KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

COLLEGE OF HEALTH SCIENCES

FACULTY OF ALLIED HEALTH SCIENCE

DEPARTMENT OF NURSING

DIPLOMA PROGRAMMES

TOPIC: PREVALENCE AND MANAGEMENT OF ANAEMIA AMONG PREGNANT WOMEN ATTENDING ANTENATAL CARE AT NSOATRE HEALTH CENTRE, NSOATRE

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2023

DECLARATION

We hereby declare that this submission is our own work towards the Diploma in General Midwifery and that, to the best of our knowledge, it contains no material previously published by another person nor material which has been accepted for the award of diploma of the University, except where due acknowledgement has been made in the text.

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ABBREVIATIONS

ANC - Antenatal Care

PNC - Post Natal Care

Hb - Haemoglobin

G6PD - Glucose Six (6) Phosphate Dehydrogenase

ABSTRACT

Background: Anaemia during pregnancy has serious complications on pregnant women antepartum and post-partum. It has a global prevalence of about 36.5% and has many effects such maternal death, perinatal death, preterm birth, preeclampsia, low birth weight, small-for-gestational-age (SGA) live birth, cesarean **delivery**, post-partum morbidity, and mortality (Smith et al., 2019). Anaemia in antepartum and postpartum is preventable, therefore the reason for this study at Nsoatre Health Centre.

Aim of the study: the main aim of the of the study is to assess the prevalence and management of anaemia in among pregnant women visiting the ANC.

Research Methodology: Descriptive Cross-sectional design was adopted for this study.

Findings: Our studies showed an overall prevalence of 55.5% among women receiving ANC. Daily folic acid and folate intake prevalence of 83.33%, sleeping in mosquito net and dietary diversification was some of the anemia preventive measures.

Conclusion: The prevalence of anaemia among women receiving ANC at NHC is high. The respondents had positive reaction regarding the prevention of anaemia, through the use of folate and folic acid, use of mosquito net, and the intake of vegetables, fruits and other iron-based diets.

Recommendations: Individually tailored nutritional consultation to address the nutritional needs of the response

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ACKNOWLEDGEMENT

The researchers are very much thankful to **Miss Osei Dorcas**, the research supervisor for his envious guidance, direction, patience and decorum. Special thanks also extended to pregnant women who participated in this study. The researchers also extend their gratitude to the Holy Family Nursing and Midwifery Training College, Berekum for granting the us the clearance to conduct the study.

ABBREVIATIONS

ANC - Antenatal Care

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

According to WHO (2021), anemia is defined as a hemoglobin concentration below 11g/dl in pregnancy. This is mainly due to the combined higher physiological demand by the fetus and the mother and also plasma volume increment than red blood cells (Yadav et al., 2021). A low Hb is an indication of low tissue perfusion, therefore, putting the mother and the fetus at risk. Evidence shows maternal anemia is associated with higher rates of maternal death, perinatal death, preterm birth, preeclampsia, low birth weight, small-for-gestational-age (SGA) live birth, and cesarean delivery (Smith et al., 2019).

This is a huge global public health problem affecting pregnant women living in all countries across the globe (Nuru Yesuf & Agegniche, 2021). According to WHO (2021), the prevalence of anaemia among pregnant women globally was 36.5%. According to Hu et al. (2020), the prevalence of anaemia in China on average was 36.7%. Another study in Ethiopia and Tanzania had a maternal anemia prevalence of 20.9% and 85.5% respectively (Ngimbudzi et al., 2021; Nuru Yesuf & Agegniche, 2021).

Global anaemia prevalence in 2019 was 29.9% (95% uncertainty interval) in women of reproductive age (WHO, 2022). This is equivalent to over half a billion women aged 15 to 49 years (Wemakor, 2019). Consequently, the prevalence among non-pregnant women of reproductive age was 26.6% (95% UI 26.6%, 32.5%) and 36.5% (95% UI 34.0%, 39.1%) in pregnant women (Appiah et al, 2020). This implies that anaemia is high among pregnant women than in non-pregnant women. According to a report by the World Bank, as of 2019, Ghana had a prevalence of

anaemia among pregnant women at 47% (World Bank, 2022). Even though the prevalence of anaemia is below 50%, it is still regarded as a major health problem that needs to be addressed. According to Appiah et al. (2020), anaemia is associated with increased health problems in maternal and newborns and can also result in death. It is also associated with an increased risk of miscarriage, prematurity, stillbirth, low birth weight and consequently perinatal mortality. This makes anaemia a major public health issue in Ghana and the world as a whole.

Due to the impact of anaemia on the health of pregnant women, the government of Ghana as well as renowned health organisations around the world have put up interventions and strategic measures to control anaemia in pregnancy. Some of the interventions include health and nutrition education, improvements in sanitation, iron supplementation, control of parasite infections and fortification of staple foods with iron (Wemakor, 2019). Through these interventions, the general public, most importantly pregnant women, are being educated and informed about anaemia, its impact and preventive measures.

However, with strategic interventions put in place to inform the public about anaemia, awareness is still low among most women of reproductive age (Ademuyiwa et al., 2020; Viljakainen, 2016; Appiah et al., 2020). Viljakainen (2019) examined the knowledge of pregnant women and breastfeeding mothers on anaemia in the Kyrgyz Republic of Central Asia. The study found that awareness of anaemia was low especially in rural areas of the area. In Nigeria, Ademuyiwa et al. (2020) assessed the awareness of pregnant women on anaemia prevention. Findings of the study indicated that most of the women were aware of anaemia as a health problem in pregnancy but there was low awareness of the preventive measure for anaemia. Moreover, Appiah et al. (2020) conducted a study in Ghana to assess the knowledge of pregnant women on strategies for anaemia

prevention. Results from the study indicated that knowledge and awareness of pregnant women on anaemia was low in terms of preventive strategies. Different studies (Ademuyiwa et al., 2020; Viljakainen, 2019; Appiah et al., 2020) have shown similar findings in terms of awareness of pregnant women on anaemia. Unfortunately, the prevalence of anaemia in Ghana nationally has been worse, 47.2%, as of 2019 according to WHO (2021). Studies done in Ghana showed ranges of 57.1% (Kumasi), 34.5% (Kintampo), and 50.8% (Tamale Teaching Hospital) respectively (Annan et al., 2021; Sumaila et al., 2022; Wemakor, 2019). It is therefore important that the prevalence, associated factors, and management practices of anaemia among pregnant women are studied in every region in Ghana and well-tailored interventions implemented to help solve the problem of anemia and improve the morbidity and mortality outcomes of the pregnancy for both mother and fetus hence the reason for this study among pregnant women visiting the ANC at the Nsoatre Health Centre, Nsoatre.

1.2 Problem Statement

Anaemia is a major public health issue in Ghana and the world as a whole. It is associated with an increased risk of stillbirth, miscarriage, low birth weight, prematurity and perinatal mortality. Due to the health consequences posed by anaemia during pregnancy, pregnant women have been a major target for interventions that create awareness of anaemia. This has called for several studies (Ademuyiwa et al., 2020; Wemakor, 2019; Appiah et al., 2020) to be conducted on the awareness of pregnant women on anaemia. However, studies (Ademuyiwa et al., 2020; Wemakor, 2019; Appiah et al., 2020) have shown various gaps that must be bridged in the area of awareness on prevention.

Anemia among pregnant women is a significant global public health concern, associated with adverse outcomes for both mothers and infants (Nuru Yesuf & Agegniche, 2021). The prevalence of anemia varies across different countries and regions, with Ghana experiencing particularly high rates. Despite efforts to address this issue, the prevalence of anemia remains alarmingly high among pregnant women in Ghana (Sumaila et al., 2022).

Nsoatre Health Centre provides antenatal care services to a large population of pregnant women at the Nsoatre vicinity and the peripheral towns. However, there is limited information regarding the prevalence, associated factors, and management practices of anemia among pregnant women attending ANC at this hospital or within the area. Understanding these factors is crucial for developing targeted interventions to effectively reduce the prevalence of anemia and improve the health outcomes for both mothers and infants and therefore the reason for the study.

1.3 Research Objectives

The main aim of the study is to describe the prevalence and management of anaemia among pregnant women attending the ANC at the Nsoatre Health Centre (NHC), Nsoatre. The study is specifically to:

- Assess the prevalence of anaemia among pregnant women at the ANC of NHC, Nsoatre.
- Identify the factors associated with anaemia among pregnant women attending the ANC at NHC, Nsoatre.
- Assess the management practices for anemic pregnant women at the ANC at NHC, Nsoatre.

1.4 Operational Definition of Terms

Anaemia: Low red blood cell or hemoglobin concentration.

Antenatal Clinic: A place of care for pregnant women before delivery

Mortality: the percentage of death in a patient with a certain condition.

Morbidity: the percentage of a disease for the population being exposed.

Hemoglobin: It is a protein in red blood cells that carries oxygen from the lungs to the body's tissues and organs.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This section of the study focuses on the literature review which aims to explore the existing body of knowledge on Anaemia among Pregnant Women attending the ANC at Holy Family Hospital Berekum. By analyzing relevant studies, it aims to uncover the prevalence of anemia, its associated

factors, and management practices of Pregnant in anemia prevention. The review also identifies research gaps and proposes areas for further investigation, which can help develop effective strategies to address anemia in pregnant women attending ANC at this hospital.

2.1 Definition of Anaemia

According to the World Health Organization (2021), anaemia is a medical disorder in which the body lacks sufficient red blood cells to give oxygen to its tissues. WHO (2021) noted that when human tissues lack sufficient oxygen, organs and other bodily functions are compromised. Pregnancy is frequently connected with anaemia which is one of the disorders with a significant frequency among pregnant women in Ghana. Pregnant women are more likely to develop anaemia because they need more blood to provide nutrients for the baby's growth and wellness (Annan et al, 2021). When pregnant women lack key nutrients in their diet and refuse to adopt a healthy lifestyle like eating balanced diets, anaemia develops severe and causes complications for both mother and child (Saaka et al, 2019). The terms anaemia, iron deficiency and iron-deficiency anaemia (IDA) are too often used interchangeably, masking the need to address the full scope of causes of anaemia. Although iron deficiency leads to decreased haemoglobin and production of red blood cells, which in turn decreases haemoglobin concentrations and haematocrit (used to identify anaemia), there are many other causes of anaemia that do not involve iron (WHO, 2020).

2.1.1 Defining Anaemia in Pregnancy

According to WHO (2020) anaemia in pregnancy is Hb concentration below 11 g/dl in the first half of pregnancy or 10.5 g/dl in the second half of pregnancy. WHO additionally categorized AIP into mild anaemia (Hb = 10-10.9g/dl), moderate anaemia (Hb = 7.0-9.9g/dl) and severe anaemia (Hb < 7g/dl). Pregnant women are at higher risk of becoming anaemic, as the nutrients the consume will be used by the pregnant woman herself and her developing foetus (Zeye, 2019). Also, her red

blood cells serve both the foetus and herself. The foetus needs it for its growth and development. Due to these, the pregnant woman is more predisposed to becoming anaemic in her condition. Apart from nutrition and physiological state of the pregnant woman, other factors, like infections (especially malaria and helminthiasis) could determine whether a woman becomes anaemic during her pregnancy or not. Less pronounced factors like genetic conditions and socio-economic status can also influence the anaemia status of pregnant women (Zeye, 2019).

2.1.2 Consequences of Anaemia in Pregnancy

It is well established that anaemia in pregnancy poses a substantial risk in increasing the incidence of both maternal and foetal morbidity and mortality (Kalaivani, 2019). In essence, maternal anaemia contributes to an increase in low birth weight, perinatal mortality, still birth, preterm and neural tube defect on foetus (Zerfu, Umeta, & Baye, 2021). Meanwhile, Hojaji, et al. (2020) indicated that anaemia in pregnancy reduces the blood level and leads to impaired function and cardiac failure. Additionally, insufficient maternal folate status has been linked to placentae abruption, preeclampsia, spontaneous abortion, stillbirth, preterm delivery, and low birth weight (Shao, et al., 2021). Meanwhile, Ouédraogo et al., (2021) has provided evidence that the inadequate intake of folate during pregnancy also adversely affects the development and growth of offspring. Ogundipe et al. (2021) has explained that iron deficiency during pregnancy are risk factors for iron deficiency anaemia, preterm delivery, low birth weight, and this contributes to poor neonatal health and increased maternal mortality. Severe anaemia in pregnancy needs critical medical treatment and attention but Hb < 4.0g/dl in pregnancy is an emergency situation which puts the pregnant woman at risk of congestive cardiac failure (Goonewardene, Shehata, & Hamad, 2019).

2.1.3 Causes and symptoms of Anaemia

There are two prevalent forms of anaemia among pregnant women. Iron-deficiency anaemia and folate-deficiency anaemia (Intiful et al, 2019). Iron deficiency is the most common cause of anaemia in pregnant women. Iron is a mineral found in red blood cells, and its main function is to transport oxygen from the lungs to the body's tissues; however, when the body lacks sufficient iron, it gets fatigued and less resistant to illness (Kahissay et al, 2021). During pregnancy, folate deficiency anaemia damages the neural tube (Arzoaquoi et al, 2020). Therefore, Pregnant women are given folic acid to increase the number of red blood cells in their blood. Folic acid can also be found in cereals, bananas, green vegetables, and melons, in addition to medication. In addition, pregnant women diagnosed with anaemia experience symptoms such as vertigo, chest pain, or a heart attack, and are prone to fainting. Anaemia is caused by a deficiency of iron and folic acid in the bloodstream, heavy menstrual bleeding, and pregnancy (Annan et al, 2021). In contrast, anaemia can be prevented without posing any health risks to either the mother or the kid (Annan et al, 2021). Iron-rich diets, such as red meats, nuts and seeds, green vegetables, as well as Vitamin-C-rich foods, can prevent anaemia (WHO, 2021).

Parasitic worm infestation is one of the main causes of anaemia. Parasitic worms, especially hookworms, trigger chronic blood loss mostly by the release of anticlotting factors that ensure they have continuous flow of blood from the host (Osazuwa, Ayo, & Imade, 2021). Helminthiasis has been found to be associated with anaemia in pregnancy (Shrinivas, Radhika, Sreelatha, & Kavitha, 2021). During pregnancy, a lot of women do not pay much attention to personal hygiene and their diet. Some eating disorders like pica due to hormonal and nutritional changes in pregnancy also make it easier for pregnant women to get helminth infections, especially soil-transmitted helminths (Shrinivas et al., 2021). Apart from causing continuous internal bleeding which may lead to anaemia, these helminths can deprive a person of nutrients consumed, lead to improper digestion

and absorption of these nutrients, thereby leading to anaemia and other deficiency diseases (WHO, 2021). The WHO recommends preventive chemotherapy for pregnant women in regions where prevalence of helminthiasis is above 20% or regions with 40% or more prevalence of anaemia in pregnancy (WHO, 2021).

2.2 Prevalence of Anemia among Pregnant Women Attending ANC at NHC

Anaemia among pregnant women is a major public health problem and an important contributing factor for maternal and perinatal morbidity and mortality especially in developing countries. This calls for a study on the prevalence of anaemia within each region to help develop tailored solutions to the problem. According to WHO (2021), the prevalence of anaemia among pregnant women globally was 36.5% and 47.2% in Ghana as of 2019. This was classified as severe according to WHO designations which indicated five to twenty (5-20) as mild, (20-40) as moderate, and more than 40 as severe.

In a study by Nuru Yesuf & Agegniche (2021) of 286 pregnant women in Ethiopia, Bahirdar, the overall prevalence of anaemia among pregnant women visiting the antenatal clinic was 20.9% and similar to the findings of Balis et al. (2022) also indicated a prevalence rate of 25.3%. This was not consistent with what was found by Pobee et al. (2021)among pregnant women in Ghana in the Central Region who indicated a prevalence rate of 37%, 63%, and 58% in the first, second, and third trimesters respectively which is also similar to the findings of Wemakor (2019) on cross-sectional studies done on 400 pregnant women attending the ANC at the in the Tamale Teaching Hospital (TTH) that showed about half, 50.8%, of the pregnant women were anemic. Surprisingly, a study by Ngimbudzi et al. (2021) showed an overall prevalence of 83.7% of anaemia among pregnant women Attending the Antenatal Clinics in Mkuranga District, Tanzania.

Regarding the severity of the anaemia, identified 4(6.6%) had severe anaemia, and the remaining 32 (53.4%) and 24 (40%) had moderate and mild anemia respectively which was also consistent with Balis et al., 2022; Ngimbudzi et al. (2021) that indicated 27 (6.10%), 36 (8.13%), and 49 (11.08%) had mild, moderate, and severe anemia, respectively in the afore studies and 7.2% had severe anemia, 24.4% had mild anemia, and51.9% had moderate anemia in the later.

A study in Dhaka city on associated factors with maternal anaemia, reported that 63% of study participants had normal Hb level but 37% had Hb below 11g/dl, 26% were mildly anaemic while 11 % were moderately anaemic (Chowdhury et al. 2019). A similar study on prevalence of anaemia in pregnancy and sociodemographic factors in Aurangabad city, India also identified 87% prevalence anaemia in pregnancy (Lokare, Gattani, Karanjekar, & Kulkami, 2021).

In Ghana, anaemia is a significant contributor to the maternal mortality rate. The World Health Organization and other health agencies have devoted considerable attention to a sickness prevalent among pregnant women (Dim & Onah, 2019). Government and health officials have implemented numerous social measures to combat anaemia, yet its incidence continues to rise (Kotey, 2021). In 2019, the prevalence of anaemia was 55.8% and 54.3% in 2015 whereas, in 2016, anaemia was recorded at 54.3% (Appiah et al., 2020). From 2014 to 2018, the reported anaemia cases is above 50%. A study in Sekyere West district of Ghana on AIP determinants using Hb threshold of Hb <10g/dl, indicated that 57.1% of respondents were anaemic (Owusu, Akanmori, & Glover-Amengbor, 2019). Another study among pregnant women at Sunyani municipal hospital using a cut-off value of Hb<11.0g/dl showed 41.5% prevalence of anaemia in pregnancy (Anlaakuu & Anto, 2021). A study conducted in the Navrongo War Memorial Hospital reported that the prevalence of anaemia was 42.7% and was high among teenage mothers (52%), mothers who booked in the third trimester (55%) and grand multiparous women (58%) (Nonterah, et al., 2019).

This implies that anaemia cases are high in the country thus making it an important health problem to address.

2.3 Factors Associated with Anaemia among Pregnant Women Attending the ANC at Nsoatre Health Centre

The prevalence of anaemia is affected by so many factors, from medical, sociodemographic, and economic factors which include Residence, parity, disease conditions such as malaria, hookworm infections, intake of green leafy vegetables in their diet, and additional intake of diet (Nuru Yesuf & Agegniche, 2021).

Sociodemographic Characteristics

The age of a pregnant woman has not been found to have a strong association with anaemia or the severity of anaemia(Sumaila et al., 2022; Yadav et al., 2021).

Surprisingly the prevalence of anaemia was higher among those who were married or living with a man (81.4%) as compared to their unmarried counterpart (18.6%) (Ngimbudzi et al., 2021). This may be due to increased household index which also has a strong correlation with anemia(Yadav et al., 2021).

Also, many studies have found a strong relationship between anaemia and level of education. That is, the higher the level of education the less likely the patient has anaemia (Sumaila et al., 2022; Yadav et al., 2021).

Yadav et al. (2021) did not find any correlation between the type of employment and anaemia but a different study revealed a correlation between the occupation of the participants and anemia. Individuals who were self-employed or unemployed (including housewives and concubines) had

a considerably reduced risk of anemia compared to those employed in government establishments(Sumaila et al., 2022).

Dietary habits

Sumaila et al. (2022) identified a strong association between anaemia among pregnant women and the intake of vegetables or fruits. This finding correlates with Nuru Yesuf & Agegniche, (2021) who also found an inverted correlation between green leafy vegetable intake and anaemia reduction. This was because those who consumed fruits or vegetables at least twice every week were twice as likely to have anaemia compared to those who took it once a week.

Also, other studies found a strong correlation between food deprivation and anemia (Nuru Yesuf & Agegniche, 2021). According to Yesuf and Agegniche, an additional intake of meals reduces your chances of getting anemia.

Medical factors

The number of times ANC visits was found to be significantly associated with anemia. A patient who has fewer visitors at the ANC are most likely to have anemia (Ngimbudzi et al., 2021; Nuru Yesuf & Agegniche, 2021; Balis et al., 2022). This makes perfect sense due to education being done at the ANC, preventive interventions such as iron and folic supplement, timely intervention and treatment of anaemia, and medical conditions that cause anaemia among pregnant women.

Also, several studies have indicated anemia prevalence is worse as gestational age increases (Balis et al., 2022; Ngimbudzi et al. 2021). Also, multiparity was found to have a strong association with anemia. That is women with more than one child were almost three times more likely to have anaemia than one with less than one child.(Annan et al., 202, Balis et al., 2022). Patients with hemoglobinopathies such as SCD, alpha and beta thalassemia, globin cha variant, and infections

such as malaria and hookworm showed a strong positive correlation with the prevalence and severity of anaemia(Shand et al., 2020).

2.4 Anaemia Management Practices among Pregnant Women Attending the ANC the NHC

With the proper intervention anaemia among pregnant women can be managed to prevent its unwanted effect on pregnancy and the mother. Since the major causes of anaemia in pregnancy in Ghana are parasitic infections (GSS, 2019), including malaria and helminthiasis, combating infections has been one of the strategies that have been adopted to reduce the burden of anaemia among pregnant women. Some preventive strategies like the distribution of insecticide treated bed nets to pregnant women who attend ANC. Insecticide treated bed nets have been found to be effective in the control of malaria causing vectors (Lengeler, 2019). The WHO recommends the promotion of the use of ITNs by pregnant women as part of the package for ensuring a positive pregnancy experience (WHO, 2019). WHO also recommends giving Intermittent Preventive Treatment in Pregnancy with Sulfadoxine-Pyrimethamine to pregnant women after the first trimester of pregnancy on each ANC visit (from the second trimester onwards). By the end of her term, a pregnant woman should receive at least three doses of IPTp-SP (WHO, 2019). This also helps combat the malaria-causing parasites. Unfortunately, the distribution of ITNs does not guarantee it's use. Studies have shown that, not all households which have ITN make use of it. According to the GDHS, 68% of households own an ITN but only 43% of pregnant women in these households slept under the nets the night before the survey (GSS, 2019). Also, uptake of IPTp in some African countries had been found to be low and declining. This mostly was attributable to the uncertainty of health professionals about SP administration. After simplified and targeted messages were adopted, and countries implementing policies towards the administration of at least three doses of SP during pregnancy, some improvements were seen (WHO, 2021).

The WHO recommends preventive anthelmintic treatment for pregnant women who live in endemic areas (areas where the prevalence of soil-transmitted helminths is above 20%) and where anaemia is a severe public health problem (anaemia prevalence of greater or equal to 40%). This treatment is done with a single-dose (400mg) albendazole or (500mg) mebendazole in the second trimester of pregnancy. This is a highly cost-effective means of allowing better nutrient absorption and preventing anaemia. However, out of 10 women in Ghana, only 4 of them took deworming medications during their last pregnancies (GSS, 2021).

Anlaakuu (2021) studied the social intervention done at Sunyani Municipal Hospital to curtail anaemia among pregnant women. The study selected 316 women using a basic random selection technique. The study also included a quantitative approach to data collection. The study found that pregnant women should be encouraged to increase their consumption of a balanced diet and iron supplements to prevent anaemia. In addition, women, particularly women, are schooled to be well-prepared for anaemia before becoming pregnant.

Kotey (2021) investigated the measures implemented in Agogo, Ashanti Region to minimise the prevalence of anaemia. The study selected 200 participants at the Agogo hospital using a strategy of purposive sampling and quantitative data collection methods. According to the findings of the study, cleanliness, hygiene, food safety, and the availability of health facilities are the social interventions implemented to reduce anaemia among pregnant women in Ghana.

Pita, et al. (2019) investigated the measures taken to reduce anaemia among pregnant women in Eastern Cuba. The study employed stratified multistage cluster sampling to collect data from the respondents. The qualitative method was employed to acquire data for the investigation. Among the social interventions put in place to lower the prevalence of anaemia among pregnant women,

the study found the implementation of educational activities, food-fortification methods, and the utilisation of antenatal care.

Akowuah et al (2022) also conducted a study on the predictors of anaemia prevalence among Ghanaian pregnant women. One of the objectives of the study is to identify the social interventions recommended for addressing anaemia in pregnancy. The study adopted a cross-sectional survey using a two-stage sampling technique to select 220 pregnant women who attend antenatal care at four health facilities in the Kwabre East Municipality. The study found that the social interventions included administering folic acid, intensive education on early ANC and regular iron sulphate intake.

Kefiyalew, et al (2020) investigated the mechanism used to address the prevalence of anaemia among women in Southeast Ethiopia. The study collected data using quantitative methods and selected 258 pregnant women using systematic sampling. The study indicated that health professionals have assumed the role of educating pregnant women about the effects of anaemia during and after childbirth. In addition, routine screening and deworming of pregnant women are performed in the majority of health care facilities to combat the problem.

Ahenkorah, et al (2021) studied the social intervention used at Bolgatanga Regional Hospital to reduce anaemia. In the majority of health centres, nutritional support via nutrition counselling and the avoidance of unintended pregnancies are supported. Hand washing, intervention in sanitation, and access to clean water are among the social interventions implemented in Ghana to prevent anaemia. Data was collected from 400 pregnant women receiving their first antenatal treatment at the Bolgatanga Regional Hospital using a combination of mixed methods and basic random sampling approaches.

WHO recommends iron and folate supplements during pregnancy. This will help fill up the iron and folate stores thereby increasing red blood cell production and Hb levels(Shand et al., 2020). Unfortunately, compliance with iron and folate supplements has not always been on the high. A study by Ba et al. (2019) on 22 countries in sub-Saharan Africa indicated an average of 28.7% varying from 1.4% in Burundi and 73% in Senegal. Contrary, Minyila (2019) had 66.2% and 65.63% regarding iron and folate compliance in a study on pregnant women in the Upper East Region of Ghana. Lumor et al. (2019) indicated pregnant women whether anemic or non – anemic were given iron (200 mg daily) and folic acid (5 mg daily) supplementation, and malaria prophylaxis. Current antimalaria prophylaxis is sulfoxide/pyrimethamine due to the increasing resistance of parasite strain to chloroquine(Mikomangwa et al., 2020)

Dietary Practices have a huge role in the management of anemia in pregnancy. Intake of green leafy vegetables increases the Hb of patients compared to those who do not take in vegetables (Nuru Yesuf & Agegniche, 2021). In a study by Demis et al. (2019) on the management adherence to iron and folic supplementation in pregnancy, patients benefited hugely from daily nutritional education, and food intake was supervised and discharged when HB<10.0g/dl.

Regarding patients with hemoglobinopathies and medical conditions, (Mikomangwa et al., 2020) patients with anemia were given metronidazole for seven days, antimalaria treatment, and hematinic. Patients with Hb of less than 8g/dl were transfused according to (Mikomangwa et al., 2020). A proper and timely intervention will help reduce the outcome of the condition.

M'Cormack and Drolet (2022) investigated the media used to teach pregnant women in Sierra Leone about the causes and prevention of anaemia. The study collected and analysed data using quantitative methods. The study collected data from 171 respondents using questionnaires. The respondents were selected using a simple random sampling method. The study revealed that health

practitioners, hospitals, clinics, and other health centres were the primary sources of information about the aetiology and prevention of anaemia for women

Baixhumanova, et al. (2022) conducted a study on the effectiveness of communication campaigns on iron deficiency anaemia in Kazakhstan. The study aims to evaluate the prevalence of anaemia, iron deficiency and IDA before and after the campaign. The study included 121 pregnant women aged 15-49 years who were selected using a two-stage sampling process. The study revealed that pregnant women were educated about the causes and prevention of anaemia through the use of medical posters, television, and radio, as identified by the study's findings. Awuah et al (2021) also conducted a study on perceptions and beliefs of anaemia. The aim study aims at exploring the perception of anaemia to understand the local beliefs and knowledge as well as an opportunity to provide informed interventions. The study adopted a cross-sectional qualitative study in selected communities in three regions of Ghana which included the Central, Northern and Volta region. The study conducted 48 focus group discussions for adolescent girls and adult women of reproductive age. The study revealed that health practitioners, hospitals, television, and radio were the primary sources of information for women on the cause and prevention of anaemia.

Hussain and Shu (2022) evaluated the usage of media in China to raise awareness about the aetiology and prevention of anaemia. According to the findings of the study, health care centres and the media should be used to raise awareness about the cause and prevention of anaemia. The study used both qualitative and quantitative methods to collect data and systematically sampled 385 Chinese women to get information.

Duko et al (2021) studied pregnant women's awareness of the cause and prevention of anaemia in South Ethiopia. The study found that health care centres, the media, and medical posters are the most effective means of raising awareness about the causes and prevention of anaemia.

Quantitative and qualitative methods were employed to collect data for this study, and simple random selection was used to identify 244 people with an awareness of anaemia.

Kumar (2019) conducted a study on the burden of iron deficiency among women in India. The study aimed to investigate the media utilised to disseminate information on the causes and prevention of anaemia among 87 pregnant women in India. The study found that women learned about the causes and prevention of anaemia through press media, school or teachers, hospitals or clinics, family, electronic media, health professionals, and peers, according to the study's findings. The research employed both quantitative and qualitative methods in data collection and analysis.

Ahenkorah, et al (2021) investigated anaemic pregnant women attending the prenatal clinic at Bolgatanga Regional Hospital. The majority of women obtained information about the origin and prevention of anaemia through the press, social media, medical posters in stores and health centres, as well as the internet. The study collected information from 400 pregnant women receiving their first antenatal treatment at the Bolgatanga Regional Hospital using a combination of mixed methods and basic random sampling approaches.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

The chapter of the study focuses on the study area and study population, study design, sampling techniques, data collection method and instrument, data analysis techniques, ethical considerations, and the limitations of the study.

3.1 Study Area

The study was conducted at the Nsuatre Health Centre, Nsoatre. This facility was established in 2003. It takes care of about four hundred patients monthly and has 17 staff. Two Consulting rooms, A pharmacy, Maternity Unit, and Labour Ward, and Laboratory. The facility sees about 190 pregnant women and 45 deliveries monthly. The hospital was chosen for its advanced and big ANC that provides care for a lot of pregnant women and its efficient labor ward.

3.4 Sampling Technique and Sample Size

The sampling technique adopted for this study was simple random sampling. Simple random sampling is the basic sampling technique where we select a group of subjects (a sample) for study from a larger group (a population). Each individual is chosen entirely by chance and each member of the population has an equal chance of being included in the sample(Acharya et al., 2013). The lottery method of sampling was used where each member of the population was assigned a number

on a sheet, which was then mixed and randomly selected by us for the study. This was done by giving each pregnant woman a number to identify and choose randomly.

The specific nth number was selected for the study. Using the Yamane formulae (Size, n.d.), n = N / [1 + N (e) 2],

Where n = sample size

N = Total population under study 087

e = margin of error.

Using the Yamane formulae (Size, n.d.), with a population of 150 at an ANC clinic.

The sample size is (71.24) which is final-year students. With a specific 72 pregnant women visiting the clinic.

Therefore, the sample size of the study is 72.

3.5 Data Collection Methods and Instruments

An open-ended questionnaire was used in our data collection tool. A questionnaire is a research instrument consisting of a set of standardized questions to gather statistically useful information on some subjects from one or more respondents (Aishash,2012). This tool was selected because it's easier to use that is requires less expertise, and the more comfortable for the respondents. Also, it is economically favorable, and data can be collected by just a person through sharing the questionnaires and taking the data as a then. The adopted data collection instrument has been used by other researchers for similar studies. (Mutani, 2016). Data was collected on a selected date after approval has been given by the appropriate authority. Data was collected by the research team on

campus where the data collection tool (google forms) was presented to the respondents to fill in. Respondents were assisted in answering the questions.

3.6 Data analysis techniques

Data was collected using google forms and transferred to IBM SPSS for data to be analyzed using the Statistical Package for the Social Sciences (SPSS) and the results were presented in tables depicting frequencies and percentages. The software (SPSS) was adopted for this study because this is a quantitative study and SPSS is better software for data analysis and presentation.

3.7 Ethical consideration

Our research topic has been reviewed and approved by our supervisor to start the studies and we intend to seek consent from the authorities of the school before considering data collection. We informed the respondents (pregnant women) about the use of the information. We ensured privacy and confidentiality (information from data collection was used for the intended purpose only, that is the studies and not any other). The full consent of the in charge of the department was obtained before data collection. We sought permission from respondents to use their information in our research. Data was collected using Google Forms, which is well-protected with online login request access.

3.8 Limitations of the Study

The sample population adopted for the study is limited to a limited group of pregnant women visiting the clinic at the time of data which will be limited in comparison to collecting data of all regular pregnant women visiting the facility. There was a limited time for the study to be completed. This affected both our study design and the data collection instrument.

CHAPTER FOUR

DATA ANALYSIS AND RESULTS

4.1 Prevalence of Anemia among Pregnant Women Attending ANC at NHC

Table 1: Haemoglobin Concentration of respondents at ANC

HB (g/dl)	FREQUENCY	PERCENTAGE
< 11	32	44.44%
< 10.9 – 9	32	44.44%
< 8.9 – 7	6	8.33%
< 7	2	2.78%
TOTAL	72	100

According to **Table 1** above, almost of half, 32(44.44 %), of the respondents had an HB of more than 11g/dl and the same proportion,32 (44.44 %), had an Hb (10.9 – 9) g/dl on their most recent visit. A few, 6 (8.33%), had an Hb between (8.9 – 7) g/dl in their most recent visit and almost none 2 (2.78 %) had an Hb less than 7g/dl.

4.2 Factors Associated with Anaemia among Pregnant Women Attending the ANC at Nsoatre Health Centre

Table 2a: Factors associated with Anaemia among Pregnant Women Attending the ANC at NHC

Factors	**Frequency of Demography**	**Anaemia Prevalence (Frequency)**	**Percentage (%)**
Sociodemographic Factors			
AGE			
12-18	5	4	**80**
20-29	59	29	**49.15**
30-39	6	5	**83.33**
40-49	2	2	**100**
Marital Status			
Single	27	16	**59.26**
Married	30	12	**40**
Cohabitating	15	9	**60**
Divorced	10	5	**50**
Educational Background			
Basic Education	32	21	**62.63**
Secondary Education	22	10	**45.45**
Tertiary education	18	9	**50**

According to table 2a. above, all (100%) the pregnant women within the age of 40-49 were anaemic, majority, (83.33%) and (80%), of the respondents within the ages of 30-39 and 12-18 were anemic respectively. Less than half of the respondents within the ages of 20-29 are anemic.

Regarding marital status, majority (60%) of the respondents that were cohabitating were anaemic. More than half (59.26%) of the respondents that indicated being single were anemic. Also, half (50%) of the divorced pregnant women were anaemic and almost half of the respondents that were married were anaemic.

Concerning education, more than half (62.63%) of the respondent who had only basic education were anemic. Also, half (50%) of the respondents who had tertiary education were anaemic and less than half of the respondents who had secondary education were anaemic.

Table 2b: Factors associated with Anaemia among Pregnant Women Attending the ANC at NHC

Factors	**Frequency of Demography**	**Anaemia Prevalence (Frequency)**	**Percentage (%)**
Medical Factors			
Trimester of Pregnancy			
First Trimester	5	4	**80**
Second Trimester	59	29	**49.15**
Third Trimester	8	7	**87.5**
Parity			
Nulliparous	27	16	**59.26**
Primiparous	30	12	**40**

Multiparous	25	14	**56**
Medical Conditions During Pregnancy			
Malaria	5	4	**80**
Helminthiasis	8	3	**37.5**
G6PD	18	13	**72.22**
Sickle Cell Disease	20	18	**90**
None	40	10	**13.89**

According to table 2b. above, majority (87.5% and 80%) of the respondents in the first and third trimester were anaemic respectively. Almost half (49.15%) of the respondents in the second trimester were anaemic.

Also, regarding parity, more than half (59.26%) and (56%) of the respondents that were nulliparous and multiparous were anaemic respectively and a few (40%) were primiparous.

Concerning, morbidity, almost all (90%) of the respondents that had sickle cell disease were anaemic. Also, 80% of the respondents that had malaria were anaemic and about 72.22% of the respondents that had G6PD were anaemic.

4.3 Anaemia Management Practices among Pregnant Women Attending the ANC the NHC

Table 3a: Anaemia Management Practices among Pregnant Women Attending the ANC the NHC

ANAEMIA PREVENTION PRACTICE	**FREQUENCY**	**PERCENTAGE (%)**
EDUCATION		
Education on Anaemia Prevention Strategies		
Yes	15	20.83%
No	57	79.17%
Education on diet		
Yes	60	83.33%
No	7	9.72%
Unanswered	5	6.94%
IRON AND FOLATE SUPPLEMENT		
Daily folic acid Supplement Intake		
Yes	60	83.33%

No	7	9.72%
Unanswered	5	6.94%
Frequency of folic acid Supplement Intake		
Once Daily	**61**	**84.72%**
Twice Daily	**5**	**6.94%**
Unanswered	**5**	**6.94%**
Erroneous Answer	**1**	**1.39%**
Daily **Iron** Supplement Intake		
Yes	**60**	83.3%
No	**7**	9.72%
Unanswered	**5**	6.94%
Frequency of Iron Supplement		
Once Daily	**44**	**61.11%**
Twice Daily	**21**	**28%**

Unanswered	**6**	**8.33%**
Erroneous Answer	**1**	**1.39%**

According to Table 3a above, regarding anemia **management** practices, a few, 15(20.38%) reported they had some form of education on anemia prevention. Surprisingly, most, 60 (83.33%), of the respondents had some form of education on diet, with one (3.33%) person not responding.

Concerning the intake of iron and folate supplements as an anemia prevention strategy, the majority 60 (83.33%) of the respondents reported to have received folic acid with a few 7(9.72%) and five (6.94%) not responding to the question.

Most 60(83.33%) of the respondents indicated they were prescribed or received folic acid with a very few, 7(9/72%), reporting not to have received it. The majority 61(84.72%) of the respondents that received folic acid reported having taken it once daily, 5(6.94%) took it twice daily and two,5(6.94%) deciding not to answer, and one (1.39%) gave an erroneous answer.

Table 3b. Anaemia Management Practices among Pregnant Women Attending the ANC the NHC

PREVENTION AND TREATMENT OF MEDICAL CONDITIONS		
Sleeping in Treated Mosquito Net		
Yes	**56**	**77.78%**
No	**16**	**22.22%**
Receiving Malaria Prevention Prophylaxis		
Yes	**65**	**90.27%**
No	**7**	**9.72%**

According to Table 3b above, the majority,56(77.78%), of the respondents sleeps in treated mosquito net with a few,16(22.22%) reporting to have not been sleeping in treated mosquito

Also, with regards to the intake of malaria prophylaxis, almost all 65(90.27%) of the respondents had taken anti-malaria prophylaxis with a few indicating they did not take anything net.

Table 3c: Anaemia Prevention Practices among Pregnant Women Attending the ANC the NHC

DIETARY MEASURES		
Daily Meal Intake		
Twice daily	10	13.89 %
Three Times Daily	39	54.17 %
Four Times Daily	10	13.89 %
Five Times Daily	6	8.33%
Unanswered	7	9.72%
Intake of Vegetables		
Yes	**60**	**83.33%**
No	**12**	**16.67%**
Frequency of vegetable intake		
Everyday	**72**	**100%**
Intake of Fruits		

Yes	**65**	**90.27%**
No	**3**	**9.72%**
Intake of Iron-Based Meals		
Yes	**53**	**73.61%**
No	**19**	**26.39%**

According to Table 3c above, more than half 39(54.17%) of the respondents indicated they eat about three times daily, and a good proportion 10(13.890%) also responded they eat twice daily and four times daily each. A few,6(8.33%), of the respondents reported they eat about 5 times daily with 7(9.27%) not responding to the question. With regards to the intake of vegetables, the majority,60(83.33%), of the respondents reported taking vegetables as part of their meal, with very few, 12(16.67%), indicating they do not take vegetables as part of their meal. Regarding the frequency of vegetable intake by those who indicated it as part of their meal, all of the respondents indicated they take it every day. Regarding intake of iron-based meals, the majority 53(73.61%) of the respondents took some form of iron-based meals with a few,19(26.39%), indicating they do not take in iron-based meals.

CHAPTER FIVE

DISCUSSION, CONCLUSIONS, RECOMMENDATIONS

5.1 Discussion

5.1.1 Prevalence of Anaemia among Antenatal Women at NHC

According to our study, the prevalence of anemia (less than 11g/dl) during pregnancy was 55.5 % during pregnancy (antepartum). This was consistent with the findings of (Wemakor, 2019) that showed a prevalence of 50.8%, and does not correlate with the findings of (Balis et al. 2022; Nuru Yesuf & Agegniche 2021) that showed a prevalence of 25.3% and 20.9% and was also higher than the WHO (2023) reported anemia prevalence rate on Ghana (47.2%).

5.1.2 Anaemia Management Among Pregnant and Postnatal Women

Iron and Folic Supplement Intake

Our study showed the majority of our respondents were taking folic acid 83.33% iron supplements respectively as part of anemia prevention antepartum. This was quite higher concerning the findings of Minyila (2019) had 66.2% and 65.63% regarding iron and folate compliance in a study on pregnant women in the Upper East Region of Ghana. This contradicts the findings of 22 countries in sub-Saharan Africa that showed folic and iron intake of an average of 28.7% varying from 1.4% in Burundi.

Dietary Diversification

Most of our respondents took in vegetables, 25(83.33%), fruits,27(90%), and iron-based,22(73.33%), meals respectively. This higher dietary diversification, though good, does not correlate with the findings of Bambo et al. (2023c) that reported high dietary diversification was associated with low anemia prevalence.

5.2 Conclusion

The study showed a higher prevalence of anemia among both antenatal and postnatal women. The finding's revealed compliance was high among those who are aware of the specific anemia prevention strategy. Surprisingly, with higher folic and iron intake and dietary supplementation, the anemia prevalence was still high.

5.3 Recommendation

Based on the outcome of the study, we recommend:

1. More studies will be done in a larger domain and detail regarding anemia prevention and implementation within the study area to further understand and make well-tailored policies
2. Individually tailored nutritional counseling to solve problems involving diet and supplementation.
3. There is an establishment of a community-based group responsible for sharing knowledge, experience, and successful strategies regarding anemia prevention during pregnancy.

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APPENDIX

DATA COLLECTION TOOL

QUESTIONNAIRE

PREVALENCE AND MANAGEMENT OF ANAEMIA AMONG PREGNANT WOMEN ATTENDING ANTENATAL CARE AT THE NSOATRE HEALTH CENTRE

Dear Madam,

We, the final year nursing students, are conducting a study on the prevalence and management of anemia among pregnant women attending the ANC of the Nsoatre Health Centre. Please rest assured that all the data provided by respondents will be kept confidential and will only be used for the purpose indicated in this study.

1. **Assess the prevalence of anemia among pregnant women at the ANC of Nsoatre Health Centre.**

HB of the current or recent ANC visit: …….**(g/dl).**

2. **Assess the management practices for anemic pregnant women at the ANC of Nsoatre Health Centre**

Visiting the ANC

I. Do you visit the ANC **regularly**?

   a. Every time [ ] Sometimes [ ] Rarely [ ]

Prevention of Medical Condition

II. Do you sleep in a treated insecticide net?

Every time [ ] Sometimes [ ] Rarely [ ]

III. Do you take Malaria Prevention Drug **(Suphadoxine Pyrimethamine)?**

   a. Yes [ ] No [ ]

Intake of diet

IV. How many meals do you have within a day?

   a. Once [ ] Twice [ ] Three Times [ ] Four Times [ ]

Do you take in **Vegetables**?

If Yes How frequently have you been taking it

Everyday [ ] Regularly but not everyday [ ] Sometimes [ ] Rarely [ ]

Do you take in **Fruits**?

If Yes How frequently have you been taking it

Everyday [ ] Regularly but not everyday [ ] Sometimes [ ] Rarely [ ]

Intake of Supplements

Please indicate whether you take these supplements and the frequency in preventing or managing anaemia

Drug Supplement

Folic Acid: Yes [ ] No [ ]

If Yes How frequently have you been taking it

Everyday [ ] Regularly but not everyday [ ] Sometimes [ ] Rarely [ ] Never [ ]

Ferrous Sulphate: Yes [ ] No [ ]

If Yes How frequently have you been taking it

Everyday [ ] Regularly but not everyday [ ] Sometimes [ ] Rarely [ ] Never [ ]

Multivitamins: Yes [ ] No [ ]

If Yes How frequently have you been taking it

Everyday [ ] Regularly but not everyday [ ] Sometimes [ ] Rarely [ ] Never [ ]

THANK YOU

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Your Ref. .....

Date August 16, 2023

The Matron
Health Centre, Nsoatre
P.O. Box 47
Nsoatre

Dear Matron

PERMISSION TO CONDUCT RESEARCH

I wish to introduce to you the under listed names of final year students of the College:

1. **Oforiwaa Effah Millicent**
2. **Afrah Evelyn**
3. **Danquah Alice**

As part of the pre-requisite for the award of Diploma in Midwifery they are to conduct a research study, on the topic **'Prevalence and Management of Anemia among Pregnant Women attending the Antenatal Care at Nsoatre Health Centre, Nsoatre.'**

I would be grateful if you could assist them with any material or help they may need to accomplish this task.

Thank you.

Yours sincerely

.....
Dorcas Osei
Supervisor

For: Principal

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RESEARCH TOPIC

PREVELANCE AND MANAGEMENT OF ANEMIA AMONG PREGNANT WOMEN ATTENDING THE ANTENATAL CARE AT NSOATRE HEALTH CENTRE, NSOATRE.

STUDENTS NAME

1. OFORIWAA EFFAH MILLICENT
2. AFRAH EVELYN
3. DANQUAH ALICE

SUPERVISORS NAME:

MS DORCAS OSEI

SIGNATURE.....

THE MATRON

HEALTH CENTRE, NSOATRE

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SIGNATURE.....