

## Original Research/Systematic Review

# Evaluation of the Program for Giving Iron Tablets to Young Women

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### ABSTRACT

**Background:** Anemia due to iron deficiency is a prevalent health issue that affects many people, particularly women, from early childhood through adulthood. Bleeding can be a problem for pregnant women who have iron deficiency anemia, among other things, during pregnancy, labor, and the puerperium. Low birth weight, early birth, and problems of growth and development that result in stunting are some of the effects that anemic mothers experience while carrying their unborn children. Adolescent anemia continues up until the point at which the adolescent becomes pregnant. To treat iron-deficient anemia, the government is marketing blood replacement tablets. Purpose of study is to determine the effectiveness of iron tablets, the authors worked with the Klaten District Health Office to compare Hb and ferritin levels in pupils who had received blood tablets for 9 months versus kids who had not had blood tablets.

**Methods:** This study used a cross-sectional research approach and is a case analysis study. The SMP Negeri 1 Jogonalan Klaten is the research location. Study do in June to September 2022. Respondents are 60 pupils from Klaten Public Middle School I, ages 11 to 14, participated in the survey. Of them, 30 female respondents had taken iron supplements for 9 months (40 weeks), while the remaining 30 served as controls and had not received blood supplements. After being told of the advantages of the study, participants who signed a written informed permission form and agreed to take part in it had their ferritin and hemoglobin levels checked.

**Results:** When compared to the control group's ferritin value of 16.13% and Hb value of 6.45%, the treatment group's ferritin value was low (24.14%) and the Hb value was 10.34%.

**Conclusion:** 20% of young women are still found to have anemia. Young women should be prevent anemia.

### ARTICLE HISTORY

Received : February 16<sup>th</sup>, 2023

Accepted : June 9<sup>th</sup>, 2023

### KEYWORDS

anemia; hemoglobin; iron; young women

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Cite this as: Rohimah, Y. T., Astuti, S. L. D. ., Insiyah, I. ., & Suyanto, S. (2023). Evaluation of the Program for Giving Iron Tablets to Young Women. (*JKG*) *Jurnal Keperawatan Global*, 8(1), 39–44. <https://doi.org/10.37341/jkg.v8i1.782>

## **INTRODUCTION**

Anemia due to iron deficiency is a prevalent health issue that affects many people, particularly women, from early childhood through adulthood. According to the 2018 Riskesdas data, the prevalence of anemia in young women increased from 37.1% in the 2013 Riskesdas to 48.9% in the 2018 Riskesdas, with the age groups 15–24 and 25–34 years having the highest proportions of anemia (RI Ministry of Health, 2018). Children who have anemia due to iron deficiency may experience growth and developmental disorders, behavioral changes, and impairments in motor function. These effects may lead to decreased learning capacity, which may in turn lead to lower academic achievement (Intantri, 2020). If untreated, anemia can have negative effects on adolescent daughters and women who are of childbearing age up until they become pregnant. This can result in bleeding before, during, and after birth, endangering the health and safety of both the mother and the unborn child. In addition, problems that can be caused to the unborn child when the mother has anemia include impaired fetal growth, premature birth, BBLR and child growth disorders such as stunting and neurocognitive disorder (Kemenkes RI Ditjen P2P, 2021).

Consuming foods high in vitamins and minerals, particularly those that can encourage the production of red blood cells as a preventive strategy, fortifying foods with iron, and taking iron supplements are all ways to treat and prevent anemia. Not everyone is able or ready to eat a variety of foods high in iron, folic acid, vitamin B12, and vitamin C; therefore, the most practical alternative is to administer iron tablets (TTD) to ensure iron consumption. The administration of iron supplements to young women is carried out through UKS/M at educational institutions (junior high and high schools or equivalent) by determining the day of taking iron tablets together. The Ministry of Health determines the provision of iron supplements to young women and women of childbearing age. Young girls at SMP Negeri 1 Jogonalan Klaten, held every Friday after breakfast together at school, receive a weekly dose of one tablet (RI Ministry of Health Directorate General of P2P, 2021).

The authors worked with the Klaten District Health Office to conduct an evaluation by comparing the Hb and ferritin levels of Joyonalan Klaten 1 Public Middle School students after 9 months of consuming iron tablets to those of students who had not yet taken iron tablets in order to determine the efficacy of giving iron supplements to young women there.

## **MATERIALS AND METHOD**

This research method is a case study with a cross-sectional research design. The research was conducted from June to September 2022 at SMPN I Jogonalan-Klaten. Ethical approval for this study was issued by the Health Research Ethics Commission at RSUD Dr. Moewardi in Surakarta. Respondents in this study amounted to 60, who were divided into two groups, each consisting of 30 respondents. The first group was comprised of female students who had taken 60 mg ferrous fumarate supplements for nine months, and the 30 respondents as controls were female students who had not been given supplements. Purposive sampling was used to collect samples, and the inclusion criteria included being between the ages of 11 and 14 years old, taking iron supplements regularly every Friday for nine months, not having periods, and having a phobia of blood. All female students had their blood drawn for ferritin and hemoglobin testing after being told of the advantages of the research and expressing their understanding and

willingness to take part in the following study by signing the informed consent form. A chi-square with a value of 0.05 was applied for data analysis.

**RESULTS**

**Table 1.** Female Ferritin Value After Taking Blood Supplement Tablets (n = 60)

Respondent	Ferritin Value (mg/dl)			Keterangan
	Low	Normal	High	
Taking Blood Supplement Tablets	24,14%	65,52%	10,34%	p = 0,532
kontrol	16,13%	80,65%	3,23%	

Based on the data above, the low ferritin value remains at 24.14% after taking blood-added tablets; more than half of this value is considered normal, while the high ferritin value only makes up a minor percentage of the total. Prior to taking iron supplements, only a tiny percentage of ferritin readings in the control group were low, while the majority (80.65%) were normal. The chi-square test results showed a p-value of 0.532.

**Table 2.** Hemoglobin Value of Young Women After Taking Blood Supplement Tablets (n = 60)

Respondent	Hemoglobin Value (gr%)			P Value
	Low	Normal	High	
Taking Blood Supplement Tablets	10,34%	75,86%	13,79%	0,847
kontrol	6,45%	77,42%	16,13%	

The table above shows that the Hb levels were generally normal in both the iron tablet group and the control group, with just a few individuals having low and high Hb readings. The chi-square test outcomes were p = 0.847.

**DISCUSSION**

According to the findings of this study, the low ferritin value was 24% and the low hemoglobin value was 10.34% after taking blood supplement tablets for nine months, but in the control group, the low ferritin value was 16.13% and the poor hemoglobin value was 6.45%. According to Tiyas' findings, the prevalence of anemia reduced from 20% to 15.7% after eating blood supplement tablets (Permatasari et al., 2018). The findings of this investigation were different from those of Tiyas.

This research supports the findings of other studies (Yuanti et al., 2020; Kapoh et al., 2021) that showed elevated Hb levels following the administration of blood-

supplement tablets. The hemoglobin value after taking 30 blood tablets is not significantly different from that of pregnant women who do not take iron tablets. A considerable increase in hemoglobin was observed in a study (Daniilidis et al., 2020) in which women were given acetylated iron aspartate for 4 weeks. According to the study's findings, low ferritin levels were found in both the controls and the female adolescents who had taken blood-supplement tablets, suggesting that the presentation of anemia in these young women was more severe than that of individuals who had low hemoglobin levels. These findings also suggest that not all individuals with low ferritin levels exhibit the physiological symptoms of anemia.

Masrizal asserts that despite the physiological absence of anemia symptoms, a person with extremely low iron levels is prone to anemia. A person is said to have iron nutritional anemia if their body does not have enough ferritin, which serves as its iron reserve, and this lack of ferritin affects their ability to form red blood cells in the bone marrow, causing their hemoglobin level to drop below normal (Masrizal, 2017). In this study, young women who had been taking the blood supplement for nine months had a higher incidence of anemia than the controls. Chronic malnutrition and micronutrient deficiency are closely associated with low hemoglobin levels and can prevent the body from responding to iron delivery (Allen et al., 2000).

The prevalence of anemia is frequently employed as a variable to evaluate iron deficiency anemia because, in Durrani's view, anemia is an accumulation of different causal causes, but iron deficiency is by far the most important one (Santosa et al., 2022). The mineral iron is one that the body truly needs. Every 1 mg of iron consumed can boost hemoglobin concentration by 0.052 hemoglobin, serving as a chemical that aids in the synthesis of hemoglobin. According to Beck, compared to women who don't drink milk, who only have subpar body iron reserves, women who consume milk and its derivatives have enough body iron reserves. Beck advised young women to consult a nutritionist, saying that the most effective way to treat anemia is through diet (Beck et al., 2014), (Nazanin Abbaspour 1, Richard Hurrell 2, 2014). He further stated that in order to increase the absorption of non-hem iron, it is necessary to consider foods that can inhibit or increase iron absorption at every meal. The value of serum ferritin-free erythrocyte protoporphyrin (FEP) can be increased by providing female adolescents with iron supplementation at a level of 60 mg/day regularly, two times per week, for 17 weeks (IDAI, 2012).

The outcomes of recycling the destruction of erythrocytes by macrophages in the reticulum, in accordance with Dan et al. (2023) are the source of iron for iron metabolism. Heme and non-heme forms of iron are both present in the diet, and these are the two types. Fish, meat, and chicken have heme iron, whereas vegetables, fruits, eggs, and pasta contain non-heme iron. Food sources of iron contain ferric ions, which must first be converted to ferrous ions in order to be absorbed. If the respondent consumes foods high in vitamin C, amino acids, and fructose from fruits, administering iron pills will be more effective.

## **CONCLUSION**

The hemoglobin value in female adolescents who had been given iron supplement tablets (TTD) in the form of ferrous fumarate 60 mg for 9 months (40 mg) was not significantly different from female adolescents who had not been given iron supplement tablets ( $p = 0.847$ ). Female adolescents who had received iron supplement

tablets (TTD) in the form of ferrous fumarate 60 mg for 9 months (40 mg) did not differ substantially from female adolescents who had not received iron supplement tablets, according to the results ( $p = 0.532$ ).

## ACKNOWLEDGEMENT

According to IDAI standards, it is preferable for 20% of female students who are still anemic to get ferrous fumarate pills (60 mg) twice a week for 17 weeks.

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