(RESEARCH ARTICLE)

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Evaluation of knowledge on home management of malaria in under-fives among mothers and caregivers in Bende Local Government Area (LGA), Abia State, Nigeria

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Abstract

Background: In Nigeria, pregnant mothers and under-five children are the vulnerable who are most at risk of malarial infections. Despite the presence of numerous accessible health facilities, the community-based home management of childhood fevers remains a very common practice in the country.

Objectives: To evaluate knowledge on home management of malaria in under-fives among mothers and caregivers in Bende LGA, Abia State, Nigeria.

Methods and materials: A descriptive cross-sectional study was conducted among 375 heads of household Bende LGA. A semi-structured questionnaire was used to obtain data from participants and was self-administered. Data were cleaned and coded into SPSS version 26 for analysis. Numerical variables were summarized using mean and standard deviation, categorical variables were summarized using frequency and proportions. Chi-Square test was used to test association, p<0.05.

Results: A total of 375 household heads with a response rate of 360 (96.0%) participated in the study with a mean age of 37.2 ± 0.8724, A good number of the participants 136 (37.8%) were in the age range of 35 – 39 years. Majority of them 310 (86.0%) were married. Majority of them 204 (56.6%) had secondary education. One hundred and fifty-eight (43.8%) of them responded that mosquito bite was the cause of malaria. Prevalence of home management of malaria was 117(32.4%) and overall knowledge level of mothers and caregivers was 202 (56.1%). There association between age range, marital status and level of education was statistically significant, p<0.05.

Conclusion: There were several gaps in the participants' level of knowledge relating to home management of under-five children, however, overall knowledge level of mothers and caregivers was 202 (56.1%) and prevalence of home management was low as majority of the under-fives were taken to the hospital for their management.

Keywords: Evaluation; Knowledge; Home management; Malaria; Under-fives; Mothers and caregivers; Bende; Abia State; Nigeria

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1. Introduction

Malaria is one of the leading causes of childhood morbidity and mortality in Africa [1,2]. Each year, 0.7 to 2.7 million people die of malaria, of whom more than 75% are African children [3-5]. In 2017, 435,000 deaths were reported from malaria in the world with most of the cases from Africa, of which the majority were children under five years old, with one child dying every two minutes from this preventable and curable disease 6. During the same year, like the 10 most affected African countries, available records showed that at least 50 percent of the population of Nigeria suffers from at least one episode of malaria each year and this accounts for over 45 percent of all outpatient visits7.

More than half of the global population (4.2. billion people) is at risk of malaria occurring annually with over one million deaths per year. Thirdly percent of these annual death, occur in children under five years. Around 75% of global malaria cases are due to P falciparum and more than 80% of global malaria deaths occur in sub-Saharan Africa. In endemic Africa countries, malaria accounts for 25-35% of all outpatient visit 20 -40% of hospital admission and 15-35% of hospital deaths. Most vulnerable are under-fives, pregnant women and HIV infected persons 6.

Malaria is a protozoan infection caused by intracellular parasite of the genus plasmodium and transmitted from one person to another by the bite of a plasmodium infected female anopheles' mosquito [8,9]. Of the hundred species of plasmodium genus, only four can transmit malaria to the human host. They include P falciparum, P oval, P. vivax, and P. malarias. Of all the species, plasmodium falciparum is the most predominant parasite causing malaria in sub-Saharan Africa and also mortality due to falciparum malaria has the highest mortality due to its complications and drug resistance 9.

Early diagnosis coupled with prompt treatment are the main strategy to reduce morbidity and mortality caused by malaria. As part of World Health Organization's (WHO) Roll back malaria (RBM) strategies10, early diagnosis coupled with prompt treatment is the main strategy set by Federal Ministry of Health Malaria Control Program to reduce mortality and morbidity; especially among the most vulnerable groups that are young children and pregnant women. It has been recognized that, in endemic countries, most malaria episodes are treated outside public health facilities mainly at homes11, health facility-based treatment does not reach the majority of the population, as a result, the provision of improved home-based treatment for meeting RBM country targets. At RBM summit in Abuja in April 2000, Heads of most African countries made a commitment to ensure that by the year 2005, 60% of malaria episodes were adequately treated within 24 hours onsets of symptoms [12,13]. Although management of severe cases using the WHO Guideline9 for management of severe and complicated malaria at referral health care facilities can prevent mortality due to malaria, the outcome largely depends on the management of cases before admission.

In Africa, evidences indicate that 70% of malaria cases in rural areas and 50% of the cases in urban areas treat malaria first at home. In as much as there is prompt access to treatment via health centres and pharmaceutical stores, etc. within 24 hours of onset of fever 14.

Fever is a major manifestation of malaria and other infections in children. Malaria and fever contribute to high levels of malnutrition and mortality in children. Hence, presumptive treatment of fever with anti-malaria medication is advocated in many developing countries where malaria is endemic. In Africa more than 70% of malaria episode in rural areas and more than 50% in urban areas are self-treated [15,16]. Prevalence of home treatment of malaria is 76.0%17.

This study aimed to evaluate the knowledge of mothers and care-givers about causes, preventive measures of malaria and home treatment given to their children. Health-seeking behaviour of mothers and caregivers of under-five children with fever would be evaluated in order to better understand their subsequent implications on health of children affected by malaria

2. Material and methods

This was a community-based study from March to June 2022 among mothers and caregivers of under-five children in Bende Local Government Area (LGA), Abia state, South-east Nigeria. Bende LGA is a local government area in Abia state, Nigeria. It lies within approximately latitude **5**° 33' 31.46" North and longitude 7° 38' 0.92" East. It has area of 59,080 hectares, 590.80km2 with a population of 192,621 according to the National Population Census (2006) projected to 252,300 up to 2022 with annual population change of 2.7% (2006 - 2016) with 784 under-five children [18,19]. It is a rural community in the state. Her residents are made up of civil servants, teachers, traders, some It is a rural community in the state. Her residents are made up of civil servants, teachers, traders, some engage in vocations such as commercial

bus driving, tailing, shoe making, farming, patent medicine operators, employees of private organizations like schools, POS machines operations, hospitals.

2.1. Study population

The study population comprised of heads of households (2,000)19 in Bende LGA.

2.2. Inclusion criteria

All Households in the selected villages that consented to participate in the study

2.3. Exclusion criteria

Households outside the study area and those who didn't give consent to participate

2.4. Study design

A descriptive cross-sectional study of household home management of malaria in under-five children by using pretested semi-structured self-administered questionnaire to obtain information from consenting participants. Information was collected on the basis of knowledge of heads of households in the home management of malaria in under-five children and confidentiality was maintained. This was used to assess the knowledge of mothers and caregivers in Bende LGA, Abia State, Nigeria.

2.5. Sample Size Determination

The sample size was determined using the formula20.

$$N = \frac{Z^2PQ}{D^2}$$

Where
N= required sample or minimum sample size
Z= constant (1.96) [standard normal deviate]
P= proportion with the desired characteristics17.
P = 76.0%
Q= 1-P
D= degree of accuracy (0.05)

$$Q = 1 - P\ (= 1 - .76 = 0.24)$$

$$N = \frac{[1.96]^2\ x\ 0.76\ x\ 0.24}{[0.05]^2}$$

$$= [1.96]^2\ x\ 0.76\ x\ 0.24/[.05]^2$$

$$= 288.0283136$$

$$= 288.0$$

The sample size obtained was then increased by 16% to accommodate the non-response rate.

$$N + 16\%\ of\ N = 288 + [15/100\}\ x\ 288] = 288 + 42.0$$

Therefore, sample size [N] was equal to 330.1 = 330. Fifty-five was added to 330 to make it up to 375 as the sample size which made it almost one-fifth of the household population and population of study. This was done to increase level of precision.

2.6. Sampling technique

Multi-stage probability sampling technique was used.

- First step: Five wards were randomly selected, out of the twelve wards in Bende LGA. this included; Igbere A, Umuhu Ezechi, Umu imenyi, Item B and Uzuakoli
- Second step: three villages were selected in each of the five wards giving a total of 15 villages
- Third step: Each village was taken as a cluster and 25 heads of households were randomly chosen and interviewed. In 15 villages randomly selected gave a total household heads of 375 and questionnaires were produced for the same number of heads of household.

2.7. Tool for data collection

Data were collected using a pretested semi-structured questionnaire developed by the researchers and were interviewed by self-administered.

2.8. Data analysis

Data collected were analysed using Statistical Package for the Social Sciences (SPSS) software version 26.0. Data were presented in frequency tables. Chi-square test was used to test association between categorical variables, P – value of <0.05 was taken to be a statistically significant.

2.9. Data presentation

Data generated were summarized using tables and frequency distribution of variables. Descriptive analysis was done by calculating relevant means and standard deviation for quantitative variables, while qualitative variables were analyzed using proportions.

2.10. Ethical consideration

Ethical clearance of the study was obtained from Abia State University Teaching Hospital, Aba, Informed consent was also obtained from the Bende LGA Chairman, Ward Councilors of the selected wards and 375 heads of the households and they were briefed on the objectives of the study. They were counselled and confidentiality of the information given was assured.

2.11. Statistical analysis

Data collected was analysed using Statistical Product and Service Solution (SPSS) software version 26.0. formerly called Statistical Package for the Social Services. Data were presented in frequency tables, Chi-square test was used to test association between categorical variables, P- value of <0.05 was taken to statistically significant.

2.12. Ethical consideration

Ethical clearance of the study was obtained from Department of Community Medicine, Abia State University Teaching Hospital, Aba. Informed consent was also obtained from the fifteen (15) village heads. Meetings with the respondents from various villages were held, they were counseled, briefed on the objectives of the study, and thereafter their consents obtained before the beginning of the study

3. Results

A response rate of 360 (96.0%) and non-response rate of 15 (4.0%) were recorded after the exercise. A mean of 37.2 ± 0.8724 was obtained.

Table 1 shows the socio-demographic characteristics: most of the participants 136 (37.8%) were in the age range of 35 – 39 while the least 26 (7.2%) were in the age range of 20 – 24. Majority of the participants 340 (84.4%) were females while minority 20 (15.6%) were males. Majority of the participants 310 (86.0%) were married while minority 22 (6.0%) were divorced/separated. Majority of the participants 218 (51.0%) were catholic while minority were Pentecostal. Majority of the tribe 342 (95.0%) while the minority 7 (2%) were Hausa. Majority of the participants 204 (56.6%) had secondary level of education while the minority had no formal education. Majority of the participants 152 (42.4%) were farmers while the minority 9 (2.4%) were professional of different types. More details of information can be found on the table,

Table 1 Socio-demographic variables with a total participant of 360 (100.0%)

Variables		Frequency (N)	Percentage (%)
Age range	20 – 24	26	7.2
	25 – 29	40	11.1
	30 – 34	88	24.4
	35 – 39	136	37.8
	>40	70	19.5
Gender	Male	20	15.6
	Female	340	84.4
Marital status	Married	310	86
	Widowed	28	8
	Divorced/Separated	22	6
Religion	Pentecostal	9	2
	Protestant	188	44
	Catholic	218	51
	Traditional religion	13	3
Tribe	Igbo	342	95
	Hausa	7	2
	Yoruba	11	3
Educational level	No formal education	33.	9.1
	Primary	70	19.5
	Secondary	204	56.6
	Tertiary	53	14.8
Occupation	Civil servants	65	18.1
	Farming	152	42.4
	Artisan	29	8.1
	Professional	9	2.4
	Trading/Business	94	26.0
	Unemployed	11	3.0

Table 2 shows responses from participants on their level of knowledge of the mode of transmission of malaria and knowledge of the symptoms of uncomplicated malaria. All the participants 360 (100.0%) have heard of malaria. A good number of the participants 158 (43.8%) of the respondents knew correctly that only mosquito transmitted malaria, a good number of the participants 178 (49.6%) responded correctly that it is a serious illness. All the participants 360 (100.0%) responded that they knew symptoms of malaria and majority of them knew the symptoms, Details of more information could be found on the table.

Table 2 Responses from participants on their Knowledge level of Uncomplicated Malaria

Variable	Frequency	Percent (%)
Ever heard of Malaria?		
Yes	360	100
No	0	0.0
Cause of Malaria		
Mentioned mosquito bite only	158	43.8
Mentioned mosquito bite with another cause	184	51.0
Never mentioned mosquito bite	19	5.2
What do you think about Malaria?		
It is serious illness	178	49.6
It is minor illness	161	44.7
I don't know	21	5.7
Do you know the symptoms of Malaria?		
Yes	360	100
No	-	-
Which symptoms do you know?**		
Fever	357	99.2
Weakness	397	99.5
Bitter mouth	355	98.6
Body pain	314	87.2
Loss of appetite	355	98.6
Vomiting	353	98.1
Convulsion	156	43.3
Others	14	3.9

** This sign shows the figures following it do not add up to 100% as it is based on individual item.

Table 3 Responses from the participants on their knowledge level of malaria prevention

Variables		Frequency (N)	Percentage (%)
Source of Insecticide treated net (ITN)	Yes	268	74.5
	No	92	25.5
Uses of Insecticidal treated net	Yes	116	32.3
	No	244	67.7
Possession of insecticidal treated net	Yes	122	34.0
	No	238	66.0
Need to wash insecticidal treated net	Yes	103	28.5
	No	257	71.5

Table 3 shows responses from the participants on their levels of knowledge of malaria prevention. Majority of them 268 (74.5%) responded correctly the source of Insecticide treated net (ITN). Few of the participants responded 116 (32.3%) correctly the uses of ITN, few of the participants 122 (34.0%) responded correctly the possession of ITN, few participants 103 (28.5%) responded correctly the need to wash ITN.

Table 4 Responses from participants on their first line of action for the Treatment of uncomplicated malaria

Variable	Frequency	Percentage (%)
First Line of Action for the Treatment		
Take the child to the Hospital	35	9.7
Take the child to a pharmacy shop	50	13.9
Take the child to church or prayer house	39	10.8
Give him medicine that is in the house	102	28.4
Buy drugs from patent medicine shop	68	18.9
Give him herbs	36	10.0
Take him to health centre	30	8.3
Next line of action if symptoms persist		
Take him to the health centre/clinic	68	18.9
Take him to a traditional healer	224	62.2
Take him to the church	68	18.9

Table 4 shows that 102 (28.4%) participants responded "give him medicine that is in the house" while 30 (8.3%) participants responded that "take him to the health centre" on question on considering the first line of action for treatment. On line of action to take if symptoms persist, 224 (62.2%) participants responded "take him to traditional healer" while 68 (18.9%) participants responded that "Take him to the health centre/clinic" and "Take him to the church" respectively. Details of more information can be found on the table.

Table 5 Responses from participants on home management of febrile convulsion within 24 hours

Home Management of Febrile Convulsion	Frequency	Percentage (%)	Prevalence of hospital & home management
Hospital	243	67.6	243 (67.6%)
Warm cloths	7	1.9	117 (32.4%)
Prayer house	29	8.1	
Kernel oil	57	15.7	
Fire	2	0.5	
Herbal Medicine	22	6.2	

Table 5 shows responses from participants on home management of febrile convulsion of under-5 children: Majority 243(67.6%) of the participants responded that they would take the child to the hospital while 117 (32.4%) of the participant managed at home which ranged from warm cloths 7 (1.9%), prayer house 29 (8.1%), kernel oil 57 (15.7%), herbal medicine 22 (6.2%) and 2(0.5%) responded that they will put the child into fire.

Table 6 Knowledge level of mothers and caregivers on home management of malaria in under-fives

Variables		Frequency	Percentage (%)
Knowledge level of mothers and caregivers	Good knowledge	202	56.1
	Poor knowledge	158	43.9
Total		360	100.0

Table 6 shows the overall knowledge level of mothers and caregivers on home management of malaria in under-five children. Majority 202 (56.1%) of the participants had good knowledge of school health service while 158 (43.9%) of them had poor knowledge. Participants were assessed on a 32-points knowledge scale. Knowledge scores <16 was rated poor and scores ≥16 were considered good. Those who scored sixteen and above were regarded to have good knowledge and they were 202 (56.9%) caregivers. Those who scored less than sixteen were regarded to have poor knowledge and they were 158 (43.9%).

Table 7 Association between Socio-demographic characteristics and knowledge level of mothers and caregivers on home management of malaria in under-fives

Variables		Knowledge of mothers and caregivers on home management of malaria		Total	χ 2	P – value
		Good knowledge N (%)	Poor knowledge N (%)			
Age range	20 – 24	15	11	26	0.008	46.286a
	25 – 29	22	18	40		
	30 – 34	49	39	88		
	35 – 39	76	60	136		
	>40			70		
Total		202	158	360	a-0cells (0.0%) have expected count less than 5. The min is 19.77	
Sex	Male	11	9	20	0.183	8.318a
	Female	191	149	340		
Total		202	158	360	a-0cells (0.0%) have expected count less than 5. The min is 28.75 for 2x2 table	
Married status	Marital	174	136	310	0.021	25.645a
	Widowed	16	12	28		
	Divorced/Separated	12	10	22		
Total		202	158	360	a-0cells (0.0%) have expected count less than 5. The min is 14.38 for 2x2 table	
Educational level	No formal education	19	14	33	0.004	5.031a
	Primary	39	31	70		
	Secondary	114	90	204		
	Tertiary	30	23	53		

		202	158	360	a-0cells (0.0%) have expected count less than 5. The min is 32.34 for 2x2 table	
Total		202	158	360	a-0cells (0.0%) have expected count less than 5. The min is 32.34 for 2x2 table	
Occupation	Civil servants	36	29	65	0.212	42.144a
	Farming	85	67	152		
	Artisan	16	13	29		
	Professional	5	4	9		
	Trading/Business	53	41	94		
	Unemployed	6	5	11		
Total		202	158	360	a-0cells (0.0%) have expected count less than 5. The min is 48.52 for 2x2 table	

Table 6: shows the association of socio-demographic characteristics and knowledge level of mothers and caregivers on home management of malaria in under-fives. Association of age, marriage and level of education and knowledge level of mothers and caregivers on home management of malaria in under-fives were found to be statistically significant, p <0.05. Sex and occupation did not show statistically significant in association with level of knowledge of mothers and caregivers on home management of malaria in under-five children. Details of more information can be found on the table above.

4. Discussion

This study recorded a response rate of 360 (96.0%) mothers and caregivers, males and females with a mean value of 37.2 ± 0.8724, these findings were in contrast with the study conducted in Ibadan North Local Government Area (LGA) of Oyo State21 where 400 mothers of under-five, who were only female with mean age of 29.9 ± 0.70 participated in the study. This study was similar to another study conducted in Federal Medical Centre in Owo22 Local Government Area of Ondo State where 380 caregivers comprising of 27 (7.1%) males and 353 (92.9%) females were enrolled for the study. The age range of their participants was from 25 years to 65 years with mean age of 30.48± 6.61 and consisted of mothers 346 (91.0%) and other types of caregivers 34 (9.0%) including fathers 19 (5.0%), sisters 6 (1.5%), brothers 4 (1.1%), uncles 4 (1.1%) and grandmothers 1 (0.3%). Though this study had males and females in their study, their composition differed from this study which composed of 340 (84.4%) females and 20 (15.6%) males and ranged in age from 20 years to a little over 40 years. The differences may be from the choice of the researchers.

In this study, Majority of the caregivers 310 (86.0%) were married and 342 (95.0%) were Igbos and this in variance with a study in Oyo State21 where majority of the caregivers 364 (91%) were married and 365 (91.1%) were Yorubas. The reason for the variance may be due to the location of the studies, one was carried out in Igbo land and the other one was in Yoruba land with difference in tradition and culture even though both are in the same country Nigeria, again the study in Bende Local Government Area was a community-based while that Oyo State was hospital-based study

In this study, all the caregivers 360 (100.0%) have heard of malaria, majority of the caregivers 202 (56.1 %) had good knowledge of home management of malaria in under-five children while in a study in Owo22 276 (72.6%) of the caregivers had good knowledge of about the causes of malaria. Both levels of knowledge differ from the study in Oyo20 where 87.3% had fair knowledge, 9.8% had good knowledge and 2.9% had poor knowledge. A study done in rural areas of Northern Nigeria showed that caregivers had a good knowledge of both the cause and the measures of prevention of malaria, but the knowledge of proper administration of anti-malaria drugs was limited23 Similar findings were also reported in an urban community in South-Western Nigeria24 and a semi-urban area of Cameroon25. Probably, as Webster and Beyeler et al., stated 26,27 that the caregivers and the patent medicine sellers lacked effective knowledge about medical treatment.

Unfortunately, caregivers preferred seeking medicine vendors as the place to receive treatment, because they are easily accessible and available, despite the fact that a real knowledge of medicine called for treating the disease's causes and not symptoms. In a study carried out in Ado-Ota, Ogun State, Southwest Nigeria (2004) knowledge on the control and treatment of malaria amongst caregivers of under-five children was also inadequate, calling for urgent interventions to

improve home management of childhood fever and in consideration to the socio-economic and cultural context of anti-malaria drugs use28.

In this study caregivers' levels of knowledge of malaria prevention is high as 268 (74.5%) responded correctly the sources of Insecticide treated net (ITN) and 116 (32.3%) correctly the uses of ITN, few of the caregivers 122 (34.0%) responded correctly the possession of ITN, few participants 103 (28.5%) responded correctly the need to wash ITN and these findings differed from that of Owo study22 in which about half of the caregivers 225 (59.2%) knew about it and less than half 142 (37.3%) of the caregivers used insecticide-treated nets, however, there was a wide difference in their frequency of use by caregivers ('always' 42 18.7%; 'often' 112 (49.8%); 'sometimes' 62 (27.5%; 'rarely' 9 (4.0%)). The differences may be due to location of study, this study was community based while that of Owo was hospital based.

In this study responses from caregivers on home management of febrile convulsion [prevalence of 117 (32.4%)] ranged from use of warm cloths 7 (1.9%), prayer houses 29 (8.1%), use of kernel oil 57 (15.7%), fire 2 (0.5%) the use of herbal medicine 22 (6.2%) and majority of the caregivers 243 (67.6%) responded that hospital was where febrile convulsion was managed such that 102 (28.4%) participants responded "give him medicine that is in the house" while 30 (8.3%) participants responded that "take him to the health centre" on question on considering the first line of action for treatment. On line of action to take if symptoms persist, 224 (62.2%) participants responded "take him to traditional healer" while 68 (18.9%) participants responded that "Take him to the health centre/clinic" and "Take him to the church" respectively. Whereas in Owo study22, there was a high prevalence 370 (98.4%) of home management of fever and before presenting the hospital, paracetamol was the most used drugs 171 (45.0%), a combination of paracetamol with antimalaria drugs was given by about one third of the caregivers 126 (33.0%), and antimalarial (artemisinin-based combination therapy) was used by 93 (10.3%) caregivers. Majority of their caregivers 320 (84.2%) use antimalarial treatment at home within 24 hours. With regards to anti-fever drug's provider, majority of the caregivers 275 (77.7%) bought medications from the patent medicine stores. The differences in the approach to home management of malaria may be due to location of study, this study was carried out in Bende Local government Area which is a less developed rural setting with less enlightened population while Owo Local Government Area which is a more developed Urban settings with enlightened population.

This study's home management prevalence of 117 (32.4%) was lower than that of Owo22 with a prevalence of 370 (98.4%) and also lower than other study where it was found to be between 50.0% and 90.0% [29,30]. Probably, as past research had highlighted [31,32]. seeking hospital care was considered as a last resort by caregivers and the use of home treatment might be because most of them could not afford hospital and needed prompt treatment. In Nigeria, patent and proprietary medicine vendors (PPMVs) and their shops were usually the first point of call when people fall sick, especially in the rural settings. They are called 'doctors' by people who do not know the difference from qualified medical doctors. Indeed, it is less expensive to seek patent medicine sellers than accessing healthcare facilities. In both patent medicine shops and health care facilities payment are usually made out-of-the pocket, which had over time been shown to push household into poverty33.

In this study, association of age, marriage a nd level of education and knowledge level of mothers and caregivers on home management of malaria in under-fives was shown to be statistically significant, p>0.05. Sex and occupation did not show statistically significant in association with level of knowledge of mothers and caregivers on home management of malaria in under-five children. This finding was similar to that of the study in South West Nigeria34 where it was found out that age and educational background were associated with the use of guideline and knowledge of caregivers. This confirmed the findings in another study where use of guideline was associated with increase chloroquine use after the caregivers had been educated35.

5. Conclusion

The study revealed that mothers and caregivers may underestimate the severity of malaria and delay medical care by self-medicating, which may be detrimental to the health of the children and prevent immediate healing of the child and recovery. There were several gaps in the participants' level of knowledge relating the disease and its management of under-five children. However, majority of them had good knowledge of home management of malaria of under-fives.

Recommendation

Sustained public enlightenment interventions relating to home management of malaria targeted at mothers and caregivers of under-five are needed. These interventions should be aimed at improving their knowledge and their malaria prevention and control skills so that they will be able to distinguish between uncomplicated and complicated malaria. They should be discouraged from attempting complicated and severe cases and refer such cases to hospitals

for adequate specialist care. Artemicinin Combination Therapy (ACT) is a good strategy for managing malaria. Training is needed to improve their knowledge and skill relating to the approach. Formal health care facilities are commonly used by the residents for the management of malaria in under-five. The capacity of health workers should be enhanced to help upgrade mothers' and caregivers' knowledge and skills. Their management of the uncomplicated cases should be timed bound, once the management last beyond 24 hours without remarkable improvement, the child should be referred immediately for specialist attention.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare no conflicts of interest regarding the publication of this paper.

Statement of informed consent

Informed consent was obtained from all individual participants included in this study.

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