

THE EFFECT OF RED GUAVA JUICE ON HEMOGLOBIN LEVELS IN PREGNANT WOMEN DURING THE SECOND TRIMESTER AT PANCASILA PRIMARY CLINIC ,BATURETNO WONOGIRI

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ABSTRACT

Background : The prevalence of anemia in Indonesia reaches 48.9%, attributed to various factors such as iron malabsorption. Therefore, additional vitamin C is required to improve the absorption of FE tablet consumption.

Research Objective: The study aimed to examine the effect of red guava juice on improving hemoglobin levels during the second trimester of pregnant women at Pancasila Primary Clinic Wonogiri.

Research Method : The research employed an experimental method with a pretest-posttest design with the control group. The sampling technique used total sampling involving 44 respondents, divided into experimental groups (22 respondents) and control group (22 respondents).

Research Results: The statistical analysis using the paired sample t -test revealed a Pvalue of $0,004 < 0.005$ in the control group and $0.000 < 0.005$ in the experimental group. In addition , the independent t-test demonstrated a P value of $0.002 < 0.005$, indicating a significant effect of red guava juice on improving hemoglobin levels.

Conclusion: Based on the study development, red guava juice evolved as valuable therapeutic option for increasing hemoglobin levels during pregnancy, whether used independently or in combination with iron (FE) tablets.

Keywords: anemia, pregnant women, red guava juice

1. INTRODUCTION

Anemia in pregnancy is one of the national problems because it reflects the value of people's socio-economic welfare and has a huge influence on the quality of human resources. Anemia in pregnant women is said to have the potential to harm mothers and children. Therefore, anemia requires serious attention from all parties involved in health services (Manuaba, 2016).

The frequency of anemia or lack of blood in pregnant women in Indonesia is still relatively high, at 48.9% (Ministry of Health of the Republic of Indonesia in 2019). This condition shows that anemia in Indonesia is quite high and the figure is close to a serious public health problem, with the prevalence limit of anemia being more than 40% (Ministry of Health of the Republic of Indonesia, 2013). Anemia not only affects the mother, but also the baby she is carrying. Newborns are most likely to have low or no iron stores, leading to anemia in newborns. The impact of anemia on pregnant women can be seen from the large number of maternal illnesses and deaths, the increase in fetal morbidity and mortality, and the increased risk of low birth weight.

WHO (*World Health Organization*) reports that the increase in pregnant women worldwide with anemia is 41.8%. The increase in pregnant women varies from 31 % in South America to 64% in South Asia. Southeast Asia in total accounts for 58% of the anemic population in developing countries. In North America, Europe and Australia, iron deficiency during pregnancy is rare. Even in USA, there are about 5% of young children and 5-10 % of women of reproductive age who suffer from iron deficiency anemia (WHO, 2015). In Indonesia, the rate of anemia in pregnant women is also very high based on 2018 Rikesdas data, the percentage of anemia in pregnant women has increased in the last 5 years, namely from 2013 to 2018. In the 2013 Rikesdas of 37.15% while the results of the 2018 Rikesdas have reached 48.9% so it can be concluded that over the last 5 years the problem of anemia in pregnant women has increased by 11.8%. From 2018 data, the number of pregnant women who experience the most anemia at the age of 15-24 years is 84.6%, the age of 25-34 years is 33.7%, the age of 35-44 years is 33.6%, and the age of 45-54 years is 24%.

The prevalence of anemia and the risk of chronic lack of energy in women of childbearing age greatly affect the health condition of children at birth, including the potential for low birth weight (Ministry of Health of the Republic of Indonesia, 2018).

In pregnancy, anemia is relatively occurring because pregnant women experience hemodilation (dilution) with an increase in volume of 30% to 40%, which peaks at 32 weeks to 34 weeks of pregnancy. The number of blood cells increases by 18% to 30% and hemoglobin is about 19%. Anemia in pregnant women is often found in the 1st and third trimesters. But the most common is found in the third trimester. In the first trimester, pregnant women experience periods of nausea and vomiting. This can lead to reduced iron availability. Meanwhile, in the third trimester, iron is needed by the fetus for growth and development. Therefore, the fetus absorbs iron from the mother which causes the mother's need for iron to increase. If pregnant women do not pay attention to their nutritional status, it can cause anemia. The need for iron during pregnancy is approximately 1000 mg. Iron requirements in the first trimester were relatively small around 0.8 mg a day and increased during the second and third trimesters at 6.3 mg a day (Manuaba, 2016).

Blood can increase the frequency of complications in pregnancy and childbirth. The risk of maternal death, premature death, low birth weight and perinatal mortality rate increased. Antepartum and postpartum bleeding are more common in anemic women. Complications that occur in anemia during pregnancy vary from very mild complaints to impaired pregnancy continuity (abortion, premature or premature partus), disorders of the delivery process (inertia, atonia, old partus, atonic bleeding), disorders of the postpartum period (sub-involution of the

uterus, resistance to infection and stress, lack of breast milk production) and fetal disorders (abortion, BBLR dysmaturity and perinatal death) (Rukiyah A & Yulianti, 2018).

What directly causes bleeding in pregnant women is the lack of iron in the body caused by the lack of food sources that contain iron, enough food but the food sources have low iron content and the amount of iron received is low. And the food we eat contains substances that prevent the absorption of iron (Roosleyn, 2016).

Anemia in pregnancy cannot be separated from physiological changes that occur during the pregnancy process, the age of the fetus, and the condition of the previous pregnant woman. At that time, the body will undergo significant changes, the amount of blood in the body increases by 20-30%, so it requires an increase in the need for iron and vitamin supply to make hemoglobin. When pregnant the mother's body will make more blood to share with her baby. The body needs up to 30% more blood than before pregnancy (Noversiti, 2017).

Based on Rosidah's research, 22 out of 36 pregnant women (61.1%) had lower Hb levels before taking Fe pills with guava juice. Fe pills and guava juice increased Hb levels in 16 pregnant women (44.4%). Paired Samples T-test statistical test shows significant degree values (0.000) and t ; (0.05), this confirms H1 that Fe tablets with guava juice have an effect on hemoglobin levels of pregnant women in Tlomar Village, Tanah Merah Regency, Bangkalan in 2022. Researchers found that giving Fe pills along with vitamin C foods helped pregnant women absorb iron and increase hemoglobin levels. According to Research (Fitriani, Y., Panggayuh, A., & Tarsikah, 2017) found that third-trimester pregnant women who took 250 ml of Fe tablets with guava juice for seven days had 100% higher hemoglobin levels. According to Rusmiati Research, Fe and vitamin C pills in 2019 increase hemoglobin levels more than Fe pills alone. According to Noviana Luthfi Jayanti (2018), the increase was 1.1 g/dL in the treatment group and 0.7 g/dL in the control group. After controlling calories, protein, iron and vitamin C, guava juice and Fe pills had no effect on hemoglobin (0.439) by the ANOVA test.

Iron requirements during pregnancy are 800 mg, consisting of 300 mg for the baby and placenta and 500 mg for increased maternal erythrocytes. Mothers need an additional 2-3 mg of iron per day (Ratih, 2017). Oral or parenteral iron supplements treat iron deficiency anemia. Pregnant women can also get iron from guava juice which has 87 mg of ascorbic acid per 100 grams. Guava juice has 49 calories, 0.9 grams of protein, 0.3 grams of fat, 12.2 grams of carbohydrates, 14 mg of calcium, 28 mg of phosphorus, 1.1mg of iron, 0.005 mg of vitamin B1 and 86 grams of water per 100 grams. Guava juice contains vitamin C which increases iron absorption and increases Hb. (Rhamosa, 2018). Vitamin C can increase iron absorption by four times with an amount of 200 mg will increase iron absorption by at least 30% (Goodman, 2008). Guava fruit contains 2 times as much ascorbic acid as oranges, which is about 87 mg/100 grams of guava. Guava plants are easy to find and more economical so guava juice is one of the reasons for choosing ingredients to be products for intervention. In addition, red guava is also rich in vitamins and minerals. The need for vitamin C in pregnant women is 85mg per day (Cunning, 2018)

To increase the absorption of vitamin C in the body, guava will be processed into guava juice which is adjusted to the daily vitamin C needs of pregnant women. According to Wijayakusuma in Sari (2018), giving guava in the form of juice is very helpful in the form of absorption by the digestive system within 20 minutes, while fruit consumed in its entirety takes about 18 hours to digest.

At the Pancasila Primary Clinic, the data on visits of pregnant women in 2020 was 1340 people with the number of pregnant women who experienced anemia as many as 40 people, which was 2.9%. In 2021, the data on visits of pregnant women was 1441 people, with the number of pregnant

women experiencing anemia as many as 51 people, which was 3.5%. Then in 2022 the data on visits by pregnant women was 1296 people, with the number of pregnant women experiencing anemia as many as 40 people, which was 3.1%. In 2023, there will be 1342 visits for pregnant women, with the number of pregnant women experiencing anemia as many as 53 people, which is 3.61%. With the results of the data, it was concluded that there was an increase in anemia in pregnant women from 2020-2023 at the Pancasila Baturetno Wonogiri Primary Clinic, so this problem must be considered.

From the description above, the author is interested in conducting a study entitled *The Effect of Guava Juice Administration on Hemoglobin Levels in Pregnant Women in the Second Trimester at the Pancasila Primary Clinic Baturetno Wonogiri*

2. RESEARCH METHODS

The research design uses an experimental method with a pretest-posttest *with control group design*. The sampling technique was a total sampling of 44 respondents with an experimental group of 22 respondents and a control group of 22 respondents. Research conducted in Pancasila Primary Clinic Baturetno Wonogiri on Juny 2024. Respondents to this study is pregnant Women in the Second Trimester

3. RESEARCH RESULTS

3.1 Characteristics of Respondents

Table 3.1 Distribution of Respondent Characteristics

Variable	Category	Group				P value
		Control		Experiment		
		F(n=22)	%	F(n=22)	%	
Age	20-24	5	22,72%	5	22,72%	0,858
	25-28	8	36,36%	9	40,90%	
	29-35	9	40,90%	8	36,36%	
Education	High School	13	59,09%	13	59,09%	0,882
	University	9	40,90%	9	40,90%	
Work	Housewife	8	36,36%	9	40,90%	0,336
	Private	4	18,18%	3	13,63%	
	Self employed	5	22,72%	6	27,27%	
	Civil servants	5	22,72%	4	18,18%	
	Honorary	0		0		

Factors such as the respondent's age, education and occupation are not necessarily the direct factors of low hemoglobin levels. Although on average respondents are in a group with a risk of anemia. This can be caused by several direct factors that cause anemia such as the consumption of blood-boosting tablets, nutritional intake and antenatal care visits. However, being at a low risk age with good education reduces the risk of developing more severe anemia.

3.2 Hemoglobin levels pre test

Table 3.1 Average Hemoglobin of Control and Experimental Groups

Group	Variable	N	Mean	Interval lower n upper	Std.Dev
Control	Pre Test	22	11,20	10.68-11,73	1,29
	Post Test	22	11,35	10,83-1186	1,28
Experiment	Pre Test	22	10,92	10,56-11,28	1,13
	Post Test	22	11,51	11,08-1193	1,14

From table 4.2, the hemoglobin level pre-test (before giving guava juice) in pregnant women in the second trimester at the Pancasila Baturetno Wonogiri Primary Clinic was obtained by the control group respondents (Fe administration only) with an average of 10.92 gr% and in the intervention group (Fe administration and guava juice) by 11.20 gr%.

3.3 Post test Hemoglobin Levels

Table 3.3 Average Hemoglobin of Control and Experimental Groups

Group	Variable	N	Mean	Interval lower n upper	Std.Dev
Control	Pre Test	22	11,20	10.68-11,73	1,29
	Post Test	22	11,35	10,83-1186	1,28
Experiment	Pre Test	22	10,92	10,56-11,28	1,13
	Post Test	22	11,51	11,08-1193	1,14

From table 4.3, the hemoglobin level of the post test (after giving guava juice) in pregnant women in the second trimester at the Pancasila Baturetno Wonogiri Primary Clinic, namely the control group respondents (Fe administration only) obtained an average of 11.35 gr% and in the intervention group (Fe administration and guava juice administration) of 11.51 gr%.

3.4 Differences in hemoglobin levels of pregnant women in the second trimester before and after being given guava juice

Table 3.4 Analysis of Differences in Hemoglobin Levels of Control and Experimental Groups

It	Group	N	Mean	P value
1.	Control Group	22	0,5864	0,002
2.	Experimental Group	22	0,1409	

From table 4.4, it is stated that the difference in hemoglobin levels of pregnant women in the second trimester before and after being given guava juice at the Pancasila Baturetno Wonogiri Primary Clinic is based on the results of independent analysis of the t test sample, a Pvalue of $0.002 < 0.005$ was obtained so that there was an effect of giving guava juice plus FE on the increase in hemoglobin levels of pregnant women in the second trimester at the Pancasila Baturetno Wonogiri Primary Clinic.

4. CONCLUSION

The difference in hemoglobin levels of pregnant women in the second trimester before and after being given guava juice at the Pancasila Baturetno Wonogiri Primary Clinic is based on the results of independent analysis of the t test sample obtained a Pvalue of $0.002 < 0.005$ so that there is an effect of giving guava juice plus FE on the increase in hemoglobin levels of pregnant women in the second time at the Pancasila Baturetno Wonogiri Primary Clinic

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