

International Journal of Current Research in Medical Sciences

ISSN: 2454-5716 (A Peer Reviewed, Indexed and Open Access Journal) www.ijcrims.com



Original Research Article

Volume 11, Issue 5 - 2025

DOI: http://dx.doi.org/10.22192/ijcrms.2025.11.05.002

Anaemia and associated risk factors among pregnant women attending antenatal clinics across primary healthcare centers in Gwagwalada area council, FCT, ABUJA

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Abstract

Anemia in pregnancy has been proven to be a devastating public health problem. Specifically, it contributes to more than 115,000 maternal deaths and 591,000 prenatal deaths across the globe. This cross-sectional descriptive study was conducted to assess the prevalence of anemia and associated risk factors among pregnant women attending antenatal clinics across Primary Health Centers in Gwagwalada Area Council, FCT, Abuja. A total of 423 blood samples were collected from the pregnant women attending clinics whose ages range from <20 to 35 years and above using 2ml syringes and needles for Haemogram(full blood count) to determine the prevalence of anemia, while sociodemographic data were collected using structured self-administered interview questionnaire. The data obtained were analysed using Statistical Package for Social Sciences (SPSS) version 26.0. The result of the study revealed that out of 423 samples analysed, 139 (34.2%) of the pregnant women had anemia. Mild anemia was found to be more prevalent among pregnant women between the age-group of 25 - 29 years; however, those below the age of 20 years had the highest prevalence of both moderate and severe anemia constituting 48.7% and 66.7% respectively. Age (X 2 =0.236; p=0.014) of the respondents and their family income ($X^2 = 0.876$; p=0.003) were found to be risk factors associated with anemia among the pregnant women. In conclusion, anaemia is a serious threat in pregnancy and this study demonstrated that the prevalence of the disease in pregnancy in Gwagwalada Area Council, FCT, Abuja, remained high and especially affects pregnant women in their trimesters and age-groups of 25-29 years and 20-24 age cohort. Government, the local and policy makers should encourage health education campaign to create more awareness among the study population.

Keywords: Anaemia, Pregnancy, Blood, Age-group, Women, Gwagwalada, Abuja.

Introduction

One of the most frequent haematological disorders diagnosed in pregnancy worldwide is Anaemia and is a pathophysiological condition that occurs as a result of a noticeable reduction in the number of red blood cells¹, moreso, anaemia affects all human species. It has been reported to affect 2.2 billion people worldwide at a prevalence rate of $33.0\%^2$. Nevertheless, pregnant women are more exposed, resulting in over 30% of women and more than 50% of pregnant women globally suffering from anaemia³. In specific terms, 14.0% of maternal anaemia has been reported in developed countries of Europe and America, while, in developing countries of Africa, the prevalence rate is reported to be 51.0%. However, in Asian nations like India, the prevalence varies from 65.0% to 75.0% 4,5,6 . It is on this bases that ^{7,8} concluded that anaemia in pregnancy is one of the main public health problem across the globe and affects 41.85% of pregnant women globally and developing countries especially Africa has a larger proportion of its share which stands at 57.1%, representing 17.2 million people. It has been reported that more than one-third of women in the Middle East have anaemia as a result of either iron deficiency or a combination of other factors, majority of observed women between the ages of 15 and 49 in Saudi Arabia with Hb<12g/dl accounted for 40.0%¹. In developing countries like Nigeria, anaemia affects 41.8% of pregnant women and is one of the major public health problems. It was estimated that in Africa 52.0% of pregnant women are anaemic and between 1.0% and 5,0% are severely anaemic, as ¹⁰ found out that the actual prevalence of anaemia in pregnancy in Nigeria is 60.0%.

Moreover, ^{7,8, 10} and the ¹¹, discovered that anaemia in pregnancy has an array of contributing factors inter alia; the iron deficiency which accounts for 75.0% globally, insufficient intake of and poor bioavailability of iron-rich foods, repeated infection from malaria and hookworm, poor feeding due to socio-economic factors such as poverty and low educational status and haematological conditions ranging from impaired

erythrocyte production or increased erythrocyte loss, age, parity and gravidity, personal and household income, household size, short birth intervals and higher gestational age at booking. However, ¹² found out that of all causes of anaemia, malaria in pregnancy stands out, as it accounts for over 50.0% of cases of anaemia in pregnancy in Nigeria. Moreso, ¹³ reported that 40.0% of all maternal perinatal deaths are attributed to anaemia, while, 30,0% to 45.0% success pregnancy outcomes occur rarely in anaemic mothers and their infants have less than one and half of normal iron reserves. There is therefore, no doubt that the causes of anaemia are multifaceted and known and research findings have also shown that anaemia is preventable and easily treatable if discovered in time, with effective management measures through treatment of fundamental causes, rebuilding of the haemoglobin concentration to normal levels, prevention and treatment of difficult cases. Despite these prevailing shreds of evidence, anaemia remains a frequent cause of mortality and morbidity among pregnant women in Nigeria. Regrettably, there is limited data on the relative associated factors and this has made it difficult to address the problem. Various studies have been carried out on the subject matter, but there are no convergent result findings on the prevalence of anaemia and its associated factors which are considered relatively occasioned by a variation in different cohorts considering socioeconomic, biological, ecological, educational and political factors ¹. In Abuja, especially in Gwagwalada Area Council, not much has been done in this all important area of health concerning pregnant women, therefore, this study was aimed at providing a base-line data of prevalence and associated risk factors of anaemia among pregnant women attending antenatal clinics across primary healthcare centers in Gwagwalada Area Council for future reference as well as creating more awareness among the study population in Gwagwalada, Abuja and indeed the whole country called Nigeria.

Materials and Method

Study Design

This study employed an experimental descriptive design to determine the prevalence of and associated risk of anaemia among pregnant women attending antenatal clinics across primary healthcare centers in Gwagwalada Area Council, FCT, Abuja.

Study Area

The study was carried out in Gwagwalada Area Council of the Federal Capital Territory of Nigeria. The council area is located between latitude 8° 55' and 9° 00'N and longitude 7° 00' and 7° 05'E. Gwagwalada is an area council in the federal republic of Nigeria with an area of 1043km and a population of 157,770 (as of the 2006 census). It is projected to have a 6.26% growth between 2020 and 2025, the largest increase in the African continent. It has a latitude of 8.9393 and a longitude of 7.078700000. The postal code of the area is 902101. Before the creation of the federal capital territory, Gwagwalada was under the Kwali District of the former Abuja emirate now Suleja emirate. Gwagwalada was created on 15th October, 1984. The relocation of the seat of government from Lagos to Abuja in 1992 and the demolition of illegal structures within the federal city center brought a massive influx of people into the area being one of the fastest-growing urban centers in the federal capital territory. Gwagwalada is administered by an executive chairman elected through adult suffrage. The council is composed of ten elected councilors representing the ten wards of the council, namely; Zuba, Ibwa, Dobi, Kutunku, TungaMaje, Gwako, Paikonkore, Ikwa, Quarters, and Central. Gwagwalada is where the mini campus of the University of Abuja is located. It is bordered by Abuja Municipal Area Council (AMAC) to the East, Kwali to the south, Abaji to the west, and some part of Niger State to the north. The school for the gifted as well as the University of Abuja Teaching Hospital are also located in the area ¹⁴



Map of Gwagwalada Area Council (Regional Development Plan, 2018)

Study population

The study population for this comprised of all pregnant women residing and attending antenatal units in the primary healthcare centers within Gwagawalada Area Council.

Ethical Consideration

Ethical approval was obtained from Gwagwalada Area Council and Ethics and Research Committee of the National Open University of Nigeria Abuja. Additionally, permission was sought from the unit head of the clinics before conducting the study. Informed consent was obtained from each participant before the administration of questionnaire and collection of blood samples. They were assured that all information given was to be treated confidentially. Information collected is to be handled with the utmost confidentiality and strictly for the proposed study and every participant was also assured of withdrawal if he or she is no longer willing to continue.

Study Criteria

Inclusion Criteria

The study included pregnant women who met the following criteria: the pregnant women who have lived in Gwagwalada for more than 6 months, consenting to participate in the study, attending antenatal clinics at the time of the study and pregnant women in their 2nd and 3rd trimesters as well as literate and illiterate mothers meeting all the above criteria.

Exclusion Criteria

The study excluded pregnant with the following characteristics: Pregnant women not consenting, pregnant women attending the clinics for the first time and not residing in the council area as well as pregnant women in their 1st trimester.

Sample Size Determination

The sample size was determined using¹⁵ as follows; $n=Z^2 pq(1/d^2)$ Where;

n= minimum sample size for the study Z= abscissa of the normal curve (1.96) – Statistical Constant d= desired level of precision (0.05) p= prevalence of 50% was considered since no reasonable previous prevalence is available q= complementary probability (1-p) n= 3.8416 × (0.5)(0.5) 0.0025 n= 384.18

By adding an attrition of 10%, we have a sum of ≈ 423

Therefore, the minimum sample size for the study comprised 423 pregnant women attending antenatal clinics in Primary Healthcare centers within Gwagwalada Area Council.

Sampling Technique

A double-stage cluster sampling technique was employed whereby Gwagwalada Area Council was grouped into 10 clusters (Zuba, Ibwa, Dobi, Kutunku, TungaMaje, Gwako, Paikonkore, Ikwa, Quarters, and Central) after which the clusters were selected based on the probable number (either even or odd number) chosen at random. Simple random sampling was then employed to obtain the required sample size for the study from the Primary Healthcare centers in the selected clusters. This involved the use of the balloting (fish-bowl) method whereby the names of political wards were written on paper and inserted into a box. The number of papers were selected by a random individual. The names of wards selected from the box at random were utilized for the study and the Primary Healthcare centers within the selected clusters were used as research areas.

Study Instruments

(a) Questionnaire:

A structured questionnaire was developed to obtain the socio-demographic characteristics and clinical data of the participants.

(b) Materials for estimation or measurement of blood parameters

Haematocrit tubes, Sealer, Haematocrit PCV reader, Haematocrit Centrifuge, Hand gloves, EDTA bottles, 2ml syringes and needles.

Method of Data Collection

The blood samples of those chosen were collected with syringes and needles into to evaluate their Packed Cell Volumes (PCV); a plain capillary well-mixed EDTA anti-coagulated with blood(tested within 6 hours of collection) the unfilled end of the capillary was sealed using a sealant material. The filled capillary was carefully located in one of the numbered slots of the microhaematocrit rotor with the sealed end against the rim gasket(to prevent leakage). The number of the slot was written on the pregnant woman's form for identification. The inner lid was carefully positioned to avoid dislodging the tubes. The samples were carefully centriguged for 5 minutes (RCF 12000-15000xg). Immediately after centrifuge, the PCV was read using a PCV reader. The readings obtained were recorded in the clinical data section of the questionnaire. The clinical data (paleness of the skin, palms, tongue, mucous membrane and conjunctiva) of the participants were as well obtained and recorded in a section of the questionnaire. The sociodemographic data were also obtained with questionnaire.

Data Analysis

The data obtained were analyzed using Statistical Package for Social Sciences (SPSS) version 26.0. Descriptive statistics were presented in simple statistical measures using frequencies and simple percentages. Inferential statistics were achieved by employing Spearman Ranking correlation coefficients and Logistic Regression Analysis to ascertain the relationship between the socioeconomic factor and the anemia status of pregnant women. A p-value of less than 0.05 indicated statistical significance whereas greater than 0.05 indicated statistical insignificance.

Results

Table 1: Clinical Data and Reproductive History of the Respondents

Variables	Frequency(%)		
Gravidity			
1	97(23.8)		
2	72(17.7)		
3	163(40.1)		
4 & above	75(18.4)		
Age of pregnancy			
First trimester	211(51.8)		
Second trimester	119(29.2)		
Third-trimester	77(18.9)		
Packed Cell Volume (PCV) level (pregnancy range)			
Low (Less than33%)	139(34.2)		
Normal (33 – 38%)	268(65.9)		
Menstruation			
Regular	350(86.0)		
Irregular	57(14.0)		
The interval between two menstruations			
Less than 28 days	356(87.4)		
More than 28 days	51(12.5)		

Duration of menstruation	
1-5 days	309(75.9)
6 – 10 days	98(24.1)
Abortion in the past	
Yes	24(5.9)
No	383(94.1)
Used contraceptives in the past	
Yes	105(25.9)
No	302(74.2)
If yes, what kind of contraceptive	
Pills	109(26.8)
Injection	60(14.7)
IUDs	159(39.1)
Implants	79(19.4)
Past history of anemia	
Yes	268(65.9)
No	139(34.2)
Access to health facility	
Yes	407(100.0)
Past history of Malaria	
Yes	179(44.0)
No	228(56.0)

Table.1 above indicated that four in every ten (40.1%) of the respondents had three pregnancies in the past, more than half (51.8%) were in their first trimester, 139 (34.2%) of the respondents had low packed cell volume, the majority reported having regular 55 menstruation, with an interval of fewer than 28 days between the two menstruation and which lasted within 1 - 5 days constituting 86.0%, 87.4%, and 75.9%

respectively. Only 24 (5.9%) reported having had abortions in the past, and only 105 (25.9%) reported having used contraceptives in the past, out of which the majority stated using Intrauterine Contraceptive Devices (IUDs). The majority (65.9%) of them had no history of anemia, all (100.0%) of them stated that they have access to the health facilities, with the majority (56.0%) having no history of malaria in pregnancy.

Table 2: Level of Severity of Anemia among Pregnant Women (N=139)

Severity of Anemia	Frequency(%)
Mild (PCV between 30–33%)	88(63.3)
Moderate (PCV between 21–30%)	39(28.1)
Severe (PCV less than 21%)	12(8.6)

Table 4.2 showed that among the 139 pregnant women found to be anemic, about two-thirds (63.3%) of them had a mild form of anemia, more

than a quarter (28.1%) had a moderate form and only 12 (8.6%) had a severe form of anemia.

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Table 3: Distribution of Respondents According to Dietary Characteristics of the Pregnant Women (N=407).

Not even once Twice Thrice or more					
Items	F(%)	F(%)	F(%)	F(%)	
Eating Frequency in a day 0	(0)	29(7.1)	283(69.5)	95(23.3)	
Meat consumption in a week	67(16.5)	79(19.4)	208(51.1)	53(13.0)	
Vegetable consumption in a week	19(4.7)	27(6.6)	197(48.4)	164(40.3)	
Fruit consumption in a week	11(2.7)	45(11.0)	101(24.8)	250(61.5)	

Table 4.3 revealed that more than two-thirds (69.5%) of the respondents reported that they eat twice a day, more than half (51.1%) stated that they consume meat twice in a week, only

19(4.7%) reported not consuming vegetables even for once in a week, the majority (61.5%) reported that they consume fruit at least three times a week

Table 4 : Age-related Prevalence of Anemia among the Study Population (N=139)

Variables		Severity of A		
Age	-	Mild(N=88)	Moderate(N=39)	Severe(N=12)
F(%)	F(%)	F(%)		
< 20		17(19.1)	19(48.7)	8(66.7)
20-24		26(29.5)	6(15.4)	0(0.0)
25-29		32(36.4)	8(20.5)	0(0.0)
30-34		11(12.5)	2(5.1)	1(8.3)
35 & above		2(2.5)	4(10.2)	3(25.0)

Table 4 revealed that mild anemia was found to be more prevalent among pregnant women between the ages of 25 - 29 years; however, those

below the age of 20 years had the highest prevalence of both moderate and severe anemia constituting 48.7% and 66.7% respectively.

Table 5: Risk Factors Associated with Anemia among Pregnant Women

Variables Severity of Anemia					
·	Mild Mod Severe	Chi-sq value	df p-value		
Age					
< 20	17	19	8		
20-24	26	6	0		
25-29	32	8	$0\ 0.236\ 4$ 0.014^{*}		
30-34 11 2 1					
35 & above	2	4	3		
Religion					
Islam	58	26	8 1.436 1 0.214		
Christianity	30	13	4		

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234155 15.232 3 0.3343221034 and above1361EthnicityHausa23103Yoruba1041Igbo941 1.152 4 0.732Gbagyi29134Fulani1783	1	19	8	3
3221034 and above1361Ethnicity	2	34	15	5 15.232 3 0.334
4 and above 13 6 1 Ethnicity 23 10 3 Hausa 23 10 4 1 Igbo 9 4 1 1.152 4 0.732 Gbagyi 29 13 4 Fulani 17 8 3	3	22	10	3
EthnicityHausa23103Yoruba1041Igbo941 1.152 4 0.732Gbagyi29134Fulani1783	4 and above	13	6	1
Hausa23103Yoruba1041Igbo941 1.152 4 0.732Gbagyi29134Fulani1783	Ethnicity			
Yoruba1041Igbo941 1.152 4 0.732Gbagyi29134Fulani1783	Hausa	23	10	3
Igbo941 1.152 4 0.732Gbagyi29134Fulani1783	Yoruba	10	4	1
Gbagyi 29 13 4 Fulani 17 8 3	Igbo	9	4	1 1.152 4 0.732
Fulani 17 8 3	Gbagyi	29	13	4
	Fulani	17	8	3

Table 5 above revealed that the age of the respondents and their family income were found to be risk factors associated with anemia among

pregnant women as the values were found to be statistically significant (p=0.05).

Table.6: Relationship between the Socioeconomic Factors and Anemia Status of Pregnant Women

Variables Anemia status					
	Anemic (N=139)	Not anemic (N=268) 2	value dfp-value		
Educational level					
	None	37	72		
Primary	20	40	2.456 3 0.424		
Secondary	54	105			
Tertiary	28	50			

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Occupation		
Housewife	89	171
Civil Servant	24	46 16.32 2 0.112
Trader	26	51
Family Income		
5,000 - 10,000	37	72
11,000 - 20,000	54	$105\ 0.876\ 3\ 0.003^*$
21,000 - 50,000	27	52
>50,000	20	40
Family Members		
1-4	76	147
5-7	41	78 2.152 2 0.334
8 and above	22	43

Table 6 above showed a relationship between the family income and the anemic status of the pregnant women as the value was found to be statistically significant (p=0.05).

Discussion

Anaemia in pregnancy has been proven to be a devastating public health problem, and affects more than half of all pregnant women in Nigeria as the risk is very high as a result of the increased iron requirement, physiological demand, loss of blood and owing to infections¹⁶. In this study, the analysis of the result showed a prevalence of 34.1% anaemia among pregnant women in the study setting. The overall prevalence of 34.1% revealed in this study is unhealthy and constitute a major public health threat to the pregnant women in the area and is consistent with the works of 17&7who in their studies reported 32.3% in South-South Nigeria and 30.0%, 33.3% in Ibadan and Sagamu in South-Western Nigeria. Nevertheless, the result when compared with those of ¹⁹ who obtained 59.0%, 65.0% and 60.0% maternal anaemia in Nepal, Bhutan and Sri Lanka;^{9,7,19,10&} ²⁰ who variously revealed prevalence of 51.8% in Gombe North-Eastern Nigeria; 76.5%, 62.2% in Abeokuta and Lagos; 58.7% in Warri using a cross-sectional design and 46.0% in Enugu among 400 pregnant women respectively in their studies, is low. It is, however, high when compared with the work of ^{21&9} who got 28.0% and 12.2% of maternal anaemia among pregnant women in South-Eastern Nigeria and Zaria respectively.²² in a cross-sectional health facility based study showed a prevalence of 11..6% anaemia in

Ethiopia, positing that gestational age and ironfolic acid supplementation were statistically associated with anaemia. Furthermore, ¹², found out that of all causes of anaemia, malaria in pregnancy stands out and accounts for over 50.0% of cases of anaemia in pregnancy in Nigeria, as ¹³, opined that 40.0% of all maternal perinatal deaths are attributed to anaemia, saying that 30.0% and 45.0% success pregnancy outcomes occur rarely in anaemia mothers due to the facts that their infants have less than one and half of normal iron reserves.

Nevertheless,^{8,7,10} and¹¹ reported that anaemia in pregnancy has an array of contributing factors inter alia; iron deficiency which accounts for 75.0% for anaemia globally, insufficient intake of and poor availability of iron-rich foods, repeated infections of malaria and hookworm, poor feeding due to socio-economic factors such as poverty and low educational status, haematological conditions ranging from impaired erythrocyte production or increased erythrocyte loss, age, parity, gravidity, personal and house-hold size and short birth intervals. It is also worthy to note that a synthesis of study findings and reports from various geographical regions, or zones, revealedvariations in the prevalence of maternal anaemia across geographical different locations, regions. countries and among different people of various socio-economic status and backgrounds. This disparities in the prevalent rates of maternal anaemiamay be attributed to different factors including duinal variations and is affected by dietary influence, lack of general acceptability of routine screening with serum ferritin in patients

with pregnancy associated anaemia, unreliable use of serum iron as a parameter to be used in pregnancy, variation in nutritional status of pregnant women, and differences in methodology, such as Sahli-Hellige method, Pack Cell Volume(PCV) or Haematocrit method, Haemoglobinometer, AB, Angelhom, Sweeden etc used in measuring or estimating Haemoglobin(Hb) in pregnant women and certain associated risk factors in maternal anaemia²³.

On age-related prevalence of anaemia among the study population, the result showed that mild anemia was found to be more prevalent among pregnant women between the ages of 25 - 29years; however, those below the age of 20 years had the highest prevalence of both moderate and severe anemia constituting 48.7% and 66.7% respectively. This corroborated the reports of ²⁵. who discovered a higher prevalent rate of anaemia (51.1%) among pregnant women in the second trimester and within the age-group of 20-35 years(62.7%), moreso, in a similar study, ⁴, in a hospital-based retrospective study, in Nepal Medical College Teaching Hospital revealed that out of 368 anaemic mothers, only 13.0% of anaemia was discovered among womenless than 19 years of age, while, the majority (84.8%) of them were within the age-group of 20-35 years and that only 2.2% of them, who had anaemiawere more than 36 years old. The level of anaemia among these groups of women were either attributed to increased demand or decreased intake or due to nausea or a decrease in appetite or lack of knowledge, chronin disease, or due to poverty²⁴

This study reported the age and gestational age(p=0.014) and family income(p=0.003) as the risk factors associated with anaemia status among the pregnant women attending antenatal clinics across primary healthcare centres in Gwagwalada Area Council, FCT, Abuja, and this is consistent with the reports of earlier researchers. For instance, ²⁵, said that third trimester of pregnancy is associated with iron deficiency anaemia, claiming that there is an increase in both red cell mass and plasma volume to accommodate the needs of the growing uterus and fetus, and that the plasma volume increases more than the red cell

mass leading to a fall in the concentration of haemoglobin in the blood. Moreso,²⁶, opined that the dilution of blood in pregnancy is a natural process and starts approximately at the 8th week of pregnancy and progresses until the 32nd to 34th week of pregnancy.²⁷, buttressed this fact by saying that there is a marked demand for extra iron during pregnancy, especially in the second half of pregnancy.²¹, in supporting that family income is one of the associated risk factors of anaemia, said that the majority of the pregnant women with iron deficiency anaemia, have no occupation as most of them were housewives with little or no official income. They went on to say that this status bring about poor nutritional status among pregnant women as they have low purchasing power and, hence, low access to better nutrition and better health condition. Moreover, the pregnant women are expected to pay for the iron tablet and other medications.

On the relationship between socio-economic factors and anaemia status of the study population, the study showed that there is a relationship between family income ($X^2 = 0.876$; P = 0.003) and anaemic status of the pregnant women as the value was found to be statistically significant (p=0.05). However, there was no relationship between their educational level (X^2) =2.456; p=0.424), Occupation ($X^2 = 16.320$; p=0.112), and Family members ($X^2 = 2.152$). This contradicts the findings of ²² who reported low educational attainment as a risk factor for maternal anemia. They posited that the majority of the women with iron deficiency anemia had no formal education or primary education which impacts their economic status and went on to say that, is a common belief that more enlightened women would secure better job, has better living condition, and keeps better hygienic practices; hence, lower incidence of iron deficiency anemia possibly due to better nutrition as well as reduced chances of parasitic infections.²⁸, in opposing this, reported that illiteracy in women was six times more likely to promote anemia compared with women who achieved secondary and higher educational levels.

Conclusion

In conclusion, anaemia is a serious threat in pregnancy and this study demonstrated that the prevalence of the disease in pregnancy in Gwagwalada Area Council, FCT, Abuja, remained high and especially affects pregnant women in their trimesters and age-groups of 25-29 years and 20-24 age cohort. The study recommends that stern steps should be applied to curtail the risk factors for anaemia in women by mounting enlightenment campaigns against anaemia at primary healthcare centers and in public arena. Primary healthcare centers should put more effort in advising pregnant women to consume more of iron-rich foods on steady basis to avert iron-deficiency anaemia during their reproductive age, especially during pregnancy.

References

- 1. AlfarisNAlTamini, J,Alkehayez N,&AlMushaswah F. Prevalence of anemia and associated risk factors among nonpregnant women in Riyadh Saudi Arabia: A Cross-sectional Study. International Journal of General Medicine, 2021; 14765-14777
- 2. Allen LH, Anemia and iron deficiency: effects on pregnancy outcome. Am J ClinNutr; 2020;71(5):1280S-1284S.
- WHO. Hemoglobin concentrations for the diagnosis of anemia and assessment of severity. Geneva,Switzerland:WHO, 2018 WorldHealthOrganization.<u>http://www.who.int/ vmnis/indicators/ha</u>
- 4. Marahatta R. Study of anaemia in pregnancy and its outcome in Nepal Medical College,
- Teaching Hospital ,Kattmandu, Nepal. Nepal Med Call J.2007; 9:270-4.
- 5. Karaçam Z,Kizilca E,Çakaloz D. & Demir R. The impact of adolescent pregnancy onmaternal and infant health in Turkey: Systematic review and meta-analysis. Journal of Gynecology Obstetrics and Human Reproduction,2021; 50(4):102093
- 6. Kalaivani K. Prevalence and consequences of anaemia in pregnancy. Indian Journal Med Res,2019; 130:627-633.

- Sholeye OO, Animashahung VJ&Shorunmu T. Anaemia in pregnancy and its associated factors among primary care clients in Sagamu, South-West Nigeria: a factory based study. Family Med Prim Care, 2017; 6: 323-329.
- Sharma S, Pal Kaur S & Lata G. Anemia in pregnancy is still a public health problem: A Single Center Study with Review of Literature. Indian Journal of Hematology and Blood Transfusion, 2019;36: 129-134
- Bukar M, Audu BM, Yahaya UR, Melah GS. Anemia in pregnancy at booking in Gombe, North-Eastern Nigeria. J ObstetGynaecol. 2018;28:775–8.
- Ejiofor CC,Ozokono RU and Ugwu JI. Prevalence of anemia among pregnant women attending 82 Division Nigerian Army Hospital, Enugu. Open Jour of Gynec and Obstetr Res,2019; 6 (1), pp.1-5 doi: 10,171/Goroj6-148
- 11. WHO, UNICEF, UNU. Iron deficiency anemia: assessment, prevention, and control.
- A guide for program managers.Geneva: World Health Organization,2021, WHO/NHD/01.3.3
- 12. Ali and Okan. Anaemia and malaria. Malar Journal,2017;doi:10.1186/s12936-018-2509-9.
- 13. Bothwell TH. Iron requirements in pregnancy and strategies to meet them. Am J Clin Nutri,2020; 72(Supply):257S64S
- 14. Federal Department of Survey . Nigeria Demographic and Health Survey,2018.
- 15. Cochranain WG. Sampling Techniques, 2nd Edition, John Wiley & Sons. Inc.New York, 1963.
- 16. Mclean E, Egli I, Wojdyla D, Cogswell M & de Benosit B. Worldwide prevalence of anaemia in pre-school aged children, pregnant women and non-pregnant women of reproductive age, 2006.
- 17. Ikeanyi E & Ibrahim A. Does antenatal care attendance prevent anaemia in pregnant at term. Nigerian Journal of Clinical Practice, 2015;vol.18(no.3): 323-327.
- 18. Smith C, Teng F, Branch E, Chu S & Joseph K. Maternal and Perinatal Morbidity and Mortality Associated With Anemia in Pregnancy. Obstetrics & Gynecology.2019;134 (6):1234-1244.

- 19. Omote VI,Ukwamedua HA, Bini N &KashibuE..Prevalence, severity, and correlates of Anemia in pregnancy among antenatal attendees in Warri, South-Southern Nigeria—A systematic review. Niger J ClinPract 2020; 23:889-96
- 20. Esike CO, Anozie OB,OnohRC,SundayUC,Nwokpor OS.&UmeoraOU.J.Prevalence of anaemia in pregnancy at booking in Abakiliki, Nigeria. Trop J ObstetGynaecol, 2018;33: 332-336.
- 21. Ugwu,N and Uneke CJ. Iron deficiency anemia in pregnancy in Nigeria—a systematic review. Available fromhttp://www.njcponline.com, 2020, IP: 197.90.36.231]
- 22. Gebreweld and Tsegaye (2018). Prevalence and factors associated with anaemia among pregnant Women attending antenatal clinic at St Pauls's Hospital Millennium Medical College,Addis Ababa, Ethiopia. Hindawi Advances in Haematology2018;ID 3942301. doi:.org/10.1155/2018/3942301.

- 23. Tandom R, Jain A & Malhotra P. Management of iron deficiency anemia in pregnancy in Indian. Indian Journal Hematol Blood Transfu,2018;34 (2): 204-215
- 24. Singh R, Singh AK, Singh HK & Gupta SC. Correlates of anaemia in pregnant Women. Indian J Community Health, 2015;27:351-5.
- 25. Okafor LA, Dieiomaoh FM &Oronsaye AU. Bone marrow status of anaemic pregnant Women on supplemental iron and folic acid in a Nigerian community. Angiology, 1985;36: 560-3.
- 26. Soma-Pillay P, Nelson-Piercy C, Tolppanan H &Mebazaa A. Physiological changes in pregnancy. Cardiovasc J. Afr, 2016;27:89-94.
- 27. Fisher AL & Nemeth E. Iron homeostasis during pregnancy. Am J Clin Nutr, 2017;106(Suppl.): 1567S74S.
- 28. Habib F, Alabdin EH,Alenaz M & Nooh R.Compliance to iron supplementation during pregnancy.JObstet Gynecol.,2019; 29:487– 492. doi:10.1080/01443610902984961

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Quick Response Code				
DOI: 10.22192/ijcrms.2025.11.05.002				

How to cite this article:

G.I.A.Okoroiwu; N.I.Ubosi; B.Knigami and Emmanuel Ifeanyi Obeagu. (2025). Anaemia and associated risk factors among pregnant women attending antenatal clinics across primary healthcare centers in Gwagwalada area council, FCT, ABUJA. Int. J. Curr. Res. Med. Sci. 11(5): 5-16. DOI: http://dx.doi.org/10.22192/ijcrms.2025.11.05.002