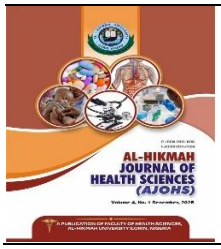
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Original Article

Prevalence, Predictors and Health Implications of Anaemia Among Pregnant Women Attending Selected Tertiary Hospitals in Ilorin, Kwara State, Nigeria

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ABSTRACT

Background: Anaemia in pregnancy remains a major cause of maternal and perinatal morbidity worldwide, with the highest burden reported in sub-Saharan Africa.

Objective: To assess the prevalence, predictors, and health implications of anaemia among pregnant women attending selected tertiary hospitals in Ilorin, Kwara State.

Methods: A descriptive cross-sectional survey was conducted among 375 pregnant women attending antenatal clinics at the University of Ilorin Teaching Hospital, Kwara State University Teaching Hospital, and Sobi Specialist Hospital, selected using a multistage sampling technique. A structured, interviewer-administered questionnaire was used to obtain socio-demographic, obstetric, nutritional, and health-related data.

Results: The prevalence of anaemia (haemoglobin <11.0 g/dL) was 52.5% (mild 26.1%, moderate 19.2%, severe 7.2%). Fatigue (76.3%) and dizziness (52.8%) were the most common symptoms. Independent predictors of anaemia were monthly household income below NGN 50,000 (AOR=11.94), suboptimal iron supplementation, infrequent consumption of iron-rich foods, non-receipt of intermittent preventive treatment for malaria (AOR=2.66), and lack of deworming (AOR=3.56).

Conclusion: Anaemia in pregnancy remains highly prevalent among women attending tertiary hospitals in Ilorin and is driven by socio-economic and modifiable preventive-care factors.

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Introduction

Anaemia in pregnancy remains one of the most important public health problems affecting maternal and child health globally. It is defined as a haemoglobin concentration below the physiological requirement of the body, with the World Health Organization classifying pregnant women as anaemic when haemoglobin concentration falls below 11.0

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g/dL (World Health Organization, 2024). Pregnant women are at increased risk of anaemia because of physiological changes including expanded blood volume and increased iron demand for fetal growth.

Globally, an estimated 37–40% of pregnant women are affected by anaemia, with the burden felt most acutely in low- and middle-income countries; prevalence exceeds 50% in some African countries (World Health Organization, 2024).

In Nigeria, national surveys and hospital-based studies consistently report moderate-to-high anaemia prevalence among pregnant women, driven by inadequate dietary intake, malaria infection, poor compliance with supplementation, parasitic infections, frequent pregnancies, and socioeconomic inequality (National Population Commission & ICF, 2019; Adeyemi *et al.,* 2023).

This study therefore assessed the prevalence, predictors, and health implications of anaemia among pregnant women attending selected tertiary hospitals in Ilorin, Kwara State, with the specific objectives of (1) determining the prevalence of anaemia, (2) describing the socio-demographic, obstetric, and nutritional characteristics of respondents, (3) identifying factors predicting the occurrence of anaemia, (4) assessing the health implications of anaemia on maternal health and pregnancy outcomes, and (5) examining the preventive and management practices adopted by pregnant women.

Materials and Methods

A descriptive cross-sectional study was conducted among pregnant women attending antenatal clinics at the University of Ilorin Teaching Hospital, Kwara State University Teaching Hospital, and Sobi Specialist Hospital in Ilorin, Kwara State. The estimated study population across the three facilities was 4,500 pregnant women.

The sample size was determined using the Yamane (1967) formula for a finite population. A minimum of 367 participants was calculated, which was increased to 404 after allowing 10% for non-response. A multistage sampling technique was used. The three hospitals were purposively selected, participants were proportionately allocated based on antenatal attendance, and eligible women were selected using systematic random sampling. Pregnant women attending antenatal clinics who gave consent were included, while those with obstetric emergencies, those who declined consent, and those attending for non-antenatal services were excluded.

Data were collected using a structured, interviewer-administered questionnaire covering socio-demographic, obstetric, nutritional, health-related, preventive, and management factors. Haemoglobin values were obtained from antenatal records. The instrument was reviewed for face and content validity by experts in Community Medicine and Public Health, Maternal and Child Health, and Epidemiology. A pilot study conducted outside the study area produced a Cronbach's alpha of 0.84, indicating good reliability (Nunnally & Bernstein, 1994).

Data were analysed using SPSS version 25.0. Frequencies, percentages, means, and standard deviations were used for descriptive analysis. Chi-square tests assessed associations between selected variables and anaemia status, while binary logistic regression identified independent predictors. Adjusted odds ratios with 95% confidence intervals were reported, with statistical significance set at $p < 0.05$.

Ethical approval was obtained from the relevant Health Research Ethics Committees. Written informed consent was obtained from all participants, and confidentiality, anonymity, and the right to withdraw were maintained throughout the study.

Results

Of 404 questionnaires distributed, 375 were correctly completed and returned, giving a response rate of 92.8%.

Table 1: Socio-Demographic Characteristics of Respondents (n=375)

Variable / Category	Frequency (n)	Percentage (%)
Age group (years)		
<20	32	8.5
20–29	168	44.8
30–39	142	37.9
≥40	33	8.8
Marital status		
Married	318	84.8
Single	41	10.9
Divorced	11	2.9
Widowed	5	1.3
Religion		
Christianity	112	29.9
Islam	258	68.8

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Traditional	3	0.8
Others	2	0.5
Educational attainment		
No formal education	18	4.8
Primary	34	9.1
Secondary	107	28.5
Tertiary	216	57.6
Occupation		
Housewife	142	37.9
Formally employed	98	26.1
Unemployed	67	17.9
Student	51	13.6
Other	17	4.5
Monthly household income (NGN)		
<50,000	156	41.6
50,000–99,999	98	26.1
100,000–199,999	72	19.2
≥200,000	49	13.1

Source: Field Survey, 2026. Median monthly household income was NGN 62,500 (IQR: NGN 35,000–NGN 127,500).

The socio-demographic profile showed that most respondents (44.8%) were aged 20–29 years and were predominantly married (84.8%), Muslim (68.8%), and had attained tertiary education (57.6%). However, 55.8% were housewives or unemployed, and 67.7% of households earned below NGN 100,000 monthly, reflecting a population with reasonable education but limited economic participation.

Table 2: Obstetric, Nutritional, and Preventive-Practice Characteristics of Respondents (n=375)

Variable / Category	Frequency (n)	Percentage (%)
Gestational age		
First trimester	89	23.7
Second trimester	146	38.9
Third trimester	140	37.3
Parity		
Primigravida	98	26.1
2–3 pregnancies	187	49.9
≥4 pregnancies	90	24.0
Antenatal care visits		
1–2 visits	78	20.8
3–4 visits	167	44.5
>4 visits	130	34.7
Iron supplementation		
Taking regularly	201	53.6
Taking sometimes	87	23.2
Not taking at all	87	23.2
Folic acid supplementation		
Taking regularly	245	65.3
Taking sometimes	96	25.6
Not taking at all	34	9.1
Dietary iron-rich food consumption		
Daily	133	35.5
3–4 times/week	108	28.8
1–2 times/week	95	25.3
Rarely	39	10.4
Malaria treatment received		
Yes	208	55.5
No	167	44.5

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IPTp received		
Yes	182	48.5
No	154	41.1
Don't know	39	10.4
Deworming during pregnancy		
Yes	158	42.1
No	217	57.9
Vaginal bleeding during pregnancy		
Yes	103	27.5
No	272	72.5

Source: Field Survey, 2026. Mean iron-rich food consumption frequency was 4.1 (±1.9 SD) days/week.

Table 3: Prevalence and Severity of Anaemia, and Reported Symptoms, among Respondents (n=375)

Category	Frequency (n)	Percentage (%)
Anaemia status (Hb <11.0 g/dL)		
No anaemia (≥11.0 g/dL)	178	47.5
Mild (10.0–10.9 g/dL)	98	26.1
Moderate (7.0–9.9 g/dL)	72	19.2
Severe (<7.0 g/dL)	27	7.2
Total anaemic	197	52.5
Reported symptoms*		
Fatigue	286	76.3
Dizziness	198	52.8
Pallor	167	44.5
Shortness of breath	123	32.8
Tachycardia	89	23.7
None of the above	54	14.4

*Symptom categories are not mutually exclusive.
Source: Field Survey, 2026.

More than half of respondents (52.5%; 197/375) were anaemic, exceeding the global WHO estimate of 37–40%. Mild anaemia was the most common severity category (26.1%), followed by moderate (19.2%) and severe (7.2%) anaemia. Fatigue (76.3%) and dizziness (52.8%) were the most frequently reported symptoms; 14.4% of respondents reported no symptoms.

Table 4: Bivariate Analysis of Selected Factors Associated with Anaemia (n=375)

Variable	Category	Anaemic n (%)	Not Anaemic n (%)	χ^2	p-value
Age group	<20 years	28 (87.5)	4 (12.5)	25.14	<0.001*
	20–29 years	82 (48.8)	86 (51.2)		
	30–39 years	60 (42.3)	82 (57.7)		
	≥40 years	27 (81.8)	6 (18.2)		
Education	No formal education	17 (94.4)	1 (5.6)	25.57	<0.001*
	Primary	32 (93.9)	2 (6.1)		
	Secondary	57 (53.3)	50 (46.7)		
	Tertiary	91 (42.1)	125 (57.9)		
Household income	<NGN 50,000	122 (78.2)	34 (21.8)	83.99	<0.001*
	NGN 50,000–99,999	46 (46.9)	52 (53.1)		
	NGN 100,000–199,999	21 (29.2)	51 (70.8)		
	≥NGN 200,000	8 (16.3)	41 (83.7)		
Parity	Primigravida	36 (36.7)	62 (63.3)	15.59	<0.001*
	2–3 pregnancies	101 (54.0)	86 (46.0)		
	≥4 pregnancies	60 (66.7)	30 (33.3)		

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Iron supplementation	Taking regularly	70 (34.8)	131 (65.2)	64.42	<0.001*
	Taking sometimes	65 (74.7)	22 (25.3)		
	Not taking at all	62 (71.3)	25 (28.7)		
IPTp received	Yes	67 (36.8)	115 (63.2)	41.48	<0.001*
	No	112 (72.7)	42 (27.3)		
	Don't know	18 (46.2)	21 (53.8)		
Deworming	Yes	47 (29.7)	111 (70.3)	52.04	<0.001*
	No	150 (69.1)	67 (30.9)		

Source: Field Survey, 2026.

Table 5: Binary Logistic Regression Analysis of Predictors of Anaemia

Predictor Variable	B	S.E.	Wald	df	p-value	AOR	95% CI for AOR
Age (Ref: ≥40 yrs)							
<20 years	1.72	1.18	2.13	1	0.145	5.58	0.55–56.2
20–29 years	0.05	1.04	0.02	1	0.885	1.05	0.14–8.08
30–39 years	-0.83	1.06	0.61	1	0.435	0.44	0.06–3.52
Income (Ref: ≥NGN 200,000)							
<NGN 50,000	2.48	0.55	20.15	1	<0.001	11.94	4.04–35.28
NGN 50,000–99,999	1.10	0.57	3.73	1	0.054	3.00	0.98–9.20
NGN 100,000–199,999	0.63	0.63	1.00	1	0.318	1.88	0.55–6.48
Parity (Ref: Primigravida)							
2–3 pregnancies	0.22	0.40	0.31	1	0.578	1.25	0.57–2.74
≥4 pregnancies	0.83	0.48	3.02	1	0.082	2.29	0.90–5.82
Iron suppl. (Ref: Regularly)							
Sometimes	2.09	0.39	28.68	1	<0.001	8.08	3.76–17.36
Not at all	1.63	0.42	15.00	1	<0.001	5.10	2.24–11.63
Dietary iron (Ref: Daily)							
3–4 times/week	0.66	0.36	3.40	1	0.065	1.94	0.96–3.91
1–2 times/week	1.96	0.39	25.53	1	<0.001	7.10	3.32–15.17
Rarely	2.76	0.60	21.06	1	<0.001	15.80	4.87–51.29
IPTp (Ref: Yes)							
No	0.98	0.39	6.33	1	0.012	2.66	1.24–5.69
Don't know	-0.26	0.66	0.15	1	0.695	0.77	0.21–2.84
Deworming (Ref: Yes)							
No	1.27	0.38	11.37	1	0.001	3.56	1.70–7.43
Constant	-5.51	1.52	13.17	1	<0.001	0.004	

Source: Field Survey, 2026.

The logistic regression model was statistically significant (χ^2 = 195.63, df = 16, p<0.001) and correctly classified 81.3% of cases. Significant independent predictors of anaemia included monthly household income below NGN50,000 (AOR=11.94, 95% CI: 4.04–35.28), taking iron supplements sometimes (AOR=8.08, 95% CI: 3.76–17.36) or not at all (AOR=5.10, 95% CI: 2.24–11.63), consuming iron-rich foods 1–2 times/week (AOR=7.10, 95% CI: 3.32–15.17) or rarely (AOR=15.80, 95% CI: 4.87–51.29), non-receipt of IPTp (AOR=2.66, 95% CI: 1.24–5.69), and lack of deworming (AOR=3.56, 95% CI: 1.70–7.43).

Discussion

This study found an anaemia prevalence of 52.5% among pregnant women attending selected tertiary hospitals in Ilorin, exceeding the global WHO estimate of 37–40% (World Health Organization, 2024) but consistent with reported patterns across sub-Saharan Africa, where prevalence ranges from 40–60% (Stevens *et al.,* 2022), and within the range reported across Nigerian studies (Babah *et al.,* 2024). The

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predominance of mild anaemia (26.1%) alongside a notable proportion of severe anaemia (7.2%) underscores a continuing public health burden with implications for maternal morbidity and mortality.

Conclusion

Anaemia remains highly prevalent among pregnant women attending tertiary hospitals in Ilorin, Kwara State, affecting more than half of the study population. Low household income, suboptimal iron supplementation, inadequate dietary iron intake, non-receipt of IPTp, and lack of deworming were identified as independent predictors, indicating that anaemia in this setting is driven jointly by socio-economic constraints and modifiable gaps in preventive antenatal care. Strengthening the consistency and quality of antenatal interventions particularly supplementation compliance, nutrition education, and coverage of malaria and helminth prevention alongside broader efforts to address household poverty, is needed to reduce the burden of anaemia in this population.

Recommendations

Based on these findings, tertiary health facilities should strengthen routine antenatal haemoglobin screening and ensure uninterrupted supply of free iron and folic acid supplements, particularly for low-income women. Antenatal health education should be intensified to improve supplementation adherence and dietary diversity, and IPTp and deworming should be systematically integrated into every antenatal visit in line with WHO protocols. Multi-sectoral approaches linking maternal health services with poverty-alleviation and food-security programmes are also recommended to address the underlying socio-economic determinants of anaemia identified in this study.

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