FACTORS ASSOCIATED WITH ANAEMIA IN PREGNANCY: A CASE STUDY OF MATIBIDI VILLAGE, EHLANZENI DISTRICT, MPUMALANGA, SOUTH AFRICA

by

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DECLARATION

I, **Present Tresure Mathebula**, hereby declare that the dissertation, "**Factors Associated with Anaemia in Pregnancy. A Case Study in Matibidi Village, Enhlanzeni District, Mpumalanga, South Africa**", submitted to the **University of Venda** for the **Master of Nursing** degree, is my own work and that all sources used have been duly acknowledged in the text and the list of references. This thesis has not been submitted previously for a degree at this or any other institution.

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DEDICATION

This study is dedicated to my parents, siblings, friends, and relatives.

ACKNOWLEDGMENTS

To my GOD, you have brought me this far; I am appreciative of your grace toward me; in fact, my cup overflows.

The following individuals deserve my gratitude for helping to make this study a success. My hard work and completion of this study were made possible by their love, support, and prayers.

- Although it wasn't always easy, my supervisor, Dr T. Malwela, was there for me the entire time I was studying. I appreciate all her advice, patience, support, and encouragement.
- Throughout the entire study, my co-supervisor, Prof M.S. Maputle, supported and advised me.
- My independent coder, Prof T.M. Mothiba, for assistance with coding as well as the development of themes and sub-themes.
- The Matibidi Village Chief, for putting his trust in me and letting me conduct data collection in the village.
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ABSTRACT

Pregnant women who have anaemia are more likely to experience preterm birth, low birth weight, perinatal and neonatal mortality, which is one of the major public health issues. In the South African province of Mpumalanga, in the Matibidi Village of the Ehlanzeni District, the study's goal was to explore and identify risk factors for anaemia in pregnancy. It was done using a qualitative approach that combined descriptive and exploratory designs. The population consisted of pregnant women of age 18 years years and above. A Non-probability purposive sampling method was used because the participants were aware of the risks associated with pregnancy. Immediately after receiving permission from the University of Venda Research Ethics Committee (UVREC), the researcher sought permission to access the villages from the Chief and Ward Councillor of Matibiti Village. In-depth one-to-one interviews were conducted using a semi-structured approach. Data saturation was reached at participant number 16, however, the researcher continued to interview a total of 20 participants. Four criteria, namely, dependability, confirmability, transferability, and credibility were used to ensure trustworthiness. Tesch's six steps were applied to analyze the qualitative data. The findings showed that various factors in Matibiti Village contribute to anaemia in pregnant women. These included the socio-economic status, pre-existing maternal chronic conditions, and religious and traditional beliefs and cultural practices of the participants. Recommendations were made based on the study's findings. Recommendations included: the need to start administering intravenous supplements like Ferramed to pregnant women who are anaemic to help improve their haemoglobin levels; health workers should be aware of religious and cultural practices interfering with adherence to the proper pregnant health care so that they emphasize their urgency during health talks.

Keywords: anaemia; haematunic, haemoglobin, pregnant women; traditional practice

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LIST OF ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal Care
DoH	Department of Health
EMTCT	Elimination of Mother-to-Child Transmission
HIV	Human Immunodeficiency Virus
MCWH	Maternal Child and Women's Health
NHRD	National Health Research Database
PLWHA	People Living with HIV/AIDS
PPH	Post-Partum Haemorrhage
RBC(s)	Red Blood Cell(s) or Erythrocytes
SHDC	School Higher Degree Committee
TB	Tuberculosis
UNICEF	United Nations International Children's Emergency Fund
UVREC	University of Venda Research Ethics Committee
WHO	World Health Organization

CHAPTER 1

OVERVIEW OF THE STUDY

1.1 Introduction

Anaemia is one of the most serious public health issues during pregnancy, putting pregnant women at risk for preterm birth, low birth weight, and perinatal and neonatal mortality (Hlatswayo, 2017). A variety of factors, including cultural and traditional practices, poor prenatal nutrition, religious beliefs, parasitic diseases such as malaria, and multiple pregnancies, have been linked to anaemia in pregnant women (Hlatswayo, 2017). Some cultural and traditional practices are based on the idea that a pregnant woman is on the verge of death; as a result, cultural and traditional practices are used to provide protection and ensure the foetus' safety (Hlatswayo, 2017).

1.2 Background to the Study

Evidence suggests that following traditional practices during pregnancy has both therapeutic and detrimental consequences (Turner, Pol & Kingori, 2017). To provide a foundation for the integration of Westernized medicine with cultural and traditional practices, the health care system must learn more about cultural and traditional practices among pregnant women. Under the Traditional Healers Act, No. 22 of 2007, South Africa has made it permissible for people to consult with traditional healers (Maori, 2009). Since most pregnant women are unaware of the negative effects of most traditional and cultural beliefs, it is crucial to understand the traditional and cultural practices among pregnant women, even if most of them prefer traditional consultation to medical attention. Most pregnant women continue to prefer cultural and traditional practices, which can have both positive and negative consequences.

One example of how culture influences health is how patients and health care professionals perceive the disease's contributing factors and causes. Because they believe that being a woman entails having children, the majority of married African women are opposed to the use of birth control pills pills (Adegboyega: 2019). Negative pregnancy outcomes have been linked to iron deficiency during pregnancy and are more common with multiple births (Mayhew, 2018).

According to Visser (2020), anaemia is considered to be an indicator of poor nutrition and poor health, as well as a marker of socio-economic disadvantage. Anaemia is thought to affect approximately 42% of pregnant women worldwide, making it one of the most serious global health concerns. Anaemia has been linked to poor pregnancy outcomes, according to Tunky and Moodley (2016). According to WHO 2020, Anaemia affects 23% of pregnant women in high-income countries and 56% of those in low- and middle-income countries. The primary cause of Anaemia is iron deficiency.

Pre-existing conditions such as HIV/AIDS, Tuberculosis (TB), Malaria, nutritional deficiencies, and the consumption of non-nutritional substances (pica), particularly during pregnancy, all contribute to the development of anaemia, which is a global health concern. Anaemia in people with pulmonary tuberculosis is caused by inflammation and a lack of iron in their diet, (Lynch, Largent, & Zarin, 2017). Malaria-related Anaemia is multifactorial the causes include mandatory destruction of non-parasitized red blood cells, bone marrow dysfunction that can last weeks, reduced red cell survival, and increased splenic clearance (Lynch, Largent, & Zarin, 2017).

Massive gastrointestinal haemorrhage can also aggravate malaria-related anaemia (Kakkilaya, 2016). According to WHO (2020), approximately 30% of the population is anaemic, though prevalence rates may vary depending on socio-economic status, lifestyle choices, dietary preferences, and the prevalence of communicable and non-communicable diseases. Anaemia may be an HIV complication due to the frequent haematological abnormalities associated with taking antiretrovirals and having tuberculosis. Mpumalanga Province, like the Kruger National Park, has a malarial

infestation; infection can cause placental malaria, which can lead to adverse pregnancy outcomes.

Nag (2017) asserted that all societies have traditional and/or religious beliefs about harmful and beneficial foods, as well as food quantity for pregnant women. Food classifications may be ambiguous, and beliefs may contradict modern maternal nutrition. In India, for example, major foods considered unsafe during pregnancy include eggs, fish, meat, pawpaw, banana, eggplant, beans, and peas. They claim that the food causes jaundice in the unborn child. Beliefs and practices can be beneficial or harmful. They are, however, intended to prevent and treat anaemia in pregnancy provision of haematinics to all pregnant mothers. A high rate of maternal and mortality is still observed in KwaZulu-Natal (Moodley, 2021).

Study conducted in 2017 by Nag state that traditional and cultural beliefs in Africa hold that when a woman is pregnant, she is on the verge of death, traditional and cultural models are put in place to protect the mother, ensure the health of the foetus, and that the baby is delivered healthy and safely. Most cultural and traditional practices have two outcomes: positive and negative, with the latter resulting in complications. Anaemia during pregnancy is a problem in most developing countries, not just South Africa (Nag,2019).

In most cultures and traditions, the husband is regarded as the family's leader and has the final say. Some men would rather a woman go the cultural route for antenatal care (ANC) than seek medical attention. Because she has little control over her husband's instructions, the woman will be forced to stay at home and obey them because doing otherwise is considered disrespectful. According to DoH Maternal Guidelines (2015), every woman who goes to the clinic for ANC must have her haemoglobin level checked in order to determine the baseline and to provide haematinics such as Folic acid 5 mg daily and Ferrous sulphate 200 mg twice a day to prevent Anaemia. According to Nigerian authors, Chimitiro, Hajison and Muula (2017), If a woman has an Hb level lower than 7.5 g/dL, she must be transfused red blood cell concentrates. Anaemia was

common among pregnant primary care clients in Sagamu, Nigeria, with the majority of cases being mild.

According to Sholeye, Animasahun, and Shorunmu (2017), the only factors associated with anaemia in pregnancy were the household's food security and level of food insecurity. Iron and folate deficiencies are the most common causes of anaemia in pregnancy in Sub-Saharan Africa. According to Maggio (2017), anaemia in pregnancy was a minor health issue in northern Tanzania, with the main risk factors being the pregnant women's place of residence and educational level.

According to WHO (2020), "Limpopo, Mpumalanga, and KwaZulu-Natal are provinces with a high rate of malarial infections. It means that women living in these provinces are at high risk of contracting malaria, especially if they are pregnant, because the malarial parasite enters the bloodstream after an infective mosquito bite, infects red blood cells at the end of the infection cycle, and causes rupture in the case of red blood cells. The process reduces the number of red blood cells and, in severe cases, can result in severe anaemia during pregnancy.

According to the Saving Mothers Report from the DoH (2010-2013), despite the fact that haematinics are provided at health facilities during pregnancy, anaemia was responsible for 40% of maternal deaths in South Africa. Furthermore, HIV is linked to a high prevalence of anaemia in Sub-Saharan Africa. Pregnancy is one of the most important stages in a married couple's life, and they become overwhelmed with the joy of welcoming a new baby into their family (Harper, 2019). Although pregnancy has consequences such as anaemia caused by hormonal changes in the body, women begin to crave a variety of things, including clay. Clay inhibits the digestion of essential nutrients; in the stomach, clay binds to iron and zinc, preventing them from being absorbed (Harper, 2019).

According to a study conducted by Moodlein 201717 at the University of KwaZulu-Natal, anaemia in pregnancy is one of the leading major causes of maternal and foetal

death in most developing countries, particularly in Africa. Cultural and traditional practices regarding food restrictions, particularly iron-rich foods such as red meat, liver, egg yolk, and so on. When a woman becomes pregnant, she becomes more vulnerable to health risks such as anaemia due to a 50% increase in blood volume and a decrease in haemoglobin concentration. Without iron in the body, red blood cell production slows, which is caused by a poor diet deficient in essential nutrients.

Anaemia is a concern among pregnant women in the Ehlanzeni District, based on cultural and traditional practices, especially when women are forbidden from consuming specific foods, depriving them of vital nutrition. To confirm this, women who came to the clinical area for examinations were interviewed. As a result, the researcher intends to investigate factors related to anaemia in pregnancy in Matibidi Village, Ehlanzeni District, Mpumalanga, South Africa. According to the DoH's Saving Mothers Report (2010–2013), anaemia was a factor in 40% of maternal deaths in South Africa, despite the fact that haematinics are available in health facilities throughout the pregnancy.

In Sub-Saharan Africa, HIV is associated with a high prevalence of anaemia. "HIV medications as well as HIV itself can affect the normal production of red blood cells in the bone marrow, which can result in anaemia," according to a study conducted by Voldbeding, Levine, Dieterich, and Mildavan (2004). Anaemia caused by HIV has three basic mechanisms: a reduction in blood cells, an increase in red blood cell destruction, and ineffective red blood cell production.

Most women who use herbal medications during pregnancy present to the hospital with low haemoglobin levels, which can cause foetal distress and necessitate a Caesarean section birth. Herbal medication can sometimes cause pre-term labour because the herbs induce early labour. Food restrictions such as eggs, fish, and oranges are common during pregnancies, resulting in women giving birth to babies with low birth weight, congenital anomalies, stillbirth, and macerated birth. Anaemia also increases the risk of cardiovascular disease in pregnant women, such as

pregnancy-induced hypertension, and may be linked to post-partum haemorrhage. The two diseases are among the top five killers of women in South Africa and worldwide (WHO, 2020.

1.3 Problem Statement

According to DoH (2016), maternal guidelines require that ANC attendance be mandatory; the woman must have fourth and fifth visits if she is still pregnant. The researcher observed that most pregnant women in Matibidi's rural areas attended one to three ANC visits and miss out on health education opportunities focusing on promotion and prevention interventions and healthy living. As shown in the background women in rural villages tend to ignore a balanced nutritious diet in favour of non-nutritional substances due to low socio-economic status and literacy levels.

Consuming clay or earth substances during pregnancy may increase the risk of Listeria contamination and malabsorption of iron from the food consumed, resulting in anaemia in pregnancy. Thus, the study aimed at investigating and identify factors associated with anaemia in pregnancy in Matibidi Village, Ehlanzeni District, Mpumalanga, South Africa. Upon admission to the hospital, each patient's ANC book is examined for ANC booking bloods such as Rhesus factor and Hb, medical and surgical histories, syphilis tests, and the patient's general conditions. Most patients only attended ANC appointments one to three times during their pregnancies, which indicated that they did not receive haematinics, which were required to raise haemoglobin levels.

1.4 Purpose of the Study

The study's goal was to explore into the factors that contribute to anaemia during pregnancy in Matibidi Village, Ehlanzeni District, Mpumalanga, South Africa.

1.5 Objectives of the Study

The objectives of the study were to:

- Explore risk factors for anaemia during pregnancy.
- Describe the factors that contribute to anaemia during pregnancy

1.6 Research Question

The research question that guided the study was:

What are the risk factors for anaemia during pregnancy?

1.7 Significance of the Study

South Africa, 2008. Traditional Health Practitioners Act No 22 of 2007.legalized the consultation of traditional healers, empowering them to collaborate with modern health care professionals and hospital institutions. This study was necessary to determine whether cultural and traditional practices that were linked to Anaemia, which may aid health care providers in providing an appropriate level of care that is compatible with local cultural practices, thereby supporting and promoting women's health. It also closed the knowledge gap among village women about what should and should not be done during pregnancy. . It also assist that women and the rest of the community become aware that most cultural and traditional practices endanger pregnant women, and it may also assist women in making the right health choices during their pregnancies. It may assist policy makers, such as the Maternal Child and Women's Health (MCWH), become more aware of traditional pregnancy practices. Furthermore, while some herbs are safe to use, scientists working with women may determine the proper dosage because most, if not all, women may never stop drinking most traditional herbs.

1.8 Theoretical Framework: Ecological Models

According to Burns and Grove (2005), a theoretical framework is an abstract, logical structure of a study that allows the researcher to link the findings to a body of nursing knowledge. Similarly, Brink (2011) defined theoretical framework as a study framework

based on theoretical prepositional statements. As a result, the research will be based on ecological models. The model was used because it made the researchers understand the variety of factors that influenced pregnant women's health and well-being, it also provided a comprehensive view of the factors contributed to anaemia in the district. Ecological models represent the interactions and interdependence of factors at all levels of a health problem. It emphasized Croyle's (2005) description of people's interactions with their physical and socio-cultural environments. The ecological framework was based on evidence that no single factor can explain why some people or groups are more vulnerable to a health problem than others (WHO, 2020). The model allowed the researcher to interact with individuals, the community, and their norms, values, or cultural practices in this study, as shown in Figure 1.1:

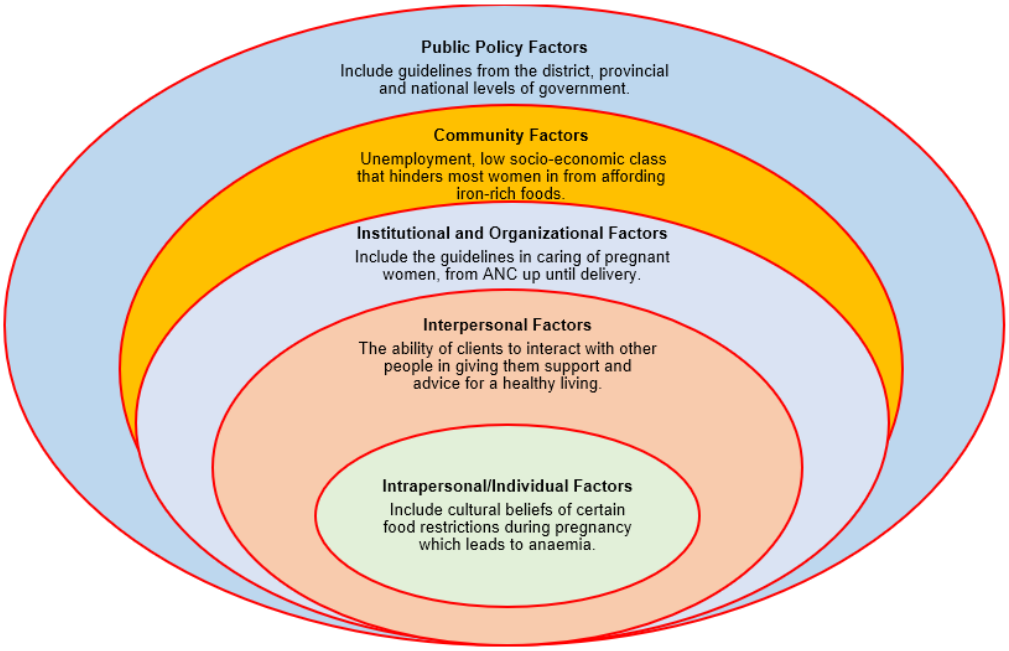

Figure 1.1: Representation of the ecological modeladapted from WHO (2020)

Ecological models included recognized multiple levels of influence on health behaviours, as indicated by WHO (2020), including:

1.8.1 Intrapersonal/Individual Factors

Knowledge, attitudes, beliefs, and personality are all factors that influence behaviour. This study on anaemia in pregnancy included cultural beliefs and related practices such as certain food restrictions during pregnancy that caused anaemia.

1.8.2 Interpersonal Factors

Interactions with other people, for example, can provide social support or create barriers to interpersonal growth that promote healthy behaviour. According to Krouse and Roberts (1989), research has shown that clients who were involved in decision making regarding follow-up and treatment feel more in control of their health. The clients' interpersonal skills were evaluated in terms of their ability to receive support and guidance from others regarding healthy living, as well as guidance from immediate family members such as the mother-in-law, sister, and grandmother regarding what should and should not be done during pregnancy.

1.8.3 Institutional and Organizational Factors

These are the rules, regulations, policies, and informal structures that either constrain or promote healthy behaviour. In this study, these include health facilities and health workers from ANC to delivery (WHO,2020).

1.8.4 Community factors

Individual groups' or organizations' formal and informal social norms, for example, that both limit and enhance healthy behaviour. Churches, schools, neighbourhoods, and workplaces are examples of settings in which community factors for relationships occur (WHO, 2020). In this study, risk factors included unemployment and low socio-economic class, which prevented most women from affording iron-rich foods, and community culture.

1.8.5 Public Policy Factors

These are the policies/laws at the district, provincial and national levels that regulate or support health actions and practices for disease prevention, such as early detection, control, and management (WHO,2020). Public policy factors, in this study, included all procedures for pregnant women, for example, women scheduled for ANC, must be given ferrous sulphate 200 mg and folic acid 5 mg to prevent anaemia in pregnancy.

1.9 Definitions of Key Concepts

1.9.1 Factors

Factors, according to Webller (2017), are circumstances, facts, or influences that contribute to a result. In this study, factors were the elements that cause anaemia during pregnancy.

1.9.2 Culture

According to Webler (2017), it is a society's ideals, customs, and behaviour. In this study, culture referred to the practices and norms that pregnant women followed during their pregnancy, such as refraining from eating certain foods such as eggs and fish.

1.9.3 Tradition Practice

It is a chronological sequence of social group or movement conventions, principles, or attitudes (Webster, 2017). Traditional practices in this study referred to pregnant women's attitudes and perceptions of the use of herbal medications and other traditional remedies, such as drinking herbal medication to relieve nausea and vomiting.

1.9.4 Pregnant Women

It is the condition of a female body carrying a developing embryo or foetus (Onwuhafua et al., 2018). In this study, it referred to pregnant women who followed cultural and traditional procedures during their pregnancy

1.9.5 Anaemia

In this study, anaemia is defined as a low haemoglobin (Hb) level of less than 7.5 g/dL. Haemoglobin levels of 12.0 g/dL in women and 13.0 g/dL in men are required (WHO, 1999). Anaemia in pregnancy is diagnosed when a woman has an Hb of 9.9 g/dL, according to South African Maternity Care Guidelines 2016.

1.9.6 Nutrition

The biochemical and physiological processes by which an organism obtains nutrition to sustain its life include ingestion, absorption, assimilation, biosynthesis, catabolism, and excretion (Gallardo *et al*., 2017). In this study, nutrition referred to the mother's diet before and during pregnancy. According to the ecological model, this was classified as both an individual and a cultural factor. Individual factors incorporate those preferences or genetic factors of a woman that limited the intake of iron-rich foods, such as beef allergy. Cultural factors included traditional practices that limited certain foods, such as eggs and milk, during pregnancy.

1.9.7 Nutritional Deficiency

A nutritional deficiency occurs when the body does not absorb the necessary amount nutrients from food. Deficiencies can lead to a variety of health issues (Mckanzie, 2014). In this study, ideficiency meant a lowered Hb level in the blood. The definition, as conceptualized by the ecological model, was classified as a public and policy factor wherein all women need to be checked for their Hb level and those with low Hb are given ferrous sulphate 200 mg and folic acid 5 mg to prevent anaemia in pregnancy.

1.10 Research Methodology

The study used a qualitative approach, with an exploratory, contextual descriptive design. The study location was Matibiti Village in the Ehlanzeni District. The researcher chose to conduct the study in the village within the participant's homes to ensure a natural setting. Only pregnant women were interviewed, so the participants were

carefully chosen. A total of 20 participants were interviewed; data saturation was reached at participant number 15, but the researcher continued to interview 5 more participants to reach the target of 20. The participants were at ease in their own village. The researcher used an interview guide, and other probing questions arose as a result of how the participants responded. Data were analyzed using the open-coding method and Tesch's six data analysis steps. The research design is detailed and outlined in Chapter 3.

1.11 Ethical Considerations

The researcher sought and received ethical clearance from the University of Venda Health Sciences Research Ethics Committee. Permission to collect data was obtained from Matibiti Village's traditional authorities. The researcher then obtained consent from the women who agreed to participate in the study. All ethical principles were followed, and a detailed discussion is provided in Chapter 3.

1.12 Layout of the Thesis

1.12.1 Chapter 1: Overview of the Study

Chapter 1 provides an overview of the planned study and included a background perspective on factors associated with anaemia in pregnancy in the province of Mpumalanga. The problem statement, research questions, and the research aim and objectives were all provided. The study's significance, definition of major concepts, research design, and methodology were all clearly stated.

1.12.2 Chapter 2: Literature Review

Chapter 2 presents the reviewed literature, which focused on the following topics guided by the definition of anaemia: interpersonal/individual factors, institution and organizational factors, community factors, and public policy factors.

1.12.3 Chapter 3: Research Methodology

Chapter 3 describes the research design and methodology, including how the sample was chosen, the steps taken to collect data, the reasons for using a specific method of analysis, and how the data were analyzed, as well as ethical considerations in this study.

1.12.4 Chapter 4: Data Presentation and Discussion of the Findings

Chapter 4 focuses on the presentation of the results and analysis of the findings.

1.12.5 Chapter 5: Summary, Recommendations, Limitations, and Conclusion

Chapter 5 provides a summary of the research findings and observations based on what was learned. Specific recommendations for future researchers are also outlined.

1.13 Summary

The overview, background, problem statement, objectives, and research question were all covered in this chapter. The significance of the study was also discussed. The following chapter conducted a review of selected literature on the factors associated with anaemia in pregnancy.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The previous chapter provided an overview of the study. This chapter covers the literature review. The systematic process of searching for information from previous scholars related to the topic of interest in order to determine what is known and unknown about the study context is known as a literature review (Brink *et al*, 2012). According to de Vos (2015), a literature review is the process of discovering, investigating, comprehending, and drawing conclusions from previously published research information, methodology, and theory on the topic of interest. The goal of the literature review was to learn about the subject, draw conclusions, identify gaps, and develop theory and guidelines for clinical practice (Burns and Grove, 2015). The following topics were covered in the literature review for this study: The themes were guided by the definition of anaemia, types, causes, and complications of anaemia, and the concepts of the ecological model explained, namely, interpersonal/individual factors, institution and organizational factors, community factors, and public policy factors (WHO,2020).

2.2 Definition of Anaemia

Anaemia is a blood disorder in which the blood's ability to deliver oxygen is compromised due to a lower than normal number of red blood cells or a decrease in the amount of haemoglobin (Janz, Johnson, Rubenstein, 2013). Anaemia during pregnancy is common in both developing and rural areas, and the causes may include traditional practices such as food restriction, preparation, and indulgence in non-nutritional substances during pregnancy.

Anaemia in pregnancy is a major public health issue that puts women at risk of preterm birth, low birth weight, as well as perinatal and neonatal mortality (Hlatswayo, 2017). According to Mayo (2020), anaemia is a medical condition in which there are insufficient healthy red blood cells (RBCs) to transport oxygen to the body's tissues. Many organs and functions are affected when tissues do not receive enough oxygen. Anaemia is especially concerning during pregnancy because it is linked to low birth weight, premature birth, and maternal mortality. Pregnant women are more likely to develop anaemia due to the increased amount of blood produced by the body to help provide nutrients for the baby. If detected early, anaemia during pregnancy can be a mild condition that is easily treated. However, if left untreated, it can be dangerous to both the mother and the baby.

2.3 The Pathophysiology of Anaemia

HIV pathophysiology may result in reduced red blood cell production, increased red blood cell destruction, and ineffective red blood cell production.

2.3.1 Decreased Red Blood Cell Production

Decreased red blood cell production can be caused by infection or neoplastic infiltration of the bone marrow, the use of myeloid suppressive medications (zidovudine), HIV infection, decreased/reduced endogenous erythropoietin production, and a blunted erythropoietin response (Prima, Kaliberova, Kaliberov, Curie and Kusmartsev, 2017).

2.3.2 Increased Red Blood Cell Production

Increased or premature RBC destruction in the circulatory system or spleen may occur in HIV patients. Haemolytic anaemia can be caused by RBC autoantibodies, disseminated intravascular coagulation, thrombotic thrombocytopenic purpura, haemophagocytic syndrome, or glucose-6-phosphate dehydrogenase deficiency (Crane, Liu, and Chadburn, A., 2021). It can also be caused by the use of other medications.

2.3.3 Ineffective Red Blood Cell Destruction

Inadequate RBC production could be caused by folic acid, iron, or vitamin B_{12} deficiency. In HIV patients, folic acid deficiency is typically caused by either jejunal pathology or dietary deficiencies (Green, 2017). Meanwhile, vitamin B_{12} deficiency can result from ileum malabsorption or gastric pathology caused by a variety of infections or conditions affecting the gastric mucosa in HIV patients (Wakeman and Archer, 2020).

2.4 Types of Anaemia

There are several types of anaemia in pregnancy, each of which is caused by a different factor, as explained below:

2.4.1 Nutritional Deficiencies

Other factors that contributed to anaemia in Sub-Saharan Africa include nutritional deficiencies in folate, iron, and vitamin B_{12} (Kumar, 2012; Piwoz and reble 2000), all of which are discussed below.

2.4.2 Iron Deficiency Anaemia

According to Lanzkowsky (2016), iron deficiency anaemia is associated with the production of small (microcytic) erythrocytes and low haemoglobin circulation. This microcytic anaemia is the final stage of iron deficiency and marks the end of long periods of iron deficiency (Roy and Babbs, 2019). Low iron intake as a result of insufficient haem in the diet could be linked to the condition. Haem is a compound containing porphyrin-class iron, which forms the non-protein part of haemoglobin and other biological molecules. Haem is also considered an important compound for food-based iron.

Microcytic anaemia is also associated with insufficient iron absorption in the body due to diarrhoea, intestinal disease, achlorhydria, and drug interactions such as antiretroviral medication, particularly nucleoside reverse transcriptase inhibitors (e.g.,

Combivir, Epivir, and Retrovir) and protease inhibitors (Lanzkowsky, 2016). Excessive menstruation, injury-based haemorrhage, or chronic blood loss from a bleeding ulcer, bleeding haemorrhoids, oesophageal varices, regional enteritis, and parasites (hookworms) are all associated with microcytic anaemia (Cuschieri, 2015). Finally, microcytic anaemia is caused by the improper release of stored iron into the plasma, as well as the improper use of iron due to chronic inflammation, fatigue, or other chronic disorders (Mahan & Escott-Stump, 2008).

Anaemia symptoms indicate that threr is a malfunction in various bodily systems. Muscle dysfunction, for example, reflects poor work performance and exercise, whereas neurological dysfunction manifests as anorexia nervosa and pica, a psychological disorder that causes an appetite for inedible substances such as hair, papers, and soil (Dios, Scully, de Almeida, Bagán, and Taylor, 2016). When iron deficiency is severe, the skin becomes pale, and the inside of the eyelids darken pink rather than red, oral changes such as glossitis and angular stomatitis occur, and fingernails that become thin, flat, and eventually spoon-shaped. Furthermore, untreated anaemia causes cardiovascular and respiratory changes that can lead to cardiac failure (Mahan & Escott-Stump, 2008).

2.4.3 Megaloblastic/Pernicious Anaemia

Megaloblastic anaemia is characterized by the presence of large, undeveloped red blood cell progenitors in the bone marrow (Anwer, Mustafa, Khalid, Younis, ul Haq, and Tayyab, 2020). According to the latter authors, folic acid or vitamin B_{12} deficiency is responsible for approximately 95% of megaloblastic anaemia cases. According to Pacei, Tesone, Laudi, Cretti, Pnini, Varesco, and Colombo (2020), the causes of vitamin B_{12} deficiency are antioxidants; conditions affecting the small intestine and causing bacterial growth with conditions such as Crohn's disease; and inadequate ingestion due to a diet lacking microorganisms and animal-based foods, which are the primary derivatives of vitamin B_{12} (Machalska *et al*., 2011). There are numerous causes of megaloblastic anaemia, but the most common in children is a folic acid deficiency (Hoffbrand, 2015).

The following are some other causes of megaloblastic anaemia: Digestive diseases - Megaloblastic anaemia which can be caused by certain diseases of the lower digestive tract. Coeliac disease, chronic infectious enteritis, and enteroenteric fistulas are examples of these, Malabsorption - Megaloblastic anaemia can be caused by inherited congenital folate malabsorption, a genetic condition in which infants are unable to absorb folic acid in their intestines. This necessitates immediate intensive treatment in order to avoid long-term issues such as mental retardation. Folic acid deficiency caused by certain medications, particularly those used to treat seizures, such as phenytoin, primidone, and phenobarbital, can impair folic acid absorption. A dietary supplement is usually sufficient to treat the deficiency (Hoffbrand, 2015).

2.4.4 Folic Acid Deficiency

Ingestion deficiencies, absorption, increased excretion, and folic acid demand and destruction all contribute to anaemia (Ojeda, Nogales Murillo, and Carreras, 2018; Owiredu *et al*., 2011). Inadequate intake can be caused by a lack of fresh, unprocessed/uncooked, or uncooked food or fruit juices (folates are heat sensitive), vitamin B_{12} deficiency, and alcoholism. Tiredness, dyspnoea, sore tongue, diarrhoea, irritability, anorexia, forgetfulness, weight loss, and glossitis are common symptoms of folic acid deficiency (Bhadra and Deb 2020). Megaloblastic anaemia affects the blood, gastrointestinal tract, peripheral nervous system, and central nervous system. Overt symptoms include paraesthesia (numbness and tingling in the hands and feet), weakened sense vibration, poor muscular coordination, hallucinations, and memory loss (Pennap and Abubakar, 2015).

2.5 Risk Factors of Anaemia in Pregnancy

Cultural and traditional practices, poor nutritional intake during pregnancy, religious beliefs, parasitic diseases such as malaria, and frequent pregnancies have all been linked to anaemia in pregnancy (Hlatswayo, 2017). Some cultural and traditional practices are based on the belief that when a woman is pregnant, she is on the verge of death; thus, cultural and traditional practices are used to provide protection and

ensure the safety of the foetus. Most pregnant women continue to prefer cultural and traditional practices that can be both therapeutic and harmful, according to a study conducted in South Africa (Visser, 2020). Anaemia is regarded as a sign of poor nutrition and poor health, as well as a marker of socio-economic disadvantage in many settings.

Due to inability to afford nutritional food, the poorest and least educated populations are frequently at high risk of exposure to risk factors for anaemia and its consequences. In developing countries, anaemia during pregnancy is caused by a variety of factors, including a lack of micronutrients such as iron, folate, and vitamins A and B_{12}, parasitic infections such as malaria and hookworm, and chronic infections such as TB and HIV. The contributions of each of the factors that cause anaemia during pregnancy differ depending on geographical location, nutritional practices, and other factors. However, a lack of iron-rich diets has been identified as the leading cause of anaemia in pregnant women in Sub-Saharan Africa (Visser, 2020).

Anaemia is associated with poor maternal and child health, and an increased risk of maternal and perinatal mortality. Negative effects for the mother include fatigue, reduced work capacity, and a weakened immune system. Preterm and low birth weight infants have been linked to anaemia during pregnancy. Preterm birth and low birth weight remain the leading causes of neonatal mortality in developing countries such as Tanzania, accounting for 30% of all deaths. It is also associated with a higher risk of intrauterine deaths, a low 5-minute Apgar score, and intrauterine growth restriction (Visser, 2020).

The origins of HIV anaemia blood loss, HIV infection, adverse drug events, and nutritional deficiencies are all causes of anaemia (Agarwal *et al*., 2010; Denue, Kida, Hamagabdo, Dayar and Sahabi, 2013). These factors are discussed further below. Blood loss is the most common cause of anaemia in HIV-infected patients. Such loss is often linked to neoplastic disease (Kaposi sarcoma) or gastrointestinal lesions caused by opportunistic cytomegalovirus infection (Agarwal *et al*., 2010). Lower

haemoglobin levels correlate directly with lower $CD4^+$ T-cell counts in established HIV infection, and several studies demonstrated a correlational effect between established anaemia infection, accelerated AIDS progression, and death (Denue *et al*., 2013; Hylemariam *et al*., 2015; Owiredu *et al*., 2011; Shen, Wang, Lu, Chen, Liu, Zhang, and Zheng, 2013). However, research by Agarwal *et al*. (2010) and Kerkhoff *et al*. (2014) made no mention of a link between established anaemia infection and accelerated AIDS progression.

Simieneh, *et al*. (2017) discovered that having advanced HIV, but not receiving ART was a significant predictor of anaemia. Takuva *et al*. (2013) discovered WHO stage III/IV to be factors associated with an increased risk of anaemia development, whereas Agarwal *et al*. (2010) found the WHO clinical stage to be unrelated to anaemia development. According to the DoH (2018), HIV has the following effects on the nutritional status of PLWHA: immune system weakness and other infections as a result of increased HIV/AIDS nutritional requirements HIV/AIDS-induced malnutrition caused by low food intake, high nutritional needs; and HIV/AIDS-induced malnutrition caused by low food intake, malfunctioning fat absorption, and high nutritional needs (Gray, Doherty, and Hopkins, 2018).

Weight loss caused by HIV contributes to poor clinical outcomes (Chigwedere and Essex, 2010). Weight loss and wasting are caused by a variety of factors, including changes in metabolism, increased resting energy expenditure and energy needs, and an increase in the demand for and use of antioxidant vitamins and minerals as a result of infection. Furthermore, food intake is reduced as a result of food scarcity, mouth or throat sores, or infection, appetite loss, depression, fatigue, and medication side effects. Also, absorption is reduced due to gastrointestinal disease or viral disruption of the intestinal mucosa; when absorption is reduced, red blood cell production is reduced, resulting in anaemia in pregnancy (DoH, 2014).

The compromised immune system of people living with HIV/AIDS makes them vulnerable to a variety of serious conditions and infections, compromising adequate

dietary intake and absorption and increasing nutrient utilisation and excretion (Crum-Cianflone *et al*., 2013; Denue *et al*., 2013). Malnutrition in PLWHA includes symptoms such as muscular tissue degeneration and subcutaneous fat loss, as well as vitamin and mineral deficiencies, weakened immunity, and an increased susceptibility to infection. Poor nutrition is caused by a combination of factors, including a lack of appetite, a decrease in nutrient intake, and a scarcity of food (Crum-Cianflone *et al*., 2013; Denue *et al*., 2013).

According to Johannessen *et al*. (2011) variety of drugs, including Zidovudine (also known as AZT); antiviral agents (e.g. Ganciclovir, also known as Cytovene); Forscanet (also known as Foscavir); Cidofovir; antifungal agents (e.g. Flu, Cyclophosphamide, Doxorubicin, Methotrexate, Paclitaxel, and Vinblastine). Cancer chemotherapy drugs are another cause of anaemia. Zidovudie, Abacavir, Didanosine, Lamivudine, and Stavudine are the most commonly known antiretroviral drugs associated with anaemia, according to the DoH (2014a; 2016). The aforementioned references show that AZT is the most commonly associated ART with anaemia. Decreased RBC production can be caused by infection or neoplastic infiltration of the bone marrow, use of myelosuppressive medications (Zidovudine), HIV infection, decreased/reduced endogenous erythropoietin production, and blunted erythropoietin response (French, 2019). Pre-existing conditions such as HIV exacerbate anaemia as a global health issue.

According to WHO (2020), more than 30% of the population is anaemic, though prevalence rates vary due to differences in socio-economic conditions, lifestyles, food habits, and rates of non-communicable and communicable disease. Anaemia may be an HIV complication due to frequent haematological abnormalities associated with antiretroviral therapy, such as Zidovudine, which damages the bone marrow where red blood cells are produced, particularly when the patient's CD4 count is low. Mpumalanga Province, like the Kruger National Park, has a malarial infestation; the infection can cause placental malaria, which can lead to adverse pregnancy outcomes such as anaemia.

Tuberculosis (TB) is the most common opportunistic infection among PLWHA in Sub-Saharan Africa, and it is most likely a major contributor to HIV-related anaemia (Pennap and Abubakar, 2015). Tuberculosis may also cause chronic anaemia by upregulating pro-inflammatory cytokines. Furthermore, TB dissemination to the mucosa of the gastrointestinal tract may result in iron deficiency anaemia (Isanaka et al., 2012). HIV/AIDS and TB, which interfere with the formation of red blood cells in the body, malaria, nutritional deficiency, and ingestion of non-nutritional substances (pica), particularly during pregnancy also casue anaemia. According to Lynch, Largent, and Zarin (2017), anaemia in patients with pulmonary tuberculosis is caused by inflammation and a lack of dietary iron.

Tuberculosis (TB) is the most common opportunistic infection among PLWHA in Sub-Saharan Africa, and it is most likely a major contributor to HIV-related anaemia (Pennap and Abubakar, 2015). Tuberculosis may also cause chronic anaemia by upregulating proinflammatory cytokines. Furthermore, TB dissemination to the mucosa of the gastrointestinal tract may result in iron deficiency anaemia (Isanaka, Mugusi, Urassa, Willet, Bosch, Villamor, Spiegelman, Duggan and Fawzi, 2012). The pathophysiology of HIV-associated anaemia may result in decreased RBC production, increased RBC destruction, and ineffective RBC production. Increased or premature RBC destruction in the circulatory system or spleen may occur in HIV patients. RBC autoantibodies, disseminated intravascular coagulation, thrombotic thrombocytopenic purpura, hemophagocytic syndrome, or glucose-6-phosphate dehydrogenase deficiency can all cause haemolytic anaemia (Amin, 2018). Haemolysis may also occur as a result of the use of other medications (Bauleth, 2013).

Inadequate RBC production could be caused by a lack of folic acid, iron, or vitamin B_{12}. In HIV patients, folic acid deficiency is typically caused by either jejunal pathology or dietary deficiency (Zehnder, 2018). Meanwhile, vitamin B_{12} deficiency can result from ileum malabsorption or gastric pathology caused by a variety of infections or conditions affecting the gastric mucosa in HIV patients (Owiredu *et al*., 2011).

According to the DoH's Saving Mothers Report (2010-2013), anaemia was responsible for 40% of maternal deaths in South Africa, despite the fact that haematinics are available at health facilities throughout the pregnancy. HIV is associated with a high prevalence of anaemia in the Sub-Sahara. According to a study by Durandt, Potgieter, Khoosal, Nel Herd, Mellet, J., Rossouw, and Pepper (2019), both HIV medications and HIV itself can interfere with the normal production of red blood cells in the bone marrow, resulting in anaemia. HIV infection causes blood loss and may be linked to neoplastic diseases. HIV-related anaemia is caused by three basic mechanisms: decreased blood cells, increased red blood cell destruction, and ineffective red blood cell production.

Malaria is a multifactorial disease. The causes include mandatory destruction of non-parasitized red blood cells, bone marrow dysfunction that can last weeks, reduced red cell survival, and increased splenic clearance. Massive gastrointestinal bleeding can also contribute to malaria anaemia (Kakkilaya, 2016). According to the findings of a WHO (2020) study conducted in South Africa, Limpopo, Mpumalanga, and KwaZulu-Natal are provinces with a high rate of malarial infections, which means that women who live in these provinces are at high risk of malarial infections, especially when pregnant, because the malarial parasite enters the bloodstream after an infective mosquito bite, infects the red blood cells, and the red blood cells die. The process reduces the number of red blood cells and, in severe cases, can result in severe anaemia during pregnancy.

Traditional practices during pregnancy have both therapeutic and harmful effects (Turner, Pol and Kingori, 2017). To create a platform for the integration of Westernized medicine and cultural and traditional practices, the health care system must learn more about cultural and traditional practices among pregnant women. The Traditional Healers Act, No. 22 of 2007, legalized the consultation of traditional healers in South Africa (Louw, 2018). As a result, understanding traditional and cultural practices among pregnant women is critical, even though most pregnant women prefer traditional consultation over medical attention due to a lack of knowledge about the

consequences of most traditional and cultural beliefs.

Anaemia is a major global health concern that affects an estimated 42% of pregnant women worldwide. According to Tunky and Moodley (2016), anaemia is associated with adverse pregnancy events. The WHO also estimates that approximately 56% of pregnant women in low and middle-income countries and 23% in high-income countries are anaemic. Iron deficiency is the most common cause of anaemia. Nag (2017) claimed that all societies have traditional and/or religious beliefs such as drinking tea for protection and healing during pregnancy, as well as harmful and beneficial foods and even food quantity for pregnant women. Food classifications may be ambiguous, and beliefs may contradict modern maternal nutrition. Consider India: eggs, fish, meat, pawpaw, banana, eggplant, beans, and peas are among the foods considered harmful during pregnancy; they cause jaundice in the unborn child. Beliefs and practices may be harmful or beneficial; they are to prevent and treat anaemia in pregnancy, which is the provision of haematinics to all pregnant mothers. KwaZulu-Natal still has a high rate of maternal and infant mortality (Hogue, 2017).

Because traditional and cultural beliefs in Africa hold that when a woman is pregnant, she is on the verge of death, traditional and cultural models are put in place to protect the mother, ensure the health of the foetus, and that the baby is delivered healthy and safely (Aziato, Aziato, Odai, Omenyo, Aziato (2016). Most cultural and traditional practices have two outcomes: positive outcomes that benefit both the mother and the child, and negative outcomes that cause complications.

According to DoH Maternal Guidelines (2016), every woman who goes to the clinic for ANC must be checked for haemoglobin levels to determine baseline and to provide haematinics such as folic acid (5 mg daily) and ferrous sulphate (200 mg twice a day) to prevent anaemia. If a woman's haemoglobin level is 7.5 g/dL or lower, she must be transfused with red blood cell concentrates. Anaemia was common among pregnant primary care clients in Sagamu, Nigeria, with the majority of cases being mild. According to Sholeye, Animasahun, and Shorunmy (2017), the only factors associated

with anaemia in pregnancy were the household's food security and level of food insecurity. Iron and folate deficiencies are the most common causes of anaemia in pregnancy in Sub-Saharan Africa. According to Maggio (2017), the main risk factors for anaemia during pregnancy in northern Tanzania were the pregnant women's place of residence and educational level.

According to the DoH Saving Mothers Report (2014-2016), 40% of maternal deaths in South Africa were associated with anaemia, despite the haematinics that are offered throughout the pregnancy at health facilities, and HIV is associated with a high prevalence of anaemia in Sub-Saharan Africa. Pregnancy is one of the most important stages in the lives of married couples, and they become overwhelmed with the joy of welcoming a new baby into their family. Although being pregnant has consequences such as anaemia, women start craving a variety of foods due to hormonal changes in the body. Some women develop a craving for clay. Clay interferes with the digestion of essential nutrients; in the stomach, clay binds to iron and zinc, preventing them from being absorbed (Harper, 2019).

Cultural and traditional practices among pregnant women in the Ehlanzeni District cause anaemia, especially when women are restricted from eating certain foods, depriving them of essential nutrition. This was discovered during an interview with women who came to the clinic for medical exams. As a result, the researcher envisioned to investigate factors related to anaemia in pregnancy in Matibidi Village, Ehlanzeni District, Mpumalanga, South Africa.

2.6 Complications of Anaemia in Pregnancy

According to Ogunbode and Ogunbode (2021), anaemia in pregnancy is one of the leading causes of maternal and fetal death in most developing countries, particularly in Africa. Cultural and traditional practices regarding food restrictions, particularly iron-rich foods such as red meat, liver, egg yolk, and so on. When a woman becomes pregnant, she becomes more vulnerable to health risks such as anaemia due to a 50% increase in blood volume and a decrease in haemoglobin concentration. Without iron

in the body, red blood cell production slows, which is caused by a poor diet deficient in essential nutrients. Anaemia also increases the risk of cardiovascular disease in pregnant women, such as pregnancy-induced hypertension, and may be linked to post-partum haemorrhage. Both conditions are among the top five killers of women in South Africa and around the world (Ramlakhan, Johnson & Roos-Hesselink, 2020).

Most women who use herbal medications during pregnancy present to the hospital with low haemoglobin levels, which can cause foetal distress and necessitate a Caesarean section birth. Herbal medication can sometimes cause preterm labour because the herbs induce early labour births (Muoz-Pérez, Ortiz, Cario-Cortés, Fernández-Martnez, Rocha-Zavaleta, and Bautista-Vila 2019). Food restrictions such as eggs, fish, and oranges are common during pregnancies, resulting in women having low birth weight babies, congenital anomalies, stillbirths, and macerated births (Muoz-Pérez, Ortiz, Cario-Cortés, Fernández-Martnez, Rocha-Zavaleta, and Bautista-Vila 2019).

2.6.1 Interpersonal/Individual Factors

Knowledge, attitudes, beliefs, and personality are all factors that influence behaviour. This study on anaemia in pregnancy included cultural beliefs and related practices such as certain food restrictions during pregnancy that cause anaemia. Nag (2017) asserted that all societies have traditional and/or religious beliefs about harmful and beneficial foods, as well as food quantity for pregnant women. Food classifications may be ambiguous, and beliefs may contradict modern maternal nutrition. In India, for example, eggs, fish, meat, pawpaw, banana, eggplant, beans, and peas are among the foods considered harmful to pregnancy; they cause jaundice in the unborn child(Hogue, 2017). Beliefs and practices may be harmful or beneficial; they are to prevent and treat anaemia in pregnancy, which is provided to all pregnant mothers. KwaZulu-Natal still has a high maternal and infant mortality rate (Hogue, 2017). The husband is the head of the family in most cultures and traditional norms of the family, and he gets the final say.

According to a 2009 study conducted by Hogue at the University of KwaZulu-Natal, anaemia in pregnancy is one of the leading major causes of maternal and foetal death in most developing countries, particularly in Africa. Cultural and traditional practices regarding food restrictions, particularly iron-rich foods such as red meat, liver, egg yolk, and so on. When a woman becomes pregnant, she becomes more vulnerable to health risks such as anaemia due to a 50% increase in blood volume and a decrease in haemoglobin concentration. Without iron in the body, red blood cell production slows, which is caused by a poor diet deficient in essential nutrients.

Pregnancy is one of the most important stages in the lives of married couples, and they become overwhelmed with the joy of welcoming a new baby into their family. Although being pregnant has consequences such as anaemia, women start craving a variety of foods due to hormonal changes in the body. Clay interferes with the digestion of necessary nutrients; the clay in the stomach binds the iron and zinc and prevents them from being absorbed (Harper, 2019). Most women who use herbal medications during pregnancy present to the hospital with low haemoglobin levels, which can cause foetal distress and necessitate a Caesarean section birth. The use of herbal medications can sometimes result in premature labour. Food restrictions such as eggs, fish, and oranges are common during pregnancy, resulting in women having low birth weight babies, congenital anomalies, stillbirths, and macerated births. Anaemia also increases the risk of cardiovascular disease in pregnant women, such as pregnancy-induced hypertension, and may be linked to post-partum haemorrhage. Both conditions are among the top five killers of women in South Africa and around the world.

Most women believe that being married entails having multiple pregnancies and having their babies on a regular basis, so pregnancy and lactation result primarily in iron demands. Food taboos have a long history and can be used to explain why any society has social dietary traditions. A healthy and sufficient diet is essential during pregnancy and lactation because the mother's needs increase significantly. Interactions with other people, which can provide social support or create barriers to interpersonal

development, are examples of these factors as stated by Feeney and Collins (2015). Most studies have found that patients who participate in decision-making about follow-up and care are more in control of their health.

This study will assess the clients' ability to communicate with one another, providing them with guidance and suggestions for a healthier lifestyle, as well as advice from immediate family members such as mother-in-law, sister, and grandmothers on what can and should not be done during pregnancy. There are patients who are religiously Jehovah's Witnesses; these clients do not believe in the transfusion of another person's blood because they deem it is demonic; this creates a challenge when working with pregnant women who are anaemic and refuse to be transfused, which leads to maternal and foetal mortality (Feeney & Collins, 2015).

2.6.2 Institutional and Organizational Factors

These are the policies, rules, and informal structures that either constrain or promote healthy behaviour. From ANC to delivery, health facilities and health workers are included in this study. Anaemia is linked to adverse pregnancy outcomes, (Tunky & Moodley, 2016). According to the WHO, 56% of pregnant women in low and middle-income countries and 23% in high-income countries are anemic. The most common cause of anaemia is iron deficiency. Pre-existing conditions such as HIV/AIDS, TB, malaria, nutritional deficiency, and ingestion of non-nutritional substances (pica), particularly during pregnancy, exacerbate anaemia as a global health issue. Anaemia in patients with pulmonary tuberculosis is caused by inflammation and a lack of dietary iron, according to Lynch, Largent, and Zarin (2017). Malaria anaemia has multiple causes. The causes include forced destruction of non-parasitized red blood cells, bone marrow dysfunction that can last weeks, decreased red cell survival, and increased splenic clearance. Malaria anaemia can also be caused by severe gastrointestinal bleeding (Kakkilaya, 2016).

Inadequate information from health care workers to patients about health education, what clients should and should not eat during pregnancy, and most clients do not prefer

medications, so if health care workers do not emphasize the importance of taking haematinics during pregnancy, it can lead to women having low haemoglobin levels during pregnancy. ANC attendance is mandatory, according to the DoH (2016) maternal guidelines, and women must have their fifth and seventh visits if they are still pregnant. Rural women, particularly in Matibidi Village, have been observed to attend one or three ANC visits and miss out on health education opportunities aimed at promoting preventive interventions and healthy living.

2.6.3 Community Factors

Individual groups' or organizations' formal and informal social norms, for example, can both limit or enhance healthy behaviours. Schools, neighbourhoods, and workplaces were all places where social relationships take place (WHO, 2020). In this study, risk factors included unemployment, low socio-economic class, which prevented most women from affording iron-rich foods, and community culture.

Cultural and traditional practices among pregnant women in the Ehlanzeni District caused anaemia, especially when women were restricted from eating certain foods, depriving them of essential nutrition. This was discovered during an interview with women who came to the clinic for medical exams. As a result, the researcher investigated factors associated with anaemia in pregnancy in Matibidi Village Ehlanzeni District Mpumalanga in South Africa. Women in rural villages often fail to eat a balanced nutritional substance during pregnancy due to low literacy levels and associated economic status. Consuming clay or earth substances caused an increase the risk of listeria contamination and poor iron absorption from food, which can lead to anaemia. According to the findings of a study conducted in South Africa by WHO (2020), Limpopo, Mpumalanga, and KwaZulu-Natal have a high rate of malarial infections, which means that women who live in these provinces are at high risk of malarial infections, especially when pregnant, because the malarial parasite enters the bloodstream after an infective mosquito bite and infects red blood cells at the end of the infection cycle, the red blood cells are raptured; this process reduces the number of red blood cells and, in severe cases, can result in severe anaemia in pregnancy.

Years ago, before health care was introduced, people lived according to their own knowledge based on their culture and tradition, even when it came to pregnancy and diseases. They mostly used herbs to cure most of the diseases that may arise during pregnancy, as Westernized medication had not yet been introduced. Culture is defined as a motive of ideas, people's behaviours, and customs shared by a specific people or society (Hornsby 2005; Mironenko and Sorokin, 2018). Culture is constantly changing, especially when people migrate to a place where the customs and behaviours are different from their own. Culture has a significant impact on health care because it alters our perceptions of health, illnesses/diseases, and treatment options. Death and the way people believe about the major causes of diseases, culture also influence how people experience illness and pain, as well as the type of treatment patients prefer. Cultures and traditions can have an impact on both the community and the health care providers.

Traditional methods of explaining and comprehending the root causes of diseases, particularly anaemia in pregnancy, exist. Most Africans believe that the first line of disease causes is an attack from evil spirits, because it is believed that when a woman is pregnant, she is on the verge of death, making it very easy for her to be targeted and either lose the baby or lose her life. Many traditional cultures believe that certain illnesses that defy scientific treatment can be transmitted through witchcraft and unforeseen forces, such as barrenness, infertility, attacks by dangerous animals, snake bites by dangerous snakes, anaemia in pregnancy, persistent headaches, and repeated miscarriages (Okpoko a& Obinna, 2017). Cultural differences in a community can lead to a wide range of health-related preferences and perceptions. Health care providers who understand the patient's culture promote trust, better health care, and higher rates of patient acceptance of diagnosis, as well as improvements in treatment and adherence. Acceptance of a diagnosis, including who should be told when and how, acceptance of preventive or health promotion measures (e.g., vaccines, prenatal care, birth control, screening tests, etc.) are all influenced by culture. Making or avoiding eye contact in most rural communities can be considered rude or impolite, depending on culture and willingness to discuss symptoms with a health care provider

or an interpreter present. According to Jucket (2005), perceptions of youth and aging, as well as how accessible and well-functioning the health system is, impact health.

2.6.4 Public Policy Factors

These are the policies and laws at the local, state, and federal levels that regulate or support health actions and practices for disease prevention, such as early detection, control, and management. Public policy factors, in this study, included all procedures for pregnant women, such as when a woman is scheduled for ANC, she must be given ferrous sulphate 200 mg and folic acid 5 mg that prevented anaemia in pregnancy. The maternal guidelines stipulated by DOH (2016) require that ANC attendance be mandatory, the woman must have fourth and fifth visits if still pregnant, blood for When the patient does not have severe anaemia, she can be treated with intravenous haematunics such as Venofer or Ferramed, which are also effective in increasing red blood cells. Most pregnant women in Matibidi's rural area attend one to three ANC visits and miss out on health education opportunities focusing on promotion and prevention interventions and healthy living.

Women in rural villages tend to ignore a balanced nutritious diet in favour of non-nutritional substances due to low socio-economic status and literacy levels. Consuming clay or earth substances during pregnancy may increase the risk of Listeria contamination and poor iron absorption from the food consumed, resulting in anaemia in pregnancy; thus, the study aims to investigate and identify factors associated with anaemia in pregnancy in Matibidi Village, Ehlanzeni District, Mpumalanga, South Africa.

2.7 Summary

This chapter focused on the literature review in which anaemia in pregnancy was thoroughly explained, including the types, risk factors, and pathophysiology. The next chapter will describe the research methodology in greater detail.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

The procedure or techniques used to identify, select, process, and analyze information about a topic are referred to as research methodology (Polit and Beck, 2014). Research methodology specifies how data will be collected or generated, as well as how data will be analyzed. The researcher conducted qualitative research. The researcher was interested in exploring, describing, and contextualizing the factors associated with anaemia in as well as obtaining detailed information about the topic.

3.2 Study Design

A study design, according to Brink, van der Walt, and van Ransburg (2012), is a plan that shows how the study will be like, a plan according to which data will be assembled. The qualitative approach was used in this study to understand the effects of cultural and traditional practices among pregnant women: a case of anaemia in pregnancy. The study design was descriptive, contextual, and exploratory.

3.2.1 Descriptive Design

A descriptive design accurately depicts or describes the traits of a person, an event, or a group of people in a real-world setting to find new meanings, described what already existed, and organized data (Gray, Grove, and Sutherland, 2016). The researcher looked at possibilities that caused of anaemia during pregnancy. No distinction was made between the phenomenon being studied and the setting in which it takes place in a contextual design (Babbie and Mouton, 2012).

Women with 18 years and above were interviewed for this study by the researcher.

3.2.2 Exploratory Design

Using an exploratory design allowed the researcher to gain a comprehensive and all-encompassing grasp of the elements that contributed to anaemia in pregnant women. According to the participants' responses, the researcher raised key questions and then further analyzed each one. In order to improve the health of pregnant women, the researcher was able to develop recommendations with the use of the explorative design, which enabled them to learn more about the cultural and traditional behaviours among pregnant women.

3.3 Study Setting

Settings are the environment within which studies are run that has important consequences for experimental design, the types of data that can be collect and the interpretation of results (Gray, Grove and Sutherland, 2016). The study was conducted in a rural area in a village called Matibidi within Thaba Chewu Municipality, Ehlanzeni District in the province of Mpumalanga, South Africa (Figure 3.1). The village is 275.5 km away from the University of Venda. Matibidi is a remote village with low socio-economic status; there is one clinic and one hospital. ANC attendance is mostly done in the clinic while the hospital attends to high-risk patients who need doctors' attention.

The population size was about 6476 people, with an estimation of 55% females, 45% males and about 70 traditional healers as stated by Census 2011. According to Statistics South Africa (2018), about 12.84% of people within the age of 15-49 years are HIV-positive. Eighty percent of pregnant women still prefer cultural ways of dealing with pregnancy rather than utilizing the health care facilities.

There were few reported cases of malaria and those who were diagnose were found to have contracted it from a high-risk malaria place like Malamulele in the neighbouring Limpopo Province.

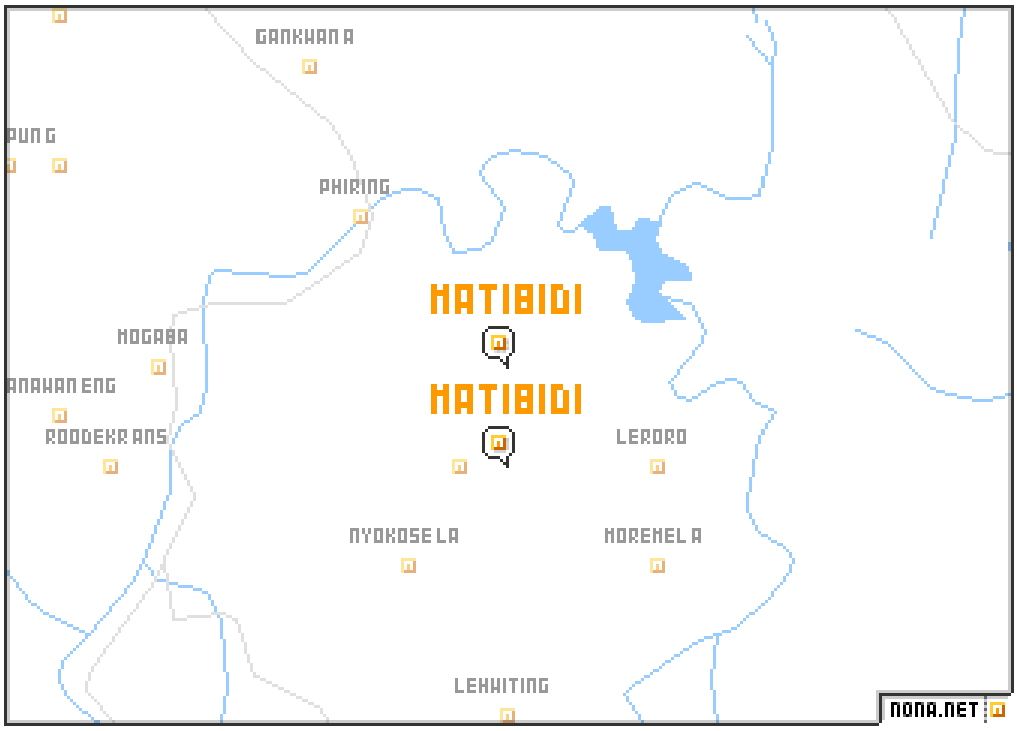

Figure 3.1: Map of Matibiti Village (Chakwizira, Nhemachena, Dube, and Maponya, 2010)

3.4 Population and Sampling

This section details the target population, sample, sampling, inclusion, and exclusion criteria.

3.4.1 Target Population

The target population, according to Brink *et al*. (2012), is the entire group of persons who share the qualities that the researcher is interested in examining. The study's target demographic were women with no age age 18 and above

3.4.2 Population Size

According to the monthly statistics from the clinic's antenatal case registry, only about 30 women from Matibiti hamlet were estimated to be pregnant. Without regard to age, 20 pregnant women were to be interviewed for the study. Some of the ladies were

found during visiting hours and others through home visits.

3.4.3 Sample and Sampling

Sampling involves choosing participants that are typical of the population being investigated (Gray, Grove and Sutherland, 2016). Non-probability sampling, such as purposive sampling, refers to sampling in which not every component of a population has the opportunity to be chosen (Gray, Grove and Sutherland, 2016). The study employed a non-probability purposive sampling method since it is a judgmental or selective sampling method that entailed the researcher consciously choosing which subjects or components to include in the study. In addition to visiting them in their homes, the researcher identified participants when they attended the ANC at the hospital.

3.4.4 Sampling Criteria

Gray, Grove and Sutherland, (2016) defined sampling criteria as a set of qualities necessary for participation in the study.

- **Inclusion Criteria**

Women with 18 year and above, who were willing to participate in interviews, and had recently given birth or are expecting a baby.

- **Exclusion Criteria**

Women who did not consent for the participation into the study

3.5 Measurement Instrument

The term "semi-structured interview" in this study refers to a meeting where the interviewer does not strictly adhere to a formalized list of questions; rather, they were asked more open-ended questions to allow for a discussion with the interviewee rather than a straightforward question and answer format (Burns, Grove and Gray, 2015). The researcher was able to collect more data with this strategy, and participants were

not constrained in how they expressed their opinions (Annexure 7). The researcher used field notes and a voice recorder during the interview to supplement information that was found during audio recordings.

3.6 Pre-Testing the Instrument

A pre-test is referred to as a "feasibility" by Brink *et al*. (2012), and it relates to a specific pre-testing of a research instrument. The researcher used interview questions to assist in identifying language obstacles using an interview guide. Participants occasionally may not be able to understand questions that sounded similar, even when researchers believed that the questions at hand are distinct; as a result, the questions were contextualized to their level of understanding. The researcher was able to determine through this what kind of data they anticipated having at the conclusion of the fieldwork. It helped the researcher localize the questions for easier understanding. Two women who fit the study's criteria participated in the pre-test, which helped the researcher gauge their interviewing prowess, as well as gather data that helped her improve the interview guide.

3.7 Plan for Data Collection

3.7.1 Recruiting the Participants

The researcher submitted a letter to the Chief of Matibidi Village to request permission to conduct the study and conduct participant interviews in their houses (Annexure 2) after gaining ethical clearance from the University of Venda Research Ethics Committee (UVREC, Annexure 1). The participants were found through house visits and also during their visitation at the hospital, and to ensure that they were ready for the visit, the researcher explained to them how the interview will be performed and provided them with information about the dates of the interview (Annexure 3A and 3B).

3.7.2 Data Collection

The primary data were gathered by the researcher. To get comprehensive information

about the subject, the researcher conducted house interviews with all expectant mothers, regardless of age. To avoid linguistic difficulties, the interviews was done in Sotho and Tsonga. Each interview lasted 45 to 90 minutes; voice recordings were made and field notes were taken. The questions asked are underlined in Annexure 5. Depending on when the University Research Ethics Committee given its clearance, the data collection process took four months. The following strategies were used by the researcher to assure the accuracy of data: summarization, probing, and listening:

- **Summarization**

The essence of the participant's statement was condensed and crystallized by the researcher through summarization.

- **Probing**

During the interview, the researcher probed participants for additional information by making ambiguous remarks that could signify a variety of things.

- **Listening**

To improve interviews, the researcher paid close attention to the messages provided by the participants and appropriately interpreted the meaning conveyed by these signals.

3.8 Plan for Data Management and Analysis

Data analysis is a methodical procedure that involves the application of logical techniques to explain and depict, summarize and assess data. Making sure that the results are correctly and accurately analyzed is crucial (Miles, Huberman and Saldana, 2014). The researcher and supervisor protected the data by utilizing a computer that locks and unlocks files with a secret pin. Thematic analysis was used to explore and organize the data, as well as to analyze and interpret the data's significance. Thematic analysis is a type of analysis that places a strong emphasis on identifying, evaluating, and documenting patterns in data. In order to understand the interviews and become

familiar with the data, the researcher listened to all the voice recordings, transcribed them verbatim, and reread the transcripts. Data was then organized by codes, divided the data into themes and sub-themes, classified it, and wrote up the report before sharing the findings. All recorded data were kept secure in the researcher's room, which was always locked and have pins and passwords set up in the laptops and recorders. The independent coder was also of great assistance as she did the coding that was affirming the reserchers codes hence confirmability was achieved.

3.9 Steps of Thematic Analysis

The data analysis will follow the steps outlined by Braun and Clarke, 2013.

3.9.1 Familiarization

Qualitative data can be found in a variety of formats, including field notes, policy manuals, recorded observations, and documented data. The researchers read and reread interview transcripts during this step to immerse themselves in the data and become familiar with it. The goal was to be familiar with the data and start paying closer attention to what interviewees are saying.

3.9.2 Generating Initial Codes

Once the researcher was comfortable with the data, she began to code the data and organize the groups of data into meaningful categories. The researcher streamlined and concentrated on particular data qualities by using coding. The researcher marked key passages in the text during coding and used labels to index them in relation to a subject or piece of information.

3.9.3 Grouping into Themes

During this stage, all significant coded data extracts were sorted and compiled into themes. Following the completion of the coding process, the researcher grouped coded data that shared a similar meaning or relationship together. The researcher then reviewed the themes against the data to make sure they adequately conveyed the

meaning of the data and develop sub-themes from those developed themes.

3.9.4 Reviewing Themes

Each theme's coded data extracts were examined by the researcher to see if they fit together in a logical way. Inadequacies in the initial coding and themes were exposed during this process, and adjustments were made, including new codes were developed while some were deleted as the themes were refined.

3.9.5 Defining and Naming Themes

This stage highlights the aspects of data that each theme captures as well as what about them is interesting and why. The researcher analyzed each theme, pinpointed the narrative it conveys, and then provided a summary of its main points.

3.9.6 Writing the Final Report

The researcher completed the thematic analysis by writing a report that is brief, coherent, logical, free of repetition, and fascinating both within and across themes. To increase confidence, the report outlined how the conclusions were derived.

3.10 Measures to ensure trustworthiness.

There were procedures in place to guarantee reliability. Confidence in the veracity of the data and its interpretation is referred to as credibility (Brink *et al*., 2012). The researcher developed credibility in this study by spending more time with the participants to build trust, which encouraged them to provide more information.

3.10.1 Credibility

Long-term interaction with participants during the 45- to 90-minute session helped establish credibility. The researcher fully immersed herself in the participant's world in order to understand the context of the study and reduce information distortions until data saturation. Through member screening, in-depth linguistic and cultural

comprehension, and spending adequate time with participants, trust and rapport were built. By using a variety of data collecting methods, such as a voice recorder and field notes, triangulation was accomplished. To validate the accuracy of the researcher's interpretation, follow-up interviews were conducted, audio tapes were played back to confirm andrephrase members' responses, where needed.

3.10.2 Transferability

According to Brink *et al*. (2012), transferability relates to how well qualitative research findings may be applied to different contexts or settings with different respondents; however, in this case, there was no study exactly like this one, hence the study was not transferrable.

3.10.3 Confirmability

The capacity of the data to reflect the voice of the participants and not the researcher's prejudices or preconceptions is referred to as confirmability, according to Brink *et al*. (2012). Because the interview was videotaped, the researcher in this case study was not acting hastily or with bias.

3.10.4 Dependability

Dependability is the providing of evidence such that the results would hold true if the study were to be repeated with similar individuals in the same situation (Brink *et al*., 2012). When designing the study, gathering the data, analyzing the findings, and reporting the conclusions, the researcher made sure there were no mistakes or carelessness. Participants were chosen by the researcher using clear logic, and the study was presented professionally.

3.11 Ethical Considerations

Plagiarism concerns and truthfulness in results reporting in all research are ethical considerations. The study of ethics focused on the fundamentals of morality and moral behaviour (de Vos, 2012). Given that study participants are people, the following

research ethics guidelines were followed:

3.11.1 Approval to Conduct the Study

The School Higher Degrees Committee (SHDC) approved the research proposal. Then it was submitted for approval to the University of Higher Degrees Committee (UHDC). The proposal was sent to the University of Venda Research Ethics Committee (UVREC) for ethical approval after it was authorized, and the UVREC then formally cleared the researcher (Annexure 1).

Permission to conduct a study

For permission to enter Matibidi hamlet (Annexure 6) and gather the data, the researcher uploaded the approved proposal and ethical clearance to the National Health Research Database (NHRD). The researcher sent a letter to the chief of Matibidi Village (Annexure 2) and received a formal letter of approval to conduct the study from the NHRD and it was approved (Annexure 6). After that, the researcher began setting up appointments with subjects who were chosen through prenatal visits.

3.11.2 Informed Consent

Participants were provided with comprehensive information about the study's purpose, potential benefits and recipients, duration, and associated hazards in order to obtain their informed consent (Barker, Pistrang and Elliot, 2015). The researcher designed a form that contains all relevant and important information that participants should be aware of prior to participating in the study (Annexure 3A and 3B). The consent forms contained the study's goals, prospective advantages, and voluntarily participating subjects (Annexure 4A and 4B). The researcher requested approval from the chief of Matibidi Village and guaranteed the chief that no special identifiers were used in order to allow women to participate in the study (Annexure 2).

3.11.3 Anonymity and Confidentiality

According to Brink *et al*. (2012), anonymity refers to keeping the researcher's identity a secret from the subject. In order to safeguard their identities, the researcher referred to participants 1 through 20 in this study without using their names.

- **Confidentiality**

According to Brink *et al*. (2012), maintaining confidentiality entails preventing unauthorized parties from learning about or having access to the data that will be collected. The researcher ensured that the data collected were confidential and inaccessible to unauthorized parties.

- **Voluntary Participation**

The term voluntary participation refers to a participant's ability and willingness to voluntarily decide whether or not to participate in the research. The researcher made sure that each participant signs a consent form (Annexure 4A and 4B), which served as a waiver for their voluntary participation and a record of their informed consent agreement.

3.11.4 Protection of the Participants from Harm

Participants were safeguarded against all types of harm, including social, psychological, spiritual, and bodily injury (Brink *et al*., 2012). In this study, the researcher carefully crafted the interview questions so that participants would not feel uncomfortable while they were being interviewed. The researcher looked out for any indicators of distress so that the interview may be stopped until the participant is healthy enough to go on. If it appeared that a participant did not understand the questions, they were given clarifications. The fact that the interview was completely optional was also made clear to the participants, who were free to end it whenever they liked.

3.12 Delimitations of the Study

The study was carried out in the homes of a few chosen women living in Thaba Chweu local municipality, Enhlazeni, as well as one clinical location, which is Matibidi Hospital. No age limitations applied to the study's pregnant participants. In order to provide the researcher with descriptive data about the subject, a qualitative methodology was used.

Contextual, descriptive, and exploratory study designs were used so that they could create a plan for how the researcher plans to carry out the investigation. Purposive sampling was used since the researcher only chose participants who were pertinently appropriate for the investigation. When performing the study, ethical principles were followed to avoid unethical behaviour and bias.

3.13 Plan for Dissemination and Implementation of the Results

The study will be published in an accredited journal, several copies of results will be made and sent to the clinics in Matibidi Village so that the health care professionals may notify people about the results, and it will also be uploaded online so that it is readily available.

3.14 Summary

The study was carried out in the households of a group of pregnant women in the Enhlazeni local municipality of Thaba Chweu. In order to gather descriptive data about the subjects, qualitative research methodology was adopted. The research designs were contextual, descriptive, and explorative in order to establish a plan for data collection. The researcher purposefully sampled participants, choosing subjects who were pertinently appropriate for the investigation. To avoid unethical behaviour and bias, ethical concerns were followed throughout the study.

CHAPTER 4

DATA PRESENTATION AND DISCUSSION OF THE FINDINGS

4.1 Introduction

The previous chapter presented the qualitative research methodology used in this study. This chapter presents the data analysis and the discussion of the findings regarding factors associated with anaemia in pregnancy: a case study in Matibidi Village Thaba Chweu in Mpumalanga. Twenty women were interviewed using a semi-structured interview technique. One main theme and five sub-themes emerged from the data by using descriptive and open-coding techniques. These themes and sub-themes are discussed in this chapter, supported by a literature control, conceptualized within ecological models, and quotes from the interview transcripts of the participants.

4.2 Demographic Profile of the Participants

Table 4.1: The demographic profile of the participants

Category (variable)		Number	Percentage
Age (Years)	20-35	14	70%
	36-55	06	30%
Gender	Male	0	0%

	Female	20	100%
Marital status	Married	08	40%
	Single	12	60%
	Widow	0	0%
	Divorced	0	0%
Ethnicity	Swati	04	20%
	Tsonga	06	30%
	Sotho	10	50%
Employment status	Employed	05	15%
	Unemployed	15	75%
Religious affiliation	Christians	17	85%
	Non-Christians	03	15%
Number of pregnancies	1-5	16	80%

	5-10	04	20%
Attendance of antenatal care (ANC)	1-3	04	20%
	4-8	16	80%
Treatment given at the clinic	Folic acid	16	80%
	Ferrous sulphate	16	80%

Table 4.1 summarizes the demographic profile of the participants. The majority of the twenty participants ranged in age from 20 to 35 years, while the minority was between 36 and 55 years of age. In comparison to individuals who are independent, participants who were unemployed more frequently attended ANC visits and adhered to supplements prescribed at the clinic. Anaemia in pregnancy is caused by a lack of iron and vitamin B_{12}, as well as illnesses that hinder the body from properly absorbing nutrients. This is particularly true when pregnant women are jobless and unable to purchase nutrient-rich food. Both the mother and foetus require iron throughout pregnancy. Anaemia can develop if a pregnant woman does not get enough of the nutrients (Martinez 2019).

It was discovered that Tsongas and Sotho members of the Zion Christian Church focus on spiritual activities like drinking tea while pregnant because they think doing so will protect the unborn child. There were four people who had many pregnancies, ranging in age from 5 to 10, and studies demonstrated that having several pregnancies can also cause anaemia during pregnancy (Mawani, Ali, Bano, and Ali, 2016). As mentioned in Chapter 1, cultural behaviours also contribute to low attendance at antenatal clinic appointments. In this study, four participants received between one

and three antenatal consultations over the course of their pregnancies, which protected the women from developing anaemia during pregnancy.

4.3 Presentation of the Findings

As shown in Table 4.2, a main theme and five sub-themes with related determinants for anaemia in pregnancy for women in Matibidi Village emerged. These are presented sequentially in the subsections that follow.

Table 4.2: Major theme, themes and sub-themes

Main Theme	Themes	Sub-Themes
1. Factors Associated with Anaemia in Pregnancy	1.1 Religious factors	1.1.1 Acceptance versus rejection of blood transfusions
		1.1.2 Indigenous practices when the woman is pregnant
		1.1.3 Care and treatment in the health facilities
		1.1.4 Indigenous and religious health education given to pregnant women by elders and church leaders
	1.2 Cultural factors	1.2.1 Cultural beliefs when a woman is pregnant
		1.2.2 Food restrictions and food permitted during pregnancy
	1.3 Chronic conditions	1.3.1 HIV/AIDS and TB
		1.3.2 Malaria
		1.3.3 Autoimmune disorders
	1.4 Socio-economic status	1.4.1 Financial stability and living conditions
		1.4.2 Availability of good nutritional food
	1.5 Health care facilities	1.5.1 Perception of supply of haematinics in the health care facilities

4.3.1 Main Theme: Factors Associated with Anaemia in Pregnancy

The religious beliefs of some participants (Jehovah's Witnesses) do not support blood ransfusions and make it challenging to treat anaemia in pregnancy because those with abnormally low haemoglobin levels require blood transfusions rather than haematinics.

These factors contribute to anaemia. The aforementioned was backed by West (2014), who claimed that some Jehovah's Witness women were compelled to compromise their beliefs in order to receive blood transfusions, while those who did not want to take a chance on their faith declined and experienced anaemia during pregnancy.

The majority of participants were also more likely to develop anaemia during pregnancy due to cultural practices. For example, in the African culture, pregnant women are thought to need the ancestors' protection; as a result, they are required to visit a traditional healer for herbs, which can sometimes be the main cause of anaemia because they damage the production of red blood cells. Leading causes of anaemia in pregnancy include chronic illnesses like HIV/AIDS and TB because they weaken the immune system, which prevents the body from producing healthy red blood cells.

Anaemia in pregnancy is caused by socio-economic factors, including unemployment and living in remote locations where it is difficult to acquire affordable, nutritious food; adequate nutrition is one strategy to prevent anaemia in pregnancy. Despite all the policies, there are participants who do not attend the health care facility to access the health services due to lack of information and ignorance. Maternity guidelines state that every pregnant woman going for antenatal visits must get tested for haemoglobin levels and also be discharged with haematinics. Health facilities play a crucial role in preventing anaemia in pregnancy.

4.3.1.1 Theme 1.1: Religious Factors

According to the tudy findings, there are religious practices for pregnant women, acceptance or rejection of blood transfusion, food restrictions or permissible foods during pregnancy, and indigenous and religious health education provided to pregnant women. Women are cared for and treated at medical facilities by elders and church leaders.

4.3.1.1.1 Sub-Theme 1.1.1: Acceptance Versus Rejection of Blood Transfusions

The results demonstrated that the majority of pregnant Jehovah's Witnesses put themselves at higher risk for anaemia because they reject blood transfusions. In contrast, some churches use herbal medications to assist their members in protecting their unborn children. West (2014) noted that Jehovah's Witness members believe that their members are not supposed to be transfused with red blood cells, placing a great danger on the patients, especially when they are pregnant. Red blood cells are accepted for transfusion by other Christians. The quotes cited by participants to support these claims were: "

- **Participant 1, Aged 25, Unemployed, Grade 12:**

  "Well, our churches have so many rules, but we mostly believe in prayers; there is no particular ritual that we perform. We don't allow blood transfusions because we think that once you have someone else's blood, your ancestors won't recognize you as their own; instead, they always advise eating beetroot and green spinach for someone who has problems with the blood."

- **Participant 10, Aged 30, Unemployed, Grade 10:**

  "We receive herbal medication, and we are expected to consume it throughout the pregnancy; it prevents miscarriages and ensures growth to the unborn child. Blood transfusions are not permitted here, and the pastors mix concussions to help us when pregnant."

- **Participant 7, Aged 34, Unemployed, No Grade 12:**

  "We only pray, no we don't allow blood transfusion as it's against the law of God."

- **Participant 9, Aged 24, Unemployed, Grade 12:**

  '"Prayer is the key to all problems. We don't allow blood transfusion, all people with blood problems are advised to eat spinach and

beetroot."

Melton (2014) supported the finding that the majority of participants are Christians and that they believe in blood transfusions.

- **Participant 5, Aged 40, Employed, Degree in Human Resource Management:**

  We only trust in prayers and we do allow blood transfusions and we do blood transfusions; after all it is helping me and the child to live.

Jehovah's Witnesses believe that the Bible forbids Christians from accepting blood transfusions (CESNUR's, 2000). The findings suggest that to "abstain from blood" is to refrain from receiving blood transfusions, giving blood, or holding onto one's own blood for transfusion. The doctrine is founded on a different interpretation of the Bible than other Christian groups. It is one of the beliefs that Jehovah's Witnesses are most well-known for (Ivanenko, 2020). Jehovah's Witnesses are instructed in their literature that refusing whole blood transfusions or those of its four main components—red blood cells, white blood cells, platelets, and plasma—is a non-negotiable religious stance and that those who value life as a gift from God do not attempt to sustain life by ingesting blood, even in an emergency.

Even in the case of an emergency, Witnesses are taught that the use of blood fractionation products such as albumin, immunoglobulin and haemophiliac preparations are not absolutely prohibited and are instead a matter of personal choice (Ivanenko, 2020). In addition, West (2014) indicated that the doctrine was introduced in 1945 and has undergone some changes since.

Members of the group who voluntarily accept a transfusion and are not deemed repentant are regarded as having disassociated themselves from the group by abandoning its doctrines and are subsequently shunned by members of the organization. Although the majority of Jehovah's Witnesses accept the doctrine, a minority do not. The Watch Tower Society has established Hospital Information

Services to provide education and facilitate bloodless surgery. This service also maintains Hospital Liaison Committees, whose function is to provide support to adherents.

4.3.1.1.2 Sub-Theme 1.1.2: Indigenous Practices When the Woman is Pregnant

According to the study findings , some religious activities, such as excessive Joko tea consumption which is harmful because it includes caffeine and readily passes through to the placenta, increasing the risk of early birth, excessive bleeding, and congenital abnormalities also put pregnant women at risk for anaemia. According to Chukuezi (2012), there is a connection between religion and health, particularly in the African context, where illnesses have long been associated with spiritual effects.

Witchcraft is associated with illness within the African context, including issues of childbirth. Pregnancy and childbirth are associated with religious and traditional beliefs and practices in many countries. In nursing and midwifery discourse, spirituality is an important component of care and should not be relegated to the background. It is an integral part of the total care provided to clients and their families in all spheres of nursing and midwifery religious beliefs differ from person to person. Participants said these to corroborate:

- **Participant 2, Aged 29, Employed, Diploma in Business Administration:**

  "It differs from person to person, and it also depends on the prophets on what they actually see in you, I was instructed to get river water, boil it and then add excel cooking oil and drink for 3 days, sometimes they will give instructions to use the river water to bath for 3 days."

- **Participant 3, Aged 37, Unemployed, No Grade 12:**

  At church we drink tea (mohamulo) which is a combination of Joko tea and water, the tea will be taken from the time we discover that we are pregnant until we deliver, and it helps in protecting the fetus from different evil spirits.

- **Participant 4, Aged 22, Self-Employed, Grade 12:**

  We only pray to God for protection to carry the child to full term with no complications, yes, we do allow blood transfusion, we also eat a lot of spinach.

A study by Aziato *et al*., (2018) supported the findings by stating that a woman's religious background might influence her pregnancy and birthing demands and expectations as well as how she and her family nurture their children. During pregnancy, some women intensify their prayers to God for protection, safe delivery, and blessings. Some women panic at the mention of caesarian section for fear of death during surgery and others who undergo caesarian section are stigmatized. This stigma transcends their generation, therefore pregnant women would explore all spiritual and traditional options to ensure that they deliver spontaneously. Women commune with their God either individually or in a group. The prayer offered by pregnant women increases their faith and hope in God and it affords them the confidence of going through a safe delivery.

A study by Aziato *et al*., (2016) supported by indicating that the method of communication women use depends on the specific religious group the woman belongs to. Women may use religious artefacts such as blessed water and oil during prayers. The blessed water and anointing/blessed olive oil are ordinary water and olive oil that the religious leader prays over. These artefacts may be used once-off or continuously for the duration of the pregnancy. It is believed that the Holy Spirit (Spirit of God) uses the blessed water and oil as a medium to impact on the user (Aziato *et al*., 2016). During prayers, some women also recite verses of the bible. Some women also sing when communicating with their God and this may be considered a nuisance to others who do not use this form of communication with their God. Some religious denominations prescribe dressing code for prayers, especially at the place of congregation. Others also remove their footwear before entering the prayer room. Religious restrictions pregnant women observe depend on the groups they belong to (Aziato *et al*., 2016). Participants supported by saying:

- **Participant 11, Aged 32, Self-Employed, Grade 12:**

  Fasting, prayer and reciting the word of God helps us in this time of need, we do allow blood transfusions.

- **Participant 12, Aged 41, Unemployed, Grade 12:**

  We just go to the pastor for prayers and read the word, that's all. We just go for hospital admission and nothing else.

- **Participant 13, Aged 20, Unemployed, University Student:**

  Prayers and faith in God is all that is needed and yes we do believe in blood transfusions.

Several religious beliefs and practices linked with pregnancy, labour and the post-partum period have been described by previous studies. Food and water limitations, avoiding specific areas such as the graveyard, not going out at specified times of the day, not associating with certain people thought to be evil and drinking special herbal preparations are some of these religious beliefs and practices (Lydia *et al*., 2016). While some women are prohibited from working while pregnant, others are not. When labour is delayed, women are subjected to negative religious beliefs that require them to confess unfaithfulness to their partners when labour is delayed, especially for those who deliver at home. Specific dietary restrictions like the avoidance of fish in the diet may cause the pregnant women to be more vulnerable to dietary deficiency like anaemia in pregnancy (Lydia *et al*., 2016).

According to Hill (2019), tea is a good source of a group of chemicals known as tannins. Iron deficiency is one of the most widespread nutritional problems in the world, and if you have low iron levels, drinking a lot of tea while you're pregnant might cause anaemia. Tannins can link to iron in some meals, making it unavailable for absorption in the digestive tract. An excessive amount of tea consumption during pregnancy may also cause issues, including miscarriages or low birth weight. Use with caution when drinking herbal teas as some substances may induce labour (Hill, 2019).

- **Participant 17, Aged 35, Employed, Grade 12:**

  It's all about trusting God and prayers, and yes, pastors have no control over our decisions and yes blood transfusions are allowed.

- **Participant 19, Aged 23, Unemployed, Student:**

  The pastors pray for us, for protection, yes blood transfusions are allowed.

- **Participant 20, Aged 43, Unemployed, Diploma in Marketing:**

  Nothing, its prayers only, yes blood transfusions are allowed.

Some ladies recite bible verses during their prayers. Some ladies also sing when conversing with their God, which may be deemed obnoxious by those who do not communicate with their God in this manner. Some religious faiths require that people dress in a certain way during prayers, especially when they are held in a public setting. Others take off their shoes before entering the prayer chamber as well, as stated by participants 11 and 12.

4.3.1.1.3 Sub-Theme 1.1.3: Care and Treatment in the Health Facilities

Some of the participants indicated that having access to a herbalist for all consultations is their most preferred option rather than actually going to a health care facility as not all herbs are beneficial to the body as some prevent the production of the red blood cells in the bone marrow. According to Omar, Zakar, and Fischer (2021), some studies on Muslim women show that they usually opt for 'faith-based' health care services. These services consist, to a large extent, of traditional or spiritual healers without an academic background to support their business. Families who are impoverished and have limited access to education are marginalized from accessing biomedical health care services. This, in turn, creates distrust in the health care system and strengthens the preference for traditional healers. Globally, the development of science and technology has helped to overcome these practices associated with pregnancy.

The study was supported by participants saying:

- **Participant 18, Aged 28, Unemployed, Grade 12:**

  I use herbs too much, like now, before stepping out of the house I drink the herbs, I don't believe in transfusion, it just seems wrong, I use herbs to treat myself.

- **Participant 16, Aged 27, Unemployed, Computer Literacy:**

  I trust herbalists more than I trust pastors, so I go to my herbalist to help me and give me herbs in liquid form in a five liter that I drink on a daily basis and also on the day of delivery where there is a specific drink to help induce labour pains. No, because the ancestors might turn their back on me because someone else's blood will be running through my body, and that is bad.

- **Participant 15, Aged 37, Unemployed, Grade 12:**

  I don't go to church, and I believe in African spirituality, I go to herbalists for herbs to protect me and the child. I only go to the hospitals when my herbalist fails.

Based on participants 15 and 16, women neglect to seek medical help during their pregnancy because of cultural and ancient knowledge which results in detrimental impacts on their reproductive health and pregnancy issues such as anaemia (Omar, Zakar, and Fischer, 2021).

4.3.1.1.4 Sub-Theme 1.1.4: Indigenous and Religious Health Education Given to Pregnant Women by Elders and Church Leaders

The study revealed that elders and church leaders provided little to no knowledge about health practices; most church leaders' main focus is on offering prayers, and the elders are still stuck in the ancient ways, such as seeking a herbalist for all issues that may arise during pregnancy, including anaemia. A growing phenomenon in Ghana is religious Pentecostal/Charismatic leaders praying for pregnant women and some

giving the women religious artefacts such as anointing oil for their use. Some of these leaders also directly anoint the women and give them other spiritual directions concerning the use of artefacts or the performance of other specific activities aimed at safe delivery (Aziato, Odai and Omenyo, 2016). The following participants demonstrated that church leaders are also responsible for some of the decisions these women make while pregnant, which can lead to anaemia if they do not follow the proper ANC route. The following quotes were cited:

- **Participant 6, Aged 32, Unemployed, No Grade 12:**

  They give us ropes to tie around our waist, the rope needs to be taken off during delivery. We allow blood transfusions, and the church has no power when it comes to decisions for our lives.

- **Participant 8, Aged 45, Unemployed, Grade 12:**

  Well, since I don't attend church, there isn't any. Well, blood transfusions are all dependent on my beliefs, and yes, I do permit blood transfusions because, in the end, the blood transfusion will assist me to live longer.

- **Participant 14, Aged 23, Employed, Diploma in Business Administration:**

  We are always encouraged to pray on a daily basis when we are church and yes, we do believe in blood transfusions.

Hassan, Leavey, and Rooney (2019) accentuated that leaders in the Christian religion who contribute to women's spirituality throughout pregnancy and labour, may have an impact on ANC.

4.3.1.2 Theme 1.2: Cultural Factors

According to the conclusions of this study, there are "cultural beliefs and behaviours during pregnancy, as well as food that is limited and food that is permitted."

4.3.1.2.1 Sub-Theme 1.2.1: Cultural Beliefs When a Woman is Pregnant

The findings of the study showed that cultural ideas such as the belief that marriage is all about having a lot of children predispose these women to anaemia during pregnancy because they bleed a lot during labour. According to Dwumfour and Kwapong (2013), the African traditional and cultural beliefs that when a woman is pregnant, she is fluctuating between life and death results in traditional and cultural models being put in place to protect the mother and ensure the health of the foetus and that the baby is delivered healthy and safely. Most cultural and traditional practices bring two results, the positive which is beneficial to both the mother and the child while the negative ones lead to complications. Anaemia in pregnancy is not only experienced in South Africa, but it's an issue in most developing countries.

According to most cultures and traditional norms, the husband is the head of the family, and he gets to have the final word. Some African men believe that it is useless for a woman to seek medical attention, but rather prefers her taking the cultural route for ANC. Since the woman has no power, she will be forced to stay at home and do what she is told, as it is regarded as being disrespectful if you don't do what your husband says (Dwumfour and Kwapong, 2013). The findings were supported by the following citations from participants:

- **Participant 5, Aged 40, Employed, Degree in Human Resource Management:**

  I do believe that having many children is what being married is about and it straightens your marriage because in my culture no 1: we believe that what you give birth to is your wealth; let's say you have seven children, you know out of seven, three or five will have a bright future as not all of them will fail. It is evident that parents do bury their children and, in the case where you have only one child, you will be left with nothing, and now you have to start all over gain but if you have seven children and one dies, you will remain with six. Lastly, we believe that when you have a lot of children, your husband's clan name will grow and a big family is beautiful.

- **Participant 10, Aged 30, Unemployed, Grade 12:**

> *Yes, being married is all about having more kids for the clan name to grow. I don't think it causes anaemia because our great parents used to have more kids and they did not suffer from anaemia.*

In most African societies, being a woman entails having as many children as possible. They're also more likely to get perinatal infection, pre-eclampsia, and haemorrhage. Postpartum cognitive deficits and behavioural issues were also reported. Intrauterine growth restriction, preterm, and low birth weight are all serious perinatal consequences with high mortality rates. (Choe, Min & Cho, 2016).

4.3.1.2.2 Sub-Theme 1.2.2: Food Restrictions and Food Permitted During Pregnancy

The findings of this study confirm that restricting food rich in nutrition during pregnancy leads to women having anaemia during pregnancy. We understand that cultural beliefs indicate that eating yellow foods, such as paw-paw and oranges, causes the foetus to be born with jaundice, which all of these are myths that have never been scientifically proven. Anaemia in pregnancy is becoming more common as a result of lack of knowledge concerning health practices.

According to Gluckman, Hanson, Seng and Bardsley (2015), cultural beliefs and practices can markedly influence a woman's pregnancy and childbirth experiences and may shape her mothering behaviour. In addition, dietary intake before and during pregnancy and through lactation is often influenced by cultural beliefs and practices. As some traditional health care beliefs and food practices favoured in different cultures appear to result from efforts to address specific environmental challenges, it is important to recognize and respect these beliefs while guiding women towards optimum nutrition and away from harmful practices or prohibitions. This chapter discusses the implications of some common food practices, as well as cultural practices that are specific to pregnancy and lactation on maternal and infant health.

According to Nag (2017), all societies have traditional and/or religious beliefs regarding harmful and beneficial food and even food quantity for pregnant women. Food classifications may not be clear, and beliefs may not conform to modern maternal nutrition. For instance, in India, major food considered as harmful to pregnancy include eggs, fish, meat, pawpaw, banana, eggplant, beans, and peas; according to them, the food causes jaundice to the unborn child. Beliefs and practices could be harmful or beneficial, they are to prevent and treat anaemia in pregnancy which is the provision of haematinics to all pregnant mothers. A high rate of maternal and mortality is still observed in KwaZulu-Natal (Hogue, 2017).

According to Cormack and Drolet (2012), foods that participants were told to avoid due to health implications included sugar or rice. These foods were believed to affect foetal growth such as the foetus would “grow too big” (reference to gestational diabetes). Participants were also told not to drink soft drinks, or take non-prescribed/street/ “country” medications (traditional herbs). Some recommendations were based on cultural beliefs, for example, participants were told not to eat eggs, as these foods were believed to cause spontaneous abortions (“steal” the baby). According to Lennox, Lennox et al., (2017), in this context of change, challenge, and cultural variance in nutritional patterns, one must consider the impacts and implications of nutrition to the Maasai. This study findings were confirmed by the citations from the following participants:

- **Participant 2, Aged 29, Employed, Diploma in Business Administration:**

  There are no specific foods that you must not eat, you eat whatever you like, you are free to indulge on your cravings and sometimes eat junk food and pica. Yes, I believe you can lose more blood because when you are pregnant, your body is supposed to supply the entire body with blood and also the baby if that makes sense.

- **Participant 3, Aged 37, Unemployed, No Grade 12:**

  I eat whatever I feel like eating at that time depending on my cravings

and it's more like the mixture of healthy and unhealthy foods. I don't believe that having too many kids can actually make you anaemic; what the nurses tell us at the clinic is that if you eat a lot of clay soil you can be anaemic.

- **Participant 7, Aged 34, Unemployed, No Grade 12:**

  I eat everything that my appetite can tolerate. I even eat eggs and tripe even though there are negative rumors or superstitions associated to eggs and tripe. Yes, I believe you can lose more blood, because when you deliver you do lose blood.

- **Participant 8, Aged 45, Unemployed, Grade 12:**

  I eat whatever I feel like eating, there is no restriction. Yes, but I can't explain as to how exactly.

- **Participant 9, Aged 24, Unemployed, Grade 12:**

  Food is life to me, and I eat everything I can find. Yes, just because you occasionally bleed a lot during delivery; for example, when I had my first child, the nurses told me I had PPH even though I had no idea what they meant.

- **Participant 11, Aged 32, Self-Employed, Grade 12:**

  Food is food, I eat everything I can get my hands on, and I'm not choosy. Well for someone like me who is not married, I wouldn't want a lot of children, but Yes, I do believe you can be anemic if you are always having babies, because your womb doesn't rest.

- **Participant 16, Aged 27, Unemployed, Computer Literacy:**

  You must not eat meat, oranges, and you must also not drink cold water as the baby will come out shivering, I'm not sure I don't want to lie.

According to Labouratory Lorne (2015), anaemia that is nutritional or diet-related

typically results from a lack of one or more nutrients that contain iron, vitamin B_{12}, or manganese. It is necessary to mobilize iron in order to treat nutritional anaemia. This can be accomplished by consuming meals or supplements to restore the deficiency. Brown rice, seafood, white and red meat, eggs, and dried fruit are examples of foods high in iron. However, certain foods, such as tea, coffee, meals high in calcium, and whole-grain cereals, might make it difficult for your body to absorb iron, which can result in a more serious condition of anaemia. The following participants support the study:

- **Participant 19, Aged 23, Unemployed, Student:**

  I eat everything even things I'm not supposed to eat like soil, because when you are pregnant you crave for everything. Haa… no, I don't think it is possible.

- **Participant 17, Aged 35, Employed, Grade 12:**

  There are no dietary restrictions; I eat anything I want. You are aware that a woman bleeds during childbirth, so consider the possibility that she may also be suffering from other illnesses that compromise her immune system.

- **Participant 13, Aged 20, Unemployed, University Student:**

  It's a personal choice, especially when it comes to children, but I don't know if it may actually cause anaemia and when it comes to food I don't even choose, I eat whatever is placed before me.

- **Participant 15, Aged 37, Unemployed, Grade 12:**

  There are no restrictions especially when it comes to food. Yoh, that one I wouldn't know as I'm not well educated.

- **Participant 12, Aged 41, Unemployed, Grade 12:**

  When the cravings kick in, I eat whatever I feel like eating. Yes, it does, because when you are pregnant your body needs to supply

you and your needs with blood meaning too much blood is needed, so having many pregnancies may result in problems.

- **Participant 1, Aged 25, Unemployed, Grade 12:**

  There is plenty of foods that we are asked not to eat especially during the first trimester, food like paw-paws and oranges although we did not know why, we respect our culture and its rules. I don't really know about the causes of anaemia but I wouldn't want to have more than 4 children considering the fact that we are not financial stable.

- **Participant 4, Aged 22, Self-Employed, Grade 12:**

  You are not supposed to eat oranges as they believe the baby will have jaundice, you are also not supposed to eat left overs the following day because when you go into labour you will mess your sheets and you are not allowed to eat ice because it is believed that the baby will come out shivering; I believe that you can get anaemia when have a lot of children, I don't know exactly how but maybe because you tend to bleed after the delivery.

- **Participant 5, Aged 40, Employed, Degree in Human Resource Management:**

  Food that you are not supposed to eat includes raw eggs or under cooked food because it is believed that it is contaminated with bacteria and that can harm the unborn child.

- **Participant 6, Aged 32, Unemployed, No Grade 12:**

  They say that we must not eat boiled eggs, oranges, paw-paws and coke, they believe that eggs make the child to be born without hair and the children will be born with yellow skin, and coke induces abortions. I don't believe that being married is having more children, I believe it is an individual's ideal to have the number of kids they think are okay to them if someone prefers to have many children and some don't.

- **Participant 14, Aged 23, Employed, Diploma in Business Administration:**

  My grandmother always advised us to stay away from eggs, oranges, lemons and paw-paw and also drinks with too much acid like coke as it has detrimental effects on the unborn child; yes, the sister at the clinic explained that having too many children can cause one to develop anaemia in pregnancy, because remember when you are pregnant you bleed after the delivery.

- **Participant 10, Aged 30, Unemployed, Grade 12:**

  We are not supposed to eat salty foods, and all orange foods are not supposed to be eaten because it leads to jaundice.

- **Participant 18, Aged 28, Unemployed, Grade 12:**

  Yellow fruits are a no-go area; they cause harm to the baby. No, I have five children, but I don't have a problem with blood because the herbs that I use help me a lot, even in labour ward as I just push once.

- **Participant 20, Aged 43, Unemployed, Diploma in Marketing:**

  There are fruits that you are not supposed to eat that are believed to cause yellowish skin color and it is believed to be deadly; I believe it does, taking into consideration that there is some medication that destroys the person's cells in the body.

According to Lennox, Petrucka and Bassendowski (2017), modified diet, calorie restriction during the third trimester, reduction of protein-rich foods, and increased water intake are practices that pregnant women need to take note of.

Community elders frequently enforce this practice in the first pregnancy, though women may choose to follow this pattern in subsequent pregnancies, as supported by a number of participants.

4.3.1.3 Theme 1.3: Chronic Conditions

According to the findings, chronic conditions like HIV/AIDS, TB, malaria, and autoimmune disorders are also factors that contribute to anaemia during pregnancy. Additionally, because the immune system is already compromised, opportunistic illnesses can further impair cell function, including red blood cell production.

According to Labouratory Lorne (2015), injury causing abnormal bleeding can result in non-nutritional anaemia. It can also be triggered by conditions other than injuries, such as cancer, heavy menstrual cycles, haemorrhoids, and stomach ulcers. Non-nutritional anaemia can also be inherited. Sickle cell anaemia and thalassemia are the two most common hereditary diseases that cause anaemia. Diseases affecting the kidneys or bone marrow can also lead to anaemia due to the diminishing of red blood cell production.

Cancer chemotherapy can harm the bone marrow resulting in anaemia; this is called aplastic anaemia, which causes not only a deficiency in red blood cells, but also white blood cells and platelets. The most prevalent blood condition is anaemia, which affects more women than males. It affects more than 18% of British women. If anaemia is not adequately recognized, it can have serious consequences for both the mother and her unborn children, including children that are deaf and/or stillbirth (Hu et al.,2016).

4.3.1.3.1 Sub-Theme 1.3.1: HIV/AIDS and TB

Even though the majority of participants know very little about the chronic illness, it was discovered in Matibidi participants with HIV/AIDS that they are also one of the causes that predispose to anaemia in pregnancy. In individuals with HIV infection who are pregnant, blood loss is a clear cause of anaemia (Ogunbode & Ogunbode, 2021). Blood loss may be associated with such conditions as neoplastic disease (e.g., Kaposi sarcoma in the gastrointestinal tract) or gastrointestinal lesions that accompany opportunistic cytomegalovirus infection. In addition to blood loss, the pathophysiology of HIV-associated anaemia may entail three basic mechanisms: decreased production

of red blood cells, increased destruction of red blood cells, and ineffective production of red blood cells. According to Gil-Santana, Bruno, and Andrade (2019), pulmonary tuberculosis is associated with chronic inflammation and anaemia during pregnancy. Mycobacterium tuberculosis infection causes a chronic pulmonary disease marked by persistent granulomatous inflammation and significant lung tissue damage, which compromises the immune system and makes the patient susceptible to anaemia during pregnancy. The following citations from participants support the findings:

- **Participant 19, Aged 23, Unemployed, Student:**

  All I know about drugs is that they can cause more harm than good in the body, I suppose they can cause, but I'm not sure about the chronic diseases.

- **Participant 17, Aged 35, Employed, Grade 12:**

  Yes, it can since one's immune system becomes weakened, and a patient can acquire a disease where the cells attach to one another and the formation of blood can be affected.

- **Participant 14, Aged 23, Employed, Diploma in Business Administration:**

  Yes, for an example, I have a chronic condition and I was diagnosed with anaemia during pregnancy.

Preterm delivery, intrauterine growth restriction, and stillbirth are among the problems associated with HIV that are more prevalent in women from developing countries. Women with advanced HIV diagnoses whose immune systems have started to deteriorate are more at danger (Unger, Ashorn, Cates, Dewey & Rogerson, 2016).

4.3.1.3.2 Sub-Theme 1.3.2: Malaria

Matibidi Village has no high statistical rates when it comes to malaria, so it is not found to be one of the leading causes of anaemia in pregnancy. According to White (2018), numerous studies have discovered a link between anaemia in pregnancy and malaria

infection simply because infection by malaria parasites and destruction of red blood cells is central to the reproduction and survival of the parasite. The health of women in reproductive age, especially in malaria endemic areas, depends on the link between malaria infection and anaemia in pregnancy. It would be necessary to reinforce the currently used interventions (iron supplementation, deworming, and indoor residual spraying), as these have been shown to be successful in previous research.

Malaria-related anaemia is multifactorial. The causes include obligatory destruction of non-parasitized red blood cells, bone marrow dysfunction that can persist for weeks, shortened red cell survival, and increased splenic clearance. Malaria-related anaemia can also be exacerbated by massive gastrointestinal haemorrhage (Kakkilaya, 2016).

- **Participant 12, Aged 41, Unemployed, Grade 12:**

  Well I think it can, but I don't know how malaria can lead to anaemia, but it can.

- **Participant 13, Aged 20, Unemployed, University Student:**

  Yes, I believe that malaria can, but I don't know how.

According to Anlanku and Anto (2017), parasitic infections, especially malaria and helminths during pregnancy have been associated with increased risk of maternal anaemia and adverse pregnancy outcomes. It is well known that anaemia is a serious clinical manifestation of malaria and results from increased destruction of both infected and uninfected red blood cells due to membrane alterations and ingestion of the cytoplasm of the red blood cells by the Plasmodium parasite. It was therefore not surprising that women who had malaria during pregnancy were about five times more likely to be anaemic than those who did not (Anlanku and Anto, 2017).

4.3.1.3.3 Sub-Theme 1.3.3: Autoimmune Disorders

Autoimmune disorders, illnesses in which the body's immune system targets joints and/or organs, or other chronic conditions lasting longer than three months can all lead

to low red blood cell count. This condition is also known as anaemia of inflammation or anaemia of inflammation and chronic disease. To name a few, common conditions that cause anaemia include HIV/AIDS, infections, chronic kidney disease, tuberculosis, and heart failure.

Anaemia as a global health problem, is worsened by pre-existing conditions like HIV and AIDS, TB, malaria, nutritional deficiency status and ingestion of no-nutritional substances (pica), especially during pregnancy. According to Lynch, Largent, and Zarin (2017), dietary iron deficiency and inflammation are the two causes of anaemia in individuals with pulmonary TB.

- **Participant 1, Aged 25, Unemployed, Grade 12:**

  I strongly believe that chronic conditions like heart disease cause anaemia and therefore being pregnant with chronic conditions may develop anaemia if iron is insufficient.

- **Participant 9, Aged 24, Unemployed, Grade 12:**

  Yes, because sometimes when your immune system is compromised, a lot can go wrong in the human body.

It is worth noting that most of the women made their first ANC visit during the first trimester of pregnancy with only a few (2%) making the first visit very late in the third trimester. Early ANC visits during pregnancy decreased the risk of anaemia. It is crucial to schedule early and frequent antenatal appointments since they may enable the treatment of any anaemia that may have existed even before the pregnancy. This essentially is achieved through iron supplementation as it is taken regularly throughout the pregnancy and supplies replenished during subsequent ANC visits.

Thus, pregnant women who do not go for ANC regularly may not have the full benefit of iron supplementation. Additionally, early ANC visits will enable quick treatment of malaria infections, which are typically more prevalent in the first trimester and put the

pregnant woman at risk for anaemia. Most participants lacked knowledge concerning the non-nutritional causes of anaemia like existing conditions, following are the quotes of participants proving little to no knowledge:

- **Participant 2, Aged 29, Employed, Diploma in Business Administration:**

  I'm not well-learned so I wouldn't know the causes of anaemia.

- **Participant 3, Aged 37, Unemployed, No Grade 12:**

  Eish! I am not sure about that.

- **Participant 4, Aged 22, Self-Employed, Grade 12:**

  I don't know much about chronic conditions, but I believe that there are some treatments that destroy blood forming cells which can lead to anaemia.

- **Participant 5, Aged 40, Employed, Degree in Human Resource Management:**

  I'm not sure if chronic conditions can cause anaemia in pregnancy.

There are few malaria cases reported in Matibidi Village; therefore, malaria was not linked to one of the factors associated with anaemia in pregnancy (Van den Broucke, Jooste, Tlali, Moodley, Van Zyl, Nyamwaya and Tang, 2010).

4.3.1.4 Theme 1.4: Socio-Economic Status

4.3.1.4.1 Sub-Theme 1.4.1: Financial Stability and Living Conditions

Socio-economic status, such as financial stability, living conditions, and availability of living conditions, are some of the factors that contribute to anaemia in pregnancy. For example, women from Matibidi, a remote village where there are no supermarkets selling food with the proper nutritional balance, may also experience anaemia in pregnancy.

According to Chowdhury, Khan, Khan, Rahman, Islam, Islam and Billah (2020), the poorest and the least educated population are often at great risk of exposure to risk factors of anaemia and its consequences simply because of low socio-economic status which lead to most women not being able to afford iron rich food like sea food (such as shrimps and clams), watermelon, red meat and pumpkin seeds. The lack of such foods results in iron deficiency in the body. The following participant's quotation supported the study:

- **Participant 15, Aged 37, Unemployed, Grade 12:**

  Living on hand-to-hand monthly may lead to unaffordability when it comes to nutritious foods. People only afford basic food thus nutrition is neglected and anaemia may be the result thereof.

According to WHO, approximately 58% of pregnant women in developing countries are anaemic although most health ministries in developing countries have policies to provide pregnant women with iron supplements. The prevalence of maternal anaemia has not decreased significantly where large-scale programs have been evaluated. Less than 10.2 g/dL of haemoglobin is considered anaemic during pregnancy. In actuality, anaemia is a symptom of an underlying condition rather than a disease. Anaemia during pregnancy can be classified either as acquired or hereditary. The acquired anaemia comprises of anaemia due to iron deficiency. Imaad, Azeez, Alwin, and Sobith (2016) stated that there may be a number of factors that contribute to the higher prevalence of anaemia in these tribal groups, including poverty, poor nutrition, illiteracy, adverse cultural practices, lack of awareness of the disease, inadequate geographic connectivity, and a lack of health personnel and services. Due to their ignorance or corruption, these marginalized groups gain the least from government schemes.

According to Dwumfour-Asare (2013), the aetiology of anaemia is thought to be more complex in developing countries than in developed countries. Insufficient diet, poor iron bioavailability from absorption enhancers and high absorption inhibitor

consumption, increased requirements at specific life stages, particularly during pregnancy and rapid early childhood and adolescent growth, blood loss due to menstruation and childbirth among women, parasites, mostly hookworm, and chronic and recurrent infections are just a few of the causes of anaemia in developing countries.

About 95% of anaemic pregnancies in Ghana are caused by iron deficiency, which is typically caused by inadequate dietary intake, parasites mostly hookworms and chronic recurrent infections like the normal loss of iron during menstruation and parasite interference with iron stores. Parasitic infections are also strongly associated with a number of interrelated risk factors, such as poverty and exposure to contaminated water (Aziato,2016). In addition to pica or geography, several reasons of anaemia in pregnancy are also prevalent in West Africa. Another one of these causes is the intake of a particular form of kaolinite clay due to a need for soil. According to the authors, pica or geography is associated with an increased risk of anaemia in pregnancy (Aziato,2016).

4.3.1.4.2 Sub-Theme 1.4.2: Availability of Good Nutritional Food

Adequate nutrition during pregnancy, which is essential for the mother's and baby's health, may be influenced by pregnancy-related food beliefs. The study has shown that food scarcity is an issue in Matibidi as well because the community is distant and there are few hawkers selling nutritious foods, largely vegetables, and people must travel for nearly 60 kilometres to get supermarkets with highly nutritious food. According to McCrickerd, Lim, Leong, Chia and Forde (2017), the majority of women (60%) who reported reducing rice intake did so because of dietary aversions and being unwell (66%), not because they wanted to have smaller children or for other cultural beliefs (18%).

Very few participants in this study reported reducing intakes of other nutrient-rich foods during pregnancy due to seasonal variations or to their high price; such foods were typically consumed in insufficient quantities. In a multivariate analysis, maternal

characteristics that were associated with decreasing food intake during pregnancy included literacy, poor appetite, socio-economic status, and presence of night blindness which is caused by vitamin A deficiency. The following participants have proven this study:

- **Participant 6, Aged 32, Unemployed, No Grade 12:**

  Being unemployed causes a problem because first and foremost, we are unable to actually get good nutrients that are important for the baby.

- **Participant 7, Aged 34, Unemployed, No Grade 12:**

  Yes, it does have an effect because you might not even afford to go for your routine clinical visits, also the food you eat will not what is really good for maintaining the pregnancy.

- **Participant 17, Aged 35, Employed, Grade 12:**

  Yes, because you won't have enough money to afford a healthier diet or even access to the best medical facilities, I can barely survive on my current salary.

- **Participant 18, Aged 28, Unemployed, Grade 12:**

  Uhmm yes, being unable to afford good nutrition.

- **Participant 19, Aged 23, Unemployed, Student:**

  Yes, being unemployed is tough, sometimes I miss clinical visits because I don't have money for transport and I'm unable to buy food that is essential for the baby.

While eating less to avoid difficult deliveries may not be very common in rural Nepal, women may do so for other reasons such as food aversion, loss of appetite, or illness. There was no evidence of a decrease in the consumption of foods high in protein and micronutrients; rather, these foods appear to be chronically underrepresented in the

diets of impoverished women in this setting (Christian, Srihari, Lyman, Kathry, Lecleq and Shresta: 2007). The prevalence of anaemia in pregnancy varies greatly between countries due to differences in socio-economic conditions, lifestyle, and health-seeking behaviours. Poor food quality and low iron bioavailability are key contributors to anaemia in pregnancy. Unfavourable socio-economic demographic characteristics may have an impact on the pregnancy's outcome. The following quotations support the study:

- **Participant 10, Aged 30, Unemployed, Grade 12:**

  Yes, I think it does because one needs money to buy fruits and fresh vegetables and without money, it's tough.

- **Participant 11, Aged 32, Self-Employed, Grade 12:**

  It was difficult to afford good nutrition as I was depending on grant; being unable to afford good nutrition can also lead to anaemia due too poor nutrition.

- **Participant 1, Aged 25, Unemployed, Grade 12:**

  Being unemployed does cause a problem because first and foremost, we are unable to actually get good nutrients that are important for the baby.

- **Participant 4, Aged 22, Self-Employed, Grade 12:**

  Unable to afford certain fruits, but you will always find a way to get certain nutrients by having a garden with vegetables.

- **Participant 13, Aged 20, Unemployed, University Student:**

  Yes, especially not being able to afford good nutritional food, and for the fact that we stay in deep rural areas, you need to travel in order to get proper food and that is costly.

- **Participant 14, Aged 23, Employed, Diploma in Business Administration:**

  Yes, it's hard to go to the shops for proper food and the ladies at the markets are selling food that is no longer fresh.

- **Participant 16, Aged 27, Unemployed, Computer Literacy:**

  Well, living in the rural areas and being unemployed means that you are unable to afford good nutritious food that is essential for the baby.

According to a study by Morsky and Alhady (2014), pregnancy causes some physiological changes that frequently confuse the diagnosis of various disorders and the evaluation of the most appropriate treatments. This is particularly valid when it comes to anaemia. In order for the body to produce red blood cells, a woman needs iron, vitamin B_{12}, and folic acid. Anaemia during pregnancy is defined as a decrease in the haemoglobin concentration of less than 11 g/dL, during which plasma volume increases relative to red cell mass, resulting in a physiological disorder. Anaemia will arise if one or more of these components are lacking. Pregnancy-related anaemia is a significant public health issue and one of the main factors in disability acute blood loss anaemic pregnant women belonging to the rural sector were superstitious.

There were not many rural Hindu anaemic mothers who cited cultural reasons for avoiding meat consumption. They had the belief that only eating red meat would help them recover from anaemia, and that because they did not eat meat for cultural reasons, their anaemia had not been prevented. The Sinhalese and Tamils showcased a dislike towards meat consumption due to religious beliefs. One mother from the rural area claimed that she is hesitant to eat papaya since her mother has warned her that the fruit's contamination of any milk could result in an abortion. When asked how she learned of it, her mother replied that her mother had informed her that it was a widely held belief that had existed for a very long time (Pitigala, 2019). A study conducted by Corkmack and Drolet (2012) states that participants ate foods that those in their social network (mothers, grandmothers, mother-in-law, and so on) or health care

professionals recommended. Similarly, participants refrained from eating foods dissuaded by their social network.

Most individuals claimed that they had been instructed to consume sweet potato leaves because they were thought to be healthy during pregnancy. Fruits, including bananas, mangoes, pineapples, limes, oranges, and plantains were suggested for consumption. In addition, foods high in protein were advised, such as black-eyed beans, peanuts, fish, meat, and chicken. Recommended foods were native to the region available in Freetown and Western Area. Other participants argued that socio-economic issues are not always a problem, saying that sometimes it helps to think creatively. For instance, one participant suggested that people should produce their own veggies. The following participants support this:

- **Participant 2, Aged 29, Employed, Diploma in Business Administration:**

  They give us folic acid where you take one a day; ferrous sulphate where you also take one twice a day. In all honesty, i only take them when I remember that I have them or when I see them.

- **Participant 5, Aged 40, Employed, Degree in Human Resource Management:**

  No, because I was in high school when I had my first child, and I wasn't able to afford the adequate nutrition that is essential, and I didn't have blood problems.

- **Participant 8, Aged 45, Unemployed, Grade 12:**

  I don't think that poor living conditions and unemployment affects pregnancy, I think it is the mentality that one has that they poor or I'm unemployed thus leading them to neglecting their health which then can have an effect on pregnancy. For an example, not eating healthy food. Healthy food does not mean you should eat bacon and eggs, soft porridge is also healthy, vegetables are healthy, clean water is also healthy.

- **Participant 9, Aged 24, Unemployed, Grade 12:**

  Yes, I think it does because one needs money to buy fruits and fresh vegetables and without money, it's tough.

- **Participant 12, Aged 41, Unemployed, Grade 12:**

  It doesn't have an effect because you can always have a garden of vegetables and you can also plant fruit trees like the Banana tree and Mango tree.

- **Participant 20, Aged 43, Unemployed, Diploma in Marketing:**

  No, it's just a mind-set, well I'm unemployed but I have a garden of fresh vegetables at home.

Because of differences in socio-economic conditions, lifestyles, and health-seeking habits between countries, the prevalence of anaemia in pregnancy varies significantly. Unfavourable socio-economic demographic characteristics may influence the outcome of the pregnancy (Ogunbode & Ogunbode, 2021).

4.3.1.5 Theme 1.5: Health Care Facilities

According to WHO (2017), anaemia during pregnancy is defined as having a haemoglobin concentration of less than 11 g/dL. According to the haemoglobin level, anaemia during pregnancy is categorized as severe if it is less than 7.0 g/dL, moderate if it is between 7.0 and 9.9 g/dL, and mild if it is between 10.0 and 11.0 g/dL. Pallor, easy fatigue, headache, palpitations, tachycardia, and dyspnoea are some of the general and nonspecific symptoms and indicators of anaemia. Long-term severe anaemia can cause angular stomatitis, glossitis, and koilonychias (spoon nails).

4.3.1.5.1 Sub-Theme 1.5.1: Perception of Supply of Haematinics in the Health Care Facilities

Through health education and the distribution of haematinics like folic acid and ferrous sulphates in accordance with maternal guidelines, the health care facilities in Matibidi

Village have significantly contributed to the prevention of anaemia in pregnancy. However, some people were not responsible enough to go and access the health care services necessary for everyone. According to DoH Maternity Guidelines from 2016, every woman who visits the clinic for ANC must have her haemoglobin level evaluated in order to establish a baseline and to administer haematinics such as folic acid 5 mg per day and ferrous sulphate 200 mg twice a day to prevent anaemia.

Despite the efforts the DoH makes to avoid anaemia in pregnancy, patients still present with it. One of the reasons could be non-compliance to the treatments. If a woman has a hb level of 7.5 g/dL and lower, she must be transfused with red blood cells. The awareness of the challenges experienced by women during pregnancy or childbirth has been improved via the adoption of a variety of various approaches by maternal health care systems around the world. The Three Delays Model is one of these approaches worth mentioning.

According to research conducted by Ruder et al., (2018), complications during pregnancy can be avoided if adequate and timely treatment is provided. However, the effects could be severe if treatment is postponed and/or insufficient. There are three types of delays here: a delay in deciding to seek care, a delay in getting to a hospital, and a delay in getting the necessary maternal care. The first delay entails early detection of maternal problems and prompt measures to obtain the necessary medical attention. According to statistics, delays of this kind cause 73% of maternal deaths.

National data on anaemia and iron status are available for women of reproductive age only. According to the 2016 South Africa Demographic Health Survey, 33% of women between the ages of 15 and 49 years who are of reproductive age are anaemic. In the 2012 South African National Health and Nutrition Examination Survey (SANHANES) conducted among younger women aged 15-35 years of age, the prevalence of anaemia iron depletion was 23%, 16% and 10%, respectively.

According to the national statistics and systematic reviews, between 23% and 33% of

South African women are predicted to be anaemic when they become pregnant, with iron deficiency being the likely cause in nearly half of these cases. Numerous strategies are being used by the South African government. Firstly, the government, in 2003, introduced a mandatory fortification of maize meal and wheat flour with eight micronutrients, including iron (35 mg electrolytic iron per kg). Secondly, and more particularly, to enhance the position of expectant mothers (Symington, Baumgartner, Malan, Wise, Zicci, Zandburg and Smuts, 2019). Participants supported the findings by indicating the following:

- **Participant 1, Aged 25, Unemployed, Grade 12:**

  Well they give us folic acids, ferrous sulphate and calcium and, yes, I do compile to the treatment.

- **Participant 3, Aged 37, Unemployed, No Grade 12:**

  They give us folic acid where you take one a day, ferrous sulphate where you also take one twice a day, yes I take them daily.

- **Participant 5, Aged 40, Employed, Degree in Human Resource Management:**

  They give us these small yellowish pills and brown ones, I don't know them by their names, I was not really taking them according as per the instructions.

- **Participant 7, Aged 34, Unemployed, No Grade 12:**

  They give us this small yellowish pill and brown ones, I don't know them by their names, I do comply.

- **Participant 9, Aged 24, Unemployed, Grade 12:**

  We receive folic acid, ferrous sulphate and calcium which helps both the baby and me. Also, health education about good nutrition, exercising and many more things concerning health and the baby.

- **Participant 10, Aged 30, Unemployed, Grade 12:**

  Well, I prefer the herbs they give us at church than what we actually get at the clinic, so I was given the yellow pills and brown pills while I was at the clinic.

- **Participant 12, Aged 41, Unemployed, Grade 12:**

  It's the folic and ferrous sulphate tablets, and, yes, I do comply with it.

- **Participant 13, Aged 20, Unemployed, University Student:**

  They give us yellow pills and brown ones and indicate that you must take them every day and they also give us health talk about the importance of eating healthy food.

- **Participant 14, Aged 23, Employed, Diploma in Business Administration:**

  They give us folic acid, which you take once daily, and ferrous sulphate, which you also take once daily. The truth is that I only use them when I remember I have them or when I see them.

- **Participant 15, Aged 37, Unemployed, Grade 12:**

  They give us yellow and brown tablets, I don't drink them accordingly, to be honest.

- **Participant 16, Aged 27, Unemployed, Computer Literacy:**

  They give us health education about the danger signs of labour, they also advise us on the diet. It is not easy to follow the diet, and they also give us these small pills and the brown ones and the ones that you must put in water to drink throughout your pregnancy, and I don't take them every day.

- **Participant 18, Aged 28, Unemployed, Grade 12:**

  They give us yellow and brownish tablets, I've never taken them, I

don't understand them.

- **Participant 19, Aged 23, Unemployed, Student:**

  They give us folic acids, ferrous sulphate and calcium. It's hard for taking them daily.

- **Participant 20, Aged 43, Unemployed, Diploma in Marketing:**

  They give us folic acids, ferrous sulphate, and calcium. Yooh I don't take them daily.

The supporting literature is typically insufficient. A routine nutritional examination as well as daily supplements containing 200 mg of ferrous sulphate (± 65 mg of elemental iron), 1000 mg of calcium, and 5 mg of folic acid are advised by the 2016 South African Guidelines for Maternity Care. In South Africa, regimens can vary by province where pregnant women in Johannesburg receive 170 mg of ferrous sulphate (± 55 mg of elemental iron) along with calcium and folic acid. Supplementation is supplied to all pregnant women irrespective of individual iron or anaemic status; however, the effectiveness of routine antenatal iron and supplementation in preventing anaemia and iron deficiency during pregnancy has not been evaluated nationally. A cross-sectional study at a regional hospital in Durban, South Africa, reported anaemia (haemoglobin < 11 g/dL) prevalence of 43% in 2000 pregnant women between 34 and 36 weeks of gestation, despite receiving routine iron supplements. Determining haemoglobin concentrations forms part of the routine nutritional assessment during ANC, while iron status is only further investigated if referred by a physician since haemoglobin is not a sensitive maker of iron status (DoH,2016).

4.4 Summary

Chapter 4 presented and discussed the findings on factors associated with anaemia of pregnant women residing at Matibidi Village, in Mpumalanga Province. The study concluded that religious beliefs, cultural beliefs and socio-economic issues are the leading cause of anaemia in anaemia in pregnancy in Matibidi Village. The study

concluded that some pregnant women from Matibidi Village that are anaemic are those who don't seek medical attention or undergo antenatal clinical visits, and they prefer herbal medications to health care for the unborn babies. The study also found that an unhealthy balanced diet and some pregnant women who eat whatever they want without considering the nutritional benefit also contribute to anaemia in pregnancy. The next chapter presents the summary, limitations, recommendations, and conclusions.

CHAPTER 5

SUMMARY, RECOMMENDATIONS, LIMITATIONS, AND CONCLUSION

5.1 Introduction

The study's findings, as presented in Chapter 4, identified factors associated with anaemia in pregnancy: a case study in Matibidi Village Thaba Chweni, Mpumalanga Province, South Africa. This chapter provides an overview of the study, recommendations, a summary, and limitations, as well as the conclusions drawn from the study findings and the themes and sub-themes articulated in Chapter four. The recommendations are designed to help midwives and patients combat anaemia during pregnancy.

5.2 Overview of the Study

The study aimed to investigate the various factors associated with anaemia in pregnancy, as well as to describe the barriers and facilitating factors that contribute to anaemia in pregnancy.

5.3 Restatement of the Objectives

The purpose of this study was to explore the factors associated with anaemia in pregnancy at Matibidi Village in Thaba Chweu local municipality, Mpumalanga Province in South Africa. The objectives of the study were to:

- Explore factors associated with anaemia in pregnancy.
- Describe factors associated with anaemia in pregnancy.

The above objectives were achieved through the following:

- Cultural, religious, and socio-economic effects on pregnant women are described. In terms of practices, in-depth, one-on-one interviews were conducted with pregnant women of any age in Matibidi Thaba Chweu local municipality, Mpumalanga Province, South Africa. A total of 20 pregnant women were sampled on purpose, but data saturation occurred at participant number 15.

- Participants described the factors associated with anaemia in pregnancy during interview sessions. As described in Chapter 3 of this study, raw data were transcribed verbatim. Data were analyzed using Tesch's method, and one theme and five sub-themes emerged and were discussed. An independent coder alo examined data transcripts verbatim. Trustworthiness was also used to obtain dense quality data by applying Guba's trustworthiness model's credibility, transferability, conformability, and dependability.

5.4 Summary of the Main Findings

The findings of the study are based on the following themes that emerged during data analysis.

5.4.1 Theme 1: Religious Beliefs

Religious beliefs varied from person to person; for example, members of the Jehovah's Witnesses believe that their members are not supposed to be transfused with red blood cells, which posed a significant risk to patients, especially pregnant women. Imagine finding a patient who is anaemic and does not believe in transfusions. It is yet another challenge that nurses and doctors face on a daily basis in the facilities because they believe that everyone with a low blood count should simply drink beetroot water, which is clearly not a solution and may result in a patient's death, increasing maternal and foetal mortality. On the other hand, some churches, such as the Zionist Christian

Church, use herbal medication to help their members into protect their unborn children, some of the herbs given to patients cause hypertonic contractions, causing the foetus to distress and necessitating an emergency caesarean section. Some women simply pray for protection, which is safe for both the mother and the foetus.

5.4.2 Theme 2: Cultural Beliefs

Because traditional and cultural beliefs in Africa hold that when a woman is pregnant, she is on the verge of death, traditional and cultural models are put in place to protect the mother, ensure the health of the foetus, and that the baby is delivered healthy and safely. Most cultural and traditional practices have two outcomes: positive outcomes that benefit both the mother and the child, and negative outcomes that cause complications. For example, women are not supposed to eat certain foods that are thought to cause jaundice in unborn children. Major foods considered harmful to pregnancy include eggs, fish, meat, pawpaw, banana, eggplant, beans, oranges, and peas; according to them, the food causes jaundice in the unborn child. Some women are forced by their husbands to go the traditional route, such as going to a traditional healer for herbal medication to protect themselves and the foetus. The problem with herbal medication is that there are no dosages; you simply drink it. The main challenge or problem could be the dosage, which is harmful to both the foetus and the mother.

5.4.3 Theme 3: Chronic Conditions

Having low red blood cell counts as a result of autoimmune disorders (diseases in which the body's immune system targets joints and/or organs) or other chronic illnesses lasting more than three months. This condition is also known as anaemia of inflammation or anaemia of inflammation and chronic disease. Anaemia is caused by a variety of conditions, including HIV/AIDS, infections, chronic kidney disease, tuberculosis, and heart failure, to name a few. Anaemia, as a global health issue, is exacerbated by pre-existing conditions such as HIV/AIDS, tuberculosis, malaria, nutritional deficiency, and ingestion of non-nutritional substances (pica), particularly during pregnancy. Dietary inflammation causes anaemia in patients with pulmonary

tuberculosis. Malaria anaemia is multifactorial, with the symptoms include the mandatory destruction of non-parasitized red blood cells, bone marrow dysfunction that can last for weeks, reduced red cell survival, and increased splenic clearance. Massive gastrointestinal bleeding can also contribute to malaria anaemia.

5.4.4 Theme 4: Socio-Economic Status

Pregnancy-related food beliefs may influence adequate nutrition during pregnancy, which is critical for the health of both the mother and the newborn. Matibidi is a remote village with no shops; they must travel for approximately 50 km just to get to the shops in order to properly obtain food with good nutrients, which also poses a challenge to pregnant women, as inadequate nutrition is one of the factors leading to anaemia in pregnancy.

5.4.5 Theme 5: Health Care Facilities

Every pregnant woman is started on haematinics such as folic acid 5 mg twice a day and ferrous sulphate 200 mg twice a day; bloods are taken to determine the baseline for the haemoglobin level, if found below 7.5 g/dL then the patients will be transfused with red blood cells, the only challenge is when women do not go to health facilities to get the medication and also the services, women who also follow religious beliefs such as refusing red blood cell concentrates.

5.5 Recommendations

The following recommendations were made based on the findings from the main theme that emerged during data collection through face-to-face interviews with pregnant women at Matibidi Village, Thaba Chweu, Mpumalanga Province, South Africa, Maternal Guidelines of South Africa, (2015), and the information processing model:

5.5.1 Recommendations for Health Care Providers (Midwives)

- Midwives in Matibiti Village should ensure that their preconception, antenatal, perinatal, and postnatal health discussions are holistic,

incorporating the religious beliefs and practices identified in this study.

- They must consider the women's individual, personal practices and preferences, such as emphasizing the use of Mopani worms and mites to prevent anaemia instead of red meat.

- Cultural beliefs and practices should be at the heart of all promotional and preventive health materials distributed to women across all platforms, including social media, flyers, and posters.

5.5.2 Recommendations for Policy Makers

- The findings of this study should be used by the district's maternal, women, and child health directorate to tailor national policy guidelines to Matibiti's individual, personal, community, and cultural preferences.

- The health care providers should encourage all childbearing women to receive mandatory haematinics because they are at risk of malaria, tuberculosis, and HIV infections.

5.5.3 Recommendations for Future Research

- More research should be conducted on strategies to assist midwives in embracing individual, cultural, religious practices, and beliefs so that midwives can provide effective early ANC.

- A follow-up study in the same area to assess the impact of the recommendations made in this study on the prevalence of anaemia in pregnancy.

5.6 Limitations of the Study

The study's sample does not represent the views of all women; rather, it reflects the views of pregnant women in Matibidi Village, Thaba Chweu municipality, Mpumalanga Province, South Africa. However, the goals of this study were to use rich, dense, and

contextualized data to Explore and describe the factors associated with anaemia in pregnancy.

5.7 Conclusion

Cultural and religious beliefs among pregnant women pose a significant barrier to combating anaemia in pregnancy and utilizing health-care services in Matibidi Village. The study findings may aid in increasing the number of pregnant women who seek early ANC, thereby improving maternal and neonatal health.

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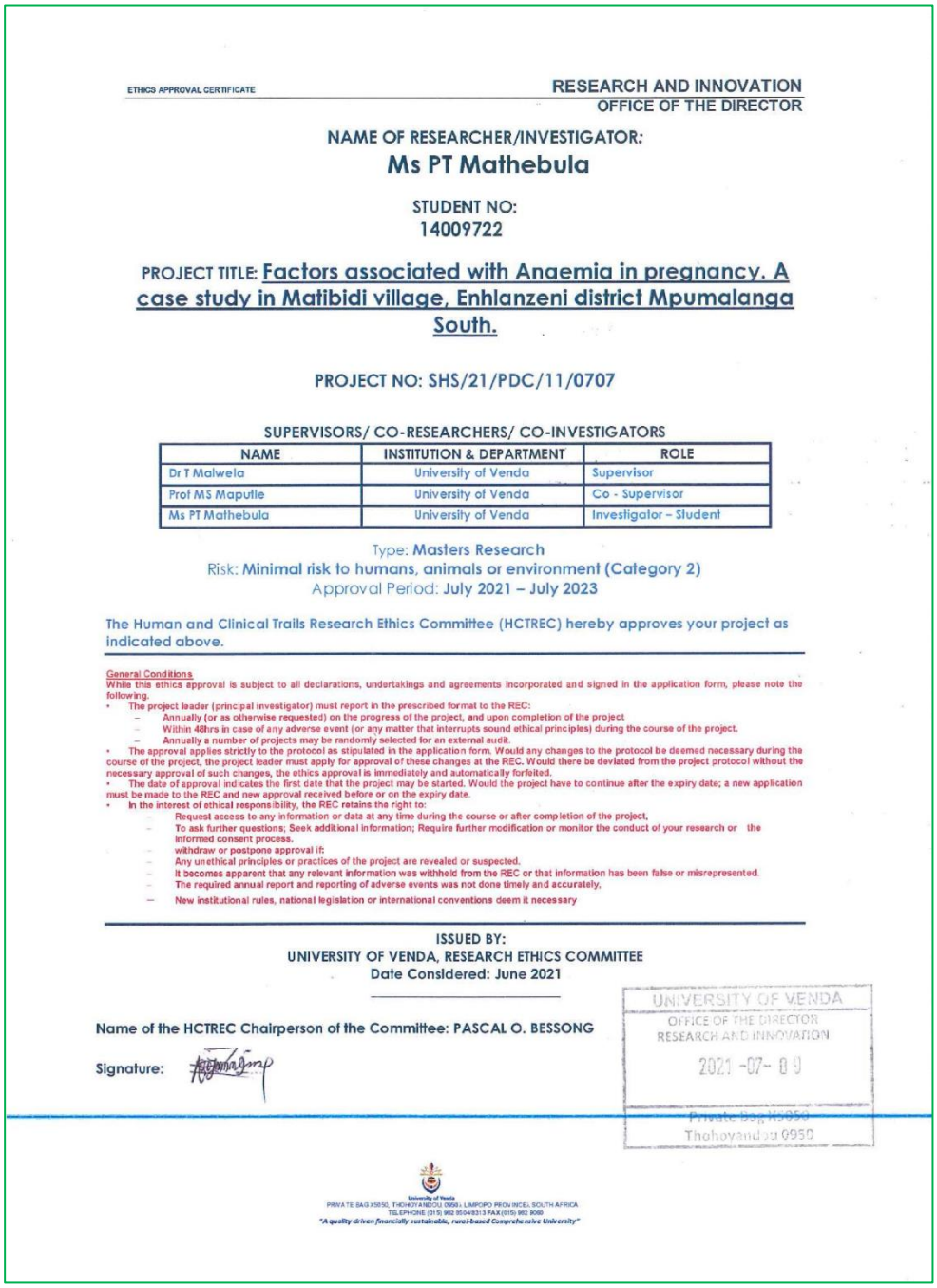
ANNEXURE 1

ETHICS CLEARANCE CERTIFICATE



ETHICS APPROVAL CERTIFICATE

RESEARCH AND INNOVATION
OFFICE OF THE DIRECTOR

NAME OF RESEARCHER/INVESTIGATOR:
Ms PT Mathebula

STUDENT NO:
14009722

PROJECT TITLE: **Factors associated with Anaemia in pregnancy. A case study in Matibidi village, Enhlanzeni district Mpumalanga South.**

PROJECT NO: SHS/21/PDC/11/0707

SUPERVISORS/ CO-RESEARCHERS/ CO-INVESTIGATORS

NAME	INSTITUTION & DEPARTMENT	ROLE
Dr T Malwela	University of Venda	Supervisor
Prof MS Maputle	University of Venda	Co - Supervisor
Ms PT Mathebula	University of Venda	Investigator – Student

Type: Masters Research
Risk: Minimal risk to humans, animals or environment (Category 2)
Approval Period: July 2021 – July 2023

The Human and Clinical Trails Research Ethics Committee (HCTREC) hereby approves your project as indicated above.

General Conditions
While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, please note the following.

- The project leader (principal investigator) must report in the prescribed format to the REC:
  - Annually (or as otherwise requested) on the progress of the project, and upon completion of the project
  - Within 48hrs in case of any adverse event (or any matter that interrupts sound ethical principles) during the course of the project.
  - Annually a number of projects may be randomly selected for an external audit.
- The approval applies strictly to the protocol as stipulated in the application form. Would any changes to the protocol be deemed necessary during the course of the project, the project leader must apply for approval of these changes at the REC. Would there be deviated from the project protocol without the necessary approval of such changes, the ethics approval is immediately and automatically forfeited.
- The date of approval indicates the first date that the project may be started. Would the project have to continue after the expiry date; a new application must be made to the REC and new approval received before or on the expiry date.
- In the interest of ethical responsibility, the REC retains the right to:
  - Request access to any information or data at any time during the course or after completion of the project,
  - To ask further questions; Seek additional information; Require further modification or monitor the conduct of your research or the informed consent process.
  - withdraw or postpone approval if:
  - Any unethical principles or practices of the project are revealed or suspected,
  - It becomes apparent that any relevant information was withheld from the REC or that information has been false or misrepresented.
  - The required annual report and reporting of adverse events was not done timely and accurately,
  - New institutional rules, national legislation or international conventions deem it necessary

ISSUED BY:
UNIVERSITY OF VENDA, RESEARCH ETHICS COMMITTEE
Date Considered: June 2021

Name of the HCTREC Chairperson of the Committee: PASCAL O. BESSONG

Signature:

UNIVERSITY OF VENDA
OFFICE OF THE DIRECTOR
RESEARCH AND INNOVATION
2021 -07- 09
Private Bag X5050
Thohoyandou 0950

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ANNEXURE 2

LETTER TO TRADITIONAL AUTHORITY

University of Venda

Private Bag X5050

Thohoyandou

0950

Tribal Authority

Re: Request for Permission to Conduct A Research Project

I, Mathebula Present Tresure, a Master of Nursing Student at the University of Venda, hereby request for permission to conduct a research project in your community. My research topic is “Factors Associated with Anaemia in Pregnancy in Matibidi Village Ehlanzeni District, Mpumalanga Province, South Africa”.

The study entails and plan to interview women who are pregnant. The interviews will be conducted in the participants’ homes.

I therefore hope that my request will receive your favourable attention.

Yours truthfully

Mathebula Present Treasure

Student No: 14009722

Contact: 079 370 2624

ANNEXURE 3A

LETTER OF INFORMATION

RESEARCH ETHICS COMMITTEE

Title of the Research Study: Factors Associated with Anaemia in Pregnancy. A Case Study in Matibidi Village, Enhlanzeni District, Mpumalanga, South Africa

Principal Investigator/Researcher: Present Tresure Mathebula

Co-Investigators/Supervisor: Dr T. Malwela and Prof M.S. Maputle

Introduction and Purpose of Study

Anaemia in pregnancy is still a number one problem in women who dwell much in cultural and traditional practices during pregnancy. The purpose of this study is to describe and explore the factors associated with anaemia in pregnancy.

Outline of Procedures

The participants will be women who are pregnant, who will be selected purposefully and will be asked questions regarding the factors associated with anaemia in pregnancy. The inclusion criteria for participants are pregnant women who are/were pregnant. The tools that will be used to obtain information are interview guide and audio recorder, as well as the researcher as the main tool to collect data. In-depth interviews will be conducted with follow ups until data is saturated on their working environment, no placebo or any treatment will be given. Only 30 – 1h30 minutes can be used. Participants are expected to give any information they know regarding the topic.

Risks or Discomforts to the Participant

The participants will experience no risk as the aim of the study is to get information so that recommendations can be made, and challenges can be addressed to relevant stakeholders.

Benefits

The benefits to participants will be information regarding the consequences of cultural and traditional practices during pregnancy. To the researcher, the benefits will include an improved health service and, qualification for master's in nursing.

Reason/s Why the Participant May Be Withdrawn from the Study

Participant may be withdrawn due to non-compliance, illness or when she decides to withdraw participation with the study and there will be no adverse consequence or penalties.

Remuneration

There will be no monetary or other types of benefit/remuneration to be received.

Cost of study

Participants are not expected to cover any cost towards the study.

Confidentiality

Confidentially and anonymity will be ensured by providing each participant with a code name to conceal the real name. Code names will be used when discussing and analyzing data. Master list of participants' names and matching codes will be kept safe during the study process and after the study is complete the list of real names will be destroyed by the researcher. The information will not be given to anyone except the supervisor and the University Research Ethics committee on demand.

Research-Related Injury

There will be no form of compensation should there be any research related injury or adverse effects.

Persons to Contact in the Event of Any Problems or Queries

Mathebula P.T. 081 214 8560 email: presenttreasurem@gmail.com or my supervisor. Dr Malwela T 0789115972 email: thivhulawi.malwela@univen.ac.za, Co-Supervisor Pro. Maputle M.S. 082 757 2013 or the University Research Ethics Committee secretariat on 015 962 9058. Complaints can be reported to the Director: Research and Innovation, Prof G.E. Ekosse on 015 962 8313 or Georges Ivo. Ekosse@univen.ac.za.

General

Participation is voluntary, refusal to participate will not involve any penalty and withdrawal from participation by participant can be made anytime without risk to the wellbeing of the participants or the profession.

ANNEXURE 3B

PAPILA RA MAHUNGU

Nhlokomhaka ya vulavisisi bya ndyondzo: ntiyiso lowu vangaka vuvabyi nga ti loko munhu abihe emirini

Mulavisis nkulu: Present Tresure Mathebula

Murhangeri wa malavisisi nkulu: Dr T. Malwela and Prof M.S. Maputle

Ntiviso na xikongomelo ya dyondzo

Vuvabyi byaku xota ngati loko munhu abihe mirini byahari vuvabyi lebyi hetaka vavasati , ngopfu lava va hanyaka hikuya hi xinto na ndhavuko loko munhu a bihe mirini. Xikongomelo xa dyondzo leyi iku hlavutela na kuhumesela handle swiyimo leswi nga endla kuri vavasati lava va biheke marini vava na vuvuvabyi bya nkati.

Maendlelo ya swilo

Vangheneleli vata va vavasati lava biheke mirini, lavangata hlawula xinfumo vatlhela va vutisiwa swivutiso mayelana na dyondzo ya swivangelo leswi endlaka kuri munhu loyi abiheke mirini atikuma ari na ngati yoxota. Lava va nga nghenisiwa ka dyondzo leyi ivavasati lava biheke mirini. Switirhisiwa leswinga ta tirhisiwa ku kuma mahungu ya nkambelovutivi kutava, nkambelotivo tsundzuxa na nkandziyiso wa rito, xikanwe na mulavusisi tani hi munhu loyi afaneleka ku teka mahungu. Ntivonkulu wuta endliwa kutlhela ku landzeleliwa kuze dyondzo yiya fika makumu endhawini yo tirhela, akuna murhi lowu wungata nyikiwa, nambela ntivo wuta heta 30-45 watiminetse. Hinkwavo lava vanghenelelaka va languseliwa kuvula hinkwabyo vutivi lava vangana byona mayelana na dyondzo.

Khombo kumbe kunga tshamiseki ka vanghenelelí

Va nghenelelí va ngeti kumi vari nghozini hikuva xivangelo xa dyondzo iku kuma hungu leswaku, kutava na swi tsundzuxo leswingata endliwa na swirhalanganyi swita kota ku lulamisiwa eka vinyi va mikabelo lava faneleke.

Mbuyelo ka va nghenelelíwa hi mayelana na hungu leri vangiwaka hi hanyelo ra hina ra ndhavuko na xinto loko wansati abihe mirini. Eka mulavisisi mbuyelo wutava ku ampyisa eka rihanyu na ku pasa “Masters” ya swavuongori

Swivangelo leswi endla leswaku munhu anga pfumeleliwa ku tshika nkambelontivo

Munghenelelí anga tshika kambelontivo loko, avabya, anga koti ku langzelela swilaveko swa dyondzo, kumbe loko atsakela ku angahayi emahlweni na dyondzo and akungevi naswi tandzhaku.

Ku khensa hi mali

Akuna mali kumbe tinyiko leti ngata nyikiwa va ngheneli va dyondzo

Kudurha ka dyondzo

Hinkwavo vangheneleli va dyondzo leyi ava fanelangi ku humesa mali leyi ngata pfuna ka dyondzo leyi.

Xihundla

Xihundla na kunga tiveki swita tiyisiwa hi ku tirhisiwa ka mavito ya khodi leswaku kunga humeseliwi handle mavito ya ntiyiso, mavito ya khodi mata tirhisiwa loko ku vulavuriwa naku hleliwa ka hungunyana. Longoloxo wa vanhu hinkwavo lava nga nghenelela eka dyondzo lowu, na hungunyana yofana swita vekiwa ndhawu leyi hlayisekeke, loko dyondza yaha ya emahlweni, loko dyondzo yi fike makumu, longoloxo lowu wungana mavito ya va nghenelela ya ntiyiso mata lahliwa hi mulavisisi. Mahungu madyondzo leyi manga nyikiwi mungu unwana handle ka murhangeri wa mulavisisi na komiti ya swavulavisisi bya xikolo xa university of Venda.

Mi vaviseko yi fambelanaka na dyondzo

Akuna kurilisiwa ko karhi loko munhu angaku kumanga loko ko tshika kuri naku vaviseka ko karhi loku fambelanaka na dyondzo leyi landelaka.

Loko kuri na swivutiso swo karhi kumbe kuri nati nkingha to karhi fonelani vanhu lava landzelaka

Mathebula P.T. 081 214 8560 email: presenttreasurem@gmail.com or my supervisor. Dr Malwela T 0789115972 email: thivhulawi.malwela@univen.ac.za, Co-Supervisor Prof. Maputle M.S. 082 757 2013 or the University Research Ethics Committee secretariat on 015 962 9058. Complaints can be reported to the Director: Research and Innovation, Prof G.E Ekosse on 015 962 8313 or Georges Ivo. Ekosse@univen.ac.za.

Hi ku angarela

Nghenelelo awu bohi, ku ala ku nghenelela eka dyondzo leyi, kungevi na xigwevo, munghenelelo anga tshika nkarhi wihi na wihi kungari na swi tandzhaku.

ANNEXURE 4A

UNIVEN INFORMED CONSENT

- I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.
- In view of the requirements of research, I agree that the data collected during this study can be recorded and processed in a computerized system by the researcher.
- I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during the course of this research which may relate to my participation will be made available to me.

Full Name of Participant	**Date**	**Time**	**Signature**
I, ...	.....	…….	.....

(Name of researcher), herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

Full Name of Researcher	**Date**	**Time**	**Signature**
I, ...	.....	…….	.....

Full Name of Witness	**Date**	**Time**	**Signature**
I, ...	.....	…….	.....

Full Name of Legal Guardian	**Date**	**Time**	**Signature**
I, ...	.....	…….	.....

ANNEXURE 4B

UNIVEN PAPILA RA MPFUMELELANO

- Ndza switiva leswaku mbuyelo wa dyondzo, ku katsa na vuxokoxoko bya mina byo fana na, rimbewu, malebe, siku ro velekiwa xikanwe na mavabyi ya min swinga humeseliwi handle ko humesela handle vu mina.
- Hi kokwalaho ka swilaveko swa ndzavisiso lowu, ndza pfumela leswaku hungunyana leri ta tekiwa edyondzweni ringa kandziyisiwa hi mulavisisi
- Ndzi nga kota ku tshika ndzi ngaha yi emahlweni na ndzavisiso nkarhi wihi na wihi loko ndzititwa ndzinga haswi tsakeli.
- Ndzi kumile nkarhi wotala wo vutisa swivutiso, ndzinga sindzisiwanga ndza pfumela kuva ndzi nga vutisiwa swivutiso mayelana na ndzavisiso lowu.
- Ndzi twisisa nkoka wa ku leswi nga ta kumiwa loko ku endliwa vulavisisi wuta tivisiwa na leka mina.

Mavito mahelerile ya mulavisisi	**Siku**	**Nkarhi**
Nsayino, ...	.....	…….....

(Vito ra mulavisis) ndzi pfumela leswaku vangheneleli lava ngala henhla va byeriwile hivutalo mayelana na ntumbuluko, vu-endli na makhombo ya dyondzo leyi.

Mavito mahelerile ya mulavisisi	**Siku**	**Nsayino**
.....	.....	……

Mavito ma helerile	**Siku**	**Nsayino**
.....	.....	……

Mavito ma helerile kumbe mutswari	**Siku**	**Nsayino**
I, ...	.....	……

ANNEXURE 5

INTERVIEW GUIDE

Factors related to Anaemia	Questions
Religious Factors	**Acceptance versus rejection of blood transfusions.** ✸ Which Indigenous practices are performed when a woman is pregnant? ✸ Care and treatment in the health facilities? ✸ What are the Indigenous and religious health education given to pregnant women by elders and church leaders?
Cultural Factors	✸ What are the cultural beliefs practiced when a woman is pregnant? ✸ What are Food restrictions and food permitted during pregnancy?
Chronic Conditions	✸ How does HIV/AIDS and TB lead to anaemia in pregnancy? ✸ How does Malaria lead to anaemia in pregnancy? ✸ How does Autoimmune disorders lead to anaemia in pregnancy?
Socio-Economic Status	✸ How does `Financial instability and living conditions affect you during pregnancy? ✸ How does unavailability of good nutritional food affect you during pregnancy?
Health Facilities	✸ Which haematinics are supplied in the health care facilities?

Ntiyiso lowu endlaku leswaku kuva na vuvabyi bya ngati.	✸ Swivutiso.
Ripfumelo ra vukhongeri	✸ Ma pfumeleliwa kumbe ku aleriwa ku pfumela ku cheliwa ngati ya unwana munhu? ✸ Hiswihi leswi xinto na dyondzo leyi nyikiwaka hi vakulukumba va kereke, leyi nyikiwaka loko wansati a buhe mirini? ✸ Vutshunguri arti ndawini tarihanyo hitini? ✸ Which Indigenous practices are performed when a woman is pregnant? ✸ Care and treatment in the health facilities? ✸ What are the Indigenous and religious health education given to pregnant women by elders and church leaders?
Ntiyiso wax into lowu endlaka leswaku kuva navuvabyi bya ngati loko wansati abihe mirini	✸ Hi byihi vutivi llllbya xinto lebyi endliwaka loko munhu abihe mirini? ✸ Hiswihi swakudya leswinga pfumeleriwiki na leswi pfumelelaka loko munhu abihe mirini?
Vuvabyi byoka byinga tshunguleki	✸ Vuvabyi bya xitsongwa tsongwa na mavabyi yarifuva ma endla njhani kuri munhu ati kuma ari na mavabyi ya kuxota ngati? ✸ Mavabyi ya tinsuna kunga maliya ma endla njhani leswaku munhu atikuma ari na vuvabyi bya ku xota ngati? ✸ Mavabyi lama yo masocha ya miri ma jikelana swi endla njhani swaku munhu ati kuma ari navuvabyi byo xota ngati?
Matshamelo ya swatimali	✸ Ku pfumala mali loko munhu abihe mirin swiva na switandzhaku swini? ✸ Kukala ka swakudya leswi swini nonisaka miri swi va naswitandzhaku swihi loko munhu abihe mirini?
Ndhawu ya rihanyo	✸ Minyikiwa murhi kumbe maphilisi waha etindhawini tari hanyo?

ANNEXURE 6

PERMISSION FROM TRIBAL AUTHORITY TO CONDUCT THE RESEARCH

Mohlala Traditional Council

Po Box 781

Graskop

1270

University of Venda

Private Bag X5050

0950

CC: Mathebula Present Treasure. 14009722

RE: PERMIT TO CONDUCT RESEARCH SURVEY

This is to Clarify that Miss Mathebula Present Treasure, Student number 14009722 was given the permission to conduct her research suNey under the Topic" Factor associated with Anaemia in pregnancy in Matibidi Village Enhlanzeni District Mpumalanaga. The Matibidi Village falls under the Jurisdiction of the Mohlala Tribal Authority.

Hope this will be taken into Consideration

Yours in Regard

MM Mabilu

Contact number 0826682564

ANNEXURE 7

EHLANZENI DISTRICT TRANSCRIPTS

Transcript 3

Researcher: Can you explain to me, the indigenous practices or the rituals religiously that are done during pregnancy to ensure that one caries the pregnancy to term?

Participant: *At church we drink tea (mohamulo) which is a combination of Joko tea and water, the tea will be taken from the time we discover that we are pregnant until we deliver, and it helps in protecting the fetus from different evil spirits and sometimes we are told to fetch water from the running river for bathing and drinking and using the water also from making tea, so that we can be protected.*

Researcher: Wow that's interesting so according to your religion. What is it that is supposed to be done when you are found to be anemic? Do you allow blood transfusions or blood transfusions are not allowed?

Participant: *Oh yes, my church has no problem when it comes to blood transfusion and they also allow us to go health care facilities when we experience any problems regarding our pregnancy.*

Researcher: Okay now tell me which foods are you not supposed to eat during pregnancy and why?

Participant: *I eat whatever I feel like eating at that time depending on my cravings it's more like the mixture of healthy and unhealthy foods. Sometimes when you are pregnant you can't help but to eat whatever you feel like eating, even though sometimes we crave clay and end up eating it knowing very well that it does not benefit us in anyway.*

Researcher: I understand that culturally we are made to believe that when you are married you need to have many children, do you believe that being married is having too many children, and don't you think it places you in real danger of being anemic?

Participant: *I don't believe that having too many kids can actually make you anaemic what the nurses tells us at the clinic is that if you eat a lot of clay soil you can be anaemic, but on second thought there is someone I know who has seven children and I hear that she was transfused with red blood cells after delivery so I think it can be that it causes the disease.*

Researcher: True it makes sense; do you think that chronic conditions, like HIV/AIDS, TB, Auto immune conditions and Malaria lead to anaemia in pregnancy and how?

Participant: *Eish! I am not sure about that my child, you know this one needs you because you went to*

school (laughs).

Researcher: Hhmmm (laughs) so how does unemployment and poor living conditions, unavailabity of nutritional foods, how do you think affect pregnancy?

Participant: *You know the place we live in, it's very tough there are no shops nearby where we can actually buy good nutritional food, the market nearby sell by date's food. Being unemployed is very tough my dear.*

Researcher: When going to the health facilities what medications do you get? And do you fully comply?

Participant: *They give us folic acid where you take on a day, ferrous sulphate where you also take one twice a day. Yes, I take them daily.*

Researcher: Okay we have come to the end of our interview, thank you so much for your time and being honest with me, aswel as answering all questions I had, I really appreciate it.

Participant: *Thank you. I enjoyed talking to you too. Take care.*

Researcher: Thank you take care too.

ANNEXURE 8

CODING CERTIFICATE

Qualitative data analysis

MASTER OF NURSING SCIENCE

OF

TREASURE PRESENT MATHEBULA

THIS IS TO CERTIFY THAT:

Professor Tebogo M. Mothiba has co-coded the following qualitative data:

Unstructured one-to-one interviews

For the study:

FACTORS ASSOCIATED WITH ANAEMIA IN PREGNANCY: A CASE STUDY OF MATIBIDI VILLAGE, EHLANZENI DISTRICT MPUMALANGA IN SOUTH AFRICA

I declare that the candidate and I have reached consensus on the major themes reflected by the data. I further declare that adequate data saturation was achieved as evidenced by repeating themes.

Prof TM Mothiba

SEPTEMBER 2021

TM Mothiba (PhD)

ANNEXURE 9

CONFIRMATION BY LANGUAGE EDITOR

CONFIRMATION BY LANGUAGE EDITOR

Prof Donavon C. Hiss

Cell: 072 200 1086 | E-mail: hissdc@gmail.com or | dhiss@outlook.com

7 November 2022

To Whom It May Concern

This serves to confirm that I have edited the language, spelling, grammar and style of the **Master of Nursing** dissertation by **Present Tresure Mathebula**, titled: "**Factors Associated with Anaemia in Pregnancy: A Case Study of Matibidi Village, Ehlanzeni District, Mpumalanga, South Africa**" The manuscript was also professionally typeset by me.

Sincerely Yours

Cert. Freelance Journalism, Dip. Creative Writing, MSc (Medicine), PhD