

Awareness and Adherence of Proprietary Patent Medicine Vendors to Malaria Rapid Diagnostic Test in Nigeria: A Cross-Sectional Study

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Abstract- Background: *Proprietary Patent Medicine Vendors (PPMV) have been identified as a widely patronized source for drugs used in the home treatment of malaria. The presence of PPMVs has increased sales and recommendation of antimalarial drugs among Nigeria populace. This study was conducted to assess the awareness and adherence of Proprietary Patent Medicine Vendor to Rapid Diagnostic Test in Ondo state, Nigeria.*

Methods: *A descriptive cross-sectional study comprising 192 registered Proprietary Patent Medicine Vendors who were selected via multistage sampling method. Relevant data collected via semi-structured questionnaire and analysed using IBM SPSS 23.0*

Results: *The mean age for the respondents was 38years. Majority of the respondents have heard of RDT (85.9%), while 75.0% know about the malaria treatment policy. The study also reveals that arthemeter was the most familiar drug among respondents. Also, 83.3% of respondents believed the use of RDT has improved the treatment of malaria.*

Conclusion: *Awareness of malaria testing and treatment policy was high, but adherence was unsatisfactory. Thus, there is need to provide vendors with competency-based training and supervision to improve the awareness and adherence which would enhance the quality of care they provide.*

Indexed Terms- *Adherence, Arthemeter, Awareness, Proprietary Patent Medicine Vendors, Rapid Diagnostic Test*

I. INTRODUCTION

In Nigeria, malaria is the leading cause of childhood mortality [1]. Nigeria has one of the highest malaria burdens in the world, and is one of five African

countries that make up 50% of all global deaths, and 47% of all malaria cases [2]. In 2012, Nigeria reported more than 13.5 million cases, and almost 100,000 deaths due to malaria [3]. In order to assist in the development of national policies and guidelines, WHO recommends that all suspected cases of uncomplicated malaria are confirmed diagnostically prior to treatment, thus, the use of RDT for testing [3]. The most common first step in the illness-seeking process for suspected malaria is to engage in self-treatment by giving febrile children western drugs stored at home or purchased from Proprietary Patent Medicine Vendors (PPMVs) [4]–[7]. PPMVs are important informal community-based providers of healthcare [7], [8]. Unfortunately, PPMVs rarely offer diagnostic testing, and do not always stock the recommended first-line treatments for malaria. In Nigeria the testing rates appear to be much lower than reported for the rest of the continent. It is estimated that only between 18% and 26% of children under five received a malaria test during their last fever episode [9].

Despite international treatment guidelines endorsing the use of ACTs, and increased access due to subsidized prices, as well as providing RDT kits to PPMVs, many people throughout the African region continue to take non-ACT antimalarial that are ineffective [10]. In many cases, more than half of all suspected malaria episodes are treated with a non-ACT antimalarial [1], [8], [11]. Among children under five in Africa, the most vulnerable population, non-ACT antimalarial, namely chloroquine, quinine, and sulphadoxine/pyrimethamine (SP), are frequently the top choice [12]. Over the past decade significant efforts have been made in both the prevention and treatment of malaria that has greatly reduced malaria incidence rates, globally and in Africa. Thus, this

study was done to provide data that would help policy makers ensure that the PPMVs are well trained to detect malaria using RDT kits which would help reduce mortality rate of malaria.

II. METHODS

Study setting: The study was carried out in Akure South Local Government Area in Ondo State.

Study design: A descriptive cross-sectional study design was used for this study

Sample population: this study was conducted among Licenced PPMVs were involved in the study and the list of registered premises was obtained from the National Association of Proprietary Patent Medicine Vendors (NAPMED) of Nigeria.

Sample size and sampling technique: A single population proportion formula was used to determine the sample size. Prevalence estimates of sample size was calculated based on the findings from a similar study which showed a prevalence of 40% level of awareness among PPMVs [7]. Using 95% confidence level and 5 % margin of error, the required sample size was 190 vendors. Participants were selected using a multi-stage sampling technique. In the first stage, 6 wards were selected among the total 11 wards in Akure south local government using a simple random sampling via balloting. In the second stage, 50% of the total PPMV centres/shops were selected from each of the chosen 6 wards. Proportionate sampling was done based on the total number of PPMVs and were purposively selected until the minimum sample size was reached.

Data collection tool & procedure: Quantitative data was collected from the participants using a semi-structured self-administered questionnaire that was purposely made for the questionnaire based on adequate literature review. Data were collected by the researchers using the tool in the selected PPMV centres/shops.

Data analysis: The data was analysed using SPSS 20.0 and relevant analysis were done.

Ethical Consideration: Ethical approval was obtained from the UI/UCH Research Ethics Review Committee before the commencement of the study. Informed consent to collect data was sought and obtained from the chairpersons of the NAPMED (Akure Chapter). Additionally, participants' consent was sought verbally before proceeding with the data collection. Respondents were told that participation was voluntary and that they will not suffer any consequences if they chose not to participate. All information gathered were kept confidential.

III. RESULTS

Socio-demographics characteristics of the respondents

Variables	Frequency (n= 192)	Percentage (%)
Age of respondents (years)		
19-39	111	57.8
40-59	70	36.5
60 and above	11	5.7
Sex		
Male	48	25
Female	146	75
Period of drug selling(years)		
1-10	148	77.6
11-20	39	20.3
>21	5	2.6
Level of education		
None	14	7.3
First school certificate	28	14.6
SSCE	79	41.1
OND	36	18.8
HND/BSC	35	18.2
Marital status		
Single	36	18.8
Married	135	70.3
Divorced	10	5.2
Separated	11	5.7

Table 1 shows the demographics of the respondents where majority of them representing (57.8%) were aged 19-39 followed by those aged 40-59 years (36.5%) and only (5.73%) were above 60 years. The mean age was 38.9 years. The sex distribution revealed that majority of the respondents were female

(75%). In the same vein, a larger proportion of them had been in the trade of drug selling for less than 10 years (77.6%), while 20.3% and 2.60% had been involved in the trade for 11-20 years and over 21 years respectively. More of the respondents (41.1%) had SSCE, (18.2%) had either an HND/BSC, 18.8% had an OND, (14.6%) had the first school certificate while only (7.3%) had no form of formal education. Finally, majority of the respondents (70.3%) were married, (18.8%) of them were single while 5.2% and 5.7% were divorced or separated respectively.

- Awareness of RDT for Malaria testing among respondents

The level of awareness among respondents was high, as (85.9%) of the respondents have heard of RDT. Similarly, more of the respondents know about the malaria treatment policy (75%), while (72.4%) of the respondents stated that they know how to use the RDT to test for malaria. It also shows that arthemeter was the most familiar drug among respondents with (58%) of the respondents stating their familiarity with the drug, this was followed closely by ACT (35.4%), SP (29.7%) and quinine, respectively (Table not shown).

- Awareness of PPMVs to government drug regulations and policies

Variables	Frequency (n= 192)	Percentage (%)
Have you attended training on malaria treatment?		
Yes	149	77.6
No	43	22.4
Are you aware of new government policy on anti-malaria drugs?		
Yes	125	65.1
No	67	34.9
Are you aware of change in policy concerning chloroquine or ACTs?		
Yes	116	60.4
No	76	39.6
What is the source of your drug?		
Open market	97	50.5
Manufacturers	28	14.6
Distributors/agents	70	36.5

Others	2	1.0
How satisfied are you with the source of drugs?		
Highly satisfied	99	51.6
Fairly satisfied	53	27.6
Not satisfied	40	20.8

Table 2 above shows the awareness of PPMVs to government drug regulations and policies on anti-malaria drugs were shown. More of the respondents had attended training on malaria treatment (77.6%). In the same vein, (65.1%) of them were aware of the government’s new policy on anti-malaria drugs. However, 34.9% were not aware of the change in policy. Furthermore, it revealed that the open market is the highest source of drugs for PPMVs (50.5%), followed by distributors/agents with 36.5% of the respondents getting their drugs from this source and then manufacturers and other sources with 14.6% and 1.0% respectively. Finally, over half of the respondents (51.6%) were satisfied with their drug source, 27.6% fairly satisfied and 20.8% were not satisfied.

- Adherence to RDT before malaria prescription

Variables	Frequency (n= 192)	Percentage (%)
Do you treat malaria?		
Yes	181	94.3
No	11	5.7
Do you do RDT before prescribing anti-malaria?		
Yes	113	58.9
No	79	41.1
Do you have enough supply of RDT kits?		
Yes	62	32.3
No	130	67.7
Do you currently have RDT?		
Yes	85	44.3
No	107	55.7
What challenges do you face with your clients before prescribing anti-malaria?		
Financial challenges of clients	44	22.9
lack of time	5	2.6
patient complain that	2	1.0

drugs are not working		
patient's unwillingness to undergo RDT test	32	16.7
patients always want to choose the drug they want	22	11.5
no challenge	87	45.4
Do your patients or clients ask for RDT before purchase of antimalarial?		
Yes	82	42.7
No	110	57.2
Are there any external supervisors that supervise the use of RDT?		
Yes	73	38
No	119	62
Do you think using RDT is a good idea?		
Yes	175	91.1
No	17	8.9
Do you think the use of RDT has improved treatment of malaria?		
Yes	160	83.3
No	32	16.6

In the Table 3 above, the study results reveal that (94.3%) of the PPMVs virtually treat malaria. Furthermore, 58.9% of the PPMVs conducted RDT before prescribing anti-malaria drugs. Only 32.3% of the respondents had enough supply of RDT while 67.7% had insufficient supply. Furthermore, only 44.3% had RDT in their stores as at the time of conducting this study while 55.7% did not have RDT. The table also reveals that majority of the PPMVs (45.9%) believed that they faced no challenge with their clients before prescribing anti-malaria. On the other hand, financial challenges of clients were identified as the greatest challenge faced by PPMVs in prescribing anti-malaria medications with 22.9% identifying this as a challenge. This was closely followed by patient's unwillingness to be tested attested to by 16.7% of the PPMVs. 11.5%, 2.6% and 1.0% believed that patients always wanting to choose the drugs they want, lack of time and patient's complaint on the ineffectiveness of drugs respectively were the challenges faced. 57.2% of the respondents

identified that clients did not request for RDT before purchasing anti-malaria while 42.7% did.

IV. DISCUSSION

Malaria as one of the leading cause of morbidity and mortality in the world, there is a need for government and regulatory agencies to ensure strict adherent of PPMVs to malaria RDT before prescribing anti malaria drugs [6]. PPMVs are integral and important informal community based immediate providers of health care and as such, they are required to be skilled in the testing and treatment of malaria. Thus, this study sought to determine and asses the awareness and adherence of proprietary patent medicine vendors in the use of malaria RDT in Ondo State.

Results from the study revealed that more females were (PPMV) and this is the true trend in Nigeria where women took the less educated and informal job in the societies in compare to the males [4]. The study also emphasized that a larger percentage of the respondents (77.6%) had been selling drugs over a period of 1 to 10 years, while a smaller number (20.3%) of PPMVs could sell drugs beyond 10years. The highest qualification obtained by the majority of PPMVs based on this study was SSCE, this is in line with the position of a study stated that more of the PPMVs are informal provider of health with little or no academic qualification [13].

A little above three-quarter had attended training on malaria treatment and 65.1% were aware of change in policy on anti-malaria drugs to newly recommended ACT as a bases for treatment of uncomplicated malaria. These statistical figures should have improved the knowledge of PPMVs on the diagnosis and management of malaria. And the new antimalarial treatment policy categorized PPMVs in level 1 of malaria management (Federal Ministry of Health, 2005). At this level, a health care provider is expected to diagnose malaria 'symptomatically' and administer Artemisinin-based combination therapy (ACTs) for uncomplicated cases [1]. Majority of PPMVs (60.4%) were aware of change in policy concerning chloroquine and ACTs. This study showed that the major source of drugs to the PMVs is the open market which is accounted to 50.5% of the respondents. And majority of these respondents (51.6) were highly

satisfied with the various sources of drug market distribution they adopted. Only few (14%) of PMVs got their drugs directly from the manufacturers, while 70% of PMVs got their drugs from distributors and agents.

According to this study, a higher percentage of PMVs (94.3%) treated malaria in their outlets or facilities, while 58.9% of PMVs used RDT before prescribing any anti-malaria drug. This is however at variant with the findings that few of the PPMVs conduct RDTs before prescribing anti-malaria drugs [7]. Majority of PPMVs do not have enough RDT kits to perform RDT before prescribing anti-malaria drugs, this might result to poor adherence to the use of RDT before malaria prescription.

Majority of the respondents (85.9%) have heard about RDT, this high level of awareness was also in line with the results from other similar studies that revealed high level of awareness of RDT [6], [7]. This further buttress that training of PPMVs improves their knowledge of anti-malaria appropriate treatment practice (which include Malaria RDTs). Three-quarter of the respondents at 75% know about malaria treatment policy to manage malaria and a majority, slightly less than three-quarter know how to use RDT to test for malaria. Though, according to a study which revealed that failure to run test (RDT) for malaria, inappropriate choice of anti-malaria, inappropriate dosage strength, dosage interval and treatment duration could partly be due to lack or deficiency in the knowledge of PPMV, considerations for profit, cost, patients' preference were the reasons mentioned by majority of PPMVs [14]. According to this study, majority of PPMVs were familiar with the use of arthemeter as a drug of choice for managing malaria, this was supported by that WHO which stated that Artemisinin-based combination therapy (ACTs), such as arthemeter should be for uncomplicated cases of malaria [3].

One plausible implication of these results revealed substantial awareness and adherence gaps on the use of RDTs and treatment with Artemisinin-based combination exist among rural PPMVs. Existing evidence regarding the effectiveness of retail outlets in malaria case management, PPMVs should be provided with competency chased training and supervision to

improve the quality of care they provide. This study however shows that majority of PPMVs conducted malaria RDT before prescribing anti malaria. The cost and availability of malaria RDT has resulted to poor adherence to RDT by both PPMVs and the clients.

- Limitations: This study has its limitations which cannot be overlooked; however, future studies should look into improving on the limitations of this study. This study samples were picked from selected wards in the State; hence, this study needs replication with samples from all other states to allow longitudinal inferences. Moreover, there is also a need to conduct this study among other health care professionals, e.g., doctors and pharmacists as well, to broaden the scope covered.

CONCLUSION

In light of the findings from this study, thus, it could be recommended that periodic training and retraining of PPMVs for effective adherent to malaria RDT should be implemented. The clients/patients themselves should be educated on the importance of the uptake of malaria RDT before taking anti malaria drugs. There should be adequate supply of malaria RDT kits in public and private settings including PPMVs outlets. Government should strengthen the policies and laws that regulate the monitoring and registration of PPMVs, and the various sources of distribution of anti-malaria should be monitored, so as to prevent substandard drugs getting to the hands of the consumers. The agencies in charge regulating food and drugs in the nation should improve regulatory control of PPMVs to ensure adherence to the antimalarial policy.

What is already known on this topic

- PPMVs are important informal community-based providers of healthcare [7], [8]. Unfortunately, PPMVs rarely offer diagnostic testing, and do not always stock the recommended first-line treatments for malaria.
- In Nigeria the testing rates appear to be much lower than reported for the rest of the continent especially among PPMVs who sometimes do not follow the guideline for testing malaria.

What this study adds

- In respect to the findings of this study, the level of awareness is high among respondents but there is need to improve their adherence to the standardized guidelines to testing and treatment of malaria as they are the first point of contact in most rural placement.
- This study shows that majority of PPMVs conducted malaria RDT before prescribing anti malaria. The cost and availability of malaria RDT has resulted to poor adherence to RDT by both PPMVs and the clients.

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