

Research Article

A Cross-Sectional Study of the Knowledge Prevalence and Risk Factors of Anaemia in Pregnancy among Pregnant Women Attending Antenatal Clinic in the Bongo District Hospital

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Abstract

This study investigated the knowledge, prevalence, risk factors, and consequences of anemia among pregnant women attending Antenatal Clinics (ANC) at the Bongo District Hospital. A clear problem statement and definition driving the researches focused issue. Four (4) research questions and four (4) related specific objectives were carved out to achieve this. This study's primary data sampled 164 consenting participants with questionnaires. Antenatal record books have been the primary secondary data source; others were from the District Directorate and Municipal Assembly. SPSS be included in the data analysis.

The sociodemographic profile of the respondents was a modal age range of 19 to 35 years (81.1%). Most participants were Frafra (98.8%), and 76.8% were Christian religion. Regarding the knowledge of Anaemia, 12.2% did not know whatsoever about Anaemia. 37.8% of participants had no understanding of the causes of Anaemia, 32.3% did not know about the prevention of Anaemia, and 43.9% did not know the symptoms of Anaemia. Also, of the 164 participants, 36% and 45.1% had HB >11 g/dl at booking and current visit, respectively.

The study concluded that a considerable percentage of pregnant women had little knowledge about Anaemia despite its effects. The findings also seem to confirm the endemic status of Anaemia during pregnancy in the population, against which preventive measures are minimally adopted.

Keywords: Knowledge; Anaemia; Pregnancy; Antenatal; Clinic

Introduction

World Health Organization (WHO) defines Anaemia in pregnancy as a concentration of hemoglobin below 11.0g/dl in pregnant women. In terms of severity, Anaemia in pregnancy is severe when the Hb concentration level is less than 7.0 g/dL; moderate when the Hemoglobin level falls between 7.0 g/dL to 9.9 g/dL; and mild from 10.0 g/dL to 10.9 g/dL [1-4]. Anemia in pregnancy is the most typical hematological complication [5]. It has a global prevalence of 41.8% [5]. Hence, it is a severe public health concern. Anemia in pregnancy is a significant cause of high maternal mortality and morbidity, increased rates of premature birth, low birth weight, and perinatal mortality.

Pregnant women are at an increased risk of anemia due to the

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increase in the blood level (hemodilution) to cater to the nutritional needs of the developing fetus. Anemia in pregnancy, if diagnosed early, can easily be treated with diet modification. However, it can become hazardous to the mother and the fetus if left untreated. Iron deficiency anemia is the most frequent micronutrient deficiency in the world (WHO, 2019). Anemia is used to describe both inadequate nutrition and bad health. The causes of Anaemia in pregnancy are multifaceted but common all over Ghana. These include nutritional insufficiency of iron, folate, and vitamin B12, inadequate spacing of births, multiparity, teenage pregnancies, religious and cultural taboos and feeding habits, helminthic infection, malaria infection, HIV infection, and hemoglobinopathies such as sickle cell anemia and β -thalassemia's, amongst others [6].

In Ghana, 42% of women aged 15-49 in Ghana are anaemic, 32% are mildly anaemic, 10% are moderately anaemic, and less than 1% are severely anaemic [7]. Furthermore, Anaemia is ranked second in the causes of all admissions and the fifth cause of death among all admitted patients in Ghana [8-11]. Health facility level data suggest that the prevalence of Anaemia among pregnant women in Ghana is increasing, from 34% in 2014 to 37% in 2016 [12].

There has been no research on this topic in the Bongo District, and the apparent lack of knowledge on the risks it poses to hopeful mothers is alarming. Anemia in pregnancy is a worldwide dilemma but most common in developing countries, especially in areas considered to be endemic malaria zones. Twenty percent of maternal deaths in Africa have been attributed to Anaemia. According to WHO, Anaemia in

pregnancy is hemoglobin levels <11.0 g/dL, and according to this definition, more than half of pregnant women in the world have a hemoglobin level indicative of Anaemia (<11.0 g/dL); the prevalence may, however, be as high as 56% to 61% in developing countries [13]. Globally, Anaemia affects half a billion women of reproductive age. In the Bongo District, for the year 2021, the total number of women that visited the various health facilities in the district was 3,945, and all these women had their HB checked at registration, and 1,442 had their HB below 11g/dl while 29 had their HB below 7 g/dl. The total ANC attendance for 2021 totaled 26,191(DHD Bongo).

Although the etiological factors are multifactorial, it has been well established that significant contributing factors include iron and folate deficiencies, malaria, hemoglobinopathies such as sickle cell disease and beta-thalassemia, and hookworm infestations and chronic inflammatory diseases. Anemia in pregnancy has been associated with increased risk of maternal mortality and morbidity, increased rates of premature birth, low birth weight, and perinatal mortality. In the Bongo District Hospital, no work has been done to determine the prevalence and risk factors of Anaemia in pregnancy. Anaemia in pregnancy, even though it is a matter of grave concern (Figure 1).

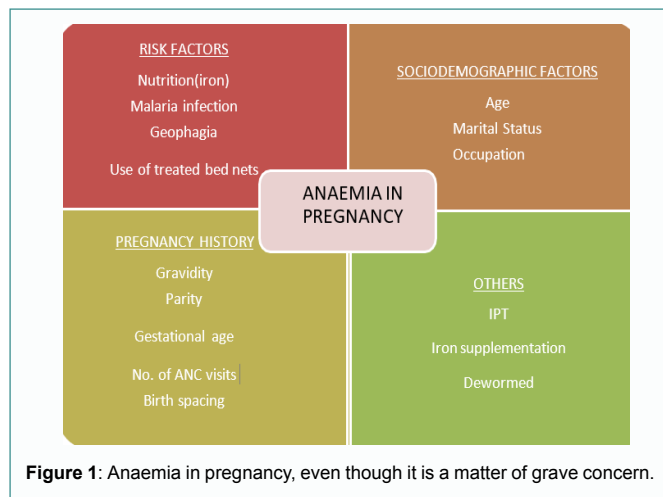


Figure 1: Anaemia in pregnancy, even though it is a matter of grave concern.

Materials and Methods

The study employed a descriptive cross-sectional study design to examine Anaemia and dietary intake of foods rich in iron among pregnant women attending ANC at the Bongo District Hospital. The study population was made up of Population of all pregnant women who attended the Antenatal Clinic at Bongo district Hospital between 31st January to 31st September 2022.

Sample size determination

The minimum sample size required for this study was calculated using the Taro Yamane formula.

$$n = \frac{N}{1 + Ne^2}$$

Where n= Sample size, N= Population size and e = Allowable error. A 95% confidence level was used. The study population size was deduced from the total number of ANC registrants in Bongo central for 2021, which was 3945. Substituting these values into the formula above yields a minimum sample size of 362.

$$\text{Sample size}[n] = \frac{3945}{1 + 3945(0.005)^2} = 362$$

Convenience sampling was used to select the participants. Thus, pregnant women who attended antenatal clinics within the period the study was being carried out were included. The ANC unit of Bongo District Hospital was purposively selected as the most organized and largest Health facility in the district, serving the health needs of the larger population cohort, including pregnant women and those needing post-natal care support. A well-structured questionnaire was designed for data collection. The questionnaire was made of four main sections with open and close-ended questions under each section. The sections assessed the sociodemographic characteristics of the respondents, obstetric characteristics, their knowledge regarding Anaemia in pregnancy, and the consumption of iron-rich foods. The maternal and child records book was the source of data on the HB status of the participants. The HB status at booking and 36 weeks was recorded within the book. It also served as the source of data on the number of ANC visits, antimalarial prophylaxis, and gestational age of the current pregnancy. Secondary data relating to trends in the prevalence of Anaemia among pregnant women was also sourced from the District Health Directorate. Information from the survey was entered into the Statistical Package for Social Sciences (SPSS) programming version 23 to be analyzed.

Results

Socio-cultural characteristics of study participants

In total, 164 pregnant women attended their antenatal at the Bongo District Hospital and willingly participated in this research study. The women involved in this study could be found in the age range of 16-40 years, with the mean age being 25 years. With regards to occupation, the majority of the women were self-employed, 54.3% with most of them being smock weavers, dressmakers, and farmers, 17.7% were under government employment, 14.6% were unemployed with the smaller percentage of 13.4 being recorded as others which included students and other forms of employment. Regarding marital status, 83.5% are married, with most being monogamous, 14.6% are single, and a few of the women, 1.8%, were widowed. Concerning religious dispensation, 76.8% are Christians, 20.1% are Muslims, and 3% practice the African Traditional Religion; the married women share the same religion with their spouses. The majority of the women, 98.8% were Frafra and hailed from the various communities within the Bongo District, with a few from other communities outside the district; other ethnicities contributed minimal (1.2%) to this Frafra dominated District.

The obstetric characteristics of the participants

The recommended minimum ANC visits for a pregnant woman is four with the introduction of the focused ANC system. Table 2 shows the obstetric characteristics of the participants, where out of 164 women, 75% met the requirement, and 25% did not. The mean parity was 2.12, with a standard deviation of 3.681. Of the participants, 21.9% were on their fourth child or higher. The mean gravidity was 2.46, with a standard deviation of 1.471. Out of the 164 women, 59.7% of the women made their booking visit in the first trimester, 39.4% in the second trimester, and 0.6% in the third trimester, with a mean gestational age at booking of 12.82 weeks and a standard deviation of 5.620. Currently, 72.4% were in their third trimester of pregnancy, 26% were in the second trimester, and 1.6% were in their first trimester, with a mean gestational age at the current visit of 31.1 weeks and a standard deviation of 7.264 (Table 1).

Prevalence of Anaemia among the participants

Tables 2 and 3 shows the levels of Anaemia among the participants

Table 1: Obstetric characteristics of the participants.

Variables	Frequency	Percentage
Parity		
0	39	23.8
0+1	1	1.6
1	51	31.1
1+1	2	1.2
1	52	31.7
2	47	28.7
3	29	17.7
Four or more	36	21.9
Gestational age at booking		
First trimester	98	59.7
Second trimester	65	39.4
Third trimester	1	0.9
Gestational age at the current visit		
First trimester	1	0.6
Second trimester	43	26
Third trimester	119	72.4
Birth Spacing (Years)		
0	28	17.1
1	4	2.4
2	32	19.5
Three or more	73	44.5

at booking and at current visits, respectively. Of the participants at booking, 3% had severe Anaemia (i.e., HB<7). 35.4% had moderate Anaemia (i.e., HB of 7 - 9.9), 25.6% had mild Anaemia, and 36% had normal Hb. For the data obtained on the current visits, out of the 164 participants, only about 25% did not have their HB recorded at the current visit because for different reasons they escape the review. Of the 75%, only 1.8% had severe Anaemia, 20.7% had moderate Anaemia, 30.5% had mild Anaemia, and 45.1% had normal Hb.

Medical intervention and malaria infections during pregnancy

Out of the total 164 valid participants, 115 received at least one dose of intermittent preventive therapy in their index pregnancy, accounting for 70.1% of the participants. This percentage could have been higher as some participants were below 16weeks of gestation. Also, 84.8% of the 164 participants have a long-lasting insecticide net. Of the remaining 15.2% who did not have a long-lasting insecticide-treated net, only 28% used other vector control methods, including mosquito spray and coils. Only 34.1% of respondents had malaria in the current pregnancy. The majority of the women, 84.8%, which is very alarming, had no anthelmintic prophylaxis.

Of the 164 valid responses, 87.8% of the participants had taken iron supplements in the current pregnancy, from which the majority took it daily. 16.5% of the participants took pica by taking in clay. From

Table 2: Anaemia at booking.

	Frequency	Percent
severe	5	3
moderate	58	35.4
mild	42	25.6
normal	59	36
Total	164	100

Table 3: Anaemia at the current visit.

	Frequency	Percent
severe	3	1.8
moderate	34	20.7
mild	50	30.5
normal	74	45.1
Total	161	98.2

the assessment of the consumption of iron-rich foods, 64% consumed some organ meat, fish, vegetables, legumes, and other fortified foods. 19.5% consumed fish, vegetables, legumes, and other fortified foods, but they did not take in any meat. 15.9% did not consume any meat or fish but took in other foods (Table 4).

Knowledge on anaemia

Of the 164 participants, 144 participants, making 87.8%, had heard of Anaemia, and 12.2% had not. Of those that had heard, 81.1% heard about Anaemia from a health worker. Approximately 37.8% did not know the causes of Anaemia. 38.8% know of only one cause of Anaemia: a lack of iron in the diet. 32.3% don't know how Anaemia can be prevented, and 43.9% do not know the symptoms of Anaemia (Table 5).

Trends on the prevalence of Anaemia among the participants

Table 6 shows the pattern in the percentage of women with Anaemia at registration and 36 weeks from 2019 to 2021. Anemic women with Hb<7 g/dl at registration reduce from 18% in 2019 to 10% in 2020 and then increased to 29% in 2021. With the percentage of anemic women at 36 weeks with Hb<7 g/dl, there was a significant rise from 5% in 2019 to 13% in 2020 and then to 17% in 2021.

Table 4: Frequency of consumption of the ff foods.

	Frequency	Percent
Other Iron-fortified foods	1	0.6
All types of food	105	64
fish, veggies, legumes	32	19.5
fish, veggies, legumes & others	26	15.9
Total	164	100

Table 5: Where did you hear about Anaemia?

	Frequency	Percent
Health worker	133	81.1
TV	1	0.6
Friend	7	4.3
Other	14	8.5

Table 6: Trends of the prevalence of Anaemia.

Year	Percentage anaemic at booking	Percentage anaemic at 36 weeks
2019	18%	5%
2020	20%	13%
2021	29%	17%

Prevalence of Anaemia among pregnant women attending ANC at the Bongo district hospital

This research sought to assess the prevalence of Anaemia among pregnant women in the Bongo District. Of the 164 participants, 36% and 45.1% had HB > 11 g/dl at booking and current visit, respectively. The remaining 64% and 54.9% had varying degrees of Anaemia at the booking and current visits, respectively, with most having moderate rate anemia at booking (35.4%) and mild Anaemia at current visit (30.5%). Compared with the data on the trends of Anaemia from preceding years, a pattern can be established. From 2019 to 2021, the percentage of Anaemic at booking increased at 36 weeks of gestation, and this is attributable to variable factors, as the research will depict. Ideally, the maximum percentage of ANC attendants who can be anaemic for any giving set should be 21% as per the WHO standards. However, as evidenced by the results, there is a grave and appalling gap between the ideal percentage and that of the Bongo District.

Several efforts have been put in place by the District Health Directorate and the hospital to curb the prevalence of Anaemia in the

District. Among these are:

- Education at ANC visits to pregnant women on the dangers of Anaemia in pregnancy.
- The regular prescription and refill of iron, folate, and vitamin supplements.
- The provision of the LLINs (Long lasting Insecticide Mosquito Nets) and education on their use to pregnant women.

Encouraging the use and taking of IPTp (Intermittent Preventive Treatment in Pregnancy), Sulphadoxine (500mg)-Pyrimethamine (25mg) oral doses.

From the data obtained, the use of iron and folate supplements was at 87.8% and a good percentage on daily intake, which is good patronage. However, what stood out was the majority of the women that had not taken any hematinic drugs in the pregnancy (84.8%). Furthermore, 70.1% of the women had taken at least one dose of IPT. This could have been higher as a number of the participants were below 16 weeks of gestation in age. Obstetric characteristics could significantly affect the prevalence of Anaemia as well. From the data obtained, 36% of women had 2 or more children, and a more significant percentage gravidity of 68.3% for more than two children. Furthermore, most of the participants, 38.2%, had their booking visits in the late second trimester. Only 19.5% had a birth spacing less than a year.

Assessment of dietary intake of iron-rich foods

Diet is considered the primary determinant of hemoglobin levels amongst populations [14]. Worldwide, iron-deficiency Anaemia is the commonest cause of Anaemia followed by folate deficiency and megaloblastic Anaemia [15-18]. Anaemia is more common in women who have inadequate diets containing iron and those who are not receiving prenatal iron and folate supplements. In addition, Anaemia, such as thalassemia and sickle cell disease, can impact the health of the mother and fetus [19]. Other genetic disorders like G6PD deficiency also impact significantly on mother and fetus. In our study, 2.4% had sickle cell while 9.1% had G6PD deficiency, either partial or complete defect. The need for iron increases up to three folds during pregnancy. This makes pregnant women more susceptible to anemias, especially iron deficiency anemia. The increase in red cell mass, as well as the growth of the fetal placenta, is a major factor within pregnancy that lead to an increased demand for more iron to sustain the normal growth of the fetus.

Pregnant women with multiple risk factors for iron deficiency anemia are strongly encouraged to use iron supplements throughout their pregnancy as their babies have an even greater risk for complications associated with iron deficiency anemia [20]. This is because during pregnancy the total iron requirement during the entire course is about 1000mg. This cannot be met by diet alone, and so iron supplements are highly recommended. The most frequent causes of true or absolute Anaemia are nutritional deficiencies. Frequently, these deficiencies are multiple, and the clinical presentation may be complicated by attendant infections such as malaria, generally poor nutrition, or hereditary disorders such as haemoglobinopathies. However, the fundamental sources of nutritional Anaemia embody insufficient intake, inadequate absorption, increased losses, expanded requirements, and insufficient utilization of hemopoietic nutrients [13].

To assess the dietary intake of iron, some questions were asked about the dietary patterns, which included certain iron-rich foods in the Bongo District. Before that, however, we had to ascertain the dietary habit in terms of Frequency. Approximately 18% of the respondents ate less than the traditional 3 square meals daily. These foods ranged from cheaper plant-based to more expensive animal-based sources and iron-fortified meals. From the data obtained as seen in chapter 4.5, Table 3, 36% did not consume any meat, 64% consumed some flesh meat, 36% consumed various types of fish, green leafy vegetables, some legumes, and other iron-fortified foods. This data was based on foods taken throughout the whole pregnancy, that is, from finding out she was pregnant to her current gestation. With these high percentages of dietary consumption of iron-containing foods, one would be tempted to believe that no woman with any underlying health problems would be anemic, but unfortunately, that is not the case. With a significant percentage of the participants being anemic at term, there is more to it than the consumption of iron-containing foods. Other factors such as gravidity and parity- obstetric factors play a significant role. Also, with such a high prevalence of Anaemia in pregnancy, it points to a lapse in either the quantity or the Frequency of intake of iron-containing foods and iron supplements. Only about 2% to 20% of ingested iron is absorbed in pregnancy; the amount of iron needed to make up for the deficit is substantial. Bridging the iron deficit is not just dependent on the regular ingestion of iron-containing foods but understanding the need for that particular diet and increasing the Frequency and quantity of consumption. Most women do not know that proper and excellent sources of rich iron foods are meats and eggs. When these women were given this information, however, they complained of financial constraints. The efforts of the Health Directorate and the staff of the hospital at ANC try and bridge this gap by mostly the supply of iron and folate supplements as well as having regular talks on Anaemia in pregnancy. These talks are usually done one-on-one with patients who attend ANC or during community gatherings like durbars or festivals. There has also been education by the District Health Directorate in schools from as low as junior high to senior high. Iron and folate supplementation has also been started very early through the GIFTS program. This program is a government policy to begin iron and folate supplementation in adolescents to have enough iron stored for when the demand increases, such as during pregnancy.

Knowledge of pregnant women attending ANC at the Bongo District Hospital on Anaemia in pregnancy

This study found that 88% of participants had heard of Anaemia; however, an in-depth questioning brought out the deficits in knowledge in relating to the factors that cause Anaemia, its presentation, that is the clinical signs and symptoms, and how it can be prevented. Specifically, 81% had heard about Anaemia from a health care professional, most likely during ANC in 4.6, Table 5.

Indeed, the paucity of knowledge was made evident when 37.8% of participants had no knowledge of the causes of Anaemia, 32.3% had no knowledge of how Anaemia can be prevented, and 43.9% had no knowledge of the symptoms of Anaemia. This level of ignorance about Anaemia implies pregnancy outcomes, because knowledge drives skills in practice. Invariably, the lagging educational, wealth quintile, development gap, religious misinterpretation, and cultural misapplication complicate the knowledge deficit. The fact that rural women, illiterate women, and women in the lowest wealth quintile suffer most from Anaemia in pregnancy are impacted by the paucity of knowledge on these salient variables [21]. This could significantly

account for the persistent fall in HB from booking to delivery. Anemia in pregnancy may cause low birth weight, preterm delivery, and perinatal and maternal mortality [22]. Thus, not understanding how to identify the causes of Anaemia, its clinical signs and symptoms, prevention, and likely complications is worse than just taking iron supplements as required since other practices could hamper the attempts to keep iron and folate concentrations up. Interventions to improve knowledge on Anaemia in pregnancy have been re-echoed in the GDHS 2014 and 2011 MICS reports by agencies that matter in Ghana [23].

Trends and effects of Anaemia in pregnancy from 2019 to 2021

In Tropical Africa, nutrition is a major problem, and with the increased nutritional demand during pregnancy, iron deficiency anaemia is the most common micronutrient deficiency. Anaemia in pregnancy is associated with adverse reproductive outcomes and is an indicator of poor nutrition and poor health. Therefore, the trends of Anaemia over the years 2019 to 2020 must be looked at. During our discussions with the District Health Director and the DHMT of the Bongo District, we were given some factors contributing to the trend of Anaemia in pregnancy in the Bongo District [24-26].

To begin with, the incidence of Anaemia in pregnancy from 2019 to 2021 at booking decreased from 18% in 2019 to 10% in 2020 but increased sharply to 29% in 2021, which is a sign that more women are being subjected to the deleterious effect of Anaemia in pregnancy [26-28]. There may be more women experiencing impaired health due to Anaemia in pregnancy, considering the fact that there are still many more women who do not come for ANC and also practice at home. As such, this is worrying and puts them at risk of maternal mortality.

The main issues the District Director of health attributed to this rise in the number of anemic pregnant women were poor nutrition both in the quality and Frequency of the food, reduced hematinic drug intake during pregnancy, malaria before the intake of the malaria prophylaxis, as well as the lack of understanding of the causes of Anaemia; it is dangerous effects and how it can be curbed [29].

Also, some locals in the district were realized to practice still early marriage, which could account for some of the numbers Anaemia in pregnancy as most of them do not have enough iron stores before getting pregnant and which is worsened during pregnancy. The survey also highlighted that about 13.4% of the ANC attendants were teenagers.

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