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The Effect of Fe, Guava Juice, and Cantaloupe on Hemoglobin Levels in Pregnant Women

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Abstract

Anemia, characterized by below-normal hemoglobin levels, is a common problem among pregnant women and can have serious consequences if left untreated. Fe (iron) plays a role in increasing hemoglobin synthesis in the body. Giving guava and cantaloupe juice containing vitamin C is expected to increase Fe absorption so that it can increase hemoglobin levels in pregnant women. A quasi-experiment with a pre- and post-test control group research design was the methodology employed. The study sample was split into two groups: the control group received only Fe tablets, while the experimental group received Fe tablets together with cantaloupe and guava juice.. The number of samples was 18 pregnant women in the second and third trimesters in each group. The study was conducted for 1 month at Mrs. "N" PMB in Mojoagung, Jombang. Pregnant women who take Fe pills together with red guava juice and cantaloupe have greater hemoglobin levels than the control group, which just takes Fe tablets. This suggests a potential link between the administration of Fe tablets and these nutrients. Pregnant women who take Fe pills together with guava and cantaloupe juice may have higher hemoglobin levels. For further research, lab tests can be conducted to measure vitamin C levels in several juice formulas.

INTRODUCTION

Anemia is one of the problems that often occurs during pregnancy. Based on basic health research data in 2018, the proportion of anemia in pregnant women in Indonesia increased from 37.1% in 2013 to 48.9% in 2018. According to the Jombang District Health Office's 2018 health profile, there were 21,288 pregnant individuals overall, and 18,287 of those pregnant individuals had hemoglobin checks. According to the data gathered, there were 3,653 pregnant women with hemoglobin levels between 8 and 11 g/dl and 200 pregnant women with levels below 8 g/dl. This demonstrates that the prevalence of anemia in expectant mothers remains unmanageable (Emu DRB & Kristianingrum DY, 2020).

Iron deficiency Anemia is one of the most common disorders during pregnancy due to an increase in iron requirements as the gestational age increases, but iron intake is lacking or obstructed. Pregnant women are said to be anemic if their Hb level is <11 g/dL. Anemia in pregnant women that is not overcome can cause the mother to easily experience fatigue, headaches, palpitations, and serious problems such as premature birth, intrauterine growth restriction, preeclampsia, and postpartum hemorrhage (Garzon et al., 2020).

Efforts to prevent and overcome iron nutritional anemia have been carried out, especially by the East Java Health Office, through the provision of blood addition tablets (TTD), which are prioritized for pregnant women (East Java Provincial Health Office, 2021). Consumption of food sources that support iron absorption, such as vegetables and fruits containing vitamin C and B12, is also important because they can help iron absorption (Krisnanda, 2020).

Cantaloupe fruit (Cucumis melo ver centalupensis) contains potassium, vitamin A, and vitamin C, which are beneficial for health. Each 100-gram cantaloupe fruit contains 36.7 mg of vitamin C (Septiriyani et al., 2021). Red guava fruit (Psidium guajava) is one of the fruits

known to be high in ascorbic acid content, 2 times that of oranges, which is about 87 mg per 100 grams. Based on the results of the literature review, it is known that consumption of fruits high in vitamin C content can increase the absorption of Fe tablets so that it affects the Hb levels of pregnant women (Utami & Farida, 2022).

Processing into juice can facilitate acceptance for pregnant women. Giving juice with a combination of guava and cantaloupe fruit, which is high in vitamin C content, is expected to increase Fe absorption so that there is an increase in hemoglobin levels. This study aims to prove the relationship between giving Fe tablets accompanied by guava and cantaloupe juice and hemoglobin levels in pregnant women.

RESEARCH METHODS

This study examined the impact of administering blood supplement pills along with cantaloupe and red guava juice on changes in Hb levels in pregnant women using a quasi-experimental research design. The purpose of this pre-post test control group research design is to compare the intervention group's results with those of the control group in order to assess the impact of therapy. The experimental group and the control group are the two groups used in this design. While the control group received simply Fe pills, the experimental group also received red guava and cantaloupe juice. The study was carried out for one month in May 2023 at Mrs. "N" PMB in Mojoagung, Jombang.

All of the study's participants were second- and third-trimester pregnant women at PMB Mrs. “N” West Subontoro Village, Mojoagung District, Jombang Regency. Sampling was done using the purposive sampling technique with the inclusion criteria of mothers having hemoglobin levels <12 mg/dL. Based on the sample calculation, the number of samples for each group was 16 people. To anticipate drop-out samples, an additional 10% sample was calculated to be 18 pregnant women for each group. Guava and cantaloupe juice was made using a formula of 50 grams of red guava and 50 grams of cantaloupe with 100 ml of drinking water, and then processed into juice using a blender and filtering the pulp and seeds. Guava and cantaloupe juice were given every day for one month to the experimental group.

The measurement of hemoglobin levels for each group was conducted at the beginning (pre-test) and at the end of the intervention period (post-test). Measurement of hemoglobin levels was carried out by health workers using the Hb meter easy touch GCHb. The statistical test used was a t-dependent test to compare hemoglobin levels after Fe, red guava, and cantaloupe juice between the intervention and control groups. The test was conducted using SPSS 16.0.

RESULT

Characteristic of Respondents

Respondents in this study were mostly aged between 25-28 years (50%) both between the control and experimental groups with education, in the education category, the results showed that the average education level of the research sample was SMA to D4, with the same percentage of 50%. Based on data collection on the characteristics of research respondents, the results can be seen in the table below:

Table 1
Characteristics of Respondents

Variable	Variable			
	Control		Experiment	
	n	%	n	%
Age				
20-24	3	20	6	30
25-28	9	50	9	50
29-30	6	30	3	20
Education				
SMA/SMK	9	50	9	50
PT/DIII/DIV	9	50	9	50

**Primary data, 2023*

Hemoglobin level measurement results

Pregnant women's hemoglobin levels were measured before and after the administration of guava and cantaloupe juice. The results showed that the experimental group's hemoglobin increased more (1.70) than the control group's (0.60) as seen on Table 2. The dependent t test was employed in this study's data analysis to determine whether or not pregnant women's hemoglobin levels are affected by the provision of guava and cantaloupe juice, as indicated in Table 3.

Table 2
Results of Pre- and Post-Given Guava and Cantaloupe Juice to Hemoglobin of Pregnant Women

Group	Hemoglobin	
	Control	Experiment
Pre-test	10,6	10,6
Post-test	11,2	12,3
Average	0,60	1,70

**Primary data, 2023*

Table 3
Results Data analysis of the relationship between guava and cantaloupe juice administration to hemoglobin of pregnant women

Group	N	Mean	Std. Deviation	Correlation	P-Value
Pre-test	36	0,4	0,094	0,97	0,001
Post-test		1,46	0,091		

**Primary data, 2023*

DISCUSSION

Anemia during pregnancy often occurs, especially during the second and third trimesters, due to an increase in oxygen demand from the fetus, causing a decrease in hemoglobin concentration. Blood dilution results from this, when the volume of blood increases more than the number of erythrocytes. (Puspita et al., 2021).

Taking Fe tablets during pregnancy can meet the iron needs in accordance with the nutritional adequacy rate of pregnant women and reduce the prevalence of anemia by 20–25%. However, the success of Fe tablets depends on whether or not pregnant women are compliant

with taking Fe tablets, as well as the influence of the consumption of food ingredients that contain absorption inhibitors such as tannin and phytate or those that increase Fe absorption, such as vitamin C (Pratiwi & Widari, 2018). Fruits that contain vitamin C include guava and cantaloupe.

Statistical tests revealed that the experimental group and the control group differed in terms of hemoglobin levels; the experimental group that received Fe tablets along with cantaloupe and red guava juice saw a greater increase in hemoglobin levels than the control group that received Fe tablets alone. The statistical test was to determine the impact of red guava juice and cantaloupe on pregnant women's hemoglobin levels. The results indicated that the administration of guava juice and cantaloupe can raise hemoglobin levels in pregnant women. The significance level was less than 0.05. This impact is consistent with studies by Setianah on hemoglobin levels in pregnant women who had an increase following the administration of Fe tablets and vitamin C-rich guava juice (Setianah, 2022). The hemoglobin levels of pregnant women who were given Fe tablets and guava juice were higher than those who merely took Fe tablets, according to a study by Herdiani that also had the same results. (Herdiani et al., 2019).

Ascorbic acid, better known to the public as vitamin C, is a water-soluble vitamin found in many fruits. Vitamin C has many benefits for maintaining health. The need for vitamin C in the body is met by external intake in the form of foodstuffs such as vegetables and fruits. Numerous studies have demonstrated that vitamin C has a positive impact on iron absorption. When iron and vitamin C are combined, a complex molecule called iron ascorbate is created that is readily absorbed and soluble. Vitamin C can help increase hem iron absorption up to four times by converting ferrous iron to ferrous. Another ability of vitamin C is that it can inhibit the synthesis of hemosiderin, which is difficult to mobilize to free iron when it is needed. Therefore, vitamin C has benefits in reducing the risk of iron deficiency anemia. Supplementing Fe tablets given together with vitamin C has a better effect on increasing hemoglobin levels when compared to iron supplementation alone (Krisnanda, 2020).

CONCLUSION

Pregnant women who take Fe tablets together with red guava and cantaloupe juice had greater hemoglobin levels than the control group, which just takes Fe tablets. This association has been observed between the administration of Fe tablets and these two nutrients.

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