

Assessing knowledge of pregnant Women on malaria and its prevention with Sulphadoxine-pyrimethamine(SP) in the South West Region, Cameroon

Djam Chefor Alain¹, Sylvester Ndeso Atanga², Marcelus U. Ajonina³,
Ndale N. Wozerou⁴

¹Department of Health and Human Services, Saint Monica University Buea, Cameroon

²Department of Health and Human Services, Saint Monica University Buea, Cameroon

³Department of Health Services, Meridian Global University Buea, Cameroon

⁴Department of Health and Human Services, Saint Monica University Buea, Cameroon

Abstract: Each year, more than 30 million African women in malaria endemic areas become pregnant and are at risk of infection with *Plasmodium falciparum*. In Cameroon, the disease is annually responsible for 30 to 35% of the total deaths, 35% of childhood mortality and 40 to 45% of morbidity cases. A hospital-based cross-sectional study was conducted among pregnant women in Fako Division Southwest Region of Cameroon to assess the knowledge and attitude of pregnant women on malaria. A questionnaire was used to collect data on the knowledge of pregnant women towards malaria prevention and 503 women aged 15–50 years responded. The questionnaires were written in English and the interviewers translated them to French or Pidgin English where necessary. They were also pre-tested to ensure that it maintained its original meaning. Of the 503 women who participated in the study, 208 (44.9%) were in the 2nd trimester and 20 (4.3%) in the 3rd trimester of pregnancy. Only 121 (24.1%) of pregnant women correctly understood that attending antenatal clinic early enough enables women to get the recommended course of SP for IPT on time. Most of the women 368(73%) knew one or more of the effects of malaria in pregnancy as 237(48.1%) said malaria in pregnancy results to maternal anaemia, while others said it results to maternal death 314(62.4%) and abortion 313(63.0%) respectively.

A majority of the women knew that Fansidar (SP) was the drug of choice for IPT during antenatal care services and that the correct dose for IPT with SP is 3 tablets though not all took the complete dose; hence there should be increase sensitization by the government on the importance of complete treatment.

Key words: Knowledge, Pregnant women, Prevention, Malaria.

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I. Introduction

Each year, more than 30 million African women in malaria endemic areas become pregnant and are at risk of infection with *Plasmodium falciparum* [7][8]. This results in high prevalence of patent parasitaemia and clinical malaria [9][1] in pregnancy. In Cameroon, the disease is annually responsible for 30 to 35% of the total deaths, 35% of childhood mortality and 40 to 45% of morbidity cases [11].

Malaria in pregnancy is common though preventable cause for adverse birth and maternal health outcomes. A recent overview article by [3] revealed that each year an estimated 125 million women living in malaria-endemic areas with *P. falciparum* and/or *P. vivax* transmission become pregnant. The authors confirmed earlier estimates of the World Health Organization (WHO) that in Africa 32 million pregnant women are at risk of malaria in areas of stable *P. falciparum* transmission [14][3].

Efforts to control malaria in pregnancy have greatly increased in the last couple of years within the context of concerted global efforts to achieve Millennium Development Goal (MDG) 4. MDG 4 aims at reducing maternal mortality rates by three quarters as well as unprecedented international commitment and action to reduce the burden of malaria. Since 2000, WHO recommends for sub-Saharan Africa a package of interventions to control and prevent malaria in pregnancy. It includes prompt and effective case management of malaria illness, the use of insecticide-treated nets (ITN) and intermittent preventive treatment (IPTp) and is commonly delivered through a combination of malaria and reproductive health programs [16]. IPTp consists of an antimalarial treatment given at regular intervals during pregnancy, regardless of the existence of malarial infection and symptoms. Sulphadoxine-pyrimethamine (SP) is the currently recommended drug for IPTp as it has been shown to be a cheap, safe and an effective single-dose treatment. Achieving this new target at a

country or regional level will go a long way in enhancing maternal and newborn survival. The intervention is to be offered to all antenatal care (ANC) attendees in every health facility as part of their antenatal care services.

According to recent records from the Cameroon Ministry of Health, it is estimated that 41% of the population has at least one episode of malaria each year, children under 5 and pregnant women being the most affected [11]. With a total population of about 25 million, this represents 10.3 million people suffering from malaria attacks each year [11]. This study is therefore designed to assessing knowledge and attitude of pregnant women on malaria and its prevention in the South West Region, Cameroon.

II. Methodology

2.1 Study area and population

A hospital-based cross-sectional study was conducted among pregnant women in Fako Division; Southwest Region of Cameroon. The division covers an area of 2,093km² and as of 2001 had a total population of 534,854 inhabitants. The division is subdivided into four sub-divisions (Limbe, Buea, Tiko and Mutengene) of which the town of Limbe is the divisional and administrative capital and Buea is the regional capital. Each of these sub-divisions contains many local districts and rural communities under their jurisdiction. The study was conducted in the Buea subdivision and Tiko subdivision – a rural setting. Buea (1,085 meters above sea level) is at the foot of mount Fako (4,100 m) while Tiko (28 meters elevation) is situated some 17 km from Buea.

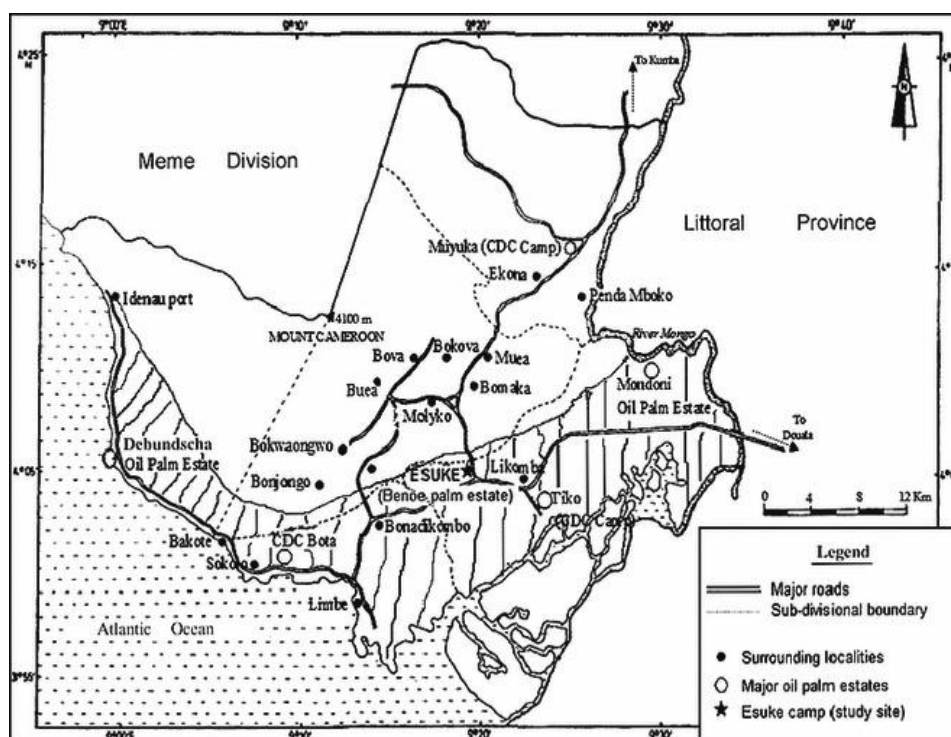


Figure 1: Partial map of Fako Division (Article April 2011 Tropical Medicine & International Health)

The study population comprised of pregnant women attending antenatal care in hospitals in Fako Division. Those excluded in the study were pregnant women who were very sick and could not be interviewed, those who did not fill the consent form and those who had withdrawn their informed consents.

2.2 Study Design

This was a cross-sectional study that employed quantitative research methods. The study involved the use of varied methodologies and data sources to help ensure more accuracy and stronger research outcomes by triangulating data from different methods. The method applied was a quantitative survey of the assessment of knowledge and attitude of pregnant women on malaria and its prevention in the South West Region.

To complement the survey, Key Informant Interviews (KII) was conducted. These were qualitative in-depth interviews with people who know what is going on in the community with the purpose of collecting information from them. They included a wide range of people such as community leaders, professionals, or residents. These community experts, with their knowledge and understanding, provided insight on the nature of problems and gave recommendations for solutions. The KIIs were to help the research team to clarify complex phenomena like behaviours and motivations that could emerge during the survey.

2.3 Sample size and sampling technique

The sample size for this study was determined based on the Yaro Yamane's approach for finite population. This approach takes in to consideration a 5% error margin and 95% CI.

$$n = N / 1 + N (e)^2$$

n = the sample size

N = the size of population

e = the level of significance (or limit of tolerable error)

For this work, the estimated population size (N) of pregnant women in Fako Division South West Region Cameroon from the 2015 population statistics was 11047 (Regional Delegation of Public Health, SW Region, 2010), and the level of significance (e) is 0.05 or 5%. So:

$$\begin{aligned} \text{Estimated Sample Size} &= 11047 / 1 + 11047(0.05)^2 \\ &= 11047 / 28.6175 \\ &\approx 386 \end{aligned}$$

In order to detect IPTp used with an error rate of 5% and 95% confidence interval (CI), the minimum sample size was inflated by 10% and rounded up to 503 to account for non-response.

2.4 Research Instrument and Measurement

A standardized questionnaire was developed on IPT of malaria in pregnant women. The questions were made to gain insight to respondents to understand and to develop a way forward for intermittent preventive treatment with sulphadoxine pyrimethamine (SP) against malaria in pregnant women. It was also to cover the demographic characteristics of respondents as well as barriers towards treatment adherence posed by the health care providers and the institutions. The questionnaires were written in English and the interviewers translated them to French or Pidgin English where necessary, they were pre-tested to ensure that it maintained its original meaning.

The questionnaires were divided into different areas having questions ranging from socio - demographics to knowledge of pregnant women on malaria prevention.

2.5 Data Collection

Authorization was obtained from the delegation of public health and the study was conducted using an interviewer- administered questionnaire adapted from a previous study^[4]. The questionnaires were structured with a combination of close and open-ended questions. Questions eliciting knowledge and attitude were on a five-point Likert scale or open ended. The questionnaire comprised of questions on socio-demographic characteristics, obstetric history, knowledge of malaria and IPTp as well as antenatal clinic attendance. The researcher checked the questionnaires at the end of each day for completeness. The data entry screens was designed and translated into electronic data for analysis. Each questionnaire was reviewed accurately at least once and corrected for any resulting data errors before analysis.

2.6 Data entry and analysis

Data were double entered in Microsoft Excel and analyzed using SPSS Statistics 20.0 (IBM Corp, Atlanta, GA, USA). Descriptive statistics were carried out to measure percentages, averages, and relative frequencies of the variables. Relationships between quantitative variables, such as knowledge and effects regarding malaria prevention were assessed using the Pearson's Chi-Squared (χ^2) and Fisher's exact tests (F) tests at 95% confidence interval (CI).

2.7 Ethical clearance

The study was approved by the institutional review board of the School of Health and Human Services, Saint Monica University, Buea. Administrative clearance and authorization was obtained from the Delegation of Public Health South West Region Buea (R11/MINSANTE/SWR/RDPH/PS/996/149) as well as the Buea District Health Services (FW2/L/MINISANTE/RDPHSW/DHS/BUEA/75) respectively, permitting us to carry out research in any of the hospitals or health centers in Fako. Authorization was also obtained from the district and community leaders in the various towns. At an individual level, verbal consent and or a filled informed consent was received from each participant before data collection. The principles of privacy and confidentiality were upheld.

III. Results

3.1 Socio-demographic characteristics

There were 503 pregnant women involved in the study. More than half 293 (58.3%) of the women were within the age of (21-30) and the least 4(0.8%) in the age group (41-50). Majority of the women 348 (69.2%) were married, a few 145(28.2%) single and 10 (1.9%) divorced. Most 142 (28.2%) of the pregnant women had

attended secondary school whereas 21 (4.2%) had never been to school before. Some of the women 106(21.0%) had attended primary education but could neither read nor write. A great number 479 (95.2%) of the women were Christians and the rest 24 (4.7%) Muslims. Majority 198 (39.4%) of the women were self-employed, 156 (31.0%) were unemployed while 85 (16.9%) were salary earners. From the interviewed 278 (55.2%) were in the 2nd trimester and 225 (55.8%) were in the 3rd trimester of pregnancy.

Table 1: Socio-demographic characteristics (N = 503)

Demographic Variables		frequency	percent
Age Group	15-20	66	13.1
	21-30	293	58.3
	31-40	140	27.8
	41-50	4	0.8
Marital Status	Single	140	28
	Married	348	69.6
	Divorced	12	2.4
Level of Education	None	21	4.3
	Primary	106	21.8
	Secondary	233	47.7
	Tertiary	127	26.1
Religion	Christianity	477	95.2
	Islamism	24	4.8
Occupation	Employed	92	19
	Not Employed	153	31.5
	Seld-employed	189	39
	Student	51	10.5
Health District	Buea	176	35
	Limbe	57	11.3
	Mutengene	196	39
	Tiko	74	14.7
Trimester	First Trimester	235	50.8
	Second Trimester	208	44.9
	Third Trimester	20	4.3

3.2 Knowledge and effects of transmission of malaria in pregnancy

Most of the women 497(98.8%) understood that malaria could be transmitted through a mosquito bite but for a few who thought malaria could be gotten from housefly 1(0.2%) and cockroach 2(0.4%) respectively. Majority 487(96.8%) of the women knew that dirty environments serves as a means for the transmission of malaria whereas 405(80.5%) thought a dam environment but a few 38(7.6%) of them said a clean environment could aid malaria transmission. Most of the women knew one or more of the effect of malaria in pregnancy such as still birth 310(61.6%) and maternal death 314(62.4%) respectively, except for a few.

Table: 2 Knowledge and effects of transmission of malaria in pregnancy

knowledge factor		n	frequency
Transmission agent	Mosquito bite	497	98.8
	Housefly	1	0.2
	Cockraoach	2	0.4
Transmission condition	Dirty environment	487	96.8
	Dam environment	405	80.5
	clean houses	38	7.6
	Ill ventilated houses	150	29.8
Effect of malaria in Pregnancy	Tuberculosis	62	12.3
	HIV	72	14.3
	Maternal anemia	237	47.1
	Stillbirth	310	61.6
	Maternal death	314	62.4
	low birth weight	334	66.4
	Spontaneous abortion	313	62.2

The overall knowledge of transmission was significantly higher in both Buea and Tiko health district than in Limbe and Mutengene health district respectfully. F=15.4, P<0.001.

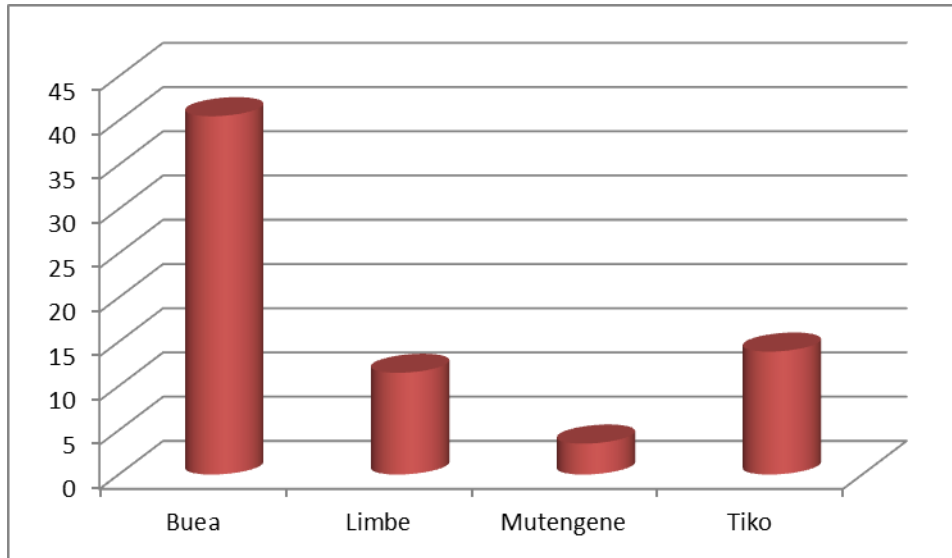


Figure 2: Overall knowledge of transmission across health district

Further analysis revealed that knowledge of transmission of malaria significantly increased with the level of education. As both secondary and tertiary education were more knowledgeable 76(48.9%) and 35(29.6%) than those without education 12(2.9%) or with primary education 49(18.6%) respectively. $F=12.93$, $P<0.001$

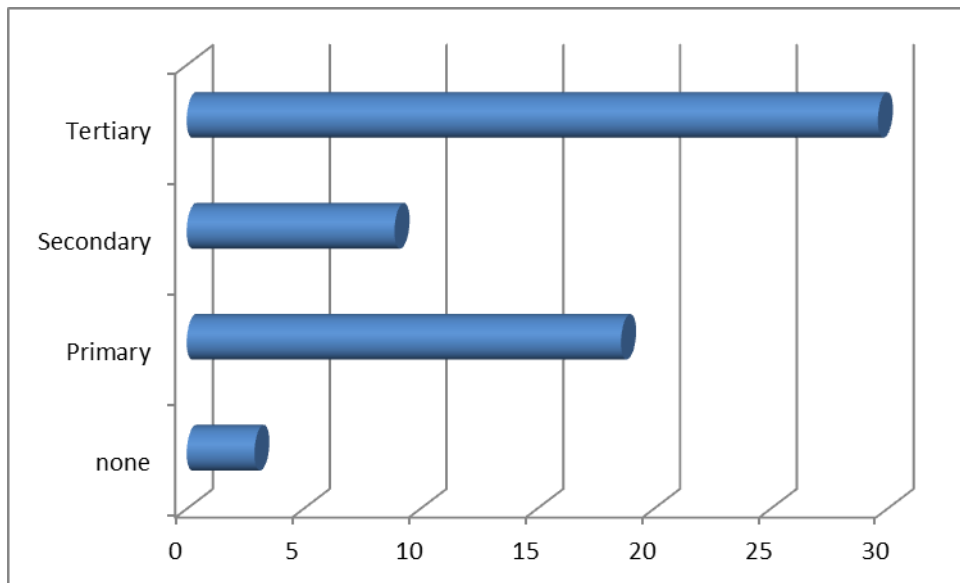


Figure 3: Overall knowledge of transmission across level education

Moreover, there was no relationship between knowledge of malaria transmission and types of religion, though the Christians 95.2% were shown to be more knowledgeable in malaria transmission than the Muslims 4.8%. $F=1.00$, $P=0.17$

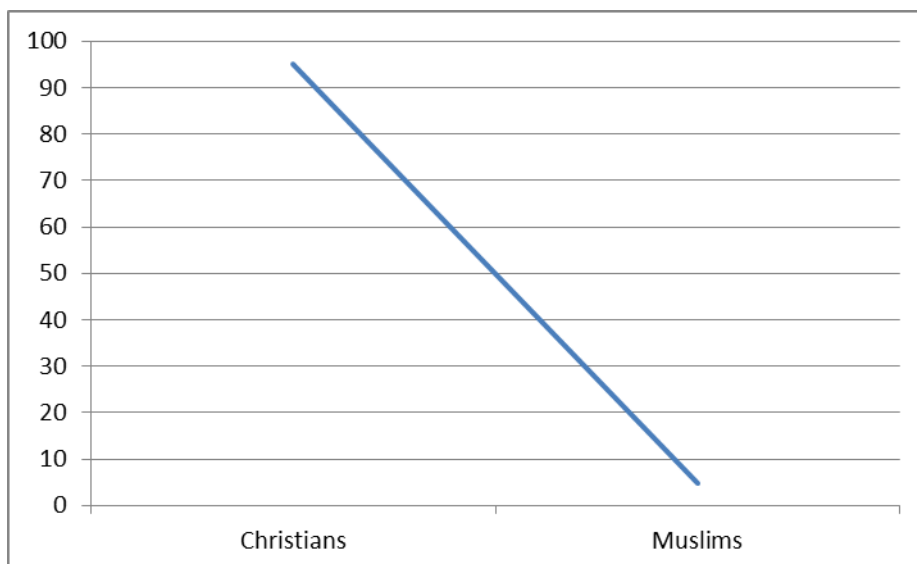


Figure 4: Overall knowledge of transmission across religion

3.3 Knowledge level of pregnant women on IPT

From the interview, 171(34.0%) women indicated that they've heard of IPT whereas 332(66.0%) said they've never heard of IPT before. 59 (34.5%) had low knowledge of what IPT was used for, 37(21.6%) had moderate knowledge of IPT use and 75 (43.8%) had high knowledge of IPT use. Most 321(63.8) of the women knew that 3 tablets of SP was the required dose during pregnancy while 110(21.8%) thought only 2 tablets was required. Most of them also knew that SP had to be administered between 4-9 months in pregnancy. A good number 121(24.1%) of the women knew that ANC is usually the right time for SP administration whereas a few 28(55.6%) thought it could be done on occasions of a health check-up.

Table 3: Knowledge level of pregnant women on IPT

Variables	Responses	n	%
Heard of IPT	YES	171	34
	NO	332	66
Knowledge of IPT	Low	592	34.5
	Moderate	37	21.6
	High	75	43.8
Tablets given	3	321	63.8
	2	110	21.8
	No Response	72	14.3
Monthly administration of SP	1-3	89	17.7
	2-4	137	27.2
	7-9	11	2.2
	4-9	233	46.3
	No Response	33	6.6
Time of administration	ANC	121	24.1
	Vaccination	23	4.5
	Health check up	28	55.6
	Counseling	92	18.3

3.4 Knowledge of the Choice of drug used at ANC

Majority of the women 439 (88.9%) know that Fansidar (SP) was the drug of choice for IPT during antenatal care services. The others responded differently as 56 (13.5%) of the women responded that Chloroquine was the drug for IPT during ANC, 25(6.1%) said Phensic, 120 (29.1%) said Coartem and 56 (13.7%) Artefan. Most of the women know that the correct dose for IPT with SP is 3 though some did not take the full dose. Therefore, the average tablet received by the women tablets was 3 and the average tablet drank was 2.79.

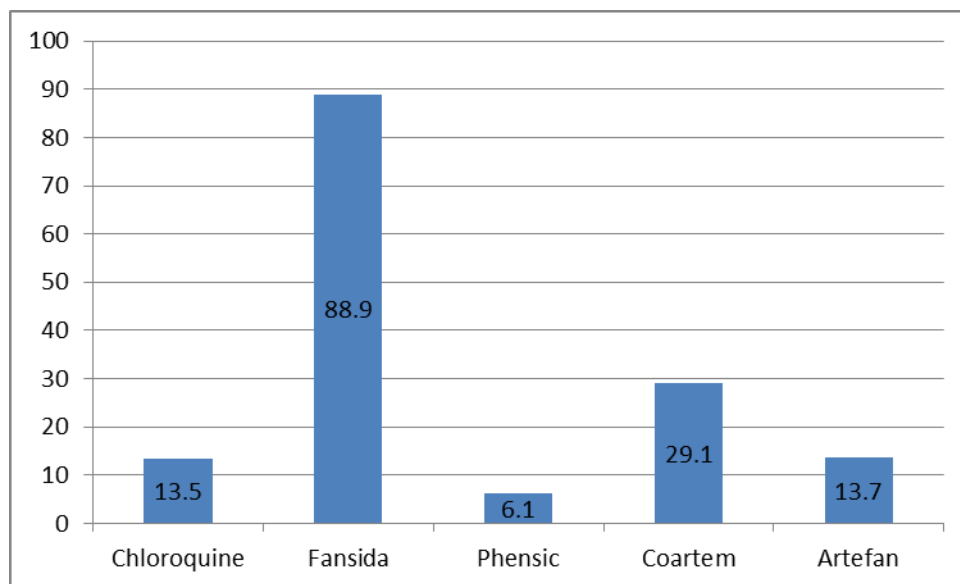


Figure 5: Choice of drug used at ANC for IPT

3.5 Knowledge of pregnant women about malaria and ITNs for malaria prevention

Of the 503 ladies who were interviewed, 489(97.2%) said they have heard about ITN and 14 (2.8%) said they have not heard of it. About 140(27.8%) of the women said that ITN protect against flies, 56(11.1%) said it shades light, 193(38.3%) says it's used in treating malaria, 472(93.8%) said it's used to protects against mosquito bite, 433(86.1%) says it prevent mosquito bites, 82(16.3%) says it's used to prevent cold and 438(87.1%) says it's used to prevent malaria. Only 25(5%) said the ITN are placed on the floor for its protection against mosquito 50(10%) says it's put on the windows, 196(39%) says on the ceiling and 453(90%) says it is place over the bed.

Table 4: Pregnant women's knowledge of malaria and ITNs

knowledge factor	n	frequency
Use		
protect against flies	140	27.8
cover cold	82	16.3
shade light	56	11.1
treat malaria	195	38.8
prevent mosquito bites	433	86.1
Right knowledge	246	48.9
setup		
on the floor	19	3.8
the window	43	8.5
on the ceiling	195	38.8
over the bed	460	91.5
Right Knowledge	278	55.3

IV. Discussion And Conclusion

The results obtained show that more than half of the women knew about IPT but for a few. Almost half of the pregnant women who had heard of IPT had low knowledge regarding its importance and most of them did not know why SP was provided, the correct timing of IPT administration and the number of SP doses that are required for IPT during pregnancy. This is unlike the findings in a study in Tanzania, which reported that pregnant women were generally aware of SP as the drug recommended for IPTp^[12]. However, some of the women demonstrated good knowledge of the drug used, whom it could be given and when it is given during pregnancy. The WHO expects 80% of all pregnant women living in areas of high transmission to receive IPTp during pregnancy by 2010^[15]. However, the coverage of the intervention is still low.

Kenya, being one of the first countries to implement IPTp, the national coverage with two doses of SP was only 14% five years after IPTp implementation^[12]. Malawi recorded the highest coverage of 60% close to achieving the 2000 Abuja target by 2005^[6]. In this study only 20.1% had received a dose of SP during the index pregnancy. The probable reason for the low uptake is the low level of awareness and poor knowledge of IPTp by the pregnant women. This is supported by the fact that those who were able to define IPTp correctly in this study were more likely to have received IPTp at least once. Also, regarding IPTp use, is the poor adherence to the recommendations for use. Hence compliance with the recommendation that IPTp drug should be given under supervision in the clinic was very low. Most of the respondents who received IPTp used SP in the clinic

and only fifty two of them were supervised by a health worker at the time of ingestion, giving a directly observed therapy (DOT) compliance rate of 10.3%. Previous related studies in eastern and northern Nigeria reported low knowledge of malaria in pregnancy and management practice as well as poor maternal health care [4][5]. The reason for poor adherence could be patient or health worker related. In a study conducted by the World Health Organization in Muheza district and Mpwapwa district in Central Tanzania by Mubyazi, [12] low compliance with the use of SP was partly attributed to health care providers' and users' fear of side effects of SP and their inadequate knowledge of the correct dose. Similarly, findings in another study conducted in Tanzania reported 74% of respondents who were said to have believed that antimalarial drug when taken during pregnancy could be harmful to the pregnant women and the unborn children [12]. A study by Mbonye [10] reported that pregnant women in Uganda believed that SP is strong and weakens pregnant women, causes abortions and fetal abnormalities. In this study, respondents expressed concern that the drug used for IPTp may cause complications during pregnancy, others said it was too big. Another user related reason for low compliance was the unfavorable disposition of the respondents to the use of cups provided in the clinic. This made them to opt for taking SP at home. Allowing pregnant women to take the IPTp drug unsupervised be it at the clinic or at home makes compliance uncertain and undermines the essence of IPTp. This practice is probably due to concern about the quality of water and hygienic use of cups provided in the clinics as shown in related past studies. For example, in a study in Tanzania, one of the district medical officers interviewed said the DOT scheme would be effective if the problem with the shortage of clean water and sharing of cups in the clinic at peripheral health facilities was solved. This was alluded to in this study whereby respondents said they would be willing to take the IPTp medication in the clinic if they were allowed to bring cups and water from home.

Most of the women knew the effects of malaria in pregnancy and also understood that malaria could be transmitted through a mosquito bite with Fansidar (SP) as the drug of choice for IPT during antenatal care services. They knew that the correct dose for IPT with SP is 3 tablets though not all took the complete dose. Hence there should be increase sensitization by the government on the importance of complete treatment as well as sensitization programs be designed to target different groups of pregnant women at the antenatal clinics and the community.

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