacy of health education in malaria control in the communities in our region. Despite the overwhelming awareness of malaria in both rural and urban communities, knowledge about treatment and preventive measures is poor. This may be attributed to a paucity of implementation of the strategies by the local health authorities. In conclusion, there seems to be little difference in the characteristics of both communities, and the presumption of better knowledge and attitudes of the urban caregivers should be discarded. Due attention should be given to both groups with regards to the quest for malaria control and better health.

We, therefore, recommend the use of appropriate health education tools to improve knowledge, and training in home management of malaria. More parallel research work should be conducted within both communities.

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