



## COMPLIANCE WITH IRON TABLET CONSUMPTION AND THE RISK OF ANEMIA IN THIRD TRIMESTER PREGNANT WOMEN IN THE CONTEXT OF MIDWIFERY COMMUNICATION

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### Abstract

Anemia in third trimester pregnant women remains a common health issue and has the potential to increase the risk of pregnancy complications. Iron tablet consumption is one of the preventive measures for anemia, but the level of compliance among pregnant women in consuming them varies, influenced by individual characteristics, knowledge levels, and midwifery communication processes during antenatal care. This study aims to analyze iron tablet consumption compliance and the risk of anemia in third-trimester pregnant women in the context of midwifery communication in the working area of the "J" Community Health Center in 2025. This study used a cross-sectional design. The research subjects were third trimester pregnant women who underwent pregnancy check-ups at the "J" Community Health Center during the period of September–November 2025, with a sample size of 62 respondents. Compliance with iron tablet consumption was determined based on a minimum consumption of 90 tablets during pregnancy, while the incidence of anemia was determined based on hemoglobin levels. Data analysis was performed using univariate and bivariate analysis with the Chi-square test and presented in Odds Ratio (OR) values with a 95% confidence level. The results showed that most pregnant women were non-compliant in consuming iron tablets (67.7%), and anemia was found in 82.3% of respondents. Bivariate analysis showed a significant difference in the risk of anemia between pregnant women who adhered to and did not adhere to iron tablet consumption ( $p = 0.014$ ). Pregnant women who did not adhere to iron tablet consumption had a higher risk of anemia than pregnant women who adhered to iron tablet consumption (OR = 5.115; 95% CI: 1.286–20.343). Variations in the incidence of anemia were also found based on maternal age ( $p = 0.015$ ) and level of knowledge ( $p < 0.001$ ), while parity did not show a significant relationship ( $p = 0.679$ ). There is a correlation between iron tablet compliance and the risk of anemia in third trimester pregnant women. Iron tablet compliance plays an important role in reducing the risk of anemia, so strengthening midwifery communication through education and assistance during antenatal care needs to be continuously improved as part of efforts to prevent anemia in pregnant women.

**Keywords:** Compliance, Iron Tablets, Anemia, Third Trimester Pregnant Women, Midwifery Communication.

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## INTRODUCTION

Anemia during pregnancy remains a common public health problem, especially in pregnant women in their third trimester. During this period, iron requirements increase in line with fetal growth and physiological changes in the mother, so that if intake is insufficient, the risk of anemia increases. Anemia during pregnancy is associated with an increased risk of maternal and neonatal complications, such as bleeding, premature delivery, and low birth weight. (World Health Organization, 2016)

Iron deficiency anemia remains a global health problem, especially in pregnant women. The World Health Organization (WHO) reports that the prevalence of iron deficiency in women ranges from 35–75% and tends to increase with age pregnancy. Globally, approximately 41.8% of pregnant women experience anemia, and this condition contributes significantly to high maternal mortality rates, especially in developing countries. Anemia during pregnancy is reported to be one of the causes of approximately 40% of maternal deaths worldwide. (Organization, 2025)

Based on the results of the 2023 Indonesian Health Survey (SKI), the prevalence of anemia in pregnant women in Indonesia was recorded at 27.7%, indicating that anemia remains a maternal health issue that needs attention in antenatal health services. This figure is lower than the previous prevalence based on the 2018 Riskesdas, but it still shows a significant health burden at the national level. (Indonesia, 2023)

Anemia in pregnant women remains a health issue that requires serious attention because it affects the health of both the mother and the fetus. The results of research by Fadli and Fatmawati show that the incidence of anemia in pregnant women is influenced by various factors, with adequate consumption of iron tablets being one of the most influential factors. Pregnant women who do not consume iron tablets adequately and regularly tend to have a higher risk of anemia compared to pregnant women who are compliant. This condition is exacerbated by various barriers to iron tablet consumption, such as perceived side effects, low compliance among pregnant women, and suboptimal utilization of antenatal services. These findings indicate that the success of anemia prevention efforts among pregnant women is highly dependent on compliance with iron tablet consumption, thus requiring special attention to improve compliance among pregnant women through continuous health services. (Fadli & fatmawati, 2019)

As an effort to prevent anemia in pregnant women, the Indonesian government has implemented a blood supplement tablet (TTD) program with a minimum consumption requirement of 90 tablets during pregnancy, each containing 60 mg of iron and 0.25 mg of folic

acid. This program aims to meet the increased iron requirements during pregnancy and reduce the risk of anemia. However, the implementation of this program still faces challenges in terms of consumption compliance. Data from the 2023 Indonesian Health Survey shows that although most pregnant women have received more than 90 Fe tablets, not all of them consume the tablets as recommended. Wulandari and Iwan reported that only 44.2% of pregnant women took iron tablets as prescribed, which is still far below the national target of 95%. This condition shows a gap between the coverage of iron tablet distribution and the level of consumption compliance, thus requiring more effective education and assistance efforts to increase the compliance of pregnant women in taking iron tablets regularly. (Putri et al., 2025)

The Iron Supplement Tablet (TTD) program for pregnant women has long been implemented as part of efforts to prevent iron deficiency anemia and support improved nutritional status for mothers and fetuses. During pregnancy, iron requirements increase significantly compared to non-pregnant conditions, so that iron intake through daily food consumption is often insufficient. This condition makes iron tablet supplementation an important intervention to meet the iron needs of pregnant women, especially in supporting hemoglobin formation and preventing anemia. (Istikhomah et al., 2023)

Various studies in Indonesia show that the knowledge and attitudes of pregnant women are related to their compliance in taking iron tablets. However, a good level of knowledge is not always followed by optimal compliance behavior. A study at the Soropia Community Health Center reported that although most pregnant women had good knowledge about iron tablets, all respondents were still categorized as non-compliant in taking them as recommended (Luh et al., 2020) Another study in Palu City showed that anemia was more prevalent among pregnant women with low levels of knowledge and poor compliance in taking iron tablets (Parumpu et al., 2024)

The compliance of pregnant women in taking iron tablets plays an important role in the success of anemia prevention. Various factors can affect this compliance, including perceived side effects, the mother's level of knowledge, family support, and understanding of the benefits of iron supplementation during pregnancy. Previous studies have shown a significant relationship between compliance with iron tablet consumption and the incidence of anemia in pregnant women. Mothers' knowledge levels have also been reported to be related to compliance with iron tablet consumption and anemia status during pregnancy. (Sari & Djannah, 2020)

In the context of improving iron tablet adherence, nutrition education and health education approaches are considered effective strategies. Various studies show that pregnant women who receive educational interventions tend to be more consistent in consuming iron-folate supplementation. This increase in adherence contributes to improved hemoglobin status in pregnant women and a reduced risk of anemia during pregnancy. In addition, the effectiveness of health education interventions has been reported to vary between regions, indicating that the success of education is greatly influenced by the social context and local health care system.(Engidaw et al., 2024)

Most previous studies have focused on the relationship between iron tablet consumption and the incidence of anemia, without examining in depth how pregnant women's compliance is formed in daily midwifery practice. Therefore, this study aimed to analyze iron tablet consumption compliance and its risk of anemia in third trimester pregnant women, taking into account the role of midwifery communication in providing information, education, and assistance to pregnant women during antenatal care. A cross-sectional approach was used to identify the relationship between iron tablet consumption compliance and anemia status during the high-risk period of pregnancy. The results of this study are expected to form the basis for strengthening midwifery communication strategies and improving the quality of antenatal care as part of efforts to prevent anemia in pregnant women

**METHOD**

**Research Design and Type**

This study used an analytical observational design with a cross-sectional approach. This design was chosen to analyze the relationship between iron tablet consumption compliance and the risk of anemia in third trimester pregnant women in the context of midwifery communication at the same time.

**Location and Time**

The study was conducted at the "J" Community Health Center during the period of September-November 2025.

**Population and Sample**

The population in this study consisted of all pregnant women in their third trimester who underwent pregnancy checkups at the "J" Community Health Center during the study period. The study sample consisted of 62 respondents, selected using total sampling techniques, with the following criteria:

Inclusion criteria: Third-trimester pregnant women, willing to be respondents, and possessing a KIA book or pregnancy examination records.

Exclusion criteria: Pregnant women with certain comorbidities that could affect hemoglobin levels and incomplete respondent data.

Research variables: Independent variable: Fe tablet consumption compliance, Dependent variable: Incidence of anemia in pregnant women in their third trimester, Characteristic variables: Mother's age, level of knowledge, and parity.

The context of midwifery communication is considered part of the education and counseling process.

**Data Analysis**

Data analysis was conducted in stages:

1. Univariate to describe the frequency distribution of respondent characteristics, iron tablet consumption compliance, and the incidence of anemia
2. Bivariate using the Chi-square test to determine the relationship between iron tablet consumption compliance and the incidence of anemia
3. The results of the analysis are presented in Odds Ratio (OR) values with a 95% confidence interval and a statistical significance level of  $p < 0.05$

**RESULTS AND DISCUSSION**

**Univariate Analysis**

An overview of the characteristics of the research respondents, including iron tablet consumption compliance, anemia status, maternal age, level of knowledge, and parity in third trimester pregnant women, is presented in the form of a frequency distribution in Table 1.

Table 1. Frequency Distribution of Characteristics of Pregnant Women in the Third Trimester

Variable	Category	N	
Compliance with iron tablet consumption	Consuming $\geq 90$ tablets	20	32
	Taking $< 90$ tablets	42	67.7
Anemia status	Not anemic	11	17.7
	Anemia	51	82.3
Mother's age	At risk	41	66.1
	Not at risk	21	33.9
Level of knowledge	Insufficient/Adequate	46	74.2
	Good	16	25.8
Parity	Primigravida	38	61.3
	Multigravida	24	38.7

Based on Table 1, most pregnant women in their third trimester in this study did not comply with iron tablet consumption, with a proportion of 67.7%. This condition is in line with the high incidence of anemia, which was found in 82.3% of respondents. From the characteristics of the respondents, the majority of pregnant women were in the at-risk age group (66.1%) and had a low to moderate level of knowledge (74.2%), with most respondents being primigravida (61.3%). The results of this study indicate that low

compliance with iron tablet consumption and the characteristics of pregnant women, particularly age and level of knowledge, remain a concern in efforts to prevent anemia in pregnant women in their third trimester

**Bivariate Analysis**

**a. Relationship Between Characteristics of Pregnant Women in the Third Trimester and Compliance with Iron Tablet Consumption**

Bivariate data analysis using the Chi-square test, the results of the analysis can be seen in Table 2 as follows.

Table 2. Relationship between Characteristics of Pregnant Women in the Third Trimester with Iron Tablet Consumption Compliance

Variable	Adherence to Iron Number Tablet Consumption						P value	OR 95% CI
	Compliant		Non-Compliant		Total			
	N	%	N	%	Total	%		
<b>Age</b>								
At risk	9	14.5	32	51.6	41	66.1	0.015	2.310 (1.18-4.517)
Not at risk	11	17.8	10	16.1	21	33.9		
<b>Knowledge</b>								
Adequate	5	8	41	66.1	46	74.2	0.000	31,500 (4,468-222,058)
Good	15	24.3	1	1.6	16	25.8		
<b>Parity</b>								
Primigravida	13	21	25	40.3	38	61.3	0.067	1.092 (0.727-1.640)
Multigravida	7	11.3	17	27.4	24	38.7		

The results of this study indicate a significant relationship between the level of knowledge of pregnant women and their compliance with iron tablet consumption (p = 0.000). Knowledge about anemia and iron supplementation plays an important role in determining the level of compliance of pregnant women with iron tablet consumption (Sari & Djannah, 2020). These results are consistent with research in Indonesia, which reports that pregnant women's understanding of anemia and the benefits of iron supplementation plays an important role in shaping their behavior regarding iron tablet consumption. Pregnant women with low knowledge tend to be more non-compliant because they do not fully understand the impact of anemia on the health of the mother and fetus. This shows that increasing knowledge is a key factor in efforts to improve iron tablet consumption compliance. (Bakhtiara et al., 2021)

Additionally, age also showed a significant relationship between the age of pregnant women and compliance in consuming iron tablets (p = 0.015), where pregnant women of risk age tended to have higher levels of non-compliance compared to women of non-risk age. This is consistent with the findings of Putri et al., who reported differences in iron tablet consumption compliance among age groups of respondents in a study conducted in the work area of a community health center (Puskesmas), although not all age groups

showed the same pattern in every health service setting (PUTRY & ANDINI, 2023). Based on Triandini's study, there were also variations in the level of compliance in consuming iron tablets among pregnant women in different age groups, confirming that age can influence compliance behavior in iron supplementation during pregnancy (Triandini et al., 2023). Other studies have stated that the mother's age is also significantly related to compliance in this study. This is in line with studies showing that maternal age can influence compliance with iron supplementation, where older pregnant women show a stronger tendency to follow consumption recommendations than younger women (Mengistu et al., 2023)

Regarding the parity variable, the study results did not find a significant relationship between parity (primigravida and multigravida) and compliance with iron tablet consumption (p = 0.0679). Although primigravida mothers showed a tendency to be more compliant than multigravida mothers, the relationship was not statistically significant. These findings are consistent with studies stating that previous pregnancy experiences do not always influence maternal health behaviors, including adherence to iron tablet consumption. (Triandini et al., 2023) However, several other studies in Indonesia have reported different results, where multiparous mothers tend to have lower adherence rates than primigravida, which is associated with factors such as fatigue and busyness in caring for children [5]. This study is also consistent with a study conducted in the midwife practice area in Bengkalis, where bivariate analysis showed that parity status was not significantly correlated with compliance in taking iron tablets (p = 0.617), although other factors such as knowledge showed a significant relationship. (Kasmara, 2024).

**b. Analysis of Iron Tablet Consumption Compliance Levels and Anemia Incidence in Third Trimester Pregnant Women**

Data analysis was conducted to examine the relationship between iron tablet consumption compliance and the incidence of anemia in pregnant women. The results of the analysis are presented in Table 2 as follows:

Table 2. Analysis of Iron Tablet Consumption Compliance Levels and Anemia Incidence in Third-Trimester Pregnant Women

Incidence of Anemia	Iron Tablet Consumption Compliance						P value	OR 95% CI
	Compliant		Non-Compliant		Total			
	N	%	N	%	Total	%		
Not Anemic	7	11.3	4	6.4	11	17.7	0.014	5.115 (1.286-20.343)
Anemia	13	21	38	61.3	51	82.3		
<b>Total subjects</b>	<b>20</b>	<b>32.3</b>	<b>42</b>	<b>67.7</b>	<b>62</b>	<b>10</b>		

The results of the study indicate that there is a significant relationship between iron tablet

compliance and the incidence of anemia in pregnant women in the third trimester. This is evidenced by the statistical test results, which obtained a p-value of 0.014 ( $p < 0.05$ ), indicating that iron tablet compliance is statistically significantly associated with the incidence of anemia in pregnant women. These findings are consistent with a study conducted by Istikomah et al., which showed a relationship between iron tablet consumption and hemoglobin levels in pregnant women. Pregnant women who regularly consume iron tablets tend to have better hemoglobin levels than pregnant women who do not consume iron tablets regularly or at all. These results indicate that iron tablet consumption plays an important role in maintaining hemoglobin levels and preventing anemia during pregnancy, especially in the final trimester when iron requirements increase physiologically. (Istikomah et al., 2023)

Adherence to iron tablet consumption plays an important role in preventing anemia during pregnancy, as iron tablets are the primary source of iron and folic acid needed for hemoglobin formation. Non-compliance in taking iron tablets can lead to suboptimal iron intake during pregnancy, thereby increasing the risk of anemia in pregnant women. Thus, knowledge and family support indirectly contribute to the incidence of anemia through their influence on compliance with iron tablet consumption. (Asmari et al., 2021) Therefore, compliance with iron tablet consumption is an important indicator of the success of anemia prevention interventions in pregnant women.

The results of this study show that proportionally, the incidence of anemia is higher in the group of pregnant women who are non-compliant in taking iron tablets compared to the group that is compliant. Conversely, in pregnant women who are compliant in taking iron tablets, the proportion of anemia cases tends to be lower. This condition illustrates that compliance with iron tablet consumption plays a role in maintaining the hemoglobin levels of pregnant women, especially in the third trimester when there is an increase in blood volume and iron requirements due to fetal growth and development (Yanti, 2016). This is reinforced by several other studies that report that compliance with iron tablet consumption plays an important role in meeting iron requirements during pregnancy and reducing the risk of anemia. The more consistently a pregnant woman takes iron tablets as recommended—including the appropriate number of tablets, correct consumption method, and frequency per day—the more likely hemoglobin levels will increase and the incidence of anemia can be minimized. (PUTRY & ANDINI, 2023)

Adherence to iron tablet consumption is not only influenced by the availability of supplements but also by individual and environmental factors. Research by Mardhiah and Marlina states that pregnant women's knowledge, perception of the benefits of iron tablets, and comfort during consumption are factors that influence compliance. Low compliance can lead to insufficient iron intake during pregnancy and contribute to anemia. (Mardhiah, 2019) This shows the importance of effective midwifery education and communication in increasing compliance among pregnant women.

Side effects also play a role in reducing compliance with iron tablet consumption. The iron content in iron tablets can cause complaints such as nausea and vomiting in some pregnant women, leading to discomfort after consumption. This condition can reduce pregnant women's desire to consume iron tablets regularly. Non-compliance can also be influenced by the perception of pregnant women who feel that their pregnancy is normal without any complaints, thus considering iron tablet consumption not an urgent need. (Omasti et al., 2021) The iron content in iron tablets in some pregnant women can cause bodily reactions such as nausea and vomiting, causing discomfort after consumption. This condition has the potential to reduce the desire of pregnant women to consume iron tablets regularly during pregnancy. Non-compliance can also be influenced by the perception of pregnant women who feel that their pregnancy is normal and without complaints, thus considering the consumption of iron tablets to be non-urgent. (Erwin et al., 2017)

This is also in line with various studies in Indonesia that report that the level of compliance with iron tablet consumption is related to the incidence of anemia in pregnant women. Research by Kusumasari et al. shows that most pregnant women who do not comply with iron tablet consumption experience anemia, and statistical analysis results show a significant relationship between compliance with iron tablet consumption and the incidence of anemia. (Kusumasari et al., 2021), this opinion further emphasizes that compliance with iron tablet consumption is an important risk factor for the incidence of anemia in pregnancy.

Thus, iron tablet consumption compliance is one of the main determinants in reducing the incidence of anemia in pregnant women. Efforts to increase compliance need to be made through continuous education, clear and easy-to-understand midwifery communication, and family support during pregnancy. This approach is expected to increase pregnant women's compliance in consuming iron tablets and ultimately reduce the prevalence of anemia in pregnant women. (Putri et al., 2025)

## CONCLUSION

The results of this study indicate that compliance with iron tablet consumption is associated with the incidence of anemia in pregnant women in the third trimester. Pregnant women who do not comply with iron tablet consumption are more likely to experience anemia than pregnant women who comply. Compliance with iron tablet consumption plays a role in meeting iron requirements during pregnancy, especially in the third trimester when iron requirements increase. In addition, the characteristics of pregnant women, namely age, level of knowledge, and parity, also influence compliance with iron tablet consumption. In the context of midwifery communication, education and assistance during antenatal care play an important role in increasing compliance with iron tablet consumption, thereby contributing to the prevention of anemia in pregnant women in the third trimester.

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