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Perception and practice of malaria prevention and treatment among mothers in Kuje Area Council of the Federal Capital Territory, Abuja, Nigeria

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ABSTRACT

Background: Malaria remains a huge public health problem in Sub-Saharan African countries and accounts for 10% of its disease burden even though it is both preventable and curable. **Aim:** To assess the knowledge of malaria and practices related to its prevention and treatment among the women of Kuje Area Council in the FCT. **Methods**: It was a comparative community intervention study conducted among 232 mothers/ caregivers of under-five children selected through a two staged sampling technique by balloting in Kuje and Rubochi community in Kuje Area Council of the Federal Capital Territory. **Result:** At baseline only 1.8% in the intervention group had good knowledge of the cause of malaria while 90.2% had fair knowledge which improved significantly (p=0.013) after the intervention. Good knowledge of the preventive measures was also poor (5.4%) in the intervention group but increased significantly after 5 months of intervention. However, the control group showed no change. Most mothers used Chloroquine to treat malaria in both the intervention and control groups. This however declined from 72.2% to 53.6% in the intervention group. **Conclusion**: Mothers of children under five in Kuje had poor knowledge of the cause of malaria and its prevention method, and were not using the recommended drug by the Federal Government of Nigeria (ACTs) for the treatment of uncomplicated malaria. However adequate health education to women especially in the language they understood effectively increased their knowledge and improved the practice of malaria treatment.

Key words: Perception, knowledge, malaria, mothers, under-five children

INTRODUCTION

Malaria is a major impediment to health in Sub Saharan Africa, and its greatest toll is among under-five children and pregnant women. It remains the single biggest cause of death among young children in Africa.[1] In highly endemic areas, children and pregnant women are most vulnerable to be attacked, as other adults acquire a degree of immunity through continued exposure.[2,3]

Malaria is stable and endemic in most of Nigeria except in some highland areas of

the Mambilla Plateau and Obudu.[2] There is seasonal variation in the intensity of malaria in Nigeria, being higher in the rainy season. Prompt and accurate diagnosis is a key component of effective disease management and the 'gold standard' is parasitological diagnosis through microscopic examination of blood smears for asexual forms of the parasites.[1,2,4] In high and moderate malaria transmission areas where infection is common, the WHO recommends that all children under the age of five with fever should be treated with effective antimalarial medicines based on a clinical diagnosis.[2,5,6]

About 60% of the cases of malaria worldwide occur in Sub Saharan Africa and over 80-90% of malaria deaths occur in this same region.[7] The situation is so serious that every 30 seconds, an under-five child dies from malaria and many children who survive an episode of severe malaria suffer permanently from learning impairments or brain damage.[7,8] It is also a major cause of anaemia in children.[2,9,10]

Malaria remains a huge public health problem in Sub-Saharan African countries and accounts for 10% of its disease burden even though it is both preventable and curable.[3,5,11]

METHODOLOGY:

The study was a Comparative Community Intervention study. Mothers of children less than 5 years in two wards in Kuje Area Council namely Kuje and Rubochi were recruited into the study, as intervention and control groups respectively.

Sample size determination

The minimum sample size was determined using the formula for comparative designs stated below.[12-15]

$$N = \frac{(Z\alpha + Z\beta)^2\, 2p(1-p)}{d^2}$$

Where N= minimum sample size for each group

Zα = percentage point of normal distribution corresponding to the (two sided) significance level. In this case significance level is 5%, so Zα=1.96

Zβ = power of the test, which is conventionally 80%; Zβ = 0.84

p = mean proportion of under-fives with malaria in the control group (55%)[16] and experimental or intervention group (28%) (From previous studies, use of ITN's will reduce the incidence of malaria by an average of 50%).[11,17]

$$p = \frac{55 + 28}{2} = 42 \text{ or } 0.42$$

1-p= the variance of the proportions = 1 - 0.42 = 0.58

d= the minimum difference to be detected by the study (20%) = 0.2

Substituting in the formula therefore:

$$N = \frac{(1.96 + 0.84)^2 \times 2 \times 0.42 \times 0.58}{0.2^2} = \frac{3.819648}{0.04} = 96.$$

Adding 20% in case of Attrition = 96 + 20 = 116

Sample size = Experimental group (116) + Control group (116) = 232.

Sampling technique

A two staged sampling technique was used to select the participants

First stage

From the ten political wards in Kuje Local Government Area, Kuje was randomly selected as the intervention group by balloting. A second ward, Rubochi with similar socio demographic characteristics but not too close to Kuje ward was selected to serve as control.

Second stage

Houses with children less than 5 years of age from each of the two selected wards were enumerated and numbered. A total of 285 houses were enumerated in Kuje and these formed the sampling frame from which a sample of 130 households from Kuje was randomly selected using computer generated random numbers. In Rubochi 245 houses were enumerated, these formed the sampling frame from which 118 houses were selected using computer generated random numbers. Mothers of the under-five children in these houses were then invited to the nearby Primary health care center and semi structured interviewer administered questionnaires were administered to them by a team of trained assistants. Where there was more than one eligible mother in a household, one was selected randomly by balloting. If a participant did not consent, was not available after three visits, or withdrew from the study she was replaced by another eligible mother selected by simple random technique using the computer generated random numbers.

Data collection

Information about the knowledge and practice in relation to malaria was collected from the mothers of selected children using interviewer administered semi structured questionnaires after they were pre-tested at Jikwoyi village, another rural setting in Abuja Municipal Area Council (AMAC).

The primary health care numbers were a guide but since some new houses were not previously numbered, new numbers were allocated to all the houses. The research assistants were taught to identify all houses in the selected wards with children aged less than five years and number them serially with chalk or marker pen and keep a record of the numbers.

Women with children under the age of five were gathered in a near-by Primary Health Care Clinic. Here consent forms were signed and baseline data were collected using the pre-tested semi structured questionnaires.

Basic health information on malaria and its prevention was given to the women using the local languages of Gbagyi and Hausa as well as English, health education messages were given along with a drama presentation depicting the dangers of malaria in children. After twenty weeks the women were reassessed again to determine their knowledge, perception and practice towards malaria in their children.

The questionnaires had three sections with a total of 43 questions.

Section 1: Socio-demographics

a. Socio-demographic information on the mothers of the under children
b. Demographic characteristics of the children under 5 years

Section 2: Knowledge:

a. Knowledge of malaria with 14 questions and 5 correct answers. 3 or more correct answers were graded as good, 1-2 correct answers graded as fair and no correct answer as poor.
b. Knowledge of prevention of malaria had 10 questions which were graded as good when 6 or more answers were correct, 4-5 correct answers were graded as fair and 3 or less correct answers graded as poor.
c. Knowledge of complications of malaria with 5 correct answers and graded as good when 3 or more answers are correct, fair when 1-2 as fair and no correct answer graded as poor.

Section 3: Practice:

a. Drugs used to treat child the last time he/she had malaria with 5 options including the nationally recommended antimalarial drug and herbal treatment.

The primary health care numbers were a guide but since some new houses were not previously numbered, new numbers were allocated to all the houses.

Data analysis

Data collected were collated and analyzed using SPSS version 17 computer software to produce frequency tables. Qualitative data such as the children's age groups and sex and educational status of the mothers collated and displayed as frequency tables. Data on knowledge of malaria, its prevention, complications and the drugs used by mothers for the treatment of malaria in their children aged below five years at baseline were compared with the data obtained after 5 months of Health Education intervention and differences or changes tested for significance using the chi- square statistical test with the soft ware. Similar data obtained form a control community was also analyzed and changes tested using chi-square for significance.

The level of significance was set at 95% ($p \leq 0.05$) for all statistical analysis.

Ethical consideration

Ethical Clearance was obtained from the Ethical Committees of the Jos University Teaching Hospital (JUTH) and the Federal Capital Territory Administration before going to the Local Government Area. Written permission was also obtained from the Chairman of the Local Government Area and the leaders of selected communities. Informed written consent was obtained from all the mothers before enrollment into the study. The aim of the study was explained to all the participants who were assured of confidentiality of any information provided.

RESULTS

The mean age of mothers of children in the intervention group was 28.1±5 years old while in the control group it was 26.3±5.9 years old (Table 1).

Up to 60 - 70% of the population had either primary or secondary education. About 16% had no formal education at all in the two groups (Table 2).

Majority of mothers were traders, accounting for 37.7% in the intervention group and 53.4% in the control group. Farmers comprised 10.8% of the

intervention group, 13.1% were civil servants while 17.7% were unemployed. In the control population 19.6% were farmers, 4.2% civil servants while 11.9% were unemployed (Table 3).

At baseline, only 1.8% of the mothers in the intervention group had good knowledge about malaria and said that malaria parasites and mosquito bites cause malaria. Knowledge of the cause of malaria was fair in 90.2% and poor in 8.0% of the group. Five months after intervention, the mothers with good knowledge of the cause of malaria increased to 11.6%, and mothers with fair knowledge was 83.9% while the percentage of mothers with poor knowledge decreased from 8.0% to 4.5% (statistically significant p=0.013). In the control group percentage of mothers with good knowledge increased from 24.3% to 33.0%, percentage of mothers with fair knowledge decreased from 68.9% to 60.2%, while percentage of mothers with poor knowledge was 6.8% but these changes were not statistically significant (p= 0.358) (Table 4).

At baseline 5.4% of the mothers in the intervention group had good knowledge of how to prevent malaria such as the use of insecticide treated bed nets, cleaning surroundings, wearing protective clothing, use of barrier nets on the windows and doors or use of insecticide sprays etc, 16.1% had fair knowledge and in 78.5% of the mothers, knowledge of these measures was poor. After five months of intervention, mothers with good knowledge of preventive measures increased to 25.0%, those with fair knowledge constituted 17.9% while mothers who had poor knowledge were 57.1%. These improvements were found to be statistically significant (p=0.0001). In the control group, at baseline, 7.7% of the mothers demonstrated good knowledge of preventive methods of malaria, while 16.6% of them had fair knowledge and 75.7% of the mothers showed poor knowledge. After five months of the intervention, good knowledge increased to 9.7%, fair knowledge was 24.3 and poor knowledge decreased to 66.0%. These changes were however not statistically significant (p=0.111) (Table 5).

In the intervention group, at baseline 3.6% of the mothers had good knowledge of complications of malaria such as anaemia, convulsions, brain damage, kidney failure and respiratory problems. Up to 72.3% of the mothers had fair knowledge of complications of malaria while 24.1% had poor knowledge. After 5 months of intervention, good knowledge of complications of malaria increased to 21.4%, fair knowledge was 59.8% and poor knowledge was 18.8% (p=0.00134). In the control group, good knowledge of complications of malaria increased from 3.9% to 12.6%, fair knowledge of complications changed from 52.4% to 48.5% while poor knowledge reduced from 43.7% to 38.9%. These changes were however, was not statistically significant (p= 0.111) (Table 6).

Most mothers used Chloroquine to treat malaria in both the intervention and control groups. This however declined from 72.2% to 53.6% in the intervention group but increased from 56.7% to 63.0% in the control group. There was also an increase in the use of ACTs in the intervention group from 9.0% to 16.5%. Sulphadoxine-Pyremethamine (SP) and herbal preparations were also used by few respondents in both the intervention and control groups (Table 7).

Table 1: Age distribution of mothers of under five children in Kuje

Age group (yrs)	Intervention		Control	
	Frequency	%	Frequency	%
15 – 19	2	1.5	5	4.2
20 – 24	28	21.5	42	35.6
25 – 29	48	35.4	33	28.0
30 – 34	37	28.5	21	17.8
35 – 39	15	11.5	14	11.9
≥40	2	1.5	3	2.5
TOTAL	130	100.0	118	100.0

Table 2: Educational Status of mothers of under five children in Kuje

Education level	Intervention		Control	
	Frequency	%	Frequency	%
None	22	17.0	18	15.3
Koranic	5	3.8	5	4.2
Primary	32	24.6	66	56.0
Secondary	53	40.8	22	18.6
Tertiary	18	13.8	7	5.9
TOTAL	130	100.0	118	100.0

Table 3: Occupation of mothers in Kuje

Occupation	Intervention		Control	
	Frequency	%	Frequency	%
None	23	17.7	14	11.9
Farming	14	10.8	23	19.6
Teaching	3	2.3	5	4.2
Civil service	17	13.1	5	4.2
Trading	49	37.7	63	53.4
Tailoring	5	3.8	3	2.5
Others	19	14.6	5	4.2
TOTAL	130	100.0	118	100.0

Table 4: Knowledge of the cause of malaria by mothers in Kuje.

Causes of malaria	Intervention				Control			
Grade	Pre intervention		Post intervention		Pre intervention		Post intervention	
	freq	%	freq	%	Freq	%	freq	%
Good	2	1.8	13	11.6	25	24.3	34	33.0
Fair	101	90.2	94	83.9	71	68.9.	62	60.2
Poor	9	8.0	5	4.5	7	6.8	7	6.8
TOTAL	112	100.0	112	100.0	103	100.0	103	100.0

X^2 = 8.68, df=2, p= 0.013 X^2 = 2.05, df=2, p= 0.358

Table 5: Knowledge of malaria prevention by mothers in Kuje

Grade	Intervention				Control			
	Pre intervention		Post intervention		Pre intervention		Post interven-tion	
	Freq	%	Freq	%	Freq	%	Freq	%
Good	6	5.4	28	25.0	8	7.7	10	9.7
Fair	18	16.1	20	17.9	17	16.6	25	24.3
Poor	88	78.5	64	57.1	78	75.7	68	66.0
TOTAL	112	100.0	112	100.0	103	100.0	103	100.0

X^2= 17.01, df=2, p=0.0002 X^2 = 1.99, df=2, p=0.369

*Freq: Frequency

Table 6: knowledge of complications of malaria among mothers in Kuje

Grade	Intervention				Control			
	Pre intervention		Post intervention		Pre intervention		Post intervention	
	Freq	%	Freq	%	Freq	%	Freq	%
Good	4	3.6	24	21.4	4	3.9	13	12.6
Fair	81	72.3	67	59.8	54	52.4	50	48.5
Poor	27	24.1	21	18.8	45	43.7	40	38.9
TOTAL	112	100.0	112	100.0	103	100.0	103	100.0

X^2 =13.1, df=2, p=0.00134 X^2 =4.39, df=2, p=0.111

*Freq: Frequency

Table 7: Drugs used for the treatment of malaria among mothers of under five Children at Kuje.

Treatment of malaria	Intervention				Control			
	Pre intervention		Post intervention		Pre interven-tion		Post interven-tion	
	Freq	%	Freq	%	Freq	%	Freq	%
Chloroquine	70	72.2	52	53.6	59	56.7	63	63.0
Amodiaquine	0	0.0	1	1.0	2	0.0	0	0.0
SP	4	4.1	7	7.2	4	4.8	2	2.0
ACTs	9	9.3	16	16.5	10	9.6	9	9.0
Herbs	0	0.0	1	1.0	0	0.0	5	5.0
Pcm/Vits	2	2.0	10	10.3	12	15.4	12	12.0
Don't know	12	12.4	10	10.3	13	13.5	9	9.0
TOTAL	97	100.0	97	100.0	100	100.0	100	100.0

X^2 =13.58, df=6, p=0.038 X^2 =8.58, df=6, p=0.199

*Freq: Frequency

DISCUSSION

The mothers of children less than five years in the intervention group demonstrated poor knowledge of the cause of malaria at baseline (only 1.8% knew that mosquitoes and malaria parasites were responsible for this deadly disease), but five months after intervention, there was remarkable improvement in this as good knowledge of the cause of malaria increased to 11.6% (*p*=0.013). In the control group, good knowledge of the cause of malaria which was 24.3% at baseline increased to 33.0% after five months. This improvement in knowledge was not found to be statistically significant (*p*= 0.358) and might have been due to the ongoing campaigns about malaria prevention and treatment by the Federal Government of Nigeria on radio and other mass media and made available to all Nigerians including both the intervention and control communities. Nganda and others found up to 95% of pregnant women in Tanzania correctly associated mosquitoes with malaria.[17] In South Eastern Nigeria, Uzochukwu and colleagues found that awareness of the association of mosquitoes with malaria was high, especially in rural settings.[18] Poor knowledge of the cause of malaria was demonstrated by the respondents who thought malaria was caused by fatigue, exposure to sun, eating groundnut oil, drinking dirty water or by witchcraft. Good knowledge of the prevention of malaria among mothers such as the use of ITNs, insecticide sprays, nets on windows and doors or protective clothing, was found to be 5.4% at baseline in the intervention group but this increased to 25% at post intervention. This was statistically significant (*p*= 0.0002). In the control group, good knowledge of prevention of malaria increased marginally from 7.7% to 9.7% but this was not statistically significant (*p*= 0.369). When the knowledge of complications of malaria such as convulsions, anaemia, brain damage, kidney and respiratory problems was assessed, only 3.6% of the mothers in the intervention group had good knowledge at baseline but five months later this increased significantly to 21.4% (*p*=0.00134). In the control group, good knowledge of complications also rose from 3.9% to 12.6% but this was not statistically

significant (p=0.111). Uzochukwu and colleagues found that mothers in South Eastern Nigeria had good knowledge of convulsions, anaemia and respiratory problems complicating malaria.[18]
Chloroquine was the most commonly used drug by mothers to treat malaria (72.2% and 56.7% in the intervention and control groups respectively at baseline). At post intervention fewer mothers used chloroquine in the intervention group (53.6%) but in the control group 63% of mothers still used chloroquine. Uzochukwu and colleagues also found that Chloroquine was commonly used in South East Nigeria.[18] Since January 2005, the Nigerian Malaria Control Programme (NMCP) recommended the use of Artemisinin-based combination therapy (ACTs) as first line treatment of uncomplicated malaria.[6] Resistance of the malaria parasites to Chloroquine is of great concern and may lead to increased complications, morbidity and mortality in children less than five years. Awareness of ACTs was found to be low in both the intervention and control communities with only about 9% of mothers reporting its use at baseline. This means there is a need for continuous health educating activities to reinforce the dissemination of accurate information and knowledge and also to motivate the communities towards continued use of the health services and other health promoting and preventive measures in the fight against malaria.

CONCLUSION

The study found that the mothers of children less than five years in Kuje had poor knowledge of the cause of malaria, its prevention and possible complications. They were also not using the drug recommended by the Federal government of Nigeria for the treatment of malaria (ACTs); and Chloroquine which had been reported to have growing resistance in most parts of the country was still in use by majority of the women.
This study showed that adequate and proper health education to women especially in the language they understood increased their knowledge and improved their practice of the treatment of malaria in children.

REFERENCES

1. World Health Organization/ UNICEF. Africa Malaria Report 2003. [Online]. Available at http://whqlibdoc.who.int/hq/2003/WHO_CDS_MAL_2003.1093.pdf:17-27. (Accessed on 25/3/2008).
2. Obionu, C. Primary Health Care for Developing countries. 2nd edition, Enugu. Ezu books Ltd, 2007:79-94.
3. World Health Organization. The behavioural and social aspects of malaria and its control.2003.[Online]. Available at http://www.who.int/tdr/publications/tdr-research-publications/social-aspects-malaria-control/pdf/seb_malaria.pdf (Accessed 25/3/2008)
4. Federal Ministry of Health. A road map for malaria control in Nigeria, National Malaria Control Programme strategic plan 2006 – 2010. (2005). [Online]. Available at http://nmcpnigeria.org/f/Nigerian%20NMCP%20%202006%20-%202010%20Strategic%20Plan%202-3-06.pdf (Accessed 20/2/2008).
5. World Health Report (1999) Roll Back malaria. Making a difference. [Online]. Available at http://www.who.int/whr/1999/en/whr99_en.pdf:49-68. (Accessed on 26/3/2008).
6. Federal Ministry of Health. National Malaria control programme. Case Management and Drug Policy. (2005). [Online]. Available at http://nmcpnigeria.org/?p=case%20management. (Accessed 20/2/2008).
7. World Health Organization. World Malaria Report (2008). [Online]. Available at http://malaria.who.int/wmr2008/malaria2008.pdf. (Accessed 30/1/2009).
8. UNICEF. Malaria – A major cause of death and poverty in Africa 2004. [Online]. Available at http://www.rbm.who.int/docs/rps_publications/unicef_malaria_en.pdf (Accessed 15/2/2008).
9. Gupta M.C, Mahajan B.K. Malaria. Textbook of Preventive and Social Medicine. 3rd edition. India. Jaypee Brothers.2003.260-273.
10. Munthali A. C, Managing Malaria in Under-Five Children in a Rural Malawian Village. Nordic Journal of African Studies *2005;*14:127–146.
11. Adetokunbo O. L and Gilles H.M. Malaria. Short Textbook of Public Health Medicine for the Tropics, 4th edition. Malta. Bookpower,2003.199-209,233.
12. Jekel J.F, Katz D.L, Elmore J.G. Sample Size, Randomization and Probability Theory. Epidemiology, Biostatistics and Preventive Medicine.2nd edition. W.B Saunders company.2001.194-200.
13. Kirkwood B.R and Sterne J.A.C. Calculation of Required Sample Size. Essential Medical statistics. 2nd edition. Oxford. Blackwell 2003.422-28.
14. Envuladu E.A, Agbo H.A, Mohammed A, Chia L, Kigbu J.H , Zoakah A.I. Utilization of modern contraceptives among female

traders in Jos South LGA of Plateau State, Nigeria. Int J Med Biomed Res 2012;1:224-231
15. Taiwo I.A, Akinde O.R. Predictability of offspring birth weight using simple parental anthropometrics in a government hospital in Lagos, Nigeria. Int J Med Biomed Res 2012;1:206-214.
16. Nsimba S.E.D, Massele A.Y, Eriksen J, Gustafsson L.L, Tomson G and Warsame M. Case management of malaria in under-fives at primary health care facilities in a Tanzanian district. Tropical Medicine and International Health 2002;7:201–9.
17. Nganda R Y, Drakeley C, Reyburn H and Merchant T. Knowledge of Malaria influences the use of Insecticide Treated Nets but not Intermitent Presumptive treatment by Pregnant women in Tanzania. Malar J 2004; 3:42.
18. Uzochukwu B S, Onwujekwe E O, Onoka C A and Ughasoro M D. Rural- urban differences in maternal responses to fever in South East Nigeria. 2008 [Online]. Available at http://www.pubmedcentral.nih.gov (Accessed 14/6/2009)

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