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The Effect of Male Partner Involvement in ANC and IPTP-SP Uptake in Urban and Rural Areas of Benue State, Nigeria

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Abstract

Globally, malaria infection is a serious communicable infectious disease that is a threat to the lives of half of world population. In regions where malaria is widespread, the World Health Organization (WHO) advises that every pregnant woman should receive a minimum of three doses of intermittent preventive treatment with Sulfadoxine-pyrimethamine (IPTp-SP) to reduce the risk of malaria during pregnancy. This study examined how male partner involvement like accompaniment to ANC, IPTp-SP awareness, and encouragement/reminders affects optimal IPTp-SP uptake among pregnant women in urban and rural of Benue State, Nigeria, comparing settings to inform targeted interventions. A community-based comparative cross-sectional study was conducted among women of reproductive age (15–49 years) in selected urban and rural communities in Benue State using a multistage sampling technique. Data analysis involved chi-square tests, logistic regression, and Spearman's correlation ($p \leq 0.05$ significance). Male involvement was higher in urban areas (65.2% partner accompaniment to ANC) than rural (49.4%). Urban women whose partners accompanied them to ANC (OR = 3.882, 95% CI: 2.561–5.885), were aware of IPTp-SP (OR = 3.600, 95% CI: 2.374–5.458), or encouraged/reminded them (OR = 4.778, 95% CI: 1.718–13.298) had significantly higher odds of optimal uptake. In rural areas, male partner awareness of IPTp-SP was significantly associated with optimal uptake (OR = 1.534, 95% CI: 1.074–2.193). Targeted strategies in rural communities, including community education, male partner engagement, and improved access to antenatal care services, are essential to reduce disparities and enhance maternal and neonatal health outcomes.

Keywords: *Involvement, Male, Optimal, Sulfadoxine-Pyrimethamine, Uptake.*

Introduction

Globally, malaria infection is a serious communicable infectious disease that is a threat to the lives of half of world population. It affects about 515 million people in Asia, Latin America, and Sub-Saharan Africa region and causes yearly one to three million deaths [1]. It is a critical public health issue, particularly in tropical and subtropical regions where malaria is endemic. Pregnant women are more susceptible to malaria which is because of the changes in their immune system during pregnancy, which can have severe consequences for both the mother and the unborn child [2, 3]. The effects of malaria in pregnancy includes maternal and newborn anemia, low birth weight, stunting, and reduced cognitive ability in children born to such mothers [4]. In regions where malaria is widespread, the World Health Organization [WHO] advises that every pregnant woman

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should receive a minimum of three doses of intermittent preventive treatment with Sulfadoxine-pyrimethamine [IPTp-SP] to reduce the risk of malaria during pregnancy [5]. Using SP for intermittent preventive treatment in pregnancy [IPTp] continues to be a reliable approach to protect against malaria. This strategy requires that pregnant women receive the full recommended dose of SP during antenatal care visits, regardless of whether they are currently infected with malaria [6].

Despite the great progress made over the past twenty years to increase IPTp-SP uptake worldwide, a recent report by the WHO shows a decline in progress in many African countries, including Nigeria [7, 8]. About 125.2 million pregnant women worldwide are at risk of contracting malaria each year, including 30.3 million and 1.5 million in sub-Saharan Africa, where the burden is highest. Malaria in pregnancy is a major public health issue that leads to severe maternal and newborn outcomes, accounting for roughly 20% of stillbirths and 11% of neonatal deaths in the region [9, 10].

Partner support, particularly from husbands, plays a pivotal role in enhancing pregnant women's engagement with ANC and adherence to IPTp-SP. A study in Nigeria revealed that husband's encouragement, remind women to take medication, and accompanying to ANC visits, facilitated access to care and preventive interventions [11]. Several barriers linked to partner dynamics persist as women often require spousal consent before ANC attendance or SP administration, and lack of such consent or financial backing contributes directly to low IPTp coverage [12, 13]. The purpose of this study was to examine the effect of male partner involvement on the uptake of intermittent preventive treatment with sulfadoxine-pyrimethamine (IPTp-SP) among pregnant women attending antenatal care (ANC) services in urban and rural communities of Benue State, Nigeria. Specifically, the study sought to determine how different dimensions of male partner involvement—such as accompanying women to ANC visits, awareness of IPTp-SP, and encouragement or reminders to take the medication influence the likelihood of pregnant women achieving optimal IPTp-SP uptake. Additionally, the study aimed to compare the level and impact of male involvement between urban and rural settings to identify contextual differences and inform targeted interventions that could improve malaria prevention during pregnancy and ultimately enhance maternal and neonatal health outcomes.

Materials and Methods

Study Site

The study was carried out in urban and rural areas of Benue State in the North-Central region of Nigeria. The study population were women of reproductive age (15 – 49 years) who have given birth a year before the study. The calculated minimum sample size was 488 for each of urban and rural areas after adjusting for 10% non-response rate. A multistage sampling technique was used to select the study participants. The Local government Areas (LGAs) were stratified in urban and rural LGAs and Makurdi and Otukpo were selected among the urban LGAs while Obi and Konshisha were selected among the rural LGAs using simple random sampling technique by balloting without replacement. From the four chosen LGAs, two wards (communities) were randomly selected in each using a balloting method without replacement. Within these wards, household lists obtained from the respective primary healthcare centres served as the sampling frame. A proportionate allocation approach was applied to determine the number of households to be included in each ward. Subsequently, households were selected through systematic sampling, with the sampling interval (k) calculated by dividing the total number of households in a ward by

the required sample size for that ward. Finally, in every selected household, one eligible woman was identified and enrolled in the study.

Data Collection Technique and Instrument

Open Data Kit (ODK) interviewer administered questionnaire was used for data collection to obtain information. A semi-structured interviewer-administered questionnaire adapted from previous studies [14, 15].

Measuring and Scoring Variables

A 4-item tool was used to assess male partner involvement. Favourable answers were awarded a score of 1 while unfavourable answers were awarded a score of 0. A 4-point Likert scale with "Rarely, Sometimes, often and Always" scoring 1, 2, 3 and 4 respectively. A score of 50% and above was termed good husband/Partner's involvement in IPTp-SP uptake while a score below 50% was termed poor husband/Partner's involvement in IPTp uptake. A 5-item tool was used to assess the uptake of IPTp-SP among the study participants. Respondents who have taken 3 to 5 doses of SP in their previous pregnancy was term to have good (optimal) uptake of IPTp while those who have taken below 3 doses in their previous pregnancy was termed to have poor (Suboptimal) uptake of IPTp-SP.

Data Analysis

The Statistical Product and Service Solutions (SPSS) version 26.0 was used for analysis which was based on the objectives of the study. Chi-square, logistic regression and spearman's correlation were used to assess and compare male partner involvement in ANC with IPTp-SP uptake among women of reproductive age in urban and rural areas of Benue State. A p-value of ≤ 0.05 was considered statistically significant.

Ethical Approval and Consent to Participate

Ethical approval for this study was obtained from the Health Research and Ethics Committee (HREC) of the Ministry of Health and Human Services, Benue State. Written informed consent was obtained from all participants before enrolment. Participation was voluntary, and confidentiality of information was strictly maintained throughout the study.

Results

In urban areas, those whose male partners were 20-29 years, 30–39 years, 40–49 years and ≥50 years made up 2.0%, 50.6%, 33.6% and 13.7% respectively while in rural areas, those whose male partners were 20-29 years, 30–39 years, 40–49 years and ≥50 years made up 19.5%, 52.7%, 25.8% and 2.0% respectively. In urban areas, those whose male partners had completed tertiary education had the highest proportion of completed formal education with 54.5% and while in rural areas whose male partners had completed secondary education had the highest proportion of completed formal education with 46.5%. In urban and rural areas, those whose male partners were employed were 90.8% (433) and 69.7% (340) respectively (Table 1).

Table 1. Sociodemographic Characteristics of Male Partner of the Respondents in Urban and Rural Areas of Benue State

Characteristics	**Location**	
	Urban (n = 488) Frequency	**Rural (n = 488) Frequency**
Male partner's age (Years)		
20-29	10 (2.0)	95 (19.5)

30-39	247 (50.6)	257 (52.7)
40-49	164 (33.6)	126 (25.8)
≥ 50	67 (13.7)	10 (2.0)
Male partner's highest level of education attained		
None	10 (2.0)	17 (3.5)
Some primary	7 (1.4)	11 (2.3)
Completed primary	15 (3.1)	19 (3.9)
Some secondary	17 (3.5)	60 (12.3)
Completed secondary	47 (9.6)	227 (46.5)
Some tertiary	126 (25.8)	60 (12.3)
Completed tertiary	266 (54.5)	95 (19.3)
Male partner's employment status		
Employed	433 (90.8)	340 (69.7)
Unemployed	45 (9.2)	148 (30.3)

In the urban areas, majority of respondents (65.2%) reported that their male partners accompanied them to antenatal care (ANC), and among them, majority (60.1%) indicated their male partners did so sometimes. Additionally, 67.2% of urban male partners were aware of IPTp-SP, among which 95.0% encouraged or reminded their partners to take it. Among rural respondents, 49.4% reported that their male partners accompanied them to ANC, out of which majority (62.7%) indicated that they did so sometimes. With respect to awareness of IPTp-SP, 49.6% indicated that their male partners were aware out of which 98.0% encouragement or reminded their wives to take it (Table 2).

Table 2. Husband/Partner's Involvement in ANC and Uptake of IPTp-SP

Characteristics	**Location**	
	Urban (n = 488) Frequency (%)	**Rural (n = 488) Frequency (%)**
Husband/partner accompany for ANC		
Yes	318 (65.2)	241 (49.4)
No	170 (34.8)	247 (50.6)
Frequency of accompanying to ANC	(n = 318)	(n = 241)
Always	65 (20.1)	42 (17.4)
Often	40 (12.6)	30 (12.4)
Rarely	23 (7.2)	18 (7.5)
Sometimes	191 (60.1)	151 (62.7)
Husband/partner aware of IPTp-SP		
Yes	328 (67.2)	242 (49.6)
No	160 (32.8)	246 (50.4)
Husband/partner encourage/remind to take IPTp-SP	(n = 328)	(n = 242)
Yes	312 (95.0)	237 (98.0)
No	16 (5.0)	5 (2.0)

Good male partner's involvement in ANC and IPTp-SP in urban and rural areas was 61.1% and 47.1% respectively. Respondents in urban and rural areas differed with respect to male partner's involvement (χ^2 = 19.079, p <0.001). Those who had good male partner's

involvement in ANC and IPTp-SP had 1.8 odds (COR = 1.757, 95% CI: 1.364 – 2.269, p <0.001) of being in urban areas than in rural areas (Table 3).

Table 3. Comparison of Husband/Partner's Involvement in ANC and Uptake of IPTp-SP Between Urban and Rural Areas in Benue State

Variable	Location		χ^2	OR (95% CI)	p-value
	Urban (n = 488) Frequency (%)	Rural (n = 488) Frequency (%)			
Husband/partner involvement					
Good	298 (61.1)	230 (47.1)	19.079	1.759 (1.364 – 2.269)	<0.001*
Poor	190 (38.9)	258 (52.9)		1	

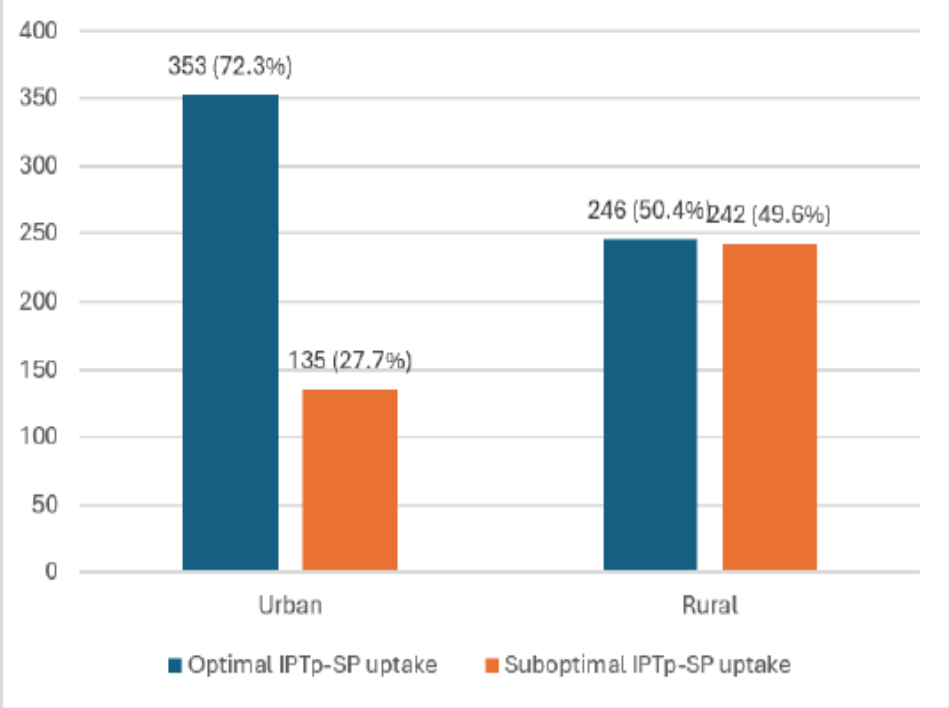

Figure 1. Showing Optimal and Suboptimal Uptake of IPTp-SP in Urban and Rural Areas of Benue State

In Benue State, optimal uptake of IPTp-SP in urban and rural areas was72.3% and 50.4% respectively (Figure 1).

In urban areas, uptake of IPTp-SP was not associated with male partners accompanying for ANC (χ^2 = 43.271, p <0.001) aware of IPTp-SP (χ^2 = 38.376, p <0.001) and encouraging/reminding women to take IPTp-SP (χ^2 = 10.611, p = 0.001). They did not differ in terms of frequency of accompanying for ANC (χ^2 = 1.525, p = 0.677). Those whose male partners accompanied for ANC, were aware of IPTp-SP and encouraging/reminding women to take IPTp-SP had 3.9 odds (OR = 3.882, 95% CI: 2.561 – 5.885, p <0.001), 3.6 odds (OR = 3.600, 95% CI: 2.374 – 5.458, p <0.001) and 4.8 odds (OR = 4.778, 95% CI: 1.718 – 13.298, p = 0.001) respectively of having optimal uptake of IPTp-SP compared to those whose male partners did not accompany them for ANC, were not aware of IPTp-SP and did not encourage/remind women to take IPTp-SP respectively (Table 4).

Table 4. Relationship Between Husband/Partner Involvement in ANC and Uptake of IPTp-SP and, Uptake of IPTp-SP in Urban Areas of Benue State, Nigeria

Variable	Uptake of IPTp-SP		χ^2	p-value	OR (95% CI)	p-value
	Optimal (n = 353) Frequency (%)	Suboptimal (n = 135) Frequency (%)				
Male partner accompanies for ANC						
Yes	261 (82.1)	57 (17.9)	43.271	<0.001*	3.882 (2.561 – 5.885)	<0.001*
No	92 (54.1)	78 (45.9)			1	
Frequency of accompanying to ANC	**(n = 126)**	**(n = 57)**				
Always	17 (73.9)	6 (26.1)	1.525	0.677		
Often	156 (81.7)	35 (18.3)				
Rarely	34 (85.0)	6 (15.0)				
Sometimes	54 (84.4)	10 (15.6)				
Male partner aware of IPTp-SP						
Yes	266 (81.1)	62 (18.9)	8.376	<0.001*	3.600 (2.374 – 5.458)	<0.001*
No	87 (54.4)	73 (45.6)			1	
Male partner encourage/remind to take IPTp-SP	**(n = 266)**	**(n = 62)**				
Yes	258 (82.7)	54 (17.3)	10.611	0.001*	4.778 (1.718 – 13.298)	0.001*
No	8 (50.0)	8 (50.0)			1	

**=Statistically significant*

In urban areas, uptake of IPTp-SP was not associated with male partners being aware of IPTp-SP ($\chi^2 = 5.549$, p = 0.018). They did not differ in terms of accompanying for ANC ($\chi^2 = 2.967$, p = 0.085), frequency of accompanying for ANC visits ($\chi^2 = 5.791$, p = 0.122), and encouraging/reminding women to take IPTp-SP ($\chi^2 = 1.271$, p = 0.271). Those whose male partners were aware of IPTp-SP 1.5 odds (OR = 1.534, 95% CI: 1.074 – 2.193, p = 0.018) of having optimal uptake of IPTp-SP compared to those whose male partners were not aware of IPTp-SP (Table 5).

Table 5. Relationship between Husband/Partner Involvement in ANC and Uptake of IPTp-SP and, Uptake of IPTp-SP in Rural Areas of Benue State, Nigeria

Variable	Uptake of IPTp-SP		χ^2	p-value	OR (95% CI)	p-value
	Optimal (n = 246) Frequency (%)	Suboptimal (n = 242) Frequency (%)				
Male partner accompanies for ANC						
Yes	131 (54.4)	110 (45.6%)	2.967	0.085		
No	115 (46.6)	132 (53.4%)				

Frequency of accompanying to ANC	**(n = 131)**	**(n = 110)**				
Always	10 (55.6)	8 (44.4)	5.791	0.122		
Often	74 (49.0)	77 (51.0)				
Rarely	18 (60.0)	12 (40.0)				
Sometimes	29 (69.0)	13 (31.0)				
Male partner aware of IPTp-SP						
Yes	135 (55.8)	107 (44.2)	5.549	0.018*	1.534 (1.074 – 2.193)	0.019*
No	111 (45.1)	135 (54.9)			1	
Male partner encourage/remind to take IPTp-SP						
Yes	131 (55.3)	106 (44.7)	1.214	0.271		
No	4 (80.0)	1 (20.0)				

**=Statistically significant*

On Spearman's correlation, there is a positive and statistically significant relationship between male partner involvement and uptake of IPTp-SP ($r = 0.295$, $p < 0.001$) in urban areas of Benue State (Table 6).

Table 6. Spearman's Rank Correlation between Husband/Partner Involvement and Uptake of IPTp-SP in Urban Areas of Benue State

Variables	**Male partner involvement**	**Uptake of IPTp-SP**
Male partner involvement	1.000	0.295** ($p < 0.001$)
N	488	488

On Spearman's correlation, there was a weak association between Husband/partner involvement and uptake of IPTp-SP ($r = 0.066$, $p = 0.144$) in rural areas of Benue State which was not statistically significant (Table 7).

Table 7. Spearman's Rank Correlation Between Husband/Partner Involvement and Uptake of IPTp-SP in Rural Areas of Benue State

Variables	**Male partner involvement**	**Uptake of IPTp-SP**
Male partner involvement	1.000	0.066 ($p = 0.144$)
N	488	488

Discussion

This study was carried to assess how male partner involvement in ANC and IPTp-SP uptake affect the optimal uptake of IPTp-SP among women of reproductive age in Benue State. Good husband's/partner's involvement in ANC and IPTp-SP in urban and rural areas was 61.1% and 47.1% respectively. Those who had good husband's/partner's involvement in ANC and IPTp-SP to be in urban areas than in rural areas. This suggests that women in urban settings are more likely to receive partner support in maternal health services than those in rural settings, possibly due to greater health awareness, better access to information, and improved availability of health services in urban areas. A study in Nigeria have shown that spousal support improves access and adherence to IPTp-SP [11]. Another reason for

this finding may be due to financial stability in which may be higher in urban compared to rural areas. It is barriers such as cost of transportation and clinic fees, thereby improving access to and uptake of IPTp-SP. Evidence from studies in Nigeria and Tanzania shows that women from households with higher socioeconomic status or employed partners are more likely to complete optimal IPTp-SP doses compared to those from poorer households [16, 17].

In urban areas, male partner accompanying to ANC visits, awareness of IPTp-SP and encouraging/reminding women to take IPTp-SP facilitated optimal uptake of IPTp-SP while in rural areas only male partner awareness of IPTp-SP facilitated optimal uptake of IPTp-SP. This indicates that in urban settings, broader social support and active male participation play a stronger role in shaping women's health-seeking behavior, likely due to better exposure to health information, higher literacy, and improved access to health services. Conversely, in rural areas, limited male participation beyond basic awareness may reflect structural barriers such as distance to facilities, cultural norms, or lower health literacy. Also, in urban areas as husband's/partner's involvement in ANC and IPTp-SP uptake increased, uptake of IPTp-SP also increased among the women which emphasizes the importance of male engagement in maternal health.

These findings in this study show the value of male involvement as both a social support mechanism and a motivator for women to comply with ANC recommendations. In contrast, the absence of a similar effect in rural areas points to gaps in male engagement which could be attributed to potential systemic or cultural barriers that limit its impact. A study in Ghana using negative binomial and time-series models found that male involvement in antenatal clinics significantly increased IPTp-SP uptake [18]. Another study in Ghana revealed that spousal support led better IPTp-SP adherence, attributing this to emotional encouragement and support from male partners during pregnancy [19]. A recent scoping review emphasized that gender-sensitive, community-based strategies are essential to improving IPTp-SP uptake suggesting that males should be intentionally included in health interventions to support maternal access and adherence [20]. The urban advantage in male involvement in this study emphasizes the need for targeted interventions especially in rural areas such as community-based education, male engagement initiatives, and improved access to ANC services which will aid in reducing disparities and improve maternal and neonatal health outcomes.

Conflict of Interest

There was no conflict of interest.

Authors' Contributions

JA conceived and designed the study, led data collection and analysis, and drafted the manuscript. OA and TA contributed to study design, data collection, and manuscript review. EO provided methodological input, contributed to data interpretation, and reviewed the manuscript. All authors read and approved of the final manuscript.

Availability of Data and Materials

The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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