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KNOWLEDGE, ATTITUDE AND PRACTICE OF MALARIA PREVENTION AMONG MOTHERS OF UNDER-FIVE CHILDREN IN YAR-AKIJA COMMUNITY, SOKOTO, NIGERIA

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Abstract

Background: Malaria is an infectious disease and a serious health issue that needs urgent attention especially in children less than 5 years. It is also a public-health problem and the principal cause of childhood mortality. Despite the global efforts that have been put in place to curtail its menace, Malaria remains endemic, with about 97% of the Nigerian population being at risk.

Aim: The aim of the study was to assess the knowledge, attitude and practices of malaria prevention among mothers of under-five children in Yar'Akija area, Sokoto.

Methodology: This was a cross-sectional survey conducted among 145 mothers of under-five children in Yar'Akija area, Sokoto. Respondents were selected using a simple random sampling technique. Data were collected via a validated interviewer administered questionnaires using Open Data Kit (ODK) and analyzed using IBM SPSS version 25 software.

Results: The ages of respondents ranged between 20 and 44 years with the mean of 30.8 … years. More than half of the respondents (50.3%) were within the age range of 30-39 years. They were predominantly Hausas (93.8%). The majority of respondents 126(87%) had good knowledge of malaria prevention and good attitude 124(85.5%) towards malaria prevention. About two-third of respondents 97(66.7%) often or always clear the bushes in their surroundings. The majority 134(92.2%) used long sleeve clothing and about ninety percent (87.6%) used insecticide treated bed nets always or often as methods of preventing malaria.

Conclusion and Recommendation: The mothers of under-five children in Yar'Akija community had good knowledge, good attitude and good practice regarding malarial prevention. It is recommended that, Sokoto State Ministry of Health should continue to carry out awareness and sensitization campaigns in order to maintain the good attitude and practice of the mothers of under-five children in Yar'Akija community towards malaria prevention.

Keywords: Knowledge, attitude, practice, malaria, mothers of under- fives.

Introduction

Malaria remains a major global public health and development challenge especially in tropical Africa. Plasmodium falciparum, the deadliest form of the malaria parasite, is responsible for the vast majority of the mortality and morbidity associated with malaria infection [1].

Malaria is a life-threatening parasitic disease transmitted by female anopheles' mosquitoes. Five species of Plasmodium can infect and be transmitted by humans, however, majority of deaths from malaria are caused by *Plasmodium falciparum* while *Plasmodium vivax*, *Plasmodium ovale*, and *Plasmodium Malariae* causes a generally milder form of malaria that is rarely fatal [2]. The zoonotic species, *Plasmodium knowlesi* is prevalent in Southeast Asia; it causes malaria in macaques, but can also cause severe infections in humans [2]. The disease causes symptoms that typically begin 7-30 days following the infection, symptoms may occur later in those who have taken anti malaria medications as prevention. The classic symptom of malaria is paroxysm—cyclical occurrences of sudden coldness followed by rigor and then fever. Severe malaria has varying patterns and the relative contributions to individual symptoms to mortality differ with endemicity, geographic locations and access to health services [3].

Malaria is a highly prevalent tropical disease, with high morbidity, mortality and high economic and social impact. As of December 2019, it accounted for 229 million cases and 409,000 deaths globally with sub-Saharan Africa accounting for 95% of cases and deaths [3]. Despite reported decline in infection and mortality, malaria remains the fourth leading cause of under-five mortality in the region. Children are particularly susceptible to the disease due to their poorly developed immune system. This is further confounded by evolving resistance of the pathogen, Plasmodium falciparum, to drugs and insecticides. Current strategies for controlling malaria continually evolve through collective action. There have been advances in terms of new drugs and vaccines, eradication is still the way and many health strategies now focus on malaria prevention and control.

Special groups like under-five children and pregnant women are susceptible to malaria [4] This is because of their lower immunity against the disease. Malaria accounts for 20% of under-five mortality and 25% of childhood mortality [5]. According to WHO 2020 over 95% of malaria cases occur in Sub-Saharan Africa, with a 65% mortality in child under the age of 5 years. Sokoto state ranks third in terms of malaria prevalence (46.6%) in a zone that has the highest prevalence of malaria (37.10%) in the country [6]

Because of these problems that are associated with malaria among the children under the age of five years (i.e., high incidence and high mortality rates as shown above), this study aimed to assess the knowledge, attitude and practice of the mothers of under-five children regarding the prevention of this deadly disease. The result from the study is believed to provide the baseline information regarding malarial prevention in study area and hopefully in the state generally. This may help the policy makers in designing control programs, resource allocation and evaluation of the existing programs regarding the prevention of malaria in the state.

METHODS

This study was carried out in Yar'Akija community of Sokoto metropolis from Sokoto South local government area of Sokoto state. Sokoto state is located to the extreme North western part of Nigeria between longitudes 4^0 E and 7^0E and latitudes 120N and 140N. It shares boundaries with Niger republic to the North, Zamfara State to the East and Kebbi state to the West and South. The state has 23 Local Government Areas (LGAs) of which four are metropolitan LGAs including Sokoto South, Sokoto North, Wamakko and Dange-Shuni LGAs.

This was a cross-sectional study conducted among mothers who had at least one child that is under the age of five years in Yar'Akija area. Care givers of under-fives who were not the biological mothers of their children were excluded from the study. A sample size of 145 was calculated from the formula for cross-sectional study $n = \frac{z^2pq}{d^2}$ [9]

using a prevalence of mothers with good knowledge of malaria prevention in previous study of 90% (p = 0.90) [10] and a precision of 5% (d = 0.05). One hundred and forty-five (145) respondents were selected using simple random sampling technique.

Data were collected from 145 pretested semi structured interviewer administered questionnaires using an Open Data Kit (ODK). The questionnaire comprised of four sections: section A, Sociodemographic Characteristics; section B, Knowledge of malarial prevention among respondents; section C, Attitudes of respondents towards malarial prevention and section D, Practices of malarial prevention among respondents. It was validated by assessing the content validity index item and scale. Medical students were recruited to assist in data collection using ODK installed in their android phones. The knowledge of malarial prevention and attitudes of respondents towards malarial prevention were determined by scoring the questions that assessed knowledge and attitude respectively. For any response, a correct answer was scored 1 and a wrong or unknown answers were scored 0. The total scores for each respondent on the knowledge, and attitude were converted to proportions and graded into good (≥50%) and poor (<50%). Data from the ODK server were transferred directly into IBM SPSS version 25 software where it was analyzed. Data in the SPSS were described using descriptive statistics and presented using tables and figures. Frequencies and percentages were used to describe all categorical variables while mean and standard deviation were used to describe continuous variables.

Ethical approval was sought from ethical committee of the State Ministry of Health Sokoto. Further permission to carry-out the study was obtained from the authority of Usmanu Danfodiyo University Teaching Hospital, Sokoto. Informed consent was also obtained from the respondents before the questionnaire was administered.

The study was prone to information bias but this was reduced by counselling the respondents on that the research is entirely for academic purpose.

RESULTS

(All Tables can be found after the references section)

Sociodemographic characteristics of the respondents

The ages of respondents ranged between 20 and 44 years with the mean of 30.8 4.6 years. More than half of respondents (50.3%) were within the age range of 30-39 years followed by 20-29 years age range (45.5%) and the least were those aged 40-49 years (4.2%). They were predominantly Hausas (93.8%) and all were Muslims. Majority of the respondents (97.9%) were married. The mean number of under-five children of respondents was 1.5 0.6 children with the majority (90.3%) having 1 or 2 children. The mean monthly income of the respondents was 48,300 12,600 Naira and the majority (72.4%) were on the monthly income of 50,000 or more. (Table 1).

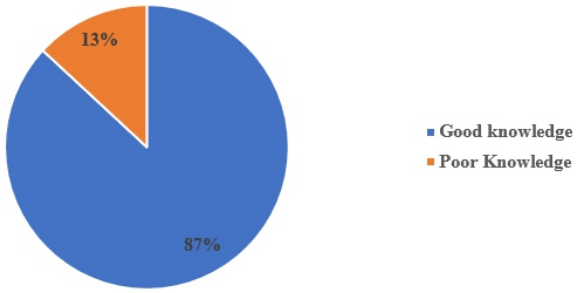

Figure 1. Overall knowledge of respondents regarding malaria prevention

Table 1. Socio-demographic Characteristics of Respondents

Variable	Frequency (n=145)	Percentage (%)
Age Group (years)		
20-29	66	45.5
30-39	73	50.3
40-49	6	4.2
Tribe		
Hausa	136	93.8
Fulani	6	4.1
Others	3	2.1
Marital Status		
Single	0	0
Married	142	97.9
Widowed	3	2.1
Number of Children		
1-4	84	57.9
≥5	61	42.1
Number of under-five Children		
1-2	131	90.3
3-5	14	9.7
Monthly Income		
<50,000	40	27.6
≥50,000	105	72.4
Mean age +/- SD	30.8 +/- 4.6 years	
Mean number of children +/- SD	3.7 +/- 2.1 children	
Mean number of under-five children	1.5 +/- 0.6 children	
Mean monthly income +/- SD	48,300 +/- 12,600 naira	

Other tribes: Igbo, Yoruba; SD = standard deviation

The respondents varied greatly in their levels of education; about one-third (31%) had only primary education, 10.3% had university degree, 29.7% had Diploma, NCE or OND, 14.5% had secondary school certificates and 11% had only Qur'anic education. About forty percent of respondents (38.6%) were full-time housewives, 20.7% were traders and 19.3% were civil servants. The majority of respondents' husbands (77.2%) were civil servants and 18.6% were business men. (Table 2).

Table 2. Educational Level and Occupation of the Respondents

Variable	Frequency (n=145)	Percentage (%)
Level of Education		
University degree or equivalent	15	10.3
Diploma/NCE/OND	43	29.7
Secondary school certificate	21	14.5
Completed primary six/JSS	45	31.0
Primary school not completed/ Quranic school	16	11.0
None	5	3.5
Occupation		
Full-time house wife	56	38.6
Petty trader	30	20.7
Farmer	1	0.7
Business woman	30	20.7
Civil servant	28	19.3
Husband's level of education		
University degree or equivalent	94	64.8
Diploma/NCE/OND	38	26.2
Secondary school certificate	3	2.1
Completed primary six/JSS	1	0.7
Primary school not completed/ Quranic school	30	20.7
None	28	19.3
Husband's Occupation		
Not gainfully employed	0	0.0
Farmer	3	2.1
Petty trader	3	2.1
Businessman	27	18.6
Civil servant	112	77.2

NCE = Nigeria Certificate in Education, **OND** = Ordinary National Diploma, **JSS** = Junior Secondary School

Knowledge of cause, transmission, symptoms and methods of prevention of malaria among respondents

Majority of the respondents (95.2%) knew that malaria is transmitted by mosquitoes and 4.1% believed it is transmitted by dirty environment. Most of them knew that fever (95.2%), headache (81.4%), vomiting (99.3%) and loss of appetite (96.6%) are among the symptoms of malaria but more than two-third (73.1%) do not know that cough is not a feature of malaria. (Table 3).

Table 3. Knowledge of cause, transmission and symptoms of malaria among respondents

Variable	Frequency (n=145)	Percentage (%)
Malaria is caused by		
Microoganisms	51	10.3
Dirty environment	13	29.7
Mosquitoes	76	14.5
I do not know	5	31.0
Malaria is transmitted through		
Mosquiti bites	138	95.1
Dirty environment	6	4.1
Cold weather	0	0.0
I do not know	1	0.8
Symptoms of malaria (multiple responses allowed		
Fever	138	95.2
Headache	118	81.4
Vomiting	144	99.3
Jaundice	108	74.5
Cough	106	73.1
Loss of appetite	140	96.6
Convulsion	136	93.8
Diarrhea	42	29.0

The majority of respondents knew that bush clearing 127(87.6%), draining of gutters 98(67.6%), use of windows and door nets 118(81.4%), insecticide sprays 129(89%) and insecticide treated bed nets 117(80.7%) are methods of preventing malaria. About one-third of respondents (33.1%) erroneously believed that good food is preventive against malaria infection, and 15.9% said exercise prevents malaria. (Table 4) The majority of respondents (87%) had good overall knowledge and only 13% had poor knowledge regarding malaria prevention (Figure 1).

Attitudes of respondents towards malaria prevention

Most of the respondents (93.8%) believed that prevention is the best approach towards malaria control, and 96.6% believed that it is easier to prevent malaria than to cure it. However, 30.3% believed that malaria prevention is not effective and that the results are the same whether preventive measures are instituted or not while 26.2% hold the belief that malaria is easily curable and hence there is no need to prevent it. Overall, the majority of respondents (85.5%) had good attitude and 14.5% had poor attitude towards malaria prevention (Table 5).

Practice of methods of malaria prevention among respondents

Majority of the respondents 97(66.7%) often or always clear the bushes in their surroundings, 102(70.3%) drain their gutters, 59(40.7%) used nets in their windows or doors, 134(92.2%)

wear long-sleeve clothing for their children, 127(87.6%) used insecticide sprays, 132(91%) used mosquito coils, and 119(82.1%) used insecticide treated bed nets (ITNs) as methods of malaria prevention (Table 6).

Table 4. Knowledge of malarial prevention among respondents

Methods of malaria prevention (multiple responses allowed)	Frequency (n=145)	Percentage (%)
Bush clearing		
Correct responses	127	87.6
Draining of gutters		
Correct responses	98	67.6
Waste management		
Correct responses	102	70.3
Use of nets on windows and doors		
Correct responses	118	81.4
Use of long sleeve clothing		
Correct responses	142	97.9
Use of repellants		
Correct responses	107	73.8
Spraying insecticides		
Correct responses	129	89.0
Use of mosquito coils		
Correct responses	138	95.2
Use of insecticide treated nets		
Correct responses	117	80.7
Intake of Fancider tablets		
Correct responses	73	50.3
Consumption of good food		
Correct responses	97	66.9
Exercise		
Correct responses	122	84.1
Use of ceiling fans		
Correct responses	93	64.1

Health seeking behavior of the respondents

The majority of respondents (88.3%) said they would take their children to see doctor when he/she has malaria symptoms, 10.3% would patronize over the counter medications, and 1.4% would patronize traditional herbal medicines if their children develop malaria. (Table 7).

Table 5. Attitudes of respondents towards malarial prevention

Variable	Frequency (n=145)	Percentage (%)
Believed malaria prevention is the best option for children		
Yes	136	93.8
No	9	6.2
Believed malaria prevention is cheaper than its treatment		
Yes	140	96.6
No	5	3.4
Believed malaria prevention is not effective		
Yes	44	30.3
No	101	69.7
Believed malaria is easily treated		
Yes	38	26.2
No	107	73.8
Advocates for malaria prevention		
Yes	132	91.0
No	13	9.0
Believed children with malaria need hospital care		
Yes	140	96.6
No	5	3.4
Overall attitude		
Good	126	86.9
Poor	19	13.1

Discussion

This current study revealed that majority of the respondents were within the ages 30 and 39 (50.3%) while the 20-29 years range came in a close second (45.5%), and with the mean age of 30.48. This is not far off from studies in other parts of Nigeria with the mean age of 28.1 years (13), and 29 years (14). Majority of the respondents were Hausa, and a few others Fulani and Igbo, which is consistent with the socio-demographic data of the community. Most of them were also married, and only a few of them widowed. All of the respondents turned out to be Muslims; a similar study in Aliero, Northern Nigeria (15), where 99% were Muslims, and another study in Ibadan South-Western Nigeria, had 58.6% Muslims and 41.3% Christians (16). In contrast, a study in Ogun had 78.1% Christian respondents and the other 21.9% were Muslims (16).

Table 6. Practice of malarial prevention among respondents

Methods of malaria prevention (multiple responses allowed)	Frequency (n=145)	Percentage (%)
Bush clearing		
Always/often	97	66.7
Sometimes/never	48	33.3
Draining of gutters		
Always/often	102	70.3
Sometimes/never	43	29.7
Waste management		
Always/often	89	61.4
Sometimes/never	56	38.6
Use of nets on windows and doors		
Always/often	59	40.7
Sometimes/never	86	59.3
Use of long sleeve clothing		
Always/often	134	92.2
Sometimes/never	21	7.8
Use of repellants		
Always/often	106	73.1
Sometimes/never	39	26.9
Spraying insecticides		
Always/often	127	87.6
Sometimes/never	18	12.4
Use of mosquito coils		
Always/often	132	91.0
Sometimes/never	13	9.0
Use of insecticide treated nets		
Always/often	119	82.1
Sometimes/never	26	17.9
Intake of Fancider tablets		
Always/often	47	32.4
Sometimes/never	98	67.6

Only about one-third of the respondents (31%) completed their primary education, as compared to studies in Aliero, Northern Nigeria (15) a, Ogun State (16), Ibadan South Western Nigeria (17), and Kuje area council (18) where most of the respondents had secondary education. The result was however different for their husbands as 64.8% of them had secondary education.

Slightly more than one-third (38.6%) of the participants were full-time housewives, and 20.7% for petty trading and other more elaborate forms of business. A similar study in Kuje area council revealed trading as the number one (18), and in Aliero (15). Their husbands were however mostly civil servants (77.6%). The average number of children per woman in the study was 4.3, with 57.9% having less than five children. The

number of children ranged from 1 to 10. Among these, the average number of children under the age of five was 1.9. 72.4% of the respondents had a household income of above #50,000.

All the participants in this study were aware of malaria, this is similar to studies conducted in Ogun state (16). Studies carried out in Kuje (18), Aliero (15) and Sudan (20) showed awareness rates of 97.1%, 93.5%, and 92.4% respectively. The knowledge of mosquitoes being the cause of malaria was 95.1%, which was very close to the value obtained in Ogun state (95.6%). This is higher than the findings reported in Ibadan (85.2%) (17), 74.3% in Aliero (15) 55% in Okemesi-Ekiti, Ekiti-State (19) 87.6% in Sudan (20).

Overall, 99.3% of the respondents have a good knowledge score of malaria which was quite remarkable. The study carried out in Ogun showed a mean score of 68.9% for malaria transmission and 60.5% for malaria symptoms. The knowledge of malaria prevention was good in 99.3% of the respondents. A similar score of 92% was obtained from Okemesi-Ekiti (19), and 75.5% in Osogbo [9]. The is way different from Ibadan where a score of 54.2% was obtained (17), and in Ogun state where 34.4% was obtained (16).

The attitude score for malaria prevention among mothers of under-five children was not as high as the knowledge. However, majority (86.9%) of the respondents have good attitude. In a similar study in Ogun state (16) 77.7% of the respondents had positive attitude towards malaria prevention. A particular question assessed the respondents on what they would do if their children developed malaria symptoms and 88.3% agreed to taking the child to the hospital. A similar variable was assessed in the study in Aliero (15), and only 68.5% gave a positive response.

Table 7. Health seeking behavior of respondents

Health seeking behavior	Frequency (n=145)	Percentage (%)
Take him or her to see doctor	128	88.3
Give him or her over the counter medications	15	10.3
Make use of traditional herbal medications	2	1.4
Wait for nature to take its course	0	0.0

The practices of malaria prevention among the mothers however differed in pattern when compared with their knowledge and attitude. This was still however better than was obtained in many other studies conducted in other places. About 78.0% of the respondents had good bush clearing practice, and 45.5% for drainage of gutters; compared to 8.5% and 17.5% respectively as obtained from Aliero in Nothern Nigeria (15) and 12.8% and 15.5% in Osogbo (21). On the average, 64.8% of the respondents had good environmental sanitation practices, although that was less than the 86.8% as obtained from the study in Ogun state (16). The use of windows and door net was well practiced in only about 64.8% of the respondents, which was much higher than what was obtainable in Okemesi-Ekiti, 21% (19), and Aliero, 3.5% (15). The use of long-sleeved clothing was also well practices, in 68.3% of the respondents, as against 29% in Okemesi-Ekiti (19).

The use of mosquito repellants was also fair among the respondents, with 56.9% having good practices. A higher score of 75% was obtained in Ogun state (16), but in Okemesi-Ekiti, (19) only 3% practiced the method. Insecticide sprays were used by 62.1% of the participants, as against 29% in Okemesi-Ekiti (19), and 11.5% in Aliero (15). Mosquito coil was used by 53.1% of the respondents in this study lower rates of 21.5% Okemesi-Ekiti (19) and 17.5% in Aliero (15) have also been reported. Most of the respondents (82.1%) of the respondents maintained proper use of insecticide treated nets. This is much higher than figures reported from studies in Ogun state, Aliero (15), Osogbo (21) and Okemesi-Ekiti (19). The use of intermittent prophylactic therapy of Sulfadoxine-Pyrimethamine (Fansidar) during pregnancy was popular among 71.0% of the participants. A much lower result of 21.4% was recorded in the study carried in Osogbo (21).

Conclusion

This study revealed that, mothers of under-five children in Yar'Akija community had good knowledge and good attitude regarding malaria prevention. Most of the mothers of children under the age of five years in Yar'Akija used insecticide-treated nets, long sleeve clothing, insecticide spraying and window nets for malaria prevention.

Recommendations

1. The Sokoto State Ministry of Health should continue to carry out awareness and sensitization campaigns in order to maintain the good attitude and practice of the mothers of under-five children in Yar Akija towards malaria prevention.
2. The Sokoto State Ministry of Health should endeavor to improve efforts in creating health education talks in Rural areas.
3. The Sokoto State Primary Health Care development Agency should endeavor to improve the enlightenment on other communicable diseases in Yar Akija and other areas in Sokoto State.
4. Researchers should carry out further studies especially exploratory studies in order to find out factors that have led to the good knowledge, attitude and practices of malaria prevention among mothers of under-five children in Yar Akija, Sokoto.

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