Original Research Article

Home Management Practices among Caregivers on Malaria Treatment in Primary Healthcare Centre Amansea, Anambra State, Nigeria

Abstract

Malaria is a major cause of fever in children. When a child has fever, parents or caregivers commonly treat them as if they were affected by malaria, with available medicines at home, with or without proper information or guideline. This study was carried out to explore the effectiveness of the various home management practices on malaria treatment among caregivers in Primary Health Care Center Amansea, Awka North L.G.A, Anambra State between May and August 2021. Mothers and caregivers (N=200) visiting the facility and their children (N=200) were involved. Blood specimens were collected through venipuncture and analyzed by microscopy while data on management practices were collected using pretested, structured questionnaires. Data were analyzed with SPSS version 25.0. Mothers and caregivers had good knowledge of the correct cause (70.0%), symptoms (63.0%) and preventive measures (53.5%) of malaria. Sources of medical treatment ranged from doctors (43.0%) to herbalist (13.5%) and 80% of them seek medical treatment within 24 hours of onset of fever. Caregivers preference of home treatment of malaria to hospital is greatly influenced by a lot of reasons with high cost of hospital bills (53.5%) being the highest reason among many. Prevalence of malaria among the mothers and caregivers was 36(18.0%) which was dependent on their age (X^2=44.629, df=3, P=0.000) and educational status but not with occupation. However, malaria prevalence among the children was 50(25%) even though it was not significant in relation to age and sex of the children (P>0.05). The effectiveness of home management of malaria depends on the early diagnosis, prompt and appropriate use of health facilities for treatment of malaria symptom especially fever. Therefore, health programmes and special campaigns to enlighten mothers and caregivers on more of the dangers of delayed treatment for their children could help to improve their treatment seeking pattern.

Keywords: Mothers, Caregivers, Malaria, Home management, Treatment

Introduction

Malaria is a disease condition caused by a protozoan parasite of the genus *Plasmodium*. Malaria remains one of the major Public health problems worldwide and continues to present a great challenge to health systems in countries within the tropical regions of the world. In 2018, an estimated 228 million cases of malaria occurred worldwide, compared with 251 million cases in 2010 and 231 million cases in 2017. Most malaria cases in 2018 were in the World Health Organization (WHO) African Region (213 million or 93%), followed by the WHO South-East Asia Region with 3.4% of the cases and the WHO Eastern Mediterranean Region with 2.1% [1]. In 2018, there were an estimated 405 000 deaths from malaria globally, compared with 416 000 estimated deaths in 2017, and 585 000 in 2010. Children aged under 5 years are the most vulnerable group affected by malaria accounting for 67% (272 000) of all malaria deaths worldwide [1]. Malaria is transmitted all over Nigeria; 76 % of the population live in high transmission areas while 24 % of the population live in low transmission areas [2]. According to the 2020 World Malaria Report, Nigeria had the highest number of global malaria cases (27 % of global malaria cases) in 2019 and accounted for the highest number of deaths [23 % of global malaria deaths] [1].

Plasmodium falciparum is the most virulent of the five species of *Plasmodium* especially in the tropical areas; if not treated within 24hours can progress to severe illness, often leading to death [3]. Fever is the most common symptom of malaria. Therefore, when the child has fever, parents or caregivers commonly treat them as if they were affected by malaria, whether right or wrong. It is at this level that individuals or caregivers recognize malaria and decide on treatment options to use. However, other symptoms and signs of both uncomplicated and severe malaria are rarely given any consideration [4].

Home management of malaria is the presumptive treatment of febrile children with medicines available at home. Home-based management of malaria is one of the key strategies to reduce the burden of malaria for vulnerable population in endemic countries [5]. Caregivers could be one's parents, nurses or teachers. Mothers are the major primary caregivers in malaria and other illnesses at home. Mothers are usually the first to recognize the signs and symptoms of malaria because they are the ones who take care of their children at home. An early diagnosis of malaria is essential because the delay in seeking hospital care can lead to delayed recovery with a subsequent high mortality rate [6].

Malaria, being a major cause of fever in children, requires mothers and caregivers to be well-informed and provided with guidelines on the early recognition of its symptoms and signs, appropriate diagnosis, and treatment with antimalarial drugs. Although self-medication practices always persist, these were influenced by their previous experiences with treatment options received from health personnel as well as high cost of treatment [7]. They also need to be well informed on when to consult health facilities if home treatment fails or when the presenting signs go beyond those of simple to severe malaria. Appropriate treatment of malaria within 24 hours of onset of fever could help reduce malaria illness [8].

Some parents prefer to administer paracetamol and perform tepid sponging on their child for malaria. Some administer antimalarial drug (artemisinin-based combination therapy) while some combine paracetamol and antimalarial drug, and when there is no improvement and symptoms become severe, they take the child to the medical healthcare centre. Although the majority of forms of malaria are successfully treated with the existing antimalarial, morbidity and mortality caused by malaria are continually increasing [9].

This study aimed at identifying the various home management practices among mothers and caregivers at the Primary Healthcare Centre (PHC) in the rural area of Amansea, Awka North Local Government Area, Anambra State of Nigeria; as well as assessing their level of knowledge on causes, treatment and preventive measures of malaria.

Materials and Methods

Study area

This study was conducted in Primary Healthcare Centre (PHC) in the rural community of Amansea, Awka-North LGA, Anambra State, Nigeria. The PHC serves the inhabitants of Amansea community and its environs. Awka-North is located in the tropical rainforest zone of Nigeria with a population of 148,400 [10]. It lies between the coordinates of $6^0$10N and $7^0$04E with the annual rainfall is about 2000-300mm, temperature ranges of 23.4^0C to 29.9^0C and relative humidity of about 80% [10]. Majority of the inhabitants are farmers, petty traders and a few civil servants.

Study design

This is a cross-sectional study involving blood specimen collection from the caregivers and the children; also, collection of valuable information using structured questionnaires. Women and children who visited the facility within the period of the study (May to August 2021) were recruited in the study. A total of 400 blood specimens were collected (200 from the caregivers and 200 from their children). Also, a total of 400 questionnaires were administered.

Collection and Examination of Blood Specimen for malaria parasites

Blood specimens (2ml) were collected from the mothers and caregivers through venipuncture and from their children through capillary puncture. Thick and thin blood films were made, stained using 10% Giemsa stain and examined microscopically according to Cheesbrough [11].

Questionnaires: Pretested, structured questionnaires were administered for collection of information on socio-demographic characteristics of mothers, caregivers and their children as well as information on knowledge of caregivers about malaria, their subsequent attitudes toward managing malaria at home as well as malaria treatment options.

Data analysis

Statistical Package for Social Sciences (SPSS) version 25.0 was used for data analysis. Chi-squared analysis was used to test for significance difference between home management practices and the prevalence of malaria.

RESULTS

A total of 200 caregivers participated in the study with the younger mothers (21-30years: 41%); mothers with secondary education (50.0%), who are married (78.5%) and who are traders (64%) having the highest population (Table 1). A total of 200 children were involved in the study. Females (74.5%) and children aged 1-4 years (29%) had the highest population (Table 2). Knowledge of correct cause of malaria was high among the caregivers (mosquito bite: (70.0%). Knowledge of symptoms and prevention was relatively high (fever: 63.0%; prevention: 96.0%) and use of ITN was 53.5% (Table 3)**.** Time to start antimalarial treatment in case of fever recorded < 24hours (80.0%) and in ≥ 24hours (20.0). Source of medical treatment ranged from doctors (43.0%) to herbalist (13.5%) [Table 4]. Caregivers who use combination of antimalarial and paracetamol has the highest response (31.5%). Again, mothers who had secondary education had the highest response (50%) in relation to malaria treatment at home. The preferred mode of malaria treatment at home by level of education among caregivers was significant (P=0.000, df=18) [Table 5]. Reasons given by caregivers for their preference of home management of malaria to hospital include high cost of treatment imposed on them by health workers (53.5%), unfriendly attitudes of workers (6.5%), long waiting hours at health centers (4.5%), all of the above (17.0%) and none of the above (18.5%) [Table 6]. An overall prevalence of malaria among the caregivers was 18.0% with the age group of 31-40 years having the highest prevalence (22.7%), although malaria prevalence according to age showed significant difference (X^2=44.629[a], df=3, P=0.000) [Table 7]. Caregivers who were students had the highest prevalence of malaria (57.1%). Malaria prevalence in relation to occupation was not statistically significant (χ^2 =9,837[a], df=5, P=0.80) [Table 8]. Caregivers with primary education had the highest malaria prevalence (26%) as shown in Table 9 although the result was not statistically significant (χ^2=44.629[a], Df=3, V=0.000) [Table 9]. An overall prevalence of malaria among the children of the caregivers was 25% with the age group 1-4 years having the highest prevalence (34.5%), although malaria prevalence in relation to the age of the children was not significant (χ^2tab > χ^2cal i.e 5.991>2.403: P>0.05) [Table 10]. Prevalence of malaria according to sex of the children showed no significant difference (χ^2=1.013[a], df=1, P=0.314) [Table 11].

Table1: Socio-demographic Characteristics of Caregivers (*N*=200)

Characteristics	No. of Respondents	Frequency (%)
Age group (years)		
15-20	39	19.5
21-30	82	41.0
31-40	44	22.0
41-50	18	9.0
51 and above	17	8.5
Educational Status		
No formal education	15	7.5
Primary	27	13.5
Secondary	100	50.0
Tertiary	58	29.0
Marital status		
Single	30	15.0
Married	157	78.5
Divorced	0	0.0

Others	13	6.5
Occupation		
Civil servants	25	12.5
Traders	128	64.0
Farmers	12	6.0
Students	35	17.5

Table 2: Socio-demographic characteristics of children (*n*=200)

Characteristics	**No. of Respondents**	**Frequency (%)**
Sex		
Male	51	25.5
Female	149	74.5
Age (years)		
<1	38	19.0
1-4	58	29.0
5-8	42	21.0
9-12	46	23.0
>12	16	8.0

Table 3: Knowledge of causes, symptoms and preventive measures among Caregivers

Characteristics	**No. of Respondents**	**Frequency (%)**
Knowledge of the correct cause of malaria		
Mosquito bite	140	70.0
Others	60	30.0
Knowledge of symptoms		
Fever	126	63.0
Others	74	37.0
Knowledge of prevention		
Yes	192	96.0
No	8	4.0
Knowledge of preventive measures		
Use of insecticide-treated nets (ITN)	107	53.5
Use of repellants	62	31.0
Others	31	15.5

Table 4: Diagnoses and places where treatment was sought by Caregivers.

Characteristics	**No. of Respondents**	**Frequency (%)**
Time to start antimalarial treatment in case of fever		
<24 hours	160	80.0
≥ 24 hours	40	20.0
Total	**200**	
Source of medical treatment		
Doctors	86	43.0
Pharmacist	30	15.0
Patent medicine shop	42	21.0
Herbalist	27	13.5
Others	15	7.5
Total	**200**	

Table 5: Preferred mode of malaria treatment at home by level of education among caregivers.

Characteristics	No formal education (%)	Primary (%)	Secondary (%)	Tertiary (%)	Total (%)
Paracetamol	2(1.0)	7(3.5)	8(4.0)	2(1.0)	19(9.5)
Antimalaria drug	6(3.0)	3(1.5)	23(11.5)	8(4.0)	40(20)
Herbal preparation	4(2.0)	2(1.0)	6(3.0)	13(6.5)	25(12.5)
Tepid sponging	0(0.0)	1(0.5)	15(7.5)	1(0.5)	17(8.5)
Antibiotics	0(0.0)	5(2.5)	12(6.0)	2(1.0)	19(9.5)
Combination of antimalarial and paracetamol	1(0.5)	9(4.5)	23(11.5)	30(15.0)	63(31.5)
Combination of antimalarial and herbal preparation	2(1.0)	0(0.0)	13(6.5)	2(1.0)	17(8.5)
Total	**15(7.5)**	**27(13.5)**	**100(50.0)**	**58(29.0)**	**200**

χ^2=63.277[a], df=18, P=0.000

Table 6: Reasons were given by caregivers for their preference of home management of malaria to hospital treatment.

Characteristics	No of respondents	Frequency (%)
Reasons given for home management of malarial		
High cost	107	53.5
Unfriendly attitudes of health workers	13	6.5
Long waiting hours at health centers	9	4.5
All of the above	34	17.0
None of the above	37	18.5
Total	**200**	

Table 7: Prevalence of malaria in relation to the Age of the Caregivers

Age	No Examined	No. Positive	Prevalence (%)
15-20	**39**	**5**	**12.8**
21-30	**82**	**15**	**18.3**
31-40	**44**	**10**	**22.7**
41-50	**18**	**4**	**22.2**
51 and above	**17**	**2**	**11.8**
Total	**200**	**36**	**18.0**

(X^2=44.629[a], df=3, P=0.000)

Table 8: Prevalence of Malaria in relation to the Occupation of the Caregivers

Occupation	No. Examined	No. Positive	Prevalence (%
Civil Servants	25	3	12.0
Traders	128	11	8.6
Farmers	12	2	16.7
Students	35	20	57.1
Total	**200**	**36**	**18.0**

χ^2 =9,837[a], df=5, P=0.80.

Table 9: Prevalence of Malaria in relation to the Educational status of the Caregivers

Education	No. Examined	No. Positive	Prevalence (%)
No formal Education	**15**	**2**	**13.3**
Primary	**27**	**7**	**26.0**
Secondary	**100**	**16**	**16.0**
Tertiary	**58**	**11**	**19.0**
Total	**200**	**36**	**18.0**

χ^2=44.629[a], df=3, P=0.000

Table 10: Prevalence Malaria in relation to age of the children

Age group (years)	No. Examined	No. Positive	Prevalence (%)
<1	38	10	26.3
1-4	58	20	34.5
5-8	42	8	19.0
9-12	46	9	19.6
>12	16	3	18.8
Total	**200**	**50**	**25.0**

χ^2tab > χ^2cal i.e 5.991>2.403 (P>0.05)

Table 11: Prevalence of Malaria in relation to Sex of the children

Sex	No. Examined	No. Positive	Prevalence (%)
Male	51	11	21.6
Female	149	39	26.2
Total	**200**	**50**	**25.0**

χ^2=1.013[a], df=1, P=0.314

DISCUSSION

Home-based treatment is a simple and effective initiative that is revolutionizing the treatment of malaria in Nigeria and Africa, putting essential drugs and know-how into the hands of those who need them most - mothers and community-based caregivers [3]. The effectiveness of home management of malaria depends on early diagnosis, prompt and appropriate treatment; therefore, proper health education about this disease is crucial [12]. The results of this study clearly indicate that the level of knowledge of mothers and caregivers about causes, symptoms and preventive measures of malaria was high which shows that they are well informed and provided with guidelines on the early recognition of its signs and symptoms of malaria.

The fact that majority of the respondents had basic education is an added advantage because most of the respondents had basic formal education. The respondents included civil servants, traders, farmers and students. This means that they know how to read and write and may have been the reason they were able to grasp any health programme at their disposal.

This contrasts the result of [13] who reported poor knowledge of correct cause of malaria among mothers and caregivers of under five children in Nigeria and in line with Chukwuocha [14] and Ahmed *et al.* [4] in a similar study in Umunneocha, Abia State and Owo, Ondo State, Nigeria respectively. This shows the importance of education in the knowledge and perception of malaria as reported previously by Chukwuocha [14].

Caregivers who use combination of antimalarial and paracetamol has the highest response. Again, mothers who had secondary education had the highest response in relation to malaria treatment at home. The preferred mode of malaria treatment at home by level of

education among caregivers was significant. This was in agreement with Okafor and Odeyemi [15] and Chukwuocha [14] who recorded antimalarial drugs as the commonest drug used in home treatment of malaria by caregivers for their young children in Abia and Lagos States, Nigeria respectively. However, the use of a combination of orthodox and herbal preparations as observed in the present studies agrees with similar report by Obiukwu *et al*. [16] in Onitsha-North LGA, Anambra State. Combination of this nature is not advisable as it could have far-reaching consequences arising from any complex reactions between the orthodox drugs and herbal preparations [16].

The use of herbal preparations for the treatment of malaria in this community is consistent with what was obtained in other communities in Nigeria [13,16]. Even though most mothers and caregivers consider the use of herbal medicines effective in treatment of malaria, the active ingredients as well as the appropriate dosage of such preparations that will be enough to treat the ailment remain unknown as that is done by guess work. Mothers and caregivers who prefer herbs to antimalarial stated that they do so because herbal medicines are relatively cheap and easily available. It was observed some that caregivers treat using other home remedies like tepid sponging and paracetamol only. Caregivers prefer seeking medicine vendors and herbalists as the place to receive treatment, because they are easily accessible, available and affordable, despite the fact that a real knowledge of medicine calls for treating the disease's causes and not its symptoms [17,18].

Caregivers attitude concerning the use of preventive measures and home treatment is greatly influenced by a lot of reasons which high cost of hospital bills is found to be higher when compared with other factors such as unfriendly attitudes of health workers and long waiting hours at health centers as well as combination of the factors. These reasons made mothers to resort to home treatment of malaria as well as seeking treatment in different places (herbalists, patent medicine stores, pharmacy shops) despite having good knowledge of malaria infection. However, quite a good number of caregivers sought appropriate treatment from doctors irrespective of the cost. This agrees with Uguru *et al*, [19] and Obiukwu *et al* [16] who recorded similar result both in Anambra State. Early treatment and appropriate use of health facilities for malaria treatment within 24 hours of fever was not poor when compared to caregivers who delay the use of antimalarial more than 24 hours of the onset of fever. This agrees with the findings of Arute and Odili [7] in management of uncomplicated *P*. *falciparum* malaria in children below five years in Delta State.

Malarial fever is often associated with nonspecific symptoms or severe complications, as past studies has showed, especially if the correct medical treatment is not promptly started within 24 hours [20, 21]. According to the National Antimalarial Treatment Policy by Federal Ministry of Health (FMH), Nigeria [22], patients with malaria should have access to appropriate and adequate treatment within 24 hours of the onset of symptoms and insecticide treated nets and other materials should be available and accessible to persons at risk of malaria, particularly pregnant women and children under 5 years of age. The accessibility to health care services is very important for good management of malaria [23, 24, 25]. Treatment of malaria depends on many factors including disease severity, the species of malaria parasite causing the infection, part of the world in which the infection was acquired, socio-economic status and by a lesser extent, the geographic location of the respondents [19].

The overall prevalence of malaria among the caregivers was 18.0% with the age group of 31-40 years having the highest prevalence. Malaria prevalence among the caregivers was significant in relation to educational status ($P<0.05$) but not with age and occupation ($P>0.05$) with those with primary education having the highest prevalence. An overall prevalence of malaria among the children of the caregivers was 25% with the age group 1-4 years having the highest prevalence (34.5%), although malaria prevalence in relation to the age and sex of the children was not significant ($P>0.05$). Nigeria has made remarkable

progress in malaria control, with decline in prevalence from 42% in 2010 to 23% in 2018 and witnessed largest reduction in malaria death in 2019 [8]. Microscopy data from the 2018 Nigeria Demographic and Health Survey (NDHS) show that the prevalence of malaria parasitaemia in children under five years of age is 23 percent (a decrease from 27% in 2015 and 42% in 2010), although there are significant regional, rural-urban, and socioeconomic differences [26].

It is essential to intensify efforts on health education programmes that can build mothers' capacity for healthy practices for malaria management [27]. Caregivers should be taught to recognize signs of severe malaria for which they must immediately bring a child to the nearest health facility [4]. Increasing access to health care services is considered pivotal to improving the health of populations. Prompt access to malaria diagnosis and treatment is a key component of the Roll Back Malaria [4]. It is necessary to educate caregivers, especially for early treatment and appropriate use of health facilities for fever. Programmes and special campaigns to enlighten the caregivers on more of the dangers of delayed treatment for their child could help to improve caregiver's treatment seeking pattern [16].

CONCLUSION

The findings of this study have shown that the study participants engage in some home management practices for malaria which sometimes lead to delayed proper medication for their children. This study was conducted over a short period of time, and captured only mothers and caregivers who visited the Health Centres. Therefore, further elaborate studies are recommended to include other mothers and caregivers who do not visit health centres. Also, special campaigns and health programmes to enlighten mothers and caregivers on the dangers of delayed treatment for their children is recommended to improve their treatment seeking pattern.

CONSENT

Informed consent of the study participants was obtained after due sensitization. Donors' Confidentiality was assured.

ETHICAL APPROVAL

Approval was obtained from the ethical Committee of Chukwuemeka Odumegwu Ojukwu University Teaching Hospital Amaku, Anambra State. (COOUTH/CMAC/ETH.C/Vol.1/FN: 04/0098).

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