



The Effectiveness of Red Bean Juice in Hemoglobin levels in Pregnant Preventing Anemia

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ABSTRACT

One of the changes during pregnancy is haematological changes such as a decrease in haemoglobin levels in pregnant women caused by the process of haemodilution with a volume of 30-40% and ends in the 32-44th week of pregnancy so that it requires special attention in fulfilling nutritional intake, because if it is not fulfilled it will be able to cause a decrease in haemoglobin levels and cause anaemia The aim of the study was to determine whether there was an effect of giving red bean juice to prevent anaemia in pregnant women. This research method is pre-experiment with the Quasi experimental design method, namely two group pretest - posttest. The sampling technique was a purposive sample of 22 people with the inclusion criteria set, the intervention was given in accordance with the SOP and Hb levels were measured with an easy touch tool. Data analysis consisted of bivariate with paired sample t-test. And the results of the study with a *P*value of $0.000 < (0.05)$, it was concluded that there was a difference in the increase in haemoglobin levels in the experimental group. So that red beans can be used as a good choice for nutritional fulfilment of pregnant women.

Keywords: Pregnant Women, Red Beans, Haemoglobin Levels

INTRODUCTION

One of the changes that occur due to the process of pregnancy in pregnant women is hematological changes such as a decrease in hemoglobin levels in pregnant women due to the process of hemodilution with a volume of 30-40% during pregnancy and ending in the 32-44th week of gestation. (Pramesti et al., 2024). Special attention is needed for nutritional fulfillment because if it is not fulfilled it can cause anemia. (Simanjuntak et al., 2024). Anemia is defined as low levels of hemoglobin in the blood and has a serious impact on health and is associated with poor cognitive and motor development in children. (Trisnawati et al., 2025). According to WHO (2021), the incidence of anemia in pregnant women in the world ranges from 20.0% to 89.0% with a hemoglobin (Hb) level < 11 gr/dL as an indicator of anemia. (Hajah et al., 2025). In the 2013 Riskesdas, the incidence was 37.15%, while the 2018 Riskesdas results reached 48.9%, so it can be concluded that over the past 5 years the problem of anemia in pregnant women has increased by 11.8%. However, based on the SKI in 2023, the prevalence of anemia in pregnant women in Indonesia is 27.7%, when compared to the 2018 Riskesdas data, it shows a decrease of 21.2% from 48.9% to 27.7% with the highest number of

pregnant women experiencing anemia at the age of 35-44 years at 39.9%, education not graduating from elementary school 41.3%, employment as a private employee 23.6%, residence in rural areas 31.3% and top economic status 45.7%. (Kemenkes RI, 2023). Anemia is often called a “potential danger to mother and child” or can be interpreted as a possible danger to a mother and child. (Vira et al., 2024). The main cause of anemia in all countries is iron deficiency, especially developing countries, due to insufficient iron intake, high iron absorption during pregnancy, iron loss due to bleeding or infectious diseases. (Medyawati, 2024) while based on research results (Dakhi et al., 2024) There are several risk factors for anemia, namely gestational age, mother's education level, family income of pregnant women, history of maternal illness, length of pregnancy interval with the next pregnancy, parity and compliance of pregnant women in taking Fe tablets. The impact of anemia on pregnant women varies greatly from mild complaints to the occurrence of pregnancy abortion, partus immaturity/prematurity, disruption of the labor process (bleeding), postpartum period disorders (reduced resistance to infection and stress, low milk production) and fetal disorders namely abortion, dysmaturity, microsomia, congenital

malformations. LBW, and perinatal mortality. In addition, bleeding during pregnancy and after childbirth is most common in anemic women and is fatal because anemic women cannot lose much blood. (Yudha, Herdha Sofitri, 2023). Efforts to prevent and overcome iron nutrition anemia are carried out through the provision of blood supplement tablets (TTD) which are prioritized for pregnant women, because the prevalence of anemia in this group is quite high. (Medyawati, 2024). In addition, the pregnant women group is a vulnerable group that has the potential to contribute to the high MMR and in North Sumatra compliance in taking blood supplement tablets $\geq 90\%$ is still low at around 11.1%. (Kemenkes RI, 2023). In addition, prevention of anemia can be done by consuming nuts. (Fariza, Yuli Zuhkrina, 2024). One of them is red beans, which is a type of food that contains iron, folic acid, calcium and carbohydrates as well as high protein and antioxidants. Every 100 grams of cooked red beans contains 500 mg of iron or the equivalent of 40% of the daily nutritional needs. (Anggraini et al., 2024). In addition, the kidney bean formula is better at overcoming SEZ in pregnant women compared to peanuts and soybeans, which contain an average of 300 kcal of energy, 17 grams of protein, 13 mg of iron (Fe),

calcium (Ca) 150 mg, magnesium (Mg) 30 mg, folic acid 200 mg, vitamin A 300 RE, vitamin B12 0.2 mg and vitamin C 10 mg in 300 ml (Sy. Lubna, Elsy Juni, Wulan dari, 2024). So based on the above background, researchers are interested in conducting research on the Effect of Red Bean Juice on Hemoglobin Levels of Pregnant Women in Preventing Anemia in the Medan Sunggal Health Center Working Area.

METHOD

The type of research used is quantitative research, with the research design used Quasi experimental design, namely two group pretest - posttest which uses two groups of subjects and conducts before and after giving intervention treatment to research subjects. This research was conducted in the Medan Sunggal Health Center Working Area. The population in this study were all pregnant women. Sampling in this study using purposive sampling technique, namely sampling based on certain considerations made by the researcher through the inclusion criteria of pregnant women in trimester I, II and III and did not consume Fe and did not have a history of disease and pregnancy complications, as many as 22 people divided into 11 people for the group experimental group and 11 people

for the control group. And the red beans used were 50 mg processed into 500 ml of juice and given to mothers 250 ml in the morning and 250 ml in the afternoon for 7 days. The instruments used were dermatography sheets, observation sheets, and easy touch devices to measure haemoglobin levels. Bivariate data analysis used paired sample t-test with 95% confidence level or $\alpha = 0.05$ (5%).

Table 2. Results of Pretest and Posttest Haemoglobin Levels in Experimental and Control Groups by Giving Red Bean Juice

Kelompok	N	Mean	SD	P _{value}	Std. Error
Eksperimen	Pretest	11	9,827	0,352	0,000*
	Posttest	11	10,68	0,260	
Kontrol	Pretest	11	9,845	0,307	0,360
	Posttest	11	9,800	0,260	

*uji paired T Test

Table.3. Results of Pretest and Posttest Haemoglobin Levels in Experimental and Control Groups by Giving Red Bean Juice

Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
		Lower	Upper
0,000*	0,8818	0,6502	1,1135

*Independent sample t test

RESULTS AND DISCUSSIONS

Result

Table. 1. Characteristics of Respondents

No	Variabel	Eksperimen (n)	%	Kontrol (n)	%
1.	Age				
	< 20 years	1	9,1	0	0
	21-35 years	5	45,4	2	18,1
	> 35 years	5	45,4	9	81,8
	Total	11	100	11	100
2.	Parity				
	Primipara	2	18,1	6	54,5
	Multipara	9	81,8	5	45,5
	Total	11	100	11	100
3.	Education				
	Elementray School	1	9,1	2	18,1
	Junior High School	2	18,1	0	0
	Senior High School	5	45,4	6	54,5
	Higher Education	3	27,2	3	27,2
	Total	11	100	11	100
4.	Jobs				
	Housewives	9	81,8	8	72,7
	Self Employed Private Employees	1	9,1	0	0
	Civil Servants	1	9,1	3	27,2
	Total	11	100	11	100
5	Gestation Age				
	First trimester	1	9,1	0	0
	Second trimester	5	45,4	3	27,2
	Third trimester	5	45,4	8	72,7
	Total	11	100	11	100

Discussion

Respondent Characteristics

Based on table 1. with 11 samples in each group, namely the experimental group and the control group with the age characteristics of respondents in the experimental group, most of them were 20-35 years old and 31-40 years old, 5 people each (45.45%), and > 35 years (81.8%) in the control group. According to the research assumption, the age of a pregnant woman does not really affect the understanding of a mother because, it could be that a mother who is young but lacks knowledge, her understanding of preventing anemia and fulfilling nutrition during pregnancy is not good, this is in line with the research assumption. research

(Rita et al., 2021) which said there was no relationship between age and the incidence of anemia.

The majority of respondents were multiparous (18.1%) in the experimental group and primigravida in the control group, the majority were primigravida (45.5%). First parity is known to have a greater risk in the occurrence of anemia cases in pregnancy, which can be supported by the knowledge and experience of pregnant women who are not yet qualified so that many things are not yet known.(Silviani et al., 2023).

The education of respondents in the experimental group was mostly high school as well as the control group of high school (54.5%). This is in line with research (Eka Nenni, 2023) The level of education of pregnant women is related to their level of knowledge. Most of the respondents had a low level of education. The low level of maternal education will affect the receipt of information so that the mother's knowledge is less about anemia so that the mother has limitations in meeting nutritional needs.

The majority of respondents in the experimental group were housewives (81.8%) as well as the control group (72.7%). A person's occupation will be related to economic status, but not always occupation and economic status can

provide economic status. Impact of good understanding to prevent anemia because according to research (Norfitri & Rusdiana, 2023) If a person's economic status is low but knowledge is good, then anemia does not occur because respondents understand and know about the right food during pregnancy to avoid the problem of anemia and understand what foods should be consumed by pregnant women, so that mothers try to meet their needs with their purchasing power.

The gestational age of respondents in the experimental group was mostly trimester II and III (45.5) while in the control group trimester III (72.2%). According to WHO, the prevalence of pregnant women who experience nutritional deficiency anemia (Fe) is around 35-75% which increases with increasing gestational age. Gestational age is at risk of increasing the incidence of anemia, and anemia in third trimester pregnancy is more than the first and second trimester, because blood dilution during pregnancy will reach a maximum of 5-8 months, this dilution factor can cause maternal blood hemoglobin levels to decrease to 10 gr / dL. The increasing gestational age of the mother, the risk of suffering from anemia becomes greater if it is not balanced. with a regular diet and balanced and Fe

consumption (Endang Wahyuningsih et al., 2023).

Effectiveness of Red Bean Juice on Hemoglobin Levels

Based on Table 2. it can be seen the results of the paired t-test conducted on the experimental and control groups. The results obtained from the experimental group are the mean pre-test of 9.827 and the mean posttest of 10.68, while in the control group the pretest is 9.845 and the mean posttest is 9.800 so it can be concluded that the mean difference is 0.853 (10.68-9.827) in the experimental group and Pvalue $0.000 < (0.05)$, it is concluded that there is a difference in the increase in haemoglobin levels in the experimental group.

Based on Table 3. it can be seen that the results of the independent sample t-test test show a Sig value. (2-tailed) of 0.000 is smaller than alpha 0.05 ($p < \alpha 0.05$), then in accordance with the basis for decision making with the test results there is a significant difference with the administration of red bean juice for 7 days processed from 50 mg to 250 ml of juice given in the morning and 250 ml in the afternoon to increase haemoglobin levels in pregnant women..

Iron requirements in pregnant women are on average close to 800 mg. this

requirement consists of, about 300 mg required for the fetus and placenta and another 500 mg is used to increase maternal hemoglobin mass. Iron deficiency anemia is obtained by complaints of fatigue, frequent dizziness and eye foginess and complaints of nausea and vomiting in young pregnancies. Therefore, pregnant women are strongly encouraged to consume foods that contain iron, so that anemia does not occur which has an impact on pregnant women and their fetuses. (Purba, R. B., Tomastola, Y., Robert, D., & Loli, 2023)

Kidney beans are a great source of iron, vitamin A and are also rich in antioxidants. In general, kidney beans are consumed in cooked form. Efforts to prevent anemia by consuming foods that contain iron. Iron is a mineral needed to form red blood cells. In addition, this mineral also functions as a component to form myoglobin (a protein that carries oxygen to the brain). One of the important elements in the formation of red blood cells is iron. Iron can be obtained from animal and plant foods, one of which is red beans. (Ningrum et al., 2023). Kidney beans are one of the foods that contain minerals that are useful in increasing hemoglobin levels in pregnant women. In 10 grams of kidney beans containing iron, copper and zinc can help increase haemoglobin levels. (Bakara et

al., 2022). This is in line with research (Nurdiyah et al., 2023) that the average results of 32 respondents experienced an increase in Hb levels of 0.2 g/dL except four respondents experienced a decrease in Hb levels of 0.1 g/dL and there were two respondents with fixed Hb levels. Pregnant women who routinely consume red beans 2 times a day every morning will experience an increase. In addition, pregnant women routinely consume red beans at 07.00 am and 16.00 pm after eating as much as 50 grams with processed red bean soup. While pregnant women who do not routinely consume red beans experience a decrease in Hb. This study is also in line with research (Jamil et al., 2023) The average Hb level of pregnant women who experienced anemia before being given red bean juice was 10.034 gr/dL. After being given red bean juice, the average Hb level of pregnant women was 10, 823 gr/dL, with the T test obtained a p value of 0.000 which proves the effect of giving red bean juice on increasing Hb levels in anemic pregnant women. This study is also in line with research (Sartika et al., 2023) which provides 200 grams of red beans per day for 3 weeks which are processed into soups, fresh drinks, and others. This study was conducted on adolescents with 56 samples consisting of 28 control groups and 28 experimental

groups and was conducted on adolescents obtained a value of 0.004 which shows the effect of red beans on hemoglobin levels in adolescent girls where red beans are rich in iron which can meet the body's iron needs so as to prevent anemia.

CONCLUSION

The author concludes that the results obtained from the experimental group are the mean pre-test of 9.827 and the mean posttest of 10.68 so it can be concluded that the mean difference is 0.853 (10.68-9.827) in the experimental group and Pvalue $0.000 < (0.05)$, it is concluded that there is a difference in the increase in haemoglobin levels in the experimental group against the control group. So that red bean juice can be used as one of the foods consumed to prevent anemia during pregnancy, because the content of red beans consists of iron and folic acid.

THANK YOU

Penulis mengucapkan terima kasih kepada Institut Kesehatan Sumatera Utara yang telah mendukung dalam penyelesaian penelitian ini. Kepada Pimpinan Puskesmas Medan Sunggal yang sudah menyediakan tempat penelitian ini.

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