
The effect of date palm juice on increasing hemoglobin (HB) in pregnant women at the Sadar Jaya Community Health Center, Bengkalis Regency

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Abstract

Anemia due to iron deficiency is the main cause of anemia in pregnant women. In 2024, 843 pregnant women underwent ANC at the Sadar Jaya Health Center, of which 129 or approximately 56% experienced anemia. This study aims to determine the effect of date palm juice on increasing hemoglobin (Hb) in pregnant women at the Sadar Jaya Health Center, Bengkalis Regency. This type of research is pre-experimental. The population was all pregnant women in the first trimester in March 2026, totaling 30 people, the sampling technique was total sampling. Data analysis used the t-test. The results showed that the hemoglobin (Hb) levels in pregnant women before being given date palm juice were mostly 18 respondents (57.2%) with moderate Hb levels. The hemoglobin (Hb) levels in pregnant women after being given date palm juice were mostly 20 respondents (66.7%) with mild Hb levels. The effect of date palm juice on increasing Hemoglobin (Hb) in pregnant women with a p value of $0.000 < 0.05$. The conclusion of this study is that there is an effect of date palm juice on increasing Hemoglobin (Hb) in pregnant women at the Sadar Jaya Community Health Center, Bengkalis Regency. Therefore, it is hoped that the community health center will increase knowledge and understanding, especially in providing services to pregnant women regarding the prevention of anemia by providing date palm juice to pregnant women in the first trimester.

Keywords: Date palm juice, Hemoglobin (Hb), Pregnant women

INTRODUCTION

Pregnancy is a natural process that every woman experiences. The gestation period to term is 280 to 300 days, or 39 to 40 weeks, during which time pregnant women require proper monitoring. Physiological changes during pregnancy, labor, postpartum, and neonatal period can at any time become pathological. This arises from many influencing factors, both the health of the mother/baby themselves and external factors, including support factors for the mother. Any pathological condition during pregnancy, labor, postpartum, and neonatal period, before an emergency occurs, will show danger signs of the problem, which, if recognized early, can save the lives of the mother and baby (Walyani, 2020).

According to the World Health Organization (WHO), the 2019 maternal mortality rate (MMR) is the number of maternal deaths resulting from pregnancy, childbirth, and the postpartum period, which is used as an indicator of women's health. The MMR is one of the global targets of the Sustainable Development Goals (SDGs) to reduce the maternal mortality rate (MMR) to 70 per 100,000 live births by 2030.

In Indonesia, anemia is a major health problem. The World Health Organization (WHO) states that reducing anemia globally will significantly contribute to achieving the Millennium Development Goals, where 15-20% of maternal deaths are directly or indirectly related to anemia. Anemia during pregnancy is also associated with increased maternal morbidity. Anemia is a condition characterized by a decrease in hemoglobin, hematocrit, and/or erythrocyte count below normal levels. Anemia due to iron deficiency is the leading cause of anemia in pregnant women compared to other nutritional deficiencies. Therefore, nutritional anemia during pregnancy is often identified with iron deficiency anemia (Romlah, 2019).

Based on data from the Bengkalis District Health Office in 2024, out of 17,317 pregnant women, 2,927 were anemic, representing 16.90% (Bengkalis District Health Office, 2025).

Meanwhile, at the Sadar Jaya Community Health Center in 2024, 843 pregnant women underwent ANC, of which 129, or approximately 56%, were anemic.

Meanwhile, based on a preliminary study conducted on January 4, 2026, on 10 pregnant women respondents, 7 (70%) of the respondents had hemoglobin (Hb) levels of 10.6-11 gr/dl based on medical records, which means the pregnant women had anemia, and 3 (30%) of the respondents had hemoglobin (Hb) levels of 11.5-16 gr/dl, which indicates normal. The prevalence of anemia in pregnant women is still high, with many deaths and morbidities that can be caused by anemia.

Anemia in pregnancy is a condition in which a mother's hemoglobin level is below 11 g% in the first and third trimesters, or less than 10 g% in the second trimester. Blood volume increases during pregnancy, commonly known as hydremia or hypervolemia. However, the increase in blood cells is less than the increase in plasma, resulting in blood dilution. The ratio is as follows: plasma 30%, blood cells 18%, and hemoglobin 19%. Pregnant women generally experience iron deficiency, thus providing the fetus with only a small amount of the iron needed for normal iron metabolism. Iron deficiency can cause disruption or stunting of fetal growth, both in body cells and brain cells (Widowati, 2019).

Risk factors for anemia are influenced by several factors, including sociodemographic conditions, obstetric history, and medical factors. Sociodemographic factors include education, knowledge, income, and maternal age. Obstetric history and medical factors include parity, gestational age, pregnancy spacing, gestational age, antenatal visits, and comorbidities. Dietary patterns and supplements during pregnancy, including supplements during pregnancy and dietary patterns, are also factors (Susanti et al. 2025).

Iron is an essential component of hemoglobin. Hemoglobin is a protein found in red blood cells. Hemoglobin functions to carry oxygen in red blood cells from the lungs to all tissues in the body. Hemoglobin concentration can provide information on the severity of iron deficiency. In pregnant women, anemia is a condition where red blood cells or hemoglobin (Hb) levels in the blood decrease, thereby reducing the oxygen-carrying capacity for the needs of vital organs in the mother and fetus. Normally, pregnant women have an Hb level of at least 11 g%. Anemia in pregnancy is defined as pregnant women who have an Hb level <11.00 g% in the first and third trimesters and an Hb level <10.50 g% in the second trimester, due to differences in hemodilution, especially in the second trimester (Lestari, et al. 2019).

Dates are a high-energy food with an ideal composition, containing carbohydrates, tryptophan, omega3, vitamin C, vitamin B6, Ca²⁺, Zn, and Mg. Dates contain very high fiber, in addition to potassium, manganese, phosphorus, iron, sulfur, calcium and magnesium which are very good for consumption. Date juice is a date that is mashed and extracted, in the form of a liquid, thick, black and sweet taste and contains complete nutrients like dates, with complete content, it is expected that date juice can increase hemoglobin levels in pregnant women (Lestari, et al. 2019).

This is in line with the results of research conducted by Nurahmah (2021) on the effect of date palm (*Phoenix dactylifera*) juice on increasing hemoglobin levels in adolescent girls. The results showed that date palm juice significantly increased hemoglobin levels, with a significant asymptotic value (0.023) < probability value (0.05). The study concluded that there was an increase in hemoglobin levels in adolescent girls who consumed date palm juice compared to those who did not consume date palm juice.

In addition, according to research conducted by Yuliasari (2022), regarding the effect of giving date palm juice on Hemoglobin levels in pregnant women in Mekar Jaya Village, Merbau Mataram Health Center, South Lampung Regency in 2020. The results of the study showed that the average difference in the increase in Hb levels of pregnant women between pre-test and post-test in the experimental group was 1.5636 gr% greater than the average difference in the control group, which was 0.7364 gr%. Using the t-independent statistical test, the Sig. (2-tailed) value was 0.000 < 0.05.

Pregnant women must carefully monitor the various nutrients and nutrients they consume. Prevention can be achieved by regulating diet and consuming iron-containing vitamins. Based on the above description, the author is interested in conducting research on the effect of date palm juice on

increasing hemoglobin (Hb) in pregnant women at the Sadar Jaya Community Health Center in Bengkalis Regency.

RESEARCH METHODS

This research is a pre-experimental study. Pre-experimental research is systematic, logical, and thorough in controlling conditions. This study analyzes the effect of date palm juice on increasing hemoglobin (Hb) in pregnant women at the Sadar Jaya Community Health Center in Bengkalis Regency.

The research began in May 2026 and the research location was carried out at the Sadar Jaya Health Center, Siak Kecil District, Bengkalis Regency. The population of this study was all first-trimester pregnant women at the Sadar Jaya Health Center, Siak Kecil District, Bengkalis Regency in May 2026 with a total of 30. The number of samples was 30 people, with the sampling technique used being total sampling. Independent variables: date palm juice and dependent variables: HB levels. The research instrument used digital Hb and observation sheets, while data collection used primary data. Statistical tests were conducted using paired sample T-tests with the help of a computer program, at a significance level of 0.05 or an error rate of 5%.

RESULTS AND DISCUSSION

Univariate Analysis

a. Respondent Characteristics Based on Age

Table 1. Frequency distribution of age First trimester pregnant women at Sadar Jaya Health Center, Siak Kecil District, Bengkalis Regency in May 2026

Age	Frequency	Percentage (%)
<20	1	3.3
20-35	18	60
>35	11	36.7
Total	30	100

(Source: Primary Research Data, 2026)

Based on table 1, it can be seen that the majority of 11 respondents (60%) are in the 20-35 year age group.

b. Respondent Characteristics Based on Education

Table 2. Distribution of frequency education First trimester pregnant women at Sadar Jaya Health Center, Siak Kecil District, Bengkalis Regency in May 2026

Education	Frequency	Percentage (%)
Base	11	36.7
Intermediate	16	53.3
Tall	3	10
Total	30	100

(Source: Primary Research Data, 2026)

Based on table 2, it can be seen that the majority of 16 respondents (53.1%) have secondary education.

c. Respondent Characteristics Based on Occupation.

Table 3. Distribution of job frequency First trimester pregnant women at Sadar Jaya Health Center, Siak Kecil District, Bengkalis Regency in May 2026

Work	Frequency	Percentage (%)
Work	16	53.3
Doesn't work	14	46.7
Total	30	100

(Source: Primary Research Data, 2026)

Based on Table 3, it can be seen that the majority of 16 respondents (53.3%) are working.

d. Respondent Characteristics Based on Parity

Table 4 Frequency distribution parityFirst trimester pregnant women at Sadar Jaya Health Center, Siak Kecil District, Bengkalis Regency in May 2026

Parity	Frequency	Percentage (%)
Primipara	20	66.7
Multipara	9	30
Grandemulti	1	3.3
Total	30	100

(Source: Primary Research Data, 2026)

Based on Table 4, it can be seen that the majority of 20 respondents (66.7%) were primiparous.

e. Respondent characteristics based on Hb before

Table 5 Distribution of Hb frequency before distribution of date palm juice at the Sadar Jaya Community Health Center, Siak Kecil District, Bengkalis Regency in May 2026

Hb Before	Frequency	Percentage (%)
Light	2	9.5
Currently	18	57.2
Heavy	10	33.3
Total	30	100

Source: Primary Research Data, 2026)

Based on Table 5, it can be seen that the majority of 18 respondents (57.2%) had moderate Hb levels before being given date palm juice.

f. Respondent characteristics based on Hb after

Table 6 Frequency distribution Hb after administering date palm juice at the Sadar Jaya Community Health Center, Siak Kecil District, Bengkalis Regency in May 2026

Hb After	Frequency	Percentage (%)
Light	20	66.7
Currently	10	33.3
Heavy	0	0
Total	30	100

(Source: Primary Research Data, 2026)

Based on Table 6, it can be seen that the majority of 20 respondents (66.7%) had mild Hb levels after administering date palm juice.

Bivariate Analysis

a. The effect of date palm juice on increasing hemoglobin (Hb) in pregnant women in the first trimester

Table 7 PinfluenceDate palm juice on increasing hemoglobin (Hb) in pregnant women in the first trimester at the Sadar Jaya Community Health Center, Siak Kecil District, Bengkalis Regency in May 2026

Variables		after		Total
		light	currently	
before	light	2	0	2
		100.0%	.0%	100.0%
	currentl	18	0	18
	y	100.0%	.0%	100.0%
heavy		0	10	10
		.0%	100.0%	100.0%
Total		20	10	30
		66.7%	33.3%	100.0%

From table 7 above, it can be seen that the cross tabulation showed that the Hb levels were light before being given date juice and after being given date juice, 2 respondents (100) had light Hb levels. (%). Hb levels were moderate before being given date juice and after being given date juice were light for 18 respondents (100%). Hb levels were heavy before being given date palm juice and after being given date palm juice were moderate for 10 respondents (100%).

b. T-Test

Table 8 T-Test				
	Hb levels	Mean	Df	ρ value
Hb levels	Before	11,926	30	0,000
	After	16,971	30	

From the results of statistical tests with the help of a computer program, the ρ value was 0.000 <0.05, meaning there was an effect of date palm juice on increasing hemoglobin (Hb) in pregnant women at the Sadar Jaya Community Health Center, Bengkalis Regency.

Discussion

1. Hb before

Of the 30 respondents studied, 18 (57.2%) had moderate Hb levels before receiving date palm juice. This was due to the fact that the majority of 16 respondents (53.1%) had secondary education. Therefore, educational level influences a person's understanding of something.

According to Notoatmodjo (2018), knowledge can be influenced by many factors, one of which is education level. The higher a person's education level, the better their knowledge, and vice versa. Higher education influences pregnant women's understanding of preventing low hemoglobin levels (anemia) by consuming iron tablets, access to fortified food sources, access to health services, access to knowledge and education about anemia, access to clean water, sanitation, and mosquito nets. These five access points can lead to inadequate nutrient intake and absorption and lead to infectious diseases.

Additionally, 11 respondents (36.7%) were under 20 years old, and 1 respondent (3.3%) was over 35 years old. Therefore, age will affect nutritional needs, especially the hemoglobin levels of pregnant women.

According to Notoatmodjo (2018), age is the length of an individual's life span, calculated from birth to their birthday. In terms of societal beliefs, a more mature person is believed to be superior to someone who is less mature. This is based on experience and mental maturity. Anemia in pregnancy is significantly related to maternal age; the younger or older a pregnant woman is, the more likely it is to affect her nutritional needs. Inadequate nutrition during pregnancy, especially for women under 20 and over 35, increases the risk of anemia.

Hb levels in pregnant women are <11 g/dl in the first and third trimesters, while in the second trimester they are <10.5 g/dl. This occurs due to hemodilution, or blood thinning. Complaints of weakness, paleness, and fainting even though blood pressure is still within normal limits should be suspected as iron deficiency anemia. Therefore, Hb testing should be a routine antenatal blood test. Factors affecting Hb levels in pregnant women (Winarsih, 2018).

From the research results above, it can be concluded that the education level and age of pregnant women in the first trimester affect Hb levels. Education will influence the mother's understanding, and age will influence the mother's nutritional needs (Hb). Therefore, it is important to provide pregnant women with an understanding that the body requires more iron during pregnancy than during non-pregnancy. Iron is needed by pregnant women to meet basal losses, as well as for the formation of increasing numbers of red blood cells, as well as for the fetus and placenta. As the gestational age increases, the need for iron increases.

2. Hb after

Of the 30 respondents studied, 20 (66.7%) had mild Hb levels after receiving date juice. This is because consuming dates increases hemoglobin levels in pregnant women.

According to Safitri (2021), dates can increase hemoglobin because they contain protein, fiber, glucose, and vitamins such as vitamin A (β-carotene), B1 (thiamine), B2 (riboflavin), vitamin C, biotin, niacin, folic acid, and minerals such as iron, calcium, sodium, and potassium. Dates contain vitamins B6 and B12, which are needed for Hb synthesis. Vitamin B6, amino acids, and glycine are involved in the initial reaction of heme formation. Vitamin B6 and vitamin B12 are needed for globin synthesis. Furthermore, the interaction between heme and globin produces Hb.

The iron content in dates stimulates hemoglobin production and increases hemoglobin levels. The vitamin C in dates can enhance iron absorption, while the potassium, B6, and B12 content helps synthesize hemoglobin. The combination of these three functions in dates can increase hemoglobin. Consuming five Ajwa dates daily for seven consecutive days can increase hemoglobin levels by an average of 1.5 g/dL.

This is in line with the results of research conducted by Nurahmah (2021) on the effect of date palm (phoenix dactylifera) juice on increasing hemoglobin levels in adolescent girls. The results showed that date palm juice significantly increased hemoglobin levels, with a significant asymptotic value ($0.023 < \text{probability value } (0.05)$). The study concluded that there was an increase in hemoglobin levels in adolescent girls who consumed date palm juice compared to those who did not consume date palm juice.

From the research results above, it can be concluded that Hb levels increased after administering date palm juice. Therefore, it is important for pregnant women in their first trimester to prevent anemia during pregnancy. Dates are black and sweet, and contain a complete range of nutrients, similar to other fruits. With its comprehensive content, date palm juice is expected to increase hemoglobin levels in pregnant women.

3. The effect of date palm juice on increasing hemoglobin (Hb) in pregnant women in the first trimester

That out of 30 respondents in the cross tabulation, it was found that the Hb level was light before being given date juice and after being given light date juice was 2 respondents (100%). The Hb level was moderate before being given date juice and after being given light date juice was 18 respondents (100%). The Hb level was heavy before being given date juice and after being given medium date juice was 10 respondents (100%).

From the results of the T-test statistical test with the help of a computer program, the p value was $0.000 < 0.05$, so there was an effect of date palm juice on increasing Hemoglobin (Hb) in pregnant women at the Sadar Jaya Community Health Center, Bengkalis Regency.

In accordance with the results of research conducted by Yuliasari (2022), regarding the effect of giving date palm juice on Hemoglobin levels in pregnant women in Mekar Jaya Village, Merbau Mataram Health Center, South Lampung Regency in 2020. The results showed that the average difference in the increase in Hb levels of pregnant women between pre-test and post-test in the experimental group was 1.5636 gr% greater than the average difference in the control group, which was 0.7364 gr%. Using the t-independent statistical test, the Sig. (2-tailed) value was $0.000 < 0.05$.

There are two approaches to preventing and managing anemia: pharmacological, such as taking iron tablets. In addition to pharmacological therapy, non-pharmacological therapy can also be administered. Anemia can be prevented by consuming foods rich in iron, such as red beans. Red beans are a high-fiber food. The minerals in red beans, such as iron, zinc, and copper, are beneficial for the formation of red blood cells, enzymes, and bones (Umrah, 2018).

Date juice is a date that is ground and the juice is taken, in the form of a liquid, thick, black and sweet taste and contains complete nutrients like dates. With complete content, it is expected that date juice can increase the hemoglobin levels of pregnant women. Dates contain high carbohydrates so they can provide sufficient energy. Some of the sugar content consists of glucose, fructose, and sucrose. According to data from the Ministry of Health, the Hajj explains that the iron content in dates is also quite high, namely 0.90mg / 100g of dates (11% RDA), 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 (Widowati, 2019).

From the research results above, it can be concluded that date palm juice has an effect on increasing hemoglobin (Hb) in pregnant women. Therefore, pregnant women must carefully monitor their nutritional intake. Prevention can be achieved by adjusting their diet and consuming iron-containing vitamins.

CONCLUSION

Based on the results of research and data analysis on the effect of date palm juice on increasing Hemoglobin (Hb) in pregnant women at the Sadar Jaya Health Center, Bengkalis Regency, with the following conclusions:

1. Hemoglobin (Hb) levels in pregnant women before being given date palm juice at the Sadar Jaya Community Health Center, Bengkalis Regency, the majority of 18 respondents (57.2%) had moderate Hb levels.
2. Hemoglobin (Hb) levels in pregnant women after being given date palm juice at the Sadar Jaya Community Health Center, Bengkalis Regency, the majority of 20 respondents (66.7%) had mild Hb levels.
3. The effect of date palm juice on increasing hemoglobin (Hb) in pregnant women at the Sadar Jaya Community Health Center, Bengkalis Regency, with a p value of $0.000 < 0.05$.

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