IJPSR (2019), Volume 10, Issue 1 (Research Article)

INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES AND RESEARCH

Received on 30 May 2018; received in revised form, 24 July 2018; accepted, 02 August 2018; published 01 January 2019

ASSESSMENT OF PRIMARY HEALTH CARE WORKERS' KNOWLEDGE, ATTITUDES AND PRACTICES ON UNCOMPLICATED MALARIA MANAGEMENT IN PLATEAU STATE, NIGERIA

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Keywords:

Healthcare workers, Knowledge, attitude and practice, Primary healthcare facilities, Uncomplicated malaria

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ABSTRACT: Overcoming the scourge of malaria infection is possible when healthcare workers have good levels of understanding and attitudes towards the disease, which will influence their treatment practices. This study assessed healthcare workers' levels of knowledge, attitudes, and practices (KAP) in uncomplicated malaria treatment at primary healthcare (PHC) facilities in Plateau state, Nigeria. The study employed a cross-sectional KAP approach to extract related data from 289 trained healthcare workers in twenty-four (24) PHC facilities. A designed and validated self-reported instruments known as Healthcare Knowledge, Attitude and Practice Instrument for Uncomplicated Malaria (HKAPIUM) (Cronbach's alpha reliability = 0.705) were filled and returned by respondents, and the descriptive statistics of the data were analyzed using IBM Statistical Package for Social Sciences (SPSS®) version 23 software. Most respondents were within 38 and 47 (37.0%), and 28 - 37 (28.0%) years of age, and the majority (73.4%) were female. Many of them (31.8%) were as community health extension workers (CHEW), with only 11.4% and 0.7% as laboratory and pharmacy technicians, respectively. Those with 8 - 13 years (34.6%) and ≥ 20 years (22.5%) of experience on the field were the highest in number, whereby most of them earned between 31,000 - 50,000 (26.6%) and ≥71,000 (24.6%) naira per month. Majority of the respondents (50.5%) showed moderate knowledge level on the disease and its management (mean (±SD) score = 6.87 (± 1.37)) while many of them (91.7%) had good positive attitudes (mean (±SD) score = 23.12 (± 2.06)) and good practices (83.7%) {mean (±SD) score = 13.32 (± 2.10)} towards uncomplicated malaria. The study concluded respondents overall possessed moderate knowledge, good positive attitudes, and practices on uncomplicated malaria treatment management and preventive practices.

INTRODUCTION: The high scourge of malaria in Nigeria has been linked to the inappropriate use of anti-malarial drugs, weather condition of the country, as well as the poverty level of the people [1]. Overcoming the problems of inappropriate use of drugs in managing the ailment is possible when both healthcare and patients have good levels of understanding and attitudes towards the disease and its management, which will influence their treatment practices. In a layman language, an individual knowledge on disease has been described as his understanding of the cause, sign, and symptoms, how to prevent and/or treat the disease, while his attitude could be expressed as the way he/she feels and beliefs toward the disease,

QUICK RESPONSE CODE

DOI: 10.13040/IJPSR.0975-8232.10(1).286-93

The article can be accessed online on www.ijpsr.com

DOI link: http://dx.doi.org/10.13040/IJPSR.0975-8232.10(1).286-93

and lastly practice could be understood as the manifestation of such an individual's understanding and attitudes through the display of his/her actions in relation to the disease [2].

Researchers have reported the presence of interrelationships between the knowledge, attitude, and practice (KAP) variables [3, 4]. Furthermore, its usefulness in cross-sectional surveys has been widely reported, especially in social sciences and public health, for the identification of knowledge gaps and behavioral patterns that influences the management of ailments [5, 6]. This is possible when the outcome measurement tools are used on the right respondents to collect the relevant data that best described such human's characteristics considered to be determinants of the disease under consideration to evaluate their levels of KAP for appropriate tailoring of interventions where needed [7, 8].

Different outcome measurement tools have been widely used in the areas of malaria-related studies both within and outside Nigeria to explore changes in KAP of respondents on malaria management [5, 9 - 13]. However, scanty information on the use of KAP instrument at the primary healthcare (PHC) levels in Plateau state have been observed from the search of previous related studies; hence the present study was aimed at assessing healthcare workers' levels of health-related KAP on uncomplicated malaria treatment in selected PHC facilities in Plateau state, Nigeria.

PATIENTS AND METHODS:

Study Design: A cross-sectional KAP approach was adopted for the survey. This was useful in situation analysis of respondents' existing levels of knowledge, attitudes, and practices relating to uncomplicated malaria disease and its management in PHC facilities of Plateau state.

Study Location: The present study was conducted across twenty-four (24) selected PHC facilities of Plateau state, Nigeria. The state is located between latitude 80º24'N and longitude 80º32' and 100º38' East, with a population of 5,178,712 and occupies 30,913 square kilometers space [14]; with seventeen (17) Local Government Areas (LGA) distributed across three senatorial zones.

Sample Size and Sampling Technique: To ensure that all part of the state was equally represented in the study, a multistage probability sampling techniques including stratified and simple random approaches were employed in selecting the Local Government Areas from which twenty-four (24) PHC facilities were selected for the study [15]. Considering the limited population of the health workers, purposeful sampling [16] methods were used in recruiting trained PHC workers involved in the treatment of uncomplicated malaria in the selected facilities to participate in the study.

Study Population: The study population consisted of the followings:

i. Government PHC facilities in Plateau state.

ii. Trained healthcare professionals involved in the management of uncomplicated malaria in Government PHCs facilities of Plateau state.

Ethical Approval: The study was approved by the Joint Research Review and Ethics Committee, Research Management Centre (RMC), MAHSA University, Malaysia (Ref. number: RMC/EC01/ 2016; Dated 25/11/2016).

This approval was subsequently used to obtain permission from Plateau State Ministry of Health, Jos, Nigeria, and the directors of PHCs of the various selected Local Government Areas (LGAs) before data collection.

Study Instrument: Previously designed and validated self-reported instruments known as HKAPIUM with Cronbach's alpha reliability of 0.705 was used for data collection in the present study. The instrument consisted of four sections: respondents' socio-demographic, knowledge of uncomplicated malaria and treatment, attitude towards, and practice during treatment of the disease.

Socio-demographic section consisted of five (5) items that inquired some basic information on respondents including gender, age, occupation, duration of experience (year(s)), and a monthly salary (naira). The knowledge section had ten (10) items to test respondents' basic knowledge on the cause and transmission, sign and symptoms of uncomplicated malaria, and diagnosis and recommended anti-malarial drugs for the treatment of the disease.

Five (5) items were used through 5-points Likert's scale to assess respondents' attitude toward uncomplicated malaria and its management. For ease of understanding by the respondents, all the items were presented as positive statements.

Respondents' prescription and diagnostic practices in the management of uncomplicated malaria had been evaluated earlier under retrospective studies aspect of the main study. This present approach tried to evaluate the levels of interactions between healthcare professionals and patients during their management practices, especially regarding instructions on how to take medications and preventive measures, which could influence patients' treatment practices.

The practice section of the HKAPIUM consisted of three (3) items presented in 5-points Likert's scale format for assessment of healthcare professionals-patients relationships during management practices.

Data Collection: A total of 324 trained healthcare workers were identified qualified to participate in the study across twenty-four (24) selected PHC facilities in Plateau state; out of which 289 (89.2%) of them consented to participate in the study and were administered HKAPIUM study instrument between May and July 2017, who filled and returned immediately to the researcher for analysis.

Data Analysis: The generated data were manually sorted and entered into Microsoft Excel software based on coded format and transferred into appropriate software on a secured laptop, and the variables were quantified and reported by descriptive statistics using IBM Statistical Package for Social Sciences (SPSS®) version 23 software.

The socio-demographic, knowledge, attitude and practice data of respondents were presented in frequencies and percentages.

Knowledge categorization of the respondents was based on their levels of correct responses to the 10 items used for the knowledge assessment which were assessed using 3 options of 'yes', 'not sure' or 'no'. To ensure that objective knowledge of the respondents was assessed, their responses were dichotomized by assigning 1 point to respondents who ticked 'yes' as their correct answer, and 0, 0 point given to those that selected 'not sure' and 'no' options respectively; in all, there was a total of possible maximum correct score of 10. Those who answered between 8 and 10 items correctly had scores of between 8 and 10, and were categorized as having good knowledge, while those that got between 5 and less than < 8 items right were allocated a score of between 5 and less than 8 points, and were considered to have moderate knowledge.

Similarly, those who got less than < 5 of the items correctly had a total score of less than 5 and were categorized as having a poor understanding of uncomplicated malaria and its management [17, 18].

The scoring system for the 5 attitudes-related items on the 5-points Likert's scale was based on the levels of agreement of the respondents to the statements, which was categorized into strongly agree = 5 points, agree = 4 points, neutral = 3 points, disagree = 2 points, and strongly disagree = 1 point; and there was a total of possible maximum score of 25, with scores of < 13, 13 - < 19, and 19 – 25 fall under poor, moderate and good attitudes.

Lastly, 3 statements indicating uncomplicated malaria-related practices were scored for each respondent on 5-points Likert's scale as follows: when a respondent chose the option indicating that he/she 'very often' performed good practice, for instance in instructing the patients on how to take antimalarial drugs during their practices, a score of 5 points was given; similarly, 4, 3, 2, and 1 score were respectively given if they selected 'often', 'sometimes', 'rarely' and 'never' as their correct responses, and these were used in categorizing the overall practices scores (maximum scoring = 15) for each respondent into poor (9 score), moderate (9 - < 12 score) and good (12 – 15 score) levels of practice.

RESULTS:

Socio-Demographics Characteristics: Two hundred and eighty-nine (289; 89.2%) healthcare workers participated in the study, with the majority as female (73.4%). About 37.0% of them fall within the age brackets of 38 and 47 years old, followed by those in the age ranges of 28 - 37 years old (28.1%), while the least was aged ≥ 58 (1.4%). In term of occupation, many of them (31.8%) were community health extension workers (CHEW),

followed by others such as environmental health officers and junior environmental health officers (21.8%), and registered nurse and midwives (21.5%).

TABLE 1: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS (N = 289)

Variables	Total (N)	Percentage (%)
Gender		
Male	77	26.6
Female	212	73.4
Age (years old)		
18 – 27	29	10.0
28 – 37	81	28.1
38 – 47	107	37.0
48 – 57	68	23.5
≥ 58	4	1.4
Occupations		
Doctor	0	0.0
Pharmacist	0	0.0
Registered Nurse and Midwife	62	21.5
CHEW	92	31.8
Junior CHEW (J-CHEW)	37	12.8
Lab Technician	33	11.4
Pharmacy Technician	2	0.7
Others	63	21.8
Duration of experience (yr)		
≤ 1	10	3.5
2 – 7	60	20.8
8 – 13	100	34.6
14 – 19	54	18.7
≥ 20	65	22.4
Monthly Salary		
≤ 10, 000	30	10.4
11,000 – 30,000	57	19.7
31,000 – 50,000	77	26.6
51,000 – 70,000	54	18.7
≥ 71,000	71	24.6

Only 11.4% and 0.7% of the respondents were laboratory and pharmacy technicians, respectively, with no doctors or pharmacists available in any of the study facilities. When asked about their years of experiences, majority of them had been in service for between 8 - 13 years (34.6%), and ≥ 20 years (22.4%), followed by those with years of practice ranging from 2 - 7 years (20.8%), with only a few (3.5%) having the least number of years of experience for ≤ 1. In term of their monthly salaries in naira currency, most of them testified earning between 31,000 - 50,000 (26.6%) and ≥ 71,000 (24.6%), with 10.4% collecting the least salary of ≤ 10, 000 naira **Table 1**.

Respondents' Knowledge: The respondents' percentage correct responses to cause of the disease (*Plasmodium falciparum*) and female Anopheles mosquitoes as the main vector for transmission were 89.6% and 95.5%, respectively, which were good **Table 2**. Regarding the signs and symptoms of the disease, they were able to recognize fever (82.4%), body weakness (80.6%), and headache (82.0%) as the correct symptoms for uncomplicated malaria, in addition to increased respiratory rate (70.9%). However, only 12.5% and 13.8% of the study populations could identify the presence of anemia and confusion as signs of complicated malaria respectively. Furthermore, the majority of them (90.3%) knew that artemisinin-based combination drug was the recommended drug for uncomplicated malaria compared to their understanding of light microscopy as the recommended diagnostic method (69.9%).

TABLE 2: RESPONDENTS' KNOWLEDGE ON TRANSMISSION AND TREATMENT OF UNCOMPLICATED MALARIA (N = 289)

Knowledge statements	Yes N (%)	Not sure N (%)	No N (%)
Cause and transmission			
Plasmodium falciparum is the most common parasite that causes malaria in Nigeria	259 (89.6)*	12 (4.2)	18 (6.2)
Female Anopheles mosquitoes transmit malaria parasite	276 (95.5)*	5 (1.7)	8 (2.8)
Signs and symptoms			
Fever is a symptom of uncomplicated malaria	238 (82.4)*	13 (4.5)	38 (13.1)
Body weakness is a symptom of uncomplicated malaria.	233 (80.6)*	16 (5.5)	40 (13.9)
Headache is a symptom of uncomplicated malaria	237 (82.0)*	18 (6.2)	34 (11.8)
Anaemia is a symptom of uncomplicated malaria	234 (81.0)	19 (6.6)	36 (12.4)*
Confusion is a symptom of uncomplicated malaria	222 (76.8)	27 (9.3)	40 (13.9)*
Increased respiratory rate is a symptom of complicated malaria	205 (70.9)*	32 (11.1)	52 (18.0)
Diagnosis and antimalarial drugs			
Light microscopy is the recommended method for malaria diagnosis	202 (69.9)*	36 (12.5)	51 (17.6)
Artemisinin-based combination therapy (ACTs) is the recommended drug for uncomplicated malaria in Nigeria	261 (90.3)*	10 (3.5)	18 (6.2)

Note: * = Correct responses

Malaria-Related Knowledge Category: With overall mean (± SD) knowledge score of 6.87 (± 1.37), majority of the respondents (50.5%) scored between 5 and less than 8 points and were categorized as having moderate knowledge of the disease and its management, followed by 43.3% of them who scored between 8 and 10 points that were considered having good knowledge on the disease and its management. Only 6.2% of the study populations fall in the category of those that got less than 5 points and were considered as having poor knowledge **Fig. 1**.

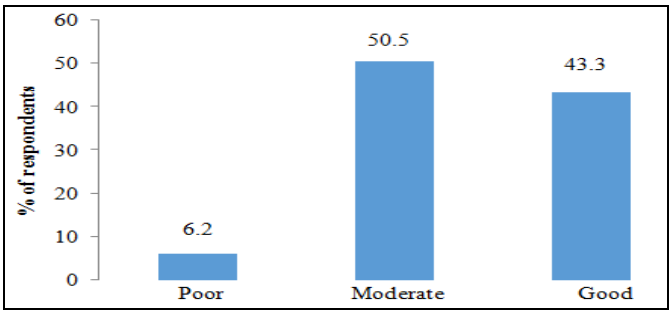

FIG. 1: KNOWLEDGE LEVELS CATEGORISATION OF RESPONDENTS (N = 289)

Respondents' Attitude Toward Uncomplicated Malaria: The respondents' general attitudes to the individual item were good, that more than 90% of them possessed good attitudes towards the disease and its management based on the responses to the attitudinal items **Table 3** with overall mean (± SD) score of 23.12 (± 2.06).

TABLE 3: RESPONDENTS' ATTITUDES TOWARDS UNCOMPLICATED MALARIA AND MEDICATION (N = 289)

Attitudinal statements	Strongly Agree + Agree on N (%)	Neutral N (%)	Disagree + Strongly Disagree N (%)
Malaria is a serious problem to the society	283 (97.9)*	4 (1.4)	2 (0.7)
Primary health care clinics can provide good care for malaria illnesses	285 (98.6)*	4 (1.4)	0 (0.0)
The appearance of the clinic and personality of the providers influences patients' patronage to facilities	276 (95.5)*	9 (3.1)	4 (1.4)
Being polite to your clients or the caregiver is a key ingredient when attending to them in the PHC	283 (97.9)*	4 (1.4)	2 (0.7)
Malaria can be prevented by educating the community on preventive measures	284 (98.3)*	3 (1.0)	2 (0.7)

Note: * = Correct responses

Malaria-Related Attitude Category: The attitudinal categorization of respondents showed that majority of them (91.7%) agreed with all the five (5) items set to assess their attitudes toward the disease and its management, which implied that they had good positive attitudes in their practices as shown in **Fig. 2** below.

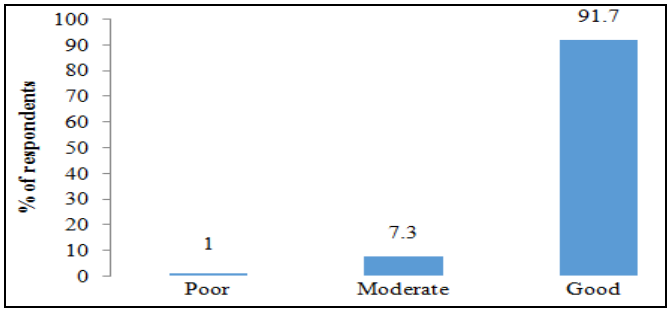

FIG. 2: ATTITUDE LEVELS CATEGORISATION OF RESPONDENTS (N = 289)

Respondents' Practices: The results showed that the overall respondent's practices in rendering the required services to their patients were good. Most of them reported writing (88.5%) and explaining (87.0%) to patients on how to take their medications, in addition to advising them on preventive measures (93.8%) **Table 4**.

TABLE 4: RESPONDENTS' PRACTICES DURING UNCOMPLICATED MALARIA MANAGEMENT (N = 289)

Practice statements	Very Often + Often N (%)	Sometimes N (%)	Rarely + Never N (%)
I always write instruction to patients on how to take antimalarial drugs	256 (88.6)*	20 (6.9)	13 (4.5)
I ensure that patients are counseled on how to use antimalarial drugs and their expected side effects	260 (90.0)*	16 (5.5)	13 (4.5)
I do advise my patients to always sleep under mosquitoes' nets	271 (93.8)*	6 (2.1)	12 (4.1)

Note: * = Correct responses

Malaria-Related Practice Category: The majority of the participants' responses (83.7%) to all the three (3) practice-related items were in accordance to the required professional services that should be rendered to patients towards ensuring that they take their medications and preventive measures

appropriately, with overall mean (± SD) score of 13.32 (± 2.10) **Fig. 3**. Hence, they were considered as optimally rendering their services to their clients. Few of them were categorized as rendering moderate (9.7%) or poor (6.6%) services during their treatment practices.

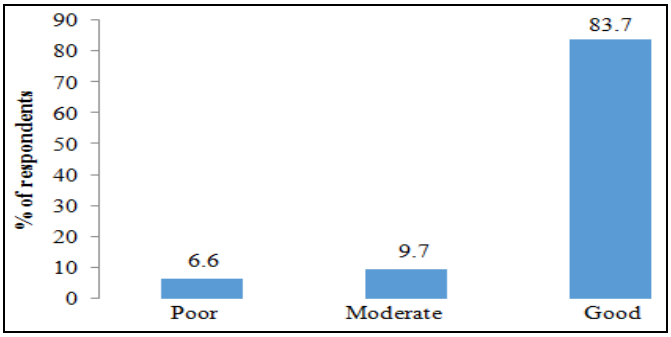

FIG. 3: PRACTICE LEVELS CATEGORISATION OF RESPONDENTS (N = 289)

DISCUSSIONS: The quality of services rendered by healthcare workers in the management of ailments depends on their knowledge and attitude levels toward the disease and its medications [19]. The present study provided an insight into KAP of PHC providers on uncomplicated malaria management in Plateau state. The results showed more presence of female (73.4%) then male (26.6%) health workers, which could be of advantage in overcoming issues of social or cultural beliefs reported to be a hindrance for some women and their children to present themselves to male health workers for necessary consultations, and they were mostly the highest populations that patronize health facilities for treatment compared to their male counterparts [20, 21].

The observed moderate knowledge gap of most of the respondents (50.5%) could be due to their inability to differentiate signs and symptoms of uncomplicated malaria from those of complicated ones, despite their good understandings on the cause, and its transmission. The poor knowledge gap could result in the late recognition of any signs of severe conditions which are mostly caused by the deadly parasite known as *Plasmodium falciparum*, leading to rapid progression into the complicated stage of the disease, resulting into serious systemic complications and organ failures leading to death [22].

Furthermore, majority of the respondents (90.3%) knew that artemisinin-based combination drug was the recommended drug for uncomplicated malaria, and this result was in agreement with similar study conducted by Bamiselu *et al*., [23] in Ogun state, Nigeria, where about 85.7% of the public health facility workers were able to recognize ACT as the recommended antimalarial drugs. Considering the importance of confirmatory diagnosis in the effective treatment of uncomplicated malaria [24], the 69.9% of respondents who recognized light microscopy as a diagnostic method for the disease was not encouraging compared to result of a similar study conducted in India where about 80.0% of health workers recognized diagnostic methods for malaria [25]. Though, this might be linked to the observed high patronage of a rapid diagnostic test (RDT) across the PHC facilities in the rural areas of the state, which had been reported to be more consistent and lead to a high detection rate of the *falciparum malaria* parasite, compared to microscopy [26]. The importance of diagnosis had been emphasized by both the World Health Organization (WHO) and Nigeria malaria treatment guidelines as a necessary step in identifying the presence or absence of the parasite before administration of the recommended drugs to the patients to avoid the possibilities of the malaria parasite becoming resistant to the drug [27, 28].

Hence, practicing by malaria treatment guideline implies effective diagnosis and treatment of the disease with appropriate medicines, which is a major strategy for the control of the disease [29]. On average, the majority of the respondents (91.7%) had good positive attitudes towards rendering their services to patients, which was also translated into the likelihood of good practices in managing their patients. The recognition of the disease as a serious problem to the society by almost all of them (98.0%), and also admitting (98.6%) that they were qualified to handle the management of the disease could be a stimuli for them to practice in accordance with current treatment guidelines and also the need to satisfy their patients.

They need to impress the patients in their own and PHC appearance, being polite to them, adequate labeling of the medication containers, counseling patients on how to take the medication, adequate information provision on the benefits and risks of the drugs, in addition to education on practicing preventive measures [30]. This has been shown to

create more patients' trust in the health workers' judgment on the ailment and motivation in taking the medications accordingly [31].

CONCLUSION: The studies showed that even though the majority of the healthcare workers had moderate knowledge on uncomplicated malaria and its prevention, their attitudes and practices in their professional services to malaria-infected patients were good. More interventions in the knowledge-related aspects may further improve awareness and clearing any misconceptions about the disease and its management to patients, which later improve their quality of managing the disease as outlined in the treatment guideline.

ACKNOWLEDGEMENT: The authors sincerely appreciate all the in-charges of the Primary Healthcare facilities and their staff who were so kind and supportive during the data collection. We also wish to thank Pharm. Kaben and Jingina for their immense contribution during the field work.

CONFLICT OF INTEREST: The authors confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.

FUNDING: This research received no specific grant from any funding agency in public, commercial or not-for-profit sector.

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How to cite this article:
Ismail NE, Jimam NS and Dapar MLP: Assessment of primary health care workers' knowledge, attitudes and practices on uncomplicated malaria management in plateau state, Nigeria. Int J Pharm Sci & Res 2019; 10(1): 286-93. doi: 10.13040/IJPSR.0975-8232.10(1).286-93.