International Journal of Public Health, Pharmacy and Pharmacology
Vol. 5, No.1, pp.11-26, April 2019
Published by ECRTD-UK
Print ISSN: (Print) ISSN 2516-0400
Online ISSN: (Online) ISSN 2516-0419

PERCEPTION AND UPTAKE OF MALARIA RAPID DIAGNOSTIC TEST AMONG CAREGIVERS OF UNDER-FIVE IN OWERRI WEST LOCAL GOVERNMENT AREA OF IMO STATE, NIGERIA

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ABSTRACT*: The launch of RDT is hoped to enable in reducing the rate of presumptive treatment of malaria. However, simply making RDTs available has not led to high uptake of the test, in light of this, it is crucial to understand the perception of RDT and its uptake among caregivers concerning the treatment of malaria in under five children, therefore the aim of the study was to determine the perception and uptake of rapid diagnostic test in the treatment of malaria among care givers of under five children in Owerri West Local Government. Descriptive study was employed and a multi stage cluster and systematic sampling techniques was used to select 420 respondents in the LGA. The Instrument for data collection was structured pre- tested questionnaire which was administered by trained researcher after gaining informed consent from the respondents. Results of the study showed that more respondents were aged 30 -49 years 161 (38.3%), females 268 (63.8%), Married 216 (51.4%), Primary education 126 (63.8%) and civil servant was 196 (46%) respectively. Perception of malaria RDT showed that 175 (41.7%) respondents were of the opinion that mRDT was useful, 102 (24.3%) not useful, 101 (24%) dangerous while 16 (2.8%) felt it was not good. Malaria RDT uptake indicated that majority of the respondents 223 (53.1%) did not know about RDT and 215 (51.2%) did not carry out mRDT test. 300 (73.8%) indicated that malaria rapid diagnostic test is not very useful and 373 (88.8%) of caregivers were of the opinion that mRDTs w ere expensive. From the study it is evident that the perception of malaria rapid diagnostic is negative and low, therefore sensitization of the caregivers about mRDTs will be of benefit.*

KEYWORDS: malaria, perception, uptake, under five, Imo state, Nigeria

INTRODUCTION

Despite the continued progress made so far towards meeting the Millennium Development goals on malaria control, the mortality and debilitating effect of malaria in Nigeria and other sub-Saharan African countries has continued to be of serious concern. According to the World Malaria Report [1], there were an estimated 216 million episodes of malaria and 655,000 malaria deaths in 2010. Of these numbers, approximately 174 million (81%) and 600,000 (91%) of cases and deaths, respectively were in African Region [1]. Malaria is holoendermic in Nigeria with greater intensity

during the wet season than the dry Season, and with fifty percent of the population experiencing at least one episode [2]; [3].

Home management of fever by caregivers is important in ensuring effective care to under-five children in Sub-Saharan countries with high-transmission of malaria like Nigeria. Fever is the most common symptom of malaria and malaria is the most prevalent illness among under-five children. Therefore, when a child has a fever, the care-giver usually treats them as if they are suffering from malaria, not minding whether they are right or wrong [4]. In Enugu state, Nigeria, it was found in the year 2009 that over 50% of malaria diagnosis was made presumptively [5]. Importantly, the presumption of all fevers as 'malaria' has been shown to hinder the investigation or diagnoses for other causes of fever, especially pneumonia, which is also a leading cause of child deaths , waste of resources in often resource-scarce settings and the development of drug resistance [6]. The problem of misdiagnosis and over (and under) treatment of malaria spurred the development of a more reliable, field-suitable, and cost effective diagnostic tool which is the malaria rapid diagnostic test (RDT. In 2010 the WHO recommended that all suspected cases of malaria be confirmed with a diagnostic test prior to treatment [1]. There is also high cost of microscopy test for malaria, caregivers tend to treat symptomatically. Despite the ease of use and interpretation of RDTs, barriers to their uptake and subsequent results-based treatment remain. Without the knowledge, it would be difficult to identify gaps to be filled and challenges to implementation.

The perception of negative test results not being reliable is a misconception and a hindrance to appropriate treatment. The launch of RDT is hoped to enable in reducing the rate of presumptive treatment of malaria. However, simply making RDTs available has not led to high uptake of the test with malaria continuing to be over diagnosed in many settings [7]. The uptake of RDT has been inconstant. In light of these, it is crucial to understand the perception of RDT and its uptake among caregivers concerning the treatment of malaria in under five children , where very little has been documented prior to the scale-up of malaria interventions by the State Ministry of Health [8]. Currently caregivers evaluate and treat children with suspected malaria but refer children with severe malaria to the nearest health facility. There is also high cost of microscopy test for malaria, caregivers tend to treat symptomatically. With regards to these problems posed malaria and the low attention malaria control efforts pay to the families' perceptions, beliefs, and attitudes about the use of RDT in the treatment of malaria, this work tends to find out the baseline information on caregivers perception and uptake of RDT in the treatment of malaria of children under five test in Owerri West Local Government Area, Imo State, Nigeria.

LITERATURE/THEORETICAL UNDERPINNING

Theoretical framework

This study is anchored on the Health Belief Model (HBM) by [9]. The theory has been adjudged to be a useful tool in predicting health behaviour change. It remains the most widely used theory in predicting and understanding perceptions of individuals in taking actions that will improve their health. It was developed on the idea that to avoid a disease an individual would believe three things.

Firstly, a personal susceptibility to a disease is present, secondly, occurrence of the disease would have at least moderate severity in some components of the individual's life and thirdly, taking a particular action would in fact be beneficial by reducing susceptibility to the condition. If the disease were present, benefit could occur by reduction of the disease severity. Therefore, it is important for care givers of under five children to understand the importance of testing or diagnosing malaria before treatment so that they can make a rationale and appropriate care seeking behaviour for children with fever under five years of age.

Operational Definition

Perception: The way people think about or understand something. It is people's notion on a particular subject.

Uptake: The ability of people to learn or practice new things.

Previous Studies

A similar study was conducted by [10] on the "Acceptability of Rapid Diagnostic Test-Based Management of Malaria among Caregivers of Under-Five Children in Rural Ghana". They conducted a survey among caregivers living close to 32 health centers in six districts in rural Ghana and used logistic regression to explore factors likely to influence caregiver acceptability of RDT based case management and concern about the denial of ACT on account of negative RDT results. Focus group discussions were conducted to explain the quantitative findings and to elicit further factors. A total of 3047 caregivers were interviewed. Nearly all (98%) reported a preference for test-based management of malaria over presumptive treatment. Caregivers who preferred test-based management of malaria were less likely to be concerned about the denial of ACT to their test-negative children (O.R. 0.57, 95% C.I. 0.33–0.98). Compared with caregivers who had never secured national health insurance cover, caregivers who had valid (adjusted O.R. 1.30, 95% CI 1.07–1.61) or expired (adjusted O.R. 1.38, 95% CI 1.12–1.73) insurance cover were more likely to be concerned about the denial of ACT to their RDT-negative children. Major factors that promote test-based management of malaria acceptability include the perception that a blood test at health center level represents improvement in the quality of care, leads to improvement in treatment outcomes, and offers opportunity for better communication between health workers and caregivers. Acceptability is also enhanced by engaging caregivers in the procedures of the test. Apprehensions about negative health worker attitude could however undermine acceptance.

METHODOLOGY

This study employed a descriptive survey study design and sample size of 420 was selected from population of 21000 which constitute of caregivers who are aged 18 and above in Owerri West Local Government Area (LGA). Respondents were drawn from the five wards that make up Owerri west Local Government Area using multistage cluster and systematic sampling techniques.
Instrument for data collection was validated structured questionnaire with three sections which addressed socio-demographic characteristics of the respondents, Perception and Uptake of mRDT.

Verbal informed consent was obtained from each respondent and inclusion criterion was aged* 18 years and above in Owerri West Local Government Area, Imo State. LGA.
Three trained research assistants were involved in the collection of data from respondents.
The SPSS (version 21.0) was used for data analysis. The statistical tools used was Chi-square test to test the hypotheses.

Ethical Consideration/Informed Consent
Ethical approval was from the Department of Health Technology, School of Health Technology, Federal University of Technology, Owerri Nigeria.

RESULTS

Socio – Demographic Characteristics

More of the 420 respondents (161, 38.3%) who participated in the study were aged 30-49 years, followed by 119 participants aged 50-59 years (28.3%), then those aged 18-29 years were 114 (27.1%),and fewer respondents were found in age group '60 years and above' with 26 respondents (6.2%) as shown in Table 1.

More of the respondents (268) were females which amounted to 63.8 percent of total respondents, while males were 152 which was 36.2 percent of total respondents (Table 1). More of the respondents (216) were married which resulted to 51.4% followed by those single, divorced and widowed 116 (27.6%), 51 (12.1%) and 37 (8.8%) respectively.

One hundred and sixty-nine (169, 52.32%) of total respondents had 3-4 children, followed by those with more than 4 children (86, 26.63%) of total respondents. Sixty-eight (68, 21.05%) of the respondents had 1-2 children and no respondent reported not having a child

One hundred and twenty six (126, 30%) of the total population had primary education, followed by those that had secondary education (87, 20.7%) of the total respondents then those with O – level tertiary education (84, 20%). Sixty eight (68, 16.2%) of the respondents had post graduate education and 55(13.1%) of the respondents had no formal education (Table 1).

Table 1 also shows that 196 (46.7%) were civil servants, 135 (32.1%) were traders, 49 (11.7%) were currently unemployed while 40 (9.5%) were famers.

The average monthly income of respondents showed that Majority 88 (44%) earned ₦10,000-17,000, followed by 69 (34.5%) earning above ₦18,000 and the least was 43 (21.5%) earning ₦18,000.

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Table 1: Socio-Demographic Characteristics of the Respondents (n=420)

Socio-demographic Characteristics	Frequency	Percentage (%)
Age (years)		
18-29	114	27.1
30-49	161	38.3
50-59	119	28.3
Above 60	26	6.2
Marital status		
Single	116	27.6
Married	216	51.4
Divorced	51	12.1
Widowed	37	8.8
Sex of Respondent		
Male	152	36.2
Female	268	63.8
Level of Education		
None	55	13.1
Primary	126	30
Secondary	87	20.7
Tertiary	84	20
Post graduate	68	16.2
Occupation		
Civil servant	196	46.7
Trader	135	32.1
Farmer	40	9.5
Currently Unemployed	49	11.7
Level of income		
10,000- 17,000	88	44
18,000	43	21.5
18,000 above	69	34.5

Figure 1, shows the perception of malaria rapid diagnostic test among care givers of under-five children in Owerri West L.G.A. it indicates that out of 420 respondents, about 175 (41.7%) were of the opinion that mRDT was useful, 102 (24.3%) not useful, 101 (24%) dangerous while 16 (2.8%) felt it was not good.

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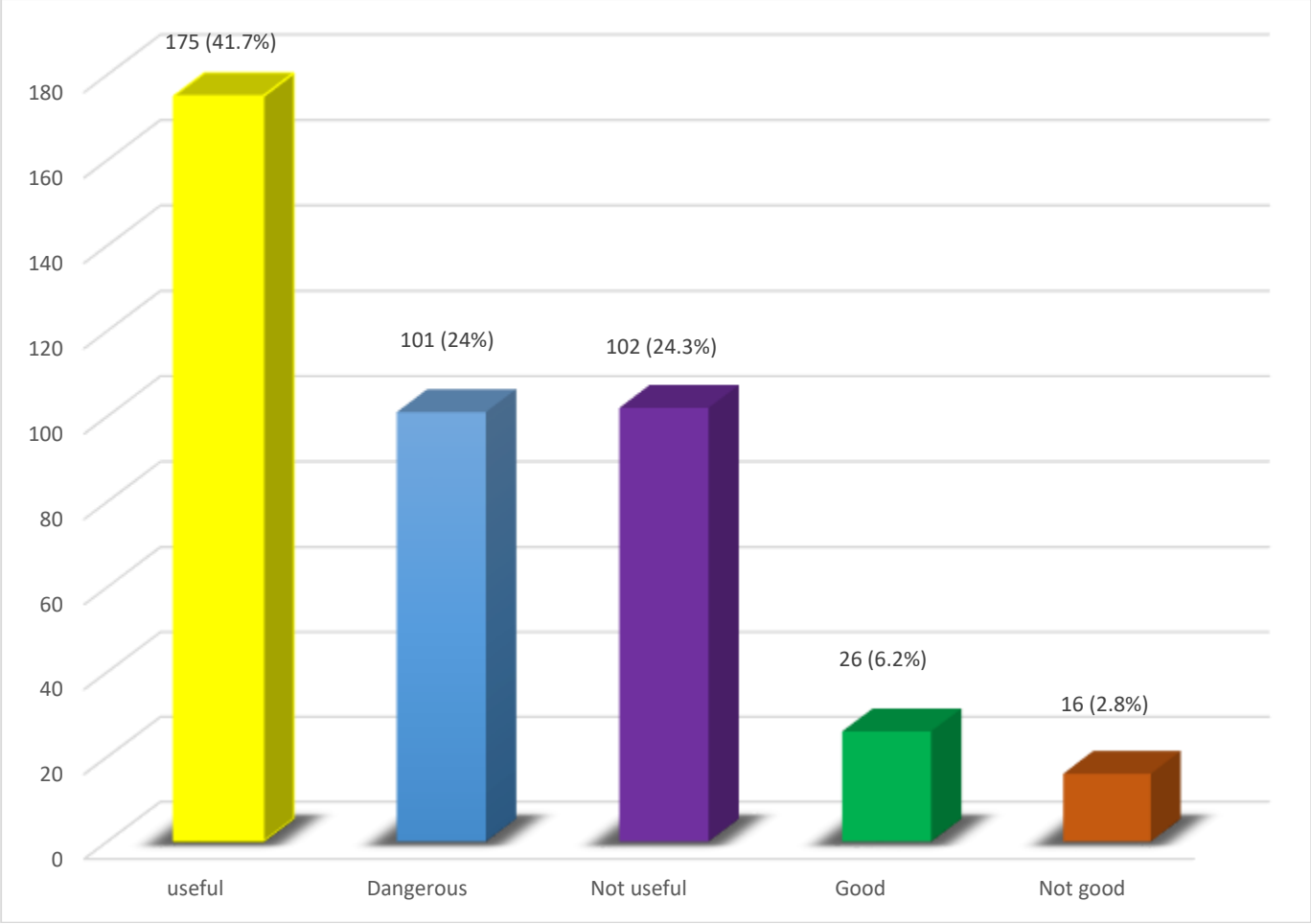

Figure 1: Showing Perception of Malaria Rapid Diagnostic Test among Caregivers of Under-five Children

Table 2 shows the perception of rapid diagnostic test among care givers of under five children in Owerri West LGA. It indicates that 197 (46.9%) of the 420 respondents know about rapid diagnostic test. The table also shows that 171 (40.7%) agree that malaria rapid diagnostic test is not very useful, 139 (33.1%) strongly agree, 77 (18.3%) disagree while 33 (7.9%) strongly disagree. Furthermore 157 (37.4%) strongly agree that it is important to make parasite- based confirmation of malaria diagnosis before commencing treatment, 153 (36.4%) agree, 92 (21.9%) disagree while 18 (4.3%) strongly disagree. The table also shows that 192 (45.7%) strongly agree that presumptive diagnosis of malaria is still better, 141 (33.6%) agree, 66 (15.7%) disagree while 21 (5%) strongly disagree. However 172 (41%) strongly agree that malaria rapid diagnostic test can reduce the quantity of anti-malaria drugs consumed in a community, 140 (33.3%) agree, 98 (23.3%) disagree while 10 (2.4%) strongly disagree. In addition caregivers who know the symptoms of malaria were 339 (80.7%) while those who do not know the symptoms of malaria

were 81(19.3%). The respondents who feel that blood is a sacred body fluid 295 (70.2%) while those who do not 125 (29.8%). Majority of the respondents 288 (68.6%) think that the blood keeps life in the body while those who do not were 132 (31.4%).

Table 2: Perception of Malaria Rapid Diagnostic Test among Caregivers of under five children in Owerri West LGA (n=420)

Perception of malaria rapid diagnostic test	Frequency	Percentage %
Do you know about malaria rapid diagnostic test		
Yes	197	46.9
No	223	53.1
Malaria rapid diagnostic test is not very useful		
Strongly agree	139	33.1
Agree	171	40.7
Disagree	77	18.3
Strongly disagree	33	7.9
It is important to make a parasite-based confirmation of malaria diagnosis before commencing treatment		
Strongly agree	157	37.4
Agree	153	36.4
Disagree	92	21.9
Strongly disagree	18	4.3
Presumptive diagnosis of malaria is still better		
Strongly agree	192	45.7
Agree	141	33.6
Disagree	66	15.7
Strongly disagree	21	5
Malaria rapid diagnostic test can reduce the quantity of antimalarial drugs consumed in the community		
Strongly agree	172	41
Agree	140	33.3
Disagree	98	23.3
Strongly disagree	10	2.4
Do you know the symptoms of malaria		
Yes	339	80.7
No	81	19.3
Do you feel that blood is a sacred body fluid		
Yes	295	70.2
No	125	29.8
Do you think that the blood keeps life in the body		
Yes	288	68.6
No	132	31.4

Table 3, shows the uptake of malaria rapid diagnostic test among care givers of under five children in Owerri west LGA. Most respondent perceived that the price of malaria rapid diagnostic test was expensive 200 (47.6%), very expensive 173(41.2%), cheap 41 (9.8%) while 6 (1.4%) think it was

very cheap. One hundred and thirty eight (32.9%) strongly agree that RDT test result were easy to interpret, 134 (31.9%) agree, 122 (29%) disagree while 26 (6.2%) strongly disagree. Three hundred and sixty two (86.2%) indicated that malaria drug was the treatment for RDT positive result, 40 (9.5%) paracetamol while 18 (4.3%) would administer flagyl. Two hundred and fifty nine (61.7%) indicated that malaria drug is the treatment for RDT negative result, 85 (20.2%) paracetamol, 51 (12.1%) would take the child to the health center while 25 (6%) would give flagyl. Majority of the respondents 186 (44.3%) strongly agree that RDT test result are always accurate, 129 (30.7%) disagree, 89 (21.2%) agree while 16(3.8%) strongly disagree.

Table 3: Uptake of Malaria Rapid Diagnostic Test in the Treatment of Malaria Among Caregivers of Under five in Owerri West LGA (n=420)

Uptake of Malaria Rapid diagnostic test	Frequency	Percentage(%)
What do you think about the price of malaria rapid diagnostic test		
Very expensive	173	41.2
Expensive	200	47.6
Cheap	41	9.8
Very cheap	6	1.4
RDT test result is easy to interpret		
Strongly agree	138	32.9
Agree	134	31.9
Disagree	122	29
Strongly disagree	26	6.2
What treatment is given for RDT positive result		
Malaria drug	362	86.2
Paracetamol	40	9.5
Flagyl	18	4.3
What treatment is given for RDT negative result?		
Malaria drug	259	61.7
Paracetemol	85	20.2
Flagyl	25	6
Take the child to the health center	51	12.1
RDT test result are always accurate		
Strongly agree	186	44.3
Agree	89	21.2
Disagree	129	30.7
Strongly disagree	16	3.8

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DISCUSSION

Socio-demographic characteristics of respondents

The study indicates that among the study population, 63.8% were females this may be due to the fact that most women stay at home to carter for the family and take care of their children unlike men who leave the house for places of livelihood, and therefore more women were at home. 38.3% of the caregivers were within the age group of 30-49 years old. This could be as a result of the fact that most people marry and have children within the age group in Owerri West L.G.A. The result indicated 51.4% were married, 30% attained primary education level. This report is in consonance with a study in Garissa, kenya by [11] who reported that majority of the respondents were illiterate and the highest level of education was secondary school. Only 46.7% were civil servants and 44% of the estimated monthly income of the respondents were between ₦10,000- ₦17,000.

Perception of Rapid Diagnostic Test in the treatment of Malaria among caregivers of under five in Owerri West L.G.A.

From the study, it shows that 53.1% of the respondents have not heard of RDT, this report is consistent with the work of [12]. The implication of this finding could be as a result of poor awareness of mRDT. Most of the caregivers knew RDT in terms of HIV, pregnancy and other diseases. 40.7% of the respondents agree that malaria rapid diagnostic test is not very useful. This is in agreement with the work of [13] where it was reported that many respondents found malaria RDTs of no use. This can also be linked to poor awareness of mRDTs. The study also indicates that 37.4% strongly agree that it is important to make parasite- based confirmation of malaria diagnosis before commencing treatment, 4.3% strongly disagree, 45.7% strongly agree that presumptive diagnosis of malaria is still better while 4.3% strongly disagree. This report however is in conformity with [14] where nearly all (98%) caregivers indicated a preference for RDT-based management of malaria over presumptive treatment. The remaining 2% either wanted the diagnosis of malaria to be based on clinical judgement or were unsure of their preference.

The findings of this study revealed also that 41% strongly agree that malaria rapid diagnostic test can reduce the quantity of anti-malaria drugs consumed in a community while 2.4% strongly disagree. This is similar to the findings by [13] where caregivers feel that mRDTs can improve the health services in primary health care centers.

70.2% of the respondents indicated that they feel the blood is a sacred body fluid while 60% of the respondents indicate that custom/ religion allow blood test when their child is ill. This finding corresponds to the research by [13] where majority of the respondent's custom/religion did not allow blood test when a child is ill. This revelation shows that custom/tradition is not a barrier to uptake of mRDT.

Uptake of Rapid Diagnostic Test among Caregivers of under-five Children

This study shows that 46% of the respondents know how to carry out malaria rapid diagnostic test while 54% do not and those who could not were willing to be trained on RDT usage. This does not support the findings of [12] where caregivers were not willing to be trained but suggested that Village Health Workers are trained instead. The implication of this finding could be said to be as a result of the similarity in procedure between mRDT and pregnancy test which the respondents were already used to.

The findings of this study also revealed that 42.9% of the respondents tested their children with mRDT anytime he/she has fever while 43.3% would prefer to do a finger prick blood test each time the child has fever. This agrees with previous finding of other scholars which reported similar results [14] ; [12].

Similarly, the result of this study shows that 51.2% of the respondents do not carry out mRDT test when their child has fever and 16.9% of the respondent said the tested once in three months. The findings of this study also revealed that 47.6% of the respondents caregivers were of the opinion that mRDTs were expensive. The implication of this finding could be said to be as a result of the cost of mRDT which was perceived by majority of care givers to be expensive.

Malaria drug was perceived by 86.2% of the respondents to be the treatment for mRDT positive result as well as 61.7% respondents for mRDT negative result. This could be due to fear of the caregivers according to the findings of [13] and the findings of [14] which reported caregivers concern that their children might have malaria and would not be given ACT on the basis of mRDT negative result and also it could be due to the fact that 30.7% of caregivers disagree that mRDT test result are always accurate.

Relationship between Perception, Socio demographic characteristics and Uptake of malaria Rapid Diagnostic Test among Care givers of Under five Children.

It can be deduced that there is a significant association between perception and uptake of mRDT (P= <0.001), age and uptake of malaria rapid diagnostic test (P= <0.001), marital status and uptake of malaria rapid diagnostic (P= <0.001), sex of the respondents and uptake of mRDT (P= <0.001), occupation and uptake of mRDT (P= <0.001) and Income level of the respondents and uptake of mRDT (P= < 0.001).

Implication to Research and Practice

This study will add to the existing body of knowledge and will be found relevant for health workers, government, health policy makers and non-governmental organization in their allocation and distribution of RDT test kits in other to increase accessibility and awareness. This study will help in understanding the perception of care givers of under five towards RDT test in Owerri West LGA. The study will also determine if care givers of under five are aware of RDT tests, if they know how to carry out RDT test and how they carry out the test. The study will also help the inhabitants to get to know about RDT test and will serve as a platform for educating them on how

to use RDTs. The results of this study will be vital in improving the uptake and usage of RDTs among caregivers of under-five. In addition, it will serve as a guide towards developing appropriate strategy aimed at enhancing the use of malaria RDT in the management of fever among under five

CONCLUSION

This study provides an insight with RDT implementation in Nigeria. It showed a poor perception and low uptake to RDT use by the care-givers of under-five children in Owerri West L.G.A. There is need to correct this negative perception in order to improve the current low level of malaria testing in Nigeria through addressing the barriers of malaria uptake by providing a comprehensive and ongoing education campaigns for both caregivers and and communities which in turn will will necessitate a reliable and consistent RDT supply and uptake.

Future Research

The findings of this study are restricted to perception and uptake of Rapid Diagnostic Test (RDT) in the treatment of malaria among care givers of under-five children in Owerri West Local Government Area, Imo State, Nigeria. Future research should be geared towards assessing the adoption and use of RDT in the treatment of malaria among caregivers in the treatment of malaria of under-five children as well as those factors that can play in the adoption of this practice among caregivers.

RECOMMENDATIONS

1. The state should expand access to malaria RDT through awareness campaigns to the community. This should include messages to caregivers on prompt response to childhood fever, education and training of caregivers as well as supplying them with mRDT, using existing platforms (media, health system, community based organizations, etc).
2. NGOs and national malaria programmes should be used to reinforce education for communities regarding malaria misconceptions, improving access to malaria RDT among caregivers of under-five children for the treatment of malaria.
3. It is also recommended that transnational approaches such as subsidizing the price of mRDT or making it free in other to secure a consistent and reliable supply of mRDTs is made a priority.
4. It is equally expedient that continuous supportive supervision, such as visit to health facility, phone calls and institutionalized feedback mechanism to increase data quality and malaria case management, quality data will support forecasting of mRDTs and ACT useage.

Acknowledgements

We thank the study participants, community members and leaders in villages where this study took place.

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QUESTIONNAIRE
SECTION A
SOCIO – DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS

1. Age of the respondent

a.>18-29 ☐ b. 30-49 ☐ c. 50-59 ☐ d. Above 60 ☐

2. Marital status

a. Single ☐ b. Married ☐ c.Divorced ☐ d. Widowed ☐

3. Sex of Respondent

a. Male ☐ b. Female ☐

4. Highest educational level

a. None ☐ b. Primary School ☐ c. Secondary School ☐ d. Tertiary ☐ e. Post – graduate ☐

5. Occupation

a. Civil servant ☐ b. Trader ☐ c. Famer ☐ d. currently unemployed ☐

6. Average income per month

a. 18,000 ☐ b. <18,000 ☐ c. >18,000 ☐

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SECTION B
PERCEPTION OF RAPID DIAGNOSTIC TEST

1. Do you know about malaria RDT
a. Yes ☐ b. No ☐

2. It is necessary to carry out RDT test before treating malaria
a. Strongly agree ☐ b. Agree ☐ c. Disagree ☐ d. Strongly Disagree ☐

3. It is important to make a parasite-based confirmation of malaria diagnosis before commencing treatment
a. Strongly agree ☐ b. Agree ☐ c. Disagree ☐ d. Strongly Disagree ☐

4. Presumptive diagnosis of malaria through presenting symptoms is still better
a. Strongly agree ☐ b. Agree ☐ c. Disagree ☐ d. Strongly Disagree ☐

5. What is your opinion on malaria RDT?
a. Useful ☐ b. Dangerous ☐ c. Not useful ☐ d. Good ☐ e.Not good ☐

6. Malaria rapid diagnostic test can reduce reduce the quality of anti-malaria drugs
a.Strongly agree ☐ b. Agree ☐ c. Disagree ☐ d. Strongly Disagree ☐

7. What are your fears on malaria RDT?
a. None ☐ b. Test result ☐ c. Picking the child to take blood sample ☐ d. Pain and carrying experienced by the child ☐

8. Do you know the symptoms of malaria?
a. Yes ☐ b. No ☐

9. Does your customs allow blood teat when your child is ill?
a. Yes ☐ b. NO ☐

10. Do you feel that blood is a sacred body fluid?
a. Yes ☐ b. No ☐

11. Do you think that the blood keeps life in the body?
a. Yes ☐ b. No ☐

International Journal of Public Health, Pharmacy and Pharmacology
Vol. 5, No.1, pp.11-26, April 2019
Published by ECRTD-UK
Print ISSN: (Print) ISSN 2516-0400
Online ISSN: (Online) ISSN 2516-0419

UPTAKE OF MALARIA RDT

SECTION C

1. Do you know how to carry out RDT malaria test

a. Yes ☐ b. No ☐

2. Do you know where to obtain Malaria RDT?

a. Yes ☐ b. No ☐

3. Where do you obtain malaria RDTs?

a. Pharmacy ☐ b. Health centre ☐ c. Cosmetic shop ☐ d. boutique ☐

4. Do you test your child any time he/she has fever?

a. Yes ☐ b. No ☐

5. During the test, will mean that each time your child has fever some little (finger Prick) blood will be taken to do the test. Would you still prefer to do the test?

a. Yes ☐ b. No ☐

6. How often do you carry out malaria RDT test?

a. Anytime my child has fever ☐ b. once in six months ☐ c. once in three months ☐ d. none ☐

7. RDT test result is easy to interpret

a. Strongly agree ☐ b. Agree ☐ c. Disagree ☐ d. Strongly Disagree ☐

8. RDT positive result is characterized by

a. Single line on the strip ☐ b. Double line on the strip ☐

9. What treatment is given for RDT positive result?

a. Malaria drug ☐ c. Paracetermol ☐ c. flagyl ☐

10. What treatment is given for RDT negative result?

a. Malaria drug ☐ b. Paracetermol ☐ c. flagyl ☐ d. Take the child to the health center ☐

11. RDT test results are always accurate

a. Strongly agree ☐ b. Agree ☐ c. Disagree ☐ d. Strongly Disagree ☐

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APPENDIX C

3.4 Sampling Size and Sampling Method

3.4.1 Sample Size

The Taro Yamane (1973), formula was used for determination of the sample size thus;

$$n = \frac{N}{1+N(e)^2}$$

Where

n= sample size

N=Population size

1= constant value

e= Level of significance (5%)

N= Population size, in this case being population of under five children in Owerri West LGA which is about twenty one thousand (21,000) as obtained from department of health, Owerri West Local Government Area headquarters.

e = 0.05

Therefore $n= \frac{21000}{1+21000(0.0025)}$

That is $n=\frac{21000}{53.5}$= 392.5 approximately 400 to the nearest hundred.

Considering 5% loss to follow up or withdrawal of consent by participants,

5/100 x 400 = 20 respondents

Therefore minimum sample size needed is

400 + 20 =420 respondents