Proceedings Series on Health & Medical Sciences, Volume 8
Proceedings of the 6th International Nursing and Health Sciences Universitas Muhammadiyah Purwokerto
ISSN: 2808-1021

The Correlation Between Compliance with Iron Supplement Tablet Consumption and Anemia Among Pregnant Women at Puskesmas Kalibagor

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ARTICLE INFO

Article history:

DOI:
10.30595/pshms.v8i.2014

Submitted:
July 29, 2025

Accepted:
Sept 22, 2025

Published:
Oct 23, 2025

Keywords:

Anemia; Compliance; Pregnancy

ABSTRACT

Anemia remains one of the leading causes of maternal mortality in 2023. One of the strategies implemented to reduce maternal mortality is the provision of iron supplement tablets to prevent anemia during pregnancy, which is associated with increased risks of preterm birth, maternal and neonatal death, and susceptibility to infections. The purpose of this study to examine the relationship between compliance with iron supplement tablet consumption and the incidence of anemia in pregnant women at Puskesmas (Community Healthcare Center) Kalibagor. Methods:This study employed a quantitative approach using a cross-sectional design. Data collection was conducted through interviews using structured questionnaires with third-trimester pregnant women. The majority of respondents were of low-risk maternal age, nulliparous, not experiencing chronic energy deficiency (CED), had a moderate level of education, were compliant with iron tablet consumption, and were not anemic. Bivariate analysis of the correlation between compliance and anemia incidence among 36 third-trimester pregnant women yielded a p-value of 0.863 and a correlation coefficient (rho) of -0.030. These results indicate no significant correlation between compliance with iron supplement consumption and the incidence of anemia, with a very weak negative correlation, suggesting that lower compliance may be associated with a higher risk of anemia.

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1. INTRODUCTION

In 2023, maternal deaths were caused by, among other things, hypertension during pregnancy, obstetric hemorrhage, other obstetric complications, infections, abortion complications, unanticipated management complications, non-obstetric complications, and others. One treatment that helps reduce the Maternal Mortality Rate (MMR) more quickly is by providing iron supplements to pregnant women. The purpose of iron supplementation is to reduce the likelihood of anemia during pregnancy, which is associated with an increased risk of preterm birth, maternal and infant mortality, and infection (Kemenkes RI, 2024)

The prevalence of anemia among women in Indonesia in 2023, based on the results of the Indonesian Health Survey, was 7.7%. The 25-34 age group has the second-highest anemia rate at 31.4%, followed by the 35-44 age group at 39.6%. Therefore, to prevent anemia in pregnant women, they should consume at least 90 iron tablets to meet their iron needs and prevent anemia. (Kemenkes RI, 2023)

According to data from the Banyumas Health Profile 2023 (Grehastuti, 2024), it was found that in 2023, the Kalibagor Community Health Center had 782 pregnant women, with 211 cases of pregnancy complications. The types of obstetric complications among pregnant women included 99 cases of KEK, 74 cases of anemia, 8 cases of bleeding, 1 case of tuberculosis, 1 case of other infections, 13 cases of preeclampsia/eclampsia, 1 case of diabetes mellitus, and 14 cases of other causes. The prevalence of anemia at the Kalibagor Health Center in 2022 was 52 cases and increased in 2023 to 74 cases. In 2023, 97.95% or 766 pregnant women received iron supplements (90 tablets) at the Kalibagor Health Center.

This study aims to determine the pattern of compliance among pregnant women in consuming iron tablets during their pregnancy. This will enable us to determine whether there is a relationship between compliance in consuming iron tablets and the incidence of anemia among pregnant women at the Kalibagor Community Health Center.

2. RESEARCH METHOD

This study uses a quantitative approach and cross-sectional research methodology. By defining independent and dependent variables simultaneously, cross-sectional research tests the relationship or correlation between two variables (Notoatmodjo, 2018). The population used is all pregnant women at the Kalibagor Community Health Center in the third trimester of 2025. The sample size was determined using the ordinal-ordinal correlative sample size formula according to (Dahlan, 2019), namely;

$$n = \left[\frac{(Za+Z\beta)}{0{,}5\ln\left(\frac{1+r}{1-r}\right)}\right]^2 + 3$$

Calculations based on the formula indicate that a minimum sample size of 32 is required, plus 10% to produce 36 pregnant women samples. Data collection was conducted by distributing questionnaires to pregnant women in their third trimester in the Kalibagor Community Health Center working area. In addition to the questionnaires, pregnant women also underwent direct Hb level examinations to determine whether they were anemic or not. The obtained data was then processed into the SPSS application using the Spearman rank test to determine whether there was a relationship between the frequency of anemia and the adequacy of iron tablet intake by pregnant women. As stated by Sugiyono (2022), the significance test for the associative hypothesis between two ordinal variables can be carried out using the Spearman Rank correlation.

3. RESULT AND DISCUSSION

Based on the results of the study, the following conclusions were drawn:

3.1 Respondent Characteristics

The characteristics of respondents in the Kalibagor Community Health Center area are presented in the following table:

Table 1. Frequency Distribution of Respondent Characteristics in the Kalibagor Community Health Center Area

No	Characteristics		Total	Percentage (%)
1.	Age	High Risk	8	22,2
		Low Risk	28	77,8
2.	Parity	Nullipara	14	38,9
		Primipara	9	25
		Multipara	13	36,1
3.	Nutritional Status	Chronic Energy Deficiency	2	5,6
		No lack of energy	34	94,4
4.	Education	Basic Education	16	44,4
		Secondary Education	9	52,8
		Higher Education	1	2,8
5.	Compliance with Iron Supplement Tablet Consumption	Compliant	28	77,8
		Non-Compliant	8	22,2
6.	Incidence of Anemia	Anemia	17	47,2
		Not Anemic	19	52,8
Total			**36**	**100**

Table 1 shows that of the 36 pregnant women in their third trimester who were surveyed, the majority were in the low-risk age group, namely: aged 20–35 years (77.8% of the total), parity 0 (nulliparous), and did not experience KEK (lila ≥ 23.5 cm) (34 respondents or 94.4% of the total), educated at the high school, vocational school, or technical school level (19 respondents or 52.8% of the total), regularly consuming iron supplements (28 or 77.8% of the total), and not anemic (Hb ≥ 11 mg/dL) (19 respondents or 52.8% of the total).

Women who are pregnant and under the age of 20 or over the age of 35 are considered to be in the high-risk age range. Pregnancy is often not considered appropriate for bodies that are not yet fully developed, both emotionally and physiologically, at ages under twenty. Due to this lack of preparation, pregnant women may not pay enough attention to ensuring they get enough iron and other nutrients. Additionally, reproductive organs at this age are still in the growth and maturation stage, further increasing the risk of anemia. Meanwhile, pregnancy at age >35 is also categorized as high-risk. As age increases, there is a decline in organ function and immune system function, including a reduction in the body's ability to produce hemoglobin. This condition makes pregnant women more susceptible to anemia. Additionally, women over 35 years of age are more prone to infections during pregnancy, which further increases the likelihood of anemia (Nuraini & Kamidah, 2024)

Mothers with low parity have a 4.2 times lower risk of anemia during pregnancy compared to mothers with high parity. This is because mothers who give birth frequently may have reduced iron stores and other health issues, making them more likely to suffer from anemia (Novianti et al., 2022). However, the results of Handayani (2024) study indicate that first-time mothers also have a high risk of anemia if they do not pay attention to adequate nutrition during pregnancy. This is due to physiological adaptations during pregnancy and childbirth, such as changes in uterine structure from muscle fibers to connective tissue, which can affect uterine function and maternal health status.

KEK is one of the factors that determine LILA value. Pregnant women with anemia and a LILA measurement of less than 23.5 cm are considered to have KEK. Critical nutritional deficiencies, such as iron deficiency anemia, can occur in patients with chronic erectile dysfunction (KEK), which is characterized by significant and persistent weight loss. The risk of anemia increases due to a decrease in hemoglobin levels caused by iron deficiency (Mutoharoh & Indarjo, 2024).

Women who have only completed elementary or secondary school, compared to those who have obtained a bachelor's degree or higher, have a greater risk of developing anemia during pregnancy. A mother's ability to obtain and understand health information, such as the reasons, effects, and importance of preventing anemia by consuming iron, may be hindered by her low level of education. This lack of understanding impacts mothers' awareness of the importance of utilizing health services optimally (Pratiwi & Safitri, 2021).

3.2 The Relationship Between Compliance with Iron Supplement Tablet Consumption and the Incidence of Anemia

The relationship between compliance with iron supplement consumption and the incidence of anemia at the Kalibagor Community Health Center is presented in the following table

Table 2. Relationship between Compliance with Iron Supplement Tablet Consumption and Incidence of Anemia at Kalibagor Community Health Center

Compliance with Iron Supplement Tablet Consumption	**Incidence of Anemia**				**Total**		***p-Value***	***r***
	No Anemia		**Anemia**					
	n	**%**	**n**	**%**	**n**	**%**		
Compliant	15	78,9	13	76,5	28	77,8	0,863	0,030
Non-Compliant	4	21,1	4	23,5	8	22,2		
Total	19	100	17	100	36	100		

Table 2 shows that among pregnant women who consistently took iron supplements throughout the third trimester, 76.5% still had anemia; meanwhile, 78.9% of women in this group did not have anemia, with a total of 28 pregnant women (77.8%). Among pregnant women in the third trimester who were non-compliant in taking iron supplements but experienced anemia, there were 4 pregnant women (23.5%), and the same number of pregnant women in the third trimester who were non-compliant in taking iron supplements but did not experience anemia, totaling 8 pregnant women (22.2%).

Pregnancy compliance in taking iron supplements and the incidence of anemia are not significantly related, according to the results of the Spearman Rank test. The p-value is 0.863, which is greater than 0.05. Additionally, the correlation coefficient (rho) value of 0.030 indicates a very weak relationship between compliance with iron supplement tablet consumption and the incidence of anemia in pregnant women, with a positive direction, meaning that the higher the compliance of pregnant women, the lower the likelihood of anemia occurring.

Several indicators can be used to evaluate compliance with iron tablet consumption, including the number of iron tablets taken, how the tablets are consumed, and how often a person consumes tablets each day (Mardhiah & Marlina, 2019). Compliance measurement for pregnant women in iron tablet consumption in this study was obtained from questionnaire results that assessed respondents' compliance levels in taking iron tablets during pregnancy. Participants were asked a total of 12 questions about their ability to adhere to the prescribed iron tablets. From these questions, an assessment was made, categorized as compliant if the correct answer rate was ≥ 80% and non-compliant if the rate was < 80% (Chowdhury & Chakraborty, 2017)

Although this study did not find a statistically significant association between anemia and pregnant women who adhered to iron tablet consumption, it did show that anemia was less common in this group. This is consistent with the findings of Putri et al.,(2023), who stated that maternal adherence to iron tablets was significantly correlated with a decrease in the incidence of anemia.

According to the researchers' assumptions, the results of the study indicate that iron tablets are very beneficial for pregnant women to consume during their pregnancy. The more regularly a woman consumes iron tablets, the lower the risk of anemia during her pregnancy. In this study, the researchers also found that some respondents experienced anemia while taking iron tablets. This was due to the respondents' poor economic status, which resulted in inadequate nutrient intake. Even though they took iron tablets regularly, if the mother's nutrient intake was insufficient, it would affect the increase in hemoglobin (Hb) levels. In this study, researchers only checked whether pregnant women had consumed 90 tablets without asking about the duration of iron tablet consumption during pregnancy, and did not take into account the number of food portions consumed by pregnant women so it cannot be ascertained whether non-compliance actually causes anemia.

4. CONCLUSION

Based on the results of data analysis and discussion, the following conclusions can be drawn:

a. A total of 28 respondents (77.8%) had never had children, 14 respondents (38.9%) did not have KEK, 34 respondents (94.4%) had secondary education, and 19 respondents (52.8%) had secondary education.
b. In the third trimester of pregnancy, 17 mothers (47.2% of the total) reported anemia, while 19 mothers (52.8%) did not report anemia.
c. The Kalibagor Community Health Center found no correlation between the number of cases of anemia in pregnant women and the number of mothers who complied with iron supplement intake.

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