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FACTORS INFLUENCING INTAKE OF IRON AND FOLIC ACID
SUPPLEMENTS AMONG PREGNANT WOMEN ATTENDING ANTENATAL
CARE SERVICES AT CHINHOYI PROVINCE HOSPITAL, ZIMBABWE

BY

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE DEGREE OF MASTER OF PUBLIC HEALTH IN
THE COLLEGE OF HEALTH, AGRICULTURE AND NATURAL SCIENCES

2025

Abstract

Iron and folic acid (IFA) are micronutrients that are necessary for the human bodies normal functioning and development. Deficiencies in iron and folic acid during pregnancy can have a severe influence on both the health of the pregnant woman and the development of the foetus. This can be corrected by uptake of iron and folic acid supplements during pregnancy, though this is known to be low in low-resource settings. We therefore set to determine factors influencing the intake of iron and folic acid supplements among pregnant women attending antenatal care services. The study used a descriptive case study focused on pregnant women who visited Chinhoyi Provincial Hospital for antenatal care. Data was collected using a interviewer administered questionnaire after observing acceptable research ethical considerations. After enrolment and history taking, data on socio-demographic, behavioural and reasons for not taking supplements was all described using frequencies and percentages. The study enrolled 232 women of which, the majority were either in the 18-25 (n=58) or 26-34 years (n=54). More-so, 41.7% and 67% of the women had attained secondary level education and married respectively. Furthermore, the majority of the participants (n=72; 35%) resided at a farm or mine. The prevalence of a previous anaemia and past pregnancy related complications was 32.5% and 24.3% respectively. Overall, a mean of 4.1 showed that most women are compliant with medical advice received from medical personnel. In addition, uptake of iron and folic acid supplements in the past five-years was 32.5% and this was mainly due to reported anaemic condition. The majority of the participants (47.6%) indicated that they took the supplements as a directive from a health worker. Of the reasons affecting uptake of iron and folic acid supplements, participants highlighted lack of knowledge (8.7%), lengthy time of taking supplements (10.7%), unavailability of tablets at health facilities (15.5%) and side effects (21.8%) as the major ones. The study notes that, the prevalence of anaemia compares with regional countries as established in extant research. Lack of knowledge among women and unavailability of tablets at clinics are among the reasons affecting uptake of supplements among pregnant women. We therefore recommend the Ministry of Health and Child Care to intensify its community awareness programs to raise knowledge and understanding of the benefits associated with iron and folic acid supplements as well as the risks associated with the failure to prescribe the medications. In addition, relevant authorities prioritize stocking of supplements at all levels of health institutions.

Key words

Anaemia; Antenatal care services; Iron and folic acid supplements; Pregnant women

Declaration Page

I declare that this dissertation is my original work except where sources have been cited and acknowledged. The work has ever been submitted, nor was it ever be submitted to another university for the award of a degree.



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Acknowledgements

Special thanks go to the Medical Superintended Chinhoyi Provincial Hospital, my academic supervisor, Dr Mugomeri and my field supervisor, Miss Chinyama for their technical guidance in conducting the study. Many thanks also go to my family and colleagues for their guidance and support during the study.

Dedication

I dedicate this dissertation to my loving family and special thanks to my daughter Kylie who has been a pillar of strength and a constant source of encouragement and support during the academic years. I am truly thankful for having you all in my life.

List of Acronyms and Abbreviations

ANC	Antenatal Care
Hb	Haemoglobin
IFAS	Iron and Folic Acid Supplements
Mg	Milligrams
SSA	Sub-Saharan Africa
WCBA	Women of childbearing age
WHO	World Health Organisation
ZDHS	Zimbabwe Demographic Health Survey

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CHAPTER 1 INTRODUCTION

1.1 Introduction

Iron and folic acid (IFA) are micronutrients that are necessary for the human bodies normal functioning and development. Iron is a mineral that can be found in practically every human cell. It serves a variety of purposes in the human body. The erythrocyte protein haemoglobin is crucial for transporting oxygen from the lungs to the cells. It is a component of myoglobin, which acts as an oxygen reservoir in the muscles. It is required for hormone and neurotransmitter production. Most enzymes essential for the metabolism of glucose and fatty acids required for bodily function contain iron as a component (Gathigi, 2011). Dried beans, dried fruits, egg yolk, iron-fortified cereals, and liver are the finest sources of iron. Iron is also found in lean red meat, particularly beef, oysters, poultry, dark red meat, salmon, tuna, and whole grains. Iron is also present in reasonable proportions in lamb, pig, and seafood. The body has a harder time absorbing iron from vegetables, fruits, cereals, and supplements (Jacobs, et al., 2000).

Iron deficiency is common globally; however, in pregnant women it continues to be the most common nutritional issue worldwide (Loy et al., 2019) and this is because many women have insufficient iron reserves when they first become pregnant (Cappellini et al., 2020). Lack of iron is classified as the reduction in haemoglobin concentration below 11 g/dl for the first and third trimesters and 10.5 g/dl for the second trimester that takes place in a woman's body during pregnancy and restricts the supply in various tissues is referred to as the problem in pregnancy (Moghaddam Tabrizi & Barjasteh, 2015). In particular, factors such as dietary iron intake, body iron

stores, the body's digestive system's ability to adapt, and supplement administration, have an impact on iron status during pregnancy(Beck et al., 2014).

Of note, iron deficiency affects 30% of the world's population, with the majority of whom reside in developing nations(Miller, 2013). Of concern, lack of iron among pregnant women has been associated with various negative foetal health outcomes(Moshi et al., 2021). As such, iron supplementation has been proven to be of high efficacy in improving foetal and infant health(Goshtasebi, A., and M. (2012)) and such recommended for pregnant women. Recommendations for iron and folic acid in pregnancy in Zimbabwe follow the World Health Organization (WHO) recommendations of 60 milligrams (mg) of iron in addition to folic acid daily for all pregnant women at risk of malnutrition to prevent anaemia(World Health Organization. 2007).

However, part-evidence has shown that there's been low uptake of iron and folic supplementation among pregnant women as a result of low levels of knowledge, attitude, and skills demonstrated by the health care providers on the importance of the supplementation(Ba et al., 2019).More-so, a lot with respect to what exactly influences the high or low uptake of iron supplementation among pregnant women remain unclear in Sub-Saharan Africa. More specifically, there is lack of evidence on, (i) what influences women to adhere to iron supplementation (ii) where women get advice to adhere to iron supplementation.

With this in mind, a descriptive cross-sectional study was performed at Chinhoyi Province Hospital in Zimbabwe recruiting pregnant women to determine the factors influencing iron and folic acid supplementation among pregnant women receiving

prenatal care services. The study employed descriptive statistical analysis to describe the uptake of folic and iron supplementation, reasons influencing iron and uptake supplementation and the role of health-care workers in influencing uptake of supplements.

1.2. Background of the Study

Iron deficiency is a major health issue in impoverished communities around the world, contributing to the development of anaemia, a condition in which the quantity of red blood cells or the concentration of haemoglobin in them is lower than normal. Haemoglobin is an essential component of the human body that transports oxygen. The capacity of the blood to transfer oxygen to the body's tissues is reduced in those who have fewer or defective red blood cells, or inadequate haemoglobin. (World Health Organization, 2019). Anaemia is defined as a haemoglobin (Hb) level of less than 11 g/dL in a pregnant woman, which reduces the erythrocytes' oxygen-carrying ability (WHO, 2019).

The most common causes of anaemia during pregnancy are a diet lacking in iron, folic acid, and vitamin B12, iron and folic acid malabsorption, haemorrhage, and helminth infection (Li et al, 2013). According to statistics, more than 40% of pregnant women globally are anaemic, with iron deficiency accounting for half of the cases. Pregnant women require more iron and folic acid to meet both their own and the developing foetus' nutritional demands. (World Health Organization, 2019). From early pregnancy through late pregnancy, the demand for iron increases by six to seven times (Christensen, 2004). Deficiencies in iron and folic acid during pregnancy can have a severe influence on both the health of the pregnant woman and the development of the

foetus. Iron and folic acid supplements have been linked to a lower incidence of iron deficiency and anaemia in pregnant women, according to research. (World Health Organization, 2019).

Maternal anaemia is a serious health problem that affects around half a billion women of childbearing age (WCBA) aged 15 to 49 years per year (Young, 2018). In 2016, the global prevalence of anaemia among pregnant women was projected to be 40.1 percent, compared to 32.5 percent for non-pregnant women and 32.8 percent for all pregnant women (World Health Organization, 2018; Development Initiatives, 2018). When compared to low and middle-income countries, the prevalence of anaemia among non-pregnant and pregnant women is low in high-income countries (Stevens et al., 2013). In 2011, non-pregnant women in high-income nations had a prevalence of 16 percent, compared to 33 percent in North Africa, 48 percent in Central and West Africa, 28 percent in East Africa, and 28 percent in Southern Africa (Stevens et al., 2013). According to 2016 estimates, 27.2 percent of pregnant women in Zimbabwe have anaemia, with 38.2 percent of pregnant women having anaemia and 26.2 percent of non-pregnant women having anaemia (World Health Organization, 2018; Development Initiatives, 2018).

In most cases, anaemia during pregnancy is linked to an unfavourable outcome for both the mother and the infant (Haggaz, 2010). Preterm labour and delivery, low birth weight, and perinatal and maternal morbidity and mortality rates are all increased by anaemia during pregnancy (WHO, 2010). Despite recent suggestions that expectant mothers should be given routine iron supplements during their pregnancy to prevent anaemia, especially in impoverished countries, the global prevalence of anaemia has

remained high. The high frequency of iron deficiency in pregnancy stresses the importance of iron supplementation.

During pregnancy, the demand for iron by both the mother and the foetus increases, necessitating the use of iron and folic acid supplements. Food alone is frequently insufficient to meet this increased requirement. The total maternal demand for additional iron throughout pregnancy is around 800 mg (elemental iron), with about 300 mg going to the foetus and placenta and the rest going to maternal haemoglobin mass increase (WHO, 2010). A pregnant lady need between 2 to 4.8 milligrams of iron each day (Christensen, 2004). The quantity of iron absorbed from food combined with that mobilised from bodily iron stores is typically insufficient to meet the demands of pregnancy. As a result, iron supplementation during pregnancy is routinely recommended (Gathigi, 2011).

However, compliance is a major issue with iron supplements in pregnancy, as most women fail to take the supplements as prescribed by their clinicians for a variety of reasons (Jackson and Seck2008). Despite the fact that there is evidence that treating iron deficiency with iron supplements improves haemoglobin levels during pregnancy, intervention efforts have proven ineffective. As a result, incidences of iron deficiency anaemia have increased, primarily in underdeveloped nations (Haggaz, 2010).

According to Lacerte (2011), iron and folic acid supplementation play a critical role in the prevention and treatment of iron deficiency anaemia, especially in pregnant women whose iron requirements rise in the second trimester and continue to rise until the third trimester. In Chinese research, a supplement containing merely 200mg/5mg of ferrous sulphate and folic acid effectively reduced the occurrence of antepartum and

postpartum bleeding by 80 percent (Berry et al., 1999). In England, taking a daily supplement of such an amount lowered the risk by 70%. (Werler et al., 2003).

A variety of policies have been implemented in Zimbabwe to prevent or rectify iron and folic acid deficiency. Several variables were found to be preventing mothers from taking iron and folic acid supplements as suggested by Mithra et al. (2010). According to the Zimbabwe Demographic and Health Survey (ZDHS) (2015), 83 percent of women who gave birth in the five years prior to the survey took iron and folic acid supplements, and 3% of women took deworming medicine during the pregnancy for their last birth. Iron and folic acid supplements were taken by 40% of women for 90 days or more, as advised, while iron supplements were not taken by 17% of women. (Source: ZDHS, 2015). However, 40 percent of pregnant women in the United States took iron supplements for longer than the recommended 180 days. The lowest percentage of women using iron and folic acid supplements for at least 90 days is found in Harare (19%), while the greatest is found in Mashonaland Central (55%). Urban women were 41% and 44% less likely than rural women to use iron and folic acid supplements, respectively. As a result, anaemia caused by iron deficiency continues to stifle national output (Gadaga, 2009).

1.3. Statement of the Problem

Iron deficiency anaemia is still a major public health issue around the world. According to 2016 estimates, the global prevalence of anaemia among pregnant women was 32.8 percent, with Sub-Saharan Africa accounting for more than 30% of all cases. Iron deficiency was responsible for about half of all anaemia cases worldwide (WHO, 2018). There is evidence that most women in Sub-Saharan Africa do not

follow WHO recommendations for iron and folic acid consumption. This has an impact on foetal development and contributes to the development of infants with birth abnormalities, as well as increasing the risk of mother and child morbidity and mortality (Rahman et al., 2014). Iron deficiency anaemia is responsible for about 20% of perinatal death and 10% of maternal mortality in Sub-Saharan Africa (WHO, 2011). The Ministry of Health and Child Care recommends a daily dose of 60 mg and 400 mcg of iron and folic acid supplements for all pregnant women for 180 days. This is true for all pregnant women, regardless of haemoglobin levels. In Zimbabwe, all women attending prenatal clinics in public health institutions are routinely given iron and folic acid supplements at no cost. Despite free distribution, iron and folic acid supplements adherence has remained low throughout time, with less than 40% of pregnant women taking IFAs for more than 90 days and more than 30% failing to take them at all (ZDHS, 2015). To lower the risk of low birth weight, maternal anaemia, and iron deficiency, pregnant women should take daily oral iron and folic acid supplements for at least 90 days and maintain an iron-rich diet (ZDHS 2015). As a result, it is necessary to investigate the factors that influence iron supplementation intake in order to aid activities aimed at boosting iron supplementation programmes.

1.4. Research Objectives

1.4.1. General Objective

To determine factors influencing the intake of iron and folic acid supplements among pregnant women attending antenatal care services at Chinhoyi Provincial Hospital, Zimbabwe.

1.4.2. Specific objectives

- i. To determine the proportion of iron and folic acid supplements intake in the last five years among pregnant women.
- ii. To determine the socio-cultural factors that influence the intake of iron and folic acid supplements among pregnant women
- iii. To determine the behavioural factors that influence the intake of iron and folic acid supplements among pregnant women.
- iv. To determine the role of health care service providers in influencing the intake of IFAs among pregnant women.

1.4.3. Research Questions

- i. What is the proportion of iron and folic acid supplements intake in the last five years among pregnant women?
- ii. What influence do socio-cultural factors have on the intake of IFA among pregnant women?
- iii. Which behavioural factors that influence the intake of IFA among pregnant women?
- iv. Are health care service providers playing their role adequately to influence the intake of IFAs among pregnant women?

1.5. Study Hypotheses

Adherence to IFAs supplements is significantly associated with gestational age, lack of knowledge of anemia, number of previous pregnancies and number of visits to ANC by the pregnant mother.

1.6. Significance of the Study

Iron deficiency anemia is the most widespread nutritional problem among women and has severe consequences for both their productive and reproductive roles. Maternal mortality rates, infant mortality rates and the incidence of prematurity among anemic women are significantly higher. Iron deficiency anemia is often associated with inadequate maternal weight gain and labour and delivery complications with an increased risk of maternal mortality (Allen, 2000). Iron supplementation has been a major strategy to reduce iron deficiency anemia in pregnancy. However, issues of adherence remain unresolved. The strategies used for control of nutrition problems need regular review to maintain and improve their effectiveness.

1.7 Delimitations of the Study

The research was undertaken with the confines of the following parameters.

1.7.1. Geographical delimitations

The study was limited to Chinhoyi Provincial Hospital, Mashonaland West largest referral health care facility. The Provincial Hospital was chosen due to the fact that it has skilled health workers who are capable of offering high-quality maternal health care. As a result, the study was not focus on the province's primary health care centres.

1.7.2. Research Participant delimitations

Research participants were delimited to pregnant women who visit Chinhoyi Provincial Hospital for prenatal care. Pregnant women who opt to use traditional delivery methods outside the health care set up was not form part of the participants to the study.

1.8. Limitations of the study

Due to the cross-sectional nature of this study, establishing a true cause and effect relationship between adherence status and associated factors would be impossible.

This study might also suffer from recall bias.

CHAPTER 2 LITERATURE REVIEW

2.1. Introduction

The notion of iron and folic acid supplements as it relates to pregnant women in resource-constrained environments was presented in the preceding chapter. Background information and the research topic were highlighted since they aided in the development of research objectives that guided the rest of the study. The purpose of this chapter is to highlight recent discussions about the use of iron and folic acid supplements by pregnant women as a prophylactic measure to reduce the spread of anaemia. Given that pregnant women are unable to create sufficient nutrients from their food throughout pregnancy, iron and folic acid supplements is critical.

2.2. Theoretical framework

The study is premised on the Health Belief Model (HBM) as a theoretical foundation that can explain the decision making process that people go through with regards to health seeking behaviours. The popularity of the Health Belief Model is credited to the works of Rosenstock (1966) who developed the model in an attempt to explain the conditions under which people engage in individual health behaviours such as preventative screenings or seeking treatment for a health condition. Since time immemorial, the Health Belief Model has been used in determination of health seeking behavioural studies that focus on health education and health promotion in different socio-economic-politico contexts.

The influential role of the Health Belief Model is based on its theoretical foundations base on the incorporation of demographic variables, psychological characteristics

internal to an individual. These factors are hypothesised to contribute towards perceptions and health motivation that ignite action with health seeking behaviours.

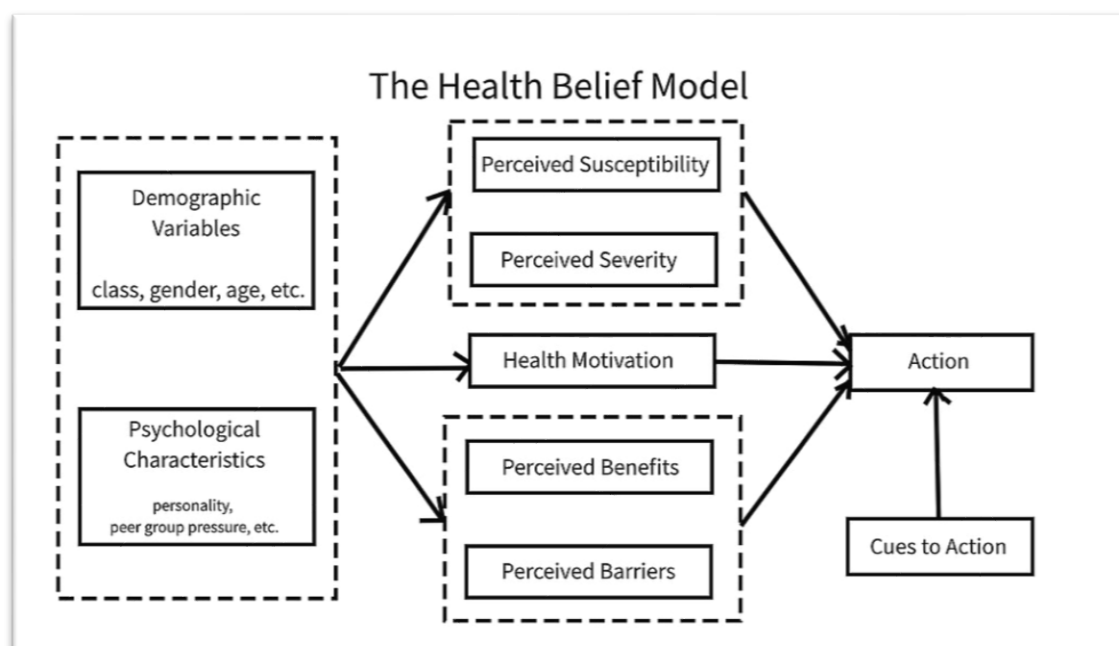


Figure 2.1: The Health Belief Model

2.3. Relevance of the theoretical framework

The Health Belief Model includes individual perceptions, modifying factors and variables likely to affect initiation of action, in this case to visit antenatal care (ANC) clinic or intake to iron and folic acid supplements. Four major constructs on the Health Belief Model are perceived susceptibility, perceived severity, perceived benefits and perceived barriers they are two more constructs which are health motivation and cues to action (Siekmans, Roche, Kung'u, Desrochers & De-Regil, 2018). Each of the perception can be used to explain one's behaviour towards health and health services.

1.2.1 2.3.1 Perceived susceptibility

Perceived susceptibility looks at the personal assessments of pregnant women that make them view themselves as prone to anaemia. Studies have shown that women, who have given birth before, have a lower perceived susceptibility towards contracting anaemia caused by iron deficiency. The levels of perceived susceptibility were found to be high amongst pregnant women on their first pregnancy as they are still developing an awareness of bodily changes. It had been observed that women on their first pregnancy are more amenable to health care advice as they assign a higher level of perceived susceptibility to infection and pregnancy related diseases.

The influential role played by Health Belief Model related to the developments of perceived susceptibility and the severity of non-adherence to iron and folic acid supplements such as the development of anaemia (Agegnehu, Atenafu, Dagne & Dagnew, 2019). Issues relating to the perceived susceptibility towards adherence to iron and folic acid supplements, perceived benefits associated with adherence to iron and folic acid supplements are key determinants of the intake of iron and folic acid supplements by pregnant women.

2.3.2. Perceived Severity

This relates to an individual's personal assessment of the intensity of seriousness of a health condition. In the case of the current study, perceived Severity focus on the health implications of non-adherence to the intake of iron and folic acid supplements. If the consequences of inaction are insurmountable, there is a greater initiative towards favourable health seeking behaviours. When the perceived severity is less intense, an

individual might absolve not to engage in health seeking behaviours such as seeking preventive measures like adherence to iron and folic acid supplements.

2.3.3. Perceived Benefits

Perceived benefits relate to the positive deliverables that are associated with adherence to medical advice and the intake of iron and folic acid supplements. Perceived benefits inspire positive health seeking behaviours amongst people. There was an impressive intake of the Covid-19 vaccination program as people perceived innumerable benefits such as the return to normalcy as characterised by reduction of national lockdowns, and the reduction of other constraints. Health researchers have proven that that intake of favourable health care programs is higher when the intended recipient's perceived benefits associated with favourable health seeking behaviours. With respect to the current study, research indicates that the intake of iron and folic acid supplements is higher where perceived benefits are assumed compared to where perceived risks are high. When pregnant women can foresee beneficial effects linked with the intake of iron and folic acid supplements they are likely to share positive word of mouth in favour of its intake.

2.3.4. Perceived Risks

Perceived risks are high such as the proliferation of negative side effects like vomiting, lack of appetite, weight gain are present, pregnant women were found not to be interested in the intake of iron and folic acid supplements. Psycho-social factors influence the intake of iron and folic acid supplements through the interplay of personal factors that are central to an individual mainly attributed to one's perceptions, their learning, childhood development that determine beliefs, norms and value

systems. Social factors also have a role to play in the health decisions made by pregnant women who are the focus of this study.

2.3.5. Health Motivations

These are drives that inspire favourable health seeking behaviours amongst individuals. Health Motivations are inspired by an individual's demographics and psychographics that influence positive or negative reinforcements with respect to health seeking behaviours. One might be motivated to make health decisions based on the positive deliverables associated with health behaviours. In the context of the current research, positive reinforcements might be linked to the need to deliver a healthy child. On the other hand, negative reinforcements are linked with dreadful consequences of inaction such as the contraction of anaemia due to the negligence in the intake of iron and folic acid supplements.

2.6. The intake of Iron and Folic Acid Supplements

This research focused on the factors that influence pregnant women's intake of iron and folic acid supplements. To balance the physiological demands of adolescence, pregnancy, and lactation, iron and folic acid supplements are essential. During pregnancy, a trace of iron nutrients is essential for the growth and development of the foetus. In the development of the nervous system, iron is essential. Folic acid is a necessary vitamin for the production of neurotransmitters during pregnancy (Agegnehu, et al., 2019). During the process of organogenesis, folic acid is essential for the creation of deoxyribonucleic acid (DNA).

Given that the body cannot produce enough iron and folic acid from the typical diet, there is a considerable demand for iron and folic acid during pregnancy. There is a

requirement to take iron and folic acid supplements. The amount to which pregnant women follow medical recommendations from their health care providers is referred to as adherence to medical regimen. Adherence rates are expressed as a percentage of a patient's recommended prescription dosages consumed over a period of time (Birhanu et al., 2018). Anaemia affects one in every two women, according to statistics, while iron and folic acid deficiency affects one in every two women.

Iron and folic acid supplement deficiency has become a major nutrition-related health issue impacting pregnant women in impoverished communities around the world (Simuyemba et al., 2020). Iron deficiency affects nearly 2 billion people, accounting for more than 30% of the world's population. Postpartum mothers, children aged 6 to 24 months, and pregnant women, who are the subject of this study, are the most vulnerable to iron deficiency

Pregnant women are more susceptible to iron and folic acid insufficiency because they require increased iron and folic acid consumption during pregnancy. Anaemia affects up to 17% of Ethiopian women of reproductive age and up to 22% of pregnant women (Birhanu et al., 2018). The Ethiopian disease control and prevention organisation has established measures requiring pregnant women to take and ingest a daily dose of 60mg iron and 400mg folic acid for a period of six months. From the first month of pregnancy or the first antenatal check-up, these nutrient dosages must be consumed. Three months after delivery, iron and folic acid supplements must be given (Agegnehu et al., 2019).

According to data from health facilities in underdeveloped nations, iron and folic acid insufficiency is a serious health problem with serious repercussions (Agegnehu et al.,

2019). Preterm birth, low birth weight, stillbirth, and maternal and neonatal mortality are some of the harmful effects of iron and folic acid deficiencies in pregnant women. There is a relationship between new-born iron status and maternal fatalities, according to current research. Infants like pregnant women, are vulnerable to iron and folic acid deficiencies.

To avoid the spread of anaemia, it is critical to take preventative steps. With the injection of 1gdl haemoglobin, the risk of death is reduced by 24%, and up to 1.8 million fatalities among infants aged 28 days to 10 years can be prevented (Icyishatse et al., 2019). A study on the prevention of anaemia in Nepal found that steps to deliver iron and folic acid extra tablets for a period of 90 days prior to the 5th month of pregnancy reduced infant mortality by 57 percent. Iron and folic acid supplements are delivered through antenatal care in other countries (Agegnehu et al., 2019).

Poor access to and utilisation of antenatal care, lack of knowledge about the benefits of iron and folic acid supplements and anaemia, negative perceptions of iron and folic acid supplements, and inadequate counselling and information dissemination about iron and folic acid supplements are all factors that contribute to low iron and folic acid supplements intake (Desta et al., 2019). According to existing studies, the ineffectiveness of anaemia prevention and control techniques is to blame for low iron and folic acid supplements adherence among pregnant women (Moshi et al., 2021a). Other studies have found that low iron and folic acid supplements adherence is caused by negative side effects, failure to take iron and folic acid supplements tablets, and limited access to iron and folic acid supplements from medical centres (Desta et al., 2019; Paudyal et al., 2022).

2.6.1. Consequences of the failure to adhere to iron and folic acid supplements

The well-documented consequence of failing to take iron and folic acid supplements is anaemia. Anaemia, defined as a low blood haemoglobin concentration, is a major public health issue that affects people from all walks of life in all countries. Pregnant women are frequently among the most vulnerable groups in the world (Icyishatse et al., 2019). According to a World Health Organization (WHO) report, anaemia affects 38.2 percent of global pregnant women and 46.3 percent of pregnant women in Africa (WHO 2015). The global prevalence of anaemia during pregnancy is estimated to be at 41.8 percent, or 56.4 million women (Sedlander et al., 2020). The continent of Sub-Saharan Africa is the most afflicted, with an estimated 17.2 million pregnant women suffering from anaemia, accounting for nearly 30% of all cases worldwide (Assefa et al., 2019).

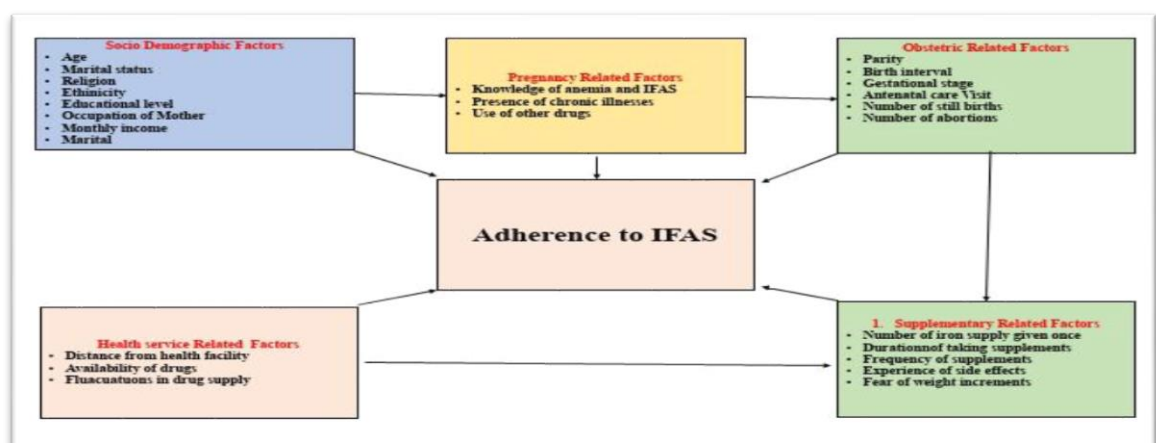
The need for iron almost doubles during pregnancy, and the women's body ability to absorb iron from the usual diet may be compromised in late pregnancy (Obsa et al., 2021). Anaemia is very common among women who even begin their pregnancies with adequate iron stores due to increased demands caused by the pregnancy. Anaemic women when pregnant have increased risk of negative pregnancy outcomes compared to those who become anaemic whilst pregnant (Getachew et al., 2018).

Maternal anaemia is greatly linked with mortality and morbidity of the mother and the child, including risk of miscarriages, stillbirths, prematurity and low birth weight (Lee et al., 2005). It impairs children's development and learning too, further impacting economic productivity and development (Getachew et al., 2018). A number of causes are reported to influence the occurrence of anaemia during pregnancy. Nevertheless,

iron deficiency is the leading cause, constituting 41.8% of the global burden (WHO 2015). Consequently, WHO recommended 60 mg iron plus 400µg folic acid supplementation during pregnancy in areas of iron deficiency anaemia (IDA), prevalence of above 40% (WHO 2014). However, studies show the proportion of pregnant women taking iron and folic acid supplements is much lower, especially in developing countries, and this continues to hinder the prevention of anaemia.

2.7. Conceptual Framework

The conceptual framework showcases different factors that have been proven to influence adherence to iron and folic acid supplements. The conceptual framework is credited to the works of Agegnehu, et al., 2019. The conceptual framework appears to



borrow insights from the Health Belief Model especially with respect to socio demographic factors that prominently feature as part of the HBM.

Figure 2.2: The Conceptual framework

Source: Agegnehu, Atenafu, Dagne&Dagnew (2019:3)

2.8. Factors influencing adherence to iron and folic acid supplements

The conceptual framework by Agegnehu, et al., (2019) identified and classified factors that influence the adherence to iron and folic acid supplements into five categories that include social demographic factors, pregnancy related factors, obstetric related factors, and Healthservice related factors and supplementary related factors. A significant proportion of women lack adherence to iron and folic acid supplements due to the interplay of a variety of factors surrounding iron and folic acid supplements intake. Extant research indicates that a consistent adhere to iron and folic acid supplements is crucial if the prevalence of anaemia, associated morbidity and mortality are to be reduced especially in developing nations.

It has been proven that there is a general lack of awareness amongst women on the benefits of adherence to iron and folic acid supplements, a situation that heightened the risk factors that pregnant women face. A related study on intake of cervical cancer screening underscored that key determinants of the cervical cancer screening programs amongst pregnant women were related to the fear of embarrassment by health care workers, fear of pain and the fear of the coming up with a positive result. Other factors that were highlighted include the inconveniences caused by abnormal cervical smear results, a poor appreciation of what a positive result means and health related barriers in accessing information (Siekman, Roche, Kung'u, Desrochers & De-Regil, 2018). This study is guided by the conceptual framework compiled by Agegnehu, et al., (2019) which categorised factors influencing the intake of iron and folic acid supplements into five classes.

2.8.1. Socio-demographic factors and adherence to iron and folic acid supplements

Socio-demographics such as age, marital status and educational level were reported in many studies to have an impact on women's choice and readiness to be screened for adherence to iron and folic acid supplements anaemia. Research carried out in Southern Brazil included 1,392 pregnant women. It was established that key demographic factors that influence adherence to iron and folic acid supplements were related to skin colour, family income, level of education attained, age at first child birth. Pregnant women with low educational levels, low-income levels and social status and had their first child before 25 years, were likely not to adhere to the intake of iron and folic acid supplements.

Wangu & Lin (2013) reiterated that non adherence to iron and folic acid supplements amongst pregnant Taiwanese women was attributed to low educational levels, unemployment, being a single parent who mainly lived in rural and semi urban area. The study established that socio-demographic factors varied between pregnant women in urban areas and those in rural areas. This might be attributed to differences in the ease of access to reliable information pertaining to the adherence to iron and folic acid supplements. Apart from location, age was singled out as the most significant determinant of the adherence to iron and folic acid supplements amongst pregnant Taiwanese women.

Insights from the works of Hayward & Swan (2012) underscored that age determined the participation of women in IFA intake programs amongst the middle aged groups (40 to 60 years). Within this age group higher levels of education were found to

influence the intake of iron and folic acid supplements. In addition, this age group was characterized by financial security and financial independence which had an effect on the dissemination of reliable information to younger pregnant women that influenced the intake of iron and folic acid supplements.

Other studies on the adherence to iron and folic acid supplements have singled out the poor intake of iron and folic acid supplements among pregnant women as composing 3 categories that include psychosocial factors, organizational and demographics. As outlined in the conceptual framework, demographic factors incorporate the income levels, age, education levels and marital status of pregnant women.

2.8.2. Psychosocial factors and adherence to iron and folic acid supplements

The influential role played by psychosocial factors related to the developments of perceived susceptibility and the severity of non-adherence to iron and folic acid supplements such as the development of anaemia (Agegnehu, *et al.*, 2019). Issues relating to the perceived susceptibility towards adherence to iron and folic acid supplements, perceived benefits associated with adherence to iron and folic acid supplements are key determinants of the intake of iron and folic acid supplements by pregnant women. Psychosocial factors are also captured within the Health Belief Model as key influential factors towards the intake of iron and folic acid supplements.

Perceived susceptibility looks at the personal assessments of pregnant women that make them view themselves as prone to anaemia. Studies have shown that women who have given birth before lower their perceived susceptibility towards contracting anaemia caused by iron deficiency. The levels of perceived susceptibility were found to be high amongst pregnant women on their first pregnancy as they are still

developing an awareness of bodily changes. It had been observed that women on their first pregnancy are more amenable to health care advice as they assign a higher level of perceived susceptibility to infection and pregnancy related diseases.

Perceived benefits relate to the positive deliverables that are associated with adherence to medical advice and the intake of iron and folic acid supplements. Research indicates that the intake of iron and folic acid supplements is higher where perceived benefits are assumed compared to where perceived risks are high. When pregnant women can foresee beneficial effects linked with the intake of iron and folic acid supplements they are likely to share positive word of mouth in favour of its intake. On the other hand, where perceived risks are high such as the proliferation of negative side effects like vomiting, lack of appetite, pregnant women were found not to be interested in the intake of iron and folic acid supplements.

Psycho-social factors influence the intake of iron and folic acid supplements through the interplay of personal factors that are central to an individual mainly attributed to one's perceptions, their learning, childhood development that determine beliefs, norms and value systems. Social factors also have a role to play in the health decisions made by pregnant women who are the focus of this study.

2.8.3. Age and adherence to iron and folic acid supplements

Age has been identified as a key factor towards the adherence to iron and folic acid supplements amongst pregnant women. An Indian study highlighted that young pregnant women (18 to 25 years) are more likely to take up iron and folic acid supplements compared to older women. (Aswathy et al., 2012). These findings were corroborated by a Californian study where older pregnant women were associated with

low levels of up taking iron and folic acid supplements (Leyden *et al.*, 2015). A Latin American research reiterated that women aged from 16 years and above and were aware of perceived benefits associated with the adherence to iron and folic acid supplements were likely to increase the usage of iron and folic acid supplements during pregnancy. Young pregnant mothers who are experiencing their first pregnancy were found to be more likely to adhere to iron and folic acid supplements as opposed to mothers we have had pregnancies before who was write more on their prior experiences with respect to adherence to iron and folic acid supplements.

In Ethiopia, it was found that adherence to iron and folic acid supplements were higher amongst pregnant women aged below 34 years. The research also established the likelihood of married women having a better understanding of the perceived benefits associated with the intake of iron and folic acid supplements among pregnant women (Getahunet *al.*, 2014). Nigerian research reiterated that the age of pregnant women has a bearing on their understanding of health-based issues especially with respect to preventive measures like adherence to iron and folic acid supplements to curtail the onset of anaemia (Ayindeet *al.*, 2015).

2.8.4. Marital Status and adherence to iron and folic acid supplements

The marital status of women has a bearing on decisions pertaining to health seeking behaviours and willingness to adhere to iron and folic acid supplements. Abdullah *et al.*, (2019) found that married women were more likely to develop awareness on iron and folic acid supplements and anaemia risk factors compared to single women. In a related study on the influential role of the marital status construct, Mutuma *et al.*, (2016) found out that women with make partners were more likely to receive support

for cervical cancer screening compared to single women. The supportive context can be related to the within the perspective of the adherence to iron and folic acid supplements amongst pregnant women.

Reviewed studies indicate that marriage provides a support structure upon which the adherence to iron and folic acid supplements can be leveraged amongst pregnant women. Extant research in different social settings concur to the fact that women living with partners were more likely to notice perceived benefits associated with the use and adherence to iron and folic acid supplements compared to single women. This intake can be attributed to the fact that single women might be inundated with sustenance and liveability issues so as not to focus on preventive measures such as adherence to iron and folic acid supplements.

2.8.5. Educational level and adherence to iron and folic acid supplements

Existing research indicate that education play a pivotal role in the sensitisation of women in the intake of iron and folic acid supplements (Utooet *al.*, 2017). The level of education attained by women determines their health seeking behaviours. Women in most indigent communities especially in Sub Saharan Africa are underprivileged when it comes to the acquisition of education (Kotonto & Wakoli, 2021). Higher education is preferred for the boy child as opposed to the girl child in poorest and resource constrained socio-economic contexts.

The Covid-19 pandemic brought the neglect of the girl child where education is concerned to the fore followed reports that more girl children opt out of school in favour of starting families during the extended national lockdowns period. Though the interplay of the covid-19 pandemic and national lockdowns is beyond the scope of the

current research, it brings out significant insights with respect to the low intake of education by a significant number of the girl child in resource constrained settings.

The failure to ensure the attainment of higher levels of education amongst the girl child translate to a low adherence to iron and folic acid supplements upon attaining the first pregnancy. Extant research shows that people with a low appreciation of educations are likely to be grounded in their culture such that they are unlikely to adhere to medical advice on preventive measures such as adherence to iron and folic acid supplements.

2.8.6. Health Service-related factors and iron and folic acid supplements

Health service-related factors pertain to issues that focus on the accessibility of antenatal health care. A sound antenatal care system is assessed based on health outcomes that include governance, sustainability, equality, equity, accessibility, transparency, effectiveness and efficiency.

2.8.7. Governance of the health service

Health related factors influence the intake of iron and folic acid supplements are determined by the governance of the health care system. The Governance dimension focuses on the way in which antenatal health care institutions are run. This encompasses aspects that include health promotion, the promotion of preventive, palliative, curative and rehabilitative care. The presence of an intact referral system from the primary health care facility to tertiary health care facility.

The adoption of private public partnerships within the primary health care sector in Zimbabwe acted as a good governance mechanism to introduce checks and balances in the delivery of antenatal health care across the country. The intervention of non-

governmental organizations in the delivery of antenatal health care in Zimbabwe such as UNICEF and the World health organization has made it possible for the country to ensure that its health delivery system adequate qualified and competent personnel at each level (Xu & Kraemer, 2020).

The inclusion of non-governmental organizations is implementing partners within the primary health care sector in the country was an effective governance mechanism to ensure that all primary health care centres were properly staffed. It also ensured that adequate resources were made available to the community with respect to the circumstances peculiar to those communities. In remote areas, the governing structure is led to the implementation of mobile clinics and healthcare centres that try to reach as much further afield places as possible. This governance aspect was implemented to promote accessibility of primary health care to all people in the country (Soeters&Griffiths, 2003). The main limitation of the governance structure within the health delivery system in Zimbabwe is that people occupy lower positions have limited by gaining power when it comes to influencing the allocation of resources.

2.8.8. Equity and inclusiveness of a health service

When examining a prenatal health care system, equity and inclusivity are key factors to consider. The provision of health care in proportion to needs is referred to as equity. Inclusion, on the other hand, refers to a healthcare system's ability to engage with users so that they may receive antenatal health care. Demographic statistics such as income levels, education levels, death rates, and death rates that are varied within different segments of a population are crucial in fostering equitable healthcare access in the country (Sithole, 2013).

The concept of equity exists to ensure that persons of various social backgrounds have access to high-quality prenatal care, regardless of their demographic traits (Sithole, 2013). As a result, most primary health care centres in the country, particularly those in rural and remote areas, do not charge users fees for antenatal health care. The justification for eliminating user fees is that most people in these impoverished regions are financially stretched to the point where collecting user fees would mean they won't be able to obtain appropriate prenatal health care.

On the other hand, healthcare centres in urban areas usually charge a nominal fee to access antenatal health care based on the argument that people in urban areas are better placed financially to pay and access antenatal health care services. The implementation of a strategy on whether or not to change user fees is informed by data that is governed through epidemiologic studies. The implementation of healthcare models such as the Results Based Financing has encouraged community participation in healthcare matters. This has promoted and equitable access to antenatal health care by all members of the community as they are aware of their rights and obligations to access health as enshrined in the constitution of the country.

The progressive deterioration in the level of economic performance in the country threatens the equity dimension in the health delivery system. Trained medical staff are shunning remote healthcare centres due to poor remuneration packages. In terms of inclusiveness, health financing models such as the Results Based Financing have enabled government to assume leadership positions in the implementation of healthcare programs through increased budgetary support to the health sector to scale up equity and inclusiveness.

Equitable access to primary health is not only attributed to the failure of health care providers alone, but also to the receivers themselves. In some communities' people prefer to resort to alternative health care systems such as spiritual healing and traditional healing methods. Strengthening of the healthcare system by expanding the availability of resources that reach marginalized communities guarantees equity and inclusiveness of antenatal health care.

However, there is a trade-off between achieving efficiency and equity in the health delivery system when up skilling health programs under the Results Based Financing program. The process of achieving equity within the health delivery system might go against the dictates of economic and allocative efficiency. Health delivery system programs that are meant to reach a large population might not reach the intended population due to a contrast between equity and economic efficiency.

2.8.9. Sustainability of a health service

The concept of sustainability is defined as the ability of an antenatal health care system to assume responsibility for programs and outcomes without obviously affecting the ability to maintain and continue program objectives and outcomes (Svedoff, 2011). Most health interventions in Zimbabwe include implementing partners who pledge money to strengthen the health delivery system in the country.

The concept of sustainability comes into play whereby, the Ministry of Health and Child Care must be in a position to continue with the health intervention programs even after implementing partners have withdrawn, they are doing a support. Epidemiologic data on the prevalence of anaemia amongst pregnant women and infants play a pivotal role in promoting sustainability of the antenatal health delivery

system. For instance, feedback collected from primary health care centres with respect to the efficacy of the results based finance have demonstrated that the financing model is poised for future development that is attributed to community buy-in and the people-centric employment approach. However, reservations have been expressed with respect to the RBF as a revenue expenditure model based on incentives rather than is a capital accumulation project. Nevertheless, health care centres that are financed by the result based finance program have demonstrated capability to sustain their operations in the future.

2.8.10. Effectiveness and Allocative Efficiency of a health service

Epidemiologic data on the prevalence of anaemia amongst pregnant women and infants is useful in strengthening the antenatal health delivery system through achieving effectiveness and efficiency. Data on the demographic characteristics of pregnant women is valuable in ensuring that effective antenatal health care is provided in line with the expectations of the community (Olmen et al., 2012). Antenatal care delivery efforts are optimized to capacitate the operational capacity of the ANC health care centres through offering incentives to healthcare personnel and ensuring that the basic drugs are available. Health Care financing models are strategically positioned to assume future roles through capital consumption programs under the auspices of the infrastructure development programs as well as care and maintenance programs that are put in place to ensure an effective and efficient health delivery system.

Information gathered through epidemiologic surveys on the prevalence of anaemia amongst pregnant women and infants have been effective incapacitating healthcare centres through the acquisition of new and improved equipment and facilities that have

expanded the breadth of services offered by the antenatal health delivery system. According to the works of Bonfere (2015) developing countries that have embraced the results based financing model are more secure is the model is recognized as a national strategy in the improvement of the health delivery system with respect to effectiveness and efficiency.

Reliance on epidemiology data is contributed towards the strengthening of the health delivery system in relation to a positive impact on health outcomes we allocative efficiency and effectiveness of the primary health delivery system is concerned (Lu et al., 2020). There has been a liberalization of the healthcare systems to achieve higher levels of efficiency through community-based decision making and empowerment approaches. These help community primary health care centres to design their own health plans in procure medicines and equipment on their own.

2.9. Empirical Studies

Extant literature shows that social demographic factors have a significant effect on the adherence to iron and folic acid supplements amongst pregnant women. A Nigerian research indicate that pregnant women seeking antenatal care and have low levels of education have a low opinion of preventive measures such as adherence to iron and folic acid supplements. On the other hand, women with higher levels of education are well versed with the risks and consequences associated with not adhering to iron and folic acid supplements (Utoo *et al.*, 2013).

A Kenyan study found out that 48% of pregnant women with tertiary education qualifications have a better intake of iron and folic acid supplements (Mutuma *et al.*, 2016). Nunez-Troconiset *al.*, (2018) contradict extant research on the interplay

between education and health seeking behaviours by reiterating that low educational attainment amongst pregnant women in Venezuela did not comprise their intake of iron and folic acid supplements.

In Kenya, 85.9% of pregnant women who adhered to iron and folic acid supplements indicated that they were married. In contrast, the works of Lyimo and Beran (2017) reiterated that 73.2% of married women in central Africa reported that to their male partners were barriers towards their adherence to iron and folic acid supplements. Hoque and Hoque (2019) indicated that young married women in the Eastern Cape Province of South Africa had a perceived susceptibility that they were less prone to iron and folic acid deficiency and anaemia. However, this perceived susceptibility was not base on any scientific evidence but on anecdotal evidence and personal feeling.

An Indian study by Nene *et al.*, (2017) was it was established that pregnant women who had higher levels of education were likely to adhere to iron and folic acid supplements. The same study established that low levels of education was strongly linked with low knowledge and perceived benefits associated with iron and folic acid supplements.

2.10. Summary

The outgoing chapter outlined the intake of iron and folic acid supplements among pregnant women. Epidemiologic data on the prevalence of anaemia amongst pregnant women and infants crucial in strengthening the health delivery system as it capacitates the healthcare system through governance, equity and inclusiveness, effectiveness and allocative efficiency, sustainability and transparency. The efficacy of epidemiologic data is supported by the presence of implementing partners who provides the necessary

funding to ensure that the health delivery system is strengthened. The succeeding chapter provide a detailed methodology that orients the data collection, measurement and analysis procedures.

CHAPTER 3 METHODOLOGY

3.1. Introduction

The outgoing chapter tackled the notion of Iron and folic acid deficiency from conceptual, theoretical and empirical perspectives. Extant literature on the concept was critically reviewed as it applied in different conditions and socio-economic contexts. The chapter managed to identify knowledge and research gaps that exist between the current research and prior studies in a related line of research. Key insights were drawn from the Health Belief Model as it provided a framework upon which a comprehensive assessment of the intake of iron and folic acid supplements amongst pregnant women could be analysed.

This chapter took over from literature review to provide a detailed account of the guiding methodology that provides an orientation on the manner in which data is gathered, measured and analysed. The chapter is organised to showcase the research design, sampling procedures, and data collection process and research analysis approaches applied to address the research questions. The first sections addressed issues to do with the study area and setting of the study, sampling procedure followed by data collection and analysis. The last section deals with issues related to ethical clearance.

3.2. The Research Design

A descriptive cross-sectional study was conducted. This research design falls under the dictates of an interpretivism paradigm whereby data is collected in the natural environmental contexts of research participants. A research philosophy is a way of thinking and looking at the world around us and determines the way in which data can

be gathered, measured, interpreted and analysed with the view to resolve research objectives(Easterby-smith et al., 2021). An interpretivism research paradigm is meant to establish the factors that contribute towards the intake of iron and folic acid supplements amongst pregnant women visiting Chinhoyi Provincial Hospital for antenatal care.

Interpretivism describes personal accounts from the point of view of people who are exposed to a phenomenon ((Brandenburg, n.d.). In line with this perspective, this research included pregnant women as ideal research participants to articulate some of the factors that influence their intake of iron and folic acid supplements based on their personal subjective experiences and opinions. The key premise behind interpretivism is its lineage towards the assumption that knowledge and meaning result from personal interpretation (Hays & Mckibben, 2021). The application of an interpretivism paradigm in the current study is inspired by the social reality surrounding the intake of iron and folic acid supplements

Data was gathered within the confines of an established maternal hospital where pregnant received antenatal care. A descriptive cross-sectional enabled the determination of personal accounts on the factors that influence the intake of iron and folic acid supplements amongst pregnant women from different socio-economic persuasions. A descriptive cross-sectional design allowed the researcher to collect data from pregnant women visiting Chinhoyi Provincial Hospital for Antenatal care and make inferences from these insights that could assist in developing a position with regards to the intake of iron and folic acid supplements. A descriptive cross-sectional involved the collection of quantitative information that can be tabulated along a

continuum in numerical form, such as scores on a test or the number of times a person chooses to use a certain feature of a project, or it can describe categories of information such as gender or patterns of interaction when accessing care in a group situation.

3.3. Population and sampling

A study population is the totality of all elements that make up the universe and to whom research findings ought to apply (Saunders et al., 2019). The study population included pregnant women attending antenatal care services at Chinhoyi Provincial Hospital drawn from a catchment area that include Chinhoyi, Zvimba, Makonde, Hurungwe and Kariba districts. The estimated population of pregnant women is in excess of 4000 as accessed from the maternity register at Chinhoyi Provincial Hospital.

3.3.1 Study Site

The study was conducted at Chinhoyi Provincial hospital which is a referral hospital situated in Chinhoyi, the provincial capital of Mashonaland West Province of Zimbabwe. Chinhoyi Provincial Hospital serves Zvimba, Makonde, Hurungwe and Kariba districts. The hospital offers routine and specialized health services, including maternal and child health clinics. The hospital offers iron and folic acid supplements services to pregnant women during the antenatal clinic. This is in line with the national guideline for micronutrient deficiency control (MOHCW, 2009).

3.3.2. Inclusion criteria

The first inclusion criteria incorporate pregnant women who visited or were referred to the Chinhoyi Provincial Hospital antenatal care. These pregnant women had at least one previous visit to the ANC during the current pregnancy, be it those in 1st trimester, 2nd trimester, 3rd trimester pregnant. The second inclusion criteria are that prospective

understood either English and/or Shona which are the languages that was be used for the purposes of data collection.

3.3.3. Exclusion Criteria

The exclusion criteria incorporated pregnant women visiting Chinhoyi Provincial Hospital for antenatal care for the first time and pregnant women who are unable to communicate in English and/or Shona. Mentally and physically incapable pregnant women were also excluded.

3.3.4. Sample size

The sample size was determined by using single population proportion formula (Fischer et al., 1998; $n = Z^2pq/d^2$) by considering 95% CI, 32% proportion of anaemia during pregnancy from a population of around 4000 visiting Chinhoyi Provincial Hospital for antenatal care (World Health Organisation, Global Health Observatory Data Repository/World Health Statistics, 2019) and absolute precision of 0.05 which gives a sample size of 232.

$$n = Z^2pq/d^2 = 232$$

Where n is the sample size to be determined,

z is the z-score (reliability coefficient) of 1.96 at 95% confidence level

p is the prevalence of anaemia among pregnant women in Zimbabwe, 32%

(WHO, Global Health Observatory Data Repository/World Health Statistics, 2019)

q is $1-p$ (0.68)

d is the degree of accuracy (0.06)

3.3.5. Sampling procedure

Pregnant women who attended the ANC in April 2022 were enrolled. On average 15 TO 20 women were enrolled each day excluding weekends as the clinic was not open on weekends. Only women who had at least one prior visit to an ANC during the current pregnancy were included to ensure that they had an opportunity to be offered the supplements. Systematic random sampling was used to select study participants. The sampling frame was estimated from the ANC register by calculating the average number of women who would be seen in one month, the period when the study was to be implemented. Approximately 565 are seen per month, this was divided by the minimum adjusted sample size 232 to give the sampling interval (2.4). A random number was picked as the starting point and then every second woman who met the inclusion criteria was included in the sample until the required sample size was reached. If a woman refused to participate in the study the next woman who agreed to participate and met the inclusion criteria was recruited and then every other 2nd woman thereafter was recruited.

3.4. Data Collection Instruments

A research tool is used for the collection of data (Creswell, 2012). This study used a structured questionnaire to gather data from pregnant women who visited Chinhoyi Provincial Hospital. The questionnaire was designed to contain 2 sections. Section A, focused on the collection of demographic variables of research participants such as age, place of residence, level of education, religion, marital status, employment status, number of children, professional qualification, and number of pregnancies, history of

anaemia and complications in pregnancy. Section B contained questions addressing factors affecting intake of iron and folic acid supplements in pregnant women such as gestation at first antenatal visit, reasons for taking iron supplements, ways in which anaemia affect pregnancy and reason for not taking iron and folic acid supplements only to mention a few among the others. The instrument was administered in both English and Shona language.

3.5. Data Collection Procedures

Participants were taken into a private room by the investigator and the purpose of the study was then explained to them including all; the risks and benefits associated with their participation. After explaining to prospective research participants, the terms and conditions of undertaking the study was permission to administer the questionnaire was sought. Questionnaires were distributed after informed consent was granted.

3.5.1. Secondary Data

Secondary data include all data that was gathered to suit other research purposes. Secondary Data cannot be relied on to resolve the objectives of the study in its format. This research used the Zimbabwe Demographic and Health Survey as the major referral point for the collection of secondary data pertaining to the intake of iron and folic acid supplements. Other secondary data sources include published and peer reviewed academic journals focusing on the notion of iron and folic acid supplements among pregnant women. Secondary Data sources complimented data gathered through the use of primary data collection methods.

3.5.2. Primary Data

Primary data is first-hand information acquired with a specific research goal in mind. As a result, primary data is critical in offering useful insights that may aid in the resolution of study objectives. Primary data was collected for this study using a standardised questionnaire that was distributed to pregnant women who visited Chinhoyi Provincial Hospital for antenatal care in order to obtain their perspectives, opinions, and beliefs on the factors that influence iron and folic acid supplement intake.

3.5.3. Analysis and Organisation of Data

Descriptive data analysis was used to profile respondents based on their demographic characteristics as highlighted in Section A of the questionnaire. SPSS version 23 was used to perform descriptive analysis through case summary, frequency tables and measures of central tendency and measures of dispersion. Preference was given to grouped data analysis as opposed to the analysing data as a single case. Bivariate analysis was done to elicit factors associated with utilization of iron and folic acid supplementation with odds ratio as the measure of association. Chi-square test was used for categorical variables at 95% confidence interval with alpha level of significance at 0.05. T-test was used to assess significance among the continuous variables ($p=0.05$). Multivariate analysis was then done where factors that had a p value ≤ 0.1 in bivariate analysis were entered in unconditional logistic regression model building process. A stepwise backward elimination procedure was performed to obtain the “final best model” which gave factors independently associated with utilization of

iron and folic acid supplementation services. The functional form of the logistic regression model is given below.

$$\text{Log} (p/1-p) = b_0 + b_1x_1 + b_2x_2 + \dots$$

Where:

log - the natural logarithm (base e)

p = probability of being highly compliant (dependent variable)

b₀, b₁ and b₂ are regression coefficients

x₁ and x₂ represents the independent variables entered in the model

3.6. Ethical Considerations

The Africa University Research Ethics Committee, the Provincial Medical Directorate Mashonaland West, and the Medical Superintendent of Chinhoyi Provincial Hospital all approved the study. All study participants were provided with written informed consent. By not using interviewees' names but rather anonymous numbers to identify participants, confidentiality was maintained and protected throughout the investigation.

The interaction between the researcher and the research participants is described in terms of research ethics. The researcher must ensure that research participants' privacy and confidentiality are respected, as well as that they are not subjected to bodily or psychological harm as a result of their participation in the study (Orb et al., 2014). The researcher obtained informed consent from the research participants prior to conducting the study. The researcher described the study's aims as well as the rights and responsibilities of research participants in relation to the study. The research

participants were informed that their participation in the study is entirely voluntary. As a result, they have complete flexibility to engage in and withdraw from the study at any time.

The researcher has a responsibility to safeguard the privacy and identification of research participants (Orb, Eisenhauer and Wynaden, 2014). As a result, the questionnaire was created in such a way that no personal information, such as name, contact information, or identification number was collected. This aims to give research participants the security of anonymity so that they may properly voice their thoughts on the impact of online learning on their final exam academic performance. The research also has a responsibility to safeguard information submitted by study participants from unauthorised third-party access.

3.7. Summary

The approach used in the data collection, measurement, and analysis was highlighted in this chapter. The ideal research strategy for the study was a descriptive cross-sectional survey to obtain first-hand testimonies of pregnant women regarding the intake of iron and folic acid supplements. The target group included pregnant women from various catchment regions who came to Chinhoyi Provincial Hospital for antenatal care. In order to choose a sample of research participants, the inclusion criteria were followed. The data collection, analysis, and ethical considerations were also covered in this chapter. The data presentation, analysis, interpretation, and discussion in the next chapter are all based on the study's objectives.

CHAPTER 4 DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1. Introduction

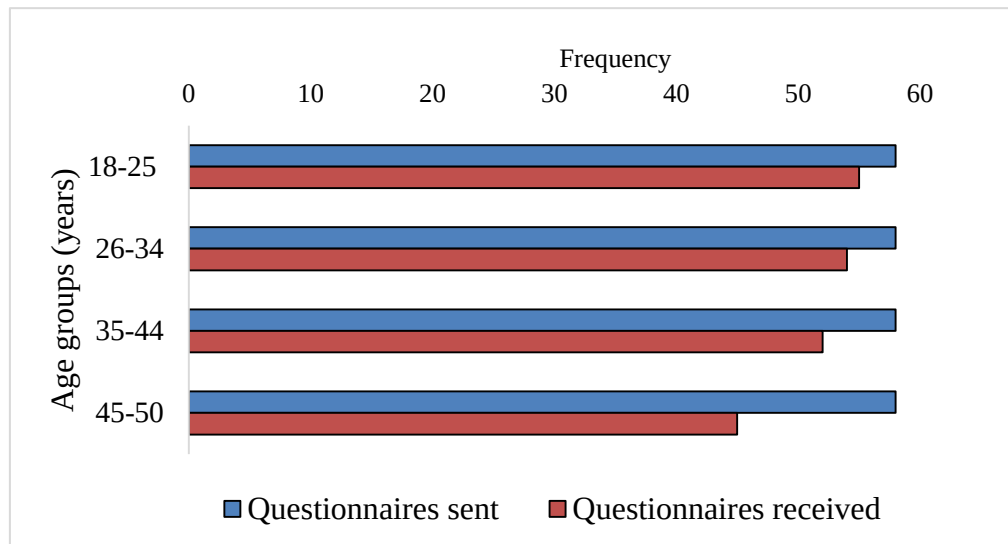
The study aimed to determine the factors affecting the intake of iron and folic acid supplements among pregnant women attending an ANC facility. This chapter presents and describes study results obtained from the enrolled participants to answer the research questions which were formulated.

4.2. Data Presentation and Analysis

4.2.1 Participants recruitment

The study aimed to recruit 232 pregnant women into the study, though 206 (88.8%) participants were enrolled after responding to questionnaires. Figure 1 summarizes the distribution of participants by age-groups who responded to the questionnaires. More specifically, higher response rates were in the youngest age group (18-25 years; 73.8%) and lowest in the oldest women (45-50 years; 50.6%). Overall, 206/232 participants responded to the questionnaires, consented, and enrolled in the study (Figure 1).

Figure 4.1: Participants response rate by age categories



4.2.2 Study participants' socio-cultural characteristics

The table summarizes the findings for the first research objective that seeks to determine the distribution of social cultural factors that influence the intake of iron and folic acid supplements among pregnant women. Notably, we summarized the social cultural demographics, marital status, highest education level, place of residence, religion, employment status, monthly income, and number of children, previous history if anaemia and pregnancy related complications.

Table 4.2: Socio-cultural factors that influence the intake of IFAS

Socio-cultural factor		Frequency
1. Marital Status	N	(%)
Single	50	24.27
Married	138	66.99

Divorced	18	8.70
2. Level of Education	N	(%)
None	26	12.62
Primary	77	37.37
Secondary	86	41.74
Tertiary	17	8.25
3. Place of residence	N	(%)
Urban	34	16.50
Rural	42	20.39
Peri-urban	58	28.16
Farm/mine	72	34.95
4. Religion	N	(%)
Christian	89	43.20
Muslim	36	17.48
Traditional	69	33.50
Other	12	.83
5. Number of children	N	(%)
None	56	27.18
1 to 3	96	46.60
4 to 6	38	18.45
7 and above	16	7.77

6. Financial status	N	(%)
Dependent on spouse	118	57.28
Independent	61	29.61
Dependent on others	27	13.10

According to demographic profiling based on marital status, 66.99% of women between the ages of 18 and 50 were married, while 24.27 percent were unmarried and self-sufficient. While 8.70 percent of the population were divorced. Knowing one's marital status is crucial when it comes to disseminating information about iron and folic acid supplementation. In addition, the majority of the women had a secondary education (41.49%), while 8.51% had a tertiary education. More-so, the highest level of education is critical in assisting ladies in comprehending anaemia-related concerns. Existing research shows that higher levels of education are linked to increased iron and folic acid supplementation. Women's financial circumstances have an impact on their intake of iron and folic acid supplements. The majority of respondents (57.45%) were financially reliant on their spouses, with 12.77 percent relying on family and friends. The rest of the respondents (29.79%) said they were self-sufficient. Literature evidence has shown that intake of iron and folic acid supplements by women are strongly influenced by financial independence.

The study also profiled the participants' place of residence as a determinant of access to health based information and health care centres. The majority of pregnant women who visited Chinhoyi Provincial Hospital (34.95%) came from farms and mining areas

surrounding the town. The minority who made up 16.50% were from within urban areas. Place of residence influence access to information pertaining to anaemia and preventive measures such as iron and folic acid supplements. With respect to participants' beliefs, religious and cultural factors are influential in the decision making relating to health seeking behaviours. Most respondents (43.2%) indicated that they were Christians, 33.5% followed the traditional religion, 17.48% were Muslims, whilst the remainder (5.83%) followed other religions. Religion has been established in literature to have a significant influence on the intake of iron and folic acid supplements.

Stillmore, the number of children is a sign of familiarity with the maternal health care system given that prior pregnancies were delivered through healthcare system such as hospitals and clinics. The research findings indicate that 27.2% of respondents did not have previous deliveries. These are newly pregnant women we have not previously used the material healthcare system for deliveries. On the other hand, 7.8% of the study participants had at least 7 biological deliveries (Table 4.2).

4.2.3 Assessment of behavioural factors among pregnant women.

Behavioural factors that influenced the intake of iron and folic acid supplements were assessed from the perspective of the Health Belief Model that look looks at psychological factors related to perceived susceptibility, perceived severity, perceived benefits and perceived barriers.

Table 4.3: Behavioural factors influencing the intake of iron and folic acid supplements

Statement	Mean	Mean Response	Std Dev
As a pregnant women I am prone to contracting anaemia (perceived susceptibility)	3.75	Agree	.543
The consequences of contracting anaemia are catastrophic (perceived severity)	3.86	Agree	.766
I am compliant with medical advice a receive from medical personnel (perceived benefit)	4.05	Agree	.587
Cultural and religious persuasions affected my adherence to medical advice (perceived barriers)	3.06	Indifferent	.786

A five-point Likert scale was used and averaged for each of the four statements. Table 4.3 describes the mean score for the behavioural statements showing the level of satisfaction. Specifically, respondents indicated a fairly high level of knowledge on iron and folic acid supplements based on responses analysed through descriptive statistics. The mean response for the first question on “*As a pregnant woman I am prone to contracting anaemia*” was 3.75 with a standard deviation of +/- .543. These statistics show that respondents are aware that they are susceptible to contracting anaemia if they do not partake iron and folic acid supplements.

Respondents agreed that the consequences of contracting anaemia are catastrophic, mean of 3.86 and a standard deviation of +/- .766. These results indicate the perceived

severity associated with the failure to adhere to maternal health advice pertaining to preventive measures against anaemia and other medical complications linked with iron and folic acid deficiencies.

With respect to perceived benefits, most respondents agreed that they are compliant with medical advice they received from medical person now with a mean of 3.06 and a standard deviation of $\pm .587$). These results indicate that pregnant women are aware of the benefits associated with taking heed of medical advice pertaining to maternal health. In a relation to perceived barriers, the majority of corresponding were indifferent (mean of 3.06 and a standard deviation of $\pm .786$) to the assertion that, *“Cultural and religious persuasions affected my adherence to medical advice.”* These findings imply that culture still have an influential role to play in the decision making of pregnant women pertaining to the intake of iron and folic acid supplements.

4.2.4 History of anaemia and pregnancy related complications

The study has confirmed that the prevalence of rate of anaemia exchange its 32.52% basing on the previous history of anaemia reported by pregnant women who undertook this study. This prevalence rate compares with regional countries as established in extant research. According to 2016 estimates, 27.2 percent of pregnant women in Zimbabwe have anaemia, with 38.2 percent of pregnant women having anaemia and 26.2 percent of non-pregnant women having anaemia (World Health Organization, 2018). A total of 24.27% of pregnant women reported having encountered pregnant related complications in their previous pregnancies. This makes them a vulnerable group for nutrition deficient illnesses such as anaemia.

Besides, an overwhelming majority of pregnant women indicated that they did not have complete pregnancy related complications before (75.73%). A total of 67.48% of respondents to the study indicated that they did not have any known previous history of anaemia. The bank of these respondents were women with their first pregnant it might not have been diagnosed for iron folic acid deficiency (Figure 4.2).

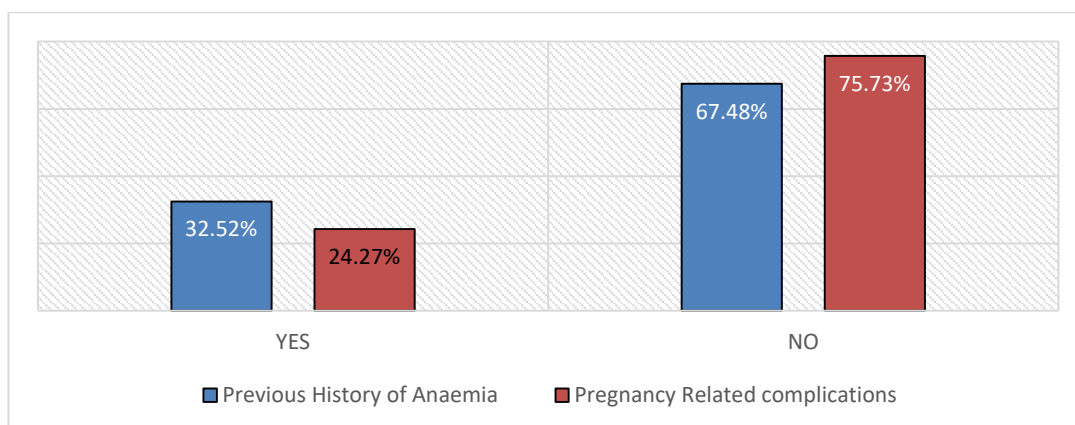


Figure 4.2: History of Anaemia and Pregnancy Related Complications

4.2.5 The role of health care providers on the intake of IFAS among pregnant women

This section tackles the third research objective focusing on the influential role of health care service providers in the promotion of the intake of iron and folic acid supplements is shown in Table 4.4.

Table 4.4: Behavioural factors influencing the intake of IFAS

Reasons for taking iron supplements	N	Frequency
Because the health worker said I have to take	98	47.57%
In order to give birth to a healthy baby	26	12.62%
To protect myself from infections	24	11.65%
To protect myself from anaemia	24	47.57%

Don't know	12	5.83%
My spouse encouraged me to take	9	3.40%
My friends/relative encouraged me to take	7	3.02%
Others (specify)	6	2.91%

Statistics indicate that health care providers have an influential role towards the intake of iron and folic acid supplements given that 47.57% of respondents were of the opinion that their decisions to take anaemia preventive measures were inspired by the medical advice they received. Other key determinants of the intake of iron and folic acid supplements were attributed to giving birth to a healthy baby (12.62%), protection from anaemia (11.65%) and protection from infections (11.65%). These factors are indirectly attributed to the efficacy of medical health personnel in disseminating information pertaining to the maternal health and preventive measures against nutrition deficiency related illnesses.

4.2.6 The proportion of IFAS intake in the last five years among pregnant women

This section of the research is meant to resolve the fourth objective on the proportion of iron and folic acid supplements intake in the last five years among pregnant women. Results on the intake of iron and folic acid supplements by pregnant women are illustrated in Figure 4.2.

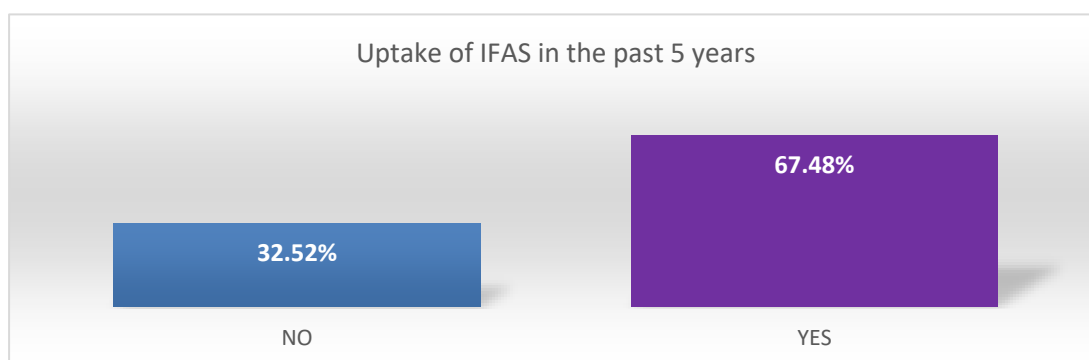


Figure 4.1: Intake of iron and folic acid supplements by pregnant women

Research results indicate that 67.48% took heed of medical advice to take iron and folic acid supplements in the past 5 years. These results are attributed to pregnant women who have delivered at least one pregnancy prior to the current pregnancy. These results show that a higher proportion of pregnant women are amenable to medical advice pertaining to maternal health care. The remaining 32.52% of pregnant women who have not taken iron and folic acid supplements might be attributed to first time pregnancies and other pregnant women whose decision making on maternal health care is moderated by socio-cultural factors.

4.2.7 Challenges experienced in taking iron and folic acid supplements

Pregnant women who participated in the research were asked to articulate some of the challenges they faced with regards to their intake of iron and folic acid supplements. These challenges are presented in Table 4.5.

Table 4.5: Challenges faced in the intake of IFAS

Challenges	Frequency	
	N	(%)
Nausea and vomiting due to pregnancy	45	21.84%
Unavailability of iron tablets at the clinic	32	15.53%
Duration of taking tablets is too long	22	10.68%
I don't know the importance of iron supplements	18	8.74%
I get enough iron from the diet	12	5.83%
I forgot to take	12	5.83%
Fear of having big babies	11	5.34%
I do not like the taste of the pills	10	4.85%

Due to religious/cultural beliefs	9	4.37%
I do not understand the information given by the health worker.	9	4.37%
I dislike taking drugs	8	3.88%
Number and frequency of taking medications	7	3.40%
Side effects	6	2.91%
Not aware of the iron supplements programme	5	2.43%

The main challenges faced by pregnant women in taking iron and folic acid supplements relate to side effects (15.53%), a long duration of taking iron and folic acid supplements tablets up to 90 days (10.68%), the frequency of taking medication on a daily basis (8.74%). Challenges relating to the bodily reactions to iron and folic acid supplements medication have been cited in literature have contributing towards a low intake of iron and folic acid supplements among pregnant women. Basically, most of the challenges that were prominently highlighted against the intake of iron and folic acid supplements are attitudinal in nature.

4.3. Discussion and Interpretation

The study established that all child bearing age groups were represented with the majority of respondents indicating that they were married, extant researches confirm that the intake of iron and folic acid supplements is higher amongst married women with higher levels of education. On the other hand, women with no formal education, who are forgetful and have cultural and religious biases, were likely to be non-adherence to iron and folic acid supplements (Tegodan, Tura and Kebede, 2021).

The study established that the financial status of pregnant women with respect to financial independence, place of residence and religious persuasions have significant influence on the intake of iron and folic acid supplements. These findings corroborate a root cause analysis by Simunyemba, Bwembya, Chola and Michelob (2020) the main hindrances towards the intake of iron and folic acid supplements was attributed to the long distance to health facility, high transport costs, causing pregnant women not to attend health centres monthly to replenish iron and folic acid supplements, iron and folic acid supplements messages and a lack of a formalised and uniform training around delivery of antenatal messages.

It was established in this research that the number of children and successful deliveries had an influence on the intake of iron and folic acid supplements among pregnant women. Research by Moshi, Millanzu & Mwampagatwa (2021) confirmed that in Tanzania, the poor intake of iron and folic acid supplements was moderated by failure to access iron and folic acid supplements during pregnancy as antenatal visits are initiated late. Most of these women were from poor families with no formal education and reside in rural settings.

The study highlighted that behavioural factor (perceived susceptibility, perceived severity, perceived benefits and perceived barriers) had an appeal on the intake of iron and folic acid supplements amongst pregnant women (Siekman, Roche, Kung'u, Desrochers, and De-Regil, 2018). A scientific study involving the control and study group on the nutritional benefits of the intake of iron and folic acid supplements indicated that the level of iron gradually increased after 3 months of supplementing, while in the control group there was a significant decrease in iron level. For the study

group, there was an inverse relationship between iron and zinc levels ($R = -0.29$) (Chmurzynska et al., 2021).

4.4. Summary

The chapter highlighted key factors behind the intake of iron and folic acid supplements among pregnant women who visited Chinhoyi Provincial Hospital for antenatal care. Results established in the research confirm extant research on key factors that comprise the level of education, area of residence, financial independence, marital status, religion, behavioural and attitudinal factors, the trimester of seeking antenatal care as the main factors to that influence the intake of iron and folic acid supplements. The research included a cross section of respondents from different child bearing age groups, religious persuasions and educational levels. The prevalence of anaemia among pregnant women who participated in the study was found to be in line with local and regional levels. The next chapter provides a holistic summary, conclusions and recommendations based on the findings of the study.

CHAPTER 5 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter gives a summary of the study findings and discusses whether the research met its objectives then gives conclusions on the hypothesized phenomena. The researcher will also give recommendations to the policy makers and suggest areas of further study to scientifically investigate factors influencing intake of IFAS among pregnant women attending antenatal care services.

5.2 Discussion

This study was inspired by the prevalence of nutrition deficient illnesses amongst pregnant women in Mashonaland West Province in Zimbabwe. Overall, the study identified that two thirds of women had took iron and folic acid supplementation in the previous five years and this was influenced by the level of education, area of residence, financial independence, marital status, religion, behavioural and attitudinal factors and the trimester. In addition, the burden of anaemia among pregnant women was comparable to regional estimates.

5.2.1 Level of uptake of iron and folic acid in the past five years

Our findings show that the majority of the women had ever took iron and folic supplementation during pregnancy in the past five years was partly in line with trends in Sub-Saharan Africa (Moshi et al., 2021b). However, there are differences in other settings with evidence from Tanzania suggesting low uptake of iron and folic supplements among women with comorbidities related to low numbers of antenatal care visits (Ogundipe et al., 2012). As such our findings that supports use of supplements with area of residence points that women closer to the health centres are

more likely to have more ANC visits increasing their likelihood of using iron and folic acid supplements (Obsa et al., 2021).

Of note, the improved uptake of iron and folic supplements over the past 5 years was attributable to the improvements in the information flows. Healthcare workers have been involved in outreach programs to promote and impart knowledge to women about these supplements. However, despite this significant progress registered in the intake of iron and folic acids supplements, the program has been derailed by some barriers to its implementation that are associated with the side effects of IFAS such as nausea, vomiting, weight gain, fear of having big babies, unavailability of iron tablets at the clinic, lack of understanding of information given by the health worker, long duration of taking tablets.

5.2.2 Factors affecting uptake of iron and folic acid supplements

Of note, uptake of IFAS was associated with the women's level of education with those of higher education status likely to take and adhere to the supplements. Compared to their less educated counterparts, educated women appeared to be more aware of and capable of finding information about the benefits of taking iron supplements while pregnant (Georgieff et al., 2019). These results are consistent with those of other studies carried out in India, which discovered that an individual's level of education increases awareness and understanding of the significance of micronutrients for healthy foetal development (K et al., 2019). Therefore, the uptake of iron supplements by pregnant women may now be positively predicted by educational level.

As a result, poor prediction regarding the uptake of iron supplements among pregnant women living in rural areas of Zimbabwe may have been caused by differences in

access to maternal health services between rural and urban residents. In particular, health facilities in rural areas are located far from residents' homes and have seasonal roads and inadequate transportation. In contrast, women living in urban areas can access maternal and child health services at a number of maternal and child health centres, including both government and private facilities. The low uptake of iron supplements among pregnant women living in rural areas when compared to those in urban areas may also be explained by the availability of supplies. When compared to urban settings, rural settings have a significantly higher rate of iron supplement shortages. The results are consistent with those by Zavaleta et al., 2014), who noted that pregnant women living in rural areas were less likely to adhere to iron supplementation because they are frequently not easily updated on its benefits to the developing foetus and occasionally suffer from iron supplements' non-availability and inaccessibility.

The respondents' financial status was also closely related to how often they took iron supplements. The results demonstrated that pregnant women who were financially independent were more likely than their poor counterparts to adhere to iron supplementation uptake. This suggests that those with higher wealth indices have access to information and knowledge about the importance of these supplements. In addition, evidence has also supported that uptake of IFAS among pregnant women with low economic status was low (Getachew et al., 2018). However, these differences between the poor and the rich could be a signal for deep structural differences in accessing health services rather than pointers to uptake of IFAS tablets.

More-so, the study also identified that the women's decision-making power was influential in the uptake of IFAS tablets as identified by their marital status. Likewise, communication with the marital partner has been shown to be important for the pregnant women's decision making (Ghose et al., 2017). On the other hand, prior studies has also suggested that poor communication and non-support from partners may lead to poor uptake of maternal health services (Ghose et al., 2017; Mullany et al., 2009). The study also identified that trimester was related to iron and folic acid supplements uptake and this could be in general point to the stage at which the antenatal booking was done. As such the findings show that pregnant women who book early are more likely to get access antenatal information and its associated services and as such adhere (Urassa et al., 2012).The study further identified a relationship between religion and uptake of IFAS tablets and this was also observed by studies from Ghana and Nigeria (Al-Mujtaba et al., 2016; Doctor et al., 2012). The studies shown lower uptake levels among Muslims as compared to Christians.

The research established that awareness of symptoms and signs of anaemia during pregnancy was relatively high amongst women who took part in the research. However, an understanding of the causes of anaemia and ways to prevent it where understood variably based on an individual's so frisk perception. The general thinking amongst respondents was that anaemia is attributed to poor diet and hard work. In line with this dietary aetiology of anaemia, both pregnant women and healthcare workers were of the opinion that eating a nutritious diet helps prevent and treat anaemia during pregnancy.

Opinions from women indicates that the main purpose of supplementing iron and folic acids wants to prevent anaemia, contribute towards the improvement of normal growth and delivery of the baby, help pregnant women stay healthy and reduce dizziness and fatigue. Most women who expressed these views attended antenatal care at least once during pregnancy, reasons given for notes consistently attending ANC or letting the pregnancy included curative purposes such as dealing with pain, complications or illnesses. Therefore, pregnant women who failed the have a healthy pregnancy did not feel the need to attend antenatal care.

5.2.3 The role of health care providers in influencing the intake of IFAS

The majority of respondents to the study testified that they became aware of the need to take iron and folic acid supplementary tablets from the information they got from healthcare providers. Being a preventive measure, women were naturally not aware off the bridge supposed to buy iron nutrition deficiency to their health. Despite barriers to the intake of iron and folic acid supplements that are moderated by culture and education, the study established that healthcare providers play in overwhelmingly influential role in the information dissemination pertaining to issues relating to iron and folic acid supplements as well as threats caused by anaemia.

The competency of health care providers with respect to their knowledge and understanding of iron and folic acids supplements and tomatoes pertaining to anaemia is crucial in the object of IFAS amongst pregnant women. This is essential given that the majority of pregnant women rely on information they get from healthcare providers. They are unlikely to actively search for information pertaining to maternal health, anaemia and iron deficiency. The high cost of living is contributed towards a

significant increase in women delivering outside the confines of the maternal health care system through the use of traditional midwives.

5.3. Conclusion

The study identified that despite free access to IFAS tablets during pregnancy, almost a third of the pregnant women did not access these supplements. Of note, access to iron and folic acid supplements during pregnancy was related to level of education, area of residence, financial independence, marital status, religion, behavioural and attitudinal factors and the trimester.

5.4. Recommendations

Having considered the research outcomes, the following recommendations are proposed for possible implementation:

- The Ministry of Health and Child Care has to intensify its community awareness programs to raise knowledge and understanding of the benefits associated with iron and folic acid supplements as well as the risks associated with the failure to prescribe the medications. These awareness programs can be done at community level using voluntary healthcare personnel who can relate better with people within their communities.
- A public sensitization program similar to the attention that was given to the outbreak of the covid-19 pandemic is critical to enhance community awareness to the threats caused by anaemia with the view to encourage behaviour change.
- The Ministry of Health and Child Care has to create strategic partnerships with other ministries like the Ministry of Primary and Secondary Education in the development of a comprehensive curriculum that raise awareness on medical

challenges caused by deficiency of iron and folic acids supplements using a similar approach to the invitation of information it was applied in the dissemination of knowledge pertaining to HIV and AIDS.

- Empowerment of the girl child at community level, through the provision of quality education and the promotion of financial Independence is influential in decision making relating to one's maternal health which is likely to improve the intake of iron and folic acid supplements. Research has proven that people with higher levels of education are better placed to make sound decisions pertaining to the maternal health as opposed to those with low levels of education.
- Women pressure groups have to be seen to playing a leading role in promoting maternal health and the adoption of health seeking behaviour within their constituencies
- Matters pertaining to maternal health have to transcend through community and church leaders as these play influential role in the object of iron folic acid supplements and have an overbearing influence on the decision making of women pertaining to IFAS.
- Capacity building amongst the healthcare workers through the provision of specific training and capacity gaps relating to iron and folic acids supplements and anaemia are critical in empowering healthcare providers in the dissemination of adequate and accurate information pertaining to IFAS.
- Health care workers have to be informed on the existing guidelines beginning to iron and folic acid supplements rather than relying on their own experience (Samson, *et al.*, 2020). This information is critical in the prescription practices to create a reliable and sound maternal health care delivery system.

- Effective maternal health care intervention systems have to be focused on the family unit as these have been found to be effective in maternal health care based decision making systems and adherence to IFAS intake regimes (Dibley, Titaley, d'Este, & Agho, 2012).
- The Ministry of Health and Child Care has to capacitate its logistics function to ensure that ironing folic acid supplementary tablets readily available across different maternal health care centres. This requires dealing with sufficient forecasting and distribution so as to minimize periodic stock out of IFAS tablets at primary healthcare centres.
- Effective quality control systems have to be put in place in the distribution of iron and folic acid supplement so as to ensure that existing practices are in line with standard operating procedures.
- There must be an effective implementation of monitoring and evaluation of IFAS supplementary programs through the establishment of a robust health management information system to track the coverage of antenatal care and adherence to IFAS.

5.5. Areas of additional Research

This research focused on women in the 18 to 50 age group in relation to factors affecting the intake of iron and folic acid supplements screening in a resource constrained environmental set up. A similar research can be conducted in a resource rich context to establish if similar factors can be identified.

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APPENDICES

Appendix 1: Research Questionnaire

[A] ENGLISH VERSION

This study aims at investigating factors influencing uptake of Ferrous Sulphate and Folic Acid supplementation among pregnant attending antenatal care services at Chinhoyi Provincial Hospital, Mashonaland West Province, Zimbabwe. The researcher is seeking your assistance in filling of this questionnaire. Kindly fill in the spaces provided or tick where necessary. Take note that the information given will only be used for the purpose of this research.

Questionnaire number:

Date filled/Received:

Researcher Assistant:

Section A: Social Demographic and Socio- Economic Characteristics

1. Age...

Age group	
18- 25 years	
26 to 34 years	
35 to 44 years	
45 to 50 years	

2. Marital status

Married () Single /never married () Divorced () Widowed ()

3. Level of education

Primary () Secondary () College () University () None () Never went to school ()

4. Place of residence

Rural Urban () Rural () Urban Farms/ Mine ()

5. Religion

Christianity () Moslem () Traditionalist ()

Other (specify).....

6. Employment Status

Occupation: Salaried () Self-employed () Housewife () Student () Others ()

7. Monthly Income (ZW\$):

<5,000 () 6,000-10,000 () 11,000-20,000 () 21,000-30,000 () >31,000 () None ()

8. How many children do you have? Number of pregnancies that you have had

1-3 () 4-6 () 6 and More () none ()

10. Previous history of anemia

Yes ()

No ()

11. Pregnancy related complications

Yes ()

No ()

(B) Characteristics of spouses among the married women

(Don't fill this section if NOT married)

9. Age:

10. Education level:

Primary () Secondary () College () University () None ()

11. Occupation:

Salaried () Self-employed () Student () Others ()

12. Income (ZW\$):

<5,000 () 6,000-10,000 () 11,000-20,000 () 21,000-30,000 () >31,000 () None ()

13. Religion: Christian () Muslim () Others ()

Section B

Factors affecting uptake of iron supplements in pregnant women

13. How many weeks was the pregnancy at first antenatal visit?

14. How many antenatal visits have you had so far?

15. Have you received iron supplement during the current pregnancy?

Yes ()

No ()

16. Where you given any information on iron supplement during the antenatal counselling session?

Yes ()

No ()

17. If yes, how old was the pregnancy when you started taking iron supplements?

.....

18. Are you taking your iron supplements as prescribed by the health worker?

Yes ()

No ()

19. What are the reasons for taking iron supplements?

In order to give birth to a healthy baby	
To protect myself from anaemia	
To protect myself from infections	
Because the health worker said I have to take	
My spouse encouraged me to take	
My friends/relative encouraged me to take	
Don't know	
Others (specify)	

20. Do you face any challenges in acquiring the tablets?

Yes () No ()

If yes, explain the challenges?

.....
.....

21. What is the source for your iron supplements?

Chinhoyi Provincial Hospital () Chemist or Pharmacy ()

Other source please specify

.....

22. Are the iron supplements affordable?

Very expensive () Are affordable () Are given freely ()

23. In what ways can anaemia affect a pregnant woman?

	True	False	Don't know
Can cause abortion/ miscarriage			
Low birth weight			
Complications during delivery			
Preterm birth			
Susceptibility to infections			
Foetal death			

24. What are the reasons for not taking iron supplements?

I don't know the importance of iron supplements	
I get enough iron from the diet	
I forgot to take	
I do not like the taste of the pills	
I dislike taking drugs	
Due to religious/cultural beliefs	
Not aware of the iron supplements programme	
Side effects	
Unavailability of iron tablets at the clinic	
Duration of taking tablets is too long	
Fear of having big babies	

I do not understand the information given by the health worker.	
Number and frequency of taking medications	
Nausea and vomiting due to pregnancy	