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The Effect of Guava Juice Consumption on Increasing Hemoglobin Levels in Pregnant Women At Puskesmas Panti

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ABSTRAK
Latar Belakang : Anemia ibu hamil, pada umumnya akibat kekurangan zat besi. Di Jember, 2.895 ibu hamil mengalami anemia, termasuk 141 kasus di Puskesmas Panti pada Desember 2024. Dampaknya bila tidak ditangani bisa terjadi perdarahan, preeklampsia, hingga kematian ibu, dan bayi. Penanganannya bisa melalui farmakologis yaitu suplementasi tablet fe dapat dilengkapi dengan pendekatan nonfarmakologis, seperti pemberian Jus Jambu biji Mengandung banyak vitamin C yang membantu meningkatkan penyerapan zat besi dari tablet Fe oleh tubuh, sekaligus menyediakan mineral zat besi tambahan untuk mendukung kebutuhan nutrisi ibu hamil. Tujuannya Penelitian ini bertujuan untuk mengetahui dampak konsumsi jus jambu biji terhadap peningkatan kadar hemoglobin pada ibu hamil di wilayah Puskesmas Panti. Metode yang digunakan adalah kuantitatif, dengan desain kuasi-eksperimental dan pendekatan one-group pretest-posttest. Sampel penelitian terdiri dari 15 ibu hamil yang dipilih secara purposif dari total populasi yang berjumlah 18 orang. Kadar hemoglobin diukur secara digital sebelum dan sesudah intervensi berupa konsumsi Jus jambu biji merah diberikan dengan dosis 250 ml per hari selama 7 hari berturut-turut. Analisis data dilakukan menggunakan uji-t berpasangan. Hasil penelitian menunjukkan bahwa rata-rata kadar hemoglobin sebelum intervensi adalah 9,2 g/dl, sedangkan setelah intervensi meningkat menjadi 11,2 g/dl, dengan nilai p <0,001.Kesimpulannya, mengonsumsi jus jambu biji merah memiliki pengaruh yang signifikan terhadap peningkatan kadar hemoglobin pada ibu hamil. Saran : Jus jambu biji dapat menjadi alternatif yang mudah didapat untuk membantu mencegah dan mengobati anemia pada ibu hamil.

Keywords:
Hemoglobin, Guava Juice, pregnant women.

ABSTARCT
Background: Anemia in pregnant women is generally caused by iron deficiency. In Jember, 2,895 pregnant women suffer from anemia, including 141 cases at Puskesmas Panti in December 2024. If left untreated, it can lead to complications such as hemorrhage, preeclampsia, and even death of the mother and baby. Treatment can be pharmacological, such as iron tablet supplementation, complemented by non-pharmacological approaches like providing guava juice. Guava juice contains a high amount of vitamin C, which helps enhance the absorption of iron from iron tablets by the body, while also supplying additional iron minerals to support the nutritional needs of pregnant women. Objective: This study aims to determine the effect of consuming guava juice on increasing hemoglobin levels in pregnant women in the working area of Puskesmas Panti. Methods: This quantitative study used a quasi-experimental design with a one-group pretest-posttest approach. The sample consisted of 15 pregnant women selected purposively from a total population of 18. Hemoglobin levels were measured digitally Results: The average hemoglobin level before the intervention was 9.2 g/dl, which increased to 11.2 g/dl after the intervention, with

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a p-value of <0.001. Conclusion: Consuming red guava juice has a significant effect on increasing hemoglobin levels in pregnant women. Recommendation: Guava juice can be an easily accessible alternative to help prevent and treat anemia in pregnant women.

Introduction

Anemia in pregnant women is caused by iron deficiency. Globally, this condition is a common health problem for women, especially in developing countries (Fatkhiyah et al., 2022). Hemoglobin plays an important role in transporting oxygen. When the number of red blood cells decreases abnormally, or the level of hemoglobin is insufficient, the ability of the blood to transport oxygen to the tissues of the body will decrease. This condition causes various complaints such as fatigue, weakness, dizziness, shortness of breath, and excessive sleepiness. Low hemoglobin levels are usually caused by a lack of nutritional intake, especially the elements iron, folate, vitamin B12, vitamin A, and other important nutrients (Puspita, 2019). According to the World Health Organization (WHO) in 2021, the global prevalence of anemia reached 31% in the United States, while in South Asia it reached 64%. The South Asian and Southeast Asian regions together account for about 58% of the total population in developing countries suffering from anemia. Based on data, the prevalence of anemia in pregnant women in Indonesia reaches 48.9% (Ministry of Health of the Republic of Indonesia, 2022). Meanwhile, according to the 2022 East Java Provincial Health Profile, there were 567 maternal deaths, one of which was caused by low hemoglobin levels (<11 g/dl) (East Java Health Office, 2022). Data from the Jember Regency Health Office as many as 2,895 pregnant women who experience anemia (Jember Health Office, 2024). Based on the results of a preliminary study, the anemia of pregnant women at the Panti health center is very high, at number 5 in Jember Regency, which is 141 pregnant women in December 2024.

The causes of anemia during pregnancy are several factors, namely discipline in taking FE tablets, healthy diet, and social status. Anemia in pregnant women has a dangerous impact, but is often considered a minor thing because the symptoms are relatively mild The impact on pregnancy is postpartum bleeding, preeclampsia, maternal death, and even severe risk of premature birth, BBL death, decreased APGAR score and has an impact on delays in child development and growth (Masfufah et al., 2023). Treatment Anemia treatment in pregnant women is generally carried out by two methods, namely pharmacological and

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non-pharmacological. Method The pharmacological approach is carried out by giving Fe tablets 60 mg and folic acid 50 nanograms during pregnancy (Ministry of Health, 2017)Fe tablets are given at least 90 tablets during pregnancy. However, the absorption treatment of fe tablets requires vitamin C and also needs to be supplemented from nutrients. Prevention of anemia by non-pharmacological means, one of which is the consumption of guava juice. Guava fruit Containing iron minerals can meet the mother's magnesium needs, as well as many guava juice Vitamin C helps improve iron absorption by reducing ferrous (Fe^{3+}) to ferrous (Fe^{2+}) in the small intestine, thus optimizing iron absorption. This process is more effective when the pH of the stomach is acidic. This study aims to determine the effect of guava juice consumption on increasing hemoglobin levels in pregnant women at the Panti Health Center.

Method

The research method used is a quantitative technique with a pseudo-experimental design pretest-posttest design approach. The sample consisted of 15 respondents from a total population of 18 pregnant women, which was taken by purposive sampling technique with independent variables in the form of consumption of guava juice while dependent variables were increased hemoglobin levels. This research was carried out from December 2024 to June 2025 in the Panti Health Center area. The study population included 18 pregnant women in the 3rd trimester with 15 pregnant women selected as samples. The sampling method uses the purposive sampling technique. The inclusion criteria include prospective mothers who are still receiving fe tablets, pregnant women in the 3rd trimester and pregnant women who become respondents by signing consent. The criteria issued in this study were pregnant women who had indigestion or could not drink guava with respondents who could not complete the intervention given due to illness or moved to a place of residence. The intervention was given 1 time a day as much as 250 ml of red guava juice for 7 days. Hb data collection uses HB checks, the data that has been collected is used a pair t-test. with the computer program SPSS statistics 30. This research has obtained ethical feasibility with the number 1086/KEPK/UDS/V/2025.

Results

The profile of the respondents in the study

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entitled 'The effect of guava juice consumption on increasing hemoglobin levels in pregnant women at the orphanage health center is presented in the following table:

Table 1. Characteristics of Respondents by Age

Usia	Frekuensi	Presentase (%)
<20 Tahun	1	6.7%
20 – 35 Tahun	14	80.0%
Total	15	100.0%

Source: SPSS Primary Data Processing

Results Based on Table 1, it is explained that of the 15 respondents of 3rd trimester pregnant women, the majority (14 respondents) are between 20-35 years old. Furthermore, the characteristics of respondents based on education level are presented in Table 2

Table 2. Characteristics of respondents Based on Education

Pendidikan Terakhir	Frekuensi	Presentase(%)
Sekolah dasar	1	6.7%
Sekolah menengah pertama	3	20.0%
Sekolah menengah atas	9	60.0%
inggi (D3, S1, S2)	2	13.3%
Total	15	100.0%

Source: SPSS Primary Data Processing Results Based on information from the table above, it is explained that of the 15 participants of the 3rd trimester pregnant women, there are more high school/vocational school graduates, namely 9 respondents (60.0%). In addition to the level of education, the characteristics of the respondents also include the aspects of work listed in table 3

Table 3. Characteristics of Respondents Based on Occupation

Pekerjaan	Frekuensi	Presentase(%)
Tidak bekerja	8	53.3%
Bekerja	7	46.7%
Total	15	100.0%

Source: SPSS Primary Data Results Based on the data in the table above, it is known that of the 15 respondents, most of them are pregnant women who do not work as many as 8 people (53.3%). In addition to work, the characteristics of the respondents also include parity presented in table 4

Table 4. Characteristics of Respondents Based on Parity

Paritas	Frekuensi	Presentase (%)
Primipara	7	46.7%
Multipara	8	53.3%
Total	15	100.0%

Source: SPSS Primary Data Results From the data in the table above, it is explained that of the 15 subjects pregnant women, the majority are located in multipara pregnancies, namely 8 respondents (53.3%).

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Furthermore, the results of research on hemoglobin levels in pregnant women in the 3rd trimester at the Panti Health Center were presented.

Table 5 shows a comparison of hemoglobin levels in pregnant women before and after consuming guava juice.

Kadar Hb	Kelompok	
	Pretest (g/dl)	Posttest (g/dl)
$\bar{x}$ (SD)	10.47	11.92
Median	10.20	11.90
Rentang	4.80	3.40

Based on table 5, the average hemoglobin level after the posttest was carried out with guava juice intervention of 10.47 gr/dl and the hemoglobin level after consumption of guava juice was 11.92 gr/dl.

Table 6. The Effect of Red Guava Juice Consumption on Increasing Hemoglobin Levels in Pregnant Women at the Orphanage Health Center

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Kadar Hb Sebelum – Kadar Hb Sesudah	-1.4466.7	.85929	.22187	-1.92253	-.97081	-6.520	14	.000

Based on the results in table 6 above, the results of the calculation were obtained from the data analysis p .000 which means that Ha is accepted and H0 is rejected so that it can be concluded that the consumption of red guava juice has an effect on increasing hemoglobin levels in pregnant women in Orphanage Health Center.

Discussion

This chapter explains the specific objectives of the research which includes facts, theories, and opinions related to the effect of guava juice consumption on increasing hemoglobin levels in pregnant women at the Panti Health Center, as follows:

1. **Identifying Hemoglobin Levels Before Consumption of Guava Juice in Pregnant Women at the Orphanage Health Center.**

The results showed that the average hemoglobin (Hb) level of pregnant women before receiving guava juice intervention was 10.47 grams/dl. All respondents were also recorded to consume iron tablets obtained from Posyandu. The condition of anemia in pregnant women is a condition when the size of haemoglobin in their blood is lower by 12 gr% in the 1st and 3rd trimester or less than 10.5 gr% in the 2nd trimester. What is meant by hydremia or hypervolemia is blood that increases in a lot in a pregnancies. However, plasma increases so much that blood dilution occurs

(Sulistyawati & Ayati Khasanah, 2022). Anemia during pregnancy is a condition where the mother with hemoglobin levels is below 11 gr% in the first and third trimesters or < levels of 10.5 gr% in the second trimester. This condition has the potential to pose various serious risks for the mother and fetus. In pregnant women, anemia can increase the risk of postpartum bleeding (after childbirth). If this condition has occurred since the beginning of pregnancy, the risk of premature delivery will also increase. The results of this study are in line with the research conducted by Suhartini and Mutia (2020).

The researcher concluded from the results of the study that it is known that the level of hemoglobin in pregnant women before hemoglobin in pregnant women was carried out was still relatively low even though the respondents had routinely taken fe tablets. This fact proves that fe tablet supplementation alone does not fully meet the potent needs in increasing the value of hemoglobin optimally in some pregnant mothers. There are several things that affect the suboptimal increase in hemoglobin levels even though they have taken fe tablets, including compliance with fe tablet consumption because not all pregnant women are really compliant in consuming fe tablets every day as recommended. Some mothers complain of discomfort after taking fe tablets such as nausea so they stop consumption without consulting a health professional first. The need for iron in pregnant women varies every trimester. In the third trimester it increases significantly because iron is required used to support growth and prenatal development. This is in line with research findings that show that anemia is more often experienced in pregnant women in the 3rd trimester. According to the researcher, the decrease in Hb levels in this phase is caused by the hemodilution process, so the use of fe tablets is needed to be able to support hemoglobin. Increasing hb levels will have a positive effect on the quality of pregnancy, making the mother have a good immune system and reducing the risk of bleeding during childbirth (Masthura et al., 2021).

2. Identifying Hemoglobin Levels After Consumption of Red Guava on Increased Hemoglobin Levels in Pregnant Women at the Orphanage Health Center

Based on the results of the study, it was found that after drinking guava juice, the hemoglobin levels of pregnant women were

on average Hb 11.9 gr/deciliter. Despite the intervention, the mother-to-be still took fe tablets because guava juice is not a substitute for fe tablets, therefore respondents are required to continue consuming fe tablets. Increased hemoglobin levels can be more optimal if the consumption of Fe tablets is accompanied by the intake of vitamin C-rich fruits, such as red guava. This condition occurs because the process of breaking down iron in the stomach will increase or iron absorption will be optimal if the pH of the stomach is in an acidic state. Ascorbic acid plays a role in strengthening the acidity of the stomach, thus, the process of iron absorption becomes more effective. The amount of vitamin C in guava juice is shown to be crucial for improving iron absorption, which ultimately contributes to an increase in hemoglobin levels in pregnant women. In this way, the combination of fe tablets with vitamin C source foods will provide better results than the consumption of unaccompanied Fe tablets (Sri lestari 2023).

According to researchers, the consumption of red guava juice has an effect on increasing hb levels through the consumption of red guava fruit containing important nutrients including iron and vitamin C. Vitamin C contributes to maximizing the assimilation of iron by the body, so that the formation of hemoglobin takes place more effectively. Pregnant women's compliance in consuming guava juice for seven days also contributed to the result, iron acts as a vital microelement in the body that plays an important role in hemopoboesis (blood formation), namely hemoglobin synthesis. Hemoglobin is a component in erythrocytes that functions to transport oxygen throughout the body. Conditions that cause the body to lack hemoglobin can be caused by a number of diseases that result in reduced levels of red blood cells in the body. A lack of hemoglobin can caused by reduced Hb production, abnormalities in hemoglobin, or blood loss. This condition can be overcome by increasing Hb levels through nonpharmacological methods or by treating the underlying cause.

3. Analysis of the Effect of Red Guava Juice Consumption on Increased Hemoglobin Levels in Pregnant Women

Based on the results of univariate analysis, it was found that there were 1 pregnant women under the age of 20 years (6.7%), 11 pregnant women aged 20-25

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years (73.3%), and 3 pregnant women aged 26-35 years (20.0%). Furthermore, in terms of education, the majority of respondents were second-educated (9 people) (60.0%). The average respondent has a high school education. Based on the results of the univariate analysis, it was found that pregnant women from work characteristics found that some respondents did not work as many as 8 people (53.3%). Meanwhile, based on the results of the univariate analysis, it was found that the gravida status of more than some of the multipara respondents was 8 people (53.3%) Some respondents were in the age criterion of 20–30 years, which is a healthy reproductive age. At this age, the function of the body's organs including the hematopoietic system (blood former) is still working optimally, so the response to nutrient interventions tends to be good. Respondents who are young (<20 years old) or very high (>35 years) have the potential to be dangerous to experience anemia because of higher iron requirements or due to metabolic disorders. In this study, productive age may be a supporting factor for the increase in Hb levels after intervention. Education plays an important role in the receipt of nutritional information and adherence to intervention programs. Mothers with higher education tend to better understand the importance of nutrition during pregnancy, including the benefits of consuming fruits high in iron compounds and ascorbic acid. This problem is likely to contribute to the success of guava juice therapy in increasing hemoglobin levels, as respondents understand the importance of following recommendations regularly. Most respondents had a parity of 1–2 children, which means that the body's iron reserves have not been depleted too much from previous pregnancies. Mothers with high parity (≥3 children) have a higher risk of developing anemia due to repeated blood and iron loss during previous delivery, especially if the distance between pregnancies is too close. In this study, the low-medium parity condition was one of the factors that supported the success of the intervention, because iron reserves had not decreased too drastically so that the response to vitamin C and iron intake from guava juice was maximized. Therefore, the administration of red guava juice is considered to be able to effectively improve the level of HB of pregnant women at the orphanage health center.

Meanwhile, in terms of statistics, the levels of maternal hemoglobin in pregnancy

differed significantly in the maternity health center before and after the consumption of guava juice. Based on the results of the study, the hemoglobin concentration of pregnant women after the intervention resulted in an increase and a positive score of 15 respondents. Meanwhile, hb levels are reviewed from age, which means that there is an effect of giving guava juice on the hemoglobin levels of pregnant women after the administration of guava juice treatment. The p value is .000 which distinguishes a significant difference in the increase in red blood pigment levels compared to the hemoglobin levels of pregnant women before and after the administration of red guava juice. So that from the results of the paired t-test analysis, a p value was obtained with a meaningful level of p-value .000, therefore ha was approved so that there was an impact consumption effect of consumption of red guava juice increasing hemoglobin levels in pregnant women at the Panti Health Center. The results obtained support the findings of Herdiani et al. (2019) who found that there was a positive correlation between the treatment of red guava juice plays a role in increasing hemoglobin levels in pregnant women. This is evidenced by the difference in average hemoglobin levels before and after treatment of 2.96 g/dl, with a p value of 0.031. The support of similar results was also shown by Nufus et al. (2023), who reported that the consumption of guava juice of 250 ml per day for seven consecutive days resulted in 17 respondents with Hb levels of > 11 g/dl. A total of 5 respondents with an initial Hb level of 9-10.9 g/dl (Mild Anemia) increased to >11 g/dl, but 1 respondent with a primary Hb level of 7-8.9 g/dl increased to 9-10.9 g/dl. This data identifies that almost all respondents experienced an increase in Hb levels. These results are in line with the research of Yantina (2020) who reported that in 15 pregnant women with anemia in the first trimester at BPS Lolita Puspita Sari, Punggur, Central Lampung, the administration of guava juice as much as 250 ml per day for seven days succeeded in increasing the average hemoglobin level by 2.89 g/dl. The selection of red guava as a strategy used to increase iron absorption, because this fruit has very high levels of vitamin C. According to Yusnaini (2020), explaining that Vitamin C in the body functions greatly, Vitamin C also supports the process of iron absorption, converting iron in the form of ferry to ferrous in the small intestine, so it is easier to absorb. This

process takes place more effectively when the pH of the stomach is in a more acidic condition. In addition, vitamin C is able to increase the acidity level of the stomach, which can ultimately improve iron absorption by up to 30%.

In the opinion of the researcher, the results of the increase in hemoglobin levels after the intervention of squeezing red guava show that a non-pharmacological approach based on local food is able to make a real contribution in the treatment of anemia in pregnant women. Although all respondents continued to consume fe tablets during the study, guava juice was proven to accelerate and optimize iron absorption in the body. This condition is in line with the theory that vitamin C is able to reduce Fe 3+ to Fe2+ thereby significantly increasing iron bioavailability.

Conclusion

The researchers concluded that:

1. Based on the results of the study, most pregnant women had a hemoglobin level of 10.4 g/dL before being given an intervention in the form of consumption of guava juice.
2. After consuming processed guava juice, all pregnant women respondents experienced an increase in hemoglobin levels to 11.9 g/dL
3. The results of the spearmen test indicated the impact of red guava juice consumption on increasing hemoglobin levels in pregnant women at the Panti Health Center

4. Ethics Approval and Consent to Participate

This research has obtained ethical feasibility with the number 1086/KEPK/UDS/V/2025.

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