*ORIGINAL ARTICLE*

# Effects of Training on Knowledge, Attitude and Practices of Malaria Prevention and Control among Community Role Model Care Givers in South Western Nigeria

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*ABSTRACT*

*BACKGROUND: Malaria is endemic in Nigeria, with significant records of mortality and morbidity. Adequate community involvement is central to a successful implementation of malaria control programs. This study assessed the effects of a training programme on knowledge of malaria prevention and control among community role model care givers.*
*METHODS: A descriptive cross sectional study of a pre-and post-test design method was conducted among 400 eligible community members in Osun State. Training was given in the form of organized lectures, health education and practical demonstration sessions. Scores of pre-test and post-test conducted after four months interval were compared. Multistage sampling method was adopted in selecting study participants, while data was analyzed using the SPSS software version 17.0.*
*RESULTS: Mean age was 43.8 (+1.4) years. Average knowledge score of cause, transmission, risk factors and consequences, awareness of common symptoms and preventive practices improved during post-training test when compared with pr-training test. The overall descriptive mean knowledge score in pre-test and post-test were 2.1 and 3.5 respectively out of an average maximum score of 5.0, giving an increment of 66.7%. Role model care givers with formal education were twice and three times more likely to know about disease 'transmission' (OR 1.9, 95%CI 0.11-0.19, p=0.002) and 'consequences' (OR 2.9, 95%CI 0.25-0.65, p=0.040) respectively compared to those without formal education.*
*CONCLUSION: Training on malaria improved the knowledge of malaria prevention and control among role model community care givers towards a successful implementation of malaria control programmes.*
*KEYWORDS: Malaria, Role model care givers, Knowledge, Training*

## INTRODUCTION

Malaria is a common haemo-parasitic infection, with approximately 300–500 million clinical cases and one million deaths globally (1). The Sub-Saharan Africa accounts for over 90% of the disease burden (2), and a majority of cases occur among women and children (3). From a previous study, knowledge about malaria prevention was as high as 78% (4), though in-depth knowledge of cause and association with mosquito bites may be as low as 48% in some communities (5).

Recently, the national malaria control programs in Nigeria took over the center stage of executing some newly funded malaria control programmes. Training of community based role model care givers on malaria prevention and control was strategically planned to assist in effective prevention and management of malaria cases at community level.
This would also serve as a basis for eventual monitoring and evaluation of programs. Because of possible difficulty in implementing prevention programmes when malaria risk is perceived to be lower (6), prevention may be cheaper than cure.

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Malaria is endemic in Nigeria despite huge resources spent on prevention and control measures. An important shortfall observed in previous country level programmes had been poor community participation in preventive measures. One of the strategies for successful implementation of the new and ongoing malaria control programmes is to use community structures (community based role model care givers) in case management and prevention. As the national and state governments and donors planned to actively involve the communities, it is important to assess their knowledge of malaria transmission, prevention and control, to serve as baseline for immediate and subsequent training needs. The objective of this study was to assess the effects of training programmes on knowledge of malaria prevention and control among community role model care givers in Osun State in South Western Nigeria.

## MATERIALS AND METHODS

**Study Area:** Osun State is situated in the Southwestern part of Nigeria, with Osogbo Town as the State capital. There are 30 local government councils with an additional area council (office) in Modakeke –Ife. Each council has ten wards, each of which has a primary health care center. There are numerous communities comprising areas and streets, and in which residents inter-relate through avenues such as community development and landlord associations, religious groups, market women groups and community meetings among others. Community volunteers are usually retirees, traders, market women or artisans.

**Study design:** This research employed a descriptive cross sectional study of a pre-and post-test design method of knowledge of malaria prevention and control among community members.

**Study population:** Eligible respondents were community members, who had lived in their community for at least five years, as it is expected that within five years they must have been conversant with the community value system and can be seen as role models in the community; community representative or leader as designated by the local government authority, who could speak the local language and who were conversant with the community systems and values on

ground. Selected eligible respondents constituted the study population.

**Pre-intervention:** The State Ministry of Health trained eight hundred (ten batches of 80 each) eligible community members, spanning some local government councils in the state. The serial training that took place in designated local government council headquarters was in form of organized lectures, and practical demonstration sessions. Communities trained included Olorunda, Osogbo, Ife, Iwo, Ede, Ila-Orangun, Inisha, Ikire, Ejigbo and Sekona. A descriptive cross sectional study of knowledge of prevention and control of malaria was carried out as a form of pre-test, by using all those who turned up for the training as subjects.

**Intervention:** Training was essentially in the form of highly participatory lectures, role plays, and practical demonstrations. These mixed methods was aimed at enlightening participants on the burden of malaria infestations and their roles in management, prevention and control of malaria.

**Post-intervention:** After four (4) months of the first training, the role model care givers came back for the data capturing component (monitoring and evaluation workshop) of the malaria control programme. The post intervention assessment was carried out on some sampled pre-intervention respondents before the commencement of this workshop.

**Sample size estimation:** Sampling was done using the formula for calculation of sample size for populations less than ten thousand, which gave an estimated sample size of 384. This number was increased to 400 to accommodate possible nonresponses. This number was used for the post-test evaluation (post intervention). For easy comparisn during data management, 400 was also used for the pre-test though a total of 800 trainees were present during pretest.

**Sampling methods:** A multi stage sampling method was employed in choosing respondents for the post-test. In the first stage, five out of ten trained batches of community role model care givers were selected using simple random sampling employing simple balloting. Questionnaires were equally allocated to each batch. In stage two, the training attendance sheet for a selected batch on a training day was obtained (sampling frame), and alternate participants whose names appeared on the list were systematically

sampled by obtaining a convenient sampling interval of two. Questionnaires were administered until allotted or earmarked questionnaire for the batch got exhausted.

**Research instruments:** The instruments consist of pre-tested, pre-coded, semi-structured, interviewer-administered questionnaire having seven sections. Pre-testing was done among fifteen conveniently selected, similarly trained community role model care givers in neighbouring Lagos State, and the responses were used in improving the content of the questionnaire. Questionnaires were administered by trained research assistants. Research assistants were trained on how to administer the questionnaire and there was translation and back translation of questionnaires between English and the local (Yoruba) language.

**Data collection:** Conduct of research and monitoring was done by four trained research assistants who could also speak the local language. The pre- and post-training questionnaires were essentially the same. Study variables consist of basic questions on epidemiology and control of malaria in the form of 'true' or 'false' responses. These include the etiological cause of malaria, common misconceptions about causes of malaria, mode of transmission through mosquito bites, people who are more at risk of malaria, consequences and costs of malaria management, common symptoms and signs associated with malaria infestations, drug treatment options and methods of preventing malaria including the use of long lasting insecticide treated bed nets.

**Data management:** Data was analyzed using the Statistical Package for Social Sciences (SPSS) version 17.0 software after sorting out the questionnaires. Proper filling of data was ensured by double entry and random-manual checks. Frequency distribution tables were generated and mean values calculated where relevant. Binary logistic regression model was used to identify predictors of variables that were earlier found to have positive associations using the Chi square test.

Using this model, age group was reclassified as younger age group (30 years and below), middle age group (31-50 years) and older age group (51 years and above). Also, education level was re-categorized into no formal education and formal education (all other education groups). Scores were calculated for the knowledge of the various sections examined. Using a predetermined arbitrary cut off point for each section of malaria epidemiology, their responses pre-and post-training sessions were descriptively compared using a knowledge score of correct answers or responses that corresponds to the number of questions asked per section of the pre-and post-test. Number of questions asked per section amounts to the number of score allocated to that section. Average knowledge score was then computed for the general population. With each question carrying one mark (from the true or false option), the maximum mark in that section was calculated by scoring +1 for a correct answer and zero(0) for a wrong answer. Score per person per section was also calculated. Average mean of all scores (divided by 400) per section was also calculated. Although four questions were used in assessing knowledge of cause of malaria, only one (mosquito being the only cause) was used in assessing correct knowledge.

**Ethical consideration:** Ethical clearance was obtained from the Health Research Ethical Review Committee of Osun State University College of Health Sciences. Permission was also obtained from the health departments of the local councils whose communities were sampled. Written informed consent was obtained from every respondents who took part in this study.

**Study limitation:** The limitation of this study was inability to use a comparison or control group of community role model care givers who did not have the benefits of the training, in order to be able to make further conclusion on the effectiveness of the training method. For easy comparism during data management, we had to use 400 as sample size for the pre-test although a total of 800 trainees were present during pre-test. In addition, we had forseen a possibility of some respondents who came for pre-test training but not not coming around for post-test training for any reason.

**RESULTS**

Table 1 shows the socio-demographic characteristics of respondents. Mean age was 43.8 ($\pm$1.4) years, 188(47.0%) of the respondents were retirees while 264(66.0%) of respondents had to secondary school as their highest level of education.

Table 1: Socio-demographic data of respondents

| Variables (n=400) | Frequency | Percent |
|---|---|---|
| **Age** | | |
| 20 years and below | 1 | 0.3 |
| 21-30 years | 45 | 11.3 |
| 31-40 | 86 | 21.4 |
| 41-50 | 176 | 44.0 |
| 51-60 | 74 | 18.5 |
| Above 60 years | 18 | 4.5 |
| **Sex** | | |
| Male | 268 | 67.0 |
| Female | 132 | 33.0 |
| **Marital status** | | |
| Married | 314 | 78.5 |
| Single | 30 | 7.5 |
| Separated | 24 | 6.0 |
| Widowed | 10 | 2.5 |
| Divorced | 22 | 5.5 |
| **Occupation** | | |
| Retirees | 188 | 47.0 |
| Religious leaders | 21 | 5.3 |
| Traders | 152 | 38.0 |
| Civil servants | 20 | 5.0 |
| Others | 19 | 4.7 |
| **Educational level** | | |
| No formal education | 4 | 1.0 |
| Primary | 107 | 26.7 |
| Secondary | 264 | 66.0 |
| Tertiary | 25 | 6.3 |
| | | |
| **Religion** | | |
| Christianity | 182 | 45.5 |
| Islam | 215 | 53.7 |
| Traditional | 2 | 0.5 |
| Other | 1 | 0.3 |

Table 2 shows average scores of pre- and post-training over a maximum of five points per section, except for the sections on consequences and transmission that had a maximum of one point each since only one question was asked from respondents in these sections. All the sections recorded an increase in the average score when pre- and post-training scores were compared.

On causes of malaria, allowable average maximum score was 5.0. Pre-intervention score was 2.5 and post-intervention 5.0 giving an increment of 100%. On transmission of malaria, allowable average maximum score was 1.0. Pre-intervention score was 0.2, and post-intervention score 0.8 giving an increment of 300%. On risk factors to malaria, average maximum score

attainable was 5.0. Pre-intervention score was 2.0 and post-intervention score 4.0 giving an increment of 100%. On consequences of malaria, allowable average maximum score was 1.0. Pre-intervention score was 0.7 and post-intervention score 1.0 giving an increment of 42.9%.

On awareness of common symptoms of malaria, allowable average maximum score was 5.0. Pre-intervention score was 4.0 and post- intervention score 5.0 giving an increment of 25.0%. On treatment and management of malaria, allowable average maximum score was 5.0. Pre- intervention

score was 2.8 and post-intervention score 5.0 giving an increment of 78.6%.

On prevention of malaria, allowable average maximum score was 5.0. Pre-intervention score was 2.2 and post-intervention 4.0 giving an increment of 81.9%. Overall, with an allowable maximum average score of 3.9, the overall average score in the pre-test was 2.1 and 3.5 after the training sessions. This amounts to an increment of 66.7% in score.

Table 2: Assessment of role model care givers pre- and post-intervention on home management of malaria

| Sections | Average maximum score | Average score Pre intervention | Average score Post intervention | Percentage increase in scores |
|---|---|---|---|---|
| Cause of malaria | 5.0 | 2.5 | 5.0 | 100.0 |
| Transmission | 1.0 | 0.2 | 0.8 | 300.0 |
| Risk factors | 5.0 | 2.0 | 4.0 | 100.0 |
| Consequences | 1.0 | 0.7 | 1.0 | 42.9 |
| Common symptoms | 5.0 | 4.0 | 5.0 | 25.0 |
| Treatments/management | 5.0 | 2.8 | 5.0 | 78.6 |
| Prevention | 5.0 | 2.2 | 4.0 | 81.8 |

Middle age respondents knew twice more on how malaria was transmitted compared to the younger age group. They also knew twice more about the consequences of malaria compared to the younger age. Role model care givers with formal education knew twice and three times more about transmission and consequences of malaria

respectively compared to those without formal education. Male respondents had the same likelihood of knowing about malaria transmission as females, while they were one and half times more likely to know about consequences of malaria compared to females (Table 3).

Table 3: Regression model of increment in some knowledge scores and some socio-demographic characteristics of respondents.

| Variables | n (T, C) | Increase in knowledge score (Transmission T) | Increase in knowledge score (Consequences C) |
|---|---|---|---|
| Middle age group (reference category=younger/older age) | 122, 107 | OR 2.1, 95%CI 0.25-0.65, p=0.001 | OR 2.3, 95%CI 0.05-0.12, p=0.000 |
| Formal education (reference category=no formal) | 202, 206 | OR 1.9, 95%CI 0.11-0.19, p=0.002 | OR 2.9, 95%CI 0.25-0.65, p=0.040 |
| Male (reference category= female) | 64, 113 | OR 1.2, 95%CI 1.20-0.42, p=0.142 | OR 1.5, 95%CI 0.06-0.12, p=0.001 |

## DISCUSSION

In this study, nearly half of the respondents were aware of the scientific cause of malaria being a 'germ'.The low awareness of malaria transmission as revealed from the pre-test of the study supports another community based study that reported moderate awareness and superficial knowledge on malaria causes and transmission (8). Poor knowledge of the bite of infected mosquito as a cause of malaria could explain the nonchalant attitude of communities towards prevention of mosquito bites including the use of insecticide treated bed nets.

Post-training scores of respondents showed a double fold increment in average knowledge score when compared to pre-intervention on the scientific cause of malaria. In a related study carried out in Swaziland, awareness of malaria rose to as high as 99% (4) following interventions targeting improvement of community awareness, interventions in the health facilities, the media and social marketing of bed nets. In malaria endemic areas like Nigeria, malaria transmission occurs all year round, and people are generally expected to have high level of awareness about this prevalent disease.

Similarly, low association of occurrence of malaria with mosquito bites as the most important and cogent question asked under 'transmission' suggested low awareness of malaria transmission during pre-test in this study. This complements a study in which only 34% of community people studied made correct association of mosquito bites with occurrence of malaria in Zanzibar (9). The improvement in knowledge score after training could be supported by another post-awareness creation study in which almost all respondents had good knowledge of malaria and attributed it to mosquito bites after an interventional health education session (10). In support of the reported increment in some knowledge indices reported in this study, improved or high malaria awareness and its association with the bite of mosquito is usually a common knowledge in malaria endemic countries such as India, Turkey, Nepal, Haiti, Latin America, Sudan and Ghana (10, 11).

The ability of respondents to mention common symptoms and signs of malaria, most especially fever, showed that the communities have some level of information about the occurrences of malaria in humans even before the training. This observation supports other similar studies (12-15). These indices significantly improved across respondents after the training. In other supportive studies, symptoms such as headache, high body temperature/fever and chills were the three most frequently mentioned symptoms of malaria (16-18). In this study, treatment, management and prevention of malaria was fair among the majority of respondents, although this greatly improved to a desired maximum level after the training session for role model care givers. In a similar post-intervention study, knowledge about malaria prevention among the participants was high, 78% (n = 320), and only a small proportion (14.7%) said malaria cannot be prevented, and the remaining 7.3% of the participants did not know whether or not malaria is preventable (4).

Most respondents knew that going to the clinics for treatment, use of insecticide treated bed nets and vector control are important for treating and preventing malaria disease. This is important for the success of community malaria control programmes, since the knowledge of care givers towards controlling and preventive measures could predict how well they will impact relevant knowledge of preventive measures onto the general population, as well as assist them to get prompt and correct treatment in the eventuality of a malaria attack.

Supporting the findings from this study, knowledge on preventive use of bed net had been observed to be high in some countries such as Nepal (12) and Ghana (19), but not in countries such as Ethiopia (20) and Iran (21). Nigeria as an endemic country could leverage from successes recorded in some of these countries to achieve efficiency in malaria control and prevention activities such as distribution of insecticide-treated bed nets, a task which these role model care givers can easily perform. The use of these community based role model care givers could thus be described as a strategic measure for preventing malaria transmission.

Formal education and middle age group were associated with good knowledge of transmission and consequences of malaria. Educated people were more likely to understand the use of electronic gadgets through which health promotion messages could be delivered. Because they could read and write in case they received

health education leaflets and pamphlets from the health care facilities, they are also more likely to comprehend issues of behavioral change. This pattern had been supported by other similar studies (12, 19).

In conclusion, an increase in knowledge scores was observed when pre- and post-training scores on malaria prevention and control were compared. Training session on malaria was found to have improved knowledge of malaria prevention and control among role model community care givers studied. Thus, adequate start off, and on-the-job training could help in improving knowledge, and possibly, the performance of community role model care givers towards a successful malaria control programme in southwestern Nigeria.

## ACKNOWLEDGEMENT

## REFERENCES

1. World Health Organization. Children and Malaria: Roll Back *Malaria Fact Sheet.* 1–14 (2002).
2. World Health Organization (WHO). Malaria in Pregnancy: Roll Back *Malaria Factsheet.* (2002).
3. World Health Organization (WHO). Malaria in Africa: *Roll Back Malaria Factsheet.* (2002).
4. Khumbulani W, Musawenkosi L, Mabaso S, Dayanandan G. & Rajendra M. Community knowledge, attitudes and practices on malaria in Swaziland: A country earmarked for malaria elimination. *Malar. J,* 2009; 8: 29–36.
5. Américo D. Knowledge and beliefs about malaria transmission and practices for vector control in Southern Mexico. *Salud pública Méx Cuernavaca*, 2003; 45: 3–16
6. Winch P. Seasonal variation in the perceived risk of malaria, Implication for promotion of insecticide impregnated bednets. *Soc. Sci. Med,* 2004; 39: 63–75
7. Araoye MO. Research Methodology with Statistics for Health and Social Sciences. Ilorin, Nigeria: Nathadex Publishers; 2004:117–120.
8. Syed M, Rashidul HHU and Awlad H. Knowledge on the transmission, prevention and treatment of malaria among two endemic populations of Bangladesh and their health-seeking behavior. *Malar. J,* 2009;. 8: 173–179.
9. Alilio M and Bammek JA. Knowledge, attitude and practise study in Zanzibar: Implications for prevention and control: A study conducted for UNICEF sub-office Zanzibar. Eval. Program. Plan, 1998; 21: 409–413.
10. Tyagi P, Roy A and Malhotra M. Knowledge, awareness and practices towards malaria in communities of rural, semi-rural and bordering areas of east Delhi (India). *J Vector Borne Dis*, 2005; 42: 30–35.
11. Sharma A, Bhasin S and Chaturvedi S. Predictors of knowledge about malaria in India. *J Vector Borne Dis*, 2007; 44: 189–197.
12. Joshi A and Banjara M. Malaria related knowledge, practices and behaviour of people in Nepal. *J Vector Borne Dis*, 2008; 45: 44–50.
13. Kroeger A, Meyer R, Mancheno M and Gonzalez M. Health education for community-based malaria control: an intervention study in Ecuador, Columbia and Nicaragua. *Trop Med Intl Heal,* 1996; 1: 836–846.
14. Faiz M. A study on clinical presentation of malaria. *Bangladesh Med. J*, 2002;11: 41–52.
15. Dunyo S.. 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: 285–288.
16. Booth C and MacLean J. Knowledge, treatment-seeking, and socioeconomic impact of malaria on the Essequibo Coast of Guyana. *MJM*, 2001; 6: 17–25.
17. Deressa W, Ali A and Enquoselassie F. Knowledge, attitudes and practices about malaria, the mosquito and antimalarials drugs in a rural community. *Ethiop J Heal. Dev,* 2003; 17: 99–104
18. Erhun W, Agbani E and Adesanya S. Malaria Prevention: Knowledge, Attitude And Practice

In A Southwestern Nigerian Community. *African J. Biomed. Res*, 2005; 8: 25–29.

19. De La Cruz N. Who sleeps under bednets in Ghana: A doer/non-doer analysis of malaria prevention behaviours. *Malar. J,* 2006; 5: 61–69.

20. Jima, D. Baseline survey for the implementation of insecticide treated mosquito nets in malaria control in Ethiopia. *Ethiop. J Heal. Dev,* 2005; 19: 16–23.

21. Rakhshani F, Moghadam A, Alemi R and Moradi A. Knowledge, perceptions and prevention of malaria among women in Sistan va Baluchestan, Islamic Republic Iran. *East. Mediterr. Heal. J,* 2003; 9: 248–256.