Dissertation in Malaria in Pregnant Women in Nigeria

By:

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**Abstract**

In this research study, the aim was to assess and explore various challenges in Nigeria regarding the malarial treatment of pregnant women. Therefore, a qualitative design was used and a systematic review was performed. After the screening of multiple research studies, 11 credible studies were involved and content analysis was performed to determine the key insights regarding challenges contained in them. The systematic review reveals that there are several key challenges that persist in Nigeria regarding the malarial treatment of pregnant women. Some of the prime challenges include the lack of awareness and education of pregnant women regarding malaria, the lack of an equitable and just healthcare system, ineffective healthcare funding, the lack of skilled healthcare experts, and the lack of adherence to the guidelines of WHO regarding IPTP.

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# Introduction and Background

In general, around three billion people around the world have a risk of being diagnosed with malaria. On the other hand, approximately 900,000 deaths and 400 million cases of malaria have been observed in the past few years (Kalu, et al., 2022). Malaria is recognized to have a global distribution, influencing individuals of almost all ages with a significant burden that amounts to 300-500 million cases annually (Emmanuel, et al., 2017). Around the world, ten new cases emerge every second, which undoubtedly presents a substantial public health problem. It is important to recognize that most of these cases appear and are identified in the Sub-Saharan African region. Malaria is accountable for over a million deaths annually and approximately 90% of them take place in Sub-Saharan Africa (Sabina, 2017).

## 1.1 Background

Malaria continues to be one of the most critical diseases of the tropics in spite of several years of work and concerted effort towards its management and control. Most of the times, accurate statistics are not available in many regions, which often leads to neglect of a critical disease and its impacts. Around hundreds of millions of individuals are influenced and pregnant women are generally more susceptible and vulnerable to diseases like malaria. In fact, malaria is considered dangerous to not only mothers but also the foetus. In comparison with non-pregnant adults, pregnant women are generally at a higher risk of symptomatic malaria disease and resulting infections. Lindsay, et al. reveal that pregnant women are more vulnerable to malaria and the densities of malaria-parasites are higher in them (Okwa, et al., 2009).

Typically, malaria is caused by four species of Plasmodium including the Plasmodium ovale, malariae, vivax, and falciparum. It is considered the most critical tropical disease wiht respect to mortality and morbidity (Hill, et al., 2006). It is indicated by Arora and Arora that 1.5-2.7 million individuals tend to die on an annual basis due to it. It is worth noting that each year, around 30 million women get pregnant in the African endemic areas. Almost similar numbers of women are exposed to the disease in South America, Oceania, and Asia. The Federal Ministry of Health in Nigeria indicates that malaria is related to 11% of all maternal deaths in the region and around 70.5% of morbidity during the phase of pregnancy. In fact, it accounts for maternal anemia of 15%, low birth weight of 5-14%, and preventable low birth weight of 30% (Madukaku, et al., 2012).

In addition to it, it is reported that every 10 seconds, one individual dies of malaria in Africa and children under five and pregnant women are generally at a higher risk. Some other burdens related to malaria during pregnancy are miscarriage and spontaneous abortion, poor socio-economic circumstances, and still birth. In African women, malaria is considered a critical cause of severe anemia. Maternal deaths caused by it are around 10,000 on a yearly basis. Furthermore, malaria infections are responsible for causing around 75,000-200,000 low birth weight annually due to fetal growth restrictions and preterm delivery (Guyatt & Snow, 2001).

It has been revealed by economists that Africa bears a burden of around $12 billion per annum due to malaria with a substantial economic burden that involves direct loss to the productive work of the government. For the management and control of this significant burden, as recommended by WHO or World Health Organization, there are two effective and proven tools including IPT or intermittent preventive treatment and ITNs or insecticide-treated nets (Organization, 2004). ITNs are used for decreasing parasite prevalence, decreasing still birth, and reducing low birth weight. On the other hand, IPT involves the use of combination therapies based on artemisinin in different forms. It has been identified to reduce placental and peripheral parasitemia while increasing infant weight and maternal hemoglobin, in particular in secundigravidea.

The complications and symptoms of malaria among pregnant women tend to vary based on the malarial transmission intensity in the specific geographical area and the level of immunity of the person. It is important to recognize that Nigeria tends to account for a quarter of all the malarial cases in all the endemic countries of Africa. Actually, it was revealed by the Nigerian Demographic and Health Survey 2013 that the utilization of ITNs in Nigeria is still low in spite of the evidence that it helps decrease morbidity and mortality related to Malaria. It was revealed by the survey that approximately 30% of the pregnant women in houses in Nigeria slept under one ITN.

It was indicated by FMOH in the new policy for malaria that the focus should be on health education and prompt detection and case management of pregnant women with different symptoms and signs of malaria. In addition, it has also been revealed that integrated vector management that includes environmental management must also be considered and an observation for adequate health education should be observed in an effective manner. It is, however, critical to note that despite the increasing evidence for the effectiveness of these measures and interventions, the prevalence of Malaria is substantial. It is primarily due to a number of obstacles and challenges that are prevalent in Nigeria. For the management and prevention of Malaria, there is a need for prompt diagnosis and treatment. The treatment itself includes the administration of effective and accessible medicines that can be used to help and treat malarial infections in pregnant women (Chukwuemeka & Okafor, 2011).

However, both the diagnosis and treatment of malaria remain a challenge in Nigeria due to the paucity of health facilities and even the lack of access to the services and assistance of an obstetrician. In addition to it, there are several other challenges that generally hinder and prevent the proper diagnosis, treatment, management, and the prevention of malaria and related diseases in Sub-Saharan Africa, especially Nigeria. Therefore, in this research study, the aim is to explore the various challenges that are present in Nigeria that prevent for the effective treatment and management of Malaria (Emmanuel, et al., 2017). In addition to it, it also offers key insights regarding the future steps and essential strategies that need to be implemented for the proper management of malaria.

## 1.2 Research Question

1. What are the challenges in the treatment of malaria in pregnant women in Nigeria?

## 1.3 Research Objectives

The following are the key research objectives that this research dissertation hopes to accomplish:

* To explore the concept of malarial treatment in pregnant women in Nigeria.
* To identify the primary challenges in the treatment of malaria in pregnant women in Nigeria.

## 1.4 Research Significance

This research study will contribute extensively to the existing literature base by shedding light on the key challenges that persist in Nigeria regarding the treatment of malaria in Nigeria among pregnant women. It will also explore the future strategies that may be considered to improve how the disease is addressed and controlled. In addition, it also synthesises information from various credible and peer-reviewed studies on malaria control and treatment in Nigeria. It will also provide readers with the insights and knowledge they require regarding the state of Malaria in Nigeria and what challenges are currently persisting in Nigeria regarding its treatment among pregnant women.

# 2.0 Literature Review

## 2.1 Malaria

Malaria is a fatal disease that can threaten life among humans and is caused by a parasite that spreads to humans through different infected misquotes. In the plasmodium genus, four different protozoa cause malaria. They include Plamodium falciparum, malaria, ovale, and vivax. It is important to recognize that P. falciparum has a specific lifecycle in both the human host and the mosquito vector (Tuteja, 2007). The vector accountable for the transmission of malaria is generally the Anopheles gambiae mosquito. In addition, the prevalence of malaria depends significantly on female anopheles species’ abundance, the rate of bite, the developmental rate of plasmodium parasite within the mosquito, and its longevity among others. For instance, when a female mosquito acquires the blood of an individual infected with malaria, the mosquito continues to bite and transmit the disease to other humans.

Typically, malaria is recognized to incubate in an individual for around 8-10 days and its spread requires conditions that are favourable for both the plasmodium parasite and the mosquito. The most conducive conditions are a humidity of around 60% and a temperature of 70-90F (World Health Organization, 2015).

## 2.2 Global Malaria Burden

Around 107 territories and countries involving more than 3.2 billion individuals are still at risk of malarial diseases and attacks (Bawah & Binka, 2005). It is indicated by present estimates that approximately 350-500 million clinical episodes of diseases occur on annual basis. It is further estimated that around 60% of different clinical cases and more than 80% of the deaths related to malaria take place in Sub-Sharan Africa. In fact, it is the second leading cause of death in Africa from different infectious diseases after AIDS. In addition, it is also a major cause of mortality in children under give, accounting for around 20% of deaths while constituting 10% of the total burden caused by diseases in Africa. It is recognized that Malaria tends to kill a child every half a minute somewhere in the world. It should be noted that more than 90% of the overall malarial burden takes place in Sub-Saharan Africa (Alnwick, 2000).

Malarial infection, in endemic areas and regions, is believed to make up to a quarter of all cases of maternal anemia and for 20% of LBW or low birth weight babies. On an annual basis, more than 500,000 women tend to die during childbirth or pregnancy and over four million children tend to die within the first month (Emmanuel, et al., 2017). It accounts for around 38% of mortality in children below five years throughout the world. Furthermore, maternal malarial infection is determined to make up for 3-8% of all deaths among infants. DRC, Nigeria, Ethiopia, Uganda, and Sudan make up for almost 50% of the overall deaths caused by malaria. In fact, high rates of prenatal and maternal mortality have been identified and observed in various Sudanese regions. It was identified that both anemia and malaria were responsible for these high rates of mortality (Talapko, et al., 2019).

## 2.3 Nigeria and Malaria

Even though a large proportion of the population tends to suffer from malarial infections, the ratio of deaths caused by malaria in Africa is around 90%, especially among women and children. Nigeria is undoubtedly an African country that has unfortunately acquired significant attention due to the number of malaria incidents in it (Emmanuel, et al., 2017). It tends to host around 30% of the overall burden related to malaria whereas 97% of the total population is at the risk of developing the infection. In addition to it, Nigeria tends to suffer from an economic loss of approximately 132 billion naira on an annual basis due to malaria.

## 2.4 Malaria Vector and its Distribution in Nigeria

In Nigeria, a number of Anopheles species have been reported. For instance, An. Gunestus and gambiae have been reported as the key species of Anopheles in Southern Nigeria that are responsible for the distribution of malaria with An. nili and moucheti. It is important to consider that the group of An. gambiae involves at least seven different species, including An. arabiensis and gambiae, which are adequate vectors of malaria and are also recognized to coexist in different parts and regions of West Africa. Meanwhile, An. gmabiae was identified to be the only Anopheles species in Northern Nigeria (Gillies & Coetzee, 1987).

When it comes to Katsina state, An. funestus, arabiensis, and gambiae were reported to exist. In the case of Yola, the collection of mosquitoes in the dry season revealed that An. gambiae was in the largest number and it was followed by An. gunestus and An. pharoensis. A study was carried out at the Ajuomoni Estate in Southwest Nigeria and it revealed that the prime species of the collected mosquitoes was anopheles. In Enugu, Southeast Nigeria, An. funestus and gambiae were reported.

## 2.5 Vector Control Practices for Mosquitoes in Nigeria

In the existing literature, it is identified that there are undoubtedly several factors that influence and affect malarial control in Nigeria. In fact, it varies from region to region, based on the method of control, attitude, and human knowledge. Financial impoverishments, illiteracy, and ignorance are also a part of these factors. It has been revealed by different studies that the adoption of different recommended methods for personal protection, attitudes, and human knowledge vary in various endemic areas of tropical countries. A cross-sectional study in Oyo state revealed that the Soku community is generally more proactive in personal protection against malaria (Tesfazghi, et al., 2016).

The WHO Global Malaria Programme, as a part of its efforts to eliminate and reduce the incidence of malaria, and for each nation to achieve the Millennium Development Goals of the United States, recommends: 1- Diagnosis of malarial cases and the use of effective medicines for treatment. 2- The distribution of ITNs for the achievement of coverage of different populations at risk. 3- IRS or indoor residual spraying for the reduction and elimination of malarial transmission (Rosenthal, et al., 2019).

# 3.0 Methodology

The current research study is performed using a qualitative research design and it carries out a systematic literature review. It helps perform a comparative analysis of different credible research studies on the challenges associated with the treatment of malaria in pregnant women in Nigeria. In addition, secondary research techniques in the form of a systematic literature review have been considered for the acquisition of relevant and sufficient information regarding the topic for performing the study (Rajasekar & Verma, 2013). In addition, PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines have been considered for the review.

## 3.1 Search Strategy

For the review and evaluation of existing research studies that explore malarial infections in Nigeria among pregnant women, a comprehensive search strategy was developed and utilized. A number of research databases were utilized for searching and identifying credible research studies and articles such as PubMed and Google Scholar. It is important to note that in these databases, several terms and keywords were used for the acquisition of a large number of research studies. Some of the research terms that were used include “Malaria in Pregnant Women in Nigeria,” “Treatment of Malaria in Pregnant Women in Sub-Saharan Africa,” and “Challenges for the Treatment of Malaria in Pregnant Women in Nigeria.”

## 3.2 Search Analysis

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**Figure 1:** Research Flow Diagram

## 3.3 Inclusion Criteria

In this research study, only relevant studies written in the English language with adequate outcomes were included. In addition to it, only those research studies that shed light on the challenges of treating pregnant women diagnosed with malaria were included.

## 3.4 Exclusion Criteria

In this research study, all the research studies and research papers that did not meet the criterion discussed above were excluded. For instance, all the research studies that included bias and were irrelevant with wrong outcomes were not included in the study. Most of the research studies did not discuss the challenges of treating pregnant women with malaria in Nigeria and that is why they were not included in the study (Chwla & Sodhi, 2011).

## 3.5 Data Analysis

For the analysis of the collected data, content analysis as a technique was used. Content analysis is a technique that helps with the evaluation of qualitative data, its different underlying themes, and the key insights offered by the content. It is important to recognize that content analysis was used for all the acquired data, which helped with the comparison of different research articles (Drisko & Maschi, 2016).

## 3.6 Ethical Considerations

In this research study, all the applicable ethical considerations and guidelines have been respected and adhered to. For instance, it has been ensured that only credible information is included in this research study, which means that the insights can be used for performing other research studies. In addition to it, all the content taken from other journal articles and sources has been cited effectively to make sure that plagiarism is avoided. In fact, different authors have been given credit through proper in-text citations in the study. Lastly, it has been ensured that this research study does not adversely influence any person. Instead, it offers key insights that may be used for the improvement of the treatment of malaria among pregnant women. It will also offer directions for authorities in Nigeria to ensure that they can improve the current state of Malaria interventions in Nigeria.

# 4.0 Results

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| **Names** | **Methods** | **Findings** | **Challenges** |
| Onoka, et al. (2012) | A household survey was performed involving 1307 women who had recent deliveries and 146 women who were attending different antenatal clinics in Nigeria. | Most respondents had five or more visits and the coverage of IPTP for the second and first doses were 7.3% and 13.7%. The coverage was higher in different urban areas. Among the women who could have acquired IPTP on the basis of the timing of their attendance, 14.3% and 14.1% were provided with the first dose on the basis of WHO and national guidelines. There is a low level of coverage for first and second doses evident by 11.6% and 3.0%. | Ineffective medicine delivery system, low coverage of IPTP, and lack of adherence to WHO and national guidelines for IPTP. |
| Emmanuel, et al. (2017) | A qualitative review of research studies prior to 2017 has been carried out regarding the state of Malaria in Nigeria. | The number of deaths from Malaria, in 2010, were the highest in Nigeria globally. It had been quite a strange phenomenon because significant effort had been invested in eradicating the problem from the country. It indicates that despite the investments and efforts, there are still significant challenges and setbacks that persist in Nigeria regarding Malaria. | Key factors contributing to the resurgence of Malaria in Nigeria include the rapid spread of resistance of parasites, low rate of insecticide, substandard and counterfeit drugs and insufficient access to a decent healthcare system, misconceptions about malaria, poverty, high abundance of vectors, and civil unrest and frequent armed conflicts.The key challenges associated with the treatment of pregnant women in Nigeria include the ineffectiveness of anti-malarial drugs due to resistance, lack of general knowledge about the control and causes of malaria, and inadequate access to the healthcare system. |
| Okafor, et al., (2019) | A descriptive cross-sectional design was used. A total of around 422 respondents were recruited with the use of a multistage sampling technique. Data was also collected with the use of an interviewer-administered and structured questionnaire in 2016’s first quarter.  | All the respondents were aware of malaria and 96.2% of the respondents were aware of the causes of malaria. 89.3% of the respondents had registered for antenatal care during the last phase of pregnancy. However, 56.6% of the respondents did the same in the second trimester. Only over half of the respondents had sufficient information about malaria in pregnancy and 27% of them were unaware of possible complications.41.9% of the respondents utilized insecticide coils and spray while 36.9% used IPT and only 24.1% of the participants used ITN.  | A major challenge regarding the treatment of pregnant women in Nigeria is the lack of education and proper awareness of pregnant women regarding malaria, its causes, its complications, its consequences, and its treatment methods. Most women are not aware of preventative care, which causes problems with the treatment of malaria. |
| Ameh, et al. (2016) | A cross-sectional survey was carried out among 400 ANC attendees with ages between 15-49 and were recruited using multistage sampling. Binary logistic regression was utilized for the determination of different factors related to the use of sulfadoxine-pyrimethamine or SP-ITP in the population studied. | 41% of the total popular self-reported the use of SP-IPTP. Meanwhile, other respondents offered negative responses regarding it. The odds of utilizing SP-IPTPs were increased with the knowledge of the utilization of ITNs for the prevention and management of malaria during treatment. | Some key challenges are the lack of autonomy of pregnant women in households, stock-outs of free SP, and inefficient supervision of SP ingestion. |
| Enato, et al. (2007) | A cross-sectional study was performed that involved a sample of around 867 pregnant women who were attending ACs or antenatal clinics in Nigeria. In two different healthcare facilities in the Edo State. A self-administered questionnaire was used.  | 87% of all the respondents determined that they had suffered from malaria at least one time during their pregnancy. 89% of the respondents attributed malaria to bites from different infected mosquitoes and 75% of them recognized malaria as a critical health risk. It is, however, important to consider that knowledge regarding the outcomes of malaria during pregnancy were poor and the mean knowledge was only 3.5 on a scale of 0 to 7. Respondents further believed that intermittent preventative therapy and nets were ineffective. | Interventions like the Roll Back Malaria Initiative are not implemented properly. There is a lack of education regarding malaria among pregnant women. The socioeconomic status of women does not enable them to acquire nets and coils.  |
| Onoka, et al. (2012) | Data was acquired from the heads of various maternal health units of six private facilities and 28 public facilities offering ANC services in Nigeria.  | Only 14.75 of around 34 providers had adequate knowledge of all the recommendations for the provision and use of IPTP. None of them were actually based in the private sector. DOT strategy was used in only one private and six public providers. It was determined that 22 providers offered sulphadoxine-pyrimethamine to pregnant women in the facility and they were allowed to take the medicine home.  | Lack of knowledge among public and private providers regarding the implementation of IPTP, which is particularly prevalent in the private sector. There is also a challenge of ineffective health facilities that are easily accessible by pregnant women in Nigeria. |
| Omo-Aghoja, et al. (2008) | A qualitative review of research papers and local sources such as newspapers is performed. | There are several challenges regarding the diagnosis and treatment of malaria during pregnancy in different low-resource settings like Nigeria. | Some key challenges include the lack of modern technologies in the private sector, the lack of shared efforts in the healthcare system, bribery and extortion of money, lack of skilled healthcare providers, lack of access to affordable healthcare services, and low coverage rates of ITN. |
| Tobin-West & Asuquo, (2013) | A cross-sectional study was performed among 339 women who were pregnant or had delivered children in the last year. A multistage sampling method was used during the study. | 76.4% of the respondents had knowledge regarding the cause of malaria and 80.8% of the participants attended different antenatal care clinics. Only 32.6% of the respondents were aware of the proper use of SP and around 62.8% of the respondents took the necessary malaria preventive treatment. Of these respondents,31.8% consumed chloroquine and 58.4% consumed SP. In addition, only 16.4% of the respondents took SP under the observation of a health worker. | Some key challenges are the persisting chloroquine dispensing, misconceptions about IPTP, and lack of education or awareness of pregnant women regarding malaria. |
| Uzochukwu, et al. (2010) | A qualitative review has been performed that considers multiple areas including malaria diagnosis, antimalarial treatment policy, objectives of treatment, and clinical disease among others. | There is a lack of adequate policies and frameworks within Nigeria for malarial treatment and the access of general public to medicines is inadequate.  | Some key challenges to the treatment of malaria in pregnant women in Nigeria include the lack of equal access to adequate healthcare, lack of equity in access, and the lack of education of women regarding malaria, its causes, and its treatment. |
| Diala, et al. (2013) | A cross-sectional research study was performed in rural and peri-urban communities in Cross River States and Nasarawa in Nigeria. The instruments of the study were based primarily on the social-ecological model. Participants of the study included women of reproductive age, their spouses, and their front-line care providers. | It was identified that the lack of understanding of IPT and beliefs of women combined with different system-based challenges contribute to low adherence and uptake. Many pregnant women are quite hesitant in seeking care for illnesses they do not have. In addition, pregnant women with malaria often use and prefer self-medications through herbs and drug shops. | The primary identified challenges to the treatment of malaria among pregnant women are lack of provider knowledge and information of IPTP protocols, stockouts, and misinformation of women regarding malaria. |
| Muhammad, et al. (2021) | A qualitative design is used and a purposive sampling strategy was utilized for the determination and selection of fourteen key informants for interviews. FGDs or focus group discussions were performed with married men and pregnant women. | There are several barriers and challenges that affect the treatment of malaria in pregnant women in Nigeria. There is undoubtedly a critical need for improvements at all levels. | Some key challenges are poor community engagement, lack of effective and sustainable funding, inadequate access to IPTP, poor antenatal care attendance, and poor implementation of policies. |

# 5.0 Discussion

In the systematic review, 11 peer-reviewed and credible studies were included after comprehensive screening and evaluation. After the analysis of 106 research studies, it was deemed adequate that the 11 remaining studies should be included in the review. It is important to recognize that each research study has identified and shed light on certain challenges regarding the treatment of malaria among pregnant women in Nigeria and its different aspects. It is, however, critical to note that in line with the research objectives of this study, only the challenges identified in the studies will be highlighted.

## 5.1 Key Challenges

Onoka, et al. (2012) have determined that Nigeria suffers from ineffective medicine delivery systems, low coverage of IPTP, and ineffective adherence to the predefined WHO and national guidelines for the administration of IPTP (Onoka, et al., 2012). Meanwhile, when it comes to Emmanuel, et al. (2017), they have highlighted a number of challenges which include the use of ineffective drugs for malarial treatment due to the increasing resistance of mosquitoes, lack of general knowledge of pregnant women regarding the causes and prevention of malaria, and an inadequate and unequal access to a proper healthcare system (Emmanuel, et al., 2017). In addition to it, Okafor, et al., (2019) have determined that the treatment of pregnant women in Nigeria for malaria is ineffective due to the lack of education of pregnant women. During their treatment, they do not employ and engage in adequate preventative care, which causes malarial infections to persist and even redevelop (Okafor, et al., 2019).

Ameh, et al. (2016) highlight that the treatment of malaria among different pregnant women in Nigeria is ineffective due to the lack of autonomy of pregnant women, stock-outs of free SP, and the ineffective supervision of SP ingestion (Ameh, et al., 2016). Enato, et al. (2007) highlight that some challenges are the ineffective implementation of initiatives like Roll Back Malaria Initiative, lack of education regarding Malaria among pregnant women, and the low socioeconomic status of women, which prevents them from purchasing costly coils and nets (Enato, et al., 2007). Onoka, et al. (2012), in another research study, indicate that some key challenges that prevent the effective treatment of pregnant women suffering from malaria include the lack of knowledge of IPTP among public and private service providers, ineffective health facilities, and the lack of accessibility (Onoka, et al., 2012).

Omo-Aghoja, et al. (2008) determine in their research study that some key challenges that prevent the effective treatment of malaria among pregnant women in Nigeria include the lack of modern technologies in the private sector, ineffective shared efforts in the healthcare system, extortion of money in the healthcare system, lack of skilled healthcare providers, lack of equal and adequate access to affordable healthcare services, and the ineffective coverage rates of ITN among pregnant women (Omo-Aghoja, et al., 2008). Tobin-West & Asuquo, (2013) indicate that important challenges are the persisting chloroquine dispensing, misinformation regarding the use of IPTP, and lack of education of pregnant women regarding malaria (Tobin-West & Asuquo, 2013). In addition to it, it is explained by Uzochukwu, et al. (2010) that in Nigeria, some challenges are the lack of equal access to adequate healthcare, lack of equity, and the general lack of awareness of pregnant women regarding the causes and treatment of malaria (Uzochukwu, et al., 2010).

In addition to it, it has been determined by Diala, et al. (2013) that some primary challenges in Nigeria are the ineffective provider knowledge regarding the protocols of IPTP, medicine stockouts, and misinformation of women regarding malaria, its development, and its prevention (Diala, et al., 2013). It has been further determined by Muhammad, et al. (2022) that the primary challenges in Nigeria regarding the treatment of pregnant women are the poor community engagement, ineffective and unsustainable healthcare funding, inadequate access to IPTP, poor antenatal care attendance, and the poor implementation and application of different policies at all levels (Muhammad, et al., 2021).

## 5.2 Implications

The findings undoubtedly indicate that Nigeria is suffering from a prevalent number of patients with Malaria. In fact, in different regions and areas of Nigeria, there is a significant number of different vectors that are responsible for the transportation and spread of Malaria. In addition to it, other than the increasing prevalence of vectors in Nigeria, there are several other challenges that persist in Nigeria. As discussed in the previous section, various research studies have highlighted the key challenges that are persisting in Nigeria that prevent the effective treatment of Malaria among pregnant women. Since pregnant women are more susceptible to Malarial diseases, they are at a higher risk of the disease. Despite it, there are still many challenges in Nigeria that prevent the treatment of pregnant women suffering from Malaria.

There are challenges at all levels throughout Nigeria that cause problems for people and prevent pregnant women from being treated. At the state level, there is a lack of effective engagement and coordination among different stakeholders. For instance, there is a lack of coordinated efforts that promote the treatment of malaria among pregnant women. It is evident in the research studies explored. In addition to it, there is a lack of effective funding on healthcare. In fact, healthcare is not really a priority in Nigeria and that is why insufficient funds are generally allocated, which results in significant problems related to the infrastructure and the state of healthcare facilities in Nigeria.

There are both private and public healthcare facilities in Nigeria. However, they lack modern and sophisticated technologies that are used for the treatment of diseases like malaria. Upon the evaluation of these facilities, it is also determined by the authors included in this study that the facilities also lack skilled and knowledgeable healthcare experts who are aware of the necessary and adequate IPT protocols and guidelines. Most healthcare providers and experts are unaware of these protocols and guidelines. In addition, they are also unaware of the guidelines and requirements highlighted by WHO. Therefore, they are unable to deliver the required outcomes and care to pregnant women suffering from malaria. It has also been identified that most healthcare facilities and centers lack the required medications. For instance, there are frequent stock-outs, which tend to influence the treatment of pregnant women in Nigeria.

Due to the lack of effective healthcare research facilities, inspections regarding different medicines for malaria are not performed. Therefore, ineffective medications are offered to pregnant women, which do not help treat malaria and its associated infections. For instance, with time, Malarial infections have become resistant to traditional medicines. As a result, they are not as effective as they used to be. Even though they have been proven ineffective, they are still being administered to pregnant women and other patients of malaria in Nigeria. Even though a number of initiatives have been designed such as Roll Back Malaria, their implementation is ineffective due to a lack of coordinated efforts and comprehensive monitoring.

In the Nigerian healthcare system, a vital problem is concerned with money extortion as different medications and services are charged at significant costs. These costs are higher in comparison with other parts around the world, which is one of the reasons why most pregnant women are unable to afford these services, medications, and coils. Moreover, the socio-economic status of most people in Nigeria is not adequate enough, which also prevents them from acquiring the healthcare services they require due to their costly nature. Furthermore, in more developed areas of Nigeria, there are better healthcare facilities as compared to more rural areas and regions. It contributes significantly to the unequal access to healthcare services and medications. It has been widely determined that Nigeria suffers from a lack of equity and equality in its healthcare system.

Other than these extensive challenges, it is important to note that there is a lack of community initiatives and programs in Nigeria that are aimed at educating general people and pregnant women regarding Malaria. There is a lack of comprehensive events that invite people and provide them with the education they require about malaria, its causes, effects during pregnancy, consequences, options for treatment, and preventative strategies. Due to the lack of these programs, most pregnant women are still unaware and have misconceptions regarding prenatal care and the use of IPTP. Since most pregnant women are unaware of the causes and preventative strategies of malaria, they are unable to protect themselves and even seek the care they require.

In most research studies, it has been determined widely that most women are unaware of the strategies they can consider for the treatment and prevention of malaria. Since they are unaware to a significant extent, they are unable to protect and secure themselves against malaria. They are most unaware of how malaria influences them and their children during pregnancy. In addition to it, it should be noted that most women have misconceptions and misinformation regarding IPTP and the treatment of malaria. Other than these problems and issues, there is also a challenge of chloroquine dispensing. Furthermore, it has been determined that there is a low coverage of ITN in Nigeria among people, which also adversely influences them in terms of malaria and the infections its causes. In the research studies, it has also been determined that some pregnant women lack the autonomy, which is required to attend different prenatal care centers.

It indicates that the increasing persistence of malaria among the Nigerian pregnant women and the problem of malaria itself must be reconsidered across all levels. It is essential for the state and policymakers to redefine the policies that are in place regarding the healthcare system, the provision of services, the administration of medicines, and even the community engagement programs that are devised and held for the education of pregnant women in Nigeria. It is essential to create new initiatives regarding the elimination of malaria and focus more on the existing initiatives. At the same time, it is also necessary for all the stakeholders and policymakers to coordinate their efforts to create a more just, equitable, and accessible healthcare system. In addition, the distribution of malarial-preventative services should be equal and both women and men should be offered education regarding all the aspects and components of malaria and its treatment.

# 6.0 Conclusion

Overall, it can be said most deaths caused by malaria occur in Nigeria and it bears a substantial burden regarding malaria and its treatment. However, regarding the treatment of pregnant women in Nigeria, there are still some significant challenges regarding it. For the malarial treatment of pregnant women, some notable challenges are the lack of an effective and equal healthcare system, ineffective healthcare spending, the lack of education of pregnant women regarding malaria, the ineffective use of coils and ITN, and the ineffective distribution of IPTP among others. It is concluded in this research study that Nigeria faces some comprehensive challenges regarding the malarial treatment of pregnant women. These challenges need to be overcome effectively through coordinated efforts at all levels.

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