

The Effectiveness of Giving Fe Tablets with Tomato Juice on Hemoglobin Levels in the Third Trimester Pregnant Women with Anemia

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ABSTRACT

Based on Riskesdas data in 2018, it was reported that the incidence of anemia in pregnant women in Indonesia nationally was 48.9%. The prevalence of anemia is still high. This is also influenced by the pattern of consumption of iron tablets which is not supported by the fulfillment of vitamin C which is very helpful in the process of iron absorption. The objective: to determine the effectiveness of giving Fe tablets with tomato juice to increase hemoglobin levels in third-trimester pregnant women with anemia. This quasi-experimental method uses a two-group pre-test-post-test design. The sample in this study amounted to 30 respondents consisting of 15 respondents from each of the intervention groups with a purposive sampling technique. Data were analyzed using Paired T-test and Independent T-test. Univariate results showed that the average hemoglobin level of pregnant women in the intervention group pretest was 9.94, and the posttest was 10.80 with a p-value of 0.000. The average hemoglobin level of pregnant women in the pretest control group was 9.99 and the posttest was 10.36 with a p-value of 0.000. Bivariate results with an independent t-test obtained a p-value of 0.008. There are differences in the effectiveness of giving Fe tablets with Tomato Juice on Hemoglobin Levels in Third Trimester Pregnant Women with Anemia. It is expected to consume tomato juice or similar foods as an alternative to vitamin C combined with Fe tablets in an effort to increase hemoglobin levels in pregnant women.

Keywords: anemia; pregnant mother; third trimester

INTRODUCTION

Based on data from the Basic Health Research (Riskesdas) in 2018, it was reported that the incidence of anemia in pregnant women in Indonesia nationally was 48.9%. This figure increased when compared to 2013, which was 37.1%. Pregnant women with anemia mostly occur in the age group 15-24 years by 84.6%. This certainly needs special attention because it means that almost half of the pregnant women in Indonesia are anemia (Kementerian Kesehatan RI Badan Penelitian dan Pengembangan, 2018). Anemia during pregnancy is reported to have a negative impact on maternal and child health and increases the risk of maternal and perinatal mortality. Negative health impacts for mothers include fatigue, poor work capacity or performance, impaired immune function, increased risk of heart disease, and maternal death. Several studies have shown that anemia during pregnancy contributes to 23% of indirect causes of maternal death in developing countries. Anemia in pregnancy is associated with an increased risk of premature birth, low birth weight (LBW) babies. Premature and low birth weight are still the leading causes of neonatal death in developing countries. In addition, anemia in pregnancy also has an impact on increasing the risk of intrauterine death (IUD), intrauterine growth restriction (IUGR), asphyxia, stunting, and stillbirth (Stephen et al., 2018; Wati, 2019).

In the third trimester, anemia can cause premature labor, antepartum bleeding, impaired fetal growth in the womb, intrapartum asphyxia to death, gestosis and susceptibility to infection, and cardiac decompensation to maternal death. The danger of anemia in pregnant women during delivery can cause primary and secondary histopathological disorders; the fetus is born with anemia, labor with high measures because the mother gets tired quickly, and the disruption of the labor journey requires operative action (Kemenkes, 2016).

Anemia in the population of pregnant women according to the criteria determined by WHO is 37.1%, and the prevalence is almost the same among pregnant women in urban (36.4%) and rural areas (37.8%). The prevalence of anemia in pregnant women is estimated at 48.2% in Asia, 57.1% in Africa, 24.1% in America, and 25.1% in Europe. In

developing countries, about 40% of maternal deaths are related to anemia in pregnancy. Most anemia in pregnancy is caused by iron deficiency and acute bleeding, the distance between the two interact. This shows that this figure is close to a severe public health problem with an anemia prevalence limit of more than 40%, and the prevalence of anemia in pregnant women in Asia is 48.2% (World Health Organization, 2015).

Iron supplementation is the administration of iron folate in tablet form. The government gives each tablet of 200 mg ferrous sulfate and 0.25 mg folic acid to pregnant women to treat iron deficiency anemia. The administration of iron begins after nausea and vomiting have disappeared, entering the age of 16 weeks of gestation; one tablet a day is consumed for a minimum of 90 days (Sitorus, 2018). Based on the 2017 Indonesian Health Demographic Survey (IDHS), pregnant women were given Fe tablets or blood-added syrup, which increased by 13 percent (76% in the 2012 IDHS compared to 86% in the 2017 IDHS). The province with the highest coverage of giving blood supplement tablets (TTD) to pregnant women was North Sulawesi (100.1%). The province with the lowest coverage was South Sulawesi (1.7%) (BKKBN et al., 2017).

Based on the results of the World Healtiests Food Rattng, dalam The George Mateljen Foundation, sources of iron are not only obtained from consuming iron (Fe) tablets. Pregnant women can get iron from various foods that contain iron, such as Ambon bananas and dragon fruit (Muliawati et al., 2022). Besides that, there are also tomatoes. including tomatoes. Tomatoes have an iron content of 0.5 mg per 100 grams; besides that, tomatoes contain 40 mg of vitamin C which can help absorb iron in the blood. The benefits of iron in tomatoes are increasing hemoglobin levels, improving brain function, preventing anemia, and boosting the immune system.

Kronjo Health Center in Tangerang Regency shows that the number of pregnant women with anemia in November 2021 was 39 from 173 pregnant women; in December 2021, there were 51 people from 193 pregnant women (Kronjo Health Center, 2021). Based on the background described above, the researchers are interested in conducting a study on the effectiveness of giving Fe tablets and Fe tablets with tomato juice on the increase in hemoglobin levels in third-trimester pregnant women with anemia at the Kronjo Public Health Center, Tangerang Regency.

METHOD

This study used a quasi-experimental with two groups, a pretest, and a posttest, with a control design. The population in this study were third-trimester pregnant women with anemia—the research location at the Kronjo Public Health Center, Tangerang Regency, in 2022. The sampling method used purposive sampling with a total sample of 30 people divided into 15 as the intervention group and 15 as the control group. Respondents in this study were third-trimester pregnant women with mild or moderate anemia. The control group was only given Fe tablets, while the intervention group received Fe tablets and tomato juice. The ingredients used are 125 grams of tomatoes, 250 ml of water, and 15 grams of sugar which are given for 14 days. The instrument used in this study used an observation sheet in the form of a checklist sheet for the consumption of Fe tablets and tomato juice. Data were analyzed using Paired T-test and Independent T-test.

RESULT

Table 1. Differences in Hemoglobin Levels in Each Group

Group	Pretest	Posttest	Differences Mean	p-value
	Mean	Mean		
Intervention	9.94	10.80	0.86	0.000
Control	9.99	10.36	0.37	0.000

Table 1 shows the results of the differences in each group with a measurement (Paired T-test) which states that before being given tomato juice, the intervention group had a mean (average) value of 9.94. After that, there is an increase to 10.80 with a difference of 0.86. There is a difference in the provision of Hb levels with a p-value of 0.000. Whereas in the control group, the average Hb level before was 9.99, and after that, it became 10.36 with a difference of 0.37, and there was a difference in giving Hb levels with a p-value of 0.000.

Table 2. Differences in the Effectiveness of Giving Fe Tablets with Tomato Juice on Hemoglobin Levels in the Third Trimester Pregnant Women with Anemia

Hemoglobin levels	Intervention	Control	Differences Mean	p-value
	Mean	Mean		
Pretest	9.94	9.99	0.04	0.655
Posttest	10.80	10.36	0.44	0.008

Based on Table 2, the results of the Independent T-test, it is known that the p-value is $0.655 > 0.05$, it can be concluded that there is no difference in hemoglobin levels between the intervention and control groups in the pretest measurement. Meanwhile, in the posttest measurement, the p-value is $0.008 < 0.05$, so it can be concluded that there is a difference in the administration of Fe tablets with Tomato Juice on Hemoglobin Levels in Third Trimester Pregnant Women with Anemia.

DISCUSSION

Based on the study's results, it was known that the Hb level before being given tomato juice was 9.94; after the 14th day given tomato juice, the Hb level increased to 10.80 with a mean difference of 0.86 with a p-value of 0.000. While the Hb level in the pretest control group was 9.99 after the 14th day, the Hb level increased to 10.36 with a mean difference of 0.37 with a p-value of 0.000.

Based on the results of the independent t-test, it is known that there is no difference in hemoglobin levels between the intervention and control groups in the pretest measurement. Meanwhile, in the post-test measurement, it can be found that there are differences in the administration of Fe tablets with Tomato Juice on Hemoglobin Levels in Third Trimester Pregnant Women with Anemia.

This study is in line with a previous study, stating that there is an effect of giving tomato juice on increasing hemoglobin levels in pregnant women (p-value 0.000) (Fitriani et al., 2020). This study is also in line with the research, which states that there is effectiveness in increasing hemoglobin levels in pregnant women in the working area of the West Delitua sub-health center with a p-value of 0.000 (Wulan et al., 2021).

Iron absorption occurs in an acidic environment in the stomach in the presence of HCl and vitamin C found in food. Before absorption, iron is freed from organic bonds, such as proteins. Some iron in the ferrous form is reduced to the ferrous form. The reduction process will be even greater if the pH in the stomach becomes more acidic. Vitamin C contained in tomatoes can increase the acid in the stomach, increasing iron absorption by up to 30%. Vitamin C inhibits hemosiderin formation, which is challenging to mobilize to liberate iron when needed. At the same time, the inhibiting factors for iron absorption are materials that come from nature. The most powerful inhibitors are food ingredients that contain polyphenolic compounds, such as tannins found in tea which can reduce up to 80%. Thus, administering iron tablets with multiple micronutrients (multiple micronutrients) is more effective in improving iron status than only giving iron supplementation in a single dose form.

Giving iron during pregnancy effectively increases hemoglobin levels in pregnant women because one tablet contains 60 mg of iron, equivalent to 200 mg of ferro sulfate. During pregnancy, at least 90 tablets are given. Giving preparations as much as 60 mg/day can increase hemoglobin levels by 1 g%/month (Umi, 2017).

According to the Regulation of the Minister of Health of the Republic of Indonesia number 88 of 2014 concerning the standard of blood supplement tablets for women of childbearing age and pregnant women, namely for women of childbearing age, it is given 1 (once) time a week and 1 (one) time a day during menstruation and for pregnant women it is given every day during her pregnancy or at least 90 (ninety) tablets. The iron supplementation program is one of the government programs in the health sector that aims to reduce and prevent anemia, especially in pregnancy (Permenkes, 2014).

According to the researcher's assumption, consuming Fe tablets in combination with tomato juice is very helpful in the absorption process because absorption is faster than consumption of Fe alone. Fe tablets with tomato juice can help increase hemoglobin levels in pregnant women with anemia because one of the vitamin C contents in tomatoes can help absorb Fe tablets better.

CONCLUSION

Based on the results of research in the Kronjo Health Center area, the authors conclude that there was an average increase in hemoglobin levels of pregnant women in both the intervention and control groups. The results of the

independent t-test, it is known that there is no difference in hemoglobin levels between the intervention and control groups in the pretest measurement. Meanwhile, in the post-test measurement, it can be found that there are differences in the administration of Fe tablets with Tomato Juice on Hemoglobin Levels in Third Trimester Pregnant Women with Anemia.

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