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Sociocultural factors influencing the control of malaria in an endemic city in north central Nigeria

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ABSTRACT

The continued persistence of malaria in Africa appears to be largely due to socio-cultural factors which very often, are at variance with the standard control methods. The study was therefore designed to ascertain the socio-cultural factors affecting the control of malaria in an endemic city- Makurdi, north central Nigeria. The study was cross-sectional in nature using systematic sampling methods to identify households; both quantitative and qualitative data were generated from adult women using structured and semi-structured questionnaires, and focused group discussions (FGDs) to obtain information on malaria. Questionnaires were administered requesting such as age, educational level, marital status, and awareness or otherwise of the existence of malaria, and methods of prevention. Focused group discussions were used to obtain qualitative information on malaria not captured in the questionnaires. Data obtained was analysed using Epi Info 6 statistical software. Of the 2,075 adult women studied, 97.0% (n=2,013) were aware of the existence of malaria. Out of these, 83.0% (n=1,671) did not consider malaria to be a serious health problem that would need urgent attention. Educational level and marriage had a positive impact on knowledge about the disease (P< 0.05). Accessibility to information on malaria and general knowledge of the modes of transmission and control was generally low, and to a large extent influenced by their cultural beliefs, values and low economic strengths. There is a need to intensify adult health education and provision should be made for home health educators to raise peoples' knowledge about the disease. Policies meant to reduce the poverty level of the people should be put in place to raise their economic status.

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1. Introduction

With all the information available about malaria via the media (electronic and print), an average person should know when,

where and how to access information about the disease [1,2,3]. The advent of information and communication technology (ICT) has made issues much easier with the internet turning the whole world into a global village [4-6]. This has made it easier for individuals, communities or groups of people to be adequately informed about the most prevalent diseases afflicting them such as malaria [7,8].

It is estimated that, without adequate control measures, about 2.5 billion of the world's 7 billion people stand the risk of being infected with malaria parasites every year with sub-Saharan Africa losing about US\$12 billion in economic value [9]. The disease

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accounts for about 500 million illnesses per year with at least one million deaths, over 70% of which occur in sub-Saharan Africa [10,11].

With so much information available on malaria, not all has been known about the disease from the very elementary to the highly technical [12-14]. Findings from Tajikistan in a study on 56 farmers on modes of control of malaria showed a low level of awareness of the disease [15]. In a sampled study from Zambia, Malawi, the Central African Republic and Mozambique among other African countries, HIV-1 epidemic was found to increase malaria parasite biomass in Sub-Saharan Africa [16]. In a related study from USA, HIV-infected children with severe malarial anaemia were found to suffer a higher all-cause mortality and malaria-related mortality than HIV-uninfected children [17]. In the Democratic Republic of Congo, the incidence of anaemia and efficacy of quinine in patients recently infected with HIV was found to decrease sharply [18].

Control of malaria in Nigerian communities would require proper knowledge of the modes of spread and the factors that enhance its control and prevention by the people concerned, with special emphasis on the care givers. Women, either as potential mothers, actual mothers, or grand mothers in Makurdi city have significant influence on the nature of treatment and control of malaria at the household level. Their collective level of knowledge would impact significantly on the realisation, or otherwise of the 2010 "Roll Back Malaria" mandate of WHO, World bank, UNDP and UNICEF [19,20]. It is in the light of this renewed commitment towards control of malaria globally; and the outcome of the recently conducted city-wide malaria incidence among the under fives in Makurdi (32.3%) that this study was carried out.

2. Materials and Methods

2.1. Study Area

The study was carried out in Makurdi, the capital city of Benue state located in north-central Nigeria which lies within latitude 7°44'N and longitude 8°35'E. The city has a population of about 700,000 inhabitants and serves as a link to most parts of northern and southern Nigeria for travellers crisscrossing the country. Makurdi experiences rainfall from April to October with an annual level of 1500mm- 1800mm with mean night and day temperatures that fluctuates between 30°C and 40°C year round. At least 95% of the inhabitants of the city are Christians and the predominant tribes are Tiv, Idoma and Iggede.

2.2. Procedure

The study was carried out between October and December 2009. Six major parts of the city comprising High level, Low level, Wurukum, North bank, Wadata and the Government Reserved Area (GRA) were selected taking into consideration the ethnic, socioeconomic, and religious backgrounds of the inhabitants. Interviewers were trained on the basic art of questionnaire administration and subsequently recruited for the study. Households were selected using systematic sampling methods. Women 18 years and above or of any age with a biological child in each household were individually interviewed to assess their depth of knowledge and perceptions about malaria. Where more than one adult female was encountered in a household, the one with an under five child was given priority or selection was based on general consensus. Semi structured questionnaires with both closed and open ended questions were either self or interviewer administered to the respondents to obtain the information.

Information such as age, educational level, occupation, methods of transmission and prevention of malaria, ownership/use of insecticide treated bed net (ITNs), drugs for

treatment of malaria, and sources of information on malaria were obtained. Focused group discussions and in depth discussions on myths and cultural practices surrounding malaria control were also carried out where it was possible to assemble more than 10 adults in any location of the city; this qualitative data was used to strengthen the quantitative data obtained from the questionnaires. Respondents were scored on key parameters of malaria control- awareness of the disease, mode of transmission, clinical features, treatment, and prevention; one point was allocated to each component with a maximum score of 5 and minimum zero per respondent. Aggregate score of 1 =Poor, 2-3=Average, 4=Above Average, 5=Sound was used to grade their overall knowledge about the disease.

Principal Component Analysis (PCA) was used to develop wealth indices for the households based on ownership of durable assets including radio, television, telephone, refrigerator, bicycle, motorcycle/scooter and car/truck. Ownership was coded as 0 or 1 and missing cases were excluded. The households were then divided into socio-economic quartiles based on their scores. Cronbach's alpha was then calculated to test consistency-reliability [21].

2.3. Analysis of Results

Data obtained was analysed using Epi Info 6 statistical software; Pearson's Chi squared test or Mantel-Haenszel were used to determine association with a P-value of ≤ 0.05 accepted as significant. Fisher's exact test was calculated for borderline significance and for cells with counts less than five. Logistic regression models were used to determine the predictors of appreciable knowledge about malaria among the study population.

3. Results

Of the 2,485 questionnaires administered, 2,196 (88.4%) were returned while 2,075 (94.5%) were correctly filled. The age range of the 2,075 women studied in Makurdi was 18 to 83 years; the mean age was 37 years and mode 32 years; 97.0% (n=2,013) of the respondents were aware of the existence of malaria; however, 83% (1,671/2,013) of them were of the view that malaria is not a serious public health problem that needs serious attention. Those who knew at least one valid means of transmission, clinical feature and prevention were 61.3% (1,234/2,013), 89.0% (1,792/2,013) and 84.9% (1,691/2,013) respectively. Those aged =20 years and 70-79 years had the highest (13.0%; 23) and lowest (1.5%; 3) number of people who had above average or strong knowledge about malaria. Also 7.6% (n=48), 4.9% (n=19), 7.8% (n=10) 2.7% (n=1) of those aged 20-29, 30-39, 60-69, and those above 80 years respectively had above average or strong knowledge about the disease (P> 0.05). (See Table 1)

Table 1. Age Distribution pattern of adult females in relation to their strength of knowledge about malaria in Makurdi, Nigeria.

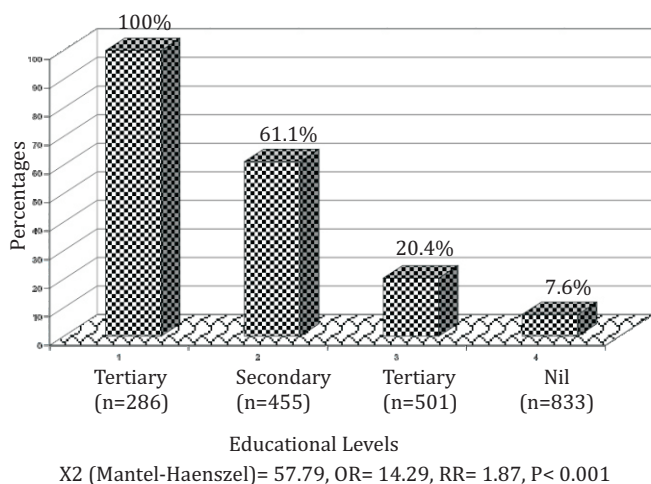
Age Interval (Years)	Aware (%)	Unaware (%)	Total (%)
=20	154 (87.0)	23 (13)	177 (100)
20-29	586 (92.4)	48 (7.6)	634 (100)
30-39	372 (95.1)	19 (4.9)	391 (100)
40-49	206 (92.4)	17 (7.6)	223 (100)
50-59	255 (91.4)	24 (8.6)	279 (100)
60-69	119 (92.2)	10 (7.8)	129 (100)
70-79	119 (92.2)	3 (1.5)	205 (100)
=80	36 (97.3)	1 (2.7)	37 (100)

χ^2 (Mantel-Haenszel)= 0.28, OR= 1.11, RR= 1.05, P> 0.05

NB: Age Range= 18- 83 Years, Mean= 37 Years, Mode= 32 Years.

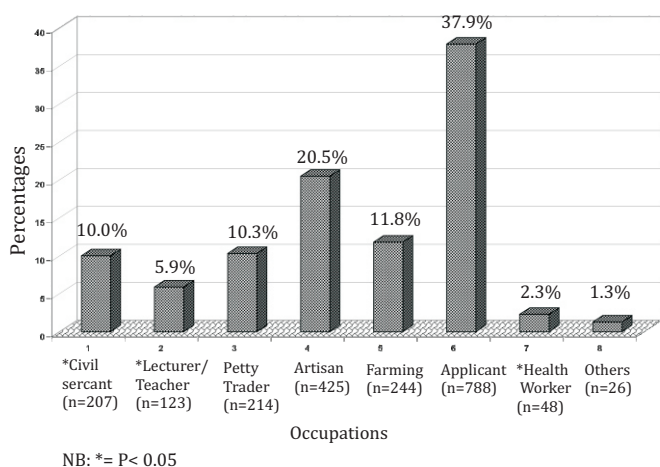
A review of educational level of the women interviewed showed that 40.1% (n=833), 24.1% (n=501), 21.9% (n=455) and 13.8% (n=268) had no formal education, primary, secondary and tertiary respectively. All the 286 (100%), 278 (61.1%), 102 (20.4%), and 63 (7.6%) of those who had tertiary, secondary, primary and nil education respectively had either above average or sound knowledge about malaria (P<0.05). (See Figure 1)

Figure 1. Educational level in relation to the strength of knowledge on malaria among women in Makurdi, Nigeria.



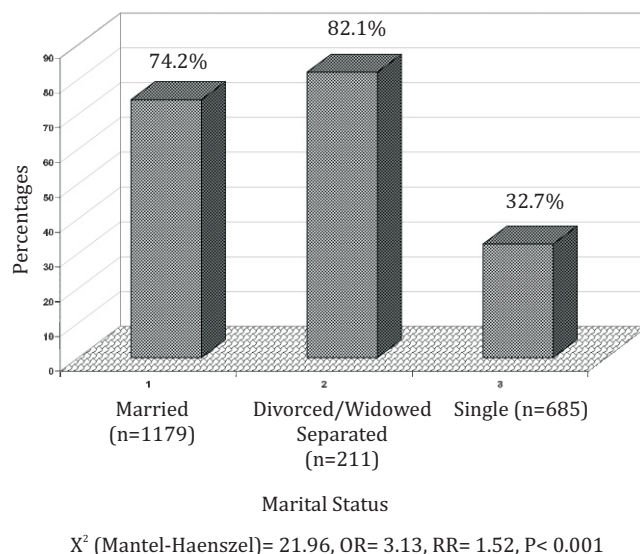
Based on occupation; 37.9% (n=788), 11.8% (n=244), 20.5% (n=425) and 10.3% (n=214) were applicants (including full time housewives), farmers, artisans and petty traders respectively. Others were civil servants 10.0% (n=207), Lecturers/Teachers 5.9% (n=123) and health workers 2.3% (n=48). All the civil servants (100%), lecturers\teachers (100%), and health workers (100%) had above average or sound knowledge about malaria compared to less than 20% recorded among applicants, farmers, artisans and petty traders (P<0.05). (See Figure 2)

Figure 2. Occupational distribution of adult females interviewed on malaria control in Makurdi, Nigeria (N=2,075).



Analysis of the marital status of the respondents in relation to knowledge about malaria showed that: 74.2% (n=875), 82.1% (n=173) and 32.7% (n=191) of those married, divorced, widowed, separated and singles respectively had above average or sound knowledge about malaria (P<0.05). (See Figure 3)

Figure 3. Marital status of respondents in relation to their strength of knowledge about malaria in Makurdi, Nigeria.



The main sources of information were radio 35.3% (n=733), television 28.5% (n=592), healthcare facilities 7.4% (n=154), newspapers 17.9% (n=372), posters and handbills 10.8% (n=225), while 7.1% (n=148) had no source of information. (See Figure 4)

Figure 4. Means of regular sources of information on malaria control among adult females in Makurdi, Nigeria (N=2,075).

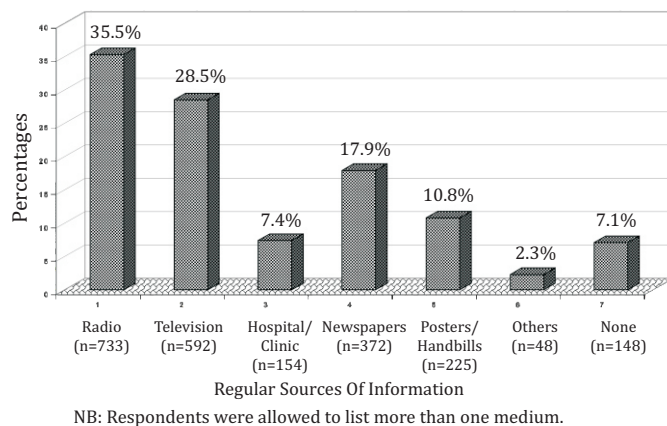
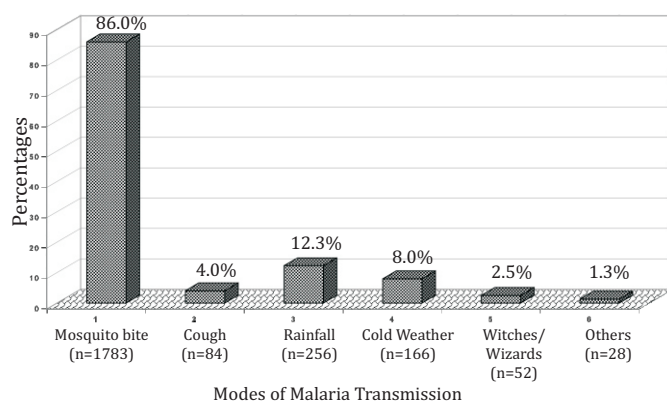


Figure 5. Ways of transmission of malaria advanced by adult females in Makurdi, Nigeria (N=2,075).



Modes of malaria transmission according to the respondents were found to be: mosquito bite 86.0% (n=1,738), cough 4.0% (n=84), rainfall 12.3% (n=256), cold weather 8.0% (n=166), witches and wizards 2.5% (n=52), and others like too much heat from the sun <0.1% was mentioned. (See Figure 5)

The clinical presentations of malaria according to the respondents were: fever 1,552 (74.8%), headache 842 (40.6%), body weakness 777 (37.4%), loss of appetite 501 (24.1%), and chills 139 (6.7%). Other features mentioned were, body pains 666 (32.1%), shivering 651 (31.4%), vomiting 114 (5.5%), jaundice 78 (3.8%), and catarrh 282 (13.6%). About 16.7% (n=347) did not know any clinical feature of malaria. (See Table 2)

Table 2. Modes of clinical presentations of malaria advanced by adult females in Makurdi, Nigeria (N=2,075).

Clinical Features*	Number	Percent (%)
Fever	1552	74.8
Body Weakness	777	37.4
Loss of Appetite	501	24.1
Headache	842	40.6
Body pains	666	32.1
Yellow eyes	78	3.8
Catarrh	282	13.6
Cough	193	9.3
Vomiting	114	5.5
Crying	34	1.6
Shivering	651	31.4
Chills	139	6.7
Don't Know	347	16.7

Methods adopted for treatment of malaria by the respondents include: visits hospital\clinic 46.8% (n=721), drugs from medicine stores 34.7% (n=721), witchdoctors 8.3% (n=172), herbs 21.1% (n=438), and seek spiritual healing 4.0% (n=83), while 18.2% (n=378) usually did nothing. (See Table 3).

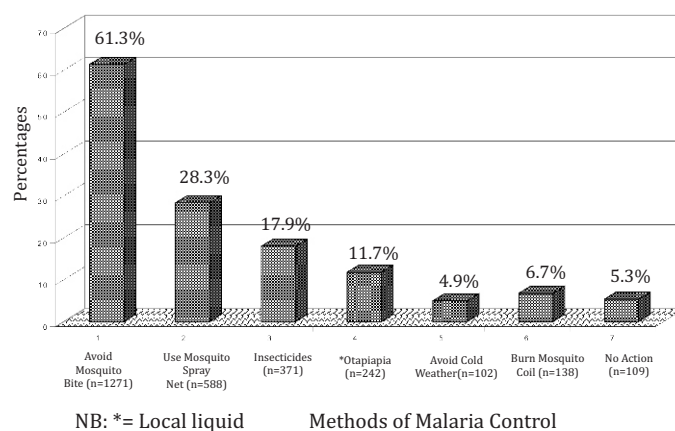
Table 3. Methods adopted for treatment of malaria by adult females in Makurdi, Nigeria (N=2,075).

Modes of Treatment	Number	Percent (%)
Visit Hospital/Clinic	972	46.8
Buy Drugs from Pharmacy	721	34.7
Visit Witch Doctors	172	8.3
Take Herbs	438	21.1
Seek Spiritual Healing	83	4.0
None	378	18.2

NB: Respondents were allowed to list more than one method

A review of the methods used by the respondents to control malaria showed that: 61.3% (n=1271), 28.3% (n=588), 17.9% (n=371), and 11.7% (n=242) would avoid mosquito bite, use mosquito net, spray insecticide, and sprinkle "otapiapia" (a local rodenticide) respectively. 4.9% (n=102), 6.7% (n=138), and 5.3% (n=109) would respectively, avoid cold weather, burn mosquito coil, and take no action. (See Figure 6)

Figure 6. Methods of malaria control advanced by adult females in Makurdi, Nigeria (N=2,075).



There was a direct correlation between high economic status and the level of awareness concerning malaria as well as a sound knowledge on most of the chain of events relevant for malaria control in the community compared to those with low socio-economic status (CI= 1.3, RR= 1.5). The awareness of those in the 3rd and 4th quartiles was significantly higher than that of those in the 1st and 2nd quartiles (93% versus 52%) (P< 0.005).

5. Discussion

The rate of awareness of the existence of malaria was found in 97.0% of the women studied; although, 83.0% of them were of the view that malaria is not a serious disease. This view was corroborated by majority of the people in virtually all the focused group discussions (FGDs). The public health implication of this belief which appears to represent the view of at least 70% of the city's inhabitants including some of the well educated poses a more serious challenge towards malaria control in the city. The low accessibility of the respondents to regular information on radio, television and newspapers, and poor knowledge about internet could have largely contributed to this erroneous belief.

Marriage, educational level and some occupations (eg. teachers and health workers) appeared to impact positively on the knowledge of malaria among the women. It is obvious that women, who have at least been married at a time, and who attended ante-natal and paediatric clinics are better informed about the disease compared to the singles (P< 0.05).

The educational status of each respondent was found to impact positively on his attitude towards malaria control [22,23]. The 40.1% and 24.1% of the respondents who had either nil or only primary education calls for concerted efforts toward mass adult education.

Fever was recognised as a symptom for malaria by 74.8% of the respondents, headache 40.6%, body weakness 37.4% and body pains 32.1%. The absence of other associated clinical features of malaria such as convulsion, anaemia, prostration, excessive crying, refusal of feeds observed from focused group discussions points to the fact that these features have not been admitted by the people in the community. This was compounded by attribution of severe anaemia and convulsions especially to evil spirits and other factors. Similar findings were observed in Dar es Salaam, Tanzania [24], Adidjan, Cote d'Ivoire [25] and Jengre, Nigeria [26] where convulsions and anaemia in children were hardly associated with malaria.

A large number of the respondents patronised witch doctors, took herbs or bought drugs over the counter in order to treat malaria while only 61.3% remembered mosquito control as important in the control of malaria. The confidence respondents had in the efficacy of those other sources of treatment and also in a bid to preserve the tradition handed over to them from their fore fathers were some of the reasons proffered.

6. Recommendations

In order to improve information dissemination, electronic bill boards in addition to the conventional ones should be positioned at strategic positions in the city with captivating jingles and special messages on malaria as a deadly disease. Also inclusion of the key components of the Roll Back Malaria in the curricula at elementary schools, secondary as well as vocational schools would further boost information dissemination as well as initiate a gradual internalization of the programme by the public [27-29].

Special provisions could be made at the outpatient clinics for brief talks on malaria control each morning shortly before commencement of consultations, or also in the course of consultations.

Government should formulate policies that could give prominence to formal and informal adult education and also create wealth for the people. This would raise the literacy level of the community and impact positively on their health status. The fact that only 86% of the respondents could attribute malaria to mosquito bite, and other modes of transmission such as cold weather, cough, rainfall, witches and wizards coming mainly from the uneducated group further strengthens the benefit of education to the people in this regard [30,31].

Healthcare providers with adequate training in malaria treatment and control should be adequately equipped for home visitation so as to interact informally as much as possible with the people and promote the result oriented integrated home management of malaria [32,33].

With only 16.8% of the respondents owning mosquito net and with no mention of other important control methods and 5.3% having no idea on malaria control, there is need to break the generational chain of transfer of cultural values and beliefs that may have impeded the control of malaria among the people through people oriented education. This could be through a well articulated and synchronised dissemination of positive knowledge to the people. These negative cultural practices and beliefs have been a negative force towards effective malaria

7. Conclusion

The study has shown that although a large number of the people are aware of the existence of malaria, its clinical impact is generally underrated. Also, the cultural beliefs and practices, poverty and high illiteracy level of the people appear to have constituted a big barrier towards freely accepting the scientifically proven facts about the disease towards its effective control. Adult mass literacy campaigns therefore should be intensified and more avenues for health education created for the people.

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