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UTILIZATION OF IPTP BY PREGNANT WOMEN ATTENDING ANTENATAL CARE AT DANGAMVURA AND SAKUBVA CLINICS OF MUTARE, ZIMBABWE

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ABSTRACT

Background: Malaria remains a significant public health threat, particularly impacting children and pregnant women, with the majority of cases and deaths occurring in Africa. Despite the known risks of maternal and fetal morbidity and mortality, the uptake of preventive antimalarials, such as intermittent preventive treatment for malaria in pregnancy (IPTp) using sulfadoxine/pyrimethamine (SP), remains low in endemic regions. A cross-sectional survey was conducted to assess the utilization of IPTp among pregnant women attending antenatal care at Dangamvura and Sakubva clinics in Mutare, Zimbabwe. Systematic random sampling was employed to select 80 participants. Although participants received IPTp medication for free and under supervision, only 46% (22.5% aged 20-24 years) took the initial dose within the recommended timeframe, while more than 41% received it only in the third trimester. Less than 40% of participants had not taken IPTp during previous pregnancies; among these, 15% had preterm births, 6.25% experienced abortions, and over 7% had stillbirths. Of the 36% who had taken IPTp in previous pregnancies, only 10% completed all three doses, all of whom had live births. Accessibility was relatively good, with 85% of participants residing within 10 km of the clinics. However, frequent stock-outs of medication and concerns about side effects were cited as barriers by 26% of women each. **Conclusions:** The utilization of IPTp was significantly affected by late booking for antenatal care, which hindered the completion of the recommended dosing schedule.

KEYWORD:- *Intermittent preventive treatment, Pregnant women, Sulfadoxinepyrimethamine, Antenatal care.*

INTRODUCTION

Intermittent preventive treatment in pregnancy (IPTp) with sulfadoxine/pyrimethamine (SP) is critical for reducing infant morbidity and mortality associated with malaria.[1] IPTp has been shown to significantly improve pregnancy outcomes, including increased birth weight and lower rates of preterm deliveries and maternal anemia.[2] However, access to IPTp remains a challenge in many regions. Arnaldo found that women in Mozambique, Uganda, and Mali face barriers such as long waiting times and irregular antenatal care (ANC) attendance, which adversely affect the uptake of IPTp.[3]

The World Health Organization (WHO) recommends administering three doses of SP to pregnant women, as studies have demonstrated its effectiveness against malaria in pregnancy.[4] In Tanzania, Akinleye *et al.*[5] and Agyei *et al*[6] reported that low compliance with IPTp was often linked to concerns about side effects of SP and a lack of adherence to recommended treatment schedules. Other barriers included late enrollment in ANC, drug shortages, and suboptimal performance by healthcare providers. The availability of SP can be unstable, and women with at least four prenatal consultations are more likely to receive IPTp, supporting WHO recommendations for early and regular ANC attendance.[4] In Ghana, despite the adoption of IPTp strategies in 2001, coverage remains low, with recent demographic health surveys indicating that only 8.0% of women received their first dose in Ghana.[6] Furthermore, van Eijk *et al*.[7] emphasized that travel distance to health facilities is a significant barrier to accessing reproductive health services in Kenya, often deterring women from attending ANC even when services are provided free of charge. Human and institutional barriers stock-outs of SP were not responsible for missed doses but pregnant women felt that theywere not ill to take the SP.[6]

According to van Eijk *et al*[7] distance travelled to the clinic affected utilization of reproductive health services in Kenya. Even if the services were provided free of charge, the long travelled distance led to additional time

cost, and in many cases, financial expenditures that overburdened the poorer women who ultimately were deterred from attending clinics for ANC or childbirth. Women missed the importance of ANC attendance which increased the opportunity for the pregnant women to receive IPTp. Agyei *et al.*[6] documented that Ghananian women felt that it was not necessary to walk long distance for IPTp only. Nigeria adopted the intermittent preventive treatment for malaria in pregnancy strategy in 2001 and studies have shown the efficacy of IPTp in preventing anaemia in pregnancy among Nigerian women, however there is still low coverage of the IPTp. The most recent demographic and health survey (DHS) in Nigeria revealed that both first and second dose coverage remain low, being 8.0% and 4.6% respectively in Northen Nigeria, and 9.9% and 5.4% in south-east Nigeria. A recent study reported values of 13.7% and 7.3% for first and second doses, respectively. IPTp using Sulfadoxine-pyrimethamine (SP) is given to pregnant women during ANC visits on at least two occasions following quickening; a dose during the second and during the third trimesters of pregnancy under direct observation.[8]

Attendance at antenatal care does not guarantee effective delivery of IPTp as favourable provider-side factors need to be in place as well. Since antenatal clinics serve as the usual entry point for IPTp implementation, the nature of service provision in the clinics as well as attendance by pregnant women is key to optimal IPTp coverage. Facility and policy-related factors were reported as being more serious impediments to IPTp coverage in Tanzania than the timing of ANC attendance. Mutseyekwa *et al.*[9] stated that 36% and 18% out of 93% of women who attended ANC reicived at least two doses and three doses of IPTp respectively. The poor level of knowledge of guidelines for IPTp delivery amongst health workers in Malawi negatively affected IPTp delivery. Health workers have also been found to offer all women IPTp (including first trimester clients) during their first clinic visits. In some cases, health workers are confused about the appropriate timing of first dose, and spacing between doses of SP, resulting in low coverage.[8]

Mchwampaka *et al*.,[4] stated that in Tanzania, some health workers were of the opinion that SP should not be taken on an empty stomach, which reduced the delivery of SP under DOTS. Unavailability of clean water in Malawi, drug stock-outs in Kenya, Tanzania, Uganda and Zambia, and staff shortages in antenatal clinics in Uganda have also negatively impacted coverage levels. Studies in Nigeria have reported low knowledge of IPTp guidelines amongst a sample of all cadres of health care providers, and poor experience of DOTS strategy among ANC attendees with 36.8% of women offered IPTp taking it in the facility and only 14.3% doing so under health worker observation. Women in Ntcheu and Nkhata bay of Malawi indicated that there should be availability and accessibility of IPTp services.[10] Furthermore, Gross[12] discovered that there was a high coverage level of the first IPTp dose (79%) in Tanzania and a low uptake of the second one with only 27% of pregnant women having received two SP doses. This pointed to pointed to the high number of missed opportunities. Although 71% of all women started ANC after the four gestational months recommended by guidelines, their late attendance was not found to be the main constraint for IPTp delivery since 81% of the women had attended the ANC clinic at the time of the first IPTp delivery and 60% had attended both during the first and the second IPTp delivery period. Low coverage levels for the second IPTp dose could be explained by health workers delivering IPTp to significantly less women during the second IPTp delivery period than the first one despite their high knowledge about the IPTp policy. In MalawiIPTp coverage is hindered by SP unavailability, health worker performance, and poor documentation of SP doses by health workers.[10]

Apart from women's late ANC initiation, it appeared that the majority of pregnant women respected the ANC schedule. However, it seemed that women's attendance was rather based on norms and rituals than on their awareness of the benefits of ANC services for their own and their child's health. Late ANC initiation was associated with ethnic group, multiparity, and late recognition of pregnancy especially the Sukuma ethnic group. Early ANC attendance, on the other hand, was triggered by primiparity, experience of a previous reproductive loss and feeling supported by the partner or husband. Male's support during pregnancy appeared to be facilitated and constrained by a broad range of institutions working along the lines of gender, family and kinship. On the other hand new norms and values imposed by the legal system or the 'modern' health system were identified as being influential on men's support during the prenatal period.[11]

In Zimbabwe, the IPTp program has faced challenges, including frequent stock-outs of SP, which hinder effective delivery.[12] The IPTp program has been characterized by regular stock out of these drugs hence hindrance to IPTp provision even though EU and UNICEF are assisting with the procurement and distribution of which SP is included.In a strategy to achieve at least 85% of IPT-2 by 2012, MOHCC introduced IPT-SP in 2004 for pregnant women attending antenatal care in 30 high transmission districts. The three dose regimen is recommended with doses of SP given at least 4 weeks apart. The goal of IPTp in Zimbabwe is to reduce prevalence of severe anemia in the mother and prevalence of low birth weight babies due to Malaria in pregnancy in line with WHO,[13] recommendation. However the IPTp component of Malaria prevention and control is failing to meet its targets in Mutare district. Review of District ANC data shows that in 2011 IPTp coverage was at 37 % for IPT1 and 19 % for IPT2 which is below national targets of 85%.

Mutare City, with a population of 300,000, has nine health centers. Sakubva Health Center had 1,892 antenatal care (ANC) attendees in 2012. The maternity unit now serves 2,581 people, with a target of 2,501 and a monthly attendance of 251. The coverage for Intermittent Preventive Treatment in pregnancy (IPTp) at Sakubva was 79.7% for the first dose (IPTp1), 57.4% for the second dose (IPTp2), and 13.7% for the third dose (IPTp3). Dangamvura Maternity Unit has 9,805 childbearing women, with 1,797 expected pregnancies in 2013. ANC attendance there was 1,434, with IPTp coverage at 51.8% for IPTp1, 34.3% for IPTp2, and 30.2% for IPTp3. The district recorded three maternal deaths due to malaria in pregnancy since January 2012. This poor coverage prompted the current study to identify barriers to the utilization of the IPTp program by pregnant women at Sakubva and Dangamvura clinics.[12]

Aim of the study

The district is one of the high malaria burdened areas, with an average of 320 cases reported per week. Despite the availability of Intermittent Preventive Treatment in pregnancy (IPTp), pregnant women continue to die from malaria. Low utilization of IPTp at Dangamvura and Sakubva clinics prompted the current study to investigate the reasons behind this in Mutare City. According to the 2012 Mutare City health report, the statistics for IPTp utilization are below the national target of 85%, indicating a low uptake of IPTp.

Methods

Study Design and Sampling

A mixed method approach was used in this study. The quantitative approach used the descriptive survey design to observe, describe and document the pattern of utilization of IPTp by Danagamvura and Sakubva pregnant women. For the qualitative approach, two focus group discussions were held one at Dangamvura and the other at Sakubva clinic. The aim of focus group discussion was to determine factors contributing to non-utilization of IPTp. Each group had 10 participants. The conceptual framework chosen to guide this study was the Health Promotion Model by Nola Pender. The targeted population was the pregnant women who attended ANC at the selected clinics during the period of study. Systematic random sampling method was considered when recruiting participants as they came for ANC services. In this study the researcher determined the sample size by performing a power analysis based on an alpha of 0.05, power 0.8 and an effect size of 0.5. In this study basing on a power 0.80, effect 0.5 and significant level 0.05, the sample size of 65 was sufficient according to Lipsey.[14]

Study setting and Population

Dangamvura and Sakubva clinics are among the seven Mutare city council health facilities in manicaland province. The town lies north of the Bvumba Mountains and south of the Imbeza valley. According to the (2002) preliminary census data, Mutare has a population of about 170 106. Recent district reports have pegged the population at 434 397; and that of women being 105 554. These two City clinics of Mutare were chosen because of their volume of work and due to recent outbreak of malaria. They are located in high density suburbs where the researcher was able to capture many women for participation. The study population was all pregnant women within the child bearing age, attending ANC at Dangamvura and Sakubva health centers. Participants were recruited as they came for ANC services at the hospital and those who met the study criteria were included in the study.

Data collection

The purpose and benefits of the study were explained to the Sister-in-Charge and staff of the ANC to gain their co-operation. The researcher requested for a private room in which to conduct the interviews so as to minimize the distraction of participants and reduce potential extraneous variables of noise and unnecessary interruptions. Data were collected through face to face interviews using a structured questionnaire while the participants were waiting to be seen by the doctor/midwives to reduce potential threat of internal validity such as history as participants had received information that would influence their responses.

The researcher scrutinized each and every completed questionnaire on the spot for immediate correction of erroneous entry. The questionnaire included questions on women's involvement in malaria prevention practices such as sleeping under the net and using mosquito repellents and coils. Prior to data collection a mini research was conducted to develop and refine instruments or data collection process. In this way the researchers became familiar with the study instrument and correct any foreseeable problems before the major study was undertaken. Two focused group discussions were held, one at Sakubva Clinic and the other at Dangamvura. Their responses were almost similar though participants from Dangamvura were reluctant to give information.

Ethics Approval and Consent to participate

Permission to conduct the study was sought from the Joint Ethics Research Committee and Parirenyatwa Group of Hospital and Medical Research Council of Zimbabwe. This was to ensure that the ethical requirements are met. The researchers explained the purpose of the study and gave information on the value and benefits of the study. Participants were assured of the right to self-determination through informed consent by informing them about the proposed study, allowing them to voluntarily choose to participate without being penalized. Anonymity and confidentiality were assured by coding the data collection forms so that no participant names appear. Signed consent forms were not attached to the instruments to ensure anonymity. Completed forms were locked in a lockable cabinet to ensure confidentially and there after data were stored in a flash

stick as a backup system destroyed after the completion of the study. Privacy was maintained throughout data collection by use of a private room. There was no women battering or child abuse observed during data collection.

Data analysis

Data analysis involved systematic organization and coding of raw data using a codebook, followed by entry into the Statistical Package for Social Sciences (SPSS) for analysis (Field, 2018). Descriptive and inferential statistics were employed to answer the research questions.[14] Demographic variables, including age, marital status, education level, occupation, religion, income, and gestational age, were analyzed using frequency distribution tables.[16] The analysis also addressed specific questions regarding the timing of IPTp doses, methods of drug acquisition, and past IPTp usage. Responses were synthesized using descriptive statistics and narrative descriptions to capture participants' experiences and perspectives effectively.[17]

RESULTS

Utilisation of Intermittent preventive treatment of malaria in pregnancy (IPTp)

Table 1 illustrates the timing of the first dose of IPTp, methods of drug acquisition, previous IPTp usage, and outcomes of prior pregnancies. The data revealed that only 6.25% of participants took their first dose of IPTp within the recommended gestational age of 4-15 weeks, while over 46% initiated treatment at 28 weeks or later. Alarmingly, 37.5% of participants did not take the second dose of sulfadoxine-pyrimethamine (SP). The majority (75%) received SP from health facilities under direct observation. Additionally, 36.25% of women who had previously delivered utilized IPTp during their last pregnancy.

Table 1: Utilisation of intermittent preventive treatment of malaria in pregnancy (n = 80).

Variable	Frequency	Percentage (%)
When the first dose was taken		
4-15 weeks	5	6.25
16-27 weeks	37	46.25
28 weeks and above	33	41.25
Did not take	5	6.25
When the 2nd dose was taken		
I week after 1st dose	5	6.25
2 weeks after 1st dose	5	6.25
3 weeks after 1st dose	2	2.50
4th week after 1st dose	38	47.50
Did not take	30	37.50
How the drug was obtained		
Offered freely at the health facility	60	75.00
Bought from a chemist	13	16.30
Bought from somewhere else	2	5.00
Not applicable	5	6.30
How the drug was taken		
In a health facility under observation	60	75.00
In a facility without observation	9	11.25
At home	6	7.50
Not applicable	5	6.25
Previous IPTp		
Yes	29	36.25
No	19	23.75
Not applicable	32(Primigravid)	40.00
Doses taken during the previous pregnancy		
1	11	13.75
2	10	12.50
3	8	10.00
Did not take	19	23.75
Not applicable	32	40.00
Outcome of the previous pregnancy		
Live baby	29	36.25
Preterm baby	10	12.50
Abortion	5	6.25
Still birth	4	5.00
Not applicable	32	40.00

Timing of IPTp

Table 2 provides data on antenatal care (ANC) visits, gestational age at booking, and parity. All participants had at least two ANC visits, starting from 4-15 weeks of gestational age.

Table 2: Timing of IPTp (n=80).

Variable	Frequency	Percentage(%)
ANC Attendances		
Once	0	00
Twice	29	36.25
Thrice	27	33.75
Fourth and above	24	30.00
Gestational age at booking		
4-15 weeks	14	17.50
16-27 weeks	42	52.50
28weeks and above	24	30.00
Gravid		
1	32	40.00
2	33	41.25
3	13	16.25
4	2	2.50

Factors affecting provision of IPTp

Table 3 presents participants' responses to factors that might affect provision of IPTp. More than 85% of the participants live within 10 km radius of the clinic, necessitate more than 68% of the participant to walk to the clinic. Despite having with over 68% walking to the facility. Despite high awareness of IPTp's importance (95%), barriers included stockouts (26.25%) and fear of side effects (26.25%).

Table 3: Factors that might affect provision of IPTp n = 80.

Variable	Frequency	Percentage (%)
Distance from the clinic		
Less than 10 kilometers	68	85.0
More than 10 kilometers	12	15.0
Means of transport used to come to the clinic		
On foot	55	68.75
Animal driven cart	1	1.25
Public transport	17	21.25
Private car	5	6.25
Others	2	2.5
Usefulness of IPTp	76	95.0
Yes	4	5.0
No		
Reasons for program failure	6	7.5
waiting too long	6	7.5
health workers not friendly	21	26.25
frequent stock outs	5	6.25
waiting area uncomfortable	11	13.75
not offered the drug	21	26,25
fear of side effects	10	12.50
believe that drugs are not useful		
Participants who suffered from malaria		
Yes	6	7.25
No	74	92.75

Age of participant and initiation of IPTp

Analysis of age-related data revealed that the highest frequency of first doses was among participants aged 20-24 years, particularly those who took IPTp during the 16-27 week gestational period (table 4).

Table 4: Age of participant when she took first dose.

		When did you take the first dose				Total
		4-15 weeks	16-27 weeks	28 and above weeks	Not taken	
Age	15-19 years	2	5	8	2	17
	20-24 years	1	18	15	0	34
	25-34 years	2	13	9	3	27
	35-44 years	0	1	1	0	2
Total		5	37	33	5	80

R= -.037 Significance = .744 SE = .124

Relationship between Age and 2nd dose was taking

Out of the 38 women who took the second dose, a significant number (14) aged 20-24 adhered to the WHO guidelines, taking the second dose 4 weeks after the first (Table 5).

Table 5: Relationship between Age and 2nd dose was taking.

		When did you take the second dose					Total
		1st week after 1st dose	2nd week after 1st dose	3rd week after 1st dose	4th week after 1st dose	Not taken	
Age	15-19 years	2	1	1	11	2	17
	20-24 years	2	2	0	14	16	34
	25-34 years	1	2	1	11	12	27
	35-44 years	0	0	0	2	0	2
Total		5	5	2	38	30	80

Relationship between Age and 2nd dose was taking

Out of the 38 women who took the second dose, a significant number (14) aged 20-24 adhered to the WHO guidelines, taking the second dose 4 weeks after the first.

Participant's educational level and initiation of IPTp

Table 6 illustrates how educational attainment affected the timing of the first dose. Most participants with secondary education took their first dose within the recommended 16-27 week period where as 24 took the first dose late.

Table 6: Educational level and initiation of IPT (n=80)

		When did you take the first dose				Total
		4-15 weeks	16-27 weeks	28 and above weeks	Not taken	
Education Level	Nil	0	0	0	1	1
	Primary	0	4	3	0	7
	Secondary	5	25	24	4	58
	Tertiary	0	8	6	0	14
Total		5	37	33	5	80

R = .107 Sig = .114 SE = .343

Marital status and initiation of IPTp

Table 7 reveals that marital status significantly influences IPTp uptake, with 65 out of 75 married participants taking the initial dose, despite some (30) taking it later than recommended.

Table 7: Marital status and initiation of IPTp.

		When did you take the first dose				Total
		4-15 weeks	16-27 weeks	28 and above weeks	Not taken	
Marital Status	Single	0	0	1	0	1
	Married	5	35	30	5	75
	Separated	0	0	1	0	1
	Divorced	0	0	1	0	1
	Widowed	0	1	0	0	1
	Cohabiting	0	1	0	0	1
Total		5	37	33	5	80

R = .066 SE = .065 Sig. =.562

Occupation of participants and initiation of IPTp

Table 8 shows that among unemployed women, 22 successfully took the first dose within the recommended period.

Table 8: Effects of occupation on initiation of IPTp.

		When did you take the first dose				Total
		4-15 weeks	16-27 weeks	28 and above weeks	Not taken	
What is your occupation?	Unemployed	3	22	17	3	45
	Student	1	3	3	1	8
	Trader	0	3	4	0	7
	Self employed	1	4	5	1	11
	White collar job	0	5	4	0	9
Total		5	37	33	5	80

R = .033 SE = .102 Sig. = .770

Table 9 indicates parity's minimal influence on the timing of the first dose of SP, as uptake was similar across parity categories.

Table 9: Parity's minimal influence on the timing of the first dose of SP.

		When did you take the first dose				Total
		4-15 weeks	16-27 weeks	28 and above weeks	Not taken	
Parity	0	2	16	13	1	32
	1-2	3	16	13	1	33
	3-4	0	5	6	2	13
	Greater than 5	0	0	1	1	2
Total		5	37	33	5	80

R = .226 SE = .111 Sig. .044

Parity has no influence in low uptake of IPTp-SP second dose taking as all parity categories took it within recommended period (Table 10).

Table 10: Information on parity and 2nd dose.

		When did you take the second dose					Total
		1st week after 1st dose	2nd week after 1st dose	3rd week after dose	4th week after 1st dose	Not Taken	
Parity	0	4	2	0	11	15	32
	1-2	1	2	2	25	7	33
	3-4	0	1	0	5	7	13
	Greater than 5	0	0	0	21	1	2
Total		5	5	2	38	30	80

R = .102 SE = .102 Sig. = .278

Religion has influence on second dose taking as 38 out of 78 Christians took second dose within recommended period as compared to Buddhists and Aesthetists (Table 11). Table 11 shows Religion and IPTp use (n=80), Obstetrics history and IPTp use(n=80). Out of 43 participants who booked their pregnancy during the second semester, 32% took both doses of SP. Among those who booked in the third trimester, 16.25% adhered to both doses, whereas the first trimester booking had a lower adherence with only 6.25% taking both doses.

Table 11: Religion and IPTp use (n=80).

		When did you take the second dose					Total
		1st week after 1st dose	2nd week after 1st dose	3rd week after 1st dose	4th week after 1st dose	Not taken	
What is your religion?	Christianity	4	4	2	38	30	78
	Buddhism	1	0	0	0	0	1

	Atheistic	0	1	0	0	0	1
Total		5	5	2	38	30	80

DISCUSSION

Findings showed that at least 63% of the participants attended ANC at least three or more times. Mutseyekwa *et al*[9] indicated that 93% of pregnant women attended ANC at leastonce and 63% at least twice. Mchwampka *et al*.[4] documented that more ANC visits promote uptake of more SP doses. In Tanzania. Overall IPTp coverage for the first and second doses was 93.7% and 63.7% respectively. Amongst women who could have received IPTp based on the timing of their attendance, only 46.3% and 47.5% were offered the first dose based on the national and WHO[13] guidelines, while 47,3% and 16.2% were offered the second dose respectively giving significant missed opportunities. Amongst ANC attendees offered first and second doses, 75% of the participants reported taking the drug under direct observation. The FGDs revealed that women just take drugs given to them by health workers because they are asked to do so. This is similar to what Agyei *et al.*[6] discovered in Ghana when women did not see the importance of taking SP when they were not ill of malaria. They do not understand why they should take SP when they had not tested positive for malaria. The majority felt that nurses should continue health educating women for them to understand why they should take the drug from their liking not to be ordered to do so. In almost similar studies Tegegne *et al.*[18] and Sonibare *et al.*[19] mentioned that preventive education should be strengthened for successive utilization. Three participants, one from Dangamvura and two from Sakubva Health centers mentioned late booking as the reason for women not to complete their SP doses. This contrary to Ghanaian pregnant who booked their pregnancy during the first trimester.[6]

Majority of the participant (90%) were well educated. They had secondary to tertiary education but however, only 40.5% of them took first dose only showing that education level does not determine how women receive malaria prevention. In the FGDs some participants indicated that they were just given some white tablets to take under observation without explanation regardless of level of education. The level of client's education should be taken into consideration by midwives should for the program to be a success. The majority of the participants (86.3%) resided in the high density area, and most of them could walk to the clinics since the health resources were within reach. This indicates that they could access health services easily including IPTp. Christianity has an impact on IPTp utilization as more than 70% of Christians utilized the program. The participants indicated that their religions were not interfering with maternal health. In this study more than half of the participants (56.3%) were unemployed and were of had a low socio income status. The rest (43.7%) either were self-employed informal traders or students. These participants lacked adequate financial resources which has implications on completion of the IPTp course as many will either book late for ANC, initiate IPTp late or do not book at all.

Utilisation of SP (the drug recommended by 2011 National Malaria prevention policy and guidelines) for preventive treatment of malaria revealed that 46.25% of the participants who took the first dose at the appropriate time was low among the study population. Out of 50 (62.5%) who took the second dose, only 38 (47.5%) took it within WHO recommended time that is 4 weeks after 1st dose. The results also showed that 36 (45%) women used Insect treated nets. This observation has been made by several other studies in Nigeria and other part of Africa according to Nigeria Demographic survey, in 2008.[20] Only 22 (27.5%) pregnant women had taken the recommended two doses of SP during pregnancy out of 45 (56.25%) women who had taken first and second doses. At Dangamvura health centre this observation has been attributed to unavailability of the drugs at the facility due to stock out and late booking. This is contrary to what Mbonye *et al* discovered in the malaria journal where the women cited drug side effects as the reason for not taking drugs.[21] The findings in this study revealed that more women from Sakubva (38.75%) had accessed to SP for the first dose as compared to those from Dangamvura (36.25%). Out of 37 (46.25%) participants who took first dose of SP 31(38.75%) were primigravid, 15 (18.75%) from Sakubva and 16 (20%) from Dangamvura clinics. Out of these 31(38.75%) only 16 (20%) took first dose within WHO recommended period that is 9 (11.25%) and 7 (8.75%) from Sakubva and Dangamvura respectively.

The reported prevalence of malaria among the study population was about 5 (12,5%) 3 women from Sakubva and 2 (2.5%) from Dangamvura clinics. This might be due to most of the women (52.5%) not benefit from proper IPTp as they took second dose of SP at various times after the initial dose. Only 38 (47,5%) of them took it as recommended at 4th week following the initial dose. This is supported by Maiga *et al*[22] who reported in their study that addition of 3rd dose halved placental parasitaemia. The same author stated that reasons given for not taking SP included not been informed by health workers, afraid of safety of drug, drug stock out, did not remember to buy, lack of funds etc. Findings from some studies in sub Saharan Africa show that pregnant women and the society associated SP with severe adverse outcomes such as abortion, skin reaction and lack of anti-fever effect, SP can cause side effects such as Stevens-Johnson syndrome in people who are allergic to sulfa with possible dramatic and potentially fatal effects.[23] In this study there were few abortions and still births, which is consistent with previous studies on malaria in pregnancy that have shown that in high transmission areas malaria leads to anaemia and low birth weight.

Outcomes of pregnancies were documented at the end of the study showed that at the health centers, 37,5% of the woman had live births, 12 (15,0%) were preterm babies, 5 (6,25%) and 6 (7,5%) were stillbirths. These women were among those who did not take SP during their previous pregnancies and this study revealed that most of these women had bad pregnancy outcome.

The majority of the women 52 (65%) were multiparous while about 28 (35%) of them were expecting their first babies. Less than one-tenth of the participants were grand-multiparous. Majority of the mothers (77.6%) booked between the gestational ages of 3(4-15 weeks) and 7(28 weeks) months with 4(16-27 weeks) months being the most frequently preferred month for booking. Only 14 (17.5%) women booked early as recommended by WHO.[13] This pattern of booking has good implications on completion of the IPT course. Fifty two (65%) women had experienced previous deliveries. Twenty four 24 (29.5%) of the women booked their pregnancy late after 28 weeks gestational age. This affects utilisation of IPTp as the woman will not be able to complete recommended doses. This is supported by Tesfaye[24] who reported that in Ethiopia women's late presentation at ANC is common, with some of them presenting for the first time in the second trimester and for the second time during the third trimester, which it is alleged has contributed to lowering the effectiveness of ANC and IPTp related services.

This study revealed that the majority of the participants were residing within the 10 km radius and transport was not a problem as 55 (68.75%) of them could walk to the clinics. Only 4 (5%) out of 80 participants had a negative attitude towards the program as they indicated that it was not useful. One (1.25%) of them mentioned that she had never seen anyone suffering from malaria in pregnancy since the program started. Mutagonda et. al 2012 cited a similar study that was conducted in Uganda in 2010 which reported that some participants had a negative attitude towards antenatal clinics. These women attend antenatal clinics late and on irregular basis thereby disrupting antenatal schedules for proper delivery of IPTp. Women in the ages between 15 and 24 years of age were the most ANC attendees in this study and adhered to the recommended period of taking the drug. At the same time a large number of these women (37.5%) did not take second dose despite taking first dose. This was also observed by Mbonye and friends in 2008[21] when they said adolescence and women in their first pregnancy were more likely to visit health centresand access care with new programs because they have no experience with pregnancies. This study reveals that education does not matter as participants delayed in initiating the course. About 30 (37.5%) women who had attained secondary to tertiary education had their first dose during the third semester. Most married women (43.75%) took their first dose as recommended. These women had support from their spouses as the maternal health policy in Zimbabwe encourages men involvement. This is supported by Diala *et al*.[25] who discovered that "male partners' influence on the uptake of maternal health services by playing an important economic role, including paying for transportation to and from health facilities, hospital services, prescriptions, and recommended foods".

More than 52% of participants were unemployed and they took SP early implying that economic status does not interfere with utilisation of IPTp. More primigravid in this study took SP as recommended that is first dose during second trimester and second dose four weeks after first dose. Two focus group discussions were held one at Dangamvura and the other from Sakubva clinic. Their responses were almost similar though participants from Dangamvura were reluctant to give information. Most common response on reason for program failure was late booking. Forty five percent of the participants mentioned that most women book late ending up not completing the course. Of the 30% who mentioned frequent stock outs, 5% were from Dangamvura and 10% from Sakubva clinic. Ten percent of the participants in the FGD mentioned fear of drug side effects and 15% mentioned that they waited for too long and not offered the drug.

CONCLUSION

The WHO recommendation of pregnant women getting at least three doses of SP during ANC visits is not feasible in Mutare due to late booking. Most women manage to take first dose of SP andonly a few take the second dose even though they have sound knowledge of prophylaxis for malaria. Uptake of IPTp can be significantly improved in these clinics if more emphasis is put on appropriate health education and improvement of availability of the drug. There is a need to continuously sensitize and educate pregnant women on early booking so as to get a full ANC package that include complete doses of SP. Sensitization programs should be designed to target different groups of pregnant women at the antenatal clinics including Dangamvura and Sakubva health Centers.

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