



Implementation of FE and Vitamin C Tablet Consumption on the Increase in Hemoglobin Levels in Pregnant Women at Ikua Koto Public Health Center

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Abstract

The risk of anemia in pregnant women is more severe if the hemoglobin level is less than 11 g/dL. Iron deficiency anemia is anemia that often occurs in pregnant women, generally due to deficiencies of key micronutrients in the hematopoiesis process, such as vitamin B12, folic acid, and iron. The purpose of this study was to examine the implementation of the consumption of Fe tablets and vitamin C on increasing hemoglobin levels in pregnant women at the Ikua Koto Community Health Center. The research design was a quasi-experiment, one group pre-test post-test design. With a sample of 30 respondents, with 2x observations, namely before and after the intervention. Statistical tests applied paired t-test tests. The analysis resulted in that the average hemoglobin level before the pre-test was 10.11 ± 0.49 g/dL, an increase of 11.04 ± 0.50 g/dL after treatment (post-test). The significance value obtained was $p\text{-value} = 0.000$ ($p < 0.05$), proving a significant difference in the variable hemoglobin levels before and after the intervention. It was concluded that consuming Fe tablets accompanied by vitamin C is very effective in increasing hemoglobin levels in pregnant women.

Keyword: Fe Tablets, Vitamin C, Hemoglobin Levels, Pregnant Women

Introduction

According to a (WHO, 2025) report, cases of anemia in pregnant women worldwide reached 36.5% in 2018, while in Asian countries the figure reached 48.7%. Several factors contribute to this increased prevalence, including poor nutritional intake, chronic infections, and limited access to food. Data shows that anemia in pregnant women is an essential risk factor contributing to maternal and infant health problems worldwide. (Hadi et al., 2017) This condition has the potential to increase the risk of various obstetric complications, such as

preterm birth, low birth weight (LBW), and high maternal mortality rate (MMR). (Romayati Keswara & Hastuti, 2017)

In Indonesia, anemia in pregnant women is a major problem. Data from the Ministry of Health (2023) shows that the prevalence of anemia in pregnant women reached 27.7%. This demonstrates that anemia in pregnant women is a major issue that requires ongoing monitoring and treatment. (RI, 2023)

Data from the Padang City Health Office in 2024 indicates that anemia in pregnant women remains common in the region. Ikuu Koto Community Health Center has the highest anemia rate, reaching 33.8% in 2024. More promotive and preventive efforts are needed to reduce the incidence of anemia in pregnant women because data shows that more than a third of pregnant women suffer from anemia during pregnancy. (Padang, 2023)

As a healthcare facility, community health centers (Puskesmas) play a strategic role in early detection and treatment of anemia in pregnant women, particularly by providing comprehensive antenatal care (ANC) services (Padang, 2023). If hemoglobin levels are below 11 g/dL, pregnant women are at risk of developing severe anemia. Iron (Fe) deficiency anemia is a common occurrence during pregnancy caused by inadequate consumption of essential nutrients such as iron, folic acid, and vitamin B12. (Wiyati & Mu'minah, 2025)

In Indonesia, the majority of anemia cases are caused by iron deficiency; this condition is called iron nutritional anemia. (Novianti, 2024) Iron deficiency anemia in pregnant women has negative effects on the health of both the mother and the fetus. Pregnant women with severe anemia are at high risk of delivering babies with low birth weight, prematurity, and perinatal death. (Listiawati, 2025)

The Indonesian Ministry of Health recommends that pregnant women consume 90 Iron tablets during pregnancy to treat anemia and support optimal fetal growth and development. (Sri Wahyuni, 2021) The purpose of providing iron supplementation is to meet the nutritional needs of the mother and fetus, prevent iron deficiency anemia, and reduce the risk of bleeding during childbirth. (Yulianti et al., 2024)

The Indonesian Ministry of Health recommends that pregnant women consume 90 iron supplements (TTD) during pregnancy to prevent anemia and support optimal fetal growth and development (Geniz Rieny et al., 2021). The purpose of iron supplementation is to meet the nutritional needs of the mother and fetus, prevent iron deficiency anemia, and reduce the risk of bleeding during labor. (Amir et al., 2023)

Literature Review

Research conducted by (Yulianti et al., 2024) found that administering iron tablets and vitamin C was effective in increasing hemoglobin levels in pregnant women. Statistical test results showed a p-value of 0.003 (<0.05), indicating an effect on increasing hemoglobin levels. This finding aligns with (Utomo et al., 2023) who found that hemoglobin levels increased significantly when vitamin C was added to anemia treatment. Furthermore, a study by (Ichwan

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Rahayu et al., 2025) showed that consuming vitamin C as a complementary anemia medication, if given during the day, starting from thirteen to forty weeks of pregnancy, can help prevent anemia before delivery.

The results of (Ariani et al., 2023) showed that consuming a combination of Fe tablets and vitamin C for clients for fourteen days significantly increased hemoglobin levels in pregnant women before and after the intervention. The data analysis showed that the combined administration of Fe and vitamin C supplementation had a statistically significant positive effect on increasing hemoglobin levels. The average hemoglobin level of clients before treatment was recorded at 10 g/dL, while after treatment it increased to 11.2 g/dL, indicating a significant increase in Hb levels after administering the combination. (Yuli Setyaningsih, 2020)

Research Method

The type of research is a quasi-experimental study with a One Group Pre-test Post-test Design. Measurements were conducted twice, before and after treatment. The study population included pregnant women with anemia registered at the Koto Panjang Iku Koto Community Health Center, Padang City. Based on data from August to December, there were 85 pregnant women with anemia. Thirty respondents were selected as the research sample to participate in the predetermined intervention.

Results

Table 1. Average Hemoglobin Levels Before Iron and Vitamin C Tablets

Variabel	n	Mean ± sd
Kadar Hb	30	10,11 ± 0,49

Based on the research results, it was found that the average hemoglobin (Hb) level of respondents before being given treatment was 10.11 g/dL with a standard deviation of 0.49 ± 0.49 g/dL. The number of respondents in this study was 30 people.

Table 2. Average Hemoglobin Levels After Iron and Vitamin C Tablets

Variabel	n	Mean ± sd
Kadar Hb	30	11,04 ± 0,50

Based on the research results, the average hemoglobin (Hb) level after treatment was 11.04 ± 0.50 g/dL. The number of respondents in this study was 30 people.

Table 3. The effectiveness of giving iron tablets and vitamin C on increasing hemoglobin levels in pregnant women at the Koto Panjang Ikua Koto Community Health Center, Padang City.

Kelompok	N	Mean (Kadar HB SD)	P value
pre test	30	10,11 ± 0,49	0,000
post test		11,04 ± 0,50	

Based on the results of statistical tests on the average hemoglobin levels in the experimental group of 30 respondents, the average hemoglobin level before treatment (pre-test) was 10.11 ± 0.49 g/dL and after treatment (post-test) it increased to 11.04 ± 0.50 g/dL. The test results showed a p-value of 0.000, meaning p-value <0.05 , thus concluding that there was a significant difference between hemoglobin levels before and after treatment in the experimental group.

Based on the research results, it was found that the majority of respondents, 17 (56.7%) weighed between 55–65 kg before the examination. Furthermore, 8 (26.7%) weighed between 45–55 kg, and the remaining 5 (16.7%) weighed between 65–75 kg. These results indicate that most pregnant women were within the normal to slightly above-normal weight range before intervention or examination.

These results align with research conducted by (Tri Aksari & Didik Nur Imanah, 2022), which found that most pregnant women weigh between 55–65 kg in the second trimester. A similar study by (Tampubolon et al., 2021) stated that pregnant women within this weight range are generally considered healthy and have a lower risk of pregnancy complications, especially when accompanied by adequate nutritional intake, including iron.

Discussion

In theory, according to (Manuaba, 2020), maternal weight is an important indicator of nutritional status during pregnancy. Being underweight can indicate nutritional deficiencies and increase the risk of anemia and intrauterine growth restriction (IUGR), while being overweight can increase the risk of complications such as preeclampsia and gestational diabetes. The data analysis showed that most respondents had a weight within the safe range, although approximately 40% were considered slightly underweight. This condition needs to be considered, especially in efforts to prevent anemia during pregnancy, as low weight is often correlated with iron deficiency. (Wirawan et al., 2015)

Based on the research results, it is known that the average hemoglobin (Hb) level in the experimental group before the intervention (pre-test) was 10.11 ± 0.49 g/dL. After being given an intervention in the form of administering Fe tablets and vitamin C for 14 days, the average hemoglobin level increased to 11.04 ± 0.50 g/dL. The results of the statistical test showed a p-Value of 0.000 ($p < 0.05$), which means there was a statistically significant difference between Hb levels before and after the intervention. Thus, it can be concluded that administering Fe

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tablets and vitamin C for 2 weeks is effective in increasing hemoglobin levels in pregnant women.

In theory, iron (Fe) is an essential component in the formation of hemoglobin, a protein in red blood cells that transports oxygen throughout the body (Yuli Setyaningsih, 2020). Iron deficiency is a major cause of anemia in pregnancy. (Sunarsih et al., 2019) Vitamin C plays a crucial role in increasing the absorption of non-heme iron in the digestive tract by converting ferric iron (Fe³⁺) into ferrous iron (Fe²⁺), which is more readily absorbed by the body (M. Chyntaka & Eka Stie Murni, 2023). Therefore, administering vitamin C along with Fe tablets can enhance iron absorption, contributing to increased hemoglobin levels.

The results of this study align with research conducted by (Sartika Pulungan et al., 2021), which showed that administering iron tablets along with vitamin C for 14 days significantly increased hemoglobin levels in pregnant women compared to the group receiving only iron tablets. A similar study by (Sartika et al., 2019) also found that the combination of iron tablets and vitamin C was effective in treating anemia in pregnant women, with a faster increase in Hb levels compared to the control group.

Analysis of the results of this study indicates that the combination of iron and vitamin C supplementation over a two-week period can produce significant results in increasing hemoglobin levels. This demonstrates the importance of not only administering iron tablets as a single intervention, but also considering factors that increase iron absorption, such as vitamin C, as well as maternal compliance in taking the supplement at the recommended dosage.

Conclusion

The average hemoglobin level of pregnant women before taking iron tablets and vitamin C for 2 weeks was 10.11 ± 0.49 g/dL, indicating that most respondents had mild anemia. After being given iron tablets and vitamin C regularly for 14 days, there was an increase in hemoglobin levels of pregnant women with an average of 11.04 ± 0.50 g/dL. The results of the statistical test showed a p-value of 0.000 ($p < 0.05$), indicating a significant difference between hemoglobin levels before and after administering iron tablets and vitamin C. Thus, it can be concluded that administering iron tablets and vitamin C is effective in increasing hemoglobin levels of pregnant women.

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