

EFFECTS OF FORMAL EDUCATION ON MALARIA KNOWLEDGE AMONG RESIDENTS OF A RURAL COMMUNITY IN ENUGU STATE, SOUTHEAST NIGERIA

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Abstract

Malaria is endemic in many developing countries where it is a major cause of morbidity and mortality. An estimated 212 million cases of malaria occurred globally, resulting in 429,000 deaths; as against the 214 million cases recorded in 2014, that resulted in 438,000 deaths. It is still a major health challenge in Nigeria. It has been documented that formal education improves overall knowledge of malaria among the populace. The cardinal objective of this research is to assess the knowledge of residents of a rural community, on malaria with emphasis on causes, complications, prevention, and management of the disease.

The study was conducted in Egede town, a rural community in Udi Local Government Area of Enugu state, Southeast Nigeria. The study was of observational, descriptive, cross-sectional design; and was carried out among rural residents who presented for a medical outreach activity in January 2015.

The socio-demographic variables for the respondents showed that 53.0% had no formal education. On the knowledge of causes of malaria, the T - test of scores = 0.001; P value = 0.05, while the T - test of scores for knowledge of malaria complications = 0.0002; P value = 0.05. T-test of scores for knowledge of malaria prevention = 0.002; P value = 0.05, and for the T - test of scores for the knowledge on management of malaria = 0.04; P value = 0.05.

Respondents with formal education had significantly better knowledge than those without formal education.

Keywords: Knowledge, Malaria, Formal, Education, Rural, Community

Introduction

The parasite, Plasmodium is the causative organism for malaria disease and is transmitted from an infected man to another person, through the bite of a female anopheles mosquito^[1]. This disease is

endemic in many developing countries where it is a major cause of morbidity and mortality. Four species of Plasmodium that are mainly responsible for malaria are Plasmodium falciparum, Plasmodium vivax, Plasmodium ovale and Plasmodium

malariæ^[2]. From the forest region of South-East Asia is reported rare cases of infection in humans with the monkey malaria parasite, *Plasmodium knowlesi*^[3]. An estimated 212 million cases of malaria occurred globally in the year 2015, resulting in 429,000 deaths; as against the 214 million cases recorded in 2014, that resulted in 438,000 deaths. Most of these cases occurred in the WHO African region where 90% of these cases were recorded. There is, however, a decrease in the incidence rate of malaria by about 41%, and a decrease in the mortality rate by about 62% globally between 2000 and 2015^[4].

Malaria is still a major health challenge in Nigeria, accounting for approximately 60% outpatient attendance in health facilities, 30% childhood mortality, and 11% maternal mortality^[5,6]. In the year 2015, the country is recorded to have the highest malaria cases in West Africa (55%), and globally (29%)^[4]. The adverse economic impact of malaria infection in Nigeria is huge. In the year 2011 an estimated 132 billion Naira was lost to malaria treatment, loss of man-hours as a result of the infection, transportation to the source of treatment, absenteeism from school and other indirect costs^[7]. Nigeria and the Democratic Republic of Congo account for about 40% of global mortality recorded from malaria infection^[8]. As many as 97% of the Nigerian population are at risk of getting infected with malaria^[9].

It has been documented that formal education improves overall knowledge of malaria among the populace. It is said that those with at least secondary school level of education could have been exposed to lessons on malaria in school, and also better placed to read or comprehend malaria messages on print or electronic media^[10,11]. Knowledge about malaria is very key in determining people's acceptance and involvement in malaria control activities^[12], and this knowledge varies in different communities^[13]. Since the majority of the

respondents in the studied population had no formal education^[14], assessing the effect of formal education on their malaria knowledge will be useful in developing appropriate interventions that will improve their knowledge on malaria, thus enhancing their acceptance and involvement in malaria control activities. This will contribute tremendously towards achieving the desired objectives of the Nigeria National Malaria Elimination Programme in the rural areas. The cardinal objective of this research is to assess the knowledge of residents of a rural community, on malaria with emphasis on causes, complications, prevention, and management of the disease.

Materials and Methods

Enugu State is one of the thirty-six states in Nigeria, and shares boundaries with Kogi and Benue states on the north, Abia and Imo states on the south, Ebonyi state on the East, and Anambra state on the west. The study was conducted in Egede town, a rural community in Udi Local Government Area of Enugu state, Southeast Nigeria. During the last population census in Nigeria, Enugu state with a land mass of 7,161Km², was recorded to have a population of 3,267,837, with Udi Local Government Area having 238,305^[15]. It is however estimated that these population figures have significantly increased now.

Residents of rural areas in Enugu state, such as Udi Local Government Area, are mainly farmers, primary/secondary school teachers, hunters, palm wine tappers, and petty traders. The study was of observational, descriptive, cross-sectional design; and was carried out among rural residents who presented for a medical outreach activity in January 2015. Data were also collected for more studies on malaria, diabetes mellitus, and HIV/AIDS during the same outreach program. Data collection was done using a pretested interviewer-administered questionnaire by ten medical interns and five

junior resident doctors in the Department of Community Medicine, Enugu state University Teaching Hospital. The Research Assistants were trained prior to the outreach activity. Information was elicited from two hundred and ninety-six (296) rural dwellers. The data were quantitatively analyzed, using SPSS version 20.0, in terms of the percentage of respondents with correct knowledge of causes, complications, prevention and management of malaria. Students T-test was done to determine the significance of the effect of formal education on the respondents' knowledge on malaria.

Results and Discussion

In this study, formal education is defined as education acquired through the organized and methodical approach to teaching^[16]. It spans from primary, through secondary to tertiary and postgraduate levels. Increasing

levels of formal education have been established to have a positive relationship with knowledge of the different aspects of Malaria^[17,18]. One study in Ghana, and possibly a few more found that formal educational level had no significant relationship with respondents knowledge on malaria^[19].

Socio-demographic variables for respondents: The socio-demographic variables for the respondents showed that 53.0% had no formal education, 76.7% were 50 years and above, 70.9% farmers by profession, 83.1% married, while 70,3% were females. Out of the two hundred and ninety-six (296) respondents in this study, one hundred and fifty-seven (157) had no formal education, while one hundred and thirty-nine (139) had at least primary level education.

Table 1: Socio-demographic variables for respondents

<i>Age range (in years)</i>	Frequency (N = 296)	Percent (100%)
19 and below	2	0.7
20 – 29	13	4.4
30 – 39	22	7.4
40 – 49	32	10.8
50 – 59	70	23.6
60 – 69	73	24.7
70 and above	84	28.4
<i>Sex</i>		
Female	208	70.3
Male	88	29.7
<i>Marital status</i>		
Married	246	83.1
Single	14	4.7
Divorced/Separated	2	0.7
Widowed	34	11.5
<i>Educational Status</i>		
No formal Education	157	53.0
Primary level	88	29.7
Secondary level	37	12.5
Tertiary level	9	3.0
Postgraduate level	5	1.7

Occupation		
Farmer	210	70.9
Petty trader	38	12.8
Artisan	15	5.2
Retired	14	4.7
Civil servant/teacher	16	5.4
Unemployed/student	3	1.0

The socio-demographic finding of respondents in this study may not be representative of the actual distribution in the studied community. Information was elicited from respondents during a medical outreach activity that lasted for about nine hours. Many young men and women obviously did not have the patience to wait, while the older age group with mostly non-communicable disease that they had not been able to access care on, were patient and waited. The female gender is seen as the weaker sex, hence culturally they usually seek medical attention more when ill^[20].

Knowledge of causes of malaria

Up to 78.4% of respondents with a formal education knew that malaria is transmitted

through a mosquito bite, while only 42.0% had the same knowledge among respondents without formal education. The majority of respondents with formal education (66.2%) had the knowledge that dirty environment leads to breeding of mosquitoes, thus causing malaria. Only 36.9% of those without formal education knew that dirty environment could lead to malaria. Knowledge about stagnant water in containers serving as breeding sites for mosquitoes was the last variable investigated in the area of malaria causative factors, and it was found that 66.9% gave the correct response, while only 36.3% of those without formal education had the knowledge.

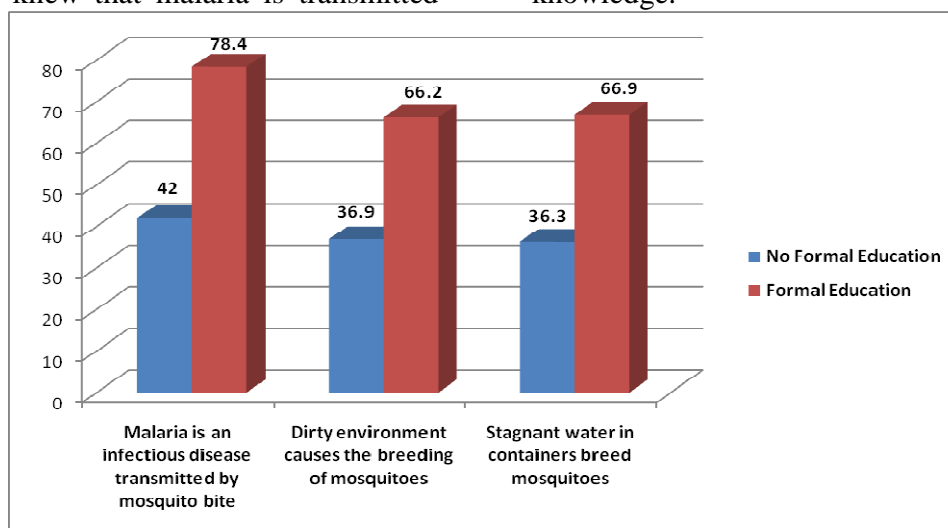


Fig 1: Knowledge of Causes of Malaria

Mean score in those without formal education = 38.4 (SD = 3.13)

Mean score in those with formal education = 70.5 (SD = 6.85)

T – test of scores = 0.001; P value = 0.05

Higher level of education having a positive effect on the knowledge that malaria is

transmitted through mosquito bite, as revealed in this study were previously

documented in some other previous studies such as seen in Tanzania, where 22.8% of literate respondents, as against 3.7% of illiterate ones knew that malaria is transmitted through the bite of mosquito^[17]. However, in a suburban community in Accra Ghana, it was found that although 63% of respondents with formal education believed that malaria is caused by mosquito bite, and 45% of those without formal education shared the same knowledge; the difference was found not to be statistically significant^[19]. The Ghana finding was in a suburban area, where residents probably could access information on malaria causation through electronic media, or awareness creation activities. Most of the respondents in the Ghana study were also literate, as opposed to those in this study, where 53.0% had no formal education. The Tanzanian study, which was in a rural community as the community used for this study also showed the significant positive effect of higher level of education on the knowledge that, dirty environment and stagnant water lead to breeding of mosquitoes, and increased incidence of malaria infection^[17]. Again, though a higher

percentage of respondents with formal education in the Ghana study knew that dirty environment and stagnant water could lead to malaria; the difference was not statistically significant^[19].

Knowledge of malaria complications

More than half of the respondents with formal education (53.2%) knew that malaria complication is commoner in children and pregnant women, while only 31.2% among those without formal education knew that malaria affects children and women more. The possibility of malaria-causing abortion in pregnant women was known by 47.5% of respondents with formal education, while only 27.4% of those without formal education possessed the same knowledge. The majority of those with formal education (54.7%) knew that convulsion can result from malaria infection, but as few as 29.3% of respondents without formal education knew about this. Convulsion in children, being a complication of malaria is known by 55.4% of respondents with formal education. On the other hand, not many of them (29.9%) knew that malaria could cause anemia in children.

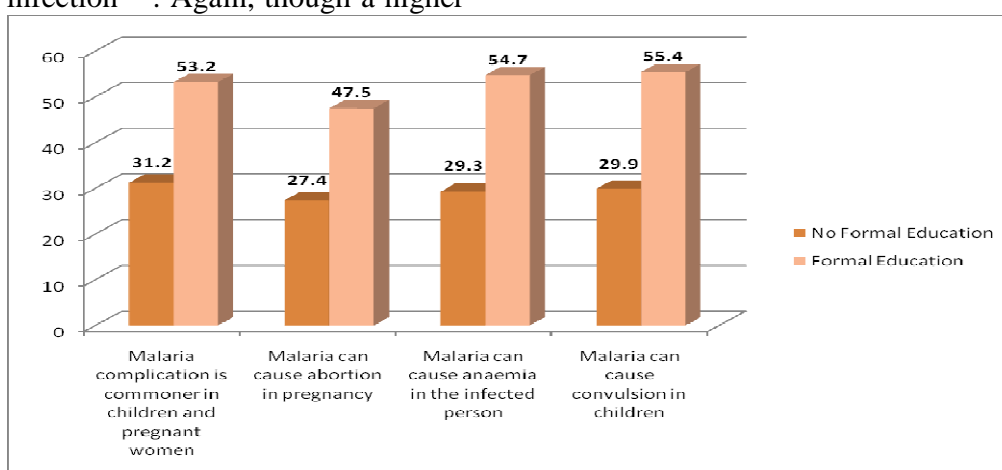


Fig 2: Knowledge of Malaria complications

Mean score in those without formal education = 29.45 (SD = 1.58)

Mean score in those with formal education = 52.7 (SD = 3.59)

T – test of scores = 0.0002; P value = 0.05

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The higher educational level of residents of a community is frequently associated with higher knowledge of different aspects of malaria, including complication^[21]. It was found in Ogun state, Southwest Nigeria, that the difference between the knowledge on malaria complications such as anemia, among women attending ante-natal care in a government tertiary hospital, who have secondary school education and above; was very significant when compared to respondents without formal education^[22]. Again in Ebonyi state, Southeast Nigeria, the finding among pregnant women was the same^[23]. In Nigeria, pregnant women are usually given health education talk during each ante-natal visit, hence one would have expected that even pregnant non-formally educated respondents would have a very high level of malaria knowledge. This, however, is not the case in those Nigerian studies. These findings concur with the finding in this study, where T – test of

scores = 0.0002; P-value = 0.05, indicating significance between the difference in knowledge scores among residents of the rural community with formal education, and those without formal education.

Knowledge of malaria prevention

Many of the respondents with formal education (68.3%) knew that sleeping under Long Lasting

Insecticidal Nets every night helps prevent malaria infection. Only 35.7% of those without formal education share the same knowledge. More of respondents with formal education (66.9%) knew that spraying insecticides inside houses help prevent malaria infection, while only 34.4% of the ones without formal education have the knowledge. Environmental Sanitation helping to prevent malaria infection is known by 71.9% of respondents with formal education, whereas only 35.7% knew that environmental sanitation helps in preventing malaria.

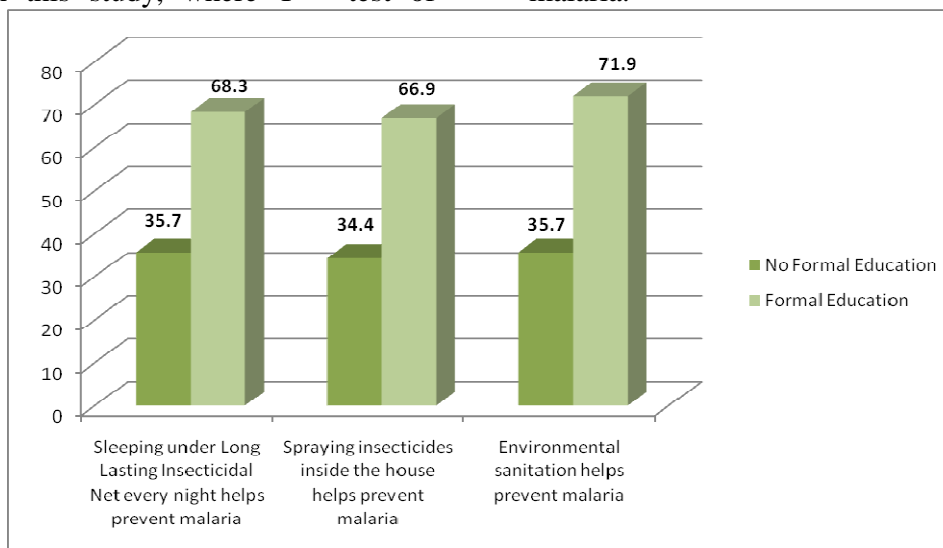


Fig 3: Knowledge of Malaria Prevention

Mean score in those without formal education = 35.3 (SD = 0.75)

Mean score in those with formal education = 69.0 (SD = 2.58)

T – test of scores = 0.002; P value = 0.05

Out of seven stated objectives of the Nigeria Malaria Elimination Programme 2014 -

2020 Strategic Plan, the first is that "At least 80% of the targeted population utilizes

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appropriate preventive measures by 2020^[9]. It is certainly of paramount importance that everybody in Nigeria has good knowledge of these malaria preventive measures if this objective is to be achieved. Formal education has been shown to significantly improve knowledge on malaria prevention^[23,24]. The same study in Ghana, that found that educational level has no effect on knowledge of causes of malaria, also reported that there are no differences in educational levels of respondents and knowledge about malaria being preventable^[19]. More respondents in the Ghana study could have been exposed to more information on malaria, since being in a suburban location could give them more access to health information, than rural dwellers in our study.

Knowledge on management of malaria

Few of the respondents with formal education (34.5%) knew that Artemisinin-

based Combination Therapy is the recommended treatment for uncomplicated malaria infection. Even fewer number of those without formal education (17.8%) have the same knowledge. The guideline that stipulates that blood test to confirm malaria diagnosis should be done before the commencement of treatment is known by 61.9% of respondents with formal education, but only 31.8% of those without formal education share the same knowledge. A small number, among those with formal education (33.8%), and smaller number among those without formal education (18.5%) knew that the quick blood test for malaria infection is called malaria Rapid Diagnostic Test (RDT). Lastly, 49.6% of those with a formal education knew that malaria infection is now resistant to many older drugs, while 24.2% of those without formal education share same knowledge.

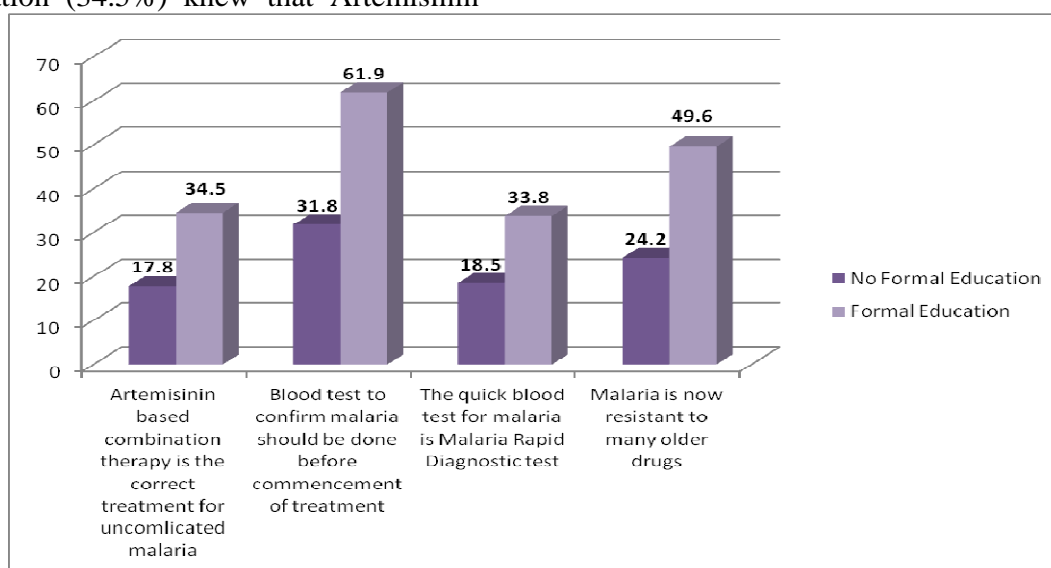


Fig 4: Knowledge on Management of Malaria

Mean score in those without formal education = 23.1 (SD = 6.48)

Mean score in those with formal education = 45.0 (SD = 13.44)

T – test of scores = 0.04; P value = 0.05

Artemisinin-based Combination Therapy (ACT) is the globally recommended first-line treatment for uncomplicated malaria infection. The use of this drug formulation

was commenced in Nigeria in the year 2005^[14]. It is worrisome that both formally educated respondents and those that were not exposed to formal education had very

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poor knowledge about this very important guideline in the treatment of uncomplicated malaria. Those with formal education, however, had significantly better knowledge when it comes to this aspect of management of malaria. This finding was also made in rural, Northwest Tanzania, in the year 2010^[17]. In the past, malaria diagnosis was mostly made presumptively and treatment commenced with Chloroquine and the other older drugs. Among other problems, this led to the development of resistance to these drugs^[3,26], thus highlighting the need to create awareness about this information. Parasitological diagnosis of malaria can be made through microscopy, or Rapid Diagnostic Test (RDT)^[3]. Respondents with formal education in this study significantly had better knowledge of these very crucial guidelines for the diagnosis and treatment of malaria. This is in agreement with the finding in a study conducted in Osun State, Southwest Nigeria, in 2013; where mothers with formal education had significantly better knowledge about the current trends in the management of malaria^[27].

Conclusions

Findings in this study revealed significant differences in the level of knowledge possessed by respondents with formal education, and those without formal education; in the areas of causes, complications, prevention and management of malaria. Those with formal education had significantly better knowledge than those without formal education. Similar findings were also made in some other studies conducted in Nigeria and beyond^[21,22,28]. In designing interventions aimed at controlling or eliminating malaria, it will be beneficial if educational attainment of majority of the people in the targeted area is taken into consideration. Provision should be made to carry the less educated along.

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