PUBLIC PERCEPTION ON FACTORS INFLUENCING CHOICE OF TREATMENT OPTION FOR MALARIA IN KANO MUNICIPAL LOCAL GOVERNMENT AREA IN KANO STATE, NIGERIA.

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ABSTRACT

Malaria is a killer disease and one of the recurring and pressing global public health of our time in local and international discourses. This study thus seeks to examine the public perception of the factors influencing the choice of treatment options for malaria disease in Kano Municipal Local Government Area of Kano State, Nigeria. The Three Delay Model served as the theoretical framework guiding this research. The study employed a descriptive survey design with methodological triangulation. A multistage sampling technique was used to select respondents, and both qualitative and quantitative data collection methods were used. A structured questionnaire was administered to 400 respondents, both male and female adults, including leaders, health workers, and patent medicine sellers across four political wards. Additionally, 12 key informant interviews (KII) were conducted to supplement the quantitative data. Descriptive statistics were used to analyse the result. Findings from the study shows that socioeconomic factors such as income level, level of education, and place of residence affect choice of treatment options for malaria disease in the study area. Therefore, the study concludes that to address these effectively, policy intervention must be multifaceted, focusing on improving health literacy, ensuring equitable healthcare access across all socioeconomic statuses as well as proper implementation of targeted income-based subsidies.

Keywords: public perception, factors, influence, treatment options, malaria disease, socioeconomic factors

Introduction

Millions of people worldwide are afflicted by malaria, a potentially fatal illness that is most common in places with low socioeconomic status and few resources. In recent times, malaria is one of the top global health challenges that has become a focus of interest in local and international health discourses World Health Organization (2023) observes that malarial infection is the major cause of sickness and death across the globe; that remains a treatable disease. However, the disease can be treated at most times with a prescribed medication (WHO, 2023). The sole aim of treating the disease at its on-fall is to expunge the malaria parasite from the body of the infected person (WHO, 2015) in order to defend against transmission to others as well as reduce the mortality rate (WHO, 2023). As such, inappropriate treatment of malaria could lead to complications (Amzat & Razum, 2014) with some severe cases and even death.

Furthermore, the African continent where the disease is more prevalent, accounted for about 95% of global malaria morbidity in 2019 as well as 96% of global deaths from malaria disease (Sarfo, et al, 2023). As in many developing countries, however, Nigeria suffers the highest burden of the disease where the reported cases were estimated at 27% of the overall global incidence of malaria disease (The Cable, 2022) and recorded 31.3% of global malaria mortality (WHO, 2023). The high mortality and morbidity rates from malaria indeed, could be attributed to Nigeria's difficult economic situation, as well as those of many other sub-Saharan African nations where many households, particularly those from lower socioeconomic status, either delay seeking formal treatment for malaria or do not seek care at all, leaving the disease untreated (WHO, 2019).

Treatment for malaria has existed for several centuries. Cinchona bark was one of the first malaria treatments used by the Spanish in America in the sixteenth century (Hujjiben, 2010). The potent antimalarial component quinine found in cinchona bark was not identified until 1820 (Hujjiben, 2010). 1934 saw the discovery of chloroquine, a novel antimalarial substance, which came after quinine. Because chloroquine is less expensive than quinine, it was more

effective in curing the condition than quinine (Anyanwu, 2017). However, adequate malaria treatment is indeed hampered in developing nations like Nigeria by the high expense of treating malaria in the current economic climate. The source of the treatment is another aspect to take into account to guarantee appropriate care (Anyanwu, 2017). The informal sector is the most widely used source of malaria treatment, according to numerous researches conducted in malaria-endemic areas (WHO, 2019). This may be because several important socioeconomic parameters, like area of residence, income level, and educational attainment, have an impact on the malaria treatment routes (Hanson et al., 2021).

It appears that factors such as educational attainment, treatment costs, the severity of the illness, and the financial status of the household head, have long been recognized as determinants of treatment seeking behaviour in the works of (Urama, 2019). Although, the risk of being infected with malaria has a greater impact on education as well as socioeconomic development of developing countries of Africa like Nigeria, yet, low educational attainment increases people's vulnerability to this severe disease (Vega, 2019). This happens due to the inability of low-income families to access necessary information about public health. Mosquitoes that are responsible for the spread of malaria disease, usually find poorly planned environments most conducive for hatching their eggs which makes the inhabitants of the place vulnerable to malaria disease. Perhaps, they do not have the money to provide good nutrition; bear the cost of medical treatment or buy medicine, in addition to a long distance they might have to travel to receive medical attention. Malaria thus, reduces labour productivity, causing many missed work days that impact the meager income flows and worsen poverty in households with more significant knock-on effects (WHO, 2019). Malaria has therefore been defined as an environmental disease (Madobi, 2019).

However, researches have shown that individuals that were infected with malaria disease in Nigeria as in other sub-Saharan countries find it difficult to access healthcare services due to the high cost of treatment (WHO, 2019); as a result, those with lower socioeconomic status frequently face barriers to effective treatment, leading them to resort to less effective but more affordable alternatives such as traditionally prepared concoctions, herbal substances or in some instances when they notice that there is no improvement after using the previous sources they consult with a nearest patent medicine vendor who requires a negligible amount of money when considered with out of pocket expenses incurred in seeking for professional care in formal healthcare facility (Vega, 2019). The costs encompass a range of expenses, such as purchasing hospital hand card, consultation fee, essential medications, laboratory investigations/tests charges, transport fare, etc.

Although Nigeria bears a significant burden of malaria cases, with a high prevalence in many regions, including Kano State, Kano Municipal LGA, as a densely populated area within Kano State experiences a substantial number of malaria cases (Madobi, 2019). As such, understanding the impact of socioeconomic status on malaria treatment is crucial for developing effective strategies to combat the disease and improve health outcomes.

However, this study examines the socioeconomic factors associated with malaria treatment in Kano Municipal Local Government Area in Kano State, Nigeria. More specifically, the study seeks to identify the factors responsible for influencing the choice of malaria treatment in the study area. Knowledge of the identified factors can assist the government at all levels, policymakers and donor organizations in designing and redesigning policy briefs and restructuring intervention programs aimed at reducing malaria-related morbidity and mortality.

Theory

The theoretical framework that underpins this study was the Three Delay Model. This theoretical model was developed in the 190s by Thaddeus and Maine (1994) the model has become a reference to the analysis of the social causes of diseases that involve malaria disease, it highlighted not only its causal sequence, but also, social and behavioural causes, related to individual social position, a family, and communitarian contexts, correlating them to the access to health care systems. In other words, three delay models as an approach to address each of the issues a person battling a disease (such as malaria) faces when trying to access a health care facility.

The model is based on the identification and combination of factors and evidence related and grouped into three delays that prevent a patient from receiving prompt and appropriate medical treatment for a particular health problem. The first is a delay in the decision to seek care which refers to the decision to seek health care, the second delay in reaching care which refers to the path for reaching and obtaining care, and finally, the third is a delay in receiving adequate health care which corresponds to the receiving of adequate care in the access of health care services.

However, the model assumes that socioeconomic factors like income, level of education, accessibility of facilities and quality of care among others may independently prolong these three delays. The model however emphasized that a lack of economic and human resources does not always result in morbidity and mortality, but, results in one of three

delays. Thus, if any of these factors lead to an unwarranted delay, poor patient outcomes are likely to follow. For instance, failing to recognize an emergency can cause a patient or their significant other to delay seeking care. As a result, the patient or their significant other may be unable to receive timely and appropriate healthcare services, which can lead to a situation where a mild disease progresses to a complicated stage of a specific health problem. The degree of education possessed by the patient or caregiver plays a role in their capacity to identify an emergency (Amzat & Razum, 2012).

Justification for Adopting the Three-Delay Model

During malaria complications, many people are involved in the decision-making process and this is mostly based on the level of knowledge about malaria disease. Knowledge about malaria disease, early signs and complications of the disease influences the delay of the patient's arrival at the health facility. However, many individuals are not aware of the early signs of the disease and due to lack of knowledge, considerable time is wasted before the appropriate care is sought. When a patient must weigh the potential cost of seeking medical attention against other household needs, the problem is exacerbated. It's been proposed that poverty and low income may be barriers that prevent someone from obtaining all they need in life, including access to health care and a healthy diet due to financial concerns (Amzat & Razum, 2012).

The expense of buying insecticide may influence a patient's or caregiver's decision to seek out the best medical care, particularly in the study area where many individuals do not have a steady source of income. Therefore, it has been discovered that malaria-related morbidity and financial availability throughout the illness are contributing factors to patients' delays in seeking medical attention, particularly during emergencies.

Methods

The research design is descriptive survey with triangulation in sampling techniques, method of data collection and analysis that has been used in this research. In other words, primary (quantitative) and secondary methods of data collection have been used in the course of this research. The primary method of data collection was done via questionnaire and Key Informant Interview (KII) while secondary method of data collection was done via reviewed literature sourced via online sources to gather data in-line with the demands of the study the study within 3months starting from June, 2025 to September, 2025 conducted by the group of researchers that published this work.

The study area, Kano Municipal Local Government (KMC) is one of the 44 local governments of Kano State, Nigeria. Being the state's capital, Kano Municipal local government is situated in the metropolitan area of the state, existing under Kano Central Senatorial Zone while, its administrative centre is at Kofar Kudu (western entrance of emir's palace), in the southern part of Kano city (NIPOST, 2009). It is made up of 13 political wards namely: Chedi, Gandun Albasa, Kankarofi, Sharada, Tudun Nufawa, Yakasai, Zango, Dan'agundi, Jakara, Shahuci, Sheshe, Tudun Wazirci and Zaitawa. The local government constitutes a legislative council who are responsible for the social and economic development of the towns and communities under its jurisdiction, which is made up of the Executive Chairman, the Councilors and other political appointees.

The Hausa language is identified as a commonly spoken language in Kano Municipal local government and the vast majority of its inhabitants are Muslim by religion (Manpower Nigeria, 2023). The dominant culture of the inhabitants is Hausa-Islamic culture because, many aspects of their cultural practice are in one way or the other connected with the Islamic religion (Yar`Zever, 2014). It covers 17 kilometers and has an average temperature of 33 degrees centigrade (Manpower, 2023) while, the relative humidity ranges from 12.9% in March to 63.5% in August (Ibrahim et al., 2012) that helps in the cultivation of mosquitoes who are vectors of malaria.

Sample Size Estimation

A sample size of approximately 400 was adopted for the quantitative aspect of this work as calculated and shown below using Taro Yamane's (1967) sample size formula.

$n= N/K +N(e)^2$

n= sample size to be determined

N= Population of study (564, 969 people)

K= Constant (1)

e= degree of error expected (0.05)

$n= N/K + N(e)^2$

$n= 564, 969/1+564, 969(0.05)^2$

n= 564, 969/1+564, 969(0.0025)

n= 564, 969/1+1,412.4225

n= 564, 969/1,413.4225
=400 respondents.
In view of the above, for the questionnaire 400 respondents have been administered.

A sample size of four hundred (400) respondents was used for the entire study. For the quantitative sampling procedure, the technique for the selecting he respondents was a multi-stage sampling technique because of the population is disperse in several political wards as equal opportunities were given to each all-sampled sizes to be selected in the study area which sees the population as predominantly homogeneous in nature (Hausa/Fulani). The quantitative technique involves the use of stages were in the first stage, the metropolis was clustered in accordance with its political wards which are 13. Secondly, a systematic random sampling method via lottery was used to select (4) political wards representing at least 1/3 of the total wards in the metropolis. Each of the wards sampled were shared equally (100) respondents as each district in each ward was randomly selected using the 5th household in each street until the total required sampled population is achieved. A multi-stage cluster was also used due to the fact that; the study population: Yakasai (100 respondents), Gandun Albasa (100 respondents), Sheshe (100 respondents), and Zaitawa (100 respondents), were political wards sampled for the study making a total of 400 respondents including both male and female adults, traditional leaders, health workers, and patent medicine sellers across the four (4) sampled political wards for the study.

Table 1 showing sample wards and their sample size for quantitative method

Sampled wards	**Sample size (S=400)**
Yakasai	100 respondents
Gandun Albasa	100 respondents
Sheshe	100 respondents
Zaitawa	100 respondents

Source: Researchers' Survey, 2025

Results

This section presents the findings of the study based on the analysis of data collected from the field. The results are organized in-line with study objectives. Tables and figures were used to enhance clarity and facilitate interpretation of results. While, detailed explanations focused on key patterns and relationships observed in the data.

Table 2 showing Socio-demographic Characteristics of the Respondents

Variables	Frequency (n=400)	Percentage (%)
Age		
18-24	41	11
25-34	120	30
35-44	145	36
45-54	53	13
44-64	25	6
65 and older	16	4
Gender		
Male	230	58
Female	170	42
Marital status	62	75
Single	298	16
Married	22	5
Widow	18	4
Family size		
1-2	80	20
3-5	200	50
6-10	91	23
More than 10	29	7

Level of education		
Primary	13	3
Secondary	42	11
Graduate	222	55
Postgraduate	111	28
Non-formal	12	3
Occupation		
Civil Servant	171	43
Trader	69	17
Artisanship	38	9
Student	46	12
Unemployed	31	8
Others	45	11

Source: Researcher's Survey, 2025

Table 2, shows the presentation of Socio-demographic data of the research participants, the first data was on the age where, out of 400 respondents that returned the valid questionnaires duly completed, 11% belonged to the age group of 18-24 years, while 30% belong to the age group of 25-34 years, 36% belong to the age group of 35-44 years, 13% belong to the 4554, 6% belong to the age group of 55-64 and 4% belong to the age group of 65 and older respectively. This is an indication that the majority of the respondents were within the age group of 30-36 years.

The table reveals the distribution of the respondents by gender where 58% respondents were male while 42% were female. The data in Table 2 indicates that the majority of the respondents sampled for the study were male, this is because there were more male respondents available than female.

The marital status of respondents was also investigated. The findings indicate that out of the total respondents, 75% were married, 16% were single, 4% were divorced, and 15.9% were widows. This could have alluded to the norms of Hausa people that promote marriage when one reaches 25 years of age and above and has the capability of doing so.

The educational qualification presented shows that, out of the total respondents, 3% obtained their Primary certificate, 11% went to Secondary school, 17% have Diploma, 12% have N.C.E., 9% have HND, 26% obtained Bachelor's degree, 14% obtained a Master's degree, 2% obtained Ph.D., 3% have a non-formal education, while 3% obtained other forms of education respectively as shown in the table. The result implies that great significant number of the respondents attended school at least up to the primary level. The result on the occupational distribution of the respondents as shown in Table 2 indicates that 43% of the respondents were civil servants, 17% were traders, 9% were artisans, 12% were students, 8% were unemployed and 11% were engaged in other economic activities. This implication of the above data from Table 2 to this study showed a significant number of the respondents were civil servants and this could be explained against the backdrop that Kano Municipal is the oldest Local Government of Kano State when it was the Headquarters of the Native Authority and it is located at the Centre of the six metropolises local government of Kano State. Since one of the study's objectives is to examine the socioeconomic factors influencing choice of treatment options for malaria, ensuring respondents are drawn from multiple wards helps reflect diverse income levels, occupations, and living conditions of the study participants.

Table 3 showing responses on the factors affecting the choice of malaria treatment in Kano Municipal

Variable	Strongly Agreed		Agreed		Strongly Disagreed		Disagreed		Undecided		Decision (facto
Category	F	P (%)	F	P (%)	F	P (%)	F	P (%)	F	P (%)	
Cost of medication	298	75	81	20	8	2	7	2	6	1	affecting
Cultural belief	202	51	97	24	41	10	45	11	17	4	affecting
Family preferences	197	49	117	29	39	10	27	7	20	5	affecting
Level of income	239	60	128	32	14	3	12	3	7	2	affecting
Past experience	214	53	138	35	16	4	11	3	21	5	affecting

Source: Researcher's Survey, (2025)

Table 3 showing participants' responses on whether the cost of medication affects one's choice of treating malaria disease, where 74.5% respondents strongly agreed, 20.25% agreed, 2% strongly disagreed, 1.75% disagreed while only 1.5% respondents were undecided. This implies that the cost of medication significantly affects the health-seeking behaviour of the participants as indicated by the findings. This notion is in tandem with the view of one KII participants (male, aged 27 from Gandun Albasa), who stated that:

> *Of course, the money that they charge us in the hospitals is too high that is why many people would prefer to talk to the traditional doctors or herbal doctors, you know they will not charge you big money. Sometimes they will even give medicine to go and use and if it works for you, you may come back and give whatever is within your reach as appreciation (KII, 2025).*

Table 3 shows that 51% of the respondents strongly agreed, and 24% respondents agreed, cultural beliefs affect one's choice of treating malaria disease, while, 10% strongly disagreed, 11% disagreed and 17% were undecided on this notion. This implies that cultural beliefs in the efficacy of traditional herbs significantly affects the health-seeking behaviour of the participants as indicated by the findings above. This tallies with the assertion of a male KII respondent, health worker (aged 56 from Sheshe) buttressed that:

> *Due to our nature and attachments to traditional medicines and beliefs in them, some illnesses were largely attached to traditional herbs due to the belief in its efficacy before ant anti-malaria therapy from the hospital is used(KII, 2025).*

The Table 3 above shows that, out of a total sampled population that participated in the study, 48% respondents strongly agreed and 29% respondents agreed that, family preference is a factor that influences one's choice of treating malaria disease, whereas, 10% strongly disagreed, 7% disagreed, while 5% were undecided. This implies that heads or elder members of the family take the responsibility of choosing a kind of treatment option for a member who is sick with a malarial illness and hence affects the health seeking behaviour to malaria treatment options in line with orthodox medications. This is in line with a statement made by a female KII respondent aged 35 from Yakasai affirmed that:

> *It is a father or elder member of the family that pays for the cost of treatment when the need arises, as a result, he has the opportunity to decide on the type of treatment option the sick member will go for (KII, 2025).*

As shown in the Table 3 above, the study found that, 60% respondents strongly agreed and 32% respondents agreed that an individual's level of income affects malaria disease treatment in Municipal local government, while 3% respondents strongly disagreed, 3% respondents disagree, and 3% were undecided. This indicates that a patient's level of income determines the kind of treatment he/she will go for. This finding is supported by a female KII participant (aged 41 from Zaitawa) and corroborated as thus:

> *A rich person can choose to attend a well standard private hospital that will give you the best of medical treatment without delays but a casual worker like me will definitely rely on government hospitals where you face a lot of delays and bureaucracies before seeing a doctor (KII, 2025).*

Table 3 shows that 53% respondents strongly agreed, 35% respondents agreed, that experience determines one's choice of treating malaria disease, while, 4% respondents strongly disagreed, 3% respondents disagreed, while 5% were undecided. This implies that personal experience on the symptoms of the illness significantly affects the health-seeking behaviour of the participants as indicated by the findings above. This tallies with the assertion of a male KII respondent (District Head from Yakasai) and presented as below:

> *Whenever I feel some signs of malaria (through feverish condition, cold and catarrh), I do use some local herbs to clear it but if it persists, I consult the nearest chemist or go to hospital (KII, 2025).*

From the above findings, the researchers deduced that factors such as Cost of medication, Cultural belief, Family preferences, Level of income and Past experience significantly affects the choice of malaria treatment in Kano Municipal

Discussion of Findings

Socio-Demographic Determinants of the Respondents

The data on the socio-demographic characteristics of the respondents of this study reveals that the majority of the respondents are between the ages of 25-34 constituting 36% of the total respondents. In addition to this majority of

them are male constituting 58% of the total respondents. However, the majority of them are married constituting 75% of the total number of respondents. On educational attainment, the majority have B.Sc. constituting 26%, Diploma 17%, M.Sc. 14%. As such majority of them are literate and can read and write in formal language. On income, however, the majority of the respondents are civil servants constituting 43% of the total respondents. As for those who are unemployed, they are only 8% which means that the majority of the respondents were either employed, self-employed, students, or artisans.

More so, family size is another socio-demographic variable, where according to the findings, a significant portion of the respondents had family sizes of

3-5 constituting 50% which plays a crucial role in healthcare access and health-seeking behaviour. The distribution of respondents across different wards or places of residence includes Chedi (100), Yakasai (100), Tudun Wazirchi (100), and Gandun Albasa (100). This variable can influence healthcare access due to variations in infrastructure and resources in different areas. These findings are in tandem with previous studies such as Edmund et al., 2017 who concentrated on educational attainment in their study, found that the educational level of residents of a locality improves general knowledge of symptoms, and etiology of diseases, including prevention and treatment of a health condition such as malaria.

This view is supported by WHO (2023) who reported that a substantial number of cases of deaths and disability that are associated with malaria infection (especially in children and pregnant women) are recorded in the rural areas of sub-Saharan Africa (SSA) in these communities, level of poverty is towering, coupled with limited access to information, while modern preventive and curative measures are lacking.

Factors Influencing Choice of Treatment Option for Malaria Disease

This study sought to examine factors that influence the choice of treatment options for malaria disease. The study found the following as factors that influence the choice of treatment option for malaria disease in Kano Municipal: cost of medication constituting 74.5%, followed by the level of income which constitutes 60%, followed by experience which constitutes 53% and finally, cultural beliefs constituting 51%. This result is found to have similarities with some previous works including Ezenduka et al, (2017); Broekhuizen et al, (2021), who published similar results. And in contrast with Alwar, (2020); Anyanwu, (2017); and Paalcious, (2020). Theoretically, according to the Three Delay Model, health behaviour is preceded by a decision-making process that includes the decision to seek care.

Conclusion

The study discovered that there is an intricate interplay between socioeconomic status and malaria treatment in the Municipal Local Government Area of Kano State. Many socioeconomic statuses affect malaria treatment in Kano municipal but notably are income, formal education, place of residence and occupation. Consequently, policymakers should consider promoting health literacy and improving healthcare access for individuals at all tiers of living-hood as those in classified areas also face some problems of easy access to good and effective healthcare concerning the treatment of fever. Additionally, occupational and housing conditions should also be taken into account when designing healthcare policy, with a specific focus on income-based subsidies. In conclusion, addressing malaria effectively in the study area requires a comprehensive understanding of the socioeconomic factors at play in the choice of treatment options available to residents of Kano Municipal L.G.A.

Recommendations

1. The current study recommends that, appropriate treatment services that are both effective and available to everyone are required in malaria-endemic nations like Nigeria to help people with lower income levels afford healthcare services and preventive measures, to lessen the devastating impacts of the disease.
2. Also, there is the need to use of community health workers to disseminate information regarding early signs, treatment choices, and prevention of malaria. They are able to offer communities advice and resources that are tailored to their needs.

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