Sahel Journal of Life Sciences FUDMA (SAJOLS)
June 2024 Vol. 2(2): 8-16
ISSN: 3027-0456 (Print)
ISSN: 1595-5915(Online)
DOI: *https://doi.org/10.33003/sajols-2024-0202-02*

Research Article

Studies on the Knowledge, Attitude and Perception (KAP) for Malaria among Patients Attending PHCs in Jos, Jos-North LGA, Plateau State

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ABSTRACT

Malaria is still a major public health challenge in Nigeria and other sub-Saharan and tropical countries. The study is aimed at determining the Knowledge, Attitude, and Perception (KAP) of malaria among 200 in and outpatients attending selected Primary Health Centers (PHC) in Jos North Local Government Area (LGA), Plateau State, Nigeria. A hyperendemicity 300(52%) with intense densities across those examined individuals computing across sex, age, and occupational groups at no significant statistical differences (PD 0.05), even though there were significant statistical differences (P<0.05) between the PHCs, Dogo-Agogo, Nasarawa, and Apata. It became necessary to analyze their inclinations to these results through only 200 of the 300 in and outpatients, alongside their specialized KAP using well-designed questionnaires. Their Yes, No, and Uncertain responses collated speak for the reasons for the hyper-endemicity and consequential high densities across the sociological indexes examined for the disease in the study. Adequate attention to discouraging dwellers of the study location from complacencies to adherences towards medical experts' prescribed treatments, and researchers commended preventive measures away from ignorance of the debilitating and disgusting mortality and inability effects impacted on their lives by the hypoendemic parasites through body exposures to these transmitters, to better their general health status, and beyond, became measure advocacy, by well-meaning individuals, non-governmental and governmental organizations and agencies, be they local, national and international.

Keywords: Hyper-endemicity, Mortality, Morbidity, Debilitating, Advocacy, Attitude, Perception

Citation: Nwibari, B.M.W., Shafa, A.B., Joachim, B.N., Luka, I., Ushie, B., Moses, J. and Nanvyat, N. (2024). Studies on the Knowledge, Attitude, and Perception (KAP) for Malaria among Patients Attending PHCs in Jos, Jos-North LGA, Plateau State. *Sahel Journal of Life Sciences FUDMA*, 2(2): 8-16. DOI: *https://doi.org/10.33003/sajols-2024-0202-02*

INTRODUCTION

It is imperative to re-emphasize on preventive measures and treatment regimens for malaria and the individuals' concerns towards adherence to them. This should be the main efforts by renowned health organizations such as World Health Organization (WHO), TDR and others. The knowledge of participants about malaria endemic foci directly influences their general attitudes towards the treatments using quinine and preventive advocacies. Ignorance exhibits a direct impact; hence, they suffer hyper-endemic prevalence and density of the disease morbility and mortality Ibrahim et al. (2022). The first effective treatment for malaria came from the bark of the Cinchona tree, which contains quinine. This tree grows on the slop of the Audes, mainly in Peru. The indigenous people of Peru made a tincture of Cinchona to control fever. Its effectiveness against malaria was found, and the

Jesuits introduced the treatment to Europe around 1640; by 1677, it was included in London as an antimalarial treatment (Kaufuian & Ruiveda, 2005; Boualam et al., 2021). It was not until 1820 that the active ingredient, quinine, was extracted from the bark, isolated and named by the French chemists Pierre Joseph Pelletier and Joseph Bienaime Caventou (Kyle & Shampe, 1974). Quinine became the predominant malaria medication until the 1980s (Achan et al., 2011; Tse e al. 2019). Arteisirinus, discovered by Chinese Scientist Tu Xouyou and colleagues in the 1970s from the plant Artemisia annum, became the recommended treatment for Plasmodium falciparum malaria, administered in combination with other antimalarial, as well as in severe disease HSU (2006).

Preventive or control measures for malarial infection stand the best before treatment. Of course, prevention is better than cure. In 2009, the National Malaria Control Programme developed a strategic plan (2009-2013) with the goal of reducing malaria-related mortality in Nigeria by 50% by the end of 2013. To achieve this goal, the following targets were projected; At least 80% of households have two or more insecticide-treated bed Nets (ITNs); At least 80% of pregnant women and children under five sleeps under an ITN; IRS covers twenty per cent (20%) of households nationwide as a complementary strategy to ITNs and where conducted, at least 85% of targeted structures were adequately sprayed. At least 80% of pregnant women received two doses of Interruptive Preventive Treatment (IPT). At least 80% of patients with fever attending any health facility received an appropriate malarial diagnostic test free, and those testing positive are effectively treated face, according to the National Treatment guidelines. Though widespread, there has been some evidence of low coverage of ITN use. Malaria control and interventions have been implemented and, in the recent past, intensified as an effort to attain the World Health Assembly, Roll Back Malaria, and Millennium Development universal targets with the aim of reducing and interrupting disease transmission in sub-Saharan Africa. Jos North is a malarial endemic focus in which malaria control measures such as the use of Artemisinin combined Therapy (ACT), the use of insecticide-treated Bed Nets (ITNs), and Intermittent Preventive Treatment (IPT) for pregnant women and children have been implemented. In spite of these efforts, the overall prevalence of malaria infection from studies recently conducted in Jos North remains high among the under-five children (38-56%) (Okoli & Solomon, 2014).

MATERIALS AND METHODS

Study Area

This study on the Knowledge, Attitude and Perception (KAP) about malarial infection among patients was conducted in Jos North Local Government of Plateau State, Nigeria. Jos is located at latitude $9^{o}55^{o}$ to 10^{o}N and Longitude $8^{o}52^{o}$ to 9^{o}E in the middle belt, North central of Nigeria. The city has a population of 900,000 residents, based on the 2006 census, with an altitude of 4,062 feet (1,217m) above sea level. Jos, the metropolis of Plateau State capital, is in the North Central geopolitical zone of Nigeria. It also serves as a referral centre for both government and private healthcare facilities within and outside the country. The vegetation is a savannah and a mean annual rainfall of 250cm. Malaria transmission is throughout the year, owing to persistent twining sites for breeding and activity Nanvyat et al. (2017).

Construction and Administration of Questionnaires for KAP Studies

A well-structured questionnaire targeted at extracting the required and suitable information from from 200 of the 300 in and outpatients, earlier examined for the disease during their admissions and visits to the three selected primary health Centers. All 200 patients selected for the study were administered the questionnaire as respondents. Proper demographic records formed integral information extracted through the varying suitable questions tailored towards achieving the main aim and objectives of the study. The oral interview section was to ascertain aspects of the required information touching or specified socio-economic and sociocultural factors associated with the transmission of malarial infection in the area.

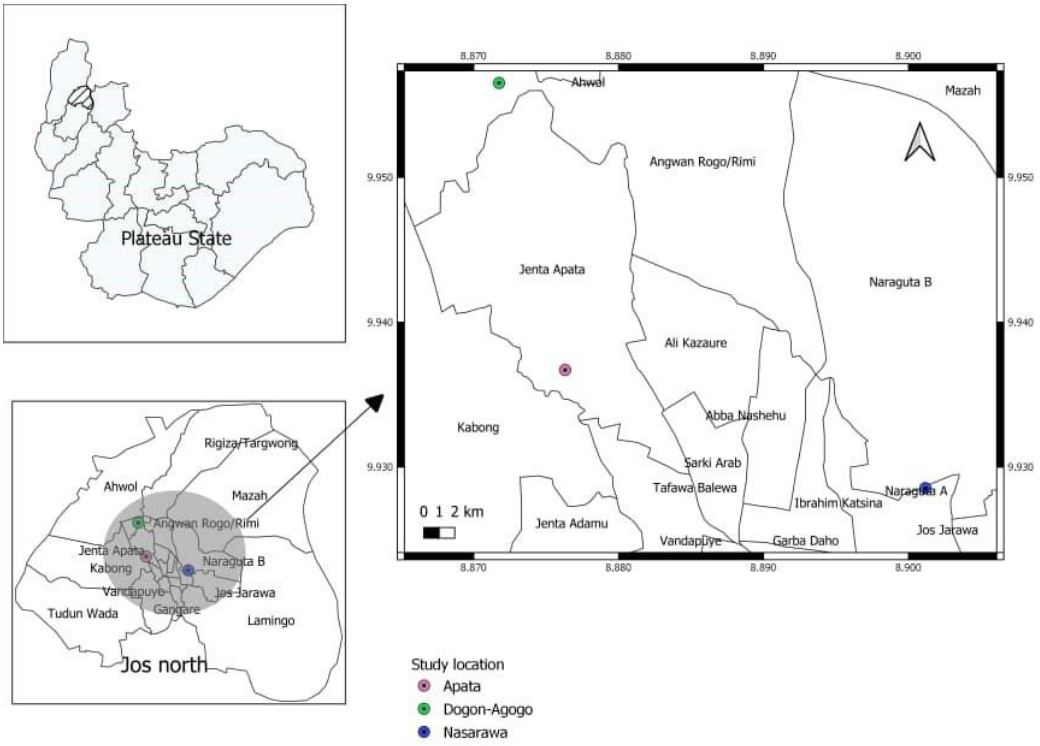

Figure I: Map showing the Study Area

RESULTS

Demographic information of respondents of in and outpatients attending PHCs in DA, N and Aim Jos North, Plateau State

Results of both socio-economic and sociocultural effects from the demographic information, as responses of patients for malaria infection under Medicare in three selected areas under consideration, were aligned with their sex, age, educational and occupational groups (Table 1). Thus, these results provided baseline data in response forms, analyzed under these sociological indices of the patients, using a simple percentage (%) analytical method. Two hundred of the three hundred (300) patients, who were randomly selected to respond to carefully tailored questions, within their sexes revealed that, up to 47(23.5%) males were interrogated in line with their health status towards malaria infection, which was less, compared to 153(76.5%) females analyzed for their health inclinations for malaria infection, leading to their attending the PHCs within the study. Results further revealed that age-group respondents, of the same 200 respondents' awareness of 20-30years, had higher knowledge, 92(46.0%) of the disease infecting them as malaria, followed by patients >19 years with 48(24%) and then those within the ages between 31-40 years had very close ties 46(23%) with the later showing their level of awareness in line with malaria infection among them. Under occupational groups, information representing their responses about their knowledge, attitude and perception of malaria infection was more certified by civil servants and business people 69(34.5%), while those without any form of education were 15(7.5%). See Table 1 below.

Results of Study for Respondents, the 200 Patients attending the Selected PHCs in the Study Area

This result show respondents' knowledge about malaria infection, which they received varying levels of health or medicates (Table 2). These were baseline data collated from specified questions, as reflected in the constructed and administered questionnaires proved higher, as 155 (77.5%) respondents' responses were "Yes" to show they knew about the disease. Only 45 (22.5%) said "No", claiming ignorance of the malaria infections. While 125 (62.5%) knew that malaria resides in human blood, only 53(265) and 22(11%) claimed that malaria resides in the saliva and stomach of humans, respectively. Among the respondents who visited the various PHCs under study, 100(50%) correctly attributed infection of malaria to be caused by a bite from infected Anopheles mosquitoes, while only 23(11.5%), 52(26%), 15(75%) and 10(5%) of them attributed to infection to evil spirits, poisonous food,

bad air and sins towards God, respectively. Furthermore, pains are two of the symptoms of malaria. While 73(36.5%) and 5(2.5%) also mentioned that fever, nausea, and vomiting were other symptoms of malaria, a few wrongly mentioned pale eyes as a symptom of the disease.

More responses by respondents showed that 11(57%) had the proper knowledge that the bites (persistent) of the infected Anopheles mosquitoes are the mode of transmission of the plasmodium malaria parasites. In comparison, up to 62(31%) and 24(12%) considered it is made of transmission to be through inhalation of bad air and blood transfusion, which were partially incorrect and covert, respectively, even though not the most proficient mode of transmission, up to 121(60.5%) highly identified anaemia as one of the consequences of malaria infection to humans, while 52(26%) and 27(13.5%) wrongly indicated Abortion and frequent steeping as its consequences. Again, 125(62.5%) had good knowledge that malaria parasites reside in human blood in another round of questions responses to authenticate the earlier responses to the same questions. While 53(26.5%) and 22(118) also further wrongly claimed that the parasites live in human salvia and stomach, respectively, 100(50%) among the respondents still rightly attributed the malaria infection to the bits (consistent exposure) of infected anopheles mosquitoes, while only 23(11.5%), 52(26%), 15(7.5%) and 10(5%) still wrongly affirmed that the parasites infect humans through attacks by evil spirits, eating poisonous food, breathing in bad air and committing sin against God respectively. Another set of 83(41.5%) respondents, still against God, reiterated that severe headaches and general and abdominal pains are symptoms of malaria. In comparison, 73(36.5%), 39(19.5%) and five also correctly insisted that fever and chills, nausea and vomiting are other symptoms of the infection. However, only 5(2.5%) still wrongly insisted that the pabe eye is a symptom of malaria. Others, about 121(60.5%), still reechoed anaemia as a consequence of having malaria, while 52(26%) and 27(13.5%) repeated wrong, Abortion and frequent sleeping as its results. One hundred and thirty-seven, 137(68.5%) rightly mentioned that the wet season exhibited a higher rate of malaria infection due to water logs everywhere. In comparison, 63(31.5%) also rightly saw the dry season as another period that enhances transmission of the parasites, in that the mosquito's 3333 adult stage that can comfortably transmit the infection is mainly in the dry season. Furthermore, 68(34%) respondents rightly believed that during stagnant water bodies, mound living houses are a means of controlling disease transmission. In comparison, 23(11.3%) and 24(12%) rightly subscribed to using protective clothing that prevents regular mosquito bites, intermittent use of insecticide, and regular sleeping under well-treated bed nets as the other perfect means of controlling the spread and transmission of malaria respectively.

Results of Respondents' Attitudes and Perceptions towards Malaria

This show that 102(51%) of the respondents rightly perceived that malaria infection should be treated with care and ensuring their complete treatment by taking the total dosage of prescribed indication of curb upsurges, while others 23(11.5%) rightly view avoidance of mosquito bites and 26(13%) wrongly considered quarantine and 49(24.5%) to be kind to mosquito's bites in their attitude and perception (Table 3). In treating malaria, 130(56.5%) rightly consented to the use of antimalarial drugs as attitude patients towards malaria infection, while 53(26.5%), 28(14%) and 6(3%) rightly the opinion to use injection, herbs for malaria treated, except the least number and percentage above that wrongly suggested that nothing should be used in treating malaria infection and that it will just stop on its own 127(63.5%) rightly approved of patient vendors as a source of medication for the treated, while 54(27%) also rightly advocate clinics, and 17(85%) also rightly advised treatment in government-owned hospitals for malarial treatment. Finally, 85(42.5%) rightly advocated immediate sought of treatment, while 70(38%), 38(19%) and 1(0.5%) suggested waiting until the next day to treat malaria and to do nothing at all, respectively.

Table 1. Demographic Information of Respondents Attending Apata, Dogon-Agogo and Nasarawa PHCs in Jos North

Parameters	No of Respondents	Percentage %
Sex		
Male	47	23.5
Female	152	76.5
<19	48	24.0
20-30	92	46.0
31-40	46	23.0
>40	14	7.0
Total	200	80.0%

Occupation	No of Respondents	%
Unemployed	28	14.0
Civil servants	69	34.5
Business people	69	34.5
Teachers	30	15.0
Artisan	04	2.0
Total	**200**	**94.0%**

Table 2 Study of Respondents' knowledge of malaria

Parameters	No of respondents	Percentage %
No	Responses	
Malaria parasite resides where in the body	155	77.5
	45	22.5
Blood	125	62.5
Saliva	53	26.5
Stomach	22	11.0
Cause of Malaria is Evil Spirit	23	11.5
Poisonous food	52	26.0
Malaria parasite	100	50.0
Bad air	15	7.5
Sin against God	10	5.0
Symptoms of malaria include:		
Fever and chill	73	36.5
Severe headache and pains	83	41.5
Nausea and vomiting	39	19.5
Pale eyes	5	2.5
The mode of transmission is through		
Blood transmission	24	12.0
Inhaling bad air	62	31.0
Site of infected mosquitoes	114	57.0
What are the consequences of malaria infection on life		
Anaemia	121	60.5
Abortion	52	26.0
Frequent sleeping	27	13.5
What reasons do we have for the high rate of malaria infection		
Wet	137	68.5
Dry	63	31.5
How do we prevent or control malaria		
Use of protective clothing	23	11.5
Clearing stagnant waters	68	34.0
Treat infected person	62	31.0
Use insecticides	23	11.5
Use of treated bed nets	24	12.0

Table 3. Study of Respondents' Attitude towards Malaria Infection in Jos North

Parameters	No of respondents	Percentage %
How should we relate to malarial patients		
Avoid them	23	11.5
Quarantine them	24	13.0
Be kind to them	49	24.0
Ensure their full treatment	102	51.0
Any home management?		
Yes	159	79.5
No	30	15.0
Not certain	11	5.5
What is your medication for malaria?		
Tablets	113	56.5
Infection	53	26.5
Herbs	28	14.5
Do nothing	06	3.0
What is your source of medication?		
Patient vendors	127	63.5
Clinics	54	27.0
Government hospitals	17	8.5
Herbal points	02	1.0
How soon do you treat the onset of malaria?		
Immediate after onset	85	42.5
The next day	76	38.0
When it is critical	38	19.0
Take no action	01	0.5

DISCUSSION

The present study considered responses by 200 patients to questionnaires about malaria infection, revealing their knowledge, attitude and perception (KAP) as they attended the various Primary Health Centers (PHCs) to clarify the reasons for the hyper-endemic status of the disease. This agreed with the findings of (Amadi, 2000; and Udonsi & Odey, 1999), who confirmed in their separate works the similar clinical symptoms of malarial infections, resulting in higher symptoms physically observed in parts of River State. They said they included headache, fever, and chills, which were slightly responded to in the current study. Under age groups also reflected a confirmation of 63.02% *Plasmodium* parasites range for these clinical signs, as well as 47.0% rate for those who tested positive for malaria, as observed physically manifesting the associated clinical signs including abdominal pain, which therefore agrees with the study, that these positive cases where also recovered from blood samples, as correctly responded by the high number of the participants in the study, implying that these patients, who were rightly treated as malarial patients, hence the manifestation of these confirmed symptoms (Udonsi and Odey, 1999; Udonsi, 1981; Udonsi, 1999).

It was further observed that in the occupational groups as outlined in this study, 60.1% (Udonsi 1999) clinical symptoms rate agreeing in line with 73(35.5%) that was observed in the study, confirmed that by (Maegraith, 1984), which also supported symptoms the findings as responded to, by the higher pursuit large respondents.

Responses were relatively high in line with the respondent's knowledge about malaria and its debilitating nature on lives, which still did influence their not being infected with infection, especially because of their light attitude and perception towards the preventive and control measures that it does not need the varying posture lifestyle in terms then behavioural wherefore all are 77.5% gave a "Yes" answer irrespective sex, tendencies, a lower percentage rate of 22.5% claimed complete ignorance about the malaria infection. It was only further observed that this had a consequential hyper-endemic status for the disease in the study, as further reported by Amadi et al. (2002) and Nwibari *et al*.,2001 & 2005 in their separate findings whereby in 2005 and 2001 where a high or hyper-endemicity 50.8% of malaria was obtained in Ogoniland Niger Delta, and 53% prevalence rate for malaria in his findings on its Medicare by practitioners in rural areas, of Imo State, and 60% in

studies on the pattern of plasmodium falciparum in two communities of Yenagoa, Bayelsa State, respectively. However, it was further confirmed that the prevailing endemic malaria in these areas was gender-specific and age-dependent, which also agreed with this study. They both reported sex and age-related prevalence of the infection to reflect 92(12.3%) for males, who showed more susceptibility and positivity among the number of positive cases observed in their study females 56 screened for the malaria infection in the different study locations. Their studies covered. More males iodinated their blood samples for screening for the disease than females, which disagreed with this study, where males and females were reported. Under age-related prevalence for malaria in their study, it was observed that the age group 31-4 years, who in this study had higher responses in terms of their knowledge of the disease, exhibited a higher number terms of their knowledge of the disease, exhibited a higher number (283) of examined persons, as volunteers where blood samples were screened, revealing a chronological highest prevalence of 151 (20.6%). In essence, it was observed in this study that the higher responses of 155 of 200 respondents did not prove their reasons for the hyper-endemicity of how much knowledge of the disease, the polenta, therefore opening the basis for further investigation for the high prevalence for the infection that, ordinarily, should impact more positively on the rate of infection in the study, rather than increased and hyper-endemicity obtained. However, this higher response of 'Yes' knowledge was countered by the attitude and perception, thereby resulting in their higher result in the study in Jos North.

The obtained results related to socio-economic and sociocultural activities that enhanced the transmission of the disease, in agreement with these studies and the higher responses obtained by the patients, consequential to their higher susceptibility to the infection, Nwibari *et al.*, (2013). Further supported this study, with a higher positivity of such activities to boost the disease infection. It was therefore observed that the various parameters analyzed, in line with the positive responses of the patient's attitude and perception in this study, inspired higher knowledge and became the main reasons for the disease hyper-endemicity. They confirmed in their study that respondents for the various socio-economic and sociocultural activities in the study location were confident with the promotion of higher transmission of malaria activities, such as reflected in highly obtained data for mosquito control methods, at 59.2%, settlement pattern 49.6%, Religious Activities 52.9% and finally the varying festivities/celebrations as well as leisure hours, 58.3%, all projecting a higher espouses towards the disease higher prevalence in their studies, thereby strengthening the favourable position of response to similar socio-economic and sociocultural activities of the patients attending PHCs in Jos North of Plateau State, also raising the prevalence of malaria in the study.

Similarly, their higher responses to the likely cause of malaria to be from *Plasmodium* parasite transmissions among dwellers in the study areas 100(50%) and persistent mosquitoes bite 114(57.0%) due to suitable breeding sites for these *Anopheles* mosquitoes and the persistent exposure of the respondents to such suitable reason and environment the promoted the hyper-endemicity of malaria in this study, agreed with Eincton (1992), Nwoke (2004) and Castro (2017) in their different studies. The former also agreed with the present studies in reports on the high prevalence status of malaria regarding the sociocultural activities of diverse celebrations and festivities that promoted the spread and regular bites of mosquitoes in the highly susceptible environment as in those of the present study in Jos North. While the latter confirmed the impact of the changing human environment, the support breeding sites for mosquito and their regular invasion of human dwellings, especially at night, as inhabitants sleep in their living houses, some uncompleted buildings, open dwelling places, or close to bushes or water-logged areas, on heavy vegetation, where mosquitoes breeding sites are also promoted, thereby influencing the hyper-endemicity of malaria in their study as agreed with the present study.

CONCLUSION

In conclusion, the results of the responses of 200 patients with varying demographic status reflect their knowledge, attitudes and perception about mosquito bites as the main sources of transmission of *Plasmodium falciparum*; they were also confirmed as the implicated parasites of malaria. The same way their attitude of the respondents towards questionnaires relating to where the parasites live in the human body in the blood, which was screened for the parasites, and their higher consideration for the most popular malaria symptoms, in line with their understanding of malaria, confirmed to the higher responses in regards to the knowledge for the malaria disease in the study. However, for the treatment and control or preventive measures they sight abused for the malaria infection, which all several the awareness towards ways of treating and preventing it, thereby, proves a higher (KAP) of the respondents to the malaria infection in the study.

AUTHOR'S CONTRIBUTION

NBMW and SAB conceptualized and designed the study. SAB and LI participated in fieldwork and data collection. UB and MJ performed the data analysis and interpreted the data. NN, UB and MJ prepared the first draft of the manuscript, reviewed by NBMW and NN. All authors contributed to the development of the final manuscript and approved its submission.

FINANCIAL SUPPORT AND SPONSORSHIP

Nil.

CONFLICTS OF INTEREST

There are no conflicts of interest.

ETHICS APPROVAL AND INFORMED CONSENT

This study received ethical clearance (JUTH/DCS/IREC/127/XXX1/2680) from the Jos University Teaching Hospital Institutional Research Ethical Committee. Consent for this study was sought from the head of the Health Centre. Verbal and written informed consent to participate in the study were also sought from the participants. All participants were duly informed of the objectives of the study.

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