

**KNOWLEDGE ON FACTORS RESPONSIBLE AND PREVENTION OF ANEMIA AMONG
PREGNANT WOMEN ATTENDING ANTENATAL CARE IN BOKKOS LOCAL GOVERNMENT
AREA OF PLATEAU STATE**

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ABSTRACT

This work is on knowledge on factors responsible and prevention of anemia among pregnant women attending antenatal care in Bokkos Local Government Area of Plateau State. A survey research design was used and the population of this study comprised 327 women in 5 health centres as at the time of the collection of data for the study which lasted about six weeks. All 327 questionnaire forms were correctly filled and returned back for the study. The instrument for the study was a self-structured questionnaire designed to collect information from the respondents. This was validated by 3 experts that are not below the rank of a senior lecturer from the Department of Physical and Health Education, University of Jos. A copy of the draft was given to them for the purpose of face and content validation, appropriateness of items, clarity of statement in the instrument and whether or not the items are related to the subject under study. Necessary corrections and observations were duly made. The observation done by the experts were duly followed. The corrections gave rise to the instrument that was used for the collection of data of the study which was pre-tested using 37 women that were not part of the main study and the reliability coefficient of the instrument was established at 0.823, the Kuder Richardson Formula 20 and the Cronbach Alpha coefficient method of checking the internal consistency of an instrument were adopted for establishing the reliability index of the instrument which was considered very high and was therefore used for the main study. It was recommended among others that this result be sustained through constant counseling and health talks for the women attending antenatal care.

INTRODUCTION

The giving birth of young ones by women sometimes does not come easy. There are some of them that will have one ill-health challenge or the other. One of those challenges is anemia in women of child bearing age. Anemia, according to Lebso, Anato and Loha (2017), is the condition in which there is less than the normal hemoglobin (Hb) level in the body. In addition, Ugwu and Uneke (2020), it is the condition of low circulating hemoglobin (Hb) in which concentration has fallen below a threshold lying at two standard deviations below the median of a healthy population of the same age, sex and stage of pregnancy causing decreases oxygen carrying capacity in a pregnant woman.

As stressed by Aboud, Elsayed and Ibrahim (2019), Anemia which is associated with poor maternal and perinatal outcome, is the most common medical disorder and a risk factor in pregnancy causing 20-40% of maternal deaths directly or indirectly through cardiac failure, preeclampsia, antepartum haemorrhage, postpartum haemorrhage and puerperal sepsis. In addition, Oyerinde, Nkanga, Oyerinde, Akintoye, Olarinmoye and Alabi (2023) who pointed out that, anemic pregnant women may suffer postpartum haemorrhage, preterm delivery, seizures and severe cases of Anemia that potentially lead to cardiac failure or death. However, it is pertinent for pregnant women and health service providers to have the adequate knowledge about the factors associated with Anemia in pregnancy.

Brooking (1999) expressed that knowledge is organized information that changes something or somebody; either by being foundations for action, or by creating an individual (or an institution) capable of different successful action. In addition, Kajang and Gregory (2022), explained knowledge to mean the formation, skills and understanding that one has gained through

leaning or experience in line with the work, fact, information and skills acquired through experience or education and theoretical or practical understanding of Anemia prevention.

A study by Daka, Iyanthipogal and Demisie (2018) found out that a total of 286 pregnant women who participated on the study. Among them only 57.3% and 50% were found to have good knowledge and 42.7% have poor knowledge respectively regarding prevention as Anemia during pregnancy. Again in a study by Appiah, Nkuah and Bonchel (2020) who discovered that about 13.5% of the pregnant women had high knowledge of Anemia, while 58.4% and 28.1% of them had fair knowledge and low knowledge, respectively. In addition, Hailu, Kassa, Abera, Mulu and Genanew (2019) found out that the prevalence of Anemia among pregnant women was 79 (10.6%). The prevalence of mild, moderate and severe Anemia were 78 (99.8%), and 1 (0.1%) respectively. Pregnant women of rural dwellers (AOR = 3.72, ci = 1.51-9.18), farmer in occupation (AOR = 3.51, ci = 1.75-7.01), and not educated (AOR = 2.25, ci = 1.13-4.48) were significantly associated with increased risk of Anemia.

World Health Organization (WHO), (2001) explained Anemia in pregnancy results from a wide range of causes. Worldwide, the major cause of Anemia in pregnancy is iron deficiency. Iron deficiency is the cause of 50% of all cases of Anemia during pregnancy. Iron requirements increases significantly during pregnancy, this is because iron is required to expand plasma volume, increase red blood cell mass and for the development of the placenta and the fetus. Iron deficiency during pregnancy causes hemoglobin concentration of the maternal blood to fall to an average of approximately 11.0g/dl during the 36th week of gestation.

The leading cause of iron deficiency among pregnant women includes increasing in iron requirements due to pregnancy, poor absorption of iron from diets, and low intake of iron. Hemolysis because of malaria, congenital hereditary defects in hemoglobin synthesis and glucose-6-phosphate dehydrogenase deficiency are also causes of Anemia during pregnancy. Other causes are; blood loss associated with schistosomiasis, hookworm infestation and nutritional deficiency such as Vitamin B12 and folic acid.

Prevention as defined by the Cambridge Dictionary (2018), is the act of stopping something from happening or of stopping someone from doing something. In this case, prevention of Anemia among pregnant women, as explained by Daka, Jayanthipogal and Demisie (2018), Anemia can be prevented and controlled in pregnant women by improvement in knowledge and practice in diet and prophylactic treatment by iron folic acid, improvement of diet and treatment for worm infestation and malaria. According to EDHS (2011) report, among women with a live birth in the five years preceding the survey, only 34 percent took iron tablets during their last pregnancy. Although reports exist about what is being done and what should be done globally and locally to address maternal Anemia prevention and treatment, maternal mortality and Anemia prevalence around the world including Ethiopia continues to remain high. Therefore, it is helpful for all stakeholders that involves in this area i.e. patient care givers, health care providers, health institution and policy maker.

Ademuyiwa, Ayamolowo, Oginni and Akinbode (2020) in this case state that the findings of this study revealed that a majority of the respondents had a good overall practice of prevention of Anemia (which includes boiling drinking water, eating a balanced diet, eating a diet rich in iron, and sleeping under insecticide-treated nets). This finding is in accordance with the study conducted by Keneni et al., to assess the knowledge and practices regarding the prevention of Anemia among practices pregnant mothers attending ANC in Governmental hospitals at West Shoa Zone, in Ethiopia, where 286 pregnant women participated in the study, the authors found that 50% of the respondents had poor practice regarding prevention of Anemia during pregnancy. Similarly, the result of this study is in agreement with a descriptive study carried out to evaluate knowledge, attitude and practice regarding prevention of IDA among pregnant women attending primary health centers in Tabuk region. The study revealed that 40.0% of them had poor practice score regarding the prevention of IDA. The result of this study also differs with a cross-sectional descriptive study carried out to assess the knowledge, attitude and practice of pregnant mother

towards the prevention of IDA in Ethiopia. Total of 128 mothers were interviewed with a mean age of 26.3 years and the majority (58.6%) having poor adherence to prevention practice of IDA. Moreover, the findings from this study show that there was no significant relationship between awareness of Anemia and its prevention among pregnant women in the study setting. This finding is similar to the report of Adznam et al on knowledge, attitude, and practice levels regarding Anemia among pregnant women in Putrajaya, in which respondent's knowledge had no significant relationship with the practice of prevention of malaria during pregnancy.

Women in Bokkos generally are known to be conscious of their health and that of the children. This is well noticed that majority of them if not all attend antenatal and postnatal care in the health facilities available in the area.

It is known that Anemia can be prevented and controlled in pregnant women by improvement in knowledge and practice in diet and prophylactic treatment by using iron, folic acid, improvement of diet and treatment for worm infestation and malaria. In line with this, Al-Sattam, Hassan, Majeed, and Al-attar (2022) pointed out that pregnant women with adequate dietary knowledge have been proven to have a higher hemoglobin level. Thus nutritional counseling and education during prenatal visits may increase mother's knowledge of iron-rich meals. However, it is known that women that suffer from Anemia have shortness of breath, tiredness, weakness, dizziness, headaches, an irregular heartbeat, and drowsiness, so if this situation is allowed to continue, more women of child bearing age are likely to die. Hence the present study on knowledge on factors responsible and prevention of Anemia among pregnant women attending antenatal care in Bokkos Local Government Area of Plateau State.

To provide direction to this work, the following research questions are stated.

- (1) What is the level of knowledge of Anemia among pregnant women attending antenatal care in Bokkos Local Government Area of Plateau State?
- (2) What are the factors responsible for Anemia among pregnant women attending antenatal care in Bokkos Local Government Area of Plateau State?
- (3) What are the different ways of preventing Anemia among pregnant women attending antenatal care in Bokkos Local Government Area of Plateau State?

METHODOLOGY

This chapter presents the description of the research design, the population of the study, the sample and sampling techniques, instrument for data collection and its validation, procedures for data collection and method for data analysis.

In order to achieve the purpose of the study, the survey research design was employed. This is because in survey, data are collected from a representative sample using questionnaires, interview, observation and test. According to Trochim (2006) stated that survey research is one most important research of measurement. To him, the broad area of survey research encompasses any measurement procedures that involve asking questions of respondents. He further said a survey can be anything in form of short paper and pencil feedback form to an intensive one on one depth interview. Kwellling (1993) stated that a survey gathers data at a particular point in time with the intention of describing the nature of existing condition. It was therefore considered for population of the study.

Population refers to the whole group of things or total numbers of people or things the researcher is interested in studying and about which he/she intends to obtain certain information of this study is made up of pregnant women that attends antenatal care in Bokkos Local Government Area of Plateau State. Only those who attended antenatal care for a period of three (3) months were the population of the study and they were 327, that was the population of the study and all of them were used as the sample size.

The sample for the study was 327 women attending antenatal care facilities used for the collection of data. This is in line with what experts in research advised that if the population is small, it could be taken as the sample.

Sampling technique is defined as a systematic process employed to select a required proportion of the target population (Daramole, 2007). The whole population was used for the study in this work.

The instrument of the study is a self-structured questionnaire designed to collect information from the respondents on knowledge on factors responsible and prevention of Anemia among pregnant women attending antenatal care in Bokkos Local Government Area of Plateau State.

There are three sections of the instrument. Section A has 10 items which sought for information on the level of knowledge of Anemia among pregnant women while Section B has 10 items which elicited information on the factors responsible for Anemia among pregnant women and Section C has 11 items which sought for information on the ways of preventing Anemia by pregnant women attending antenatal care.

Validity is the extent to which an instrument measures what it is designed to measure. The questionnaire for this study was validated by 3 experts that are not below the rank of a senior lecturer from the Department of Physical and Health Education in Faculty of Education, University of Jos. A copy of the draft questionnaire was given to them for the purpose of face and content validation, appropriateness of the items, clarity of statement in the instrument and whether or not the items are related to the subject under study. Necessary corrections and observations were duly made. The observation done by the experts were duly followed. The corrections gave rise to the instrument that was used for the collection of information of the study.

The reliability coefficient of the instrument was established at 0.823. The Kuder Richardson formula 20 and the Cronbach Alpha coefficient method of checking the internal consistency of an instrument were adopted for establishing the reliability of the instrument. A pilot study was conducted in the study areas on a sample different from the sample for the study to generate data for testing the reliability of the instrument. The calculated reliability coefficient was interpreted based on the benchmark suggested by Gall, Gall and Borg (2007) who posited that in general, test that yields scores with a reliability of 0.80 or higher is sufficiently reliable for most research purposes.

The Cronbach Alpha coefficient is advantageous because it does not require that all the test items are of equal difficulty which might be difficult to achieve. Moreso, it represents the average of split halves based on all possible divisions of a test into two parts and it can be used on tests of different forms and scoring system. Cronbach Alpha coefficient is therefore a more general and flexible method of estimating internal consistency of a measuring instrument. Kuder Richardson was also adopted for its suitability for determining the reliability of a test with items of dichotomous responses such as objective test. The Cronbach Alpha was used to test the reliability of the items in the instrument, while Kuder Richardson was used for the objective items. The mean of the two coefficient was taken for the reliability coefficient of the instrument.

The researcher collected a letter of introduction from the Department of Physical and Health Education, University of Jos and presented it to the heads of all the health facilities used for the study to seek for permission.

Frequency and percentages were used in analyzing the data that was obtained which were used in answering the research questions.

RESULTS

This chapter presents and discusses the finding of the study. The purpose of the study was to provide strategies for the evaluation on the knowledge on factors responsible and prevention of Anemia among pregnant women attending antenatal care in Bokkos Local Government Area of Plateau State.

The investigator distributed 327 copies of questionnaires forms and all were correctly responded to giving rise to 100% collection. This was considered adequate for reaching valid

conclusion. The results are hereby presented in the tables below according to the research questions stated in the study using frequencies and percentages.

KEY TO KNOWLEDGE

Below 40%	Very Low Level of Knowledge (VLLK)
40-45%	Low Level of Knowledge (LLK)
46-50%	Average Knowledge (AK)
51-55%	Above Average Knowledge (AAK)
56-60%	Good Average Knowledge (GAK)
61-69%	Very Good Knowledge (VGK)
70% and above	Excellent Knowledge (EXC)

Research Question 1: What is the level of knowledge of Anemia among pregnant women attending antenatal care in Bokkos Local Government Area of Plateau State?

The data answering Research Question 1 are contained in Table 1.

Table 1: Level of Knowledge of Anemia among Pregnant Women attending Antenatal Care

N = 327

S/N	ITEMS	CORRECT ANSWERS		INCORRECT ANSWERS		DECISION ON LEVEL OF KNOWLEDGE
		f	%	f	%	
1.	Anemia is a blood related disease.	322	98.5	5	1.5	EXC
2.	Anemia doesn't affect pregnancy.	226	69.1	21	6.4	VGK
3.	Decreased iron intake in diets lead to anemia.	306	93.6	21	6.4	EXC
4.	Iron supplement be stopped without doctor's advice.	235	71.9	92	28.1	EXC
5.	Dizziness is not a sign of anemia in pregnant women.	197	60.2	130	39.8	VGK
6.	Insufficient iron contained in diet is a cause of anemia.	290	88.7	37	11.3	EXC
7.	Green leafy vegetables are sources of iron.	302	92.4	25	7.6	EXC
8.	Fish is not an iron providing source.	211	64.5	116	35.5	VGK
9.	Worm infestation is one of the leading factors of anemia.	280	85.6	47	14.4	EXC
10.	Gastrointestinal disease is a source of iron deficiency.	267	81.7	60	18.3	EXC

Average Total = 80.6

The result in Table 1 shows that the respondents have very high knowledge on anemia among pregnant women as indicated by a highest score of 98.5% and lowest score of 60.2%.

Research Question 2: What are the factors responsible for anemia among pregnant women attending antenatal care?

The data answering Research Question 2 are contained in Table 2.

Table 2: Factors responsible for Anemia among Pregnant Women attending Antenatal Care

N = 327

S/N	ITEMS	Yes		No	
		f	%	f	%
1.	Increase iron requirement pregnancy.	260	79.5	67	20.0
2.	Poor absorption of iron from diets.	303	92.7	24	7.3
3.	Low intake of iron.	296	90.5	31	9.5
4.	Dietary factors contribute to the prevalence of anemia in pregnancy.	272	83.2	55	16.8
5.	Socio-economic factors play in the occurrence of anemia in pregnancy.	260	79.5	67	20.5
6.	Lack of access to health care service.	289	87.8	40	12.2
7.	Hypertension affects the likelihood of anemia in pregnancy.	240	73.4	87	28.6
8.	Anemic pregnant women may suffer preterm delivery.	290	88.7	37	11.3
9.	Antepartum hemorrhage leads to anemia in pregnancy.	288	88.1	39	11.9
10.	Education and awareness on nutrition affects the prevalence of anemia in pregnancy.	271	82.9	56	17.1

The result in Table 2 shows that poor absorption of iron from diets 303 (92.7%), low intake of iron 296 (90.5%), anemic pregnant women may suffer preterm delivery 290 (88.7%), antepartum hemorrhage leads to anemia in pregnancy 288 (88.1%) and lack of access to health care services 289 (87.8%) were the factors responsible for anemia in pregnant women attending antenatal care.

Research Question 3: What are the different ways of preventing anemia among pregnant women attending antenatal care?

The data answering Research Question 3 are contained in Table 3.

Table 3: Ways of preventing Anemia among Pregnant Women attending Antenatal Care

N = 327

S/N	ITEMS	Yes		No	
		f	%	f	%
1.	Eating balanced diet.	314	96.0	13	4.0
2.	Education and awareness creation regarding anemia.	291	89.0	36	11.0
3.	Control and prevention of parasitic infections in pregnancy.	300	91.7	27	8.3
4.	The use of insecticide treated nets against malaria.	271	82.9	56	17.1
5.	Effective deworming.	268	82.0	59	18.0
6.	Improved water sanitation and hygiene services.	282	86.2	45	13.8
7.	Provide antenatal care to pregnant women.	289	88.4	38	11.6
8.	Giving iron supplementation and food fortification.	301	92.0	26	8.0
9.	Adequate iron medication.	289	88.4	38	11.6
10.	Teaching of good dietary habits.	305	93.3	22	6.7

11.	Iron and folic acid supplementation.	282	86.2	45	13.8
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The result in Table 3 shows that eating balanced diet 314 (96.0%), teaching of good dietary habits 305 (93.3%), giving iron supplementation and food fortification 301 (92.0%), control and prevention of parasitic infections in pregnancy 300 (91.7%) and education and awareness creation regarding anemia 291 (89.0%) were the ways of preventing anemia among pregnant women attending antenatal care.

DISCUSSION

The findings of the study are being discussed under the following:

- (1) Level of knowledge of anemia among pregnant women.
- (2) Factors responsible for anemia among pregnant women.
- (3) Ways of preventing anemia among pregnant women.

The result in Table 1 showed that the respondents have very high knowledge of anemia among pregnant women as indicated by a highest score of 98.5% and lowest score of 60.2%. This result is not surprising because majority of the women are educated and health education is usually given to them to reduce the prevalence of anemia. In line with this, Al-Sattam et al (2022), in regard to the participant' response about knowledge questions in their study, most of the participants believe that anemia does affect pregnancy outcome, also most of them believe that decreased iron intake in diet causes anemia. The highest percentage of participants believe that iron supplementation should be stopped without doctors, consultation if you experienced side effects such as nausea, while more than half of them believe that pregnant women should not take iron supplement if she is on health diet. However, Senior and Najeeb (2019), in a study conducted on 100 Iraqi women, reported that the level of knowledge of pregnant women about anemia was poor about signs and symptoms of anemia, reasons for taking supplements, food that prevents from anemia, and cause and consequence of anemia during pregnancy that represented 98%, 87%, 90% and 100% respectively, and overall awareness among study sample about anemia during pregnancy was poor.

The results in Table 2 shows that poor absorption of iron from diets 303 (92.7%), low intake of iron 296 (90.5%), anemic pregnant women may suffer preterm delivery 290 (88.7%), antepartum hemorrhage leads to anemia in pregnancy 288 (88.1%) and lack of access to health care services 289 (87.8%) were the factors responsible for anemia among pregnant women attending antenatal care. This result is expected because the women have knowledge on anemia and are aware of the factors that causes anemia. In with this, Lumor et al (2019) the factors of anemia in pregnancy which results from a wide range of causes. Worldwide the major case of anemia in pregnancy is iron deficiency. Iron deficiency is the cause of 50% of all cases of anemia during pregnancy. Iron requirements increases significantly during pregnancy, this is because iron is required to expand plasma volume, increase red blood cell mass and for the development of the placenta and the fetus. Also, Idoko et al (2022), pointed out the various risk factors associated with pregnant women having anemia to include distance to health facility (65.7%), nutritional deficiency (47.3%), non-utilization of antenatal care services (28.7%) and ingesting of alcohol (3.7%). These results were expected as the prevalence of anemia in pregnancy varies considerably because of the difference in socio-economic conditions, lifestyle and health seeking behaviours across different cultures.

The result in Table 3 showed that, eating balanced diet 314 (96.0%), teaching of good dietary habits 305 (93.3%), giving iron supplementation and food fortification 301 (92.0%), control and prevention of parasitic infections in pregnancy 300 (91.7%) and education and awareness creation regarding anemia 291 (89.0%) were the ways of preventing anemia among pregnant women attending antenatal care. This result is expected because the women have knowledge on anemia and are aware of how to prevent it. In with this, Baskar (2020), stated that

anemia can be prevented by eating a balanced diet containing proteins, iron vitamins from the egg, meat and whole wheat. Also, Appiah et al (2020), added that Ghana through the Ministry of Health has been at the forefront with the interventions and strategies to control anemia in pregnancy. These strategies include education and awareness creation, nutrient (iron) supplementation, and control prevention of insecticide treated nets (ITNs) and intermittent preventive treatment (IPT) against malaria, effective deworming, and provision of improved water sanitation and hygiene services are also being implemented to prevent anemia among pregnant women.

CONCLUSION

Based on the findings of the study, the following conclusions were drawn:

1. Majority of the women attending antenatal care in Bokkos Local Government Area of Plateau State had excellent knowledge on anemia. They knew that anemic is a blood related disease. They knew that decreased iron intake in diet lead to anemia, green leafy vegetables are sources of iron and they knew that insufficient iron contained in a diet is a cause of anemia.
2. The major factors responsible for anemia among pregnant women are: poor absorption of iron from diet, low intake of iron, anemic women may suffer preterm delivery, antepartum hemorrhage leads to anemia in pregnancy and lack of access to health care services.
3. The major way of preventing anemia among pregnant women are: eating balanced diet, teaching of good dietary habits, giving iron supplementation and food fortification, control and prevention of parasitic infections in pregnancy and education and awareness creation regarding anemia.

RECOMMENDATIONS

- (1) The result that the respondents have high knowledge in all the items has indicated by highest score of 98.5% and lowest score of 60.2% be noted by health personnel and be sustained through one counseling, health talks and seminars during antenatal care.
- (2) The result of the factors responsible for anemia among pregnant women be noted by antenatal health care service providers and public health officers for public enlightenment and campaigns to reduce the menace.
- (3) The result of the different ways to prevent anemia among pregnant women be noted by management of health care services in the study area so that they can enlighten antenatal mothers with counseling, health talks and seminars.

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