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Nutritional Status and Anemia Prevalence Among Women of Reproductive Age in the Central African Republic: A Cross-Sectional Study

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Abstract

Background: Anemia is a major public health concern among women of reproductive age in sub-Saharan Africa, influenced by reproductive health, nutritional practices, and infection exposure.

Objective: To assess the prevalence, determinants, and nutritional correlates of anemia among women aged 14-49 years.

Methods: A cross-sectional questionnaire-based study was conducted among 385 women aged 14-49 years using a structured 38-item instrument. The questionnaire included demographics, pubertal and anemia-related history, reproductive and infection exposure, dietary practices, and perceived nutritional well-being. Descriptive statistics, frequency analysis, Spearman correlation, and linear regression were performed using SPSS version 20.0. Normality was assessed using Kolmogorov–Smirnov and Shapiro–Wilk tests.

Results: Among participants, 79.7% had attained puberty, but only 42.9% had hemoglobin or iron testing, and 43.6% reported an anemia diagnosis. Treatment was received by 34.8% of diagnosed women, and 29.9% took iron or multivitamin supplements. Iron-rich foods were consumed daily by 47.5%, while 20% never consumed dark green leafy vegetables or vitamin C-rich fruits. Current pregnancy was reported by 34.8%, with 59.7% receiving iron/folic acid supplementation. Spearman correlations showed strong positive associations among pubertal/anemia history, reproductive/infection exposure, dietary intake, and perceived nutritional status ($r = 0.954–0.992$, $p < 0.01$). Linear regression indicated dietary intake ($\beta = 0.439$), reproductive/infection history ($\beta = 0.329$), and pubertal/anemia history ($\beta = 0.244$) significantly predicted perceived anemia-related health status ($F = 4496.9$, $p < 0.001$).

Conclusions: Anemia-related well-being among women is strongly influenced by interconnected nutritional, reproductive, and health factors. Integrated strategies focusing on nutrition education, infection control, and strengthened reproductive healthcare are essential to reduce anemia burden in this population.

Keywords: Anemia, Prevalence, Nutritional Status, Hemoglobin, Iron, Pregnancy.

1. Introduction

Anemia is one of the most prevalent nutritional disorders occurring globally and continues to be a pressing public health concern among women of reproductive age (Alem et al., 2023). Anemia arises due to a deficiency of either the number of erythrocytes or the level of hemoglobin below the expected threshold in the blood, causing reduced oxygen transport capacity of the blood to tissues of the body (Brittenham et al., 2023). According to the World Health Organization (WHO), the criteria for diagnosing anemia are a hemoglobin level of less than 12 g/dL among nonpregnant women and less than 11 g/dL among pregnant women (World Health Organization (WHO), 2025). Biological as well as social factors render women of reproductive age most susceptible to the risk of anemia.

Globally, anemia affects more than 500 million women of childbearing age (Babah et al., 2024). Anaemia affects around 40% of all children aged 6-59 months, 37% of pregnant women, and 30% of women aged 15-49 years worldwide (Stevens et al., 2022). In 2019, anaemia resulted in the loss of 50 million years of healthy life through incapacity (Givens et al., 2024). The primary factors were nutritional iron deficiency, thalassaemia and sickle cell trait, and malaria. The prevalence of anemia has been increasing in developing countries, as the prevalence of poverty, lack of food, diseases, and inadequate health care systems has been widespread (Mbunga et al., 2021; Soni et al., 2025). The prevalence of anemia has also been high in sub-Saharan Africa, as 43% of women of childbearing age

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and nearly half of the women who are pregnant suffer from anemia (Correa-Agudelo et al., 2021).

Anemia among women of reproductive age has many health implications. In non-pregnant women, it leads to a decrease in physical strength, productivity, and the immune system. In pregnant women, it is a cause of increased dangers of maternal complications, including hemorrhage, infection, gestational hypertension, postoperative complications of labor, and maternal mortality (Obeagu & Obeagu, 2025). In addition, there is evidence of possible effects of anemia before conceiving as well as during pregnancy on the brain of a child.

The factors that affect anemia among women of reproductive age are intricate. Iron Deficiency is the most prevalent cause of anemia (Jackson & Al-Mousa, 2000; Kolarš et al., 2025). It is responsible for almost 49% of anemia (Means, 2013). Lack of iron intake through iron-containing foods, inadequate consumption of vitamin C, and excessive intake of iron-inhibiting compounds like tea and coffee are causes of iron deficiency anemia. Nutritional causes of anemia also include inadequate intake of folate and vitamin B12 (Kolarš et al., 2025). Infections like Malaria, HIV, and intestinal parasitic diseases are important causes of anemia, especially in sub-Saharan Africa (Tirore et al., 2023). Reproductive factors like a high reproductive rate, an increased short-term interval between births, excessive uterine bleeding, and inadequate utilization of antenatal services increase anemia.

The Central African Republic (CAR) is experiencing a high level of challenges when it comes to issues of nutrition and women's health. Conflicts, poverty, food insecurity, inadequate health facilities, and lack of clean water and sanitation make women in CAR highly susceptible to malnutrition and anemia (OCHA, 2022). However, there is a lack of scientific data that determines levels of malnutrition and anemia among women of reproductive age within CAR. Most scientific research that has been done in sub-Saharan Africa targets a single factor like pregnancy or infection, while estimates are used instead of country-specific data; there is a lack of research that considers a set of factors like socio-demographic factors, reproductive health, food habits, and self-assessed health indicators.

It is important to note that there is a gap in the literature on anemia among women because there is little emphasis on an integrated approach that looks at the interplay between different factors relating to anemia and women's health outcomes. Though there is literature that has shown different factors that predict anemia among women, evidence on the different factors that include anemia history, health outcomes, and an overall health status is limited to CAR, among other areas with conflict and health fragility.

Therefore, the primary objective of this study was to estimate the prevalence of anemia and examine the associations of pubertal and anemia-related health history, reproductive and infection-related factors, and dietary and nutritional practices with overall health and nutritional well-being among women of reproductive age.

2. Method

2.1. Study Design

This study used a quantitative, observational cross-sectional survey design to examine nutritional status and prevalence of anemia among women of reproductive age in the Central African Republic. A structured, self-administered questionnaire was used to collect self-reported data from participants.

2.2. Ethical Approval

This research was performed as per the ethical guidelines of the institutional research committee. Ethical approval was obtained initially before the data collection. Participants were given full study details, and informed consent was obtained electronically. All data collected remained anonymous, and participant confidentiality was rigorously protected throughout the research process. This research adhered to the ethical rules outlined in the Declaration of Helsinki and followed the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines to guarantee methodological clarity and ethical adherence.

2.3. Study setting and Duration

Data collection processes were carried out between March 2025 and June 2025. This focused on selected areas within the Central African Republic. Women aged 14-49 years were targeted.

2.4. Sampling Technique

A total of 385 women were selected, using sample size calculation for estimation of the confidence interval, with a margin of error of 5%, and distribution of responses estimated at 50%. The selection of participants in the study used purposive sampling. Inclusion criteria included female sex, age between 14 and 49 years, and willingness to participate. Women outside this age range or unwilling

to participate were excluded.

2.5. Study Population and Inclusion Criteria

The study population comprised women of reproductive age (14–49 years) residing in the Central African Republic. Inclusion criteria were: (1) female sex, (2) age 14–49 years, and (3) current residence in the study area. Exclusion criteria were non-residency, incomplete questionnaires, or refusal to participate.

2.6. Data Collection

Data were collected using a structured 38-item questionnaire adapted from previously published studies (Mare et al., 2023; Ssentongo et al., 2020) and divided into five sections. Section A captured sociodemographic and household characteristics, including age group, place of residence, education level, household drinking water source, type of toilet facility, household asset ownership, employment status, and marital status. Section B assessed pubertal development and anemia-related health history through seven Yes/No items, while Section C focused on reproductive history, pregnancy-related care, and exposure to infections using seven Yes/No questions. Section D evaluated dietary intake and nutritional practices using an eight-item 5-point Likert scale ranging from "Never" to "Always," and Section E measured health status and perceived nutritional well-being using eight items on a 5-point Likert scale from "Strongly Disagree" to "Strongly Agree." The questionnaire was shared through Google Forms, mainly using online social media, and all responses were tracked automatically in a secure database. Personally identifying information was not gathered; hence, participant anonymity and confidentiality were guaranteed. This instrumentation gave the opportunity to gain detailed information about relevant aspects that may affect the prevalence of anemia and nutritional status among women of reproductive age.

2.7. Data Analysis

Data were analyzed using SPSS version 20.0. Descriptive statistics, including frequencies, percentages, and means, were calculated for all variables. Normality was assessed using the Kolmogorov–Smirnov and Shapiro–Wilk tests, which indicated non-normal distribution ($p < 0.05$), likely due to the large sample size and Likert-scale data. Therefore, non-parametric Spearman correlation analysis was used to examine associations among variables. Linear regression was performed to identify the influence of independent variables on perceived health and nutritional well-being (Section E). Multicollinearity was checked using the Variance Inflation Factor (VIF), and residual diagnostics were assessed to verify regression assumptions. Statistical significance was set at $p \leq 0.05$.

3. Results

3.1. Demographics

A total of 385 women aged 14–49 years participated in the study, with the largest proportion aged 14–24 years (40.0%), followed by 25–34 years (30.1%). Nearly half resided in urban areas (46.2%), and a majority had low educational attainment, with 49.4% having no formal education. Most participants used improved water sources (60.3%), while toilet facilities were almost evenly distributed between private improved (31.7%), shared improved (36.6%), and unimproved (31.7%). About 50.9% were unemployed, and 59.5% were married. Household asset ownership was low, with 39.0% owning no assets, reflecting socioeconomic constraints in the population.

3.2. Pubertal Development and Anemia-Related Health History

Among the 385 participants, 79.7% had attained puberty, highlighting that the majority were exposed to menstruation-related iron loss. However, less than half (42.9%) had ever undergone hemoglobin or iron testing, and 43.6% reported a formal diagnosis of anemia, indicating substantial under-screening. Only 34.8% of diagnosed women received treatment, and 29.9% had taken iron or multivitamin supplements for nutritional purposes, suggesting gaps in preventive supplementation and anemia management. About one-third reported prolonged or heavy menstrual bleeding, a known risk factor for iron deficiency. Notably, only 15.3% had been tested for HIV, a condition that can exacerbate anemia risk.

3.3. Reproductive History, Antenatal Care, and Infection Exposure

Among the participants, 34.8% were currently pregnant, and 77.7% had experienced at least one pregnancy, indicating a high proportion of women with reproductive exposure. During their most recent pregnancy, only 59.7% received iron or folic acid supplementation, and 49.9% received deworming medication, highlighting gaps in essential antenatal care interventions. Most women (73.8%) attended at least one antenatal care visit, demonstrating moderate healthcare engagement.

Table 1. Demographics of participants

Variables		Frequency	Percent
Age	14-24 years	154	40.0%
	25–34 years	116	30.1%
	35–44 years	77	20.0%
	45–49 years	38	9.9%
Residence	Urban	178	46.2%
	Peri-Urban	170	44.2%
	Rural	37	9.6%
Education	No Formal Education	190	49.4%
	Primary Education	162	42.1%
	Secondary Education	30	7.8%
	Higher Education	3	0.8%
Water source	Improved	232	60.3%
	Unimproved	120	31.2%
	Purchased Water	33	8.6%
Toilet Facility	Improved, Private Facility	122	31.7%
	Improved Shared Facility	141	36.6%
	Unimproved Facility	122	31.7%
Asset Ownership	Owns none of the listed assets	150	39.0%
	Owns one asset	152	39.5%
	Owns two assets	70	18.2%
	Owns three or more assets	13	3.4%
Employment Status	Not employed	196	50.9%
	Self-employed	82	21.3%
	Formally employed	31	8.1%
	informal/seasonal worker	76	19.7%
Marital Status	Never Married	59	15.3%
	Married	229	59.5%
	Divorced	56	14.5%
	Separated	15	3.9%
	Widowed	26	6.8%

Regarding infection exposure, 72.5% had been tested for malaria, and 29.9% were diagnosed within the past year, reflecting a significant risk factor for anemia and adverse maternal-fetal outcomes in this population.

3.4. Dietary Intake and Nutritional Practices

The dietary patterns of participants revealed moderate consumption of iron-rich foods, with nearly half (47.5%) consuming them daily, which is clinically significant given the role of iron in preventing anemia. Dark green leafy vegetables and vitamin C-rich fruits were consumed less consistently, with 20% never consuming them in the past week, potentially limiting micronutrient intake essential for hemoglobin synthesis and iron absorption. Consumption of legumes, fortified cereals, and dairy was variable, with a notable proportion consuming these foods infrequently. Frequent meal consumption (≥3 meals/day) was reported by 55.3%, highlighting potential

Table 2. Pubertal Development and Anemia-Related Health History

		Frequency	Percent
Have you attained puberty (started menstruation)?	yes	307	79.7
	no	78	20.3
Since attaining puberty, have you ever had your hemoglobin or iron level tested?	yes	165	42.9
	no	220	57.1
Since puberty, have you ever been diagnosed with anemia or low hemoglobin levels by a healthcare professional?	yes	168	43.6
	no	217	56.4
If you were diagnosed with anemia, did you take any treatment or supplements for it?	yes	134	34.8
	no	251	65.2
Since puberty, have you taken iron, iron–folic acid, or multivitamin supplements for nutritional purposes (regardless of diagnosis)?	yes	115	29.9
	no	270	70.1
Have you ever experienced prolonged or heavy menstrual bleeding that lasted more than normal?	yes	134	34.8
	no	251	65.2
Have you ever been tested for HIV?	yes	59	15.3
	no	326	84.7

Table 3. Reproductive History, Pregnancy-Related Care, and Infection Exposure

		Frequency	Percent
Are you currently pregnant?	yes	134	34.8
	no	251	65.2
Have you ever been pregnant?	yes	299	77.7
	no	86	22.3
During your most recent pregnancy, did you receive iron or folic acid supplements?	yes	230	59.7
	no	155	40.3
During your most recent pregnancy, did you receive deworming medication?	yes	192	49.9
	no	193	50.1
Did you attend at least one antenatal care visit during your most recent pregnancy?	yes	284	73.8
	no	101	26.2
Have you ever been tested for malaria?	yes	279	72.5
	No	106	27.5
Have you ever been diagnosed with malaria in the past year?	yes	115	29.9
	no	270	70.1

gaps in dietary adequacy that may influence anemia risk.

3.5. Health Status and Perceived Nutritional Well-Being

The findings indicate a high burden of fatigue and dizziness among participants, with 55.6% reporting these symptoms often or always, suggesting compromised hemoglobin levels and potential anemia. Despite 60% perceiving their diet and overall nutritional status as adequate, only 20.5% reported being well-informed about anemia-preventive foods, highlighting gaps in nutritional knowledge. Access to healthcare was inconsistent, with only 30.4% often or always able to obtain services when unwell. Notably, 60.6% recognized anemia as a serious health issue, yet confidence in dietary modification to

Table 4. Dietary Intake and Nutritional Practices

		Frequency	Percent
In the past 7 days, how often did you consume iron-rich foods (such as meat, liver, or fish)?	Never	8	2.1
	Rarely	40	10.4
	Sometimes	142	36.9
	Often	12	3.1
	Always	183	47.5
In the past 7 days, how often did you consume dark green leafy vegetables?	Never	77	20.0
	Rarely	18	4.7
	Sometimes	193	50.1
	Often	19	4.9
	Always	78	20.3
In the past 7 days, how often did you consume vitamin C-rich fruits (such as oranges or mangoes)?	Never	77	20.0
	Rarely	18	4.7
	Sometimes	193	50.1
	Often	19	4.9
	Always	78	20.3
In the past 7 days, how often did you consume legumes or beans?	Never	19	4.9
	Rarely	78	20.3
	Sometimes	153	39.7
	Often	96	24.9
	Always	39	10.1
In the past 7 days, how often did you consume fortified cereals or grains?	Never	116	30.1
	Rarely	77	20.0
	Sometimes	152	39.5
	Often	19	4.9
	Always	21	5.5
In the past 7 days, how often did you consume milk or other dairy products?	Never	37	9.6
	Rarely	135	35.1
	Sometimes	155	40.3
	Often	18	4.7
	Always	40	10.4
In the past 7 days, how often did you drink tea or coffee immediately after meals?	Never	17	4.4
	Rarely	96	24.9
	Sometimes	193	50.1
	Often	38	9.9
	Always	41	10.6
In the past 7 days, how often did you eat three or more meals per day?	Never	17	4.4
	Rarely	39	10.1
	Sometimes	19	4.9
	Often	97	25.2
	Always	213	55.3

Table 5. Health Status and Perceived Nutritional Well-Being

		Frequency	Percent
I experience persistent fatigue or low energy levels during daily activities.	Never	17	4.4
	Rarely	58	15.1
	Sometimes	96	24.9
	Often	97	25.2
	Always	117	30.4
I experience dizziness or shortness of breath during routine activities.	Never	17	4.4
	Rarely	19	4.9
	Sometimes	96	24.9
	Often	96	24.9
	Always	157	40.8
I believe my diet provides enough nutrients for my health needs.	Never	56	14.5
	Rarely	58	15.1
	Sometimes	39	10.1
	Often	77	20.0
	Always	155	40.3
I believe my overall nutritional status is adequate for maintaining good health.	Never	56	14.5
	Rarely	58	15.1
	Sometimes	39	10.1
	Often	77	20.0
	Always	155	40.3
I have access to healthcare services when I feel unwell.	Never	56	14.5
	Rarely	96	24.9
	Sometimes	116	30.1
	Often	39	10.1
	Always	78	20.3
I consider anemia to be a serious nutritional and public health problem for women.	Never	17	4.4
	Rarely	58	15.1
	Sometimes	77	20.0
	Often	96	24.9
	Always	137	35.6
I feel informed about foods that prevent anemia.	Never	75	19.5
	Rarely	97	25.2
	Sometimes	115	29.9
	Often	19	4.9
	Always	79	20.5
I am confident in my ability to improve my diet to prevent anemia.	Never	17	4.4
	Rarely	77	20.0
	Sometimes	116	30.1
	Often	77	20.0
	Always	98	25.5

Table 6. Correlation

Correlations						
			Pubertal and Anemia-Related Health History	Reproductive History and Infection Exposure	Dietary Intake and Iron-Related Nutritional Practices	Perceived Nutritional Status and Anemia-Related Health Well-Being
Spearman's rho	Pubertal and Anemia-Related Health History	Correlation Coefficient	1.000	.954**	.957**	.962**
		Sig. (2-tailed)	.	.000	.000	.000
		N	385	385	385	385
	Reproductive History and Infection Exposure	Correlation Coefficient	.954**	1.000	.984**	.990**
		Sig. (2-tailed)	.000	.	.000	.000
		N	385	385	385	385
	Dietary Intake and Iron-Related Nutritional Practices	Correlation Coefficient	.957**	.984**	1.000	.992**
		Sig. (2-tailed)	.000	.000	.	.000
		N	385	385	385	385
	Perceived Nutritional Status and Anemia-Related Health	Correlation Coefficient	.962**	.990**	.992**	1.000
		Sig. (2-tailed)	.000	.000	.000	.
		N	385	385	385	385
**. Correlation is significant at the 0.01 level (2-tailed).						

prevent anemia was moderate, reflecting the need for targeted nutrition education and clinical interventions.

3.6. Correlation Between Reproductive, Nutritional, and Health Status Factors

Spearman correlation analysis revealed strong, positive, and statistically significant associations among all study domains ($p < 0.01$). Pubertal and anemia-related health history correlated strongly with reproductive history and infection exposure ($r = 0.954$), dietary intake and iron-related practices ($r = 0.957$), and perceived nutritional status ($r = 0.962$). Similarly, reproductive history and infection exposure was highly correlated with dietary intake ($r = 0.984$) and perceived health status ($r = 0.990$). Clinically, these findings suggest that women's nutritional behaviors, reproductive health experiences, and pubertal/iron-related history are closely interrelated, highlighting the multifactorial determinants of anemia and the need for integrated interventions addressing diet, infection prevention, and reproductive care.

3.7. Regression

The linear regression model demonstrated a strong and statistically significant association between pubertal and anemia-related health history, reproductive history and infection exposure, dietary intake practices, and perceived nutritional and anemia-related health status ($F = 4496.9$, $p < 0.001$) (Table 7). The model explained a substantial proportion of variance in perceived health status, indicating good overall model performance. All independent variables were significant predictors. Dietary intake and iron-related nutritional practices showed the strongest standardized effect ($\beta = 0.439$), highlighting the clinical importance of regular consumption of iron-rich and supportive foods in improving perceived health and anemia-related well-being (Table 8). Reproductive history and infection exposure ($\beta = 0.329$) also had a meaningful association, emphasizing the role of pregnancy-related care and infectious disease

Table 7. Analysis of Variance (ANOVA) for the Linear Regression Model Predicting Perceived Nutritional and Anemia-Related Health Status

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	586.563	3	195.521	4496.888	.000b
	Residual	16.566	381	.043		
	Total	603.128	384			
a. Dependent Variable: sectione_mean						
b. Predictors: (Constant), sectiond_mean, sectionb_mean, sectionc_mean						

burden in anemia risk. Pubertal and anemia-related health history (β = 0.244) remained an independent predictor, suggesting long-term effects of early reproductive health and prior anemia on current well-being. Although some multicollinearity was observed, the predictors retained clinical relevance, underscoring the need for integrated nutritional and reproductive health interventions to reduce anemia among women of reproductive age.

Table 8. Linear Regression Coefficients for Factors Associated with Perceived Nutritional and Anemia-Related Health Status

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Eraror	Beta			Tolerance	VIF
1	(Constant)	-1.044	.058		-18.118	.000		
	sectionb_mean	.744	.065	.244	11.465	.000	.160	6.264
	sectionc_mean	1.149	.105	.329	10.933	.000	.080	12.527
	sectiond_mean	.518	.034	.439	15.137	.000	.086	11.652
a. Dependent Variable: sectione_mean								

Table 9. Collinearity Diagnostics of Independent Variables in the Linear Regression Model

Collinearity Diagnostics[a]							
Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(Constant)	sectionb_mean	sectionc_mean	sectiond_mean
1	1	3.932	1.000	.00	.00	.00	.00
	2	.057	8.295	.41	.01	.00	.04
	3	.008	22.563	.10	.93	.02	.27
	4	.003	35.537	.48	.06	.98	.69
a. Dependent Variable: sectione_mean							

4. Discussion

Anemia still poses a major public health problem to Women of Reproductive Age (WRA) in low-resource and Sub-Saharan Africa countries. This study provided insights about the interrelationship between the history of puberty, reproductive/infection considerations, dietary practices, and attitudes related to nutritional and anemia-related health conditions for the age group 14 to 49 years

in the Central Africa Republic.

The study achieved the objective in pointing out apparent gaps in the screening, preventive, and nutritional aspects of anemia, in addition to clear links between reproductive, food, and self-perceived health. Almost 43.6% of the women reported having been diagnosed with anemia at one time in their lives, which was in tandem with the general overall statistics in SSA in which anemia prevalence in WRA has been found to range between 34.8% and 41.7% (Mare et al., 2023; Teshale et al., 2020; Tirore et al., 2023). Although anemia was not biochemically measured in this study, the high burden of anemia-related symptoms such as fatigue (55.6%) and dizziness or shortness of breath (65.7%) suggests a clinically significant anemia burden comparable to that reported in population-based studies from Sudan (35.6%) and Lao PDR (39.2%) (Elmardi et al., 2020; Keokenchanh et al., 2021).

Sociodemographic characteristics observed in this study further contextualize anemia risk. Nearly half of the women had no formal education (49.4%), over 50% were unemployed, and 39% owned no household assets, reflecting socioeconomic vulnerability. These findings align with large DHS-based studies showing strong associations between anemia and low educational attainment, unemployment, and poor household wealth (Mare et al., 2023; Teshale et al., 2020; Tirore et al., 2023). Poor sanitation and water access reported by 31.7% and 31.2% of participants, respectively, are also recognized contributors to anemia through increased infection and parasitic burden, as documented in SSA and Asian populations (Keokenchanh et al., 2021; Mare et al., 2023; Teshale et al., 2020).

Reproductive and infection-related factors emerged as clinically important determinants. More than three-quarters of women (77.7%) had experienced pregnancy, yet only 59.7% received iron or folic acid supplementation during their most recent pregnancy. This mirrors findings from SSA analyses showing non-attendance or inadequate antenatal care as a key predictor of higher anemia severity (Mare et al., 2023; Tirore et al., 2023). Furthermore, nearly 30% of participants reported malaria diagnosis in the past year, consistent with evidence from Sudan demonstrating a strong association between malaria infection and anemia (aOR up to 4.10) (Elmardi et al., 2020). These results underscore the compounded effect of reproductive demands and infectious diseases on women's iron status.

Dietary intake patterns revealed mixed nutritional adequacy. While 47.5% of women reported frequent consumption of iron-rich foods, intake of iron absorption enhancers such as vitamin C-rich fruits and green leafy vegetables was inconsistent, with 20% reporting no intake in the previous week. Additionally, frequent consumption of tea or coffee immediately after meals (20.5% often or always) may inhibit iron absorption, increasing anemia risk. These dietary behaviors help explain why perceived dietary adequacy (60%) did not align with symptom burden, a discrepancy also observed in studies emphasizing dietary quality rather than caloric sufficiency (Keokenchanh et al., 2021; Mare et al., 2023).

Correlation and regression analyses provide novel insights into the integrated determinants of perceived anemia-related health. Strong correlations ($r > 0.95$, $p < 0.01$) among pubertal history, reproductive factors, diet, and perceived health highlight anemia as a multifactorial condition. Regression findings demonstrated that dietary intake had the strongest independent association with perceived nutritional and anemia-related health ($\beta = 0.439$), followed by reproductive/infection exposure ($\beta = 0.329$) and pubertal/anemia history ($\beta = 0.244$). These findings are clinically relevant and consistent with multilevel analyses from SSA and Eastern Africa emphasizing nutrition, antenatal care, and infection prevention as key intervention points (Mare et al., 2023; Teshale et al., 2020; Tirore et al., 2023).

The implications of this study are substantial. Interventions targeting anemia in WRA must move beyond supplementation alone to integrated strategies combining nutrition education, improved dietary diversity, routine anemia screening, malaria control, and strengthened antenatal services. Enhancing women's education and socioeconomic empowerment may further reduce anemia risk, as consistently demonstrated across regional and global studies. Collectively, these findings support a holistic, life-course approach to anemia prevention and control among women of reproductive age.

5. Conclusion

This study highlighted a substantial burden of anemia-related symptoms and suboptimal nutritional practices among women of reproductive age in the Central African Republic. Strong associations between pubertal and reproductive history, infection exposure, dietary intake, and perceived nutritional health underscore the multifactorial nature of anemia. Dietary practices and reproductive health factors emerged as the strongest predictors of perceived anemia-related well-being. These findings emphasize the

need for integrated public health strategies that combine nutrition education, improved dietary diversity, routine anemia screening, infection control, and strengthened antenatal care services to effectively reduce anemia and improve women's health outcomes in resource-limited settings.

Strengths and Limitations

This study's strengths include a robust sample size, use of a structured questionnaire informed by previous studies, and comprehensive assessment of sociodemographic, reproductive, dietary, and health-related factors influencing anemia among women of reproductive age. The application of appropriate non-parametric analyses and multivariable regression enhances the reliability of the findings. However, the cross-sectional design limits causal inference, and reliance on self-reported data may introduce recall and social desirability bias. The absence of biochemical measurements, such as hemoglobin levels, restricts objective anemia assessment.

- Approval of ethics and consent to participate
- Permission for publication
- Availability of data and materials
- Disclosure of conflicts of interest
- Funding sources
- Contributions of authors
- Acknowledgments

Statements and Declarations

Ethics approval and consent to participate

This study was conducted in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Declaration of Helsinki and its later amendments. Ethical approval for this study was obtained from the relevant Institutional Review Board/Ethics Committee. Written informed consent was obtained from all participants prior to their participation in the study.

Consent for publication

Not applicable.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data Availability Statement

All data generated or analyzed during this study are included in this article.

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