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KNOWLEDGE AND SOCIO-DEMOGRAPHIC CORRELATES OF BIRTH PREPAREDNESS AND COMPLICATION READINESS AMONG PREGNANT WOMEN IN OSHIMILI SOUTH LOCAL GOVERNMENT AREA, DELTA STATE, NIGERIA.

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ABSTRACT: *Background to the study: Safe motherhood initiatives emphasize the importance of planning for childbirth and readiness for pregnancy-related complications. Nevertheless, many pregnant women continue to experience obstacles such as poverty, transportation difficulties, inadequate awareness, and poor decision-making autonomy, which limit effective preparedness. Birth preparedness and complication readiness is a process of planning for birth and anticipating actions in case of obstetric emergencies in order to reduce delay in seeking skilled care, as well as maternal mortality. The study seeks to assess the perceived determinants of birth preparedness and complication readiness among pregnant women accessing primary health care services in Oshimili South Local Government Area, Delta State. In line with the study, two (2) objectives and research questions were drafted, and a hypothesis was formulated to test the relationships between each variable. Methods: The study employed an analytical cross-sectional survey design with a sample size of 337 pregnant women. A structured questionnaire was adapted and modified from JHPIEGO. Data collected were collated and analyzed using descriptive statistics of frequency, percentages, mean, and standard deviation, while inferential statistics using Chi-square and Pearson product-moment correlation coefficient to test the hypothesis at 0.05 level of significance. IBM SPSS version 25 was used to encode quantitative data for analysis. The reliability index was tested at 0.85 using Cronbach's Alpha, which depicts a high internal consistency. Result: Result revealed a highest mean score of (M=3.51, SD=0.75) for knowledge of danger signs of labour, followed by knowledge of danger signs of pregnancy. The effect of socio-cultural factors on BPCR showed that distance to health facilities has the highest mean rating (M=2.89). Hypothesis on relationships between gestational age and knowledge of BPCR showed a Pearson correlation analysis of -0.009 and p-value of 0.876. The result indicated that no statistical relationship exists between the variables. Conclusion: knowledge of BPCR is high among pregnant women, but practical implementation remains inadequate due to financial, information, and structural barriers. Recommendation includes that nurses/ midwives should intensify health education on BPCR during ANC, as well as actively involve family members to enhance shared decision-making and emotional support. The government should provide adequate human resources, essential equipment, and priority referral systems to support skilled professionals.*

KEYWORDS: Antenatal care, Birth preparedness, BPCR, Complication readiness, Knowledge, Maternal health, Nigeria, Socio-demographics, Socio-demographics factors.

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INTRODUCTION

Maternal mortality and morbidity remain critical public health challenges, particularly in low- and middle-income countries where delays in recognizing complications and accessing skilled obstetric care persist. Pregnancy and childbirth-related deaths have become a global public health issue, and the burden is more prevalent in sub-Saharan Africa (Wudu & Tsegaye, 2021). The highest maternal mortality rates are in Africa, with a lifetime risk of 1 in 16 (WHO, 2015). Nigeria contributes substantially to this burden, largely due to delays in accessing timely and appropriate obstetric care. There are three major delays for women's access to health care; the first step is delaying the decision to seek care, and then delaying in reaching care, followed by delays in receiving adequate care (Wudu & Tsegaye, 2021). As a result, these three delays can be handled by the appropriate use of birth preparedness and complication readiness planning.

Birth preparedness and complication readiness (BPCR) is a key strategy recommended by the World Health Organization (2019) to reduce these delays by promoting planning for childbirth and emergencies. Core components of BPCR include identifying a skilled birth attendant, selecting a place of delivery, saving money, arranging transportation, recognizing danger signs, and identifying potential blood donors (JHPIEGO, 2004). Adequate knowledge of BPCR has been shown to improve maternal health-seeking behavior and increase the likelihood of skilled birth attendance.

Gaps in knowledge and disparities driven by socio-demographic characteristics continue to limit the effectiveness of BPCR. Evidence, according to the Federal Ministry of Health, Nigeria (2016), suggests that knowledge of BPCR remains inadequate among many pregnant women, particularly in developing countries. Balcha, Awoke, and Daniel's (2024) study highlighted that mothers who had good knowledge of the danger signs of labor and delivery were 2.29 times more likely to practice BP/CR relative to mothers who had poor knowledge of the danger signs of labor and delivery. This may be attributed to the fact that knowledge is an important factor that affects the attitude, intention, and behavior of a person. In Nigeria, factors such as low educational attainment, poverty, and limited access to health information have been associated with poor maternal preparedness National Population Commission, 2019; WHO, 2020). However, socio-demographic factors such as education, income, parity, and occupation significantly influence this knowledge and its application.

This study fills an important gap in maternal health research by providing empirical evidence on the level of knowledge of birth preparedness and complication readiness (BPCR) and the socio-demographic and obstetric factors associated with such knowledge among pregnant women accessing primary healthcare services in Oshimili South Local Government Area, Delta State, Nigeria. While previous studies have largely focused on the practice and utilization of BPCR, limited attention has been given to understanding the contextual factors that influence women's knowledge of BPCR at the primary healthcare level.

Specifically, this study examines the influence of maternal characteristics, including age, educational attainment, marital status, occupation, parity, income status, and place of delivery preference, on knowledge of BPCR. By identifying the factors that significantly predict women's awareness and understanding of birth preparedness and complication readiness, the study provides a more nuanced understanding of the determinants of maternal preparedness within a resource-constrained setting.

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The findings contribute to the existing body of maternal health literature by generating context-specific evidence that can inform targeted antenatal health education programmes, maternal health policies, and community-based interventions aimed at improving BPCR knowledge, promoting informed decision-making during pregnancy, and ultimately enhancing maternal and neonatal health outcomes.

Aim of the Study: The aim of this study was to assess the knowledge of birth preparedness and complication readiness and its socio-demographic correlates among pregnant women in Oshimili South Local Government Area, Delta State.

Specific Objectives: The study sought to assess the level of knowledge of birth preparedness and complication readiness among pregnant women in Oshimili South Local Government Area. and to examine the association between socio-demographic factors and birth preparedness and complication readiness practices In particular, the study explores whether variables such as age, educational level, marital status, occupation, parity, and income significantly influence women's preparedness for childbirth and potential complications.

Hypothesis: Guided by these aims, the study tests the hypothesis at 0.05 level of significance, there is no significant relationship between selected socio-demographic characteristics of pregnant women and their level of knowledge of birth preparedness and complication readiness. It further hypothesizes that socio-demographic variables do not significantly predict BPCR knowledge among the study population. The following null hypotheses were tested at 0.05 level of significance

MATERIALS AND METHOD

The study used an analytical cross-sectional survey design to generate quantitative data. The study was conducted in Oshimili South Local Government Area, Delta State, Nigeria. The study population covered six (6) major communities and nine (9) public primary health centres located in nine wards in one of the 25 LGAs in the South-South geopolitical zone in the Niger Delta region. In national household surveys, it is usual to have a sample to population ratio of 1:500 or even 1: 1000.

Sample size: A sample size of 337 was selected as the appropriate representative sample size of women within the reproductive age in the L.G.A.

Sampling technique: Multi stage sampling technique was used in selecting viable health facilities within the LGA, whereby purposive sampling technique was used to select five PHCs facilities from the nine wards. Systematic sampling technique was thereafter used to select eligible pregnant women attending antenatal care services at the selected facilities. The sampling interval was determined based on the average antenatal clinic attendance in each facility. Lastly, Simple random sampling through balloting was used to select respondents who met the inclusion criteria. Each eligible pregnant woman was given an equal opportunity to participate in the study. Verbal informed consent was obtained before recruitment, with all pregnant women given equal chances of being selected.

Instrument for data collection: comprises a self-structured questionnaire, adapted and modified from the birth preparedness assessment matrix, John Hopkins Program for

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International Education in Gynecology and Obstetrics (JHPIEGO 2018), a standardized assessment tool; and indicators for maternal and newborn health (MNH) which were developed in line with the study objectives to elicit responses from the respondents. The questions were close-ended in which the respondents were provided with multiple options for socio-demographic data and 4-points likert scale (strongly agreed, agreed, disagreed and strongly disagreed). It is divided into three (3) sections with a total of thirty-one items. The instrument was validated by three (3) experts from the field of nursing and midwifery, measurement and evaluation, and the supervisor. To ensure reliability of the instrument, data obtained were analyzed using Cronbach's Alpha reliability test, which yielded a coefficient of 0.85, indicating a high level of internal consistency and reliability of the instrument. An introductory letter was obtained from the Head of Department, Nursing Sciences, Nnamdi Azikiwe University, and submitted to the Ministry of Health Research Ethics Committee (MoHREC), Delta State, Nigeria, for approval. Thereafter, a drafted copy of a letter of permission and informed consent was issued to the heads of departments of health facilities and study participants. Data collection was done with the help of 3 research assistants, encoded and analysed using both descriptive and inferential statistics. IBM Statistical Package for the Social Sciences (SPSS) version 25 at a P value of < 0.05, and the Pearson product-moment correlation coefficient was used to test the hypothesis. The results were presented using tables.

RESULTS

Socio-Demographic Characteristics of Respondents

A total of 337 pregnant women participated in the study. The majority (77.4%, n = 261) were married, while single mothers constituted 15.4% (n = 52) of the sample. More than half of the participants resided in urban areas (58.2%, n = 196), with the Anioma ethnic group representing the largest proportion (41.8%, n = 141), followed by Urhobo/Isoko (34.7%, n = 117). Christianity was the predominant religion among participants (76.6%, n = 258). Regarding educational attainment, over half of the mothers had a tertiary education (51.3%, n = 173), and approximately one-third had a secondary education (32.0%, n = 108).

Self-employment was the most common occupation among mothers (62.3%, n = 210), while civil servants constituted 22.6% (n = 76). The majority of husbands were businessmen (59.1%, n = 199) or civil servants (23.4%, n = 79). Family average monthly income was distributed across categories, with the highest proportion earning between ₦50,000 and ₦100,000 (34.7%, n = 117), followed by those earning less than ₦50,000 (25.5%, n = 86). Most participants were in their second trimester of pregnancy (62.9%, n = 212), with first and third trimesters representing 18.1% (n = 61) and 19.0% (n = 64), respectively. Regarding antenatal attendance, more than half had attended 2-4 visits (56.7%, n = 191), while 30.0% (n = 101) had attended more than four visits.

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Objective one: Knowledge of Birth Preparedness and Complication Readiness Among Pregnant Women

Table 1: Showing the Knowledge of birth preparedness and complication readiness among respondents (N = 337)

Items	Mean	SD	Decision
Birth preparedness and complication readiness means planning pregnancy, delivery, and complications readiness.	3.30	0.72	Accepted
Essential items for the mother and baby can be bought on the day of delivery	2.24	1.04	Rejected
Registration in a health facility is a way of birth preparedness	3.32	0.79	Accepted
Arranging for Transportation is only important in a bad road network	2.08	0.97	Rejected
Arranging a blood donor is optional before delivery	2.55	0.98	Accepted
Identifying skilled birth attendants can prevent complications in pregnancy and delivery	3.15	0.89	Accepted
Does your community have a financial support system	2.09	1.06	Rejected
Planning for potential medical expenses relating to childbirth can help alleviate financial stress	3.28	0.80	Accepted
Do you have adequate access to information about birth preparedness and complication readiness?	2.93	0.97	Accepted
BPCR brings to awareness the danger signs of pregnancy, labour, and postpartum	3.27	0.82	Accepted
BPCR enables the mother to recognize danger signs such as yellowing of the skin and eye discharge in the newborn.	3.31	0.73	Accepted
Danger signs of pregnancy include: Vaginal bleeding, Severe headache, Blurred vision, Swollen hands and face, Reduced fetal movement, Drainage of liquor	3.45	0.68	Accepted
Danger signs in puerperium involve: Offensive vaginal discharge Vaginal bleeding, severe headache, difficulty breathing, severe weakness	3.33	0.82	Accepted
Danger sign in labour: severe vaginal bleeding, convulsion, prolong labour, high fever, severe headache with blurred vision	3.51	0.75	Accepted

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Table 1 presents the knowledge of birth preparedness and complication readiness among participants. For analysis of respondents' knowledge of birth preparedness and complication readiness (BPCR), a four-point Likert scale was used. Responses were scored as "Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1)". The calculated criterion mean was 2.50. Items with a mean score of 2.50 or above were regarded as accepted, indicating adequate knowledge, whereas items with a mean score below 2.50 were regarded as rejected, indicating inadequate knowledge.

The findings showed that respondents demonstrated adequate knowledge of most components of birth preparedness and complication readiness, as evidenced by mean scores above the criterion mean of 2.50. The highest mean score was observed for knowledge of danger signs of labor (M = 3.51, SD = 0.75), followed by knowledge of danger signs of pregnancy (M = 3.45, SD = 0.68), Knowledge regarding recognition of danger signs in newborns (M = 3.31, SD = 0.73) and danger signs in puerperium (M = 3.33, SD = 0.82) was also well established. Participants agreed that registration in a health facility is a form of birth preparedness (M = 3.32, SD = 0.79) and that birth preparedness and complication readiness involve planning for pregnancy, delivery, and complications (M = 3.30, SD = 0.72). Participants acknowledged the importance of identifying skilled birth attendants to prevent complications (M = 3.15, SD = 0.89) and recognized that planning for medical expenses can alleviate financial stress (M = 3.28, SD = 0.80).

Objective two : Association between socio-demographic factors and birth preparedness and complication readiness practices among pregnant women

Table 2: Assessing how socio-demographic correlates affect birth preparedness and complication readiness.

Strategy	H f(%)	Q f(%)	L f(%)	NA f(%)	Mean	Decision
Age	93(27.6)	112(33.2)	36(10.7)	96(28.5)	2.60	**QE**
Educational background	96(28.5)	92(27.3)	62(18.4)	87(25.8)	2.58	**QE**
Distance to the health facility	112(33.2)	118(35.0)	66(19.6)	41(12.2)	2.89	**QE**
Income in the family	116(34.4)	103(30.6)	48(14.2)	70(20.8)	2.79	**QE**
Financial cost of delivery	119(35.3)	98(29.1)	50(14.8)	70(20.8)	2.79	**QE**
Religion value	75(22.3)	99(29.4)	75(22.3)	88(26.1)	2.48	**LE**
Marital status	104(30.9)	77(22.8)	49(14.5)	107(31.8)	2.53	**QE**
Mother occupation	97(28.8)	106(31.5)	62(18.4)	72(21.4)	2.68	**QE**
Father occupation	86(25.5)	83(24.6)	52(15.4)	116(34.4)	2.41	**LE**

HE- Highly effective, Q – Quite effective, LE- Little effective, NE- Not effective.

Table 2, assess how socio-demographic correlates affect birth preparedness and complication readiness (BPCR), respondents rated each factor on a four-point Likert scale: Highly Effective (4), Quite Effective (3), Little Effective (2), and Not Effective (1). The criterion mean was calculated to be 2.50. A mean score of 2.50 and above was considered Quite Effective (QE), indicating that the factor was perceived as an important determinant of BPCR, while a mean score below 2.50 was considered Little Effective (LE), indicating a lower perceived influence.

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Results showed that distance to the health facility received the highest mean rating (M = 2.89), classified as quite effective. Financial factors, including family income (M = 2.79) and financial cost of delivery (M = 2.79), were rated as quite effective determinants. Educational background (M = 2.58), mother's occupation (M = 2.68), Age (M = 2.60) and marital status (M = 2.53) were rated as quite effective influences. This achieved mean scores above the criterion mean of 2.50 and were therefore regarded as influential factors in BPCR.

Conversely, religious values (M = 2.48) and father's occupation (M = 2.41) were perceived as having little effectiveness on birth preparedness and complication readiness and recorded mean scores below the criterion mean and were therefore perceived as having limited influence on birth preparedness and complication readiness among the respondents.

Null Hypothesis

H01: Gestational age among pregnant women will not significantly influence their knowledge of birth preparedness and complication readiness in Oshimili South Local Government Area, Delta State.

Table 3: Pearson Product-Moment Correlation Showing the Relationship Between Gestational Age and Knowledge of Birth Preparedness and Complication Readiness (N = 337)

Correlation	Knowledge R-value	P-value
Age	-0.009	0.876

Table 3 showed a Pearson correlation analysis conducted to examine the relationship between gestational age and knowledge of birth preparedness and complication readiness among pregnant women. The results indicated no statistically significant correlation between gestational age and knowledge of BPCR (r = -0.009) and the associated p-value (0.876) was greater than the 0.05 level of significance, hence the null hypothesis was retained. This finding indicates that gestational age does not significantly influence pregnant women's knowledge of birth preparedness and complication readiness in primary healthcare facilities in Oshimili South Local Government Area, Delta State.

DISCUSSION

The findings of this study revealed that pregnant women in Oshimili South Local Government Area demonstrated a generally high level of knowledge regarding birth preparedness and complication readiness (BPCR). Respondents exhibited substantial awareness of the concept of BPCR, the importance of registration in a health facility, identification of skilled birth attendants, financial planning for childbirth, and recognition of danger signs during pregnancy, the puerperium, and the neonatal period. This finding suggests that antenatal care services within the study area may be providing pregnant women with relevant information necessary for promoting safe motherhood practices and facilitating timely healthcare-seeking behaviour. The high level of knowledge observed among respondents may be attributed to the relatively high educational attainment of the study population, as over half of the participants possessed

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tertiary education. In line with JHPIEGO, 2004; WHO, 2019), this finding is encouraging because knowledge is widely recognized as the foundation upon which effective birth preparedness practices are built. Women who possess adequate knowledge of BPCR are more likely to make informed decisions concerning childbirth, recognize complications early, seek skilled obstetric care promptly, and ultimately experience better maternal and neonatal outcomes.

Educational attainment has consistently been associated with improved maternal health literacy, increased access to health information, and enhanced utilization of maternal healthcare services. According to the WHO (2019), maternal education remains one of the strongest predictors of positive maternal health behaviours because educated women are more likely to utilize preventive healthcare services and adopt recommended maternal health practices. Educated women are more likely to understand health messages delivered during antenatal care visits and apply such knowledge in preparing for childbirth and potential obstetric emergencies. The finding is consistent with the reports of Adewuyi et al. (2018), who found that women attending antenatal clinics in southwestern Nigeria demonstrated good knowledge of birth preparedness and obstetric danger signs. Similarly, Gebre et al. (2020) reported that pregnant women who regularly attended antenatal care services were significantly more likely to possess adequate knowledge of birth preparedness and complication readiness compared with those who had limited contact with healthcare providers. Comparable findings were also reported by Balcha et al. (2024), who observed that women with adequate knowledge of danger signs during pregnancy and childbirth were more likely to engage in BPCR practices than those with poor knowledge. Furthermore, the high level of awareness regarding danger signs during pregnancy, childbirth, and the postpartum period observed in this study aligns with the objectives of focused antenatal care, which emphasize continuous health education as a strategy for reducing delays in recognizing complications and seeking appropriate care. Knowledge of obstetric danger signs is particularly important because it serves as a trigger for prompt healthcare utilization during emergencies and contributes to improved maternal and neonatal outcomes.

However, despite the generally high level of knowledge, some gaps were identified. Respondents demonstrated relatively poor knowledge regarding the importance of arranging transportation before delivery and the availability of community-based financial support systems. These findings suggest that although participants understood the clinical aspects of BPCR, practical and community-level preparedness components were less well understood. Similar gaps have been reported in previous studies conducted in low-resource settings, where knowledge of danger signs was often higher than knowledge of logistical and financial preparedness measures required during obstetric emergencies (Gebre et al., 2020; Wudu & Tsegaye, 2021). The implications of these findings are important for maternal health programming. While existing antenatal health education appears effective in improving awareness of obstetric complications, greater emphasis should be placed on strengthening education regarding emergency transportation arrangements, financial preparedness, and community support mechanisms. Such interventions may further enhance comprehensive birth preparedness and contribute to reducing preventable maternal and neonatal morbidity and mortality.

The findings further demonstrated that selected socio-demographic factors exert varying degrees of influence on birth preparedness and complication readiness among pregnant women. Overall, seven of the nine socio-demographic variables assessed attained mean scores above

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the criterion mean, suggesting that respondents perceived these factors as important determinants of birth preparedness and complication readiness.

Distance to the health facility recorded the highest mean score, indicating that accessibility is a major determinant of BPCR in the study area. Several studies have reported that long distances to health facilities discourage planning and increase the likelihood of home deliveries and delayed care-seeking (Bintabara et al., 2018). Likewise, family income and financial cost of delivery, educational background, and mothers' occupation were all rated as quite effective. This finding reflects the strong influence of economic capacity on women's ability to save money, arrange transportation, purchase delivery supplies, and prepare for potential obstetric emergencies. This result aligns with numerous studies that identify financial preparedness as a core component of BPCR. Nachinab, Yakong, and Sarpong et al. (2024) reported that pregnant women perceive BPCR as essential largely because childbirth emergencies have significant financial implications.

The findings of this study revealed that distance to the health facility was perceived as the most influential socio-demographic determinant of birth preparedness and complication readiness (BPCR) among pregnant women accessing primary healthcare services in Oshimili South Local Government Area. This finding highlights the importance of geographical accessibility in the utilization of maternal healthcare services. This aligns with several studies that reported that long distances to health facilities discourage planning and increase the likelihood of home deliveries and delayed care-seeking (Bintabara et al., 2018). Women who reside far from health facilities are more likely to experience transportation difficulties, increased travel time, and delays in obtaining skilled obstetric care during emergencies. Consequently, long distances may discourage regular antenatal attendance and reduce the likelihood of adequate preparation for childbirth and potential complications. This finding supports the Three Delays Model proposed by Thaddeus and Maine (1994), which identifies delay in reaching a healthcare facility as a major contributor to maternal morbidity and mortality. Similarly, Alamrew et al. (2024) reported that women living closer to healthcare facilities were significantly more likely to practice birth preparedness and complication readiness than those residing farther away. Likewise, Balcha et al. (2024) found that geographical accessibility positively influenced maternal preparedness and utilization of skilled birth services.

Family income also emerged as an important determinant of BPCR among the respondents. This suggests that economic capacity plays a crucial role in enabling pregnant women and their families to undertake essential preparedness activities such as saving money for delivery, arranging transportation, purchasing delivery materials, and seeking emergency obstetric care when complications arise. This result corroborates with numerous studies that identify financial preparedness as a core component of BPCR. Nachinab, Yakong, and Sarpong et al. (2024) reported that pregnant women perceive BPCR as essential largely because childbirth emergencies have significant financial implications.

Households with higher income levels are generally better positioned to meet both the direct and indirect costs associated with maternal healthcare services. Similarly, Alamrew et al. (2024), in a systematic review and meta-analysis conducted across African countries, identified household wealth status as one of the strongest predictors of BPCR practice.

The financial cost of delivery was also perceived as a significant determinant of BPCR among the respondents. This finding may be attributed to the substantial out-of-pocket expenditures

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associated with maternal healthcare services in many developing countries, including Nigeria. In line with Wudu & Tsegaye, (2021), expenses related to antenatal care attendance, laboratory investigations, medications, transportation, delivery supplies, and emergency obstetric interventions often constitute considerable financial burdens for pregnant women and their families. Women who perceive delivery-related expenses as unaffordable may delay seeking healthcare services, opt for unskilled birth attendants, or fail to make adequate arrangements for childbirth and emergencies.

Findings from the Pearson correlation analysis showed no statistically significant relationship between gestational age and knowledge of BPCR. Consequently, the null hypothesis was accepted. This finding suggests that pregnant women's knowledge of BPCR does not vary significantly across different stages of pregnancy. This result aligns with recent studies conducted in similar low- and middle-income settings. A study by Bintabara et al. (2023) in Tanzania reported no significant association between gestational age and BPCR knowledge, noting that antenatal education sessions are often standardized across trimesters, leading to uniform knowledge acquisition among pregnant women. However, some studies contradict this finding. For instance, Hailu et al. (2023) reported higher BPCR knowledge among women in the third trimester, attributing this to cumulative exposure to antenatal counselling. The discrepancy may be explained by contextual differences in antenatal care delivery, timing of first ANC visit, and health worker emphasis on BPCR across pregnancy stages.

CONCLUSION

Overall, the findings of this study are largely consistent with existing literature, demonstrating that while knowledge of BPCR is high among pregnant women, practical implementation remains inadequate due to financial, informational, and structural barriers. Socio-demographic factors, particularly income, education, and access to health facilities, play significant roles in shaping BPCR practices.

Midwives should actively involve family members, especially spouses, during antenatal visits to enhance shared decision-making and emotional support

Community-based health insurance schemes or financial support programs should be expanded to reduce economic barriers to birth preparedness.

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Conflict of interest

The authors declare no conflict of interest associated with the study.

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