

The effect of beta vulgaris l juice on the acceleration of reducing the incidence of anemia in pregnant women

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ABSTRACT

The largest issue affecting mother and child health in industrialized nations with a population of 1.62 billion is anemia (1). Since using medications and supplements for the treatment of anemia sometimes results in adverse consequences, eating beets is an option (2). the number of anemia cases, as well as to maintain healthy pregnancy and minimize the usage of contemporary treatment. From planning to the outcomes, the phases of the research process are executed in compliance with the established research flow diagram. There are thirty pregnant women at the Deby Midwifery Clinic that make up the study's sample. A pre-post experimental design was used for the study, with 15 participants receiving juice and another 15 serving as the control group. H_0 is accepted and H_a is rejected, indicating an acceleration, according to the statistical analysis of the paired t test data in the above table, which shows a significance value (p) of $0.000 < (0.05)$. lessen anemia following beetroot juice use.

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INTRODUCTION

Anemia is a condition when the level of erythrocytes and/or hemoglobin (Hb) circulating in the body cannot perform its function of providing oxygen. It can also be said that there is a decrease in the level of Hb, hematocrit or erythrocytes below normal (Siagian et al., 2020). Pregnant women are diagnosed with anemia if the hemoglobin level is below 11 gr/dl. To prevent anemia, mothers should consume iron and folate tablets regularly and continue for 3 weeks postpartum (Luyckx et al., 2018)(Uribe-Leitz et al., 2019).

The cases of pregnant women with anemia in Indonesia increased by 11.8% in the last 5 years, that is, in 2018, pregnant women with anemia are 48.9%, the most pregnant women with anemia aged 15-24 years are 84.6%, age. 25-34 years old are 33.7 5, 35-44 years old 33.6%, and 45-54 years old 24% (Purba et al., 2023).

Giving drugs and supplements to treat anemia often causes side effects, making people look for alternative natural therapies to treat anemia. One alternative is to consume beets (Utami & Farida, 2022). Beets contain vitamins A, B, and C with a high water content. In addition to vitamins, beets also contain carbohydrates, proteins and fats that are beneficial for the health of the body. Other minerals are also present in beets such as iron, calcium and phosphorus (Askinah & Simamora, 2023)(Januariana et al., 2024)(Demitri et al., 2024). because folic acid and vitamin B12 found in beets play a crucial role in cellular metabolism and are necessary for erythrocyte formation (Magfiroh & Razak, 2019). In order for the blood to transmit nutrients to the body and prevent the number of red blood cells from declining, beets also help to cleanse and fortify the blood.

Beets are very popular in Eastern Europe where they are used to treat leukemia (Kemenkes, 2018). The formulation of the problem in this study is the effect of Beta Vulgaris L Juice on the acceleration of the decrease in the incidence of anemia in pregnant women at the Deby Cyntia Yun Clinic in 2024. Problem solving approach,

An alternative approach to solving the problem in this study is that the occurrence of anemia in pregnant women has not been achieved, so it is done to process beets containing vitamins A, B and C with a high water content. In addition to vitamins, beets also contain carbohydrates, proteins and fats that are beneficial for the health of the body. Other minerals are also present in beetroot such as iron, calcium and phosphorus. Because beets include folic acid and vitamin B12, which are essential for cellular metabolism and the proper formation of erythrocytes, beets stimulate the circulatory system and aid in the production of red blood cells (Sabilla, n.d.)(SA'DIYAH, 2021)(Rohanah et al., 2023)(Ardyansyah, 2023).

RESEARCH METHOD

The research methodology employed in this study is pre-experimental design research, which is a type of study that conducts activities because it has not yet developed into a true experiment because the dependent variable is not the only factor influencing its formation; there are still external factors at play. separate variable. Because the sample is not chosen at random and there are no control factors, this may occur.

Planning to address the research objectives and foreseeing some of the challenges that can arise throughout the study are the main goals of this research design. The subject group is monitored both before and after the intervention in this study, which employs a One Group pre-test and post-test design without a control group. One group was given a pretest before to receiving a particular therapy, and further measures were taken to ascertain the treatment's cause and effect. Comparing the pretest and posttest data allowed for the testing of causality.

The following is a description of the design: Intervention group X1 for pregnant women → purposive sample → consume beta vulgaris juice L → assess improvement Hb → hasten anemia decrease. Control group X1 for pregnant women → Purposive sampling → Avoiding beta vulgaris juice L → assess improvement Hb → hasten anemia decrease.

Time and Place of Research

This study was carried out in the Deby Midwifery Clinic in Medan between April and July of 2024.

Definition of Operations

1. Pregnant women are defined as those who are in good physiological health from the time of conception until the fetus is born, with no difficulties (Prawirohardjo, 2016).
2. The respondent who consumes beet juice (Beta vulgaris L) is the one who drinks it.
3. A quick drop in the prevalence of anemia in expectant mothers based on measures taken after consuming beet juice (Beta vulgaris L) as opposed to those who did not (Rizki & Nawangwulan, 2018)

Population and sample

All pregnant women who came to the Deby Midwifery Clinic for ANC made up the population. The sample is a subset of expectant mothers who meet the study's requirements and are prepared to take part. The sample size for basic experimental study ranges from 10 to 20. Since 15 participants received juice and 15 participated in the control group, the study's sample size is 30 samples (Jasmin et al., 2023).

Measurement Method

A questionnaire was used to interview pregnant women who fit the requirements and agreed to participate in the study as a research sample in order to ascertain their characteristics. Beetroot juice is then administered. 100 grams of beetroot (*Beta vulgaris* L.) are prepared, cleaned, and blended with 250 milliliters of water. The mixture is then continuously stirred until it turns into juice and filtered (Faisal et al., 2023). may also add extra brown sugar to make it sweeter, and for a week, you can drink it every day after breakfast. Additionally, the Stick/Hb Meter was used to measure a quick decrease in the incidence of anemia (Mernawati et al., 2022).

Data analysis

Following data collection, the data is edited, coded, entered, and cleaned. Then, using SPSS, a computerized method, the data analysis is carried out step-by-step. Descriptive statistical tests are used in this univariate study to produce frequency tables or distributions. Pregnant women's characteristics, such as age, parity, highest level of education, and mother's employment, are the variables in this study that have been described in the form of frequency distribution (Mernawati et al., 2022).

Using a dependent t test (paired t test), bivariate analysis was utilized to ascertain the impact of beet juice on the quick decline in the prevalence of anemia in expectant mothers. The purpose of the paired test is to evaluate how well the therapy works for the number of variables you wish to ascertain. Because the sample size was smaller than fifty, the Shapiro-Wilk data normalcy test was performed before the t test. The standard error is calculated using a value of 0.05 (Diah et al., 2024)(Indarti, 2023)(Purnama et al., 2024).

RESULTS AND DISCUSSIONS

Beetroot juice was used in this case-control study to treat anemia in pregnant women. The inquiry was conducted from August to October of 2024. pregnant ladies who are willing to serve as study subjects by providing samples. The researcher received assistance from members of the field team and research team to monitor the respondents while gathering patient data at the Deby Midwifery Clinic. This research had 30 pregnant women, 15 of whom were given beetroot juice and the other 15 of whom were in the control group. Following a week of monitoring, the pace at which anemia decreased was compared.

Prior to being sampled, respondents were requested to sign a permission form after being briefed about the study activities. Following the respondent's signature on the consent form, the researcher conducted an interview to gather data on gender, age, employment, and greatest level of education. The researcher also conducted interviews with the control group and the intervention group on anemia in pregnant women. The intervention group was then given beet juice by the researchers. After properly cleaning and processing 100 grams of beets, combine them with 250 milliliters of water. For a week, the mixture is continually mixed until it turns into juice, filtered, and eaten every day after breakfast.

Table 1. Frequency distribution of respondent characteristics

Respondent Characteristics		Accelerated reduction in anemia	
		F	%
Aged	20-35 years	27	90
	<20 years dan >35 years	3	10
	Total	30	100
Parity	Primi gravida	13	43,3
	Multi Gravida	17	56,7
	Total	30	100
Education	Education Higher	28	93,3
	Education Low	2	6,7
	Total	30	100
Work	Work	13	43,3
	Doesn't Work	17	56,7
	Total	30	100
Anemia in Pregnant Women	Anemia	16	53,3
	Not Anemic	14	46,7
	Total	30	100

Table 2. Differences in the acceleration of reducing the incidence of anemia in the intervention group and control group

No	Ex. Intervention				Ex. Control			
	Respondent	Pretest (g/dl)	Post test (g/dl)	Difference	Respondent	Pretest (g/dl)	Post test (g/dl)	Difference
1	Ny.H	9,6	14,1	4,5	Ny.R	9,6	9	0,6
2	Ny.E	10,3	12,3	2	Ny.S	10,8	10,3	0,5
3	Ny.R	9,1	11,1	2	Ny.S	9,1	9	0,1
4	Ny.I	10	11,6	1,6	Ny.A	10,3	10	0,3
5	Ny.I	10,6	11,8	1,2	Ny.D	9,6	10,6	1
6	Ny.E	11,2	12,3	1,1	Ny.H	11,2	11,2	0
7	Ny.D	10,4	13,1	2,7	Ny.F	9,4	10,4	1
8	Ny.N	9,8	11,1	1,3	Ny.M	10,8	9,8	1
9	Ny.D	9,8	12,6	2,8	Ny.Z	9,5	9,4	0,1
10	Ny.E	9,6	11,3	1,7	Ny.R	9,6	9,6	0
11	Ny.R	10,6	13,1	2,5	Ny.R	10,2	10,1	0,1
12	Ny.N	10,1	14,1	4	Ny.I	10	9,8	0,2
13	Ny.S	10,2	12,6	2,4	Ny.I	10,2	9,8	1,6
14	Ny.S	11,1	12,1	1	Ny.N	10,1	10	0,1
15	Ny.N	10,1	13,3	3,2	Ny.M	10,1	9,1	1
Average		10,16667	12,43333	2,266667		9,346667	9,873333	0,506667

Table 3. Normality test results

Group	Shapiro-Wilk			
	Statistic	df	Sig.	
Measurement results	Pre test_intervensi	.976	15	.932
	Post test_intervensi	.946	15	.457
	Pre_Kontrol	.954	15	.590
	Post_Kontrol	.960	15	.694

Table 4. Paired samples test: giving beetroot juice to accelerate the decrease in the incidence of anemia

	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
	Lower	Upper			
Pre test_intervensi - Post test_intervensi	-2.84660	-1.68674	-8.383	14	.000

Ha is accepted and Ho is rejected, indicating an acceleration, according to the statistical analysis of the paired t test data in the above table, which shows a significance value (p) of 0.000 < (0.05). lessen anemia following beetroot juice use.

Table 2 presents the findings of the study, which shows that the intervention group saw a mean difference in the rapid reduction in the incidence of anemia 2, compared to 0.5 in the control group. In addition, the results of the paired T test showed a p value of less than 0.05, indicating a decrease in the incidence of anemia between the intervention and control groups. In contrast to the control group which experienced an average increase of only two, the intervention group experienced a rapid decrease in the incidence of anemia with an average difference of two.

Based on a study conducted in 2023 by Mila Syari et al., the hemoglobin levels of pregnant women in the third trimester before being given beet juice were: 13 people (86.7%) were classified as mild anemia; this is the case. Nine (60.0%) women who drank beetroot juice at the end of pregnancy after administration fell into the usual category. Two respondents had severe anemia and thirteen respondents had mild anemia out of fifteen respondents who drank beetroot juice. It is known that all respondents or nine people noticed an increase in Hb levels in pregnant women after consuming beetroot juice. This survey involving 15 respondents produced a p-value of less than 0.001 (1).

This fruit is an alternative to treat low hemoglobin levels in pregnant women, because it contains several vitamins and minerals and can provide many benefits. Beets are a fruit rich in folic acid that promotes brain development and is also effective in treating anemia. Beets can stimulate, grow, clean and strengthen the circulatory system as well as red blood cells, so they can transfer chemicals in the body and prevent red blood cell deficiency. Hemoglonin is a blood component composed of iron-rich proteins (Dewita & Henniwati, 2020).

This study is in line with the study of Anggraini and Saragita (2020) who stated that giving beetroot juice has a significant effect on the increase in Hb levels of pregnant women in the third trimester in Plosoarang Village, Blitar Regency (p value = 0.004). According to Indrayani, Choirunissa, and Tambunan (2020)(3). The effect of giving beetroot juice on the increase of hemoglobin levels in pregnant women with anemia in BPM Miftah, Wahyudi Jatijajar Subdistrict, Depok is proven by the p value of 0.000, the increase in hemoglobin levels occurred in pregnant women who only consumed Fe 0.16 gr pills. /dl. Meanwhile, the hemoglobin level of pregnant women who consumed Fe tablets and beetroot juice increased by 0.88 gr/dl. This shows that the combination of Fe tablets and beetroot juice is more effective in improving the hemoglobin levels of pregnant women with anemia in Puskesmas Tayu I compared to pregnant women who only consumed Fe tablets (4).

Based on the study of Anggraini (2019) conducted in the working area of Puskesmas Pekanbaru, the independent t-test produced $p(0.000) < \alpha(0.05)$ in the statistical test. It can be concluded that beetroot juice is beneficial for the hemoglobin level of pregnant women because there is a significant difference between the average hemoglobin levels of anemic pregnant women in the experimental group and the control group after receiving beetroot juice. women suffering from anemia. Gamus Lampung 2019 The average hemoglobin level of the respondents before receiving the beet juice was 9.835 with a standard deviation of 0.5689 according to table 2. After receiving the beet juice, the average hemoglobin level of the respondents was 11.771 with a standard deviation of 1.2164 and the difference between the average . 1.9353. The results of a statistical test using a dependent sample t-test show that there is an effect of giving beetroot juice to increase hemoglobin levels in pregnant women, with a p-value of 0.000 (p-value $< \alpha = 0.05$) (5).

Besides being a strong source of vitamin C, beets are also rich in B vitamins and vitamin A, making them beneficial for health. Therefore, people with low blood pressure are advised to eat a lot of beets (Sunarjono, 2004)(H. Sunarjono & Nurrohmah, 2018)(H. H. Sunarjono, 2015). Pregnant women who consume at least 90 Fe per day can prevent anemia (6).

CONCLUSION

Based on the results of the statistical analysis of paired t test data, a significance value (p) of $0.000 < (0.05)$ was obtained, so it can be concluded that H_a is accepted and H_o is rejected, which means

that there is a rapid decrease in anemia after the administration of beetroot juice. Table 2 presents the findings of the study, which shows that the intervention group saw a mean difference in the reduction of the incidence of anemia of 2, compared to 0.5 in the control group. In addition, the results of the paired T test showed a p value of less than 0.05, indicating a decrease in the incidence of anemia between the intervention and control groups. In contrast to the control group that experienced an increase in the mean difference of only two groups.

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