



THE EFFECT OF BEET AND DATE JUICE ON CHANGES IN HEMOGLOBIN IN PREGNANT WOMEN WITH ANEMIA 2025

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ABSTRACT

Anemia in pregnant women contributes to an increased risk of pregnancy complications. Beetroot and dates are known to contain iron, folate, vitamin C, and antioxidants that can support hemoglobin formation. Providing a combination of beetroot and date juice can be an alternative non-pharmacological nutritional intervention to increase hemoglobin levels in pregnant women with anemia. The purpose of this study was to determine the effect of beetroot and date juice on changes in hemoglobin levels in pregnant women with anemia. This study used a pre-experimental design with a one-group pretest-posttest approach. The sample consisted of pregnant women with mild to moderate anemia selected using a purposive sampling technique. The intervention consisted of administering 250 ml of beetroot and date juice once daily for 7 days. Hemoglobin levels were measured before and after the intervention using a hematology analyzer. Data analysis used the Wilcoxon Signed Rank Test. There was an increase in hemoglobin levels after administering beetroot and date juice. The average Hb level of pregnant women after consuming the juice was 12.96 with a standard deviation of 0.9. There was an average increase in Hb levels after consuming beetroot and date juice of 1.29 g%. The results of the hypothesis test using a paired sample t-test showed a p-value of 0.000 with a 95% confidence level ($\alpha = 0.05$). Beetroot and date juice administration is effective in increasing hemoglobin levels in pregnant women with anemia and can therefore be recommended as a complementary therapy for managing anemia during pregnancy.

Keywords: Beetroot, dates, hemoglobin, anemia, pregnant women.

INTRODUCTION

Pregnancy is a condition that is very vulnerable to various types of stress, which can result in physiological and metabolic functional changes. During pregnancy, there is also an increased need for energy and oxygen, as the placenta contains many mitochondria that enhance oxidative metabolism to produce energy, which ultimately affects the continuation of the pregnancy process. In the metabolic process of pregnancy, it triggers physiological changes that obscure the diagnosis of several hematological disorders as well as their assessment. One of the most significant changes is the increased consumption of oxygen by the mother's body, the placenta, and fetal development. When the number of red blood cells (erythrocytes) or oxygen carriers in the blood,

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hemoglobin (Hb), does not meet the physiological needs of the pregnant woman's body, anemia can occur (Varney, 2021)

According to World Health Organization (WHO) data in 2023, the prevalence of anemia is still high; globally, the prevalence of anemia among pregnant women worldwide is 43.9%. The prevalence of anemia among pregnant women in Asia is estimated at 49.4%. In developing countries, about 40% of maternal deaths are related to anemia during pregnancy. Most anemia in pregnancy is caused by iron deficiency and acute bleeding, and often, the two factors interact. The high prevalence of anemia among pregnant women is an issue currently faced by the Indonesian government. Based on the 2018 Basic Health Research (Riskesdas), the percentage of pregnant women experiencing anemia is 48.9%, meaning that 5 out of 10 pregnant women in Indonesia suffer from anemia (Ministry of Health of the Republic of Indonesia, 2020). Based on a preliminary study conducted at Ngasem Community Health Center, 33% of pregnant women were found to have anemia (Ngasem Community Health Center, 2024).

Anemia is the reduction in the hemoglobin level below the normal value (Varney, 2010). Anemia during pregnancy is a national problem that reflects the socioeconomic welfare of the community and has a significant impact on human resources. Anemia in mothers is referred to as a "Potential Danger To Mother And Child." Therefore, anemia requires serious attention from everyone involved in healthcare services in the future (Manuaba, 2010). The prevalence of anemia in pregnancy worldwide ranges from 10% to 20%, while in Indonesia it shows a fairly high value of 63% (Prawirohardjo, 2017). Anemia in pregnancy is a deficiency in hemoglobin (Hb) levels of less than 11% in pregnant women. One of the causes of complications in pregnancy is iron deficiency, which can lead to death during pregnancy and postpartum. There is a 20% mortality rate in developing countries, with the main cause being a lack of red blood cells. Anemia has a significant impact on pregnancy, childbirth, the postpartum period, and the baby. The effects of anemia on pregnancy may include preterm labor, antepartum hemorrhage, premature rupture of membranes, abortion, and more. Anemia can also affect delivery, such as retained placenta and postpartum hemorrhage due to uterine atony. During the postpartum period, anemia can lead to subinvolution of the uterus and postpartum anemia. In the fetus, mothers with anemia will reduce the body's metabolic capacity, thereby disrupting the growth and development of the fetus in the womb and can lead to complications such as abortion, low birth weight, intrauterine death, and congenital defects (Ibraheem, Hasan and Hasan, 2018).

Efforts to overcome anemia in pregnant women include several types, both pharmacological and non-pharmacological (Riau Province Health Profile, 2019). The pharmacological approach can be by consuming a minimum of 90 iron tablets during pregnancy with a dose of 60 mg. Meanwhile, the non-pharmacological approach can be carried out by administering herbal or plant-based remedies, such as legumes, red spinach, *Beta vulgaris* L (beet), and dates (Damayanti, 2018). Beetroot is one of the non-pharmacological therapies that offers several significant health benefits. Among all the benefits of beetroot, it is one of the fruits that contains a relatively high iron content compared to other fruits such as dragon fruit and melon. The iron content in beetroot is 7.4% (Yuliana, et al., 2020). Iron is important for maintaining and forming healthy red blood cells, ensuring the circulation of oxygen and the iron needed by pregnant

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women. This fruit has been recommended by naturopathy experts as a colon cleanser. Beetroot contains copper and folic acid, which are very good for supporting fetal brain development and addressing anemia (Sari, M., 2022). In addition to beets, a fruit that can increase hemoglobin levels is dates. Dates contain high carbohydrates, which can provide sufficient energy. Some of their sugar content consists of glucose, fructose, and sucrose. According to the Hajj Health Ministry data, the iron content in dates is also quite high, at 0.90 mg/100 g of dates (11% of the RDI), where iron is one of the components in the blood to carry oxygen in the blood, to maintain iron balance in the body, thereby reducing the risk of bleeding in pregnant women (Saafi et al., 2011). In the research conducted by Liananiar in 2020, a significant difference was found between pre-test and post-test hemoglobin levels after consuming beets. The results can be concluded that there was an increase in the average hemoglobin levels of third-trimester pregnant women who were given beets in the experimental group, which was 11.5 mg/dL (Liananiar, Harahap, and Liesmayani, 2020).

Another study titled the effect of giving dates on increasing hemoglobin levels in pregnant women with anemia stated that there is an effect of giving dates on the increase of hemoglobin levels in pregnant women with anemia in the working area of Rajabasa Indah Health Center, Bandar Lampung, with a p-value of $0.000 < \alpha (0.05)$ (Yuviska and Yuliasari, 2019). From several studies conducted, it can be concluded that beets are one of the quick ways to increase hemoglobin levels in pregnant women. Based on preliminary studies that have been conducted, the incidence of anemia in pregnant women at Ngasem Health Center has increased in 2025, with 187 pregnant women experiencing anemia out of a total of 457 pregnant women, representing 29.7%. Meanwhile, Ngasem Health Center has been implementing programs to address anemia, namely the provision of 90 iron tablets for pregnant women. Other programs include nutritional consultations for pregnant women with anemia, covering maternal nutrition and how to correctly take iron tablets. In addition, pregnant women with anemia are also given supplementary feeding (PMT) provided through the prenatal class program. Management of pregnant women with severe anemia (Hb levels <7.0 g/dL) is done through referral to the hospital. Based on this background, the researcher is interested in conducting a study on 'The Effect of Beetroot and Date Juice Intake on Changes in Hemoglobin Levels in Pregnant Women in 2025'.

RESEARCH METHODS

Based on the scope of the study, it uses an inferential research design technique. Based on the research location, it is classified as a field research design. Based on the data collection method, it is classified as an observational research design. Based on the research objective, it is a pre-experimental research design with a one-group pretest-posttest design. Based on the data source, it involves primary data. The population consists of pregnant women with anemia. The sample size in this study includes the entire population, which is 20 individuals. Using the Infinite Formula, the sampling technique employed is purposive sampling. The instrument used is an observation sheet. Respondent bias was controlled through standardization of intervention procedures, monitoring of compliance with consumption, recording of Fe tablet intake and dietary patterns, as well as providing research information neutrally to all respondents.

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The materials in this study are data from pregnant women with anemia. For the treatment of providing beetroot and date juice, the materials include: stationery, notebook, 300 grams of beetroot, 200 grams of dates, 250 ml glass/bottle, food scale, food strainer, funnel, lancet, alcohol swabs, dry cotton, HB strips, pen, and the EasyTouch GCHB HB meter. With a dose of 250 ml of juice obtained from 300 g of beets and 200 g of dates and given for 7 days in the morning, drunk after breakfast. (Al-Shwyeh, 2019).

RESULTS

1. Hemoglobin Levels in Pregnant Women Before Administration of Beetroot and Date Juice in the Ngasem Health Center Area, Kediri Regency, 2025

Table 1 Frequency Distribution of Respondents Based on Hemoglobin Levels in Pregnant Women Before Administering Beetroot and Date Juice at the Ngasem Health Center Area, Kediri Regency, in 2025

Hb level	n	mean	Median	Modus	St.Dev
before	20	11,67	11,6	12,2	0,8

Source: Primary Data, 2025

Based on Table 1, it is known that the average hemoglobin (Hb) level of pregnant women before consuming beetroot and date juice was 11.67 g% with a standard deviation of 0.8.

2. Hemoglobin Levels in Pregnant Women after Administration of Beetroot and Date Juice in the Ngasem Health Center Area, Kediri Regency, 2025

Table 2 Frequency Distribution of Respondents Based on Hemoglobin in Pregnant Women After the Administration of Beetroot and Date Juice in the Ngasem Health Center Area, Kediri Regency, 2025.

Hb level	n	mean	Median	Modus	St.Dev
After	20	12,96	12,8	12,5	0,9

Source: Primary Data, 2025

Based on Table 2, it is known that the average hemoglobin (Hb) level of pregnant women after consuming juice was 12.96 with a standard deviation of 0.9. There was an increase in the average Hb level after consuming beetroot and date juice by 1.29 g%.



3. Hemoglobin Levels in Pregnant Women Before and After Consumption of Beetroot and Date Juice in the Ngasem Health Center Area, Kediri Regency, in 2025

Table 3 Analysis of the Effect of Giving Beetroot and Date Juice on Increasing Hemoglobin Levels of Pregnant Women in the Ngasem Health Center Area, Kediri Regency, in 2025

Hb Level	Mean	Median	modus	St.Dev	min	max	N	P value
Before	11,67	11,6	12,2	0,8	10,2	13,7	20	.771
After	12,96	12,8	12,5	0,9	11,4	15,0	20	.946
difference	-1,29							

Source: Primary Data, 2025

Based on Table 3, it is known that after receiving beetroot and date fruit juice, there was an average increase in hemoglobin levels of 1.29 g%. The test results showed that the data were normally distributed (Shapiro-Wilk significance $> \alpha$), so hypothesis testing was conducted using a paired sample t-test, which showed a p-value = 0.000 with a 95% confidence level ($\alpha = 0.05$). It can be stated that p-value $< \alpha$, so H_0 is rejected and H_1 is accepted, meaning there is an effect of administering beetroot and date fruit juice on the increase in hemoglobin levels of pregnant women in the Ngasem Health Center area, Kediri Regency, in 2025.

DISCUSSION

The hemoglobin (Hb) level of pregnant women before consuming beet and date juice in the Ngasem Health Center area, Kediri Regency, was on average 11.67 g% with a standard deviation of 0.8. The hemoglobin level of pregnant women after consuming beet and date juice in the Ngasem Health Center area, Kediri Regency, was on average 12.96 g% with a standard deviation of 0.9. In a study conducted by Gustina (2020), the results showed a significant relationship between the administration of beet juice and the increase in Hb levels of pregnant women, with a P value of 0.001. This indicates that there is a significant difference between the mean hemoglobin levels of pregnant women with anemia.

With the addition of dates, it will further help increase the hemoglobin levels of mothers. According to (Al-Shwyeh, 2019), consuming five dates every morning for 7 days can increase hemoglobin levels, as every five to seven dates (100 grams) contain high iron (1.02 mg) and can meet the body's daily iron requirements. The data analysis results using a test showed a p-value = 0.000 at $\alpha = 0.05$; since the p-value $< \alpha$, H_0 is rejected and H_1 is accepted, which means there is an effect of giving beetroot and date juice on increasing hemoglobin levels in pregnant mothers in the Ngasem Health Center area, Kediri Regency.

Beetroot (*Beta vulgaris*) is rich in various phytonutrients: betalains, nitrates, vitamins (including vitamin C), phenolics, and antioxidants that can reduce oxidative stress and support hematopoiesis. The nitrate content in beets also increases NO bioavailability, which can improve tissue perfusion, although

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the direct link between nitrate → increased hemoglobin has not been fully explained; other components (folate, vitamins, minerals) and antioxidant properties can support red blood cell production. Dates (*Phoenix dactylifera*) contain varying amounts of iron, folate, vitamin C, and other micronutrients that help in hemoglobin synthesis and enhance the absorption of non-heme iron. Vitamin C, in particular, increases iron absorption from food or supplements. Therefore, regular consumption of dates has the potential to raise hemoglobin levels in individuals with iron deficiency. Besides the direct nutrient content, juice combinations (e.g., beet + date) can complement each other: beet provides antioxidants and hematopoiesis-supporting factors; dates add iron and vitamin C intake, thereby maximizing absorption. Several local studies have also reported increased hemoglobin levels with combination formulations (e.g., beet + honey, dates).

In research conducted by Gustina (2020), it was found that there is a significant relationship between the consumption of beetroot juice and the increase in hemoglobin levels in pregnant women, with a P value of 0.001. This indicates that there is a significant difference in the mean hemoglobin levels of pregnant women with anemia between the experimental group and the control group after being given beetroot juice. With the addition of dates, it will further help increase the mother's hemoglobin levels. This is in accordance with Al-Shwyeh (2019), who stated that consuming five dates every morning for 7 days can increase hemoglobin levels, as five to seven dates (100 grams) contain a high amount of iron (1.02 mg) and can meet the body's daily iron requirements.

CONCLUSION AND RECOMMENDATION

There is an effect of giving beetroot juice and dates on increasing hemoglobin levels in pregnant women in the Ngasem Health Center area, Kediri Regency, in 2025. It is hoped that pregnant women, in addition to consuming iron (FE) tablets, will also consume a combination of beetroot juice and dates.

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