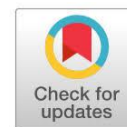


## The beetroot (*Beta vulgaris L.*) juice on the handling of anemia in third-trimester pregnant women



Irwana Wahab<sup>1</sup>, Dewi Setiyawati<sup>2</sup>, Siti Hadijah<sup>3</sup>

<sup>1</sup>Diploma III in Medical Laboratory Technology, Poltekkes Kemenkes Aceh, Indonesia, [irwana\\_wahab@yahoo.com](mailto:irwana_wahab@yahoo.com)

<sup>2</sup>Diploma III in Medical Laboratory Technology, Poltekkes Kemenkes Medan, Indonesia, [budewisetiyawati@gmail.com](mailto:budewisetiyawati@gmail.com)

<sup>3</sup>Diploma III in Medical Laboratory Technology, Poltekkes Kemenkes Aceh, Indonesia, [siti091176@gmail.com](mailto:siti091176@gmail.com)

### ARTICLE INFO

#### Article history:

Received: April 26<sup>th</sup>, 2022

Revised : June 16<sup>th</sup>, 2022

Accepted: June 18<sup>th</sup>, 2022

#### Keyword:

Bit fruit juice;

Anemia;

Third-trimester pregnant women

### ABSTRACT

Anemia in pregnancy can be detrimental to the health of the mother and child. Handling anemia can be done non-pharmacologically by giving beetroot which is one of the benefits of anti-anemia. Beetroot is a vegetable that is safe for pregnant women. The purpose of this study was to analyze the effect of giving beetroot juice on the incidence of anemia in third-trimester pregnant women in the working area of Syamtalira Bayu Public Health Center. This study used a quasi-experimental research design with a pre and post-test group design approach. This research was carried out in the working area of the Syamtalira Bayu Public Health Center from July to September 2021. The sample consisted of 10 people. A dependent t-test was utilized for bivariate analysis. The results showed that the p-value was 0.000, which means that there is an effect of giving beetroot juice to decrease cases of anemia in third-trimester pregnant women. Anemia in third-trimester pregnant women is affected by giving beetroot juice for 7 days at the same time as consuming Fe tablets. Pregnant women must maintain their health so that the fetus in their womb can grow and develop with quality.

This is an open-access article under the [CC-BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.



### Corresponding Author:

Irwana Wahab

Poltekkes Kemenkes Aceh

Soekarno-Hatta Street, Unified campus of Poltekkes Kemenkes Aceh, Aceh Besar, 23352. Telp : 0651-46128

Email: [irwana\\_wahab@yahoo.com](mailto:irwana_wahab@yahoo.com)

### INTRODUCTION

Anemia during pregnancy period is a health problem globally worldwide. The classification of anemia is part of the dilution process physiological one in normal pregnancy. Normal first and third-trimester hemoglobin <11 g/dL while second trimester <10.5 g/dL.(1) A anemia deficiency iron could own consequence health seriously detrimental to mother and child.(1,2) Risk anemia in pregnant women can result in birth premature It can even result in fetal death.(2) important for distinguishing deficiency anemia iron of physiological anemia, making it possible to be overcome according to the source of the problem.(1)

In the activities of the World Anemia Convention in 2017, WHO (World Health Organization) stated that as many as 4 out of 10 mothers pregnant all over the world have anemia. WHO data, the global prevalence of anemia in mothers pregnant all over the world is 41.8%. The prevalence of anemia in mother pregnancy in Indonesia is increasing compared with 2013, in 2013 as many as 37.1% of pregnant women with anemia while in 2018 it increased to 48.9%.(2) Data in Aceh Province in 2019 found pregnant women with anemia who received 78% Fe tablets. The need for iron content in pregnant women is



around 800 mg during pregnancy. These requirements consist of 300 mg needed by the fetus and 500 mg to increase the mass of maternal hemoglobin. (3) The results of the initial survey, the profile of the Bireuen District Health Office in 2020 found that 31.3% of pregnant women had anemia. Consists of severe anemia (5.6%), moderate anemia (9.5%), and mild anemia (16.2%). The number of cases of anemia in third-trimester pregnant women ranges from 28-36 weeks of gestation. (4)

Classification of anemia in pregnant women can be grouped into four, namely no anemia Hb 11 g%, mild anemia Hb 9-10 g%, moderate anemia Hb 7-8 g%, and severe anemia Hb <7 g%. (5) The rate of anemia was significantly higher in women of reproductive age at risk (<20 years and 35 years); multipara; (6,7) pre-pregnancy weight less than 50 kg; not a smoker; previous cesarean delivery, hypertension, chronic disease, or history of perinatal death; and women with in vitro fertilization in current pregnancies. Prevention of anemia in pregnant women can be followed up in two ways, namely pharmacological and non-pharmacological. Pharmacologically, it is giving 60 mg Fe tablets and an additional 50 nanogram of folic acid during pregnancy. The non-pharmacological (8) method is by consuming nutritious foods such as beef/chicken liver, red meat, nuts, processed cow's milk, seafood, green leafy vegetables, and fruits. (9) Based on research by Stephana et. Al. regarding the effectiveness of giving beetroot juice on hemoglobin levels of pregnant women with anemia using a quasi-experimental design with a population control group of 70 anemic pregnant women. Hemoglobin levels were measured using an easy-touch digital measuring device. Statistical results obtained using an independent t-test showed that the average hemoglobin level of pregnant women after being given beetroot juice in the experimental group was 11.27 g/dL and the average hemoglobin level of pregnant women without beetroot juice was 9.22 g/dL. Statistical analysis obtained  $p = 0.000$ . (10)

The results of another study conducted at the H.Syaruddin Tanjung Balai Clinic on the effect of fruit juice consumption on increasing Hb levels of pregnant women in 2021. The number of respondents was 20 people using a checklist sheet containing 15 questions. Furthermore, the results are presented in the frequency distribution table and analysis using the Chi-Square test. It was concluded that the results of the Chi-Square Test, where the p-value was 0.021 (less than 0.05), meant that there was an influence between the consumption of beetroot juice on the increase in HB levels of pregnant women. The content of chemical compounds in beets is very beneficial for health, including as a blood purifier, anti-anemia, baby brain development, and anti-cancer. This research was also supported by Rosmayanti in 2019 at the Seyegan Public Health Center (PHC), Yogyakarta, who stated that giving beetroot juice to pregnant women with anemia which were carried out once a day, a dose of 500 ml, was beneficial for increasing the hemoglobin levels of pregnant women. (11) Research that has been conducted in other areas outside the city of Aceh has succeeded in increasing hemoglobin levels in pregnant women. In the study, beet juice was given for 7 days. (10–12) So it is hoped that this research can provide a solution for handling anemia in Aceh. The purpose of this study was to analyze the effect of giving beetroot juice on the incidence of anemia in third-trimester pregnant women in the working area of Syamtalira Bayu PHC.

## METHOD

This study used a quasi-experimental research design with a pre and post-test group design approach. This research was conducted in the working area of the Syamtalira Bayu PHC. The study was conducted from July to September 2021. The population in this study were all anemic pregnant women in the working area of the Syamtalira Bayu PHC. The number of samples in this study was as many as 10 people. The sampling technique used is total sampling. This sample will be treated with beetroot juice. Sampling using a purposive sampling technique.

The independent variable is the administration of 250 ml of beetroot juice for 7 days which was given 2 times a day and the dependent variable is the status of hemoglobin levels. Collecting data using a quasi-experimental test observation sheet. The type of data is primary data obtained from the results of experimental test observations while secondary data is by looking at the PHC documentation regarding anemia in pregnant women. Bivariate data analysis was carried out using a statistical test, namely t-dependent, ie respondents were measured twice/researched twice or often called pre-test and post-test. The level of significance is 95% ( $\alpha = 0.05$ ). Guidelines for accepting the hypothesis: if the p-value  $< 0.05$ , then there is an influence between the administration of beetroot juice on the incidence of anemia in third-trimester pregnant women in the working area of the Syamtalira Bayu PHC.

## RESULTS

This study involved third-trimester pregnant women who experienced anemia in the working area of the Syamtalira Bayu PHC with a sample of 10 pregnant women with anemia who had several characteristics as shown in Table 1.

### Univariate Analysis

**Table 1. Characteristics of respondents**

Characteristics	Total	
	N	%
<b>Age</b>		
20 – 35 Years	6	60
< 20 and > 35 Year	4	40
<b>Parity</b>		
Primipara	2	20
Multipara	8	80
<b>Education</b>		
Secondary	2	20
High School	5	50
Bachelor	3	30

**Table 2. Hemoglobin levels before and after beetroot juice was given**

No	Rate Hemoglobin	Beetroot Juice			
		Pre-Test		Post-Test	
		n	%	n	%
1	Normal	0	0	10	100
2	Mid	5	50	0	0
3	Moderate	5	50	0	0
<b>Total</b>		<b>10</b>	<b>100</b>	<b>10</b>	<b>100</b>

Based on Table 2 that in the intervention group, changes in hemoglobin levels were found, namely before being given treatment, they were in mild and moderate levels, but after being given treatment, all pregnant women had normal hemoglobin levels.

**Table 3. Average hemoglobin levels before and after giving bit fruit juice**

No	Test	Average
1	Pre-test	8
2	Post-test	11

Based on the data in Table 3, it is known that the average hemoglobin level in pregnant women with anemia before being given beetroot juice was 8 g/dL and the average hemoglobin level after the intervention was 11 g/dL.

### Bivariate Analysis

Bivariate analysis was used to analyze the effect of giving beetroot juice on the incidence of anemia in third-trimester pregnant women in the working area of Syamtalira Bayu PHC. The results of the study are presented in the following table:

**Table 4. The results of the analysis of beetroot juice on reducing anemia cases in third-trimester pregnant women**

Group	Tes	mean	SD	Statistics	
				t	p-value
Treatment	Pre-test – Post-test	-2.7700	.7573	-11,567	0.000

Based on the data above, the results of statistical analysis of the treatment group, namely *p-value* 0.000, means that there is an effect of giving beetroot juice to decrease cases of anemia in third-trimester pregnant women.

## DISCUSSION

### Age

Based on the results of the entire sample, it was found that the majority of the ages were 20-35 years as many as 6 people (60%). The age of pregnant women is a high-risk factor incidence of anemia in mothers pregnant, especially in the third trimester of pregnancy mother. (13) An estimated 30% of women of childbearing age are anemic. (1) According to Afriyanti (2020) that the 20-35 age group is the right age group for pregnancy. However, at this age, there are also many possible risks of complications that occur during pregnancy. At reproductive age, the body will easily lose iron due to menstruation and childbirth. If pregnant at this age, iron must be met so as not to experience anemia in pregnancy. (14)

### Parity

This study involved 8 pregnant women with anemia, the majority of whom were multiparas (80%) compared to primiparas, which amounted to 2 (20%). Adawiyah's research also involved 43.7% of respondents with multipara, it can be said that more than half of the sample experienced multipara or pregnancies that had been born alive or died more than once. (15,16)

### Education

This research is mostly at the top level of education, namely high school 5 people (50%) followed by higher education as many as 3 people (30%). High-risk anemia occurs in respondents who have a low level of education, this will affect the understanding and awareness of respondents about health to avoid various complications such as anemia and health impacts during pregnancy to childbirth and other health cycles. (15)

### Hemoglobin levels

Pre-test 5 people on light hemoglobin levels and 5 people on moderate hemoglobin levels. After being given beetroot juice, 100% of the hemoglobin levels rose to normal levels. Univariate analysis showed that the treatment had an impact on increasing hemoglobin levels in pregnant women. In line with Dewita's research in the red beet treatment group, the average hemoglobin at the *pre-test* was 10.033 gr% and *the post-test* was 11.507

---

gr%, meaning that there was an increase in hemoglobin levels after being given beetroot juice treatment of 1.474 gr%. (17)

### **Beetroot Juice**

From the univariate analysis, it was found that during the pre-test there were 5 respondents with moderate anemia and 5 respondents with mild anemia. Then when the post-test was carried out, pregnant women increased their hemoglobin levels. While the results of the bivariate analysis of the difference in hemoglobin levels before and after administration of beetroot juice showed that the p-value of 0.000 was smaller than the alpha value (0.05), it was found that there was an effect of giving beetroot juice to the incidence of anemia in third trimester pregnant women in the region of Syamtalira Bayu PHC working area. This research was conducted by giving beetroot juice along with Fe tablets for 7 days regularly, which significantly affected changes in hemoglobin levels, which was 11 g%.

Beetroot contains most of vitamin A and vitamin C, calcium, iron, phosphorus, protein, and carbohydrates and is high in folate and betacyanin. (18) Beetroot is an alternative to manage low hemoglobin levels so that hemoglobin levels can return to normal. Beetroot contains vitamins and minerals that have many benefits. Beetroot can stimulate, build, cleanse, and strengthen the circulatory system and red blood cells so that they can carry body substances and can prevent the lack of red blood cells in the body. Hemoglobin is part of the blood that contains iron-rich protein. Beets are one of the fruits that are high in folic acid and are also very good for helping brain formation and overcoming anemia. The results of this study are in line with research conducted by Harahap, the results of the analysis can be seen that the significance value of the p-value of 0.000 is smaller than the alpha value (0.05) indicating that there is an effect of hemoglobin levels before and after consumption of beetroot juice. (19)

According to Dewita's research, there was an increase in hemoglobin levels after being treated with beetroot juice of 1.474 gr%. The duration of the treatment was 14 days. The test used was Paired T.Test with sig 0.000 (<0.05), meaning that there was an effect of giving beetroot juice with hemoglobin for pregnant women with anemia in the control group by giving Fe tablets. This research is also supported by Stephana with the title The effectiveness of giving beetroot juice on hemoglobin levels of pregnant women with anemia. Based on the results of the research conducted, the results of statistical tests using independent t-tests were obtained, p (0.000) < (0.05). It is said that there is a significant difference between the mean hemoglobin level of pregnant women with anemia in the experimental group and the control group after being given beetroot juice so it can be concluded that the administration of beetroot juice is effective on the hemoglobin level of pregnant women who are anemic. (20)

This study is in line with Zahyrah's research entitled the effectiveness of juice beta vulgaris L (bit) to increase hemoglobin levels in anemic pregnant women at the Kotaraja PHC that the results of statistical tests using the T Dependent Test obtained p value = (0.000) < (0.05). So there is a significant difference in hemoglobin levels before and after being given beta vulgaris L (Bit) juice. It can be concluded that beta vulgaris L (Bit) juice is effective in increasing hemoglobin levels in pregnant women with anemia. (21)

### **CONCLUSION**

Anemia in third-trimester pregnant women is affected by giving beetroot juice for 7 days at the same time as consuming Fe tablets. Pregnant women must maintain their health during pregnancy so that the fetus passes the first 1000 days well to prevent stunting.

### **ACKNOWLEDGEMENTS**

Thank you to Poltekkes Kemenkes Aceh for supporting this research and the Head of Syamtalira Bayu PHC for allowing this research to be carried out.



**REFERENCES**

1. Auerbach M, Helain L. Anemia in pregnancy - UpToDate. UpToDate. 2019.
2. Rosda R. Faktor-Faktor Resiko Kejadian Anemia Pada Ibu Hamil Di Wilayah Kerja Puskesmas Kebun Kopi Jambi Tahun 2018. *J Ilmu-Ilmu Kesehat.* 2019;5(1):14.
3. Dinas Kesehatan Pemerintah Aceh. Profil Kesehatan Provinsi Aceh Tahun 2019. Aceh: Dinkes Aceh; 2019.
4. Bireuen PDKB. Data Anemia Ibu Hamil. 2020;
5. World Health Organization. World health statistics 2018: monitoring health for the SDGs, sustainable development goals. World Health Organization; 2018.
6. Mahamoud NK, Mwambi B, Oyet C, Segujja F, Webbo F, Okiria JC, et al. Prevalence of anemia and its associated socio-demographic factors among pregnant women attending an antenatal care clinic at kisugu health center IV, makindye division, Kampala, Uganda. *J Blood Med.* 2020;11:13–8.
7. Shah T, Warsi J, Laghari Z. Anemia and its association with parity. *Prof Med J.* 2020;27(05):968–72.
8. Risnawati I, Indanah I, Sukesih S. Efektivitas Pemberian Jus Buah Bit Terhadap Kadar Hemoglobin Ibu Hamil Dengan Anemia Di Puskesmas Tayu I. *Indones J Kebidana.* 2021;5(1):36–41.
9. Gustina I, Yuria M, Dita PS. Manfaat Pemberian Jus Buah Bit Pada Ibu Hamil Dengan Anemia Terhadap Peningkatan Kadar Hemoglobin Di Wilayah Kerja Puskesmas Kec. Jatinegara Dan Puskesmas Kec. Kramat Jati Tahun 2019. *J Ilm Bidan.* 2020;V(1).
10. Anggraini DD, Saragita N. Pengaruh Pemberian Jus Buah Bit Terhadap Kenaikan Kadar Hb Pada Ibu Hamil Trimester III. *J Darul Azhar.* 2019;8(1):7–14.
11. Rosmayanti N. Asuhan kebidanan Pemberian Jus Buah Bit Pada Ibu Hamil Dengan Anemia. *Anal PICOT CSR.* 2019;23.
12. Hasibuan UH, Wulandary H. The Effectiveness of Provisioning Bit Fruit Juice on Increasing Hb Levels for Pregnant Women with Anemia in H. Syahrudin Clinic Tanjung Balai. *Sci Midwifery.* 2022;10(2):668–71.
13. Yuliska P, Yuanita V. Faktor-faktor yang Berhubungan dengan Kejadian Anemia pada Ibu Hamil di Puskesmas Bukit Sangkal Palembang tahun 2019. *J Kesehat Dan Pembang.* 2020;10(19):114–25.
14. Afriyanti S D. Faktor Risiko Yang Berhubungan Dengan Kejadian Anemia Pada Ibu Hamil Di Kota Bukittinggi. *Menara Ilmu.* 2020;14(01):6–23.
15. Adawiyah R, Wijayanti T. Hubungan Paritas dengan Kejadian Anemia pada Ibu Hamil di Puskesmas Trauma Center Samarinda. *Borneo Stud Res.* 2021;2(3):1553–62.
16. Hidayati I, Andyarini EN. The Relationship Between The Number of Parities and Pregnancy Age with Maternal Anemia. *J Health Sci Prev.* 2018;2(1):42–7.

17. Dewita D, Henniwati H. Jus Bit Merah (*Beta Vulgaris L.*) Bermanfaat Meningkatkan Kadar Hemoglobin Ibu Hamil Dengan Anemia. *Kebidanan*. 2020;6(4):462–9.
18. Indrayani T, Choirunissa R, Herlina M. Pengaruh Pemberian Jus Umbi Bit Terhadap Kenaikan Kadar Haemoglobin Pada Ibu Hamil Dengan Anemia Di BPM Miftah Wahyudi Kec. Jatijajar Depok Tahun 2019. *J Qual Womens Health*. 2020;3(2):146–52.
19. Harahap FSD, Liesmayani EE. Analisis Pengaruh Konsumsi Buah Bit Terhadap Peningkatan Kadar Hemoglobin Pada Ibu Hamil Trimester III. *Health CARE J Kesehat*. 2020;9(1).
20. Stephana W, Utami S, Elita V. Efektivitas Pemberian Jus Buah Bit Terhadap Kadar Hemoglobin Ibu Hamil Dengan Anemia. 2018;8.
21. Zahyrah S. Efektivitas Jus Beta Vulgaris L (BIT) Untuk Meningkatkan Kadar Hemoglobin Pada Ibu Hamil Anemia Wanita. *Poltekkes*. 2020;2(2):48–53.