

HUSBAND'S KNOWLEDGE AND PERCEPTION ON IRON  
CONSUMPTION COMPLIANCE AMONG PREGNANT WOMEN IN  
HOSPITAL UNIVERSITI SAINS MALAYSIA

NORELYSYA NABILA BINTI SAIDON

SCHOOL OF HEALTH SCIENCES  
UNIVERSITI SAINS MALAYSIA

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By

NORELYSYA NABILA BINTI SAIDON

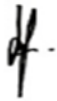
Dissertation submitted in partial fulfilment of  
the requirements for the degree  
of Bachelor in Nursing (Honours)

August 2024

# CERTIFICATE

This is to certify that the dissertation entitled “Husband's Knowledge and Perception on Iron Consumption Compliance Among Pregnant Women in Hospital Universiti Sains Malaysia (HUSM)” is the research work done by Ms “Norelysa Nabila Binti Saidon” during the period from October 2023 until June 2024 under my supervision. I have read this dissertation and, in my opinion, it conforms to acceptable standards of supervision of scholarly presentation and is fully adequate, in scope and quality, as a dissertation to be submitted in partial fulfilment for the degree of Bachelor in Nursing (Honours).

Main supervisor,



.....  
**Puan Hasni Embong**  
Lecturer,  
School of Health Sciences  
Universiti Sains Malaysia Malaysia  
Health Campus  
16150 Kubang Kerian  
Kelantan, Malaysia

Date: ..... 08/08/2024 .....

Co-supervisor,



.....  
**Dr. Norhasmah Mohd Zain**  
Lecturer,  
School of Health Sciences  
Universiti Sains Malaysia Malaysia  
Health Campus  
16150 Kubang Kerian  
Kelantan, Malaysia

Date: ..... 08/08/2024 .....

## DECLARATION

I hereby declare that this dissertation is the result of my investigations, except where otherwise stated and duly acknowledged. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at Universiti Sains Malaysia or other institutions. I grant Universiti Sains Malaysia the right to use the dissertation for teaching, research and promotional purposes.



.....

**Norelysya Nabila Binti Saidon,**

Degree of Bachelor of Nursing (Honours),

School of Health Sciences,

Health Campus,

Universiti Sains Malaysia,

16150 Kubang Kerian,

Kelantan, Malaysia.

Date: 08/08/2024.....

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## **LIST OF ABBREVIATION**

USM	Universiti Sains Malaysia
HUSM	Hospital Universiti Sains Malaysia
HBM	Health Belief Model
O&G	Obstetrics and Gynaecology
HREC	Human Research Ethical Committee
IDA	Iron deficiency Anemia
WHO	World Health Organization

# **PENGETAHUAN DAN PERSEPSI SUAMI MENGENAI PEMATUHAN PENGAMBILAN ZAT BESI DI KALANGAN WANITA HAMIL DI HOSPITAL USM**

## **ABSTRAK**

Anemia ialah masalah global utama dalam kesihatan awam yang memberi kesan terutamanya kepada individu dalam pelbagai peringkat kehidupan, termasuk kanak-kanak kecil, dan remaja perempuan yang mengalami haid, serta wanita hamil dan selepas bersalin. Kajian ini bertujuan untuk menilai tahap pengetahuan dan persepsi suami terhadap pematuhan pengambilan zat besi dalam kalangan wanita hamil di Hospital Universiti Sains Malaysia (HUSM). Kajian keratan rentas telah dijalankan ke atas suami kepada wanita hamil di klinik Obstetrik dan Ginekologi (O&G) dan wad obstetrik HUSM. Data dikumpul menggunakan soal selidik yang ditadbir sendiri. Seramai 125 suami kepada wanita hamil yang memenuhi kriteria inklusi kajian ini telah dipilih untuk menjawab soal selidik. Mereka dipilih melalui persampelan mudah. Kajian menggunakan statistik deskriptif dan Pearson Chi-square. Hasil kajian menunjukkan bahawa 116 (92.8%) peserta mempunyai tahap pengetahuan yang tinggi tentang pematuhan pengambilan zat besi dalam kalangan wanita hamil dan 71 (56.8%) peserta mempunyai tahap persepsi yang lemah terhadap pematuhan pengambilan zat besi dalam kalangan wanita hamil. Tidak terdapat perkaitan antara skor pengetahuan dan skor persepsi ( $p = 0.786$ ), keputusan menunjukkan hanya 65 (91.5) peserta mempunyai pengetahuan yang baik dengan persepsi negatif terhadap pematuhan pengambilan zat besi pada wanita hamil. Kesimpulannya, kajian ini boleh meningkatkan peranan suami dalam menggalakkan wanita hamil mengambil suplemen zat besi secara berkala. Walau bagaimanapun, penyelidikan lanjut perlu melibatkan sampel yang lebih besar dari pelbagai hospital di daerah berbeza untuk mendapatkan keputusan yang lebih tepat dan representatif.

# **HUSBAND'S KNOWLEDGE AND PERCEPTION ON IRON CONSUMPTION COMPLIANCE AMONG PREGNANT WOMEN IN HOSPITAL USM**

## **ABSTRACT**

Anemia is a major global problem in public health that particularly affects individuals in various stages of life, including young children, and adolescent girls experiencing menstruation, as well as pregnant and postpartum women. The study aims to assess the level of husband's knowledge and perception on iron consumption compliance among pregnant women in Hospital Universiti Sains Malaysia (HUSM). A cross-sectional study was conducted on husband of pregnant women in Obstetrics and Gynecology (O&G) clinic and obstetrics ward at HUSM. Data was collected using a self-administered questionnaire. 125 husband of pregnant women who fulfilled the inclusion criteria of this study was selected to answer the questionnaire. They were selected through convenience sampling. The study used descriptive statistics and Pearson Chi-square. The results show that 116 (92.8%) participants had a high knowledge level on iron consumption compliance among pregnant women and 71 (56.8%) of the participants have poor level of perception on iron consumption compliance among pregnant women. There was no association between knowledge score and perception score ( $p = 0.786$ ), the result shows only 65 (91.5) of participants have good knowledge with a negative perception on iron consumption compliance in pregnant women. In conclusion, this study may contribute to enhancing the husband's role in encouraging pregnant women to take iron supplements regularly. However, further research should involve a larger sample of pregnant women's husbands from various hospitals across different districts to provide more accurate and representative findings.

# CHAPTER 1

## INTRODUCTION

### 1.1 Background of the study

Anemia is a major global problem in public health that particularly affects individuals in various stages of life, including young children, and adolescent girls experiencing menstruation, as well as pregnant and postpartum women. Hemoglobin level below 11 g/dl characterizes anemia during pregnancy and is frequently caused by insufficient iron levels. According to the World Health Organization (WHO), approximately 37% of pregnant women and 30% of women aged 15 to 49 globally are have anemia (WHO, 2023). Moreover, anemia has the potential to impact pregnant women worldwide, with an estimated global prevalence of roughly 41.8% during pregnancy (Di Renzo et al., 2015). In this matter, pregnant women are acknowledged as a susceptible demographic group owing to the potential adverse effects on pregnancy, as well as the well-being of both the mother and the fetus.

Anemia during pregnancy is classified by the World Health Organization (WHO) according to its prevalence. A prevalence rate lower than 4.9% is an insignificant issue in terms of public health. Anemia can be classified as mild, moderate, or severe based on the prevalence rates falling within the ranges of 5.0% -19.9%, 20.0% -39.9%, and  $\geq 40.0\%$  (Who et al., 2011). During pregnancy, the human body increases in blood production to facilitate the physiological demands associated with fetal development. Insufficient availability of iron, vitamin B12, and folate can result in inadequate production of red blood cells, leading to an insufficient supply to meet the body's demands. As pregnancy progresses, there is an increase in blood volume, leading to a simultaneous occurrence of hemodilution.

Iron deficiency anemia is the most common cause of anemia in pregnant women. 75–95% of cases of anemia in pregnant women are caused by iron deficiency anemia. Anemia has been linked to a variety of clinical outcomes, including premature labour, perinatal death, and postpartum depression (Ministry of Health, 2023). The consequences experienced by the fetus and newborn encompass low birth weight as well as poor mental and psychomotor functioning. On top of that, the main issue of iron supplementation during pregnancy is adherence due to a tendency among women to frequently neglect the regular use of supplements as prescribed by their healthcare practitioners. The high prevalence of anemia among pregnant mothers is probably due to this potential etiology.

## 1.2 Problem Statement

Anemia in pregnancy has been reported to affect 29.9% of pregnant women worldwide. Daily use of iron (30-60 mg) and folic acid (400 mcg) supplementation is strongly recommended by WHO throughout pregnancy to reduce the risk of maternal anemia, iron deficiency and fetal low birth weight (World Health Organization et al., 2012). Pregnant women who diagnosed with iron deficiency anemia (IDA) are recommended to receive a higher dosage of elemental iron, specifically 120 mg (World Health Organization, 2016). Iron supplementation compliance is vital in preventing and treating IDA, especially among second and third-trimester pregnant women due to increased iron requirements (Sajith et al., 2016).

Social support is a broad term that describes an individual's voluntary action toward another that produces a positive reaction. Social support may appear in terms of physical and emotional (sympathy, love, care), verbal, financial, or self-evaluation assistance to the patient (Logsdon et al., 2005). This voluntary action may develop from several people, such as family, friends, the community, or a spouse (Harley et al., 2006). Orr, S. T. (2004) found that pregnancy outcomes were enhanced when friends, relatives, and spouses supported mother. Another research has shown that the role that husbands play in prenatal care is the most important factor in improving pregnant mothers' health and lowering mother and newborn mortality during pregnancy and delivery (Nwokocha, 2007). For instance, most studies on male involvement in reproductive health in Africa have found that when women were supported by their husbands during the various stages of maternity, pregnancy outcomes improved significantly (Nwokocha, 2007). As a result, men are critical partners in improving maternal health and lowering maternal mortality.

The lack of compliance among pregnant women in the consumption of iron supplements is influenced by the level of information these women possess and the role

played by healthcare professionals who have failed to adequately communicate the benefits of consuming iron supplements (Sonkar et al., 2017). In Shkodra, Albania, it was discovered that approximately 39.6% of the population has inadequate knowledge regarding iron supplements and how they affect the health of the mother and child while 35.6% of the women surveyed reported that iron supplementation had adverse effects on the health of the mother and child (Kraja et al., 2013). Thus, maternal knowledge regarding iron supplement use is crucial because it can potentially to encourage women to take iron supplements throughout pregnancy (Theng et al., 2017).

As for perception, adherence to iron supplement is significantly impacted by how individuals perceive these supplements. The level of perception among pregnant women also has a role in influencing compliance with the consumption of iron tablets (K et al., 2016). In Indonesia research conducted by Saputri et al., (2021) revealed that pregnant women have a negative perception of anemia and iron supplementation, with 60% worried about it and 61.7% aware it could harm both the mother and fetus. Perceptions of iron tablet consumption among pregnant women are affected by various influences, including maternal knowledge, perceived benefits, health worker recommendations, and family encouragement (Alam et al., 2015).

In Malaysia, few studies have been conducted on the knowledge of iron supplement intake among pregnant women. However, there is no study conducted focused on husband's knowledge and perception on of iron consumption compliance among pregnant women in Malaysia. Therefore, the purpose of this research was to investigate the husband's knowledge and perception on of iron consumption compliance among pregnant women.



### **1.3 Research Question**

1. What is the level of husband's knowledge on iron consumption compliance among pregnant women in Hospital USM?
2. What is the level of husband's perception on iron consumption compliance among pregnant women in Hospital USM?
3. Is there any association between husband's knowledge and perception of iron consumption compliance among pregnant women in Hospital USM?

### **1.4 Research Objective**

#### **1.4.1 General Objective**

To identify the level of husband's knowledge and perception on iron consumption compliance among pregnant mothers in Hospital USM.

#### **1.4.2 Specific Objective**

1. To determine the level of husband's knowledge on iron consumption compliance among pregnant women in Hospital USM.
2. To determine the level of husband's perception on iron consumption compliance among pregnant women in Hospital USM.
3. To examine the association between husband's knowledge and perception of iron consumption compliance among pregnant women in Hospital USM.

## 1.5 Research Hypothesis

- Hypothesis** : There is no association between husband's knowledge and perception on iron consumption compliance among pregnant women in Hospital USM. (**H<sub>0</sub>**)
- : There is an association between husband's knowledge and perception on iron consumption compliance among pregnant mothers in Hospital USM. (**H<sub>A</sub>**)

## 1.6 Conceptual and Operational Definitions

Items	Conceptual	Operational
<b>Iron</b>	Element is found in small amounts in blood and all living things (Cambridge Dictionary,2023).	In this study, iron refers to an essential element that pregnant women require.
<b>Consumption</b>	The quantity consumed or used (Cambridge Dictionary,2023).	In this study, it refers to pregnant women's consumption of iron.
<b>Compliance</b>	The act or process of doing something that fulfils a requirement, demand, proposal, regimen, or coercion (Merriam-Webster, 2023).	This study refers to pregnant women's compliance with iron supplementation during pregnancy.
<b>Pregnant women</b>	Physiological state of a human female carrying a developing fetus from conception to the completion of gestation and delivery (Pregnant Women Definition, 2023).	In this study, it refers to pregnant women and in the period before giving birth.

<b>Knowledge</b>	knowledge or comprehension of a subject acquired through study or experience, whether possessed by an individual or by the public (Cambridge Dictionary, 2023).	This study refers to the husband's knowledge regarding iron consumption among pregnant women.
<b>Perception</b>	Individuals can process reactions into either positive or negative views using the experience obtained through the five senses. Responses are obtained by going through the processes of selection, interpretation, and reaction (Erin, & Maharani, 2018).	This study refers to the husband's perception of iron consumption among pregnant women.
<b>Anemia</b>	A condition characterized by an abnormally low production of healthy red blood cells in the circulation (National Heart Lung Blood Institute, 2022).	This study refers to the low production of red blood cells or hemoglobin concentration in pregnant women.

## **1.7 Significance of the study**

Daily oral iron supplements are distributed to all expectant women in Malaysia. Iron supplements has been shown to be an effective method for managing and preventing anemia during pregnancy. Iron supplementation compliance is vital in preventing and treating iron deficiency anemia, especially among second and third-trimester pregnant women due to increased iron requirements (Sajith et al., 2016) . However, Malaysia still has a high occurrence of iron deficiency anemia and a significant lack of compliance with iron supplementation.

Inadequate knowledge and negative perceptions about iron intake may affect the compliance towards oral iron supplementation. This study was conducted to enhance the husband's role in encouraging pregnant women to take iron supplements regularly. Moreover, it is essential to raise their level of understanding and awareness regarding the medical, psychological, and financial requirements of their expectant spouses, emergency obstetric situations, and birth preparation and complication readiness. Other than that, this study supported preliminary data of the husbands on iron supplement use by pregnant women and enabled public education that enhances community health and well-being benefits. Last but not least, husbands and families still need to be urged to assist pregnant women in taking iron supplements regularly.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.0 Introduction**

This chapter reviews a series of literature regarding the knowledge and perception on consumption of iron supplement among pregnant mothers and the association between demographic characteristics variable on consumption of iron supplement. The general findings of the literature reviews were presented into a few sections by the key term of the research. The recent articles and related issues were included in this chapter. The chosen conceptual framework to guide this proposed study is discussed.

#### **2.1 Anemia**

According to the World Health Organization, anemia is defined as a condition in which the number of red blood cells or hemoglobin concentrations within them is lower than normal. It mostly affects women and children. Anemia occurs when the body does not have enough hemoglobin to carry oxygen to the organs and tissues.

Centers For Disease Control and Prevention (CDC) states that anemia is a disorder in which the body does not have enough red blood cells or their ability to transport oxygen throughout the body is impaired. Women and children are more vulnerable to severe anemia, which increases maternal and child mortality. Anemia can also impair cognitive and physical development in children and reduce adult productivity.

Anemia symptoms include fatigue, skin and conjunctiva pallor and general weakness. Vertigo, breathing difficulties, rough skin, tachycardia, syncope, and even more concerning cardiac symptoms including heart murmurs and angina pectoris can all be present in a severe anemic state (Lopez et al., 2016). According to the World Health Organization, numerous non-specific symptoms, such as weakness, fatigue, lightheadedness or dizziness,

drowsiness, and shortness of breath, particularly after physical activity, can be caused by anemia. Iron deficiency is the most prevalent nutritional cause of anemia, while folate, vitamin B12, and vitamin A deficits are also significant causes.

Anemia during pregnancy is characterized by a hemoglobin concentration below 11 g/dl (World Health Organizations,2011). The condition is further classified into three categories: mild, moderate, and severe. The mild category is defined by a hemoglobin level ranging from 10.0 to 10.9 g/dl. The moderate category encompasses hemoglobin levels between 7.0 and 9.9 g/dl. Lastly, the severe category is characterized by a hemoglobin level below 7.0 g/dl (World Health Organization et al., 2012).

### **2.1.1 Prevalence of Anemia**

Anemia is a critical health condition that has a global impact on individuals. With only a few physical symptoms and a gradual progression, the disease is asymptomatic. Anemia during pregnancy can cause fetal malformations, low birth weight, and preterm birth, in addition to incurring additional financial burdens on families and society.

A study found that mild anemia is the most prevalent in pregnant women globally. According to meta-analysis results, the overall prevalence of anemia in pregnant women is 36.8%. The highest prevalence of anemia is mild at 70.8 (95% CI 58.1-81) and highest in the third trimester of pregnancy with a prevalence of 48.8 (95% CI 38.7-58.9), while the highest prevalence of anemia in pregnant women was in Africa with the prevalence of 41.7 (95% CI 32.3-49.4) (Karami et al.,2022).

A systematic review was conducted among pregnant women in Malaysia revealed that overall, the prevalence of anemia in pregnancy ranged from 19.3 to 57.4%, whereas iron deficiency in pregnancy ranged from 31.6 to 34.6% (Abd Rahman et al., 2022). Prevalence of anemia among primigravidae attending an urban university hospital in Kuala Lumpur was

found to be the lowest at 19.3% (Tan et al., 2013). The highest prevalence (57.4%) was found among pregnant women attending a rural antenatal clinic in Terengganu, a state on the east coast of Malaysia (NH et al., 2012).

## **2.2 Iron Supplementation**

Iron is a vital dietary component that plays a crucial role in supporting bodily functions. The primary role of this molecule is to facilitate the storage and transportation of iron inside the human body, primarily in the form of myoglobin and hemoglobin. The synthesis of hemoglobin occurs in a situation of iron deficiency, leading to microcytic anemia characterized by the formation of small erythrocytes (Nguyen et al., 2023).

Several ferrous salts are commercially available, such as ferrous fumarate, ferrous sulfate, and ferrous gluconate (Franco-Piña et al., 2017). Many iron preparations are available to treat iron deficiency anemia in pregnancy. Ferrous sulfate is the most frequently used iron preparation in the world. Nausea, vomiting, abdominal pain, constipation, diarrhea, dyspepsia, and other adverse effects have been associated to conventional iron salts. Due to the limitations of traditional iron salts, more recent oral iron formulations have been developed, including ferrous bisglycinate, carbonyl iron, iron polymaltose complex, and sodium ferredetate (Singhal et al., 2015).

Pregnant women in Malaysia have access to medications containing ferrous fumarate, folic acid, vitamin B complex, and vitamin C. During their initial antenatal care visit until delivery, all expectant women were administered oral prophylactic iron, folic acid supplements, and both vitamin B complex and vitamin C, regardless of their hematological status or trimester (Fadzil et al., 2021).

In antenatal care, WHO recommends daily iron and folic acid supplementation to lower the risk of low birth weight, maternal anemia, and iron deficiency. Moreover,

Consuming 300 mg of ferrous sulfate heptahydrate, 180 mg of ferrous fumarate, or 500 mg of ferrous gluconate is recommended as they provide an equivalent of 60 mg of elemental iron (WHO,2023). If anemia in pregnant women is a major public health issue ( $\geq 40\%$ ), the supplement should contain 30-60 mg of iron and 400  $\mu\text{g}$  of folic acid (WHO,2023). It is recommended that supplementation be sustained during the postpartum period to facilitate the formation adequate iron stores by women (Charles et al., 2010). Table 2.1 shows the guidelines for iron supplementation for pregnant women.

**Table 2. 1 Guidelines for Iron Supplementation to Pregnant Women**

<b>Prevalence of anemia in pregnancy</b>	<b>Dose</b>	<b>Duration</b>
<40%	60 mg iron + 400 $\mu\text{g}$ folic acid daily	6 months in pregnancy
$\geq 40\%$	60 mg iron + 400 $\mu\text{g}$ folic acid daily	6 months in pregnancy, and continuing to 3 months postpartum

**Source:** (Charles et al., 2010)

### **2.3 Iron Used In Pregnant Women**

Iron deficiency is a prevalent nutritional disorder particularly common in developing nations. Iron deficiency is the leading cause of nutritional anemia in children and pregnant women of reproductive age. Based on the report of the World Health Organization, 58% of the women in developing countries suffer from anemia and despite of suggestion to use iron during pregnancy in their health policies, no reduction was observed. Iron requirements increase during pregnancy, primarily due to an increase in red blood cell mass and the growth of the unborn child and placenta especially during the second and third trimesters.



In a previous study in four German states, out of the 207 respondents, 65.7% indicated that they had supplemented iron during pregnancy. 94.2%, nearly indicated all women had had their iron status measured. In addition, based on self-reported information from participants, two-thirds of them which is 62.1% had been diagnosed with iron deficiency (ID)/anemia at some stage of pregnancy. The majority of cases had been detected in the second is 45.5%, 33.1% in the third trimester, and 18.2% already in the first trimester of pregnancy. Furthermore, 85.2% of women who had supplemented iron have been reported to have done so mainly because of a diagnosed ID/anemia. However, 15% also reported (indiscriminate) iron supplementation by women who had either not been detected with ID/anemia or could not report it because their iron status had not been examined (Demuth, I. et al., 2018).

A study was conducted in the United Republic of Tanzania, among respondents residing in rural settings, whereas very few were from Zanzibar (Unguja and Pemba). The results indicated that a significant proportion, specifically 81.6%, of women consistently adhered to iron supplementation during pregnancy, whereas 18.4%, did not take iron supplements at all (Moshi et al., 2021). Most pregnant women in this study consumed iron supplement 77.5% while 22.5% did not intake of iron during pregnancy (Theng et al., 2017).

### **2.3.1 The Impact of Iron Supplement and Maternal and Child Health**

During pregnancy, the requirement for iron for both the mother and the fetus gradually increases, increasing towards the end of the pregnancy. The reason for this high need is that the mother's blood volume grows by around 35% throughout the second and third trimesters, as well fetal growth, placenta, and other mother tissues, which increases the need for iron about three to five times. When storage is limited, even an iron-rich diet is unable to satisfy this elevated demand an increase in iron absorption can only partially compensate (Balasubramanian et al, 2016).

A cross-sectional study by (Yang et al., 2017), revealed that iron (Fe) supplements during pregnancy can lower the risk of a low-birth-weight baby (LBW), especially during the second and third trimesters. However, no association was found between Fe supplements use during the first trimester and LBW risk, suggesting that a balanced diet and adequate iron intake can significantly reduce the risk of LBW.

Another cross-sectional study in Shaanxi Province, Northwest China showed that iron supplementation during pregnancy is related to an increase in neonatal BW, and the impact was more pronounced in newborns with lower BW and newborns whose mothers had anemia during pregnancy. Based on the study, 5.15% of pregnant women used iron supplements, which increased their body weight (BW) by 43.07 g on average. The researchers also discovered that iron supplementation raised neonatal BW from the lowest to the highest percentiles. However, as BW increased neonatal BW gain in the iron-supplemented group decreased compared to the non-supplemented group (Shi et al., 2021).

#### **2.4 Husband support on Iron Supplementation During Pregnancy.**

An essential component in enhancing compliance with taking ferrous fumarate tablets is the involvement of the family, especially the husband's role as a reinforcing influence. Pregnant women are more likely to consume ferrous fumarate tablets if concerned about paying attention to and monitoring their daily consumption (Kody et al., 2021). Thus, increased pregnancy complications will result from a husband's lack of attention to his supportive role (Abdollahpour et al., 2005).

A qualitative study with a cross-sectional design conducted in the working area of Pondok Kacang Timur Health Center in South Tangerang showed that two-thirds of respondents received support from their husbands and family. In contrast, only one-third did not receive support from their husband and family. Besides, it shows that when pregnant women's characteristics and the health professional's role are controlled, husband and family

support have no significant effect on iron tablet consumption compliance (Handari et al., 2016).

A descriptive survey in Ogun state, Nigeria conducted among pregnant women revealed that 96.5% agreed that husbands' support is essential during pregnancy, labour, and delivery. 80% of women disagreed with the statement that they did not require their husbands' support during pregnancy, labour, and delivery. As a result, women regard their husbands' support as vital during this time. However, 84% of participants recognized the risks of not having a spouse's support during pregnancy, birth, and delivery (Sokoya et al., 2014).

Family members are the closest to pregnant women and significantly influence how they experience pregnancy. The emotional support they offer is crucial and impacts the pregnancy process (Triharini et al., 2018). A qualitative study conducted by Darmawati et al., (2022), found that husbands eagerly anticipate pregnancy and are willing to support their pregnant wives, such as by providing nutritious food to ensure they receive necessary vitamins. In another study conducted by Nur et al., (2019), revealed that husbands support their wives' pregnancies by accompanying them to Antenatal Care(ANC) services, reminding them to take iron tablets, and seeking information related to their pregnancies.

## **2.5 Husband's Knowledge of Iron Supplement Consumption Among Antenatal Women**

Husbands and family members are crucial in ensuring a healthy pregnancy for expectant mothers. Husbands, in particular, significantly influence the behaviors of pregnant women, which can help in preventing anemia. A qualitative study conducted by Darmawati et al., (2022), found that Acehnese men, both as husbands and future fathers, often lack knowledge about anemia during pregnancy. It is essential to improve their understanding, as husbands typically serve as the primary decision-makers in the family. Moreover, most participants

had a high level of education, making it relatively easy to enhance their knowledge about pregnancy (Darmawati et al., 2022).

A cross-sectional study was conducted in Health Complex in the Tangail district of Bangladesh. The study found that husbands with adequate knowledge of detecting pregnancy risks positively contribute to reducing maternal mortality (Zaman et al., 2018). Hence, when husbands have good knowledge and provide positive support to pregnant women, it leads to increased adherence to iron tablet consumption (Darmawati et al., 2022).

Compliance with oral iron supplementation has been found to be influenced by knowledge of iron consumption. Lower knowledge regarding iron supplementation during pregnancy considerably increases the risk of anemia in pregnant women in India. Although 96.4% of respondents acknowledge the significance of iron supplementation during pregnancy, this finding highlights the need to enhanced awareness and implementation (Ghimire et al., 2013).

In another study by Saputri et al., 2021, most pregnant women had good knowledge about iron supplements. Most pregnant women know the definition of anemia, target Hb levels, signs and symptoms, risk factors, increased iron requirements, risk of pregnancy anemia, monitoring HB levels during pregnancy, iron-containing foods, and how to consume iron tablets. However, half of them do not understand of the side effects of iron tablets (50%), and the management of these side effects (21.7%). Despite being well-informed about how to consume iron tablets, half of the pregnant women still lack knowledge of the side effects and their management.

A study among pregnant women in Pegasing Health Center Central Aceh revealed that 41.8% of the level of knowledge among pregnant women regarding the definition and requirement of iron is in the satisfactory category. Education significantly impacts

knowledge, and information influences the initial incentive for someone to behave. The majority of respondents are well-informed regarding the consequences of iron deficiency during pregnancy and the rationale behind iron supplementation. Only 65.71% of pregnant women have enough knowledge of iron-rich foods. As a result, pregnant women are expected to obtain information about iron-rich meals (Hidayana et al., 2022).

In Malaysia, a few studies on iron supplement consumption were conducted at particular states. A study was conducted in Kuala Terengganu, Terengganu revealed that only 58.3% of pregnant mothers possessed a satisfactory level of knowledge regarding iron intake because most pregnant women had the highest education level which contributed 48.3% (Theng et al., 2017). A study showed 9.3% respondents had good knowledge, while 90.7% had poor knowledge scores in the previous Kelantan study (Kadir et al., 2021).

## **2.6 Husband's Perception Of Iron Supplement Consumption Among Antenatal Women**

The key factor influencing the ineffectiveness of the iron tablet intake program on pregnant women was the low degree of adherence to the consumption of these supplements. The low compliance rate was caused by pregnant women's perceptions regarding the intended use of iron pills or the decreased quality of life caused by the absence of iron supplement consumption (Matsui, 2012). Many expectant women believe that iron supplementation during pregnancy can reduce the risk of anemia (Alam et al., 2015).

Based on the qualitative study done by Darmawati et al., (2022), shown the husbands' perceptions and actions concerning their wives being advised to regularly take iron tablets to prevent anemia and identified two situations: some husbands supported their wives in regularly taking iron tablets, while others did not offer full support. Previous studies indicate that pregnant women who receive support from their husbands, such as being accompanied to ANC visits, show a high level of adherence to regularly taking iron tablets (Darmawati et al., 2022).

Additionally, the cultural beliefs of husbands will influence the health status of pregnant women. This is due to cultural dietary restrictions impacting the nutrients pregnant women require. This study found that husbands imposed certain dietary restrictions on their pregnant wives, including avoiding satay, pineapple, fermented rice, and durian. In another study done by Gao et al., (2013); Mohammed et al., (2019), found that food restrictions based on cultural beliefs that are violated are thought to harm both the mother and the unborn child. Therefore, health workers must educate the public, particularly pregnant women and their husbands, to change their perceptions of dietary restrictions (Darmawati et al., 2022) .

A descriptive survey in Kathmandu, Nepal revealed that 73.2% of the respondents showed good adherence. The findings suggest that the majority of respondents (40.7%) had a positive perception. Concerning the supplementation of Iron and Folic Acid (IFA) and Iron Deficiency Anemia (IDA), a significant proportion of individuals, specifically 39%, showed a highly positive perception. Just 12% of individuals portrayed a negative perception, while only 8.2% had a severely negative perception. Perceptions of availability, forgetfulness, adverse effects, and family reminders concerning IFA supplementation were significant determinants of adherence, according to additional analyses of the independent perception variables (Rai et al., 2014).

Another study conducted by (Nisar et al., 2014) showed that most rural mothers were aware of antenatal IFA supplementation but had little knowledge of its benefits. Some claim that vitamins provide strength, cure dizziness, lethargy, and back pain, improve maternal health, and prevent difficulties during pregnancy and delivery. These supplements were taken regularly and continued throughout the pregnancy. On the other hand, Urban women are aware of many supplements and report benefits such as increased hemoglobin levels, appetite, and anemia. These vitamins are good for maternal health, preventing delivery problems, and maintaining a healthy diet alongside to the supplements.

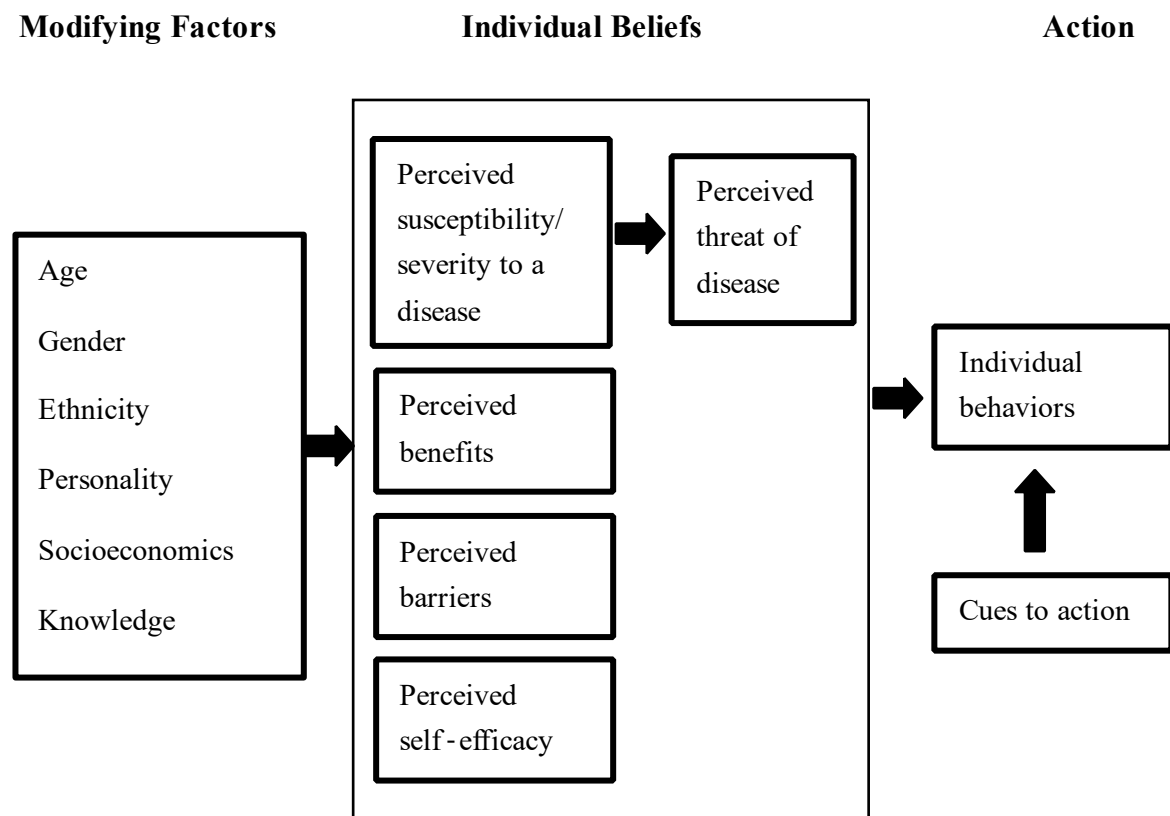
A cross-sectional study showed 51.7% (<30.65) of pregnant women had a negative perception of iron supplement consumption while 48.3% ( $\geq 30.65$ ) had a positive perception of it. Based on the study, pregnant mothers are concerned about anemia (60%), which damages both mother and fetus (61.7%). More than half (63.3%) believe that regular iron supplements can help to alleviate anemia symptoms. However, 55% are unaware of the risks or how to avoid them. Family support is essential for reminding and inspiring children to take iron supplements regularly. Furthermore, 53.3% believe it is important to enhance iron intake by eating foods high in iron. Iron supplements are a common approach to preventing anemia during pregnancy (Saputri et al., 2021).

## **2.7 Theoretical and Conceptual Framework of the Study**

The study is guided by the Health Belief Model (HBM), the conceptual framework. The Health Belief Model (HBM) was developed by a social psychologist inside the U.S. Public Health Services during the 1950s. Its purpose was to provide an explanatory framework for understanding individuals' reluctance to participate in illness prevention and detection campaigns. This paper provides a comprehensive analysis of the theoretical foundations of the model, drawing upon established principles in psychology. The aim is to enhance readers' comprehension of the model's justification for specific ideas and their interconnections, while highlighting its inherent strengths and limitations. The model experienced a progressive evolution in response to real public health challenges, while maintaining consistency with psychological theory (Glanz et al., 2008)

HBM is comprises components perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cue to action and self-efficacy. Perceived susceptibility is the belief of an individual about the probability of getting sick, perceived severity is the individual judgment of the seriousness of a health condition, perceived benefit is the belief in positive outcome of health behavior, perceived barriers is the belief about the

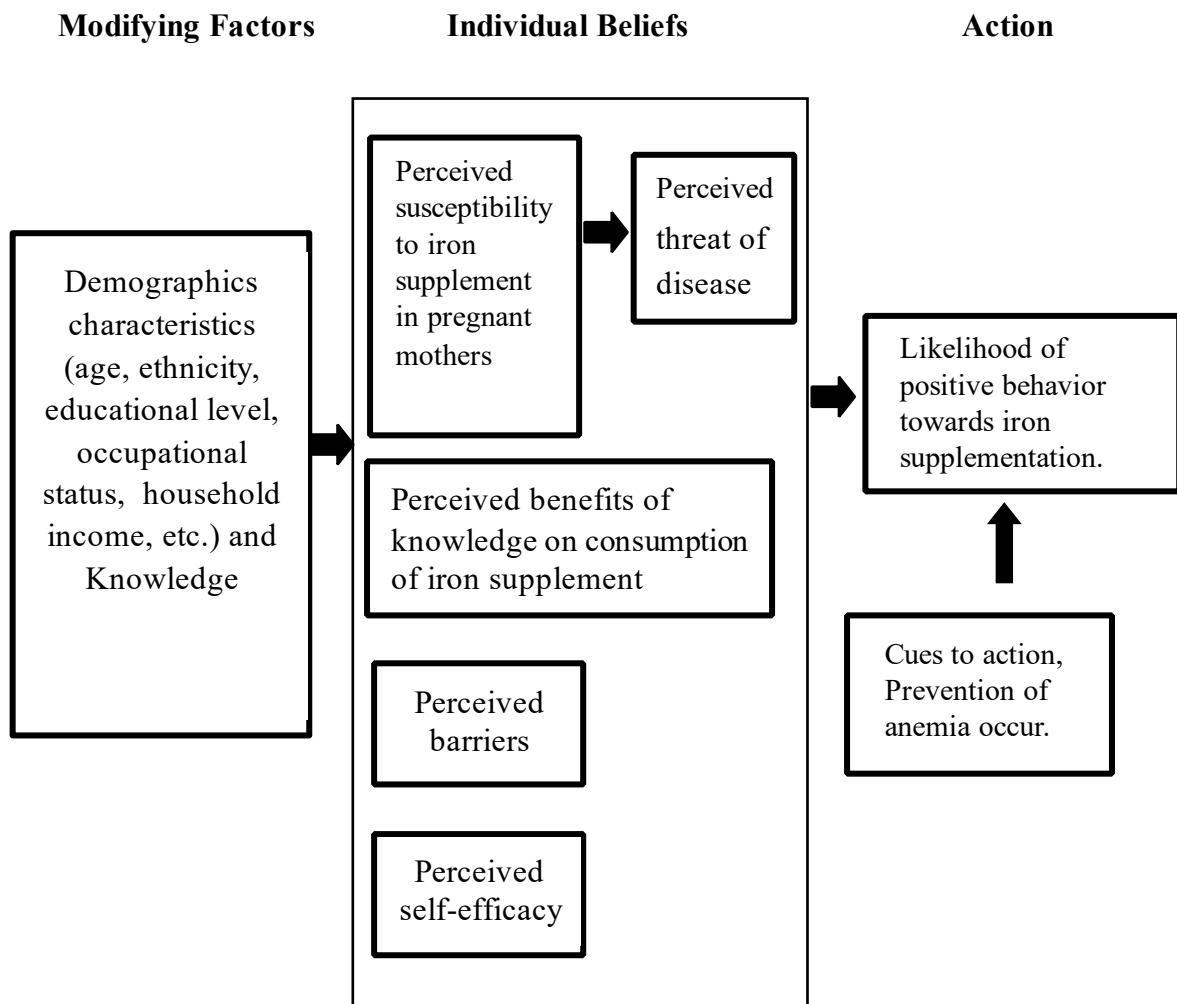
hindrance of the health action, cue of action is a readiness to take action after perceived susceptibility and benefit and self-efficacy is the self-motivation the individual to execute the health behaviors to produce the positive outcome. Demographic variables such as age, gender and psychological characteristics such as personality, and peer group pressure may indirectly influence health behaviors (Conner & Norman, 2015).



**Figure 2. 1 :Structure of the Health Belief Model (Glanz, Rimer, & Viswanath,2008).**

HBM explained the husband's perception of iron consumption compliance among pregnant women to change their health beliefs through knowledge on consumption of iron supplement including the causes, signs and symptoms, side effects, complications, risk factors, and prevention. Figure 2.2 shows the adopted theory of HBM in this study.





*Figure 2. 2 The adapted theory of Health Belief Model (HBM).*

## **CHAPTER 3**

### **METHODOLOGY**

#### **3.1 Introduction**

This chapter describes a detailed explanation of the cross-sectional design research design and justification for choosing this approach. A description of the study population and setting, sampling plan, participant selection criteria, sample size determination, instrumentation, variables, and data collection plan is written. The final section explained the method for data analysis, ethical consideration and expected research outcome.

#### **3.2 Research Design**

In this study, cross-sectional study design was used. This approach was considered appropriate to give a detailed description of the husband's knowledge and perception of iron consumption compliance among pregnant women in Hospital Universiti Sains Malaysia (USM).

#### **3.3 Research Location**

This study was conducted at the Obstetrics and Gynecology (O&G) clinic and obstetrics ward at Hospital Universiti Sains Malaysia. The obstetric ward was located at 2 Akik and 2 Baiduri. The O&G clinic open from Sunday to Thursday, which is specializes specifically for female patients who are either pregnant or experiencing gynecological issues.

#### **3.4 Research Duration**

The study was conducted from December 2023 until August 2024.

#### **3.5 Research Population**

This study was conducted among the husband of pregnant women who attends the Obstetrics and Gynecology (O&G) clinic and obstetrics ward at Hospital Universiti Sains Malaysia.

### **3.6 Subject Criteria**

#### **3.6.1 Inclusion Criteria**

Specific requirements for eligibility in this study of each subject must be:

- Spouse of a pregnant woman
- Aged 18 years old and above.
- Able to understand, speak, and write Malay.

#### **3.6.2 Exclusion Criteria**

Subject is excluded from this study if they:

- Non-Malaysian citizen.
- Cognitive impairment such as traumatic brain injury.

### **3.7 Sampling Plan**

Sampling is the process of selecting persons or sampling units from a sample frame because the sampling method can affect sample size estimation, the sampling strategy must be determined in advance (Martínez-Mesa et al., 2016). Sampling ensures that the validity and reliability of research are representative of the population of interest. An effective sampling method enables researchers to achieve research goals.

#### **3.7.1 Sampling Method**

Convenience sampling was applied to select the sample for this study. This sampling method was chosen due to its geographical proximity, availability at a certain time, or willingness to participate in the study. In non-probability sampling, the researcher selects the sample rather than using random selection, resulting in unequal chances for all individuals in the population to participate in the study (Simkus, 2023). Data collected easily accessible and available group of people. The researcher collected data in the obstetrics ward and Obstetrics and Gynecology (O&G) clinic at Hospital Universiti Sains Malaysia. The

obstetrics ward was located at 2 Akik and 2 Baiduri. The participants who voluntarily decide to participate in this study was provided with a set of questionnaires.

### 3.7.2 Sampling Size Estimation

For first and second objective, single proportion is used in sample size estimation.

$$n = \left[ \frac{z}{\Delta} \right]^2 p(1 - p)$$

n = required sample size

z = value of the standard normal distribution curve cutting off probability Alpha ( $\alpha$ ) in one tail for one-sided alternative or  $\alpha/2$  in each tail for a two-sided alternative (z 0.05=1.96)

$\Delta$  = desired level of precision

p = estimated proportion of an attribute that is present in the population

For first objective, to determine the level of husband's knowledge on of iron consumption compliance among pregnant women in HUSM,

z = 1.96,  $\Delta$  = 0.05, p = 9.3% (Kadir et al., 2021)

$$n = \left[ \frac{z}{\Delta} \right]^2 p(1 - p)$$

$$n = \left[ \frac{1.96}{0.05} \right]^2 0.093(1 - 0.093)$$

$$= 129.6$$

$$= 130 \text{ respondents}$$

The minimal sample size was 130 and after considering 10% of drop out, the calculated sample size is 143.