Jurnal Eduhealth
Volume 16, Number 04 2025 DOI 10.54209/eduhealth.v16i04
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

The Relationship Between Regular Consumption of Fe Tablets and the Incidence of Anemia in Pregnant Women in the Third Trimester of Pregnancy in the Jombang-Jember Community Health Center Service Area

Dian Dhurotul Maftukha[1*], Susilawati[2], Eni Subiastutik[3]
[1,2,3]Program Studi Sarjana Terapan Kebidanan Jember, Politeknik Kesehatan Kemenkes Malang, Indonesia

Article Info
Keywords:
third trimester pregnant women,
regularity,
anemia.

ABSTRACT
In all nations, including Indonesia, anemia during pregnancy is a serious issue for expectant mothers. Due to poor regular ingestion of iron, pregnant women suffer from anemia. According to Riskesdas, 37.1% of Indonesian pregnant women suffered from anemia in 2020. 5.8% of people in East Java Province suffered from anemia. In 2017, 10.42% of pregnant women in Jember Regency and 47.993% of pregnant women in Jombang District had anemia. According to Dolang (2020), anemia affects 25.0% of people who do not frequently take iron tablets and 74.5% of people who do not regularly take iron supplements. Goal: to ascertain if frequent use of iron supplements and the incidence of anemia during the third trimester of pregnancy are connected. This study employs a correlational technique and an analytical research strategy. Using a proportionate random sampling approach, 42 pregnant women made up the sample, whereas 47 pregnant women made up the population in this study. Analyzing data with Fisher's exact test. The results of the study showed that 13 (31.0%) of the individuals did not regularly use iron supplements, whereas 29 (69.0%) did. Twenty (48.0%) of the people did not have anemia, whereas 22 (52.0%) did. Fisher's exact test findings revealed a p-value of 0.01 < 0.05. The prevalence of anemia during the third trimester of pregnancy is significantly correlated with the regular use of iron supplements. In conclusion, anemia is more common in women who do not regularly take Fe pills than in mothers who do. To promote the rise in Fe pills, pregnant women must take them consistently every day and have a healthy diet.

Corresponding Author:
Dian Dhurotul Maftukha
Program Studi Sarjana Terapan Kebidanan Jember, Politeknik Kesehatan Kemenkes Malang, Indonesia
diandhurotul63@gmail.com

INTRODUCTION

More than half of pregnant women worldwide, including in Indonesia, continue to struggle with anemia during pregnancy. Because it significantly impacts the quality of human resources and reflects the social and economic well-being of a community, anemia during pregnancy is a national concern (Dolang, 2020).

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If the hemoglobin concentration in the blood is >11 grams percent in the first and third trimesters, or >10.5 grams percent in the second trimester, this condition is known as pregnancy-related anemia. Due to hemodilution, pregnancy-related anemia is more physiological in the first and second trimesters, but is more common in the third trimester. Pregnant women who follow medical professional advice to regularly take iron supplements are said to be taking them regularly (Dolang, 2020).

According to the World Health Organization (WHO) in 2016 (Asmin et al., 2021), 40.1% of pregnant women suffer from anemia. It is estimated that worldwide, anemia affects up to 48.2% of pregnant women in Asia, 57.1% in Africa, 24.1% in the Americas, and 25.1% in Europe. According to the 2020 Basic Health Research (Riskesdas), anemia affects 37.1% of pregnant women in Indonesia. The average incidence of anemia in East Java Province is 5.8%. The anemia rate for pregnant women in East Java Province is below the national target of 28% (RPJMN 2015–2019). Conversely, 10.42% of pregnant women in Jember Regency experienced anemia in 2017 (Irwanti et al., 2019) and with 275 incidents or 47.993%, it ranked third in Jombang Regency (Dinkes Jember, 2023).

Based on data, 88.6% of pregnant women in Jember Regency received birth control pills (Jember Health Office, 2022). Only 38.1% of pregnant women reported consuming 90 or more birth control tablets; the remaining 61.9% reported consuming fewer than 90 pills (Riskesdas, 2018). Of the 60 respondents, 25.0% experienced anemia due to not taking the iron pills as directed, while 74.5% of the 55 respondents who did not take the tablets as directed experienced anemia (Dolang, 2020).

The results of a pilot study involving ten pregnant women who completed a questionnaire on May 17, 2024. Based on laboratory results, of the 10 pregnant women, 30% had anemia, especially hemoglobin, while 70% did not have anemia. Eighty percent of pregnant women regularly took one iron pill daily, while twenty percent did not. Routine prenatal checkups were conducted on the ten pregnant women, none of whom were over 35 years old. Based on previous research, the frequency of anemia in pregnant women correlated with how often they took iron tablets (Waridah, 2019).

Pregnant women experience hemodilution, or blood thinning, due to hypervolemia, or increased blood volume, which can lead to anemia. Because folate increases iron concentrations, iron supplements are another effective way to prevent folate-deficient anemia. Because pregnant women with iron deficiency can develop anemia, health professionals urge mothers to increase their intake of iron (Fe) and other nutrients (Asmin et al., 2021).

The frequency of iron (Fe) pill use is one variable that can influence the development of anemia. This is because pregnant women require an average of 800 mg of iron daily, of which 500 milligrams are needed to increase the mother's red blood cells and 300 milligrams are needed for the fetus and placenta. Therefore, pregnant women should consume two to three milligrams of iron daily to increase the production of placental tissue and hemoglobin in the fetus. Anemia during pregnancy can negatively impact maternal and fetal morbidity and mortality (Asmin et al., 2021).

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Intrauterine growth retardation (IUGR), premature birth, birth defects, and two impacts of anemia on infants are low birth weight (LBW) and an increased risk of fetal death during pregnancy. Shortness of breath, heart palpitations, insomnia, fatigue, preeclampsia, high blood pressure, abortion, and an increased risk of maternal death and prenatal and postpartum hemorrhage are some of the impacts of anemia on pregnant women (Asmin et al., 2021).

To prevent and treat anemia, iron, found in high concentrations in Fe tablets, is consumed during pregnancy to increase the mother's hemoglobin levels. This prevents anemia, which can lead to postpartum bleeding. Regular consumption of Fe tablets is recommended by utilizing the KIA (Mother's and Child's Health) book from TM I to TM III, specifically the pregnancy control card on page two, or by monitoring iron tablet consumption to monitor regular or irregular consumption. For the body to synthesize red blood cells, iron (Fe) is a necessary microelement (Kunis Lili Windari, 2023).

There is a close relationship between the use of iron pills and hemoglobin levels in pregnant women. The government has taken steps to reduce maternal mortality, such as improving the quality of services in health facilities, funding health insurance, directing community efforts to distribute at least 90 Iron Supplement Tablets (TTD) during pregnancy, and educating the public about healthy eating habits to improve the nutritional status of all pregnant women (Kunis Lili Windari, 2023)..

RESEARCH METHODS

This study used a coequal approach. In the service area of the Jombang-Jember Community Health Center, a total of 42 samples were taken from a population of 47 pregnant women in their third trimester, which constituted the sample in the study. Proportional random sampling was used as the sampling technique. Pregnant women in their third trimester who were willing to participate in the survey were able to register from the Jombang Community Health Center service area. This study excluded pregnant women who were absent in the third trimester, pregnant women with twins, pregnant women in the first and second trimesters, and pregnant women with APB. Easy Touch and questionnaires were used to assess the level of anemia in pregnant women. To confirm the relationship between anemia and the frequency of iron tablet use, the Chi-Square Test was used in the analysis of the correlation test..

RESULTS AND DISCUSSION

A total of 42 pregnant women in their third trimester participated in the study in July 2024. The study results contained specific data, such as the regularity of Fe birth control pill use and Hb levels, which were displayed in tabular form, and general data, such as maternal age, education, parity, and gestational age.

General Data

a. Age

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Table 1. Distribution of Respondents in the Working Area of the Jombang Community Health Center, Jember Regency in 2024 According to the Age of Pregnant Women in the Third Trimester.

Age Vulnerability	Frequency (n)	Percentage (%)
<20 years old	1	2.4%
20-34 years old	39	92.8%
>35 years old	2	4.8%
Amount	42	100.0%

Based on Table 1, almost all pregnant mothers are aged 20-34 years (92.8%). The remaining 2 mothers are aged 20-34 years.>35 years (4.8) and<20 years (2.4%).

b. Education

Table 2. Frequency distribution of respondents according to education of pregnant mothers in the third trimester in the working area of the Jombang Community Health Center, Jember Regency in 2024.

Education	Frequency (n)	Percentage (%)
Elementary School	2	4.8%
JUNIOR HIGH SCHOOL	8	19.0%
High School/Vocational School	30	71.4%
S1	2	4.8%
Amount	42	100.0%

The majority of pregnant women, as shown in Table 2, had a high school diploma or a vocational school diploma. Eight (19.0%) had completed junior high school, while thirty (71.4%) had completed senior high school or vocational school. The remaining two pregnant women (4.8%) had completed elementary school and a bachelor's degree.

c. Knowledge

Table 3. Distribution of Respondents in the Work Area of the Jombang Community Health Center, Jember Regency in 2024 Based on the Knowledge of Pregnant Women in the Third Trimester.

Level of Knowledge	Frequency (n)	Percentage (%)
Good	30	71.0%
Not enough	12	29.0%
Amount	42	100.0%

Twelve pregnant women, or 29% of the total, had poor knowledge, while half, or 30 pregnant women, or 71% of the total, had good knowledge, according to Table 3.

d. Gestational Age

Table 4. Frequency Distribution of Respondents According to Gestational Age in Pregnant Women in the Third Trimester in the Working Area of the Jombang Community Health Center, Jember Regency in 2024.

Gestational Age	Frequency (n)	Percentage (%)
27-30 weeks	3	7.1%

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31-35 weeks	25	59.6%
36-40 weeks	14	33.3%
Amount	42	100.0%

Looking at Table 4, more than half of the women were between 31 and 35 weeks' gestation, with 25 (59.6%) in this age range. Next came 36 to 40 weeks' gestation, with 14 (33.3%) in this age range. The remaining 27 to 30 weeks' gestation, with 3 (7.1%) in this age range.

e. Dietary habit

According to the research results, side dishes in the form of tofu, tempeh, beef, poultry, fish, and eggs contributed 100.0% of the total data on pregnant women's eating habits.

f. Classification of Anemia

Table 6.Distribution of Respondents in the Working Area of the Jombang Community Health Center, Jember Regency in 2024 Based on the Classification of Anemia in Pregnant Women in the Third Trimester.

Anemia	Frequency (n)	Percentage (%)
No Anemia	20	48.0%
Mild Anemia	19	45.0%
Moderate Anemia	3	7.0%
Amount	42	100.0%

Looking at table 5, almost half, 20 pregnant women or 48.0%, did not experience anemia. Then the remaining 3 pregnant women or 7.1%, and 19 pregnant women or 45.0% experienced moderate anemia.

Special Data

1. Regularity of taking Fe Tablets in Pregnant Women in the Third Trimester

Table 6. Distribution of Respondents Based on the Frequency of Iron Tablet Use in Third Trimester Pregnant Women in the Jombang-Jember Community Health Center Work Area in 2024.

Regularity Consumption of Fe Tablets	Frequency (n)	Percentage (%)
Regular	29	69.0%
Irregular	13	31.0%
Amount	42	100.0%

Looking at table 6 above, as many as 29 pregnant women or 69.0% of all pregnant women consistently took Fe birth control pills, while as many as 13 other pregnant women or 31.0% took them irregularly.

Knowledge and education are factors that influence how often people take iron tablets. A mother's acceptance of information is influenced by her education level, resulting in a lack of awareness of the need for iron to prevent anemia during pregnancy. Pregnant women with a higher level of education will find it easier to manage their health issues. However, it will be difficult for pregnant women with a lower level of education to learn about their health issues (Neshy, 2022).

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In this study, researchers concluded that knowledge significantly influences how often pregnant women use iron supplements. According to this study, the highest level of education for pregnant women was high school, while a small proportion had elementary school. A mother's ability to learn and apply what she has learned is positively correlated with her level of education. This is because people with lower levels of education have a harder time obtaining information, making them less aware of the use of birth control pills. The results of a study by Feny Wartisa et al. (2017) are consistent with the finding that maternal education levels influence birth control pill use by pregnant women.

2. Anemia Incident

Table 7. Frequency Distribution of Respondents According to the Incidence of Anemia in Pregnant Women in the Third Trimester in the Jombang-Jember Community Health Center Working Area in 2024.

Anemia	Frequency (n)	Percentage (%)
No Anemia	20	48.0%
Anemia	22	52.0%
Amount	42	100.0%

Based on Table 7, as many as 22 pregnant women (52.0%) experienced anemia, which is more than half of all anemia cases; while the remaining 20 pregnant women (48.0%) did not experience anemia.

Hemodilution, also known as blood thinning, occurs when the plasma volume increases more than the number of red blood cells. Here are some reasons why pregnant women experience anemia. Anemia is influenced by several factors, including age, parity, gestational age, education, and diet. Those under 20 are considered very young, while those over 35 are considered very old. The age range between 20 and 35 is considered safe for pregnancy because at that age the body and mind are ready for pregnancy. If a pregnant woman is under 20, iron will be divided between the fetus in the womb and her own biological growth. Pregnant women over 35 are in the early stages of the degenerative phase, which means their bodies are not functioning properly and they face a number of health problems (Neshy, 2022).

Scientists believe that maternal age is a contributing factor to anemia. Research findings indicate that a small percentage of pregnant women who are too old to conceive are found to have anemia, caused by factors that occur when the mother is 35 years old. Anemia is caused by the process of hemodilution, also known as blood thinning. This begins in the second trimester, or week 36, and peaks between weeks 32 and 36. Pregnant women over 35 years of age are more susceptible to anemia due to both physical and psychological factors, as well as because their immune systems begin to weaken during pregnancy. This is in line with the conclusions of a 2021 study by Senja Atika Sari HS., et al., which stated that pregnant women between the ages of 35 and 35 are susceptible to anemia.

3. The Relationship Between Regular Consumption of Fe Tablets and the Incidence of Anemia in Pregnant Women in the Third Trimester

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Table 8. Relationship between the Incidence of Third Trimester Anemia in Pregnant Women in the Work Area of the Jombang Community Health Center, Jember Regency in 2024 and the Frequency of Consumption of Fe Tablets.

Regularity of Consumption of Fe Tablets	Anemia Incident				Total		*p-value*
	No Anemia		Anemia				
	Total (%)		Total (%)		Total (%)		
Regular	20	47.6%	9	21.4%	29	69.0%	<0.001
Irregular	1	2.4%	12	28.6%	13	31.0%	
Total	21	50.0%	21	50.0%	42	100.0%	

Table 8 shows that regular users of Fe tablets have a risk of anemia that is almost half that of the 20 anemic pregnant women (47.6%), while non-routine users of Fe tablets have a risk that is almost the same as that of the 12 pregnant women (28.6%). With a value ofρby 0.01<0.05, the Hi Square test rejects H0. This illustrates the relationship between the prevalence of anemia that occurs in pregnant women in the third trimester in the service area of the Jombang Community Health Center, Jember Regency, with the frequency of use of Fe tablets.

Several factors, including not taking iron supplements as prescribed by your doctor and not consuming enough foods rich in protein, iron, and folate, can lead to pregnancy-related anemia. You should eat a wider variety of foods to increase your body's iron absorption. In addition to taking iron supplements, you can eat foods rich in iron, such as green vegetables, meat, chicken, fish, eggs, and nuts. Animal-based iron is more easily digested than plant-based iron. Iron absorption can also be enhanced by other micronutrients, including animal protein, folate, vitamin C, and vitamin A.

According to research, those who are aware of the importance of taking iron tablets regularly are more likely to experience anemia throughout their lives. Conversely, when pregnant women take iron tablets less regularly, the risk of developing anemia increases. Because pregnant women experience hemodilution (blood thinning), which can lead to anemia or low hemoglobin levels, taking iron tablets can prevent the increase in hemoglobin levels in pregnant women. Iron-rich foods, including meat, poultry, fish, eggs, nuts, vegetables, and protein, can be consumed by pregnant women in addition to taking iron supplements. Because women must consume adequate iron to support fetal development, pregnant women should also be given in-depth education about the importance of taking iron supplements.

Because this diet can affect hemoglobin levels, research shows that all pregnant women's meals should include side dishes such as tofu, tempeh, beef, chicken, fish, and eggs to prevent anemia. This is consistent with research by Melia Pebrina et al. (2021), which found a relationship between food and the prevalence of anemia in pregnant women.

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CONCLUSION

The results showed a link between regular iron supplementation and the development of anemia during the third trimester of pregnancy. Nearly half of pregnant women who did not regularly take iron supplements did not experience anemia, while a small proportion did. Health workers can teach pregnant women and their families how to maintain a balanced diet and adopt a healthy lifestyle. They can also regularly check iron supplement use from early pregnancy through delivery to help pregnant women and the general public prevent anemia..

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