

DRAGON FRUIT (*HYLOCEREUS POLYRHIZUS*) AND HONEY (*MELLIS*) FOR IMPROVING HEMOGLOBIN LEVELS IN ANEMIC PREGNANT WOMEN

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ABSTRAK : BUAH NAGA (*Hylocereus polyrhizus*) DAN MADU (*Mellis*) UNTUK MENINGKATKAN KADAR HEMOGLOBIN PADA WANITA HAMIL YANG MENGALAMI ANEMIA

Latar Belakang: Anemia pada ibu hamil merupakan masalah kesehatan yang umum dan dapat menimbulkan komplikasi bagi ibu maupun janin. Terapi non-farmakologi berupa pemberian makanan kaya zat besi dan vitamin C, seperti jus buah naga dan madu, dapat menjadi alternatif penanganan.

Tujuan: Mengetahui pengaruh pemberian jus buah naga dan madu terhadap peningkatan kadar hemoglobin (Hb) pada ibu hamil anemia.

Metode: Penelitian ini menggunakan desain pretest-posttest dengan kontrol kelompok. Sampel terdiri dari 34 ibu hamil anemia di Puskesmas Hajimena, dipilih dengan teknik total sampling. Intervensi berupa pemberian jus buah naga dan madu selama periode tertentu. Analisis data menggunakan uji t dependent untuk membandingkan kadar Hb sebelum dan sesudah intervensi.

Hasil: Terdapat peningkatan signifikan kadar Hb setelah intervensi (rata-rata dari 10,1 g/dL menjadi 10,55 g/dL, $p < 0,05$).

Kesimpulan: Pemberian jus buah naga dan madu berpengaruh signifikan terhadap peningkatan kadar hemoglobin pada ibu hamil anemia. Terapi ini dapat menjadi alternatif tambahan yang aman dan alami untuk mengatasi anemia kehamilan.

Kata kunci: Buah naga, madu, anemia, ibu hamil

ABSTRACT

Background: Anemia during pregnancy is a common health problem that can seriously affect both the mother and fetus. Non-pharmacological interventions, such as consuming iron-rich foods and vitamin C, including dragon fruit and honey, are one strategy to address this condition.

Objective: This study aimed to determine the effect of dragon fruit juice (*Hylocereus polyrhizus*) and honey (*Mellis*) consumption on increasing hemoglobin (Hb) levels in anemic pregnant women.

Methods: A pretest-posttest design with a control group was used. The sample consisted of 34 anemic pregnant women at Puskesmas Hajimena, South Lampung, selected through total sampling. The intervention involved daily consumption of dragon fruit juice and honey for a specified period. Data were analyzed using statistical tests to compare Hb levels before and after the intervention.

Results: A significant increase in Hb levels was observed after administering dragon fruit juice and honey. Statistical analysis showed a meaningful effect on hemoglobin levels ($p < 0.05$).

Conclusion: Daily consumption of dragon fruit juice and honey significantly increases hemoglobin levels in anemic pregnant women. This natural intervention can be a safe and effective complementary strategy to prevent and treat anemia during pregnancy.

Keywords: Dragon fruit, honey, anemia, pregnant women

INTRODUCTION

Pregnancy is a critical phase in a woman's life, where not only the mother's health but also the safety of the developing fetus must be carefully monitored (Agung et al., 2023). During this time, various physical and emotional changes occur,

often leading to specific difficulties. The mother's inability to recognize early danger signs of pregnancy can potentially threaten the lives of both mother and fetus (Asli et al., 2022). Therefore, a thorough understanding of pregnancy danger signs and the importance of early detection is essential.

Pregnancy danger signs include conditions such as vaginal bleeding, unusual abdominal pain, and symptoms of preeclampsia like severe headaches and swelling in the hands and feet. For instance, bleeding during the first trimester may indicate a miscarriage, while bleeding in the second and third trimesters could suggest serious issues like placenta previa or placental abruption. Timely recognition and response to these symptoms are crucial for the safety of both mother and baby. Research indicates that prompt recognition and management of the danger signs can prevent approximately 20% of maternal deaths (WHO, 2021).

Early detection not only involves physical monitoring but also includes psychological aspects. Pregnant women often experience anxiety and stress that can affect their health and that of the fetus. Therefore, it is important for pregnant women to receive emotional support from family, friends, and healthcare providers. For example, support groups for pregnant women can help them share experiences and obtain necessary information to address any concerns that arise (WHO, 2021). In this context, effective communication between the mother and healthcare providers is essential to ensure all questions and worries are adequately addressed. A clear example of the importance of early detection is preeclampsia, which can develop into eclampsia if left untreated. Preeclampsia is characterized by high blood pressure and organ damage, which can be fatal to both mother and fetus (Pratama et al., n.d.). Regular monitoring of blood pressure and urine tests to detect protein can help identify this condition early. A study by Dzannastia (2023) shows that early intervention in women with preeclampsia can significantly reduce the risk of serious complications. The transition from a healthy pregnancy stage to a dangerous condition is often very rapid, so pregnant women need to be equipped with knowledge and skills to recognize changes in their bodies (Jannah, 2020). Good antenatal education can provide the information needed to recognize danger signs. Thus, pregnant women are not just recipients of information but also active agents in maintaining their own and their fetus's health. Involving partners in this process can also enhance understanding and support for the pregnant woman (Astuti, 2018).

One of the health issues during pregnancy is anemia. Iron deficiency is the most common cause of anemia in pregnant women in Indonesia (Oleh & Putri Basuki, 2021). The World Health Organization (WHO) recommends checking hemoglobin (Hb) levels in pregnant women, with normal hemoglobin levels being above 11 g/dL for maintaining health.

Iron requirements vary by trimester, with the first trimester requiring 0.8 mg/day. The need for iron increases to 7.5 mg/day starting in the second and third trimesters (Gunawan, 2024). Hemoglobin (Hb) is defined as a group of components that form red blood cells, produced by the bone marrow, which functions as a transporter of O₂ from the lungs to the entire body and carries CO₂ from body tissues to the lungs. Hb consists of protein, iron salts, and pigments (Rahmawati, 2021). A person's anemia status can be determined by measuring Hb levels in the blood. Blood samples can be taken from the finger or toe; however, for accurate results, samples should be taken from a vein (Ministry of Health of the Republic of Indonesia, 2023). Hb levels can be classified according to age and gender. Anemia during pregnancy remains a significant maternal health issue in many countries, including Indonesia. It is defined as a condition where hemoglobin levels in the blood are below normal—less than 11 g/dL in pregnant women. This condition increases the risk of pregnancy complications such as preterm birth and low birth weight (LBW) and raises the risk of maternal and infant mortality (Ramadhani, 2022).

Anemia in pregnant women can increase the risk of complications such as preterm birth, infant and maternal mortality, and other health issues (Aisyah et al., 2024). It can also affect fetal and infant growth and development during pregnancy and afterward (Ministry of Health of Indonesia, 2020). Iron deficiency anemia during pregnancy specifically impacts fetal growth and development both prenatally and postnatally (Ministry of Health of Indonesia, 2019). The World Health Organization (WHO) estimates that 40% of pregnant women worldwide suffer from anemia (WHO, 2021). The prevalence of iron deficiency anemia increases during pregnancy, affecting approximately 43% of pregnant women globally (Andani & Yuliawan, 2022). Data from the Indonesian Health Research showed that the proportion of anemia in pregnant women increased from 37.1% in 2013 to 48.9% in 2018. Among the 15-24 age group, anemia in pregnant women was especially high, at 84.6% (Ministry of Health of Indonesia, 2020). In Lampung Province, according to the Lampung Provincial Health Profile (2022), the prevalence of anemia in pregnant women reaches 49.2%. Data from the South Lampung District Health Office (2023) shows that in Natar Subdistrict, the incidence of anemia among pregnant women is 47.8%, which is considered high. The main factors contributing to the high prevalence of anemia in Natar are low intake of iron-rich foods and a limited dietary diversity. The increased iron requirement during

pregnancy is difficult to meet through diet alone, making the consumption of iron supplement tablets (Tablet Tambah Darah or TDD) necessary to prevent and manage anemia (Ministry of Health of Indonesia, 2020). To enhance iron absorption, vitamin C and certain animal protein sources act as enhancers. For optimal absorption, iron tablets are recommended to be taken between meals along with fruits containing vitamin C, which facilitates the iron absorption process (Sari, 2020). Given the persistently high anemia rates in pregnant women, apart from improving hemoglobin levels through iron supplement tablets, combining non-pharmacological or complementary therapies can also be effective. One example of non-pharmacological therapy is the administration of dragon fruit (Setiawan, 2019).

Dragon fruit contains important nutrients such as iron, vitamin C, vitamin B complex, phosphorus, calcium, sodium, and potassium that support blood cell formation and help combat decreases in hemoglobin (Hb), thereby preventing anemia (Jannah, 2020). Iron in dragon fruit plays a crucial role in hemoglobin and red blood cell production, while vitamin C enhances iron absorption, optimizing hematopoiesis. Research by Sholeha et al. (2020) demonstrated that consuming 250 grams of dragon fruit daily for 14 days increased hemoglobin levels in pregnant women by 1.82 g/dL. Vitamin C content in dragon fruit is higher than in apples and grapes, though lower than in strawberries, and it supports collagen synthesis, wound healing, and immune function. The fruit's fiber content also promotes digestive health and reduces cardiovascular disease risk. Additionally, dragon fruit contains betalain antioxidants, which have been studied for anti-cancer and anti-inflammatory properties (Wibowo, 2021). Compared to grapes, which are high in resveratrol, dragon fruit stands out for its combination of fiber, water, and natural antioxidants supporting digestive and immune health.

Research (Sholeha, 2020) in Taiwan showed that consuming dragon fruit juice significantly increased hemoglobin (Hb) levels in pregnant women, with an average Hb level before treatment at 8.8 g/dL and after treatment at 12.6 g/dL. The statistical test confirmed the effect with a p-value of 0.007. The dragon fruit was administered as juice. Preliminary surveys revealed that pregnant women with anemia only took iron tablets but did not consume specific foods like dragon fruit or honey, which can help address anemia. This research aims

to investigate the effect of giving dragon fruit and honey on increasing Hb levels in pregnant women at Hajimena Health Center, South Lampung, in 2025.

RESEARCH METHODS

This study uses a pre-experimental design with a pretest-posttest approach and a control group, aiming to examine the effect of administering dragon fruit juice and honey on hemoglobin (Hb) levels in pregnant women with anemia. The research is conducted in 2025 at the Hajimena Health Center. The population consists of all anemic pregnant women at the Hajimena Health Center in February 2025, totaling 34 individuals, with the sample taken through total sampling (all population members are included as samples). The sampling technique involves the entire population of anemic pregnant women who receive the intervention. The independent variables are the administration of dragon fruit juice and honey, while the dependent variable is the hemoglobin (Hb) level in the pregnant women. Data analysis is performed using univariate descriptive statistics and bivariate analysis with a dependent t-test to assess differences between pre-intervention and post-intervention hemoglobin levels.

RESEARCH RESULTS

The study was conducted at Hajimena Health Center in South Lampung Regency, focusing on pregnant women with anemia. Sampel penelitian sebanyak 34 orang dipilih menggunakan teknik total sampling. The research sample consisted of 34 individuals selected using a total sampling technique. Analisis data dilakukan menggunakan uji statistik deskriptif untuk analisis univariat dan uji t-test dependent untuk analisis bivariat. Data analysis was performed using descriptive statistical tests for univariate analysis and dependent t-tests for bivariate analysis.

Description of Research Location

UPT Puskesmas Hajimena is a primary health care facility located in Natar Subdistrict, South Lampung Regency, covering a work area of 11.650 km². Administratively, its work area is divided into three villages: Hajimena (7.50 km²), Sidosari (2.97 km²), and Pemanggilan (1.18 km²). The health center plays a vital role in providing health services for pregnant women, including early detection programs for anemia and nutritional interventions

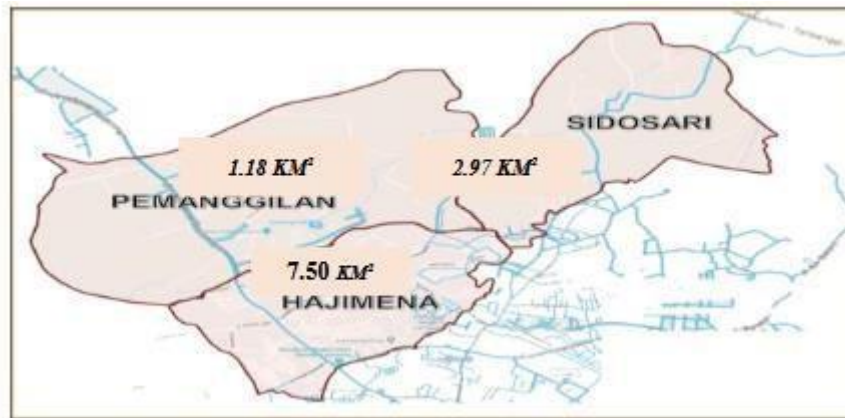


Figure 1

Map of the Working Area of the Hajimena Community Health Center (UPT Puskesmas Hajimena), Natar Subdistrict, South Lampung Regency, 2025

RESEARCH RESULTS

Univariat Analysis

The hemoglobin (Hb) level of pregnant women before administration of dragon fruit juice and honey averaged 10.1 g/dL with a standard deviation of 0.29368, indicating mild anemia among the respondents. After the intervention, the Hb level

increased to an average of 10.55 g/dL with a standard deviation of 0.32809. This increase demonstrates an improvement in the anemia condition of pregnant women following the administration of dragon fruit juice and honey.

Table 2

The hemoglobin (Hb) levels in pregnant women before receiving dragon fruit juice and honey at Hajimena Health Center, South Lampung in 2025

Hb	N	Mean	St. Deviasi	Std.Error	95%-CI
Before the administration of dragon fruit juice and honey	34	10.1	0.29368	0.07123	0.19856-0.35155

Bivariate Analysis

The dependent t-test results indicate a significant difference in hemoglobin (Hb) levels before and after the intervention. The mean difference in Hb before the intervention was 0.2118, increasing to 0.4529 after the intervention. The calculated t-value was 7.517 with a P-value of 0.000, showing that consumption of dragon fruit juice and honey significantly raised Hb levels in pregnant women. This increase demonstrates a positive effect of the non-pharmacological intervention, which is rich in vitamin C, iron, and other nutrients supporting hematopoiesis. Additionally, this intervention provides a safe, natural alternative to reduce the risk of anemia-related complications during pregnancy. In conclusion, administering dragon fruit juice and honey has been proven effective in raising hemoglobin levels in anemic pregnant women at Hajimena Health Center, South Lampung, in 2025, supported by statistically significant evidence. This supports the use of

nutritional interventions as complementary strategies for managing anemia during pregnancy.

DISCUSSION

The research findings demonstrate an increase in hemoglobin (Hb) levels among pregnant women after being given dragon fruit juice and honey at Hajimena Health Center, South Lampung. Before the intervention, the average Hb level was 10.1 g/dL, indicating mild anemia. After the intervention, the average Hb increased to 10.55 g/dL. This improvement reflects the positive effect of the combination of dragon fruit juice and honey in supporting the health of pregnant women. The increase in Hb levels can be attributed to the nutritional content of dragon fruit and honey. Dragon fruit is rich in iron, vitamin C, B complex vitamins, and betacyanin antioxidants, which play essential roles in hemoglobin synthesis and red blood cell formation. Vitamin C enhances the absorption of non-heme iron from plant sources, helping to

address iron deficiency in pregnant women (Herni, 2022). Meanwhile, honey provides additional nutrients, enzymes, and bioactive compounds that support metabolism, energy, and immune function during pregnancy. The synergistic effect of both contributes beneficially to increasing hemoglobin levels (Kuswanti, 2023).

The findings are consistent with previous studies by Magee (2020) and Fadlun (2021), which showed that regular consumption of dragon fruit can increase hemoglobin levels in pregnant women. Research by Rusdi (2020) also supports these results, demonstrating a significant increase in Hb levels in the intervention group consuming dragon fruit juice and honey compared to the control group. This confirms that dragon fruit juice can be a safe and effective non-pharmacological alternative for managing anemia in pregnancy. In addition to nutritional content, the adherence of pregnant women to the intervention plays a crucial role. In this study, respondents regularly consumed dragon fruit juice and honey for 14 days and continued to eat iron-rich foods such as green vegetables, fish, and legumes (Putri, 2023). This adherence supports the significant improvements in Hb levels. However, some respondents still exhibited mild anemia, possibly due to the limited duration of the intervention, indicating a need for longer-term programs for optimal results (Fatmawati, 2021).

The analysis highlights the crucial role of nutritional education for pregnant women. Providing dragon fruit juice and honey along with information about healthy eating patterns enhances respondents' awareness of iron and vitamin C intake (Andani, 2022). The combination of nutritional intervention and health education strengthens the effectiveness of anemia prevention programs. Family and social support also play a key role in the program's success by motivating pregnant women to maintain nutritious diets (Nuraeni, 2023). Overall, this study demonstrates that dragon fruit juice and honey have significant potential to increase hemoglobin levels in anemic pregnant women (Andriani, 2021). This intervention offers a natural, safe, and practical alternative that can be combined with routine health programs like iron supplement tablets. These findings serve as a foundation for developing maternal nutrition programs at health centers to reduce anemia prevalence and improve maternal and fetal health outcomes (Rohanah, 2023).

CONCLUSION

Based on the research findings, administration of dragon fruit juice (*Hylocereus*

polyrhizus) and honey (*Mellis*) significantly increased hemoglobin (Hb) levels in pregnant women with anemia at Hajimena Health Center, South Lampung. The average Hb level rose from 10.1 g/dL before the intervention to 10.55 g/dL afterward. This improvement indicates that the combination of dragon fruit juice and honey is an effective, safe, and natural nutritional intervention to help address anemia during pregnancy.

SUGGESTION

Based on the research results, several recommendations can be made:

For pregnant women, it is recommended to regularly consume dragon fruit juice and honey as part of the daily diet to help increase hemoglobin levels and prevent anemia during pregnancy.

For healthcare workers: Health centers and health officers are encouraged to incorporate dragon fruit juice and honey as part of nutritional intervention programs for pregnant women. Alongside providing these natural supplements.

For future researchers, it is recommended to conduct further studies with longer intervention durations, larger sample sizes, and to consider additional factors such as dietary patterns, physical activity, a overall health status. This will help obtain more comprehensive and generalizable result.

For the government and health institutions, it is important to provide policy support and programs that facilitate pregnant women's access to nutritious foods, especially dragon fruit and honey. This can help ensure the equitable implementation of nutritional interventions across communities.

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