

FROM KNOWLEDGE TO UPTAKE OF INTERMITTENT PREVENTIVE TREATMENT OF MALARIA AMONG PREGNANT WOMEN ATTENDING PRIVATE CLINICS IN UYO LOCAL GOVERNMENT AREA, AKWA IBOM STATE, NIGERIA.

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ABSTRACT

Background: Malaria during pregnancy poses a considerable public health concern, carrying substantial risks for both the expectant mother and her newborn, and it is prevalent in tropical and subtropical regions worldwide. This study assesses knowledge and IPTp uptake among pregnant women attending a private clinic in Uyo, Akwa Ibom state

Methodology: The study was a cross-sectional study carried out among 327 participants using interviewer administered questionnaire for data collection. The data was subjected into SPSS IBM version 24 software for analysis and the results were presented in table of frequencies. Ethical approval was obtained from the University Of Port Harcourt School Of Public Health, permission was gotten from head of private facilities selected for the study.

Results: A total of 327 respondents participated in the study. The majority of respondents, 237 (79%), know what IPTp is. On availability, 52% claimed that the IPTp drug is always available in the health facility. The majority of respondents (49.0%) have the age of their pregnancy between 7-9 months. While most started ANC within that period, more than 4 months affected 185 (61.7%), and so affected the normal absorption of IPTp at the health facility. 228 (76%) have collaborated with the uptake of IPTp in the institution since the ANC. 35.7% of responses said that IPTp was taken in the 2nd and 3rd trimesters. A total of 32 (10.7%) respondents indicated that they had challenges of one sort or another in the intake of IPTp. While the majority of them identified miscarriage and low birth weight (31.3% and 28.3%), respectively, as serious concerns. The majority of respondents (99%) claimed that they were not observed by healthcare personnel while taking IPTp. The unavailability of clean water was the top reason respondents claimed not to take IPTp utilizing the DOT approach.

Conclusion: Many pregnant women recognize the inconsistent barriers related to malaria during pregnancy (IPTp), but fail to grasp the significance of early attendance at prenatal clinics, timely involvement in ANC services, or the importance of receiving effective IPTp medication and adhering to the correct dosage regimen. The unavailability of potable water in the hospital was an excellent challenge in clarifying the reason IPTp is not being captured as Directly Observed Therapy, therefore, there is a need for the provision of potable water and cups to ANC hospitals, as this will advance correct consumption of SP in the hospitals and improve uptake of IPTp.

Keyword: Pregnancy, Malaria, treatment, intermittent

INTRODUCTION

The obstetric, social, and medical challenges associated with malaria during pregnancy require multidisciplinary and multidimensional intervention. Pregnant women are the greatest adult risk group for malaria, and 80% of deaths related

to malaria in Africa occur in pregnant women and children under 5 years of age (Global Fund website, 2021). Malaria in pregnancy is a significant public health problem with substantial risk for the pregnant woman and her newborn child, and it is present in the tropical and subtropical regions of the world. It is related to maternal mortality, morbidity, and severe neonatal effects (Global Fund website, 2021). Malaria is a life-threatening parasitic infection spread by the bite of female *Anopheles* mosquitoes. It is one of the most severe communicable infections, especially affecting pregnant women, killing more than 1 million people annually (WHO, Malaria and Pregnancy, 2021). It was projected that over 6 million Nigerian women would become pregnant each year, and malaria is more widespread and worrisome during pregnancy, with detrimental consequences. Malaria is responsible for around 11% of all maternal deaths and 70.5% of morbidity among pregnant women in Nigeria (Global Fund website, 2021). The symptoms and consequences of malaria in pregnancy vary depending on malaria transmission intensity in a given geographical region and the individual's degree of acquired immunity (Global Fund malaria program, 2021). Pregnant women have the highest morbidity and mortality from malaria infection. Pregnant women infected with malaria typically have more severe symptoms and consequences, with greater consequences for both the mother and her unborn child. These include an increased risk of miscarriage, intrauterine death, premature delivery, low-birth-weight neonates, and neonatal mortality (Global Site for Malaria, 2021). Additionally, pregnant women with malaria are vulnerable to developing severe complications such as severe anemia, hypoglycemia, acute renal failure, prostration, and even maternal death). Medically speaking, malaria is classified into two main categories: simple or uncomplicated malaria and severe or complex malaria (White *et al.*, 2008). The severity of malaria depends on the specific species of parasite that infects the individual. *Plasmodium falciparum* infection is known to cause severe malaria, which is characterized by various clinical manifestations such as organ damage and blood abnormalities. These include cerebral malaria, hemolysis, severe anemia, pulmonary edema, acute respiratory distress syndrome, thrombocytopenia, renal failure, and cardiovascular collapse. These complications can have a significant impact on overall health and well-being.

Malaria infection poses a significant threat to pregnant women, necessitating the implementation of additional preventive measures to ensure their well-being and improve birth outcomes. According to the World Health Organization (WHO, 2014), approximately 125 million women worldwide are at risk of contracting malaria annually. According to Steketee (2001), research has consistently shown that Africa bears the greatest burden and faces the highest risk of malaria infection. The statistics demonstrate that approximately 80% of all reported malaria cases and close to 90% of reported fatalities occur in Africa. Tragically, it is the vulnerable populations such as children under five years old and pregnant women residing in malaria-endemic regions who are disproportionately affected by this disease. *Plasmodium falciparum* is known for causing the most severe form of malaria, often leading to life-threatening complications if left untreated (Wirima, 1996). Additionally, *Plasmodium vivax* is the most widespread parasite outside of Africa and is responsible for a significant number of malaria cases in Asia and South America (Wirima, 1996) and *Plasmodium malariae* and of recently *Plasmodium knowlesi* was added to the list (Wirima, 1996). According to the World Health Organization's malaria policy in 2013, pregnant women are particularly vulnerable to malaria due to their weakened immune systems and susceptibility to complications. This is supported by a study conducted in sub-Saharan Africa from 2000 to 2011, which found that the prevalence of malaria among pregnant women attending antenatal clinics was 29.5% in East and Southern Africa and 35.1% in West and Central Africa (WHO, 2013). The World Malaria Report of 2011 revealed that a staggering 216 million individuals fell victim to malaria in the year 2010, resulting in a devastating death toll of 655,000 people due to the transmission of this parasite by mosquitoes (WHO, 2010). These alarming statistics shed light on the urgent need for effective measures to combat this deadly disease and protect vulnerable populations worldwide. Addressing the issue of malaria in pregnant women is a crucial focus for the Back Malaria partnership. According to a study conducted by Dasai *et al.* (2007), implementing intermittent preventive therapy can play a significant role in reducing severe maternal anemia by 38%, decreasing low birth weight by 43%, and lowering prenatal mortality by 27%. These findings highlight the importance of prioritizing preventive measures to protect both the health of pregnant women and the well-being of their unborn babies. Malaria infection poses a significant threat to individuals, particularly pregnant women. Those who have received a confirmed malaria test result must undergo treatment with the appropriate ACT regimen. To ensure protection against malaria during pregnancy, the World Health Organization (WHO) recommends a minimum of two doses of IPTp, administered at least four weeks apart, starting from the 13th week of pregnancy until delivery (WHO, 2021). This preventive measure aims to safeguard the health of both the mother and her unborn. In addition to the

prompt and effective intermittent Preventive Therapy (IPT) with Sulphadoxine pyrimethamine (SP), several other measures can be taken to combat malaria in pregnancy. These include the utilization of Insecticide Treated Nets by individuals at risk and implementing indoor residual spraying with insecticides to control the vector mosquitoes. Furthermore, maintaining proper environmental sanitation is crucial in preventing the spread of malaria among pregnant women (WHO world malaria website, 2021). In 2001, Nigeria implemented the intermittent preventive treatment for malaria in pregnancy (IPTp) approach (FMOH, 2005). A study conducted in Nigeria by Falade *et al.* (2013) showcased the positive impact of IPTp in preventing anemia during pregnancy among Nigerian women. Despite these findings, it is evident that there are challenges regarding the widespread adoption and adherence to this intervention in Nigeria. According to Okwa (2003), pregnant women are significantly more susceptible to contracting malaria compared to women who are not pregnant. In fact, their risk of infection is three times higher, and unfortunately, the mortality rate among pregnant women with malaria can reach as high as 50%. Malaria itself is an infectious disease caused by the plasmodium parasite and is primarily transmitted through the bite of a female anopheles mosquito that is infected. Malaria transmission remains a prevalent issue across Nigeria, with pregnant women being particularly vulnerable due to their heightened sensitivity compared to the general population. Plasmodium falciparum, the predominant species responsible for approximately 97% of uncomplicated malaria cases, also poses a significant threat as it is the primary cause of severe malaria that can ultimately result in fatalities within the country (Global malaria strategy, 2005). Pregnancy poses significant risks for both the baby and the mother, with increased chances of mortality and health complications. Studies have shown that pregnant women are more vulnerable to these risks (Omoaghoja *et al.*, 2008). In Nigeria, malaria can often go unnoticed during pregnancy, but taking preventive measures like intermittent preventive treatment (IPT) with SP has been found to reduce malaria-related problems throughout the entire pregnancy (Global malaria strategy, 2005). The Global Malaria Plan of 2005 highlights the importance of educating both ANC participants and health personnel about IPTp and addressing the challenges associated with the directly observed strategy (DOT). Despite Nigeria's adoption of the IPTp strategy in 2001, there remains a low uptake of IPTp among pregnant mothers in the country. Consequently, it is crucial to invest additional efforts in expanding IPTp coverage within the community. One potential solution to this issue is to enhance the knowledge and awareness of IPTp among healthcare professionals, pregnant women, and the general public. By conducting targeted educational campaigns and training programs, healthcare providers can be better equipped to inform pregnant women about the importance of IPTp and its benefits. Additionally, ensuring that SP is readily available at antenatal care clinics would ensure that pregnant women have convenient and timely access to this preventive treatment throughout their ANC period. To further optimize its effectiveness, it is recommended.

STEP 1: If a pregnant woman has already attended the antenatal clinic during her first trimester or before feeling the baby's movements, she should be advised to return for her next scheduled ANC appointment. During this visit, it is important to provide her with counseling regarding the advantages of IPT and LLIN administration. Additionally, it is crucial to assess her medical history for any allergies to medications containing sulfur and record this information on both her ANC card and the health facility registry.

If the woman is in her second trimester or has experienced quickening, it is important to inquire about any recent treatment with SP within the last month. If she has received such treatment, it is advisable to schedule her for a follow-up during her next ANC visit. However, if she has not received a dose of SP in the past month, it is necessary to proceed to step 2.

This study aims to provide valuable insights into the current uptake of IPTp and shed light on factors such as knowledge and uptake of IPT during pregnancy among clients. By examining these aspects, the study intends to identify areas for improvement and facilitate the implementation of preventive measures that promote the use of IPTp in Nigeria. Ultimately, the findings from this research will serve as a crucial resource to initiate effective strategies and interventions that encourage the widespread adoption of IPTp for improved maternal health outcomes. The challenges in implementing IPTp include a lack of clear policy and guidance, which leads to confusion among healthcare providers regarding the timing of IPTp doses. Additionally, the general healthcare system faces issues such as drug shortages, which further hinder the provision of IPTp. Moreover, health facilities often lack necessities like water, making it difficult to administer IPTp through Directly Observed Therapy. Lastly, delayed antenatal care-seeking practices among pregnant women contribute to the overall challenges in effectively implementing IPTp. The study highlights the challenges faced in ensuring the widespread availability and usage of IPTp in sub-Saharan Africa. These barriers,

which are found to be consistent across different countries, emphasize the need for urgent multi-country studies. Such studies can help identify specific interventions that can effectively enhance the accessibility and utilization of IPTp, ultimately reducing the detrimental impact of malaria during pregnancy. According to a study conducted in Ghana in 2009, it was found that only 38.9% of pregnant women were aware of the benefits of IPTp. The study, which involved 12 focus group discussions with pregnant women attending ANC in various health facilities, revealed a concerning lack of knowledge regarding IPTp. Additionally, the findings highlighted that women who did receive IPTp placed a great deal of trust in ANC staff to ensure their safety during the process. According to a cross-sectional study conducted in 2009, which focused on pregnant women in rural communities of Uganda, it was found that certain barriers were preventing the women from receiving the next dose of IPTp-SP. These barriers included factors such as not returning for the next ANC visit, which could be attributed to the long distance to the health facility and the financial burden of transportation costs. A hospital-based investigation conducted in rural Burkina Faso aimed to identify the barriers hindering high IPTp coverage among pregnant women. The study, which involved 1235 respondents, revealed that both illness and societal constraints were major obstacles in achieving optimal IPTp coverage. However, it is important to note that this research did not provide insights into the situation in urban Burkina Faso, leaving a gap in understanding the factors influencing IPTp coverage in urban areas compared to other regions. The cost of attending ANC plays a significant role in limiting the chances for pregnant women to receive at least 3 doses of IPTp. Furthermore, this study, similar to the research conducted in Ghana in 2009, highlights a lack of awareness regarding IPTp among pregnant women. It reveals that women who do receive IPTp heavily rely on ANC staff to administer safe treatments. This reliance on healthcare providers emphasizes the importance of effective communication and education about IPTp to ensure its proper utilization. To assess the quality of life among pregnant women receiving IPTp, various research approaches were employed. The investigation revealed that a significant number of pregnant women did not receive IPTp due to their concurrent intake of routine ANC medications or being referred to the laboratory for malaria testing, even when they did not exhibit any symptoms of malaria.

However, it is important to note that the study's limited sample size may restrict the generalizability of these findings. The unavailability of DOT hindered the implementation of IPTp, as revealed by this investigation. Additionally, a significant obstacle identified was the frequent and prolonged absence of women who did not receive IPTp were those who did not attend ANC. In addition, inadequate patient counseling was identified as a major obstacle to the uptake of IPTp. Other contributing factors include women relying on their husbands, who often struggle to afford ANC user fees and prescriptions. This financial burden negatively impacts ANC attendance and ultimately leads to low IPTp uptake rates. Moreover, addressing these barriers through improved counseling services and reducing financial constraints could potentially increase the uptake of IPTp among women. ock out of SP. This resulted in pregnant women being given prescriptions to purchase the drug elsewhere, which poses a risk as there is no guarantee that they will obtain and consume it. In a study conducted in Uganda during the 2013/2014 period, researchers employed in-depth interviews to gather insights from various respondents. Through thematic analysis, they uncovered several obstacles linked to knowledge and attitude among pregnant women. These barriers encompassed a lack of understanding regarding health risks associated with pregnancy, a tendency to delay the initiation of antenatal care (ANC), hesitancy towards taking medications, and apprehensions about the potential side effects of SP. A comprehensive review conducted in 2016 analyzed data from 58 demographic health surveys, encompassing a sample size of 205,200 individuals. Contrary to previous beliefs, the findings revealed that a significant percentage of women attended antenatal care (ANC) visits as recommended. Specifically, across all surveys, it was observed that 76% of women attended ANC three times, while 88% attended twice. However, the study also highlighted a concerning statistic: only 19% of women received. According to a comprehensive systematic review conducted between 2003 and 2013 in 31 sub-Saharan African countries, it has been observed that the use of SP (sulfadoxine-pyrimethamine) for the treatment of acute malaria is no longer recommended. This finding has raised concerns among healthcare workers regarding the administration of IPTp (intermittent preventive treatment in pregnancy), as its effectiveness may be compromised. As a result, there is a need to further investigate the implications of this shift. The study mentioned above highlights the lack of consensus among healthcare practitioners regarding the distinction between different healthcare practices.

This finding is consistent with a cross-sectional hospital-based study conducted in Accra, Ghana, in 2017. The study involved 253 pregnant women as respondents and revealed that the level of IPTp uptake was influenced by the number of ANC visits made by pregnant women. These results suggest that there may be variations in healthcare provider awareness and recognition of the importance of IPTp uptake for pregnant women. A study conducted in Nigeria in 2013 analyzed secondary data from the Nigeria Demographic and Health Survey. The study aimed to identify the factors influencing the uptake of IPTp (Intermittent Preventive Treatment in pregnancy) among pregnant women. The analysis included a sample of 38,948 women from all 36 states of Nigeria. The findings revealed that pregnant women residing in urban areas had a higher rate of IPTp uptake compared to those living in rural areas. One important aspect that influences the uptake of IPTp is the level of support from women's partners. A study conducted in 2012 in metropolitan Kano with 239 participants revealed that women expressed the necessity of their partners' support or agreement to attend ANC or take any medication during pregnancy. Therefore, the lack of approval from partners poses a significant obstacle to the adoption and utilization of IPTp. This finding highlights the crucial role that partner involvement plays in promoting IPTp uptake among pregnant women. The study conducted in Ibadan, Oyo State in 2012 also highlighted the issue of poor knowledge on IPTp among health workers, which was found to be a significant barrier to its uptake. This lack of understanding often leads to confusion regarding the appropriate dosage of IPTp. Additionally, it is crucial to address this knowledge gap as it directly impacts the effectiveness of health facilities in providing proper care and treatment. The limited understanding of healthcare protocols among certain individuals often leads to the provision of self-administered medication, such as SP, to pregnant women instead of ensuring their presence in a health facility for direct observation therapy (DOT). Unfortunately, this approach fails to guarantee that the pregnant women consume the prescribed medication, as there is a possibility that some may discard it on their way home. It is important to note that this study solely focused on the urban region of Kano and did not include a comparison. According to a cross-sectional study conducted in 2009, focusing on 209 pregnant women residing in a rural area of Ekiti State, it was found that approximately 43.9% of the participants who had utilized IPTp during their current pregnancy expressed apprehension regarding potential side effects of SP on their pregnancies. Furthermore, the study also highlighted the occurrence of periodic shortages of SP stock. In a qualitative study conducted in 2013, researchers examined 25 peri-urban and rural communities in Cross River and Nasarawa States, Nigeria. The study focused on ten study facilities in each state and found that recipients lacked understanding regarding the distinction between prophylaxis and treatment. Additionally, the research highlighted system-based challenges such as frequent stockouts, which further hindered effective healthcare delivery. The study employed a systematic approach to gather data from both rural and peri-urban areas, ensuring a comprehensive understanding of the factors influencing IPTp adoption and adherence. The findings highlight the need for targeted interventions that address the specific challenges faced by women in these communities, as well as the broader health environment they are situated in. By tailoring programming to address these factors, we can effectively enhance IPTp adoption and adherence rates among pregnant women. In 2012, a cross-sectional study was conducted in Sagamu, a rural town, involving 255 pregnant women. The research aimed to identify the factors influencing the utilization of IPTp (Intermittent Preventive Treatment in pregnancy) for malaria prevention. The study revealed that the only significant predictor of IPTp usage among pregnant women in this rural region was their knowledge about prophylaxis for malaria prevention. However, it is important to consider that this finding may be influenced by the relatively higher illness. According to a study conducted in Enugu State, it was found that there is a significant difference in the administration of the first dose of IPTp between pregnant women in urban and rural areas. The study revealed that 16.9% of pregnant women in urban areas received the first dose, whereas only 8.6% of women in rural areas received it. Additionally, the research also highlighted that women residing in urban areas were more likely to receive the second dose of IPTp compared to their counterparts. According to the findings of the aforementioned study, it was revealed that awareness about IPTp was remarkably low among the participants involved in focus group discussions. Surprisingly, out of all the participants, only two individuals had prior knowledge of IPTp. Interestingly, one participant residing in an urban area became aware of IPTp when she overheard visitors discussing it at a healthcare facility where she had registered. Similarly, another lady from a rural region learned about IPTp through a friend at school. According to the two individuals who were aware of the practice, they mentioned that it was a method employed to combat malaria. However, they were unable to provide any details regarding the specific drug used, the recommended dosage for pregnant women, the optimal timing during pregnancy for administration, or the proper method of administration. Interestingly, participants from rural areas shared their belief that if a woman schedules her appointment in the eighth month of pregnancy, she should not be given two doses.

This lack of comprehensive knowledge and inconsistent information. In the aforementioned study, participants highlighted that in these areas, the decision of whether or not a pregnant woman should take the drugs provided by antenatal care providers, including SP, was often influenced by her husband, mother, and mother-in-law. These individuals were identified as key influencers in the decision-making process. It is important to note that participants also mentioned that women preferred to complete their herbal remedies before starting any prescribed medications. In 2015, a cross-sectional study was conducted in Ebonyi State to evaluate the malaria preventive practices adopted by pregnant women attending ANC. The study included 504 respondents and revealed a noteworthy correlation between the level of education and malaria preventive practices. Specifically, it was observed that individuals with post-secondary education exhibited more favorable practices in preventing malaria. Nevertheless, it is important to acknowledge that the sample size of the study was substantial enough to generate such a notable difference.

METHODOLOGY

Study Area

The study was carried out in Uyo LGA of Akwa Ibom State which is one of the oil-producing states in Nigeria, located in the coastal southern part of the country, with Uyo as the state capital. The people of Uyo Akwa Ibom State, are predominantly Christians, and the main economic activities are fishing, farming, trading, artisanship, and civil services. ninety (90) private hospitals in the state The state currently does not have free medical services for any particular age group that is ongoing, no state-driven drug revolving fund is in place although very few facilities initiated it on their own and there is ongoing health insurance scheme for targeted groups of the state owned health facilities currently. Apart from English, the primary languages spoken in this region include Ibibio, Annang, Ekid, Oron, and Obolo. These languages reflect the rich cultural diversity of the area and are widely used by the local communities for daily communication and cultural expression.

Study Design

This study utilized a descriptive cross-sectional study design

Study Population

The study population are pregnant women who are currently receiving care at the Antenatal clinic (ANC) of private hospital.

Inclusion Criteria: All pregnant women registered for antenatal care

Exclusion criteria

Severely unwell ANC clients and pregnant women who declined consent were also excluded from the study

Sample size determination

The sample size for this study was selected using (Kadam & Bhalerao, 2010) formula.

$$n = \frac{Z^2 Pq}{d^2}$$

Where:

n = the minimum sample size necessary

P = prevalence of value from previous study, 25.9% (Edidiong S, 2018)

q = percentage of failure (1-P)

Z = Standard normal deviate and probability at 95% = 1.96

d = degree margin of error at = 0.05 (5%)

Calculated sample size = 295

Taking a non-response rate of 10%

≈327

Sampling method

A systematic sampling technique was used to ensure that all participants had an equal chance of being included. The study focused on the daily average antenatal care attendance at the Private hospital. The recorded attendance figure stood at 63 individuals per day. During the data collection process, we utilized three diligent data collection assistants who were able to administer a maximum of 7 questionnaires per day. To ensure accurate representation, we set a target of collecting 21 samples each day from a total daily attendance of 65 individuals. To achieve this, we established a sampling interval of 3 ($63 \div 21 = 3.0$) for each day of the data collection period. Typically, the team responsible for collecting data prefers to wait until there are a minimum of three pregnant women present at the antenatal care clinic.

To ensure fairness in the selection process, they employ a simple random sampling technique. This involves assigning unique identification numbers to each attendee, writing them on separate pieces of paper, folding them, and placing them into a small bag. Finally, one number is chosen blindly from the bag, ensuring an unbiased selection. This systematic approach was followed consistently throughout the data collection period until the desired number of participants was reached and the required sample size was attained.

Method of data collection

Three research assistants were trained for data collection. The questionnaires were designed with five components. The first section aimed to gather socio-demographic information from the respondents, while sections 2, 3, 4, and 5 delved into their knowledge, attitude, uptake of IPTp, and factors influencing its uptake and compliance rate. The study evaluated the level of uptake of IPTp, categorizing it as either good or poor. A scoring system was employed, with a score of 1 indicating good knowledge and 0 representing poor knowledge. Similarly, respondents' attitudes were assessed as either positive or negative, with a score of 1 denoting a positive attitude and 0 indicating a negative attitude. Additionally, compliance with the uptake of IPTp was measured, scoring 1 for good compliance and 0 for poor compliance. Over 2 months, the data were gathered during antenatal clinic days.

Validity and Reliability

The study collected data through an interviewer-administered questionnaire. A pre-test involving 32 pregnant women from a general health institution, representing 10% of the total sample size, was done. Any questions that were found to be unclear or confusing were revised to enhance clarity and facilitate easy responses. By eliminating any potential ambiguities through the pre-test, the researcher ensured that the data collection tool would consistently yield reliable results even when administered multiple times.

Data analysis

Statistical Package for Social Sciences (SPSS), IBM version 24.0, was used. The variables were presented in frequency and percentages. Chi-square tests were used to examine the potential relationship between independent and dependent variables. Statistical significance was determined using a p-value of 0.05 (5%) at a 95% confidence interval. The significance of each variable was assessed, and only those with P-values less than or equal to 0.05 were considered statistically significant.

Ethical considerations

Ethical approval was obtained from the Ethics Review Committee of the University Of Port Harcourt School Of Public Health. Permissions were obtained from the hospital management and the head/in-charge. Confidentiality was assured as respondents were not asked to disclose their names in the questionnaire. Participants were given the freedom to withdraw from the study at any point without facing any negative consequences. Informed consent was obtained by signing consent forms. Throughout the study, great importance was placed on respecting the cultural values, norms, and beliefs of the participants.

RESULTS

A comprehensive total of 327 questionnaires were distributed and successfully completed by the participants. Response rate was 100%.

Table 1: Socio-demographic characteristics of the respondents

Variables	Frequency(%) n= 327	χ^2	p-value
Age(year)		1.53	0.818
15-19	8 (3.5)		
20-24	53 (16.2)		
25-29	82 (25.1)		
30-34	94 (28.8)		
35-39	63 (19.5)		
40-44	21 (6.4)		
45-49	6 (1.8)		
Mean age	36.7±2SD		
Marital Status		1.982	0.602

Singled	6 (1.8)		
Married	318 (97.3)		
Divorced	0 (0.0)		
Separated	2 (0.6)		
Widowed	1 (0.3)		
Ethnic Group		1.81	0.803
Ibibio	146 (44.7)		
Annang	91 (27.8)		
Oron	60 (18.3)		
Others	30 (9.2)		
Religion		1.93	0.600
Catholic	137 (41.9)		
Pentecostal	161 (49.2)		
Islam	11 (3.4)		
Others	18 (5.5)		

¥ Statistically significant at 0.05

Table 1 depicts the demographic features of the respondents. The mean age was $36.7 \pm 2SD$. The majority of the respondents were between the ages of 30-34 years, with 28.80%. On Marital status, the majority of the respondents were married, with 318 (97.30%). The proportion of participants who are Ibibio by tribe is bigger than that of the Annang, 146 (44.7%) and 91 (27.8%) respectively, 60 (18.35%) for Oron, and others take the remaining 9.17%. The majority of the respondents are of the Pentecostal religion, 161 (49.2%), Catholic, 137 (41.9%), Islam, 11 (3.4%), and others, 18 (5.5%).

Table 2: Knowledge of pregnant women on IPTp

Variable	Frequency (%) N 300	χ^2	p-value
What IPTP is		1.931	0.818
Drug to prevent malaria in pregnancy	237 (79)		
A drug to reduce any sickness	36 (13)		
Others	27 (9)		
Source of Information		1.812	0.721
Health facility	136 (45)		
Social media	86 (28.6)		
Market	19 (6.4)		
Church	22 (7.4)		
School	24 (8)		
Others	13 (4.3)		
Drug used for IPTp		1.612	0.534
SP	171 (57)		
ACT	75 (25)		
I don't know	54 (18)		
When to take IPTp		1.908	0.801
Ist and 2 nd Trimester	50 (16.6)		
2 nd and 3 rd Trimester	107 (35.7)		
Ist and 3 rd Trimester	45 (15)		
I don't know	98 (32.7)		

¥ Statistically significant at 0.05

From the above on knowledge of IPTp, most of the respondents, 237 (79%), know what IPTp is, while 27 (9%) do not know IPTp. Overall, respondents had a good knowledge of IPTp.

About those who knew what IPTp is, most of them, 136 (45%) reported that they learnt of IPTp from the health facility, while 86 (28.6%) heard it through social media. The majority of the respondents knew the medicines used for IPTp, 171 (57%), while 54 (18.0%) did not know the medication used for IPTp. The majority of the respondents, 107 (35.7%), identified that IPTp is generally used during the 2nd and 3rd trimesters, while 98 (32.7%) do not know when to take the drug.

Table 3: Compliance rate and Uptake of IPTp

Variable	Frequency (%) N 300	χ^2	p-value
Taken IPTp since started ANC		1.623	0.421
Yes	228 (76)		
No	72 (24)		
When 1st dose is received		1.908	0.233
1st Trimester	41 (13.7)		
2 nd Trimester	106 (35)		
3 rd Trimester	153 (51.3)		
Observed by a Health worker to take IPTp		1.023	0.453
Yes	3 (1)		
No	297 (99)		

¥ Statistically significant at 0.05

Pregnant mothers who had taken IPTp at the ANC were 228 (76%), whereas 72 (24%) had not taken IPTp since they began ANC. Of those who had taken IPTp at ANC, those who got the first dose of IPTp in the 2nd trimester are below average, 106(35%), while 153 (51.3%) received it in the 3rd trimester.

The pregnant mothers being watched by the health care provider while using IPTp were 3 (1%), while 99% were not observed, possibly as a consequence of DOTs not being practiced when taking IPTp. Overall, respondents had a good compliance uptake

DISCUSSION

This study aimed to assess the knowledge and uptake of intermittent preventive treatment in pregnancy (IPTp) among pregnant women attending the antenatal clinic at the Private Hospital in Uyo Akwa Ibom State. The findings of this study indicated that the majority of expectant women attending the antenatal clinic were familiar with IPTp and obtained information about it from healthcare professionals at primary healthcare centers (PHCs) and secondary health facilities in the state. This aligns with the research conducted by Illiyasu et al, where a significant number of participants demonstrated knowledge of IPTp. However, it is important to note that these findings contradict the results of Onoka et al's study, which revealed that only a small fraction (256 out of 1307 individuals) possessed knowledge about IPTp.

Interestingly, a significant number of respondents demonstrated a good understanding of the appropriate timing for the first dose of IPTp.

This finding aligns with a previous study conducted by Akinyele et al, where 61.5% of participants stated that the first dose could be taken anytime from the second trimester until delivery, with a one-month interval between doses. During the early stages of pregnancy, many women fail to receive the recommended first dose of IPTp, which is typically administered during the second trimester. This finding contrasts with a study conducted in northern Nigeria, where 63% of pregnant women registered for ANC during their second trimester. Interestingly, this study also observed that some expectant mothers initiated ANC within their first trimester. These variations highlight the importance of timely and comprehensive prenatal care for all pregnant women. Many pregnant women are aware of the risks associated with

malaria during pregnancy, which motivates them to seek early antenatal care (ANC). However, it was observed that the majority of pregnant women tend to take IPTp only during the 3rd trimester. Interestingly, when expectant mothers were interviewed during the study, a common concern emerged - many pregnant women expressed fear or hesitation in seeking ANC services if they did not have any specific health issues bothering them. The lack of awareness regarding the importance of IPTp uptake among pregnant women often leads to a hindrance in administering the recommended three doses before delivery. This issue was highlighted in a study conducted by Launiala et al, which found a correlation between delayed attendance at antenatal clinics and incomplete IPTp dosage among expectant mothers. These findings emphasize the need for improved education and awareness campaigns to ensure proper IPTp adherence during pregnancy. The researcher observed that a significant proportion of the participants, specifically 45%, initiated their antenatal care (ANC) visits during the third trimester of their pregnancy. Additionally, the study revealed that only 23.7% of the participants received intermittent preventive treatment in pregnancy (IPTp). A noteworthy discovery from this research is that many participants reported no adverse effects or difficulties associated with utilizing IPTp. Interestingly, this finding contradicts a study conducted in Ibadan, southwest Nigeria. The study focused on the impact of placental malaria on pregnant women, aiming to improve pregnancy outcomes. It revealed promising results, indicating a decrease in preterm deliveries, maternal anaemia, and the delivery of bigger babies.

RECOMMENDATIONS

To pregnant women:

Considering implementing Contact antenatal care. This approach has the potential to significantly enhance the quality of ANC delivery and subsequently improve the overall health condition of pregnant women, particularly concerning malaria concerns. Additionally, all pregnant women need to receive three doses of IPTp after quickening, administered as directly observed therapy (DOT) during regularly scheduled ANC visits. By adhering to these recommendations, we can ensure better outcomes, it is crucial to promote the timely initiation of ANC among pregnant women to improve their chances of effectively benefiting from IPTp intervention and reducing the risks associated with malaria. Additionally, reinforcing the importance of early booking during antenatal clinic visits can further emphasize the significance of seeking prenatal care at an early stage. By doing so, pregnant women can maximize their opportunities for optimal absorption and uptake of necessary interventions, ultimately safeguarding their health and well-being during pregnancy.

To health care personnel

It is essential to make necessary revisions. Encouraging healthcare practitioners to educate expectant mothers about the importance and timing of taking IPTp is crucial. Additionally, implementing effective health communication interventions through mass media can play a significant role in promoting this intervention among pregnant women. This approach will help ensure that expectant mothers are well-informed and actively engaged in their healthcare journey.

To a health facility

It is crucial to ensure that pregnant women have access to IPTp (Intermittent Preventive Treatment in pregnancy) at the antenatal clinic, allowing them to take it under direct observation. Although malaria can be prevented, controlled, and treated, it poses a serious threat when contracted during pregnancy. By avoiding malaria during this critical period, we can significantly reduce the negative impact on both the mother and the unborn child, leading to improved health outcomes for pregnant women and their newborns.

References

1. Conroy, A.L., McDonald, C.R., & Kain, K.C. (2012). Malaria in pregnancy: Diagnosing infection and identifying fetal risk. *Journal of ObsGyn* , 10(11), 41-48. <https://doi.org/10.1586/eri.12.123>
2. Steketee, R., Nahlen, B., Parise, M., & Menendez, C. (2001). The burden of malaria in pregnancy in malaria-endemic areas. *Am J Trop Med Hyg* , 64(1), 28-35. <https://doi.org/10.1187>
3. Steketee, R.W., Wirima, J.J., & Campbell, C.C. (1996). Developing effective strategies for malaria prevention programs for pregnant African women. *Am J of Trop Med and Hyg* , 5(1), 95-100. <https://doi.org/10.1156/s1306-1400>

4. White, N.J., Breman, J., Fauci, A.S., Braunwald, E., & Kasper, D.L. (2008). Tropical malaria. *Harrison Lancet Publication*, New York: McGraw-Hill; 36(1), 351-366. <https://doi.org/10.10931>
5. WHO (2004). A strategic framework for malaria prevention and control during pregnancy in the Africa Region. World Health Organization, Geneva. <https://doi.org/AFR/MAL/04/01>
6. WHO (2021). Malaria and pregnancy: A global health perspective. *Journal of Obstetrics and Gynecology*, 49(5), 36-40. <http://www.incbi.nlm.nih.gov> (Accessed November 1, 2021)
7. WHO (2021). The Global Fund Web site. <http://www.who.int.theglobalfund.org/10.1093> (Accessed 4/11/2021)
8. World Health Organization (2007). Malaria in pregnancy: Guidelines for measuring key monitoring and evaluation indicators. Geneva Global Malaria Program. www.who.int/malaria/publication/i/985711457