

Compliance with intermittent preventive treatment during pregnancy among postpartum women in Ibadan, Nigeria.

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Abstract

Introduction: Malaria has adverse effects on pregnancy outcomes for mothers, their foetuses and newborns. The effective use of Intermittent Preventive Treatment - Sulfadoxine-Pyrimethamine (IPT-SP) would be of benefit to these vulnerable women. The aim of this study is to assess the compliance with IPT during pregnancy among postpartum women in Ibadan, Nigeria.

Methods: The descriptive survey collected data from 346 postpartum women attending postnatal and child welfare clinics of the University College Hospital, Adeoyo Memorial Maternity Specialist Hospital and Saint Mary Catholic Hospital (all in Ibadan, Nigeria) using a questionnaire. The three settings were selected based on their high client flow and strategic locations within the reach of resident people of Ibadan (both the rich and poor). The three settings operate the traditional model of antenatal care. None of the settings provide preconception care. Descriptive and inferential statistics were employed for data analysis.

Results: Antenatal visit recorded among the women was marked with irregularities. Majority of the women received information on IPT during clinic visits. Nearly half of the women received other antimalaria prophylaxis apart from SP. Less than 40% of the women had good knowledge of malaria in pregnancy (MIP). Only 20.9% demonstrated positive attitudes towards the use of IPT-SP for malaria prevention. Presentation of malaria symptoms influenced the uptake of IPT significantly. **Conclusion:** The study recommends integration of focused antenatal care with fewer clinic visits into the existing health care system to improve ANC service utilization. Since majority of the women accessed information on IPT during antenatal clinic visits, same should be intensified to improve its uptake and compliance among women.

Keywords: Compliance, malaria, intermittent preventive treatment, pregnancy, postpartum women

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Introduction

Malaria in pregnancy (MIP) has been described as a hydra-headed health problem requiring multidisciplinary and multidimensional solutions, because it is a combination of obstetric, social and medical problem [1]. Pregnant women constitute the main adult risk group for malaria and 80% of deaths

due to malaria in Africa occur in pregnant women and children below five years. In Africa alone, perinatal mortality due to malaria is at about 1500/day. In areas where malaria is endemic, 20-40% of all babies born may have a low birth weight. MIP has been described as a priority area in the Roll Back Malaria (RBM) strategy [1].

It has been argued that malaria and pregnancy are mutually aggravating conditions. The physiological changes of pregnancy and the pathological changes due to malaria have a synergistic effect on each other. The synergy makes life difficult for the mother, the child, the attending nurses, midwives and physician [2]. Besides, it has been observed that *Plasmodium falciparum* malaria can run a turbulent and dramatic course in pregnant women; the non-immune primigravidae are usually the most affected. In pregnant women, the morbidity due to malaria infection includes anaemia, febrile illness, hypoglycaemia, cerebral malaria, pulmonary oedema and puerperal sepsis. In addition, mortality may occur from severe malaria and haemorrhage [3]. The problems in the new born include low birth weight, prematurity, Intrauterine Growth Retardation IUGR, malaria illness and mortality as well [2, 4, 5]. The recommended Intermittent Preventive Treatment –Sulphadoxine pyrimethamine (IPT-SP) is already in place and its use as malaria prophylaxis during pregnancy has been proven to be very effective and affordable globally [6]. However, the high prevalence and persistence of the disease during pregnancy everywhere in Nigeria including Ibadan is of concern to well meaning stakeholders. It is believed that vulnerable pregnant women in areas faced with serious environmental sanitation management challenges such as Ibadan could benefit maximally from receiving IPT.

The 2008 Nigeria Demographic and Health Survey (NDHS) reported that only 6% of pregnant women in Southwest Nigeria received IPT-SP. However, this study was conducted among postpartum women in order to explore the use of IPT across the three trimesters of their pregnancy.

Materials and methods

Study design and settings

This clinic-based descriptive survey was employed to determine utilization of WHO's recommended malaria preventive measures during pregnancy among postpartum women attending postnatal and child welfare clinics of the selected hospitals.

The selected study settings are all within Ibadan, the state capital of Oyo state, Nigeria. Ibadan

is the largest city in West Africa sub-region. It is located in the South-Western geo-political zone of Nigeria. The city is densely populated with most of the population living in slums and high-density areas. Ibadan is blessed with different levels of health care facilities such as primary health care centres, general hospitals, a teaching hospital, and mission and private hospitals. Out of the facilities listed above, three hospitals were purposively selected for the study on the basis of their being strategically located within the reach of people (both the rich and poor) and their high client flow rate. The postnatal and child welfare clinics of the following selected hospitals were used for the study: University College Hospital (UCH), Adeoyo Specialist Maternity Hospital and Saint Mary's Catholic Hospital, Eleta in Ibadan, Oyo State.

UCH is the only tertiary health institution in Ibadan. UCH is majorly utilized by people of middle and upper socio-economic status but serves as a referral centre to other health care facilities across the country. The maternity unit comprises of the antenatal clinics, a labour ward, antenatal wards, postnatal wards, postnatal and child welfare clinics. The postnatal and child welfare clinics are utilized by women who delivered their babies in and outside UCH. The unit is relatively well-staffed with Obstetricians and Gynaecologists and Nurse-Midwives of different cadres. The antenatal clinic is provided with a malaria laboratory unit where pregnant women are screened for the malaria parasite.

Adeoyo Specialist Maternity Hospital belongs to Oyo State government, Nigeria. It is a secondary health care facility, which provides gynaecologic, obstetric and neonatal care services to dwellers of Ibadan metropolis and suburbs. The centre is popularly known for a high rate of patronage of obstetric services. Hence, it is commonly referred to as the "baby factory". Women of low socio-economic status are known to use this centre more than other categories of women. The centre is staffed with relevant health professionals such as Nurse-Midwives, Obstetrician-Gynaecologists, Pharmacists, Laboratory Scientists and other supporting staff. Besides, Adeoyo Maternity serves as a referral centre to primary health care (PHC) centres, faith-based clinics, Traditional Birth Attendant TBA homes, private clinics and hospitals within Oyo State. However, complicated cases are referred from the centre to the University College Hospital, Ibadan for further management. Also, participants were drawn from the child welfare clinic

of Saint Mary's General Hospital, Eleta, Ibadan, Nigeria. This fee-paying secondary health care facility belongs to the Roman Catholic Mission and provides maternity care and child welfare services to women in Ibadan and environs. The hospital is staffed with registered Nurses, Midwives, and medical practitioners, but obstetric Specialists are invited to manage special cases at the general hospital. The hospital is adequately equipped with facilities for managing obstetric emergencies. The Saint Mary's General Hospital has a well organised Child Welfare Clinics. The selection of this facility as one of the study sites was based on its proximity to the people who live in the slums.

Sample size and sampling technique

The calculated sample size of 346 (30% attrition inclusive) was utilized for this study. This was obtained by employing statistical formula for population < 10,000 as stated below:

$$nf = \frac{n}{1 + \frac{n}{N}} \quad (\text{Araoye, 2004})$$

Where: nf = the calculated sample size when population is < 10,000.

n = the desired sample size when population is > 10,000.

N = the estimate of the population size.

The sample size 'n' when population is > 10,000 was unknown and therefore it was calculated in order to substitute the value for 'n' in the above equation.

The equation for calculating the value of 'n' is stated below:

$$n = \frac{z^2 pq}{d^2} \quad (\text{Araoye, 2004})$$

Where:

n = the desired sample size when population is > 10,000

z = the standard normal deviate, set at 1.96 which corresponds to the 95% confidence level.

p = the estimated proportion in the target population (ITP users) = 50% (i.e. 0.50).

q = 1.0 – p (i.e. 0.50)

d = the desired degree of accuracy, set at 0.05.

Study population

The study was intended to use a calculated 346 out of the average monthly total of 860 postpartum women who attend postnatal or child welfare clinics of the selected hospitals within a period of one month. The average total number of postpartum women who brought their babies for vaccination was

860 per month in the three study settings. Their distribution across the three study settings was as follows:

UCH	=	2	0	0
postpartum women				
Adeoyo Maternity Specialist Hospital	=	5	0	0
postpartum women				
SMCH	=	1	6	0
postpartum women				
Total	=			860
postpartum women				

Sources: Immunization records at the child welfare clinics of the respective study settings

The calculated 346 sample size was distributed proportionately across the three study settings thus:

UCH	=	81	postpartum women
Adeoyo Maternity Specialist Hospital	=	201	postpartum women
SMCH	=	64	postpartum women
Total sample size	=	346	postpartum women

Inclusion criteria: Immediate postnatal women (i.e. women whose babies were within age range 1 – 42 days or 6 weeks at the instance of data collection) who utilized postnatal or child welfare clinics and were willing to participate were included in study.

Exclusion criteria: All pregnant women who were yet to deliver babies and nursing mothers whose babies' age are more than 42 days or 6 weeks were excluded from the study. This was to ensure accurate information that may be compromised by long-term memory loss.

The study utilized systematic random sampling technique for sample selection. The immunization records of each setting served as sample frames from which the participants were selected. The immunization records of each setting served as sample frames from which the participants were randomly selected. Hence, the formula stated below was employed to determine sampling interval.

$$K = \frac{N}{n}$$

Where, K = Sample interval

N = Total population in the

sample frame

n = sample size

$$K = \frac{860}{346}$$

$$K = 2.4855$$

Sample interval (K) for this study ≈ 3

Hence, every 3rd person on the list was selected. Thus, the first respondent (i.e. the starting point “X”) was selected randomly from the sample frame. Therefore, the subsequent respondents were selected as follows: X + K, X + 2K, X + 3K, X + 4K etc.

In this study, the first respondent who was randomly selected was number 2 (i.e. X) on the list, then the next respondent was determined by (X + K)

That is $2 + 3 = 5$

Therefore, the next respondent was number 5 on the list

Followed by X + 2K

That is $2 + 2(3)$

$= 2 + 6$

$= 8$; (i.e. no 8 on the list) etc.

Data collection and analysis

This study utilized a validated structured interviewer-administered questionnaire having reliability coefficient of 0.7 for data collection. The instrument was designed to assess socio-demographic characteristics, utilization of antenatal care, level of knowledge of MIP, attitudes towards IPT use and pattern of utilization of the malaria preventive measures. In addition, the results of the tested hypotheses are reported. The level of significance (p-value) was set at 0.05. Six research assistants were recruited for data collection. The training of the research assistants spanned four hours; two hours per day (i.e., 2 days). During the course of the training, the research assistants were familiarised with each question item, the appropriate meaning and the correspondent desired information expected from each participant. Data collection spanned a period of four weeks. Copies of questionnaire were administered to 346 participants to complete. The copies of the local language (Yoruba version) of the questionnaire were administered to the participants who understood and spoke the Yoruba language only, or preferred it to the English language after written informed consent had been obtained. The investigator cross-checked the returned copies of the questionnaire to ensure correctness and completeness right on the field. The data were analysed using the Statistical Package of Social Sciences (SPSS) version 15. The frequencies and percentages of respondents' socio-demographic characteristics were analyzed and presented in tables and figures. The study received ethical clearance from the University of Ibadan/UCH Ethical Committee. Confidentiality of information collected from respondents was strictly ensured throughout and after the study. Therefore,

respondents were not required to write their names on the questionnaires that were given to them to complete and their names could not in any way be used in connection with the information they gave. Besides, written informed consent from the prospective respondents was obtained before administration of questionnaires. Participation was made voluntary and withdrawal from the study at any stage was allowed without any form of coercion or discrimination. No person was coerced to participate in the study.

Results

The findings reveal the participants' socio-demographic characteristics, utilization of antenatal care, level of knowledge of MIP, attitudes towards IPT use and pattern of utilization of the malaria preventive measures. In addition, the results of the tested hypotheses are reported accordingly. Out of 346 questionnaires administered to respondents, 335 were completed for analysis. The remaining 11 were not properly completed. Therefore, the response rate was 96.8%.

Table 1: Participants' socio- demographic characteristics

Maternal age group (years)	N	%
< 25	49	14.6
25 – 34	224	66.9
35 – 47	62	18.5
<i>Levels of educational</i>	<i>N</i>	<i>%</i>
No formal education	8	2.4
Primary School Education	39	11.6
Junior Secondary School (JSS) 1- 3	19	5.7
Senior Secondary School (SSS) 1- 3	138	41.2
Tertiary Education	131	39.1
<i>Employment status</i>	<i>N</i>	<i>%</i>
Applicants	11	3.3
Students	28	8.4
Housewives	11	3.3
Self-employed	220	65.7
Junior civil servants	13	3.9
Senior civil servants	38	11.3
Private staff	14	4.2
<i>Marriage type</i>	<i>N</i>	<i>%</i>
Monogamy	274	81.8
Polygamy	47	14.0
Single (unmarried)	14	4.2
<i>Residential areas</i>	<i>N</i>	<i>%</i>
High density area	248	74.0
Low density area	20	6.0
Slum	67	20.0

Socio-demographic characteristics

The women's ages ranged from 18 to 47 years, with the mean age being 29.4 ± 0.8 years. Table 1 shows

the respondents' socio-demographic characteristics.

The women registered for ANC at different gestational age but 82.1% initiated ANC late (i.e. second and third trimesters) and irregular clinic visits were observed among them. Moreover, 31.0% initiated ANC at the time they did due to feeling of unwellness, while 63.0% did so for other reasons. Malaria fever topped the list of health problems reported and treated among the women during pregnancy, particularly during the first ANC visits. Episodes of malaria presentation were more among women who lived in both densely populated and slum areas of Ibadan. However, this was not statistically significant.

Knowledge of MIP among participants

One hundred and sixty-eight (50.1%) and 127 (37.9%) of the participants had average and high knowledge of MIP, respectively (Figure 3). However, 149 (44.5%) and 132 (39.4%) did not know that loss of pregnancy and low birth weight (LBW) babies could be outcomes of MIP. Similarly, 203 (60.8%) of the women believed that other causes of malaria infection exist besides malaria parasite-laden mosquitoes.

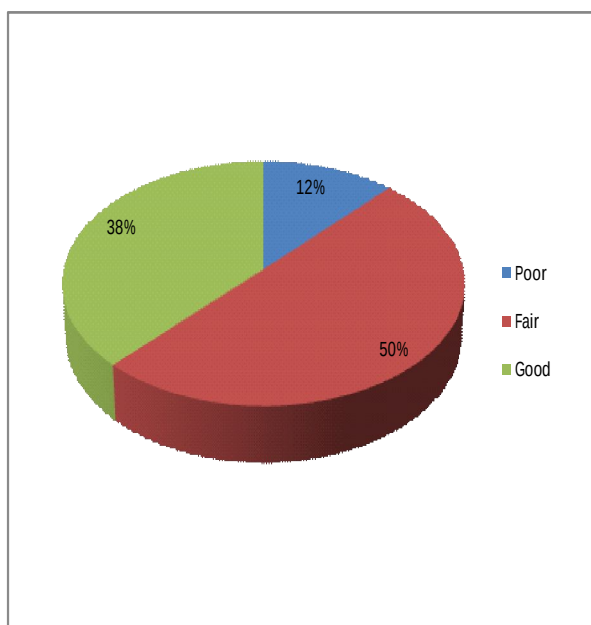


Fig. 3: Participants' level of knowledge of MIP (with the ratings)

Awareness and utilization of IPT among participants

Out of 335 postpartum women studied, 265 had information on IPT prior to data collection. Antenatal clinics topped the list of sources of information on IPT to the women (Fig.1). More than three-quarters of the women initiated ANC at a period other than the first trimester.

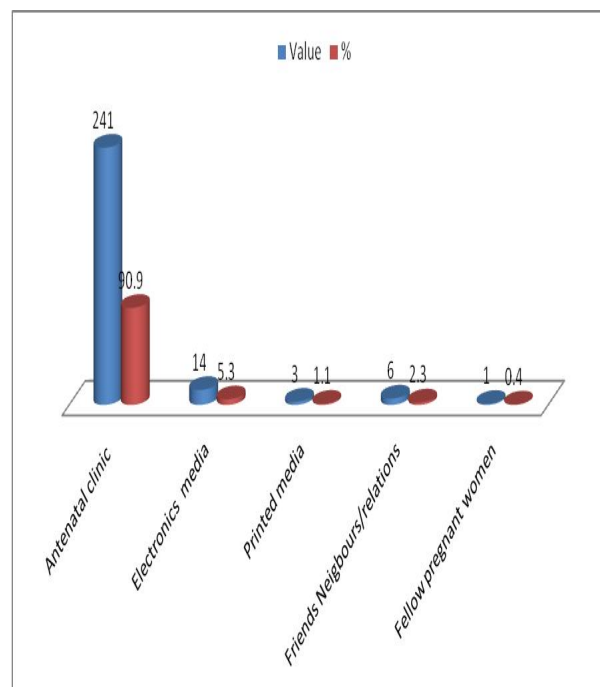


Fig. 1: Sources of information on IPT

Out of the 335 studied women, 201 (60%) received IPT at least once during their immediate past pregnancy. The age group of the respondents significantly influenced uptake of IPT (P-value = 0.017). Table 2 shows the association between respondents' age group and use of IPT.

Table 2: Association between participants' age groups and the use of IPT

Participants' age group (Years)	Receipt of IPT	
	Yes	No
Less than 25	21 (10.4%)	28 (20.9%)
25 – 34	138 (68.7%)	86 (64.2%)
35 – 47	42 (20.9%)	20 (14.9%)
Total	201 (100%)	134 (100%)

$X^2 = 7.789$, $df = 2$, $p\text{-value} = 0.020$ (sig).

Besides, the findings of this study reveal that those who became ill due to malaria infection during pregnancy received IPT more than those who did not experience malaria-related illness. This association was found to be significant ($p\text{-value} = 0.018$). Table 3 shows the association between incidence of malaria and uptake of IPT by the participants.

Similarly, the gestational age at period of antenatal booking was found to influence uptake of IPT among the women. Thus, women who booked for antenatal late particularly at third trimester) stand more risk of not receiving IPT at all during

pregnancy. This was statistically significant (p -value = 0.001). Table 4 shows the association between IPT uptake and gestational age at booking.

Table 3: Association between presence of malaria symptoms and the use of IPT

Illness due to malaria infection	Utilization of IPT	
	Users of IPT	Non-users of IPT
Women with malaria symptoms	101(50.5%)	45 (37.3%)
Women without malaria symptoms	112(49.5%)	89 (62.7%)
Total	201 (100%)	133 (100%)

$X^2 = 5.63$, $df = 1$, p -value = 0.018 (sig).

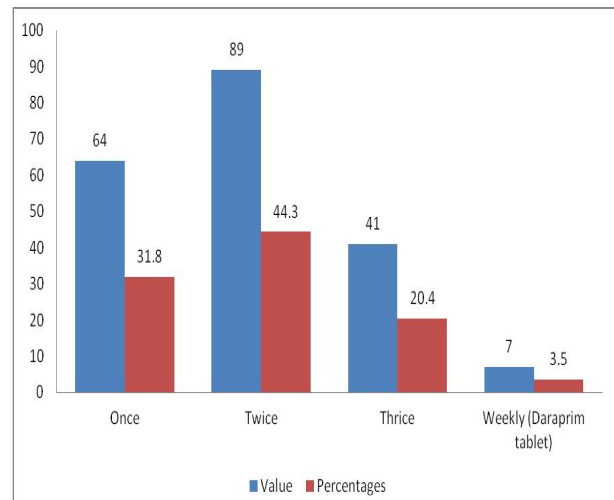


Fig. 2: Number of doses of IPT use among recipients

Table 4: Association between IPT uptake and gestational age at booking

Initiation of IPT	Gestational age at ANC Booking		
	1 st Trimester	2 nd Trimester	3 rd Trimester
Uptake of IPT	33 (61.1%)	127 (66.1%)	31 (41.3%)
Non-uptake of IPT	21 (38.9%)	65 (33.9%)	44 (58.7%)
Total	54 (100%)	192 (100%)	75 (100%)

$X^2 = 13.849$, $df = 2$, p -value = 0.001 (sig).

Out of the 201 women who received IPT before the collection of this data, 171 (51.0%) got their prescriptions at the ANC clinics (Table 5).

Table 5: Sources of IPT prescription to the respondents

Sources of IPT prescription	N	%
Health workers outside ANC facility	23	11.4
ANC clinics	171	85.1
Self (as OTC drugs)	3	1.5
Relations/friends/neighbours	4	2.0
Total	201	100

Table 6: Types of antimalaria tablets used as prophylaxis by participants

Types of antimalaria	N	%
Sulphadoxine/pyrimethamine	110	54.7
Artemisinin + Amodiaquine	4	2.0
Artesunate	10	4.9
Arthemether + Lumefantrine	8	4.0
Daraprim	7	3.5
Chloroquine	3	1.5
Amodiaquine	2	1.0
Unidentified antimalaria	41	20.4
Forgotten antimalaria	16	8.0
Total	201	100

In addition, out of the 201 women who received IPT during pregnancy, 44.3% of them were given once, while 3.5% used weekly Daraprim tablets as prophylaxis (Figure 2). However, 110 (54.7%) of them took Sulphadoxine+pyrimethamine (SP), while 91(45.3%) took different varieties of antimalaria tablets (Table 6).

Discussion

Most of the women studied were within ages 25 and 34 years. This is not surprising as this age range corresponds to the usual childbearing age of women, particularly among South-Western Nigerian women. Other studies within this geo-political zone and elsewhere confirm this finding [7-9]. The above cited studies reported highest population of women utilizing ANC aged 20 to 34 years.

About half (41.2%) of the women had senior secondary school education followed by women with tertiary education (39.1%). This is expected, because much emphasis is currently placed on acquisition of good education in the country particularly, among the Yorubas who happen to be the predominant tribe living in Ibadan. This attribute must have contributed to the good knowledge of MIP (38%) and appreciable level of IPT compliance (60%) observed among the women.

Majority of the women were residing in high-density areas. This is likely to be because house rents in these areas were relatively cheaper than the low-density areas of the city. Overcrowding alongside poor environmental hygiene is a major problem of the high-density areas, while modern buildings as well as clean environment are peculiar to low-density areas. The situation in slums is often worse than that of the high-density areas. Buildings in these areas are usually old, dilapidated and of low quality. Vector control in densely populated and slum areas of cities always constitute great challenge to their inhabitants. However, this may require further study.

More than three-quarters of the women initiated ANC at a period other than the first trimester. Reasons for this kind of negative health-seeking behaviour requires further studies and appropriate urgent intervention in order to achieve the reproductive aspects of Millenium Development Goals (MDGs) (that is, goals 4 and 5). Previous studies by Aluko and Oluwatosin (2008), Oluwatosin, Aluko and Onibokun (2011) reported similar findings [7, 8]. Only 7.6% of the women studied started ANC at first trimester in the first study, while only 9.4% of the women in the later study commenced ANC during the first trimester. This factor is implicated for delay commencement and incomplete uptake of number of IPT doses. In addition, episodes of malaria fever were more among women who lived in densely populated and slum areas of the city, though not significant. However, the unhygienic environment which characterises the densely populated and slum areas might have contributed in a way to the reported cases of illness due to malarial infection among these women.

Larger percentage of the women had information about IPT. This was found to be better than what was reported among Uyo women with low level of IPT awareness¹⁰. Antenatal care clinics constitute the major source of information on IPT to the women. Therefore, the efforts of midwives at the three study settings are laudable. Although, 60% of the women received IPT at least once, a little above half this population took Sulphadoxine+pyrimethamine (SP), while the remaining used other types of antimalaria drugs. Interestingly, this finding differs from the reported low uptake of IPT among Uyo women in Nigeria but agrees closely with that of Kenya women [10, 11]. However, this level of IPT uptake still requires improvement. In addition, the significant association between IPT uptake and gestational age at booking observed in this current study poses serious health concern. Late commencement of ANC in this current

study has been implicated for late uptake of IPT among the women. Besides, the use of other types of antimalaria drugs other than SP as prophylaxis was reported in this study. Therefore, it is important to state that Nigeria as a member country in the Roll Back Malaria (RBM) initiative has adopted SP as IPT, particularly for pregnant women and the under-five children. SP is an evidence-based antimalaria option for the prevention of MIP [6, 12, 13]. Therefore, its use for malaria prevention during pregnancy should be encouraged in all health care facilities across the country. However, pregnant women with hypersensitive reactions to SP will benefit from other antimalaria drugs as alternative but it advisable to be strictly on prescription. The safety of other alternatives during pregnancy should be ascertained as well before prescription [12, 14].

In the knowledge rating, close to 90% of the women had at least average knowledge of MIP and its prevention. This is probably one of the bases for the high proportion of the women taking at least one type of antimalaria in form of IPT. The appreciable level of education of the respondents might have enhanced their knowledge on MIP. This stresses the importance of formal education as a means of dealing with ignorance and superstitions that negate positive health behaviour.

Lastly, it is observed that women who become ill due to malaria infection are more likely to use IPT than their counterparts who do not. This finding supports this common saying "Experience is the best teacher." Thus, it is apparent that the unfavourable experience suffered by women who became ill due to malaria during pregnancy was responsible for the level of IPT uptake among them. Therefore, it is pertinent to let pregnant women understand that they need not to wait until illness comes before reporting to clinic. It is believed that early ANC booking promotes early commencement IPT and prevents malaria incidence among pregnant women.

Limitation of the study

Postnatal women who were too ill to respond to the administered questionnaire were excluded from this study for ethical reasons.

Conclusion

This study has been able to assess the utilization of IPT during pregnancy among postpartum women in Ibadan. From the study, a little above half of the women used at least one form of IPT but significant proportion did not use SP (the Nigeria-adopted malaria drug for IPT). Besides, late initiation and irregular clinic visits observed among the women

was implicated for late commencement and inability of the women to complete recommended number of doses of IPT. In addition, significant proportion of the women went to hospitals of their choices due to illness, the condition which lead to their registration for ANC the same day. Information on IPT was accessed majorly through antenatal clinics. Therefore, it is recommended that the integration of proven focused antenatal care into the existing health care system; a better option to the current traditional antenatal care practised in all the formal centres in the country. This will help women to access relevant health information early. Such information may include importance and appropriate timing of initiation of ANC, use of IPT. Furthermore, health education/information to women should be intensified during antenatal clinic visits. The effectiveness of other media of disseminating relevant health information to this category of women may be explored in future.

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