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Original article

Knowledge and practices regarding prevention of anemia amongst pregnant women in rural communities of South-West Nigeria

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Abstract

Background: The burden of anemia in pregnancy (AIP) is significantly higher in developing countries, most especially in rural areas. This study was carried out to evaluate the effect of pregnant women's knowledge and practices on the prevention of AIP in South-West Nigeria.

Methods: This cross-sectional-based study involved 138 consenting pregnant women aged 18 - 42 years who had no complications (maternal and fetal) during pregnancy. Pretested interviewer-administered questionnaire consisting of three parts was used to collect data. The first part obtained information on the socio-demographic characteristics of the respondents. The second part assessed their knowledge on adequate diet and prevention of AIP, while the third part assessed the practices of respondents on the prevention of AIP. A binary logistic regression model was used to identify factors associated with anemia.

Results: About 18.8% of respondents had poor knowledge, while 8.0% had a high score. Although all respondents claimed regular clinic attendance, 55.8% of them took their routine antenatal care (ANC). Pica practices were found in 7.2%. None of the respondents smoked, while 5.8% drank alcohol. None had food taboo. There was a significant association between the knowledge score and educational status ($p = 0.006$).

Conclusion: The findings indicated that the majority of pregnant women in rural communities in South-West Nigeria had moderate knowledge and good practices regarding the prevention of anemia.

Keywords: Anemia, Health Knowledge, Attitudes, Practice, Pregnant woman

Introduction

Anemia in pregnancy (AIP) is a well-known public health challenge affecting nearly half of all pregnant women worldwide (1). In addition, it is a common complication of pregnancy, partly due to physiologic adaptation, in which any increase in red cell mass is not commensurate with the increase of plasma volume (2). The burden of AIP is significantly higher in developing countries, most especially in the rural areas, which could be due to poverty and ignorance (3). At ante-natal booking, available reports put the prevalence of AIP in Nigeria as very high. Esike et al from Abakaliki, South- East Nigeria reported a prevalence of 56% (4), although women are exposed to physical, physiological and mental changes throughout the pregnancy (5). Practices and lack of

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knowledge of nutritional needs AIP during pregnancy may further complicate pregnancy with attendant's increase in morbidity as well as the mortality of the mother and fetus (6).

In sub-Saharan Africa, due to poverty and ignorance, women are at greater risk of developing malnutrition during pregnancy with a significant increase in iron requirements for the growth of the placenta and fetus (7). This may result in negative pregnancy outcomes such as delay in fetal growth and development, pre-term delivery, and low birth weight (6, 8).

Pregnant women, depending on their level of education, have a considerable variation in knowledge and practice on the prevention of anemia in many developing countries. Results of a study carried out in Ibadan South Nigeria revealed that the majority (73.4%) of the respondents had adequate knowledge of AIP and 63% adopted the use of iron supplements and folic acid as a preventive measure against AIP. However, a large percentage (79.9%) of them avoided eating culturally forbidden foods that are rich in iron (9). A report from Malaysia gave a high knowledge score of about 55%. However, another a study in India reported poor score on cause, signs and symptoms of anemia and proper diet to prevent anemia (10).

High level of knowledge on anemia prevention will improve the attitude of pregnant women towards its prevention. However, reports available show that pregnant women, depending on their level of education, have a considerable variation in knowledge and practices on the prevention of anemia. Therefore, there is paucity of data on this topic in South Nigeria. This study was, therefore, carried out to evaluate the effect of pregnant women's knowledge and practices on the prevention of AIP in South-West Nigeria.

Materials & Methods

This cross-sectional-based study involved 138 consenting pregnant women aged 18- 42. The study was carried out in four primary health care centers in Ikene Local Government of Ogun State Nigeria– Ikene PHC Ward 1, Ilisan PHC Ward 8, Iperu Healthcare Ward and Ogere Health Centre. Ikene Local Government is one of the three local government areas where Remo people are found in Ogun State, Nigeria. The other two local governments are Sagamu and Remo North Local Governments. According to 2006 Nigeria Population census, Remo Land has a population of 628,560 people (Ikene LG-165,700; Sagamu LG-253,421; Remo North LG- 209,439) (11). The inclusion criteria were pregnant mothers aged 18 – 42 years, who had no complications (maternal and fetal) during pregnancy. Moreover, pregnant women with complications such as pregnancy-induced hypertension, gestational diabetes heart disease, and bad obstetric history were excluded from the study.

Pretested interviewer-administered questionnaire was used to collect data. The questionnaire was designed by the authors, adjusted to local setting, and was pre- tested for congruency and the exclusion of ambiguities. It was then refined thereafter and applied in the target population. The English version of the questionnaire was translated into the native language of the study area and then translated back to English language by language experts.

The questionnaire had three sections. The first section included the demographic and socio-economic information including age, the level of education, the occupation of the women and their husbands and households' wealth status. Also included in this section were some pregnancy related questions such as parity, gestational age, the last child birth, the history of fever in the index pregnancy, and the presence of any chronic illness. The anthropometric characteristics of the respondents such as weight and height were also reported.

The second section included 16 questions that assessed the nutrition knowledge of the respondents on adequate diet and anemia prevention. This section was divided into four subsections, i. What is adequate diet? ii. What are the benefits of eating adequate diet? iii. What are sources of iron rich food? iv. What are health risks of iron shortage during pregnancy? Respondents were expected to tick the correct options in each section. Mark one was awarded for identifying the correct, while mark zero was given to wrong answers. The total knowledge score was 12 and mark 1-5 out of 12 was considered as poor, 6-8 as average, and 9-12 as good. The third section contained a set of 15 questions that assessed their knowledge of anaemia prevention related practices. Each question had a Yes or No and mark one was given to each correct answer.

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AIP occurs when the hemoglobin (Hb) concentration is less than 11g/dL. It is divided into three levels in terms of severity: Mild (Hb level, 9 - 10.9g/dl), moderate (Hb level, 7-8.9g/dl), and severe (Hb level 7-4.5 g/dl) (12).

A pilot study was conducted as a pretest for the questionnaire to suit the local context using 5% of the total sample. During pre-test, the applicability of data collection procedures and tools was regularly evaluated. All questionnaires filled were checked for completeness, clarity and consistency by the supervisors and investigators including dietitians who, after scoring, organized group discussions with women to discuss answers to the second part of the questionnaire.

This study received ethics permission from office of the Medical officer of Health (MOH), Ikenne Local Government of Ogun State, Nigeria with approval memo number IKLG 102/21 dated 27 June 2019. All analyses were performed with SPSS (Version 22.0). Chi-Square and independent t-test were used for the qualitative and quantitative variables. p values less than 0.05 were considered significant.

Statistical analysis

The data were analyzed using the Statistical Package for Social Sciences (SPSS) version 20. Descriptive statistics, including frequencies and proportions were used to summarize variables. A binary logistic regression model was used to identify factors associated with anemia. Variables with a P-value of <0.2 in the bivariate analysis were exported to the multivariate analysis to control the possible effect of confounders. The Adjusted Odds Ratio (AOR) with a 95% confidence level was estimated to show the strength of association and a P-Value of <0.05 was used to declare the statistical significance in the multivariate analysis of the study.

Results

A total of 138 pregnant women were recruited for the study. The majority of them (98.5%) were married. Only 12 of the married respondents were in the polygamous setting. All women had booked for antenatal clinic in the first trimester. They all claimed regular antenatal care clinic attendance, even though 55.8 % took routine antenatal drugs (iron and folic acid tablets) regularly. All respondents belonged to low socio-economic status, with 62% being artisans (tailors, hair dressers etc). Others were housewives (26%), farmers (24%) and 18% were employed as teachers, clerical officers, cleaners, messengers, etc., in government/private schools and small /medium scale enterprises. The youngest was 18 years, while the oldest was 42, and most of them (42.8%) were in the age group of 25-29. This was followed by the age group of 30-34 with 23.9%. The age group of 35-42 was the least with 13%. Most (79.7%) of the respondents were of Yoruba extraction. This was followed by Igbos (14.8%), Hausas (2.2%) and other tribes (4.3%). On their educational status, the majority of them (59.4%) had secondary education. 12.3% studied up to post-secondary level such as national diploma or national certificate in education, while 23.9% had only primary education. The rest 4.3% had no formal education. When the women were grouped according to their parity, more than half 52.2% were of parity 1-3. This was followed by primigravid women 39.9%. Only 8.0% belonged to the parity of 4 and above (Table 1).

Table 1. Socio-demographic and antenatal characteristics

Variable	(N)	Percentage
Age (years)		
18-24	28	20.3
25-29	59	42.8
30-34	33	23.9
35-42	18	13.0
Tribe		
Yoruba	110	79.7
Igbo	19	13.8
Hausa	3	2.2
Others	6	4.3
Education		
None	6	4.3
Primary	33	23.9
Secondary	82	59.5
Tertiary	17	12.3
Gestation		
First trimester	34	24.6
Second trimester	58	42.1
Third trimester	46	33.3
Parity		
0	55	39.9
1-3	72	52.2
>3	11	7.9

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That main source of information for the majority (93.5%) of respondents was health professionals (mostly doctors / nurses). Other sources of information included television/radio (2.9%) and social media (3.6%). Table 2 shows the knowledge score of respondents on questions related to balanced diet. Of 135 respondents, 115 (83.3%) correctly defined a balanced diet. However, many had poor knowledge of the benefits of eating balanced diet during pregnancy. For example, only 35 (25.4%) knew balanced diet could influence normal and eventful delivery. 66 (47.8%) knew that balanced diet could ensure the provision of enough blood to cater for the mother's well-being during pregnancy and fetal development. This can also ensure that blood loss during delivery does not jeopardize the health of the mother. Lastly, only 34 (24.6%) respondents also knew that balanced diet could guarantee the delivery of a healthy baby. Half (50%) correctly identified that red meat, liver, etc., are rich sources of iron. Also, more than half (55.1%) knew that some vegetables such as pumpkin (''ugu'') leaves, jute mallow (''ewedu'') leaves were rich sources of iron. All of them knew that tea, coffee, sweets, soft drinks, etc., did not offer iron rich nutrients.

Table 2. Knowledge on nutrition and anemia

Statements		Correct (n)	Wrong (n)
Balanced diet	Diet that fills the stomach and one is satisfied	125	13
	Diet that provides different nutrient in adequate amount essential for good health	115	23
	Diet that contains what one likes	135	3
	Diet that contains what one eats to become fat	136	2
Benefits of balanced diet	Normal delivery	35	103
	Provides enough blood	66	72
	Healthy baby	34	104
	Fat baby	137	1
Iron rich foods	Vegetables (ugwu, ewedu)	76	62
	Red meat, liver chicken etc.	69	69
	Tea coffee	128	10
	Sweets, soft drinks	138	0
Health risk of iron shortage	Weakness	49	89
	Dizziness	95	43
	Headache	10	128
	Low birth weight babies	39	99

Many respondents did not know the clinical features and health risks of anemia, especially iron deficiency anemia. Only 49 (35.5%) respondents knew weakness/tiredness could be a symptom of anemia. Furthermore, only 39 (28.3%) knew that anemia could cause the delivery of low birth weight babies. About 95 (68.8%) respondents knew that anemia could cause dizziness during pregnancy, and only 10 (7.2%) knew that anemia could cause headaches in pregnant women. The total mean score for their knowledge was 6.7±1.5, which indicated moderate knowledge. The minimum was 3, while the maximum was 11. The majority, 73.2%, had an average score. This was followed by 18.8% of respondents who had poor knowledge, while only 8.0% of the respondents had a high score. There was a significant association between knowledge score and educational status (p=0.006). Only respondents who had secondary and post-secondary level of education had good knowledge (Table 3).

Table 4 shows the assessment of practices on the prevention of anemia. Although all respondents claimed regular clinic attendance, 55.8 % of them took their routine antenatal care (ANC). Almost all of them (98.6%) took breakfast regularly, while 28.3% of them usually skipped meals. Pica practices, mainly of ice and mud, was reported among 7.2% of the respondents, and about 58.7% of them had history of nausea/vomiting. Few, 10.9% respondents, drank tea

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and 2.9% drank coffee regularly. None of the respondents smoked, while only 5.8% drank alcohol regularly. About 30.4% took soft drinks such as coca cola, etc., and 12.3% of the respondents confessed to taking herbs. None reported a food taboo.

Table 3. Association between demographic characteristics and knowledge score (n=138)

	Poor knowledge N=26 N (%)	Average knowledge N=101 N (%)	Good knowledge N=11 N (%)	X^2	DF	P-value
Marital status				1.06	2	0.586
Single	1(0.7)	3(2.2)	1(0.7)			
Married	25(18.1)	98(71.2)	10(7.2)			
Education status				18.18	6	0.006
No formal education	4(2)	2(1.4)	0(0)			
Primary	6(4.3)	27(19.6)	0(0)			
Secondary	13(9.4)	62(44.9)	7(5.1)			
post-secondary	3(2.2)	10(7.2)	4(2.9)			
Age(years)				9.72	8	0.285
<18	3(2.2)	12(8.7)	0(0)			
18-24	8(5.8)	15(10.9)	0(0)			
25-29	6(4.3)	40(29)	5(3.6)			
30-34	5(3.6)	22(15.9)	4(2.9)			
>35	4(2.9)	12(8.7)	2(1.4)			
Sources of Information on nutrition				6.11	4	0.191
Doctors/ Nurses in ANC	23(16.7)	97(70.3)	9(6.5)			
Tv / Radio	2(1.4)	1(0.7)	1(0.7)			
Social media	1(0.7)	3(2.2)	1(0.7)			

The total knowledge score = 12, 1-5 score as poor, 6-8 score as average, and 9-12 as good
ANC: Antenatal care, Tv: Television
P-value significant at <0.05

Table 4. Practices on prevention of anemia

Practices	Yes (%)	No (%)
Take routine antenatal drugs regularly	77	61
Take antimalarial drugs	3	135
Usually skip meals	39	99
Eat breakfast regularly	136	2
Have pica (such as ice, mud, charcoal)	10	128
Usually vomit or feel like vomiting	81	57
Drink tea regularly	15	123
Drink coffee regularly	4	134
Take cocoa drink regularly	8	130
Eat raw eggs	15	123
Smoke cigarette	0	138
Drinks alcohol	8	130
Take soft drinks such as Coca-Cola	42	96
Take traditional medicine or herbs	17	121
Have food taboo	2	136

Discussion

Anemia is thought to be an indicator of nutritional deficiencies, which can significantly contribute to adverse birth and maternal obstetric outcomes (13, 14). In the present study, the highest proportion (42.8%) of the respondents was in the age group of 25-34. This is similar to 30.7% of respondents in the age group of 23-27, reported by Masresha Leta Serbesa and Maleda Tefera Iffa in Ethiopia (7). In a similar study in Malaysia, the highest percentage, 38% was found in the age group of 18-24 (15). Another study in Nigeria noted that the majority (34.1%) of the respondents were in the age group of 30-34 (16). The moderate knowledge score observed in this study is similar to a report by Hasnal et al. with a moderate knowledge of 57.41 ± 4.80 (15, 17). However, Adznam et al.'s study reported that 55.7% of subjects had high knowledge on anemia during pregnancy, while 28.6% had moderate knowledge score followed by 15.7% with low knowledge score (6).

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A high percentage of respondents knew the definition of a balanced diet and the majority of them could define anemia in layman's language as 'shortage of blood'. Although many of the pregnant women were educated up to secondary school and above, their level of knowledge regarding the benefits of balanced diet and clinical features of anemia was poor. About a quarter of the respondents knew that balanced diet could influence normal and eventful delivery. Almost half of the respondents knew that balanced diet could ensure the provision of enough blood to cater for the mother during pregnancy and child birth, and less than half of the respondents knew that balanced diet could guarantee the delivery of a healthy baby.

Excellent knowledge on nutrition was, however, observed among 61.9% of women of child bearing age in Shomolu, an urban settlement in Lagos State in SW Nigeria (18). In a report by Lim et al., more than half (63.6%) of mothers who attended antenatal clinic had good nutritional knowledge (19).

It was difficult to ask questions on knowledge of prevention of iron deficiency anemia because almost all respondents had little or no knowledge of anemia and iron deficiency. This might indicate the lack of impact of health education in our secondary schools.

None of the women without formal education gave any correct answer regarding the cause of anemia. The majority of correct answers were given by women who had secondary education and above. There was also a significant association between knowledge score and educational status ($p<0.05$), as only women with secondary and post-secondary education had good knowledge. This is in agreement with a report by Ghimire and Pandey, in which there was a significant association between knowledge and educational status (20). This result is, however, at odds with a study by Zani et al, which concluded that education was not a direct factor affecting pregnant women's knowledge on health (17).

More than half of the pregnant women in the study reported that they took iron supplements regularly. This may be due to the impact of regular health talks given to pregnant women in all health facilities where this study was carried out. This percentage was higher than what had been reported by pregnant women in Nepal's Demographic Health Survey, where less than half of the respondents took a complete course of iron tablets (21). But lower than 76.1% obtained by Ghimire and Pandeyalso from Nepal (20).

Nausea and vomiting are common during pregnancy, especially during the first trimester, although some women may experience these symptoms throughout their pregnancy. In the present study, 58.7% of the respondents had nausea or vomiting or both. This is almost similar to 60.5% reported by Ahwinahwi et al. from Agbor in South Nigeria (22).

Skipping meals was not a common practice among the respondents, as only 28.3% admitted to skipping meals regularly. Reasons for the skipping of meals included loss of appetite, nausea or fear of vomiting, busy schedules, lack of what to eat, etc. Drinking tea or coffee was not a common practice in the women studied. This could not be due to the fact that the respondents had prior knowledge that drinking tea or coffee could adversely affect iron absorption, but it could be attributed to the fact that these women could not afford the cost of procuring these items, or it was not a common practice in the study area. This is inconsistent with a report by Alamneh et al. in Ethiopia, where almost all pregnant women (98.2%) in their study consumed caffeine (23).

None of the respondents in our study indulged in smoking. The prevalence of smoking among pregnant women varied across different countries. The prevalence rates ranged from 9.9% in Japan (24) to 17% in Australia (25) and Canada (26) to 30-35% in Spain (27). None of the respondents in this study drank alcohol. Globally, 9.8% of women consume alcohol while they are pregnant (28). Our finding is not in line with the finding of a study from South-South Nigeria, which found that more than half (59.28%) of the pregnant women in the study had taken alcohol during the index pregnancy and about a third (39.40%) of whom drank alcohol on a regular basis (29). Another report from Uganda showed that 23.6% admitted to current alcohol use (15). Use of herbs for different ailments is a common practice in African communities. However, only 12.3% of the women studied used herbs. This figure was lower than the findings reported by Duru et al. from South East Nigeria (30). Contrary to reports from other studies in which women would adhere to different food taboos and beliefs, which can interfere with adequate prenatal nutrition (31-33), none of our respondents had food taboos. Ekwochi et al. from South East Nigeria reported that approximately

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37% of respondents avoided some foods in pregnancy due to food taboos and that no relationship was seen between this avoidance of food and maternal educational attainment, parity, and occupation (33). In another report from South Africa, approximately 37% of respondents admitted avoiding one or more foods during pregnancy based on the local food taboos (34).

Conclusion

The majority of pregnant women in rural communities in SW Nigeria have moderate knowledge and good practices regarding the prevention of anemia. The level of education has a significant contribution to the knowledge of respondents. It is recommended that health education given to women and their close family members should be reinforced to improve the compliance with routine antenatal drugs. There should be a focused, simple, easy-to-understand and customer-friendly nutrition counseling service at antenatal care facilities. This should specifically focus on symptoms and causes of anemia and how to prevent it in pregnancy.

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Conflicts of Interest

There is no conflict of interest to be declared.

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