The Impact of Health Education Intervention on Perception and Treatment Seeking Behaviour About Childhood Infections among Caregivers in Rural Communities in Western Nigeria

O. M. Fatugase[1], O. E. Amoran[1*] and O. K. Fatugase[1]

[1]*Department of Community Medicine and Primary Care, College of Health Sciences, Olabisi Onabanjo University Teaching Hospital, Sagamu, Nigeria.*

Authors' contributions

This work was carried out in collaboration between all authors. Author OMF designed the study, author OEA performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Author OKF managed the analyses of the study and the literature search. All authors read and approved the final manuscript.

Research Article

ABSTRACT

Primary health care as stated in the Alma Ata declaration underscores the importance of health education as one of the key methods of preventing and controlling prevailing health problems. This study seeks to test the effect of health education on perception and treatment seeking behaviour among care givers of under fives in a rural setting in Ogun State, Nigeria.

The study design was a quasi-experimental study carried out in Ijebu North Local Government Area of Ogun State. A multistage random sampling technique was used in choosing the required samples for this study and a semi- structured questionnaire was used to collect relevant information. The intervention consisted of a structured educational programme based on a course content adapted from the national malaria control programme. A total of 400 respondents were recruited into the study with 200 each in both the experimental and control groups and were followed up for a period of 3 months when the knowledge and treatment seeking behaviour was reassessed.

There was no statistically significant differences observed between the experimental and control groups in terms of socio-dermographic characteristics such as age [p=0.99],

_____

*Corresponding author: Email: drfamoran@yahoo.com;

marital status [p=0.48], religion [p=0.1], and income [p=0.51]. The highest proportion of mothers reported malaria [45% & 47%] in experimental and control groups respectively, followed by Upper respiratory tract infection [22% & 25%], diarrhoea and vomiting [14% & 17%], measles [12% & 15%], convulsion [8% & 11%] and others [3% & 5%]. Only 52.1% (experimental) and 48% (control) groups of mothers believed that fever can kill a child. Furthermore, about 40% (experimental) and 44% (control) groups believed fever was not fatal while 8.0% of both groups were not sure. Post intervention, these differences were not statistically significant. The proportion of those who got their source of information about prevention of fever from health worker increased from 60.0% (pre-intervention) to 95.0% (post-intervention) (p<0.001) compared to the control group which increased from 62.0% (pre-intervention) to 62.5% (post-intervention) (p>0.001). Furthermore, 72.9% & 50.8% of respondents in the experimental and control group respectively commenced treatment at the right time (first day of fever). There was a significant increase of 24.6% [p=0.001] post intervention in the experimental group with no significant change in the control [p=0.64].

The study concludes that a systematic health education programme to caregivers should be a component of Roll back Malaria programme in Africa. Early diagnosis and prompt treatment is essential to control of infection and this can only be effectively carried out by those at the frontline of care at home.

1. INTRODUCTION

Children in Africa, South of the Sahara, are vulnerable to childhood infection from about four months of age [1,2]. More than one million deaths from childhood infection especially malaria occur worldwide each year among African children under the age of five. In areas of intense transmission, young children may have as many as six episodes of malaria infection each year [2].Of the more than 500,000 African children who develop cerebral malaria (a severe forms of the disease that affects the brain) each year, 10-20% die and approximately 7% are left with permanent neurological damage. Children with infection typically develop fever, vomiting, headache and flu-like symptoms. If untreated, the disease may progress rapidly within 24 hours, to convulsions, coma, and death [3]. Malaria constitutes a major economic burden in the sub-Sahara Africa including Nigeria [1-2]. In some countries with a heavy malaria burden, the disease may account for as much as 40% of public health expenditure, 30-50% of inpatient admissions, and up to 50% of outpatient visits [3-4].

Primary health care as stated in the Alma Ata declaration underscores the importance of health education as one of the key methods of preventing and controlling prevailing health problems [4]. Infections accounts for more than 70% of hospital attendance and the commonest cause of death among the Under-fives [1-2]. Also, it becomes imperative to focus more on preventive measures which can be achieved by a fraction of the amount spent in treating these diseases. Hence there's need to know the mothers knowledge about various ways of disease prevention and management among their under fives in order to reduce the morbidity and mortality associated with the preventable killer diseases.

The ultimate aim of Behavioural Change Communication (BBC) is to ensure that individuals, families, communities and health workers are taking preventive measures against communicable diseases especially vaccine preventable diseases among children, improve

on their recognition of these diseases and early diagnosis and treatment [5]. Intensive BBC and capacity development should be directed towards consumers and all cadres of health providers through under listed means. The objective of health education is to make people value health as a worthwhile asset and to show them what they can do as individuals, families and communities to improve their own health [4]. The more people value health the more they will be willing to make the appropriate allocation of resources to promote and safeguard their own health. At the personal level, they will be prepared to make the effort on such matters as exercise, cleanliness in the home, diet and discipline with regard to the use of tobacco and alcohol. The community will be more prepared to allocate resources for improvement of environmental sanitation, and for other priorities within the health services.

Effective health program involved multiple intervention aimed at disease prevention and control, with an increasing emphasis on health education [6]. Health education intervention includes interpersonal communication, health education messages, training workshops and dissemination of education materials. Although health education interventions have been carried out in several study settings [7-9] few have considered effect of multiple interventions on attitude, knowledge and treatment seeking behaviour of mothers of under fives. Despite all efforts to control common childhood diseases, in the past years, vaccine preventable diseases are still common problems and a major killer among under five children. Furthermore, there is a higher prevalence of childhood infection in rural areas with the rural population having less access to health facilities and health education [10-11]. This study therefore seeks to test the effect of health education on perception and treatment seeking behaviour among care givers of under fives in a rural setting in Ogun state Nigeria.

2. METHODOLOGY

2.1 Study Design

The study was carried out in Ijebu North Local Government Area of Ogun State. Ogun state was randomly selected among the states in Western Nigeria. Ijebu North Local Government is one of the twenty Local Government in Ogun State. The experimental study was carried out in Oru a semi-rural town in Ijebu North Local Government Area, of Ogun State Nigeria. It is bounded in the East by Iperin, West by Awa, North by Ijebu-Igbo, and South by Ago Iwoye. Oru has a population of about 100,000 people (2006 population census). The control study was carried out in Atikori ward at Ijebu-Igbo, a semi-rural town in Ijebu North Local Government Area, of Ogun State Nigeria with a population of about 150,000 people (2006 population census) [9].

The study design was a quasi-experimental study to determine the effect of health education on perception and treatment seeking behaviour among care givers of under fives in a rural setting in Ogun state Nigeria. Two political wards, one randomly selected from the southern axis (Ijebu-Oru) and the other one randomly selected from the northern axis (Ijebu-Igbo) formed the experimental and control groups respectively. It was decided to choose the experimental and control groups from two different ends (North axis and South axis) of the Local Government to prevent cross interference during and after the intervention periods. The distance between the experimental and the control group is about 10km.

The study was carried out in three phases – Pre-intervention, Intervention and Post-Intervention phases. Phase one (pre- intervention) involved cross-sectional comparative descriptive study, while phase two involved comprehensive health education intervention in

the experimental group only. Phase three (post-intervention) involved comparative study between the experimental and control group.

2.2 Pre-Intervention Activities

These included the following:

1. Obtaining official permission to proceed with the project from the Local government areas [LGA] authorities.
2. Consent of the mothers of under-five children to fully participate at all stages of the project was obtained.
3. Fifty households were selected in a nearby community (Ilaporu) for pre-testing of the questionnaire before large scale study. The questionnaires were pre-tested with the research assistants, who had debriefing on field experiences and proffered solutions to identified problems. Amendments were made, which led to re-designing aspects of the instrument that were ambiguous or lacked clarity.
4. A baseline survey to determine the mother's knowledge, attitude and practice (KAP) about infection prevention and management was conducted using the corrected questionnaires. This represented the pre-training assessment for the intervention group and the initial assessment for the control group.

2.3 Intervention Activities

The intervention consisted of a structured educational programme based on a course content adapted from the national infection control programme and the information obtained from the gaps in knowledge identified from the distributed questionnaire formed the basis of the training. Training sessions were conducted during which various aspects of the management and control of infection was taught. Multiple health channels were used. These include: a training workshop, Use of education materials such as posters, story book, and infection post signs. The training lasted for one day and was part of a comprehensive training for infection control. The training consisted of 2 modular units which are; knowledge about infection transmission, its prevention and treatment; and attitude on prevention strategies. Each module consisted of a lecture and an exercise.

2.4 Post-Intervention

The post-intervention evaluation was carried out using same questionnaire that was used during the pre-test evaluation to determine a residual gain in malaria-related KAP three months after the training and initial assessment in the intervention and control groups respectively. This represented the three months post-training assessment. Evaluation of the effects of training was done using standardized scores for the various variables during analysis.

2.5 Sample Size

The minimum sample size needed was obtained from the formula for comparing proportions between two groups.

$$n = \left\{ \frac{Z_{1-\alpha/2}\sqrt{2P_0(1-P_0)} - Z_\beta\sqrt{P_0(1-P_0) + P_1(1-p_1)}}{P_0 - P_1} \right\}^2$$

The outcome measure for computing the sample size was the proportion of households in Nigeria using mosquito nets, P1 = 12% (NDHS, 2003).

The study was hoped at improving the percentage by 15%

P2   = Minimum proportion of mothers expected to be seeking treatment in a PHC= 27%

P0   = average of p1 and p2 = (12+27)/2 = 19.5%

$Z_{1-\alpha/2}$ = Standard normal deviate corresponding to level of significant (α) of 5% = 1.96

Z_β = Standard normal deviate corresponding to type II error of 10% (Power=90%)= 1.28.

D   = design effect of 1.5 for the sampling design used

P1-P2 = 15%

Then

$$n = 1.5 \left\{ \frac{(1.96\sqrt{2 \times 0.195(1-0.195)} + 1.28\sqrt{0.12(1-0.12) + 0.27(1-0.27)}}{0.15} \right\}^2$$

The minimum sample size from the above formula is 182 for each group. However 200 women per group were studied after allowing for 10% attrition rate.

2.6 Subject Selection

 (i)   **Inclusion Criteria:** Only mothers or guardians who are permanent residents (resident in the area >6months) and currently having children of <5yrs of age living with them were included in the study.

 (ii)   **Exclusion Criteria:** Mothers or guardians whose <5yrs old children were not living with them at the time of the study were not included in the study.

2.7 Sampling Technique

A multistage random sampling technique was used in choosing the required samples for this study. Ijebu North Local Government has seven political wards. Four of these wards were located in the Northern axis of the local government and the remaining three were in the Southern axis of the Local Government. Each of the political wards served as a cluster. The

first step was to choose between the northern part and the southern part which one became the experimental or control group, this was done by tossing a coin. From the list of political wards in each axis, a ward was selected by simple random sampling technique by casting a lot e.g. balloting using same size of papers and thoroughly mixed and then picking it at random. House enumeration was carried out by the researcher and two officials from the town-planning unit of the Local Government. A total number of one thousand, and eight hundred houses were counted in the experimental and control wards respectively. A systematic random sampling technique using a sample interval of five and four in the experimental and control wards respectively was used to choose two hundred houses each in experimental and control groups respectively. The sample interval was obtained by dividing the total number of houses by the sample size in the experimental and control wards respectively (1000/200 and 800/200}. The first house was determined by using the table of random number to pick a house from the house enumeration list and the one household was studied per house and this was randomly selected. In the two groups, a simple random sampling technique was carried out by ballotment to choose a mother of under five from an household where there were more than one mother with under five in a house. Where there was one household in a house, the mother of under five automatically qualified to participate in the study.

2.8 Data Analysis

The questionnaires were kept safe and confidential and checked for proper completion on collection from participants. The data was entered into SPSS statistical software version 12. Frequencies were generated for detection of errors (data editing). Data was summarized using means, standard deviation and proportions.

To measure the effectiveness of health education intervention, the degree of change was measured and this was subjected to the tests of significance (McNemar's Chi-square, P-values) where appropriate. The degree of change between two samples was calculated by finding the difference in percentage point between the proportions in the second sample with a given attribute and the proportion in the first sample with the same attribute. This was calculated in both the experimental and control groups.

For the purpose of analysis, marital status was re-categorized as currently married and not married. Not married included the single, the separated and the widows. Knowledge of childhood infection was categorized as good and poor.

2.9 Ethical Consideration

The research proposal was approved by the Olabisi Onabanjo University Teaching Hospital Ethical Committee. Informed consent was obtained from the Chairman, Ijebu North Local Government Area and the community leaders. Oral and written consent was obtained from the selected mothers and guardians before administering the questionnaires. The participants promised to fully cooperate and they were also assured of their freedom to opt out at any stage of the project. The participants/respondents were assured of confidentiality and this assurance was indicated on the questionnaire (non inclusion of self identifying characteristics).

3. RESULTS

3.1 Socio-dermographic Characteristics of Respondents

Four hundred mothers/guardians of children under five years of age completed the questionnaire at the commencement of the study. These respondents were in two groups – the control and experimental (intervention) groups. The control group had two hundred respondents (50% of the total number of participants); 180 (90%) of them were available to complete the questionnaire after the three-month intervention period. The experimental group had two hundred respondents (50% of the total number of participants) of which 190 (95%) responded to the study questionnaires after the three-month intervention period. The socio-demographic characteristics of the caregivers in both the experimental and control groups are shown in Table 1.

Table 1. Socio-demographic characteristics of the respondents

	Experimental group N = 200 (%)	Control group N =200 (%)	Test statistic value (X^2)	p–value
Age in years			0.02	0.99
<25	52 (26.0)	53 (26.5)		
25 – 34	105(52.5)	105 (52.5)		
35+	43(21.5)	42(21.0)		
Total	**200 (100)**	**200 (100)**		
Marital Status				
Currently married	184 (92.0)	180(90.0)	0.49	0.48
Others	16(8.0)	20 (10.0)		
Total	**200 (100)**	**200 (100)**		
Religion				
Christianity	133 (66.6)	148 (74.0)	2.68	0.1
Islam	67(33.3)	52 (26.0)		
Total	**200 (100)**	**200 (100)**		
Mother's income(Naira]				
Less than 2500	66 (33.0)	74 (37.0)	2.33	0.51
2500-4999	64 (32.0)	59 (29.5)		
5000-7499	27 (18.5)	19 (9.5)		
7500+	43 (21.5)	48 (24.0)		
Total	**200 (100)**	200 (100)		
Father's income(Naira)				
Less than 2500	11(5.5)	12(6.0)	1.13	0.77
2500-4999	19(9.5)	23(11.5)		
5000-7499	38(19.0)	43(21.5)		
7500+	132(66.0)	122(61.0)		
Total	200 (100)	**200 (100)**		

More than half of the respondents fell into age group 25-34years in both the experimental (52.5%) and the control (52.5%) groups, followed by 26.0% (experimental) and 26.5% (control group) in the <25 years of age category and those above 35years were 21.5% (experimental) and 21.0% (control group). A high percentage of the experimental group

(92.0%) and control (90.0%) were married. Over 66.6% (experimental) and 74.0% (control) were Christians while the rest while Muslims (Table 1). About 40% of the experimental group were earning above 5000 naira compared with 33.5% of the control group. While 52.9% of the experimental group had up to secondary school education, only 55% of the control group had the same level of education, followed by primary level in 29.2% of experimental group and 25% of control while for those with no formal education, about 5% and 7% were found among the experimental and control groups respectively. There was no significant statistical differences observed between the experimental and control groups in terms of sociodermographic characteristics such as age [p=0.99], marital status [p=0.48], religion [p=0.1], and income [p=0.51].

3.2 Perception of Mothers about Common Diseases Affecting Under Five Children

Fig. 1 shows the respondents perception of the common diseases affecting under five children. The highest proportion of mothers mentioned malaria - 45% (experimental) 47% (control) groups. This is followed by URTI 22% (experimental) and 25% (control) groups, diarrhoea and vomiting 14% (experimental) and 17% (control) groups, measles 12% (experimental) and 15% (control) groups, convulsion 8% (experimental) and 11% (control) and others 3% (experimental) and 5% (control) groups.

Fig. 2 shows that 52.1% (experimental) and 48% (control) groups of mothers believed that fever can kill a child. Furthermore, about 40% (experimental) and 44% (control) groups believed it is not fatal while 8.0% of both experiment and control groups were not sure [p>0.05]. These differences are not statistically significant.

3.3 The effect of Health Education on treatment seeking behaviour of Caregivers
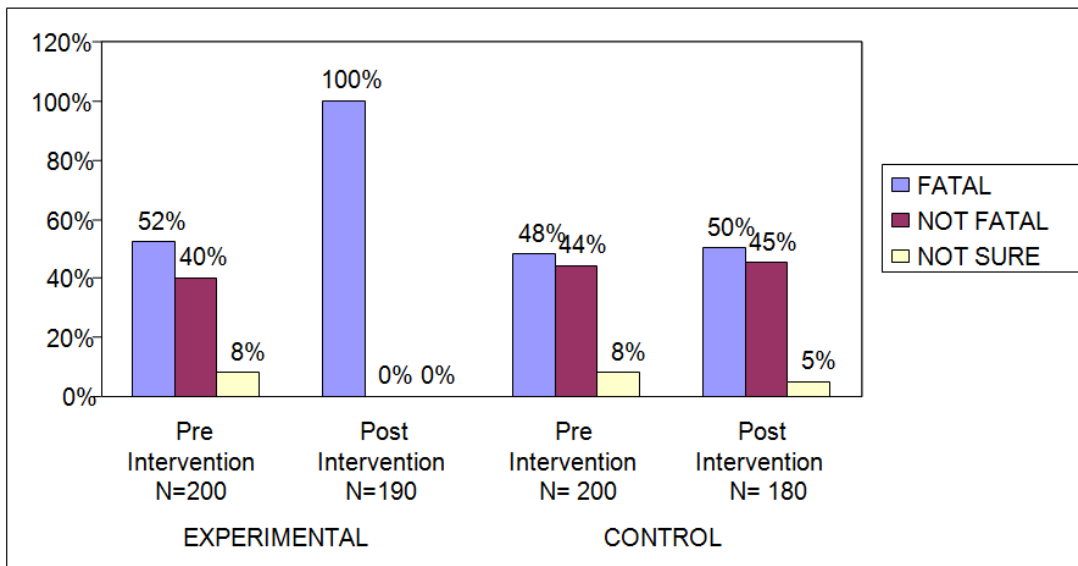
The proportions of respondents with their source of information on infection prevention were compared. The results are shown in Table 2. In the experimental group, the proportion of those who got their source of information about infection prevention from health worker rose from 60.0% (pre-intervention) to 95.0% (post-intervention) which was statistically significant (p<0.001). On the other hand in the control group, there was a minimal rise from 62.0% (pre-intervention) to 62.5% (post-intervention) which was not statistically significant.

Furthermore, 72.9% & 50.8% of respondents in the experimental and control group respectively commenced treatment at the right time (first day of fever). There was a significant increase of 24.6% [p=0.001] post intervention in the experimental group with no significant change in the control [p=0.64].
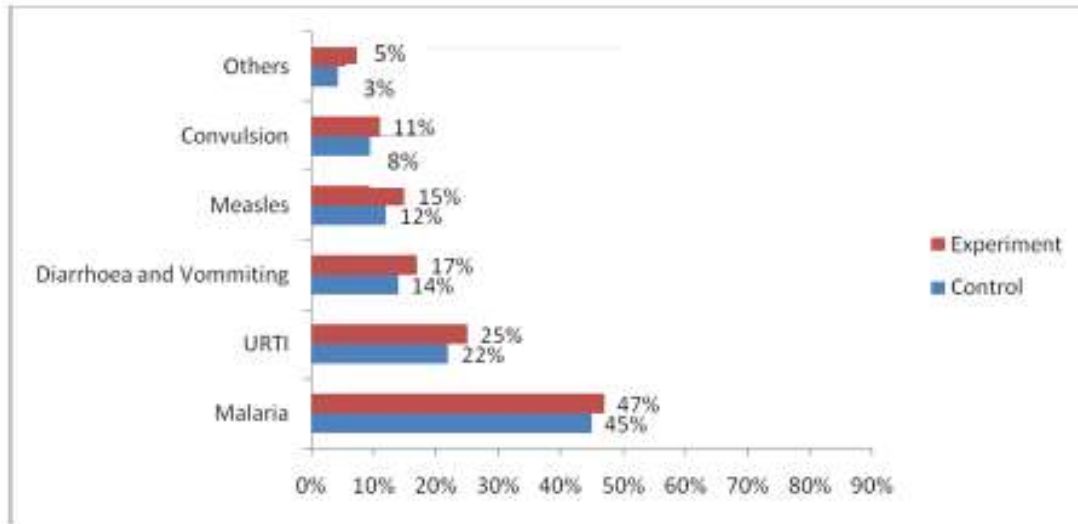
Fig. 1. Self reported perception of mothers about common diseases affecting under five children

Fig. 2. Opinion of mothers about fatality (severity) of fever

Table 2. Comparison of proportion respondents with their source of information on infection prevention and treatment

	Experimental group				Control group			
	Pre intervention N = 200	Post intervention N = 190	Degree of change	P value	Pre intervention N = 200	Post intervention N = 180	Degree of change	P value
Health worker	60.0%	95.0%	35%	<0.001	62.0%	62.5%	0.5%	>0.05
Relatives & friends	20.4%	2.7%	-17.7%		23.3%	26.6%		
Radio	19.6%	2.3%	-17.3%		14.7%	10.9%	3.3%	
Total	**100%**	**100%**			**100%**	**100%**	-3.8%	
Commence treatment after symptom recognition								
1st day	146 [73.0]	185 [97.4]	24.4%	<0.001	101 [50.5]	88 [48.9]	-1.6%	0.64
2nd day	47 [23.5]	5 [2.6]	-20.9%		72 [36.0]	72 [40.0]	4.4%	
3rd day	7 [3.5]	0 [0.0]	-3.5%		27 [13.5]	20 [11.1]	-2.6%	

4. DISCUSSION

A good percentage of respondents in both experimental group 60.0% and control group 62.0% got their information on childhood infection from the health workers even before the intervention programme. This result is consistent with finding of the Ede and ife studies [9-12] and in contrast to the finding of a similar study carried out in Ibadan where elders and friends were the major source of information [13]. The difference observed may be due to good level of interaction between the mothers and health workers in the local government area studied and it was a reflection of the behaviour of the health workers towards the mothers. The result obtained in this study was close to the findings of another study carried out in Zimbabwe where 72.9% of the mothers got information on childhood infection from the health workers [14]. However, after the training programme 95.0% of the mothers in the intervention group said that they got more detailed information from the training. There was a significant association between the training and the sources of information. No such relationship existed in the control group that had no training; hence, the pattern of source of information did not change from what obtained in the pre-intervention phase. One of the targets of primary health care [PHC] is comprehensive care, and it includes health education. The health workers should be properly empowered to be efficient in getting information across to the mothers not only at the health facilities but also in the communities.

The attitude to childhood infection prevention pre-and post intervention of the experimental group shows that there were improvement in the proportion of those who believe that childhood infections is not fatal (p=0.001). This finding was similar to that of the Gambia study who found out that some health education interventions, especially interpersonal communication, appeared to have a positive impact on fever and malaria beliefs and attitudes and on positive treatment-seeking behaviours [15-16]. Inadequate number of health care workers in the rural areas in Nigeria may be major hindrances to effective health communication in the prevention of childhood infection [16]. This issue of inadequate resources, both human and material resource, is a major problem in rural areas and poor income settings. The local government authorities should increase funding of health care in the rural areas in order to prevent childhood infections. This indicates that programs that will be geared towards increasing the efficiency of health care workers for prevention of childhood infections should be introduced in the rural areas in Africa.

This study indicates that more than one quarter of the care givers do not start treatment at the appropriate time. And the training programme carried out by the authors had a significant impact on the ability of the care givers to recognize appropriate signs and symptoms for prompt treatment and referral signs for presentation at the health centres. Several report had indicated a high infection burden in sub-Saharan Africa [1,3,17]. One of the major problems responsible for this may be the inability of the care giver to recognize when to take action. The authors recommend that a systematic health education programme to caregivers should be a component of Roll back Malaria programme in Africa. Early diagnosis and prompt treatment is essential to control of infection and this can only be effectively carried out by those at the frontline of care at home.

5. CONCLUSION

Our study has certain limitations. The study findings are limited in terms of overall generalization and impact since the study might also have been faced with recall bias. Despite these limitations, we believe that our data provide useful information for the

assessment and prompt home management of childhood infections in Nigeria and will also inform policy decision in Nigeria and other low income countries.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Najera AJ. Malaria infection Control Achievements, problems and strategies. Parasitologia. 2001;43(1-2).
2. Carter R, Mendis K. Evolutionary and history aspects of the burden of malaria infection. Clinical microbiological Reviews. 2002;615(4):564-594.
3. Nabarro DN, Mendis KN. Roll Back Malaria is unarguably both necessary and possible. Bulletin of the World Health Organization. 2000;78:1454–1455.
4. Federal Ministry of Health. The National Antimalaria Treatment Policy; National Malaria and Vector Control Division, Abuja, Nigeria. 2005;17-26.
5. Lucas AO, Gilles AM. A New Short Textbook of Preventive Medicine for the Tropics, 4th ed., Bounty Press. 1998;353-354.
6. World Health Organization Expert Committee Malaria infection WHO technical Report. 2000; Series 892, Geneva 1- 74, Switzerland.
7. Nchinde T. C A re-emerging disease in Africa. Emerging Infectious Diseases 1998;4:398-403.
8. Pagnoni F. Convelbo N, Tiendrebeogo J, Simon C, Esposit F. A community based programme to provide prompt and adequate treatment of presumptive malaria infection. Transaction Royal Society of Tropic Medicine and Hygiene. 1997;91:512–517.
9. Opreh OP, Abioye-kuteyi EA, Aboderin AO, Giebel H, Bello IS, Senbanjo IO. The pattern of malaria infection in under five in Ile-ife Nigeria. Trans RSoc. Trop Med. Hyg. 2008;102(9):868-74.
10. Bojalil R, Kirkwood BR, Bbali M, Guiscafre H. The relative contribution of case management and inadequate care seeking behaviour to childhood deaths from diarrheoa and acute respiratory infectionsin Hidalgo, Mexico. Trop. Med. Int. Health. 2007;12(2):1545-52.
11. Adepoju EG, Onajole AT, Oreagba LO, Odeyemi KA, Ogunnowo BO, Olayemi SO. Health education and caregivers' management of malaria among under fives in Ede North L.G.A., Osun State of Nigeria. Nigerian Medical Practitioner. 2005;48(4):72-81.
12. Dunyo SK, Africa, Koran KA, Ahorlu CK, Abubakar I, Nkrumah FK. Health Centre versus home presumptive diagnosis of malaria in Southern Ghana; implications for home-based care policy. Trans R Soc Trop Med Hyg. 2000;94(3):285-8.
13. Aderounmu AF, Salako LA, Adelusi SA. Chloroquine sensitivity of Plasmodium faciparum in Ibadan, Nigeria. Trans-R-Soc-Trop-Med-Hyg. 1980;74(3):393-5.
14. Trigg PI, Kondrachine AV. Commentary; Malaria infection Control in the 1990s Bulletin of the World Health Organization. 1998;76;11-16.
15. Kidane H, Morrow R. Teaching Mothers to provide home treatment of malaria infection in Trigay, Ethiopia: a randomized trial. Lancet. 2000;356(9229):550-555.
16. Pandey A. Health care options in ARI before hospital care. India. J .Public Health 2002 Apr-Jun;46 (2):51-6.

17. Happi CT, Gbotosho GO, Sowunmi A, Falade CO, Akinboye DO, Kyle DE, Milhous W, Wirth DF, Oduola AMJ. Molecular analysis of plasmodium falciparum recrudescent malaria infection in children treated with chloroquine in Nigeria. AM J Trop. Med Hyg. 2004;70:20-6.

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sciencedomain.org/review-history.php?iid=205&id=12&aid=1269