

Knowledge and Prevention of Anaemia in Pregnancy among Pregnant Women attending Antenatal Clinic at Oba Ademola II Maternity Hospital, Ijemo, Ogun State, Nigeria

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Date of Submission: 15th October 2025

Date of Acceptance: 21st November 2025

Date of Publication: 28th February 2026

Abstract

Introduction: Anaemia in pregnancy remains a major global health concern and the most common nutritional disorder affecting women in developing countries. It contributes significantly to maternal and perinatal morbidity and mortality. This study assessed the knowledge and preventive practices regarding anaemia among pregnant women attending the antenatal clinic at Oba Ademola II Maternity Hospital, Ijemo, Ogun State.

Methods: A descriptive cross-sectional design was employed among 210 pregnant women selected using a convenience sampling technique. The sample size was determined using Taro Yamane's formula. Data were collected with a validated, structured self-administered questionnaire covering socio-demographic characteristics, knowledge, preventive measures, and associated factors. Ethical approval was obtained from the Oba Ademola II Maternity Hospital Research Ethics Committee. Data were analysed using SPSS version 23.0 with descriptive and inferential statistics; significance was set at $p \leq 0.05$.

Results: Although only 53.8% correctly defined anaemia as low haemoglobin, 80.5% demonstrated good overall knowledge based on a $\geq 70\%$ score cut-off. Preventive measures were widely practised, with 86.7% adhering to iron-rich diets, supplements, and regular antenatal visits. Major factors associated with anaemia included poor nutrition (76.7%), financial constraints (71.9%), frequent pregnancies (74.3%), and parasitic infections (74.3%). Knowledge was significantly associated with socio-demographic characteristics ($p < 0.05$) and preventive practices ($p < 0.001$). The instrument showed high reliability (Cronbach's alpha = 0.882).

Conclusion: Although awareness and preventive practices were encouraging, misconceptions and economic barriers persist. Strengthened health education, culturally sensitive counselling, and socioeconomic support are essential to enhance anaemia prevention and improve maternal health outcomes.

Keywords: Anaemia in pregnancy, Knowledge, Prevention

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Introduction

Anaemia in pregnancy is one of the most prevalent and preventable public health problems affecting women of reproductive age, particularly in low- and middle-income countries. The World Health Organisation (WHO) defines anaemia in pregnancy as a haemoglobin concentration below 11 g/dl. It contributes significantly to maternal and foetal morbidity and mortality, leading to complications such as preterm delivery, low birth weight, postpartum depression, and even death (1).

Globally, an estimated 40–57% of pregnant women are anaemic, with the highest burden occurring in sub-Saharan Africa and South Asia (2). In Nigeria, the prevalence ranges between 47% and 83.7%, depending on the region (3). Common contributing factors include deficiencies of iron and folate, malaria and other parasitic infections, chronic illnesses, poor dietary intake, and limited access to quality antenatal care (4). Despite ongoing national efforts such as iron-folate supplementation, nutrition education, and malaria prophylaxis, anaemia in pregnancy remains widespread due to persistent socioeconomic inequalities, cultural beliefs, and delayed antenatal booking (5).

In Ogun State, particularly within Abeokuta, many women rely on carbohydrate-based diets with limited access to iron-rich foods such as meat and green leafy vegetables due to financial constraints. Cultural practices also influence dietary habits during pregnancy, with some women avoiding certain foods believed to “cause big babies” or “difficult labour.” Such practices, combined with inconsistent antenatal attendance, contribute to the continued risk of anaemia in this population.

Although several Nigerian studies have investigated anaemia in pregnancy, most were conducted in tertiary hospitals located in major urban centres such as Lagos, Port Harcourt, and Kano. However, there is a paucity of data from community-level maternity facilities like Oba Ademola II Maternity Hospital, Ijemo, which primarily serves women from diverse socio-economic backgrounds. Understanding pregnant women’s knowledge and prevention within this context is crucial for designing locally appropriate health interventions.

Therefore, this study aims to assess the knowledge and preventive practices regarding anaemia in pregnancy among pregnant women attending the antenatal clinic at Oba Ademola II Maternity Hospital, Ijemo, Ogun State. The findings are expected to bridge existing gaps in localised data and inform the development of community-based strategies to enhance maternal and child health in the region.

Methods

Study setting and design

The study was conducted at Oba Ademola II Maternity Hospital, Ijemo, Abeokuta, Ogun State, a government-owned health facility that provides antenatal, intrapartum, and postnatal services to women residing within the Abeokuta South Local Government Area and neighbouring communities. The hospital caters to pregnant women from diverse socioeconomic backgrounds (6).

A facility-based descriptive cross-sectional study design was employed to assess the level of knowledge, preventive practices, and factors associated with anaemia in pregnancy among pregnant women attending the antenatal clinic.

Study population and Sampling

The study population consisted of all pregnant women attending antenatal clinics at the facility over the previous six months, with an average monthly attendance of approximately 441 women. The sample size ($n = 210$) was determined using Taro Yamane’s formula with a 5% margin of error, ensuring adequate representation of the study population.

A convenience sampling technique was used to recruit eligible and consenting participants who met the inclusion criteria. While this method facilitated easy access to respondents, it may have introduced selection bias, potentially overrepresenting women who were more health-conscious or consistent in antenatal attendance. Therefore, findings should be interpreted within the context of this

facility-based sample, and generalisation to all pregnant women in Ogun State should be made with caution.

Data collection instrument

Data were collected using a self-designed, pre-tested, structured questionnaire administered in English. The instrument consisted of four sections:

Section A: Socio-demographic characteristics of respondents
Section B: Knowledge of anaemia in pregnancy CS (e.g., “Is consuming iron-rich foods beneficial in preventing anaemia?”)

Section C: Preventive measures and intervention practices related to anaemia control (e.g., “Can iron-rich food be incorporated into a pregnant woman’s diet?”)

Section D: Factors associated with anaemia (e.g., “Is lack of financial resources a contributing factor to anaemia?”)

Validity and Reliability

The instrument was subjected to expert review, including that of the research supervisor and senior academic staff members from the Department of Nursing at Crescent University, to ensure content validity and alignment with the study objectives. Modifications were made to improve clarity, accuracy, and relevance. A pilot study was conducted with 10% of the calculated sample size ($n = 21$) among pregnant women with similar characteristics to the study population to test for comprehension and clarity.

Reliability was assessed using the test–retest method and measured with Cronbach’s alpha of 0.882. This value demonstrates high internal consistency.

Data collection procedure

Questionnaires were distributed during antenatal sessions after obtaining informed consent. Trained research assistants were available to provide clarification where necessary, ensuring completeness and accuracy of responses.

Statistical Analysis

Data were analysed using the Statistical Package for Social Sciences (SPSS) version 23. Descriptive statistics (frequency and percentage) were used to summarise responses, while inferential statistics such as Chi-square tests and correlation analysis were employed to examine relationships between variables.

In addition, multiple linear regression analysis was conducted to determine the predictors of knowledge of anaemia among pregnant women. Independent variables included age, marital status, educational level, occupation, religion, ethnicity, place of residence, number of children, and monthly income, while knowledge level served as the dependent variable. Statistical significance was established at $p \leq 0.05$.

Results

A total of 210 respondents participated in the study. As shown in Table 1, 50.5% of the respondents were aged 19–26 years, and 75.2% were married. Nearly 43.3% had a tertiary education, while 38.1% were civil servants. The majority (79.5%) resided in urban areas, and most were Yoruba (58.1%). About 37.6% had no children, and 28.6%

earned between ₦50,000 and ₦100,000 monthly. The findings indicate that most respondents were young, educated, and married urban dwellers. This demographic pattern suggests a population with relatively high access to healthcare and information, which may positively influence awareness and preventive practices against anaemia in pregnancy.

Table 1: Sociodemographic Characteristics of Respondents (n=210)

Variable	Frequency	Percentage
Age in years		
<18	11	5.2
19-26	106	50.5
27-34	63	30.0
35 and above	30	14.3
Marital status		
Single	39	18.6
Married	158	75.2
Divorced	13	6.2
Educational level		
None	7	3.3
Primary	34	16.2
Secondary	78	37.1
Tertiary	91	43.3
Occupation		
Civil servant	80	38.1
Self employed	56	26.7
Employee	47	22.4
Unemployed	27	12.9
Religion		
Islam	97	46.2
Christianity	104	49.5
Traditional	9	4.3
Ethnicity		
Yoruba	122	58.1
Igbo	36	17.1
Hausa	38	18.1
Others	14	6.7
Place of residence		
Urban	167	79.5
Rural	43	20.5
Number of children		
None	79	37.6
1-2	66	31.4
3-4	48	22.9
5-6	14	6.7
7 and above	3	1.4
Monthly income range		
Below ₦10,000	14	6.7
₦10,000 – ₦50,000	55	26.2

₦50,000 – ₦100,000	60	28.6
₦100,000 – ₦200,000	59	28.1
₦200,000 – ₦500,000	18	8.6
₦500,000 and above	4	1.9

Just over half (53.8%) correctly identified anaemia as a condition of low haemoglobin levels, indicating gaps in foundational understanding despite an overall high mean knowledge score ($M = 8.5 \pm 2.1$). Most respondents recognised fatigue (83.3%) and weakness as major symptoms, while 86.2% understood that antenatal check-ups facilitate early detection. Nearly all (92.4%) acknowledged anaemia's adverse effects on foetal health, and 83.3% identified iron deficiency as its main cause. However, misconceptions persisted, particularly regarding calcium's effect on iron absorption and the notion that anaemia can be ignored if asymptomatic (57.6%). Overall, 76.7% demonstrated "good knowledge" ($\geq 70\%$ score cut-off). Findings suggest that while awareness of anaemia's consequences is widespread, comprehension of its underlying mechanisms remains incomplete.

Table 2: Knowledge on Anaemia among pregnant women (n=210)

Question	Yes (%)	No (%)
Is anaemia a condition characterised by low haemoglobin levels in the blood?	113 (53.8)	97 (46.2)
Are fatigue and weakness common symptoms of anaemia?	175 (83.3)	35 (16.7)
Can regular prenatal checkups help in the early detection of anaemia?	181 (86.2)	29 (13.8)
Is anaemia during pregnancy harmless and without complications?	66 (31.4)	144 (68.6)
Does skipping prenatal vitamins increase the risk of anaemia?	174 (82.9)	36 (17.1)
Is consuming iron-rich foods beneficial in preventing anaemia during pregnancy?	169 (80.5)	41 (19.5)
Can adequate nutrition prevent anaemia in most pregnant women?	210 (100.0)	0 (0.0)
Can anaemia in pregnancy be ignored if there are no visible symptoms?	121 (57.6)	89 (42.4)
Can Calcium-rich foods improve iron absorption?	177 (84.3)	33 (15.7)
Is it true that anaemia does not affect the health of the baby?	16 (7.6)	194 (92.4)
Is iron deficiency the most common cause of anaemia in pregnant women?	175 (83.3)	35 (16.7)
Does anaemia increase the risk of postpartum infections?	178 (84.8)	32 (15.2)

Overall, 86.7% of respondents reported high-level preventive practices (mean = 7.8 ± 1.6). Most practised dietary modification (88.1%) and regular intake of iron and folic acid supplements (90.0%), supported by antenatal counselling. However, misconceptions persisted: over one-third (36.2%) used herbal remedies without medical guidance, and 38.1% did not avoid substances that reduce iron absorption. The universal agreement on the importance of nutrition education highlights the positive influence of ongoing antenatal health talks at the facility.

Table 3: Preventive measures for intervention strategies to control anaemia among pregnant women (n=210)

Question	Yes (%)	No (%)
Do pregnant women need to take dietary measures to prevent anaemia?	185 (88.1)	25 (11.9)
Can iron-rich food be incorporated into a pregnant woman's diet?	177 (84.3)	33 (15.7)
Are there specific foods and supplements that can be recommended to prevent anaemia during pregnancy?	149 (71.0)	61 (29.0)
Is it ideal for women to avoid the intake of fruits and vegetables?	32 (15.2)	178 (84.8)
Is Vitamin C and iron recommended for pregnant women?	158 (75.2)	52 (24.8)
Is it ideal for a pregnant woman to take adequate folic Acid?	189 (90.0)	21 (10.0)
Is it important for pregnant women to avoid certain foods and substances, as they hinder iron absorption?	169 (80.5)	41 (19.5)
Can herbal remedies be used without medical advice to prevent anaemia during pregnancy?	76 (36.2)	134 (63.8)
Are there certain groups of pregnant women who are susceptible to anaemia?	170 (81.0)	40 (19.0)
Is educating women about the importance of iron-rich diets a preventive measure for anaemia?	210 (100.0)	0 (0.0)
Is anaemia prevention limited only to pregnant women?	61 (29.0)	149 (71.0)

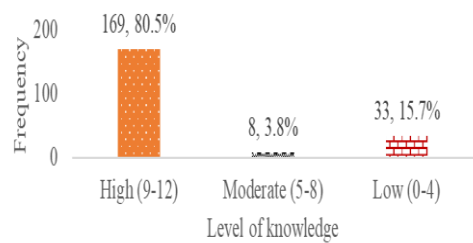


Figure 1: Level of Knowledge on Anaemia among the Respondents

Respondents identified multiple contributory factors to anaemia. The most frequently mentioned were poor dietary habits (76.7%), frequent pregnancies (74.3%), parasitic infections (74.3%), limited financial resources (71.9%), and cultural influences (70.0%). Most acknowledged that socioeconomic status, infections, and dietary patterns interact to shape anaemia risk. The findings underscore anaemia’s multifactorial nature, with both biomedical and sociocultural determinants.

Table 4: Factors associated with anaemia among pregnant women (n=210)

Questions	Yes (%)	No (%)
Is lack of financial resources a contributing factor to anaemia?	151 (71.9)	59 (28.1)
Can frequent pregnancies increase the risk of anaemia in women?	156 (74.3)	54 (25.7)
Does low socioeconomic status not contribute to a higher prevalence of anaemia?	65 (31.0)	145 (69.0)
Is anaemia unrelated to poor dietary habits during pregnancy?	49 (23.3)	161 (76.7)
Does chronic illness or inflammation have no impact on anaemia during pregnancy?	32 (15.2)	178 (84.8)
Are malaria or other parasitic infections irrelevant to the occurrence of anaemia in pregnant women?	54 (25.7)	156 (74.3)
Can cultural practices and beliefs influence anaemia prevention and treatment during pregnancy?	147 (70.0)	63 (30.0)

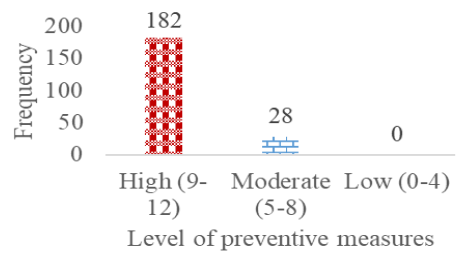


Figure 2: Level of Preventive measures for intervention strategies to control anaemia among the Respondents

Hypothesis testing

Hypothesis 1: There is no significant relationship between the demographic characteristics of respondents and the knowledge of anaemia among pregnant women attending the antenatal clinic in Oba Ademola II Maternity Hospital, Ijemo, Ogun State. The hypothesis testing in Table 5 below shows the p-value. The results showed that demographic characteristics of the respondents which include age in years (p = 0.000), marital status (p = 0.000), educational level (p = 0.000), occupation (p = 0.004) and place of residence (p = 0.000) are

significantly associated with knowledge on anaemia as the p-value of lesser than the alpha (α) p-value of 0.05 was recorded. However, religion (p = 0.089), ethnicity (p = 0.217), number of children (p = 0.407) and monthly income range (p = 0.285) were not significantly associated with knowledge on anaemia as the p-value of greater than the alpha (α) p-value of 0.05 was recorded. Age, being married, and urban residence were positively associated with knowledge, while a higher educational level was negatively associated, which may warrant further investigation.

Table 5: Association between demographic characteristics of respondents and the knowledge of anaemia

Model	Coefficients ^a				95.0% Confidence Interval for B		
	Unstandardized Coefficients	Std. Error	Standardized Coefficients	t			
	B		Beta			Lower Bound	Upper Bound

(Constant)	-0.619	0.087		-7.140	0.000	-0.790	-0.448
Age in years	0.457	0.053	0.497	8.602	0.000	0.353	0.562
Marital status	0.309	0.050	0.202	6.249	0.000	0.212	0.407
Educational level	-0.377	0.041	-0.424	-9.176	0.000	-0.458	-0.296
Occupation	0.150	0.052	0.215	2.904	0.004	0.048	0.252
Religion	-0.083	0.049	-0.065	-1.709	0.089	-0.179	0.013
Ethnicity	-0.052	0.042	-0.069	-1.239	0.217	-0.136	0.031
Place of residence	1.311	0.067	0.718	19.649	0.000	1.179	1.442
Number of children	-0.046	0.055	-0.062	-0.831	0.407	-0.154	0.063
Monthly income range	-0.045	0.042	-0.070	-10.072	0.285	-0.128	0.038

^aDependent Variable: knowledge level

Hypothesis 2: There is no significant relationship between knowledge and the prevention of anaemia among pregnant women attending the antenatal clinic in Oba Ademola II Maternity Hospital, Ijemo, Ogun State.

The p-value of 0.000 was recorded for the hypothesis of respondents, which is less than the alpha (α) p-value of 0.05.

Hence, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is accepted. This shows that there is a significant relationship between knowledge and the prevention of anaemia among pregnant women attending the antenatal clinic in Oba Ademola II Maternity Hospital, Ijemo, Ogun State.

Table 6: Association between knowledge and the prevention of anaemia among pregnant women

	Asymptotic		
	Value	df	Significance (2-sided)
Pearson Chi-Square	57.406	2	0.000
Likelihood Ratio	42.023	2	0.000
Linear-by-Linear Association	0.263	1	0.000
n of Valid Cases	210		

Discussion

Knowledge of Anaemia

This study revealed that a large proportion (80.5%) of respondents demonstrated a high level of knowledge regarding anaemia in pregnancy, with a mean score of $M = 8.5 \pm 2.1$. Over half (53.8%) correctly identified anaemia as a condition characterised by low haemoglobin levels, while most recognised fatigue (83.3%) and weakness (83.3%) as key symptoms. Likewise, 86.2% understood the importance of regular antenatal check-ups for early detection, and 80.5% agreed that consuming iron-rich foods prevents anaemia.

The high knowledge level observed may be attributed to the respondents' sociodemographic profile; nearly half (43.3%) possessed tertiary education, and most (79.5%) lived in urban areas, factors known to enhance health literacy. This finding aligns with Aleboko et al (7) in Ghana and Ozoani et al (8) in Enugu State, Nigeria, who reported similar awareness patterns among urban antenatal clients.

However, a critical observation is that while general awareness appeared high, only 53.8% of respondents correctly defined anaemia, and 31.4% perceived it as harmless. This discrepancy suggests surface-level knowledge rather than deep conceptual understanding. Possible explanations include information overload during antenatal sessions, limited time for individualised counselling, and persistent cultural misconceptions. Similar findings were reported by Ademuyiwa et al (4), who emphasised that routine health talks may not adequately

address foundational gaps in comprehension. This surface-level knowledge may be insufficient to overcome the powerful structural and cultural barriers identified, such as financial constraints and dietary taboos.

Preventive Measures

Most respondents (86.7%) employed effective preventive strategies, including adherence to folic acid supplementation (90.0%), regular consumption of iron-rich foods (84.3%), and consistent antenatal care attendance (88.1%). Furthermore, 75.2% reported taking vitamin C with iron supplements, while 80.5% avoided foods that hinder iron absorption. These findings are consistent with Ozoani et al (8), who observed high awareness and moderate adherence to preventive measures among antenatal women in Enugu.

Despite this positive trend, 36.2% of participants admitted to using herbal remedies without medical guidance, reflecting persistent cultural influences and mistrust in orthodox medicine. Herbal use during pregnancy poses potential risks such as impaired nutrient absorption, drug-herb interactions, and toxicity (1). These results highlight the need for culturally sensitive counselling that respects traditional beliefs while emphasising safety and evidence-based care. The continued use of unverified remedies despite adequate knowledge underscores the influence of cultural norms and affordability on health-seeking behaviour.

Associated Factors

Socioeconomic and reproductive factors emerged as major determinants of anaemia risk. The most reported contributors were poor dietary habits (76.7%), frequent pregnancies (74.3%), parasitic infections (74.3%), financial constraints (71.9%), and cultural beliefs (70.0%). These findings align with other studies, which similarly identified nutrition, income, and reproductive history as key determinants of maternal anaemia in sub-Saharan Africa (9, 10).

Even among knowledgeable women, financial limitations often restrict access to iron-rich foods, while closely spaced pregnancies reduce iron stores and recovery time. Moreover, cultural taboos such as avoiding eggs or red meat during pregnancy further exacerbate dietary deficiencies. These structural and cultural barriers explain why anaemia persists despite ongoing public health education and supplement programs.

Implications for Nursing Practice

The findings of this study have important implications for nursing practice, especially within the context of maternal and child health. Nurses and midwives occupy a strategic position in the prevention and management of anaemia in pregnancy through effective education, early detection, and close monitoring of clients. The high level of knowledge and preventive practices observed among the respondents indicates that antenatal health education delivered by nurses is impactful; however, persistent cultural beliefs, financial constraints, and inconsistent adherence to supplementation highlight areas where nursing intervention must be strengthened.

Nurses should intensify individualised and group counselling during antenatal sessions, focusing on the importance of iron folic acid supplementation, adequate dietary intake, and the risks associated with herbal remedies and poor nutrition. Regular screening and monitoring of haemoglobin levels should be prioritised to ensure early identification and management of anaemia cases. By adopting culturally sensitive educational approaches, nurses can bridge knowledge gaps and address misconceptions that hinder effective prevention.

Furthermore, nurses have a critical role in promoting adherence to prescribed medications and dietary recommendations. Follow-up strategies such as phone reminders, home visits, and support groups can enhance compliance. In addition, nurses should extend their health education efforts to the community by engaging male partners, families, and local leaders, as their support can improve access to resources and foster behavioural change.

At the policy level, nurses should advocate for improved accessibility of iron and folic acid supplements, deworming medications, and malaria prophylaxis at no cost to pregnant women. They should also participate actively in developing and implementing community-based maternal health programs aimed at addressing socioeconomic and cultural barriers. Continuous professional development and training on current evidence-based anaemia management guidelines

will further equip nurses with the competence to deliver quality maternal care.

Conclusion

Anaemia in pregnancy remains a major public health concern despite the relatively high level of knowledge and preventive practices demonstrated by women in this study. However, financial constraints limiting access to iron-rich foods and the prevalent use of herbal remedies without medical advice remain key barriers to effective prevention. In addition, frequent pregnancies, infections, and entrenched cultural beliefs further hinder sustained progress. Addressing these challenges requires a multifaceted approach that integrates targeted health education, socioeconomic empowerment, nutritional support, and timely antenatal interventions. Strengthening community-based counselling, ensuring consistent availability of iron and folic acid supplements, and promoting culturally sensitive nursing interventions are vital to reducing anaemia-related complications. Implementing these measures will enhance maternal health, improve foetal outcomes, and contribute significantly to reducing the burden of maternal morbidity and mortality associated with anaemia in pregnancy.

Abbreviations

ANC: Antenatal Care
 BMI: Body Mass Index
 Hb: Haemoglobin
 IDA: Iron Deficiency Anaemia
 LMICs: Low- and Middle-Income Countries
 MMR: Maternal Mortality Ratio
 SPSS: Statistical Package for Social Sciences
 UNICEF: United Nations Children's Fund
 WHO: World Health Organisation

Declarations

Ethics Approval and Consent to Participate: Ethics Approval and Consent to Participate: Ethical approval for this study was obtained from the Health Research Ethics Committee of Oba Ademola II Maternity Hospital, Ijemo (OAMH/ETH/Vol II/04). A formal proposal was submitted through the Department of Nursing, Crescent University, Abeokuta, following approval from the research supervisor. Participation in the study was entirely voluntary. Informed consent was obtained from all respondents. Confidentiality and anonymity were assured. No personal identifying information was collected at any stage of the research.

Data Availability: The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Competing Interests: The authors declare that there are no competing interests.

Funding sources: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Author contributions: SJO conceived and designed the study, supervised the research process, curated and validated the data, and led the drafting of the original manuscript. She also contributed to the development of the study methodology and coordinated the ethical approval process. ETI assisted in the development of the study methodology, managed project administration, and was responsible for data visualisation. Both authors contributed to resource mobilisation and the review and editing of the manuscript. All authors read and approved the final version of the manuscript.

Acknowledgements: The authors sincerely appreciate the time, cooperation, and valuable insights provided by all the pregnant women who participated in this study. We also extend our gratitude to the staff of OAMH, including nurses, unit coordinators, and administrative personnel, for their support in facilitating data collection. Special thanks to the research assistants for their dedication, diligence, and commitment throughout the research process, which greatly contributed to the successful execution of this study. Finally, we acknowledge the guidance and mentorship of our supervisors, whose expertise and encouragement were instrumental in shaping this work

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