Knowledge And Treatment Of Malaria And Typhoid Among Rural Dwellers In Ekiti State, Nigeria

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Abstract
Malaria and typhoid are acute illnesses that affect millions of people in less developed nations of the world. It is believed that early treatment of the diseases depends on people's knowledge of the causes and symptoms of the diseases. This study investigated the knowledge and treatment of malaria and typhoid among rural dwellers in Ekiti State, Nigeria. The study was a cross-sectional study conducted using questionnaire, in-depth interview (IDI) and key informant interview (KII). 400 respondents were selected through multistage sampling method for the quantitative component while 12 and 6 were selected for IDI and KII respectively. 383 out of 400 questionnaire distributed were completed and analysed, representing 95.7%. The data was analysed using statistical package for social sciences (SPSS) version 25.0. The findings showed that 69.5% respondents have knowledge about the diseases through electronic and social media while (30.5%) were knowledgeable through personal experience. This indicated that despite majority having the knowledge formally, a tangible proportion also have informal knowledge about the diseases. Mosquito bites, parasites, dirty environment, among others were identified by majority (87.2%) as the causes of malaria while similar proportion (86.9%) identified bacteria, consumption of contaminated water, among others as the causes of typhoid. Furthermore, high fever, headache, among others were identified by 77.3% respondents as the symptoms of malaria while (61.9%) of them identified fever, shaking chills, headache, etc as the symptoms of typhoid. This indicated that more respondents have knowledge about the causes and symptoms of malaria than typhoid, which is associated with their knowledge of the diseases. More so, significant proportion (44.6%) of the respondents identified clinic/hospital as against (36.5%) that identified traditional healers/herbalists as the place for the treatment of malaria and typhoid. Also, more than half (55.1%) of the respondents identified the use of drugs and injection as against (24.5%) that identified the use of herbs and concoction as the methods of treatment of malaria and typhoid diseases. The findings implies that as majority trust modern method of treatment of diseases, some people still believe in the efficacy of traditional method of treatment. The study concluded that most of the rural dwellers have adequate knowledge about the treatment of malaria and typhoid and it recommended the admixture of both synthetic and herbal drugs simultaneously in the treatment of malaria and typhoid diseases in Nigeria.
Keywords: *Acute Illnesses, primary health care, health facilities, health services providers, drug.*

I.   Introduction

Malaria is the most common disease in Africa, which is often attributed to parasites that reshape the cells in order to ensure that their wants are optimally provided (Simon-Oke & Akinbote, 2020). In Nigeria, research had shown that malaria and typhoid are common diseases are prevalent but common in the rural areas due to poor drainage system, poor access and distance to healthcare facilities, etc. Malaria contributes to the number of diseases-related deaths in the world. World Health Organization (2015) estimated that about 395,000 malaria-related deaths worldwide occur in Africa out of which children (0-5years) constitute about 74 percent of all malaria deaths. Relevant researches further reported that malaria contributed to about half a million infections and far more than a million deaths every year (Iwuafor, *et. al.*, 2016). Additionally, WHO (2017) revealed that sub-Saharan Africa accounted for about 9 out of 10 of all malaria deaths worldwide, which was attributed to parasites called '*Plasmodium falciparum'* that is the most deadly of the four human malaria parasites that accounts for the deaths of millions of people yearly.

Typhoid on the other hand is a disease that can be transmitted from one person to another, particularly, through poor toilet facilities, poor disposal of human excreta, poor sanitation and hygiene, poor waste disposal systems and poor/untreated water usage (Kasuku, *et. al.*, 2017). The clinical manifestations or symptoms of typhoid fever include headache, prolonged fever, malaise, constipation, among others (WHO, 2020). In some cases (rare or severe) the disease presents itself with intestinal puncture, abdominal pains and neurological

complications (WHO, 2020; Ozakpo & Olugasa, 2021). Typhoid disease was estimated to produce more than seventeen million cases each year worldwide, particularly, among the poor countries (Antillon, et. al., 2017; Adesegun, et. al., 2020). In 2017, however, more than fourteen million cases were recorded from which the sub-Saharan Africa recorded 1.73 million cases (GBDS, 2019). Between 2018 and 2020, the cases and incidences of typhoid disease in Nigeria range from 3.9% to 18.6% (Adesegun, *et. al*., 2020).

Globally, malaria and typhoid diseases remain the public health challenges. As the diseases continue to cause morbidity and mortality globally, there is urgent need to prevent the occurrences of the diseases. Although, there have been increasing efforts in tackling contagious diseases but the burden of malaria and typhoid diseases have been increasing, particularly, in poorer countries in Africa, including Nigeria. It is believed that early treatment of the diseases depends on people's knowledge of the symptoms of the diseases (Akpenpuun & Mpem, 2015). Also, early treatment goes with the appropriate health services and medications that are available and accessible for use. The strategy succeeds based on caretaker's behaviours and it has been revealed that cultural beliefs about illnesses affect the treatment seeking behaviour. In some cases, people adopt the modern method of treatment even though majority considers the traditional methods as more effective for the treatment of certain illnesses (Akpenpuun & Mpem, 2015).

It has been noted, however, that the health condition of the rural dwellers cannot be compared with those in the cities where there are varieties of treatment options such as chemist shops, pharmaceutical stores, clinic and hospitals (both public and private). The rural communities are characterized by lower wages, higher poverty, social stratification, rigid social mobility, farming, and ranch land, an ageing population and smaller choice when it comes to medical services and other social amenities. Based on this, therefore, the people in the rural areas often adopt home-based treatment as solution to any health challenges such as malaria and typhoid illnesses (Uzochukwu, et. al., 2018). The use of traditional medicine such as medicinal plants is mostly common among the people in rural communities in Nigeria and it has been used to prevent or cure diseases, including malaria and typhoid fever (Uzochukwu, *et. al.*, 2018). From the foregoing, it can be posited that the health behavior and treatment option of a people can hardly be divorced from their cultural values.

People across culture have tried several means towards treating malaria and typhoid diseases. Individual's treatment behaviour is concerned with the willingness to seek help when a person falls sick. However, poor treatment behaviour has been shown to be responsible for inadequate prevention and control of death associated with health conditions (Nas, *et. al*., 2017). Though, the first line of management of many illnesses in Africa is self-treatment due to people's knowledge about traditional remedies and the availability of chemist shops (Akpenpuun & Mpem, 2015). Studies across different parts of the world (such as Yadav, 2010; Yadav, et. al., 2010; Omotosho, 2010) have revealed that knowledge of the treatment of malaria and typhoid in the rural areas is very poor. Information from the World Bank data bank (2022) showed that the mortality rate associated with the poor health condition of the rural dwellers across African countries (including Nigeria) is between 7.8% and 10.4% in 2020. More so, Lawal, Balogun and Bada (2014) lamented that the poor behaviour of rural dwellers in Nigeria towards the treatment of diseases has become an issue of debate among the practitioners. This is due to the fact that many rural dwellers have poor knowledge about the transmission, prevention and treatment of malaria and typhoid diseases (Lawal, *et. al.*, 2014). Therefore, this study investigated the knowledge and treatment of malaria and typhoid among rural dwellers in Ekiti State.

Theoretical Framework: Health Belief Model (HBM)

The Health Belief Model (HBM), developed by Hochbaum Rosenstock and Kogels in the 1950s is one of the most well-known health behaviour theories in public health that explained the prevention, control, and treatment of diseases. This theory was based on the individual's perception of health beliefs and their decisions regarding health-seeking behaviour.

The HBM consists of four (4) variables that interrelate (Rosenstock, 1966). This include: (i) *Perceived Susceptibility,* the *belief* that one is at risk of an illness is subjective. To one extreme is an individual who is in full denial of any risk while to the other is an individual who feels danger is certain. The area between contains those who admit the statistical possibility of contracting an illness, but do not fully believe they will; (ii) *Perceived Seriousness,* the perception of the consequences of a negative health condition is also subjective. *Beliefs* of an illness causing pain, debilitation, social stigma or death are examples of seriousness perceived; (iii) *Perceived Benefits of Taking Action,* deciding on a course of action is shaped by the options accessible to the individual and the *belief* in their effectiveness. Action is thus dependent on having at least one course of action to prevent an illness from occurring while believing it will produce acceptable results; and (iv) *Perceived Barriers of Taking Action,* which indicated that despite a *belief* being established that a particular course of action may reduce a health threat, indecision may still take place. If readiness is low and negative aspects of the course of action are viewed as high, barriers are constructed preventing action.

In summary, the HBM posits that people will take the action to undergo a health prevention behaviour when they are ready; they see it as beneficial; and the difficulty is not greater than what is to be gained. Does

the end justify the means? Readiness is determined by the degree to which one believes an illness is likely. Perceived susceptibility may be influenced by proximity to an illness. For instance, someone with a family history of diabetes will more likely seek a blood test than someone who has no family history of the disease. Readiness is also determined by the consequences a health risk may impose. When perceived susceptibility is seen as likely and perceived severity of an illness is high, motivation increases. Conversely, motivation decreases as susceptibility seems unlikely and severity is viewed as inconsequential (Rosenstock, 1966).

II. Methodology

The research was a cross-sectional study. Mixed methods (quantitative and qualitative) were adopted. Questionnaire, in-depth interview (IDI) and key informant interview (KII) were used to conduct the research across selected rural areas in Ekiti State. Questionnaire was designed to collect quantitative data from the respondents. The questionnaire was designed in sections based on the socio-economic and demographic background of the respondents and the objective of the study. The in-depth interview (IDI) and key-informant interview (KII) was conducted using interview guide and analysed using content analysis.

For the quantitative component of the study, 400 respondents were selected using Taro Yamane's (1967) sample size calculation model. Multi-stage sampling method was employed in the study. Since Ekiti State Nigeria is politically divided into strata: 3 Senatorial Districts and 16 LGAs, simple random sampling method was applied in the first stage to select a local government area from each of the senatorial districts; making a total of three (3) local government areas: Irepodun-Ifelodun LGA (Ekiti Central Senatorial District), Ido-Osi LGA (Ekiti North Senatorial District) and Gbonyin LGA (Ekiti South Senatorial District). Additionally, purposive sampling method was adopted to select one rural community from each of the identified local government areas for the study, making a total of three (3) rural communities, which are: Igbimo Ekiti (Ekiti Central/Irepodun-Ifelodun LGA), Esure-Ekiti (Ekiti North/Ido-Osi LGA) and Agbado-Ekiti (Ekiti South/Gbonyin LGA). Furthermore, proportional sampling method was used to select the respondents based on their population. In addition, convenience/availability sampling method was employed to select people that are available and ready to respond to the questionnaire as at the time of the research. 158 people were selected from Igbimo Ekiti while 104 people were selected from Esure Ekiti and 138 people were selected from Agbado-Ekiti, making a total of four hundred (400) respondents.

For the qualitative component of the research, four (4) rural dwellers (2 men and 2 women) were purposively selected from other rural communities selected across the Senatorial Districts in Ekiti State (apart from the communities selected for the quantitative research). That is, 4 people (that have treated malaria/typhoid in the last 6 months) were purposively selected from each of the selected communities, making a total of twelve (12) rural dwellers comprising of 6 men and 6 women altogether. Additionally, two (2) health workers (Matrons or senior nurse in the hospitals/clinics) were purposively selected from health care facilities across each of the three (3) Senatorial Districts in Ekiti State, Nigeria, making a total of six (6) health workers altogether. The reason for this choice was because they were able to give accurate and detailed explanations on the issues concerning malaria and typhoid treatments in their respective local government areas.

III. Findings

This section presents the result of the data collected for the study. Out of 400 copies of questionnaire distributed to the respondents, 383 were completed and returned for analysis while the non-response rate was put at 4.25%.

Socio-economic and Demographic Characteristics of Respondents

The section of the analysis presents the socio-demographic characteristics of respondents, which include the gender, age, religion, ethnic group, level of education, marital status and occupation (see Table 1).

Table 1: Distribution of Respondents by Socio- Demographic Characteristics (N=383)

Socio-Demographic Characteristics	Frequency (N= 383)	Percentage (%)

Gender		
Male	196	51.2
Female	187	48.8
Age (in years)		
18 – 20	16	4.2
21 – 30	119	31.0
31 – 40	132	34.5
41 – 50	65	17.0
51 – 60	12	3.1
61 years and above	39	10.2
Mean age: 31years		
Religion		
Christianity	192	50.1
Islam	153	40.0
Traditional	33	8.6
Others	5	1.3
Ethnic group		
Yoruba	255	66.6
Igbo	69	18.0
Hausa	16	4.2
Others (like Ebira, Idoma, etc)	43	11.2
Level of Educational		
No formal education	8	2.1
Primary	46	12.0
Secondary	135	35.2
Post secondary	194	50.7
Marital status		
Single	110	28.7
Married	207	54.1
Separated	23	6.0
Divorced	20	5.2
Widowed	23	6.0
Occupation		
Public workers	51	13.3
Private workers	43	11.2
Farmers	240	62.7
Unemployed	49	12.8

Field Survey, 2023

From Table 1, slightly more than half (51.2%) of the respondents were male while a significant majority (82.5%) of the respondents were between 21 and 50 years of age and majority (90.1%) of the respondents were practicing modern religion; Christianity (50%) and Islamic religion (40%). Considering the ethnicity of the respondents, about two-thirds (66.6%) of them were Yoruba, indicating that most of the rural dwellers in Ekiti State were Yoruba which also shows the true picture of the study area, one of the Yoruba speaking states. On educational level, a large proportion (85.9%) of the respondents had secondary and post-secondary education while 12% of them had elementary education and the remaining 2.1% had no formal education. The finding implies that most rural dwellers in Ekiti State, Nigeria were literates with at least a secondary education.

On the marital status, Table 1 showed that more than half (54.1%) of the respondents were married while 28.7% of them were single and the remaining 17.2% of them claimed others (such as separated, widowed and divorced). The data implies that more than half of the rural dwellers were married. On the occupational status of the respondents, significant proportions (62.7%) of them were farmers, 13.3% were civil servants while 11.2% were private workers and 12.8% of them were unemployed. The data implies that most of the rural dwellers were working either in the formal or informal setting (see Table 1).

Knowledge of the Causes, Symptoms and Method of Treatment of Malaria and Typhoid among Rural Dwellers in Ekiti State

Table 2, 3, 4 and 5 presents data relating to the knowledge of the causes, symptoms and treatment of malaria and typhoid among rural dwellers in Ekiti State, Nigeria.

Table 2: Distribution of Respondents by Knowledge of Malaria and Typhoid among Rural Dwellers in Ekiti State (N=383)

Knowledge of Rural Dwellers on Malaria and Typhoid	f	%
Have you heard about malaria and typhoid fever before:		
Yes	383	100.0
No	-	-
If yes, how do you know about the diseases:		
Radio	184	48.0
Television	45	11.8
Social media platforms	37	9.7
Through experience	102	26.6
Through my job	15	3.9

Field Survey, 2023

From the data in Table 2, it can be observed that all the respondents have heard about malaria and typhoid fever, particularly through radio (48%); experience (26.6%); televisions (11.8%); social media platforms (9.7%); and through their job (3.9%). The research finding was supported by the submissions of some of the participants of the in-depth interview (IDI) conducted.

Table 3: Distribution of Respondents by the Causes of Malaria and Typhoid among Rural Dwellers in Ekiti State, Nigeria (N=383)

Causes of Malaria and Typhoid Diseases	f	%
What are the causes of malaria disease:		
Parasites	39	10.2
Mosquitoes bites	168	43.8
Dirty environment	49	12.8
Use of shared needles or syringes	8	2.1
Through transplant	31	8.1
Through transfusion	39	10.2
All of the above	49	12.8
What are the causes of typhoid disease:		
Bacteria	186	48.6
Consumption of contaminated water	66	17.2
Using toilet contaminated with bacteria	53	13.8
Consumption of food washed in contaminated water	28	7.3
All of the above	50	13.1

Field Survey, 2023

Table 3 presents the causes of malaria and typhoid diseases. On the causes of malaria disease, the respondents identified mosquito bites (43.8%); dirty environment (12.8%); parasites (10.2%); transfusion (10.2%) and transplant (8.1%). Similarly on the causes of typhoid, the respondents identified bacteria (48.6%); consumption of contaminated water (17.2%); using toilet contaminated with bacteria (13.8%); and consumption of food washed in contaminated water (7.3%). However, some of the interviewees corroborate the findings by identifying some common causes of malaria and typhoid fever among the people in the rural communities. Additionally, the finding of the study was corroborated by some of the submissions of the health workers across the three (3) Senatorial Districts in Ekiti State, Nigeria.

Table 4: Distribution of Respondents by the Symptoms of Malaria and Typhoid among Rural Dwellers in Ekiti State, Nigeria (N=383)

Symptoms of Malaria and Typhoid Diseases	f	%
What are the symptoms of malaria:		
High fever	133	34.7
Sweating	23	6.0
Headache/muscle ache	68	17.8
Diarrhea/ Nausea/Vomiting	45	11.7
Cough	8	2.1
Tiredness	50	13.1
Coma	4	1.0
All of the above	38	9.9
Others (e.g. dizziness, etc)	14	3.7
What are the symptoms of typhoid:		
Fever	98	25.6
Loss of appetite	12	3.1

	f	%
Headache	31	8.1
Shaking chills	57	14.9
Cough	15	3.9
Vomiting	7	1.8
Stomach/abdominal pain	14	3.7
Muscle aches	24	6.3
All of the above	117	30.5
Others (e.g. dizziness, hot stomach, etc)	8	2.1

Field Survey, 2023

Table 4 presents the symptoms of malaria and typhoid diseases. From the Table, the respondents identified high fever (34.7%); headache/muscle ache (17.8%); tiredness (13.1%); and diarrhea/nausea/vomiting (11.7%) as major symptoms of malaria. Likewise on the symptoms of typhoid fever, the respondents identified fever (25.6%); shaking chills (14.9%); headache (8.1%); muscles ache (6.3%); cough (3.9%); and stomach/abdominal pain (3.7%) as major symptoms of typhoid. The research findings are in agreement with some of the participants of the interviews. Most of the interviewees identified fever, headache, cold and tiredness as some of the symptoms of malaria while the most favoured symptoms of typhoid by most of the interviewees were fever, cold, shaking chills and cough.

Table 5: Distribution of Respondents by Methods of treatment of Malaria and Typhoid in Ekiti State, Nigeria (N=383)

Methods of Treatment of Malaria and Typhoid Diseases	f	%
How can the malaria/typhoid diseases be treated:		
Clinic/Hospital	171	44.6
Traditional medicine	128	33.4
Spiritualist	42	11.1
Traditional healer/herbalist	12	3.1
All of the above	30	7.8
What are the various methods of treatment of malaria/typhoid:		
Use of drugs	114	29.8
Injection	97	25.3
Herbs	71	18.5
Use of concoction	23	6.0
Prayers	35	9.2
All of the above	43	11.2

Field Survey, 2023

Table 5 presents the methods of treatment of malaria/typhoid diseases. From the Table, the respondents identified clinic/hospital (44.6%); traditional medicine (33.4%); spiritualist (11.1%); traditional healer/herbalist (3.1%); and all the above-mentioned methods (7.8%). For the methods of treatment of malaria/typhoid diseases, the respondents identified use of drugs (29.8%); injection (25.3%); herbs (18.5%); prayers (9.2%); use of concoction (6%); and all the above-mentioned methods (11.2%). The findings on the methods of treatment of malaria and typhoid diseases correspond with the submission of some of the interviewees who claimed to use modern medicine and traditional herbs (*Agbo*) for treating malaria and typhoid.

In summary of the knowledge of rural dwellers on the treatment of malaria and typhoid in Ekiti State, the finding shows that all the rural dwellers have knowledge about the causes, symptoms and treatment of malaria and typhoid fever because a significant majority (81.1%) of the rural dwellers have knowledge on the methods of treatment which include modern medicine (use of such as drugs and injection), traditional medicine (use of herbs, concoction and traditional healer/herbalist). Following their responses, it shows that the knowledge of the rural dwellers on malaria and typhoid is based on their belief about the illnesses. In conclusion, therefore, the level of knowledge of the rural dwellers may be associated with their level of education (see Table 1).

Hypothesis:

Knowledge of rural dwellers is not significantly related to malaria and typhoid treatment among rural dwellers in Ekiti State, Nigeria.

Table 6: Pearson's Correlation showing the relationship between Knowledge of Rural Dwellers and Malaria and Typhoid Treatment		Knowledge of rural dwellers	Malaria/typhoid treatment
Knowledge of rural dwellers	Pearson Correlation	1	.477**
	Sig. (2-tailed)		.000
	N	383	383
Malaria/typhoid treatment	Pearson Correlation	.477**	1

	Sig. (2-tailed)	.000	
	N	383	383
**. Correlation is significant at the 0.05 level (2-tailed).			

Descriptive Statistics

	Mean	Standard Deviation	N
Knowledge of rural dwellers	17.4778	2.58244	383
Malaria/typhoid treatment	13.7258	5.54142	383

Data from Table 6 reveals that knowledge of rural dwellers is significantly related to malaria and typhoid treatment. The result of the hypothesis shows that the p.value is 0.477, which is strong at 0.05 significant level. Thus, the knowledge of the rural people significantly determines malaria and typhoid treatment in Ekiti State, Nigeria.

IV.   Conclusion And Recommendation

Following the study, it was found that the respondents have some level of knowledge about treatment of malaria and typhoid fever, including the causes, symptoms and the methods of treatment. Therefore, the study concluded that most of the rural dwellers in Ekiti State, Nigeria have adequate knowledge about the treatment of malaria and typhoid and it recommended the admixture of both synthetic and herbal drugs simultaneously in the treatment of malaria and typhoid diseases in Nigeria.

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