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Knowledge and Prevalence of Anaemia in Pregnancy among Pregnant Women in Nkanu-West Local Government Area, Enugu State

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Abstract

This study determined the knowledge and prevalence of anaemia in pregnancy among pregnant women in the Nkanu-west local government area, Enugu State. Three research questions and one hypothesis guided the study. The study adopted a descriptive cross-sectional survey. A sample of 320 pregnant women was selected through a multi-stage sampling technique. Semi-structured questionnaires and blood test measurements (haemoglobin level estimation) were used for data collection. A reliability index of .78 of the spilt-half method result was established using the Spearman-Brown test. Data analyses were performed with SPSS, version 23. Frequency and percentages were used to answer research objectives 1-3 while Chi-square analysis was used to test the hypothesis at a .05 level of significance. The study found a 55.0% prevalence of mild anaemia, 26.6% moderate anaemia, and 1.20% severe anaemia among the respondents. Also, the result indicated that 14.6% had poor knowledge, 50.0% had average knowledge and 35.3% had high knowledge of anaemia in pregnancy. The chi-square test showed that occupation and parity had a significant relationship with the level of knowledge of anaemia among the women ($p < .05$). It was concluded that anaemia was prevalent among pregnant women and knowledge of anaemia was moderate which can have adverse effects on the fetal and maternal outcome. An intensified sensitization and enlightenment of pregnant women by the health care workers and health educators on the causes of anaemia, treatment and necessary precautions to prevent anaemia in pregnancy was recommended.

Keywords: Anaemia, Pregnancy, Prevalence, Knowledge of Anaemia, Pregnant Women.

Introduction

Anaemia is a public health problem globally affecting both the developed and developing countries. Anaemia can affect anybody but becomes more serious in pregnancy due to the feto-maternal conditions involved. Anaemia in pregnancy was stated to be 51per cent (Melku, et al., 2014). Sub-Saharan Africa is the most affected region with a

prevalence of 57% of pregnant women being anaemic, which corresponds to about 17.2 million affected women with severe consequences for human health as well as social and economic development (Melku et al., 2014). Anaemia is defined as a condition in which the number of red blood cells or the haemoglobin (HB) concentration within the blood is lower than normal (Musya et al., 2019). Anaemia occurs at all stages of the lifecycle but is more prevalent among pregnant women due to their physiological state of health (Abriha et al., 2014). Anaemia in pregnancy is defined as a condition where there is less than 11g/dl of HB concentration in the blood of a pregnant woman, which decreases the oxygen-carrying capacity of the blood to the body tissues (WHO 2016, Onoge, 2019). WHO (2016) further categorized anaemia in pregnancy thus: mild anaemia is HB level 9-10.9g/dl, moderate anaemia is HB level 7-8g/dl and severe anaemia is HB level less than 7g/dl. HB is a driving force for tissue oxygenation and a reduction below acceptable levels can be detrimental to both the fetus and the mother (Olatunbosun, et al., 2014). Anaemia is one of the most common nutritional deficiency disorders affecting pregnant women in developing countries with adverse outcomes for both the fetus and mother. This can result in complications such as preterm birth, low birth weight, fetal abnormality (neural tube defect), stillbirth and even maternal death.

The prevalence of anaemia among pregnant women differs depending on the socio-economic status of the country. Studies conducted in Asian countries showed that the prevalence of anaemia among pregnant women ranged from 18.1% to 90% (Chanya et al., 2022; Anuradha et al., 2021; Adizam et al., 2018). In Africa, studies by Wemakor (2019), Aboud et al., (2019) and Mulugeta et al., (2014) showed a prevalence of 16.6-50.8%. Also, studies carried out in Nigeria among pregnant mothers by Sholeye et al. (2017) and Dim et al. (2015) indicated the prevalence of anaemia ranging from 32.5-32.8%. The pregnancy outcome depends on the health status of the pregnant woman, prevailing health problems and other factors including anaemia. The more severe the anaemia in pregnant women, the more the adverse effect on pregnancy outcome. The prevalence of anaemia among pregnant women may be attributed to the level of knowledge of the concept, causes and prevention of anaemia.

Knowledge is the prerequisite to life's existence. Knowledge of anaemia is essential to pregnant women to avert its adverse effects on them and their unborn babies. Knowledge of anaemia includes knowing the causes, signs and symptoms, prevention and treatment. However, this study focused only on the knowledge of concepts and causes of anaemia in pregnancy. Previous researchers, Appiah et al., (2020) in Ghana reported that only (13.5%) of

pregnant women had high knowledge of anaemia, while 58.4% and 28.1% had moderate and low knowledge, respectively. Other researchers, Duko et al., (2017) in Ethiopia and Yesefu, et al., (2013) in Lagos, Nigeria reported that about 44.3% and 95% of respondents had comprehensive awareness of anaemia. Aboud, et al., (2019) reported poor knowledge of iron deficiency anaemia among the majority of respondents. Another researcher Adzam et al., (2018) in Putrajaya revealed that 55.7%of pregnant women had high knowledge of anaemia during pregnancy while 28.6% had moderate knowledge followed by 15.7% with low knowledge score. Ademuyiwa et al., (2022) in Calabar, Nigeria and Balasubranian et al., (2016) in India studies showed that (77.8%, and 76.5%) of the respondents have heard of anaemia. Ademuyiwa et al., (2022) went further to report that (42.2%) of them could correctly define anaemia, and (71.7%) of them could correctly identify different causes of anaemia. Dwumfour-Asare and Kwapong (2013) in Ghana results showed that the easily known cause of anaemia is poor diet (63%), followed by malaria (26%), worms (5%), and others (6%). These studies were conducted in different countries including Nigeria, but none was done among antenatal attendees in Nkanu-west LGA, Enugu State. Knowledge of anaemia among pregnant women may be linked with some socio-demographic factors.

Certain socio-demographic factors such as age, level of education, marital status, occupation and parity are likely to influence the knowledge of anaemia among pregnant women. Previous researchersAnuradha et al., (2021), Nokethonu et al., (2019) in Sikkim, India, Adznam et al., (2018) and Balasubranian et al., (2016) revealed that the educational qualification of the subjects was significantly related to knowledge of anaemia. Ademuyiwa et al., (2020), Ekwere and Ekanem (2015), Dwumfour-Asare and Kwapong, (2013), Ghimire and Pandey (2013) and Sigh et al., (2013) revealed significant associations between occupational status and knowledge of anaemia while Adznam et al., (2018) indicated that knowledge score was significantly associated with the number of children ($p < 0.01$).

Anaemia can affect anybody including adults and children but is more serious in pregnant women. The pregnant women are expected to register for antenatal care where they can gain knowledge on the causes and prevention of anaemia in Nigeria. Previous studies indicated that anaemia is prevalent among pregnant women (Chanya et al, 2022 Sikkim India and Anuradha et al,2021) in West Bengal. Therefore, this study assessed the knowledge and prevalence of anaemia among antenatal attendees in Nkanu-west Local Government Area (LGA) of Enugu State.

Objectives of the Study: Specifically, the study determined the:

1. level of knowledge of anaemia among pregnant women in Nkanu-west LGA, Enugu State;
2. prevalence of anaemia among the respondents;
3. determine the relationship between the level of knowledge of anaemia and the demographic characteristics of the respondents.

Hypothesis: The level of knowledge of anaemia will not be significantly associated with the demographic characteristics (age, level of education, marital status, occupation and parity) of the pregnant women

Materials/Methods

Study Design: This study adopted a cross-sectional survey and correlational designs in carrying out the study. The cross-sectional design is suitable to describe the events that occur at a given time among a given population while the correlational design investigates the relationship among existing variables.

***Study Population*:** The population of the study consisted of all1200 pregnant women attending antenatal clinics in 20 primary healthcare centres in Nkanu-west L.G.A, Enugu State between January-June, 2022 (Primary Health Care Department, Nkanu-west, LGA, 2022).

***Sample Size and Sampling Technique*:** The sample size for the study was 330 pregnant mothers selected in multiple stages.In Stage 1, the Yamane (1967) formula was used to calculate the sample size which gave a sample size of 300. Ten percent (10%) attrition of 30 was added giving a total of 330 pregnant women. Stage 2 involves a simple random sampling of 10 (50%) out of the 20 primary healthcare centres in the LGA. This implies that 10 primary health centres were selected, one each from the 10 communities that make up the LGA. Stage 3 involved the use of a convenient sampling technique to select 33 mothers from each of the selected health centres giving a total of 330.

Data Collection Instrument: Two instruments were used for data collection. First was the Sysmex Hematology Analyzer machine (Sysmex Europe GmbH). This was used for haemoglobin estimation to determine the proportion of antenatal mothers suffering from anaemia. The second instrument is the pre-validated researcher-structured questionnaire titled Anaemia in Pregnancy Knowledge among Antenatal Attendees "(APKAAQ)". The APKAAQ was divided into two sections; A-B. Section A contain 5 items on the socio-demographic characteristics of the respondents, such as age, level of education, marital status, occupation and parity. Section B consisted of 10 items on knowledge of anaemia which were multiple-choice questions. The respondents were required to select only

one option as it applies to any of the statements.

***Validity and Reliability*:** The questionnaire was validated by three experts from the Department of Human Kinetics and Health Education. Their inputs were used to modify the instrument to produce the final copy for data collection. To determine the reliability of the instrument of the study, 20 copies of the instrument were administered to pregnant mothers attending antenatal in Nkanu-east LGA. Using the data collected, the Spearman-Brown test of internal consistency was used, and that gave the reliability coefficient index of .78.

Study Approval and Informed Consent: A formal documented research approval letter (Ref. No. MH/MSD/REC23/373) was obtained from the Primary Healthcare Board Nkanu-west LGA. The letter was presented to the Officer-in-charge (OIC) of each health facility. Also, the antenatal mothers gave oral consent to participate after explaining the purpose of the study. They were assured that their responses would be treated with the utmost confidentiality and would be used only for academic research.

Data Collection Procedure: The researcher was assisted by one research assistant and one laboratory technician for each health facility who were briefed on the modalities of data collection. The laboratory technician collected the blood and took it to the laboratory for haemoglobin level analysis. Three hundred and thirty copies of the questionnaire were further administered to the respondents by the researcher and research assistants. The completed copies of the questionnaire were collected on the spot to ensure a high return rate. Out of the 330 copies of the questionnaire administered, 320 were properly filled which gave a rate of 96.9% viable copies used for data analysis.

***Data Analysis*:** The completed copies of the instrument were sorted and analysed. Data analysis was conducted using IBM SPSS Statistics (version 22). Research questions were answered using frequencies and percentages while the null hypothesis was tested using Chi-square statistics at a 0.05 level of significance. Research objective 1 was analyzed based on the WHO (2016)'s classification. Mild anaemia was established at HB level 9-10.9g/dl, moderate anaemia was at HB level 7-8g/dl while severe anaemia was at HB level less than 7g/dl. Research objectives 2 and 3 were analyzed using frequencies and percentages. In determining the level of knowledge of anaemia, Okafor (1997) guidelines were adopted. By this guideline, total scores below 0-39% were interpreted as low knowledge; 40-69% was considered moderate knowledge while 70% and above was considered high knowledge.

Results

The respondents were mostly (69.3%) between 15 -23 years of age. A few (12.8%) of them had no formal education, 17.8% had a maximum of primary education, 47.5% had secondary education and 21.8% had tertiary education. A greater proportion (66.5%) of the mothers were married, 7.81% were single, 14.37% were widowed and 11.56% were separated/divorced. Some (23.43%) of the mothers were farmers, 25.62% were civil servants, 14.06% were housewives, and 36.87% were traders. As regards parity, 15.31% had 0-1 children, 42.18% had 2-3 children, 29.68% had 4-5 children, and 12.81% had 6 or more children.

Prevalence of anaemia among the respondents.

The result in Table 1 indicates that the overall prevalence of anaemia was 82.8%. The prevalence of mild anaemia was 55.0%, 26.6% moderate anaemia, and 1.20% severe anaemia among the respondents.

Table 1. Prevalence of anaemia among the participants (n = 320)

Levels of Anaemia	f	%
No anaemia	55	17.20
Overall prevalence	265	82.80
Severity of anaemia		
Mild anaemia	176	55.00
Moderate anaemia	85	26.60
Severe anaemia	4	1.20

The result in Table 2 shows that overall, knowledge of anaemia among pregnant women was moderate (44.2%). The result also shows that 34.0% indicated that anaemia in pregnancy is caused by not eating foods containing meats and fish, not eating green leafy vegetables (45.6%) and not eating whole grain meals such as beans and cowpeas (49.3%). The result further shows that 51.2% had heard about anaemia and 33.7% got the correct definition of anaemia.

Table 2. Knowledge of anaemia in pregnancy among the respondents

Anaemia in pregnancy is caused by any of the following:	Correct responses F (%)	Incorrect responses F (%)
Ever heard of anaemia (shortage of blood) in pregnancy?	164(51.2)	156(48.7)
A correct definition of anaemia in pregnancy is HB less than 11g/dl	108(33.7)	212(66.2)
Anaemia is caused by not eating foods containing meats and fish.	109(34.0)	211(65.9)
Lack of green leafy vegetables and fruits in the foods.	146(45.6)	174(54.3)
Repeated malaria infection caused by mosquito bites.	124(38.7)	196(61.2)

Repeated pregnancy at short intervals of less than 2 years.	112(35.0)	208(65)
Not eating whole grain meals such as beans, akidi, (local beans),okpa (cowpeas).	158(49.3)	162(50.6)
Not taking antenatal drugs (folic acid and fersolate tablets) during pregnancy.	181(56.5)	139(43.3)
Not sleeping under insecticide-treated mosquito nets can be exposed to malaria infection.	175(54.6)	145(45.3)
Overall %	**44.2**	**55.6**

Key: 0-39% low knowledge, 40-69% = moderate knowledge, while 70% and above = high knowledge.

The result in Fig 1 shows that half (50.0%) of the pregnant mothers had moderate knowledge, 35.3% had high knowledge and only 14.6% had low knowledge of anaemia.

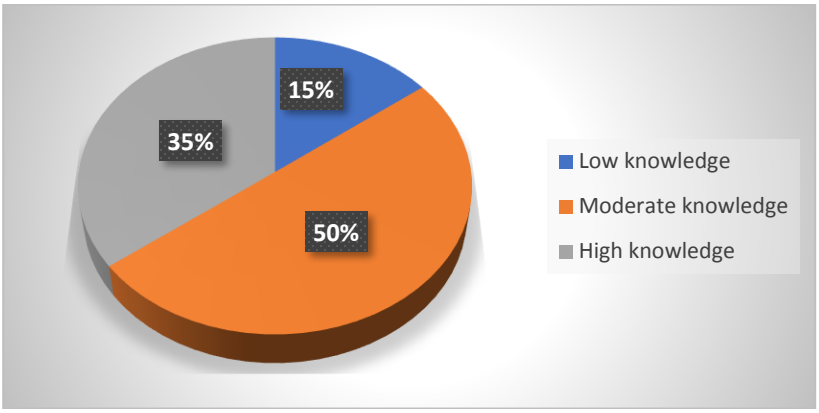

Fig 1. Level of knowledge of anaemia in pregnancy among the respondents

Relationship between knowledge of anaemia and demographic characteristics of the respondents

The result in Table 3 shows that occupation and parity of the pregnant mothers had a significant relationship ($p < 0.05$) with their level of knowledge of anaemia in pregnancy. A greater proportion (73.1%) of the civil servants had a high knowledge of anaemia compared to other occupation groups. Women who have had more than one child showed a higher level of knowledge than those who had one or no child. Age, level of education and marital status had no significant relationship($p > 0.05$) with knowledge of anaemia, though older women (> 23 years), women with tertiary education and single mothers showed higher

knowledge of anaemia than their counterparts. The study hypothesis was therefore partly upheld.

Table 3. Relationship between level of knowledge of anaemia in pregnancy and demographic characteristics of the respondents

Socio-demographic variables	Low knowledge (%)	Moderate knowledge(%)	High knowledge(%)	x^2	P-value
Age(years)					
15-23	18(18.5)	52(53.6)	27(27.8)		
24-32	17(13.6)	58(46.4)	50(40.0)		
33-41	9(11.5)	36(46.1)	33(42.3)	6.254	.395
42 and above	2(10.0)	12(60.0)	6(30.0)		
Level of education					
No formal	9(21.9)	18(43.9)	14(34.1)		
Primary	8(14.0)	32(56.1)	17(29.8)		
Secondary	22(14.4)	74(48.6)	56(36.8)	3.398	.758
Tertiary	8(11.4)	32(45.7)	30(42.8)		
Marital status					
Married	44(20.7)	92(43.3)	76(35.8)		
Single	8(32.0)	10(40.0)	7(28.0)		
Widowed	16(34.7)	20(43.4)	12(20.6)	3.787	.151
Separated/divorced	12(32.4)	15(40.5)	10(27.0)		
Occupation					
Farming	12(16.0)	28(37.3)	35(46.6)		
Civil servants	12(14.6)	10(12.1)	60(73.1)		
Housewives	15(33.3)	17(37.7)	13(28.8)	7.890	.042*
Trading	21(17.7)	69(58.4)	28(23.7)		
Parity					
0-1 child	15(30.6)	18(36.7)	16(32.6)		
2-3 Children	30(22.2)	79(58.5)	26(19.2)	6.251	.012*
4-5 Children	24(25.2)	50(52.6)	21(22.1)		
6 children and above	11(26.8)	16(39.0)	14(34.1)		

* values are significant at $p < 0.05$

Discussion

The result of the study indicated a very high (82.8%) prevalence of anaemia mostly ranging from mild (55.0%) to moderate (26.6%)levels. Only a few (1.20%)had severe anaemia, and 17.2% had no anaemia among the respondents. The reason for the great proportion of mild to moderate anaemia might be as a result of pregnant women not attending antenatal regularly, attending late when the nurses/midwives might have finished health talks regarding healthy nutrition in pregnancy or mothers not complying with the health talks given. However, the small proportion of severe anaemia observed may be attributed to the efforts of the professionally trained midwives in the ante-natal clinics in providing adequate nutrition knowledge to pregnant women. It could also be partly due to the adequate fruits and vegetables produced in the study area. The findings of this study disagree with the findings of Chanya et al., (2022) in Sikkim India which reported 73.5% mild anaemia, 26.5% moderate anaemia, and no severe anaemia among pregnant women. Wemkor (2019) in Northern Ghana reported 18.1% mild, 90% moderate and 50.8% severe anaemia. Mulugeta et al. (2014) also reported 6.0% mild, 30.0% moderate and 64.0% severe anaemia in Northern Ethiopia. The differences may be due to the location of the study as the reviewed studies were conducted in other countries with different backgrounds from Nigeria. Nigeria has a variety of nutritious diets which may enhance the haemoglobin status of pregnant women.

The result showed that the pregnant women generally had a good knowledge of anaemia in pregnancy; about a third (35.3%)of the respondents had high knowledge, half (50.0%) of them had moderate knowledge, while only a few (14.6%) had a low level of knowledge of anaemia in pregnancy. However, this finding indicates that the knowledge was mostly at a moderate level, suggesting that there is still much room for improvement, This finding is in agreement with studies of Adzam et al., (2018) in Putrajaya and Duko et al., (2017) in South Ethiopia which also reported moderate knowledge of anaemia respectively among the pregnant women. The similarity may be that pregnant women attend antenatal clinics where they are counselled on the causes and prevention of anaemia in pregnancy. The finding of the study was at variance with the findings of Yesefu, et al., (2013) in Lagos State Nigeria and Balasubranian et al. (2016) in Tamil Nadu, India which reported a high level of knowledge (44.3% and 76.5%) among the participants. The differences in the findings may be linked to the antenatal attendance of the pregnant women and the ability of the health care providers to educate the pregnant women on nutritional requirements during pregnancy. The result further reports that 51.2%, 45.6% and 49.3% indicated that anaemia in pregnancy is caused by not eating foods containing meats and fish, not eating green leafy vegetables and not eating whole grain meals such as

beans and cowpeas. The result concurs with the findings of Dwumfour-Asare and Kwapong (2013) at Brosankro, Ghana who reported that the easily known cause of anaemia is poor diet (63%). The result further reports that 51.2% and 33.7% had heard about anaemia and got the correct definition of anaemia which is in congruence with the findings of Ademuyiwa et al., (2022) at Calabar, Nigeria study that showed that (77.8%, 44.2%, and 71.7%) had ever heard of anaemia, could correctly define anaemia and correctly identified the correct causes of anaemia. This may be due to organized health talk normally delivered by the health care providers during antenatal care services.

Further findings of the study showed that there was a significant relationship between the level of knowledge of anaemia in pregnancy with the occupation and parity among pregnant mothers. The study hypothesis was therefore partly upheld. Mothers who were civil servants had a high knowledge of anaemia compared to other occupation groups. This might be because women in civil service are more likely to be more enlightened in nutrition during pregnancy than traders and farmers. Additionally, women who have had more than one child showed a higher level of knowledge than those who had one or no child. Having more children entails having more experience with pregnancy and participation in nutrition education in ante-natal clinics. This might enhance their knowledge of anaemia during pregnancy. This is in support of the previous studies by Ademuyiwa et al., (2020) in Nigeria, Adznam et al., (2018) study at Putrajaya, Ekwere and Ekanem (2015) in Nigeria, Dwumfour-Asare and Kwapong, (2013) at Ghana and Sigh et al., (2013) at sub-Sahara Africa which revealed significant associations between occupational status, parity and knowledge of anaemia ($p < 0.01$). The similarities between the results of the reviewed studies and the present study can be explained that all the studies were conducted in Africa among pregnant mothers that may have gained some knowledge about anaemia during their regular antenatal and postnatal visits. The finding further showed that there was no significant relationship in the level of knowledge of anaemia in pregnancy among pregnant mothers based on age, level of education and marital status ($p > .05$). This contradicts the findings of previous researchers: Anuradha et al., (2021) at Putrajaya, Nokethonu et al., (2019) in Sikkim, India, Adznam et al., (2018) at West Bengal and Balasubranian et al., (2016) at India which revealed that age, educational qualification and marital status of the subjects was significantly related to knowledge of anaemia ($P < 0.05$). The differences between the results of the reviewed studies and the present study might be attributed to the different areas of the studies. The reviewed studies were conducted in other countries with different economic and social development from Nigeria.The result of the study further.

Conclusion

Anaemia is a public health problem resulting in complications in pregnancy and contributes to fetal and maternal mortality. This study showed that anaemia was prevalent among the pregnant women attending antenatal clinics in Nkanu-west LGA mostly at mild-to-moderate levels. Severe anaemia was observed among a few women attending ante-natal clinics and this suggests that more efforts are needed to eradicate anaemia among pregnant women especially those in rural areas. Pregnant women in the study area generally had a good knowledge of anaemia in pregnancy which was associated with occupation and parity of the women. Pregnant women who are civil servants and those who have more than one child showed a higher level of knowledge of anaemia in pregnancy compared to their counterparts. Exposure to opportunities to acquire nutrition education is very crucial in equipping pregnant women with knowledge of anaemia and consequently might help to lower the prevalence of anaemia among pregnant women.

Recommendations

The following recommendations were made based on the findings of the study.

1. The study recommended intensified sensitization and enlightenment of pregnant women by the health care workers and health educators on the causes of anaemia, treatment and necessary precautions to prevent anaemia in pregnancy.
2. Pregnant women should also be encouraged by health care providers to cultivate vegetables and seasonal fruits around their residences to ensure regular intake of fruits and vegetables.
3. Ministry of Health, Chief Medical Directors, and Officers in Charge of the health facilities should subsidize the cost of antenatal care services to encourage pregnant women to access the antenatal care services.

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