EFFECTIVENESS OF BEET JUICE ON INCREASING HEMOGLOBIN LEVELS IN PREGNANT WOMEN WITH ANEMIAAT KERTAJATI HEALTH

CENTER IN 2024

Yeti Yuwansyah[1*], Suharno[2] Silvia Gita M[3] Lina Siti N[4] Dhora Darojatin[5]
[1,2,3,4,5]universitas YPIB Majalengka

**Corresponding author:yetiyuwansyah@gmail.com*

Abstract

Anemia, especially in pregnant women, is still a classic problem that can never be treated and has serious impacts on the mother and baby. Anemia in pregnancy is a condition of pregnant women with hemoglobin (Hb) levels < 11g/dl. One way that can be done to increase the Hb levels of pregnant women is by consuming beetroot juice. The research aims to determine the effectiveness of beets in increasing hemoglobin levels in pregnant women with anemia at the Kertajati Community Health Center in 2024. Method. This research uses a pre-experimental research design in the form of one group pretest posttest. The population in this study was all anemic pregnant women in the working area of the Kertajati Community Health Center, totaling 66 people, the total sample was 40 people. This sampling procedure uses purposive sampling. Data analysis used univariate with central tendency distribution and bivariate using the sanded t- test. Results and Conclusions. The majority of Hb levels of pregnant women with anemia at the Kertajati Community Health Center before giving beets experienced mild anemia of. In the moderate anemia category (10 – 10.9 gr/dl). The majority of pregnant women at the Kertajati Community Health Center had normal anemia after giving beetroot. In the mild anemia category (11.90 – 14.00 gr/dl). Providing beetroot juice was significantly effective in increasing the Hb levels of pregnant women with anemia at the Kertajati Community Health Center in 2024, with a p value = 0.000 < 0.05. Efforts by health workers to try to apply the treatment technique of giving beetroot juice as an alternative medical treatment to treat anemia in pregnant wo

Keywords: Beetroot Juice, Hemoglobin Levels, Anemic Pregnant Women Bibliography: 42 (2014 – 2024)

1. INTRODUCTION

Anemia in pregnancy is one of the causes of maternal mortality or so called "potential danger to mother and child", and is a cause of chronic debility which may have an adverse impact on social welfare, economic, as well as physical health (Wahyu, 2019). Based on the World Health Organization (WHO) data, anemia in pregnancy is categorized as a global health problem with a prevalence of 29.6% in 2018. On the other hand, the prevalence in Indonesia in 2017 to 2019 increased from 43.2% to 44.2%. In 2021, the incidence of anemia in pregnancy in Indonesia was still relatively high by 49.5% (Ministry of Health of the Republic of Indonesia, 2022). Such high rate indicates that anemia in pregnancy in Indonesia has approached the level of severe public health problem with the prevalence of anemia of more than 40% (Ministry of Health of the Republic of Indonesia, 2022).

According to the data reported by Majalengka District Health Office in 2023 regarding the incidence of anemia, there were 39.81% of pregnant women who experienced anemia. Of the 31 CHCs in Majalengka District, Kertajati CHC had the highest incidence of anemia in pregnancy namely 109 of 512 pregnant women (21.29%) (Majalengka Health Office, 2023).

Anemia in pregnant women is generally caused by physiological changes during pregnancy and is exacerbated by the state of malnutrition. Anemia that is often found in pregnancy is related to to iron deficiency due to an increas in iron needs to supply fetal and placenta, in the case of enlargement of tissue and the mass of red blood cells. Anemia in pregnant women can cause resistance to fetal growth both in the body cells and brain cells, abortion, prolonged duration of labor due to lack of uterine strength to push, bleeding, and infection (Septiyaningsih, 2019). According to Tadesse, et al in Padmi, pregnant women in the first semester are twice as if they are likely to experience anemia compare to the second semester. Moreover, pregnant women in the third semester almost three times tend to experience anemia compared to the second semester (Padmi, 2021).

The effects of anemia in pregnancy include premature labor, antepartum bleeding, PROM, abortion, etc. Anemia can also affect labor that may cause placental retention, and postpartum hemorrhage due to uterine atony. The effects of anemia during pregnancy include abortion/miscarriage, premature childbirth, intra uterine growth retardation, and potential cord decompensation (Hb <6). In addition, the effect of anemia on the fetus include intrauterine asphyxia to death, IUFD, BBLR, birth with anemia, congenital defects, susceptible to infection, and low IQ (Astutik, 2020)

A preliminary study conducted by the authors on 28 February 28 - 2 March 2024 at Kertajati CHC revealed that there were 66 pregnant women with anemia (Hb <11gr/dL) in January - February 2024. 20 of them said they were often dizzy, tired, had a decrease in appetite, and had never consumed beets. Fe tablets were provided by the village midwife every semester as many as 30 tablets, but the consumption of Fe tablets by pregnant women often experienced obstacles, namely nausea and vomiting, so that they did not regularly consume Fe tablets. During pregnancy, pregnant women also rarely consumed fruits or foods that contain vitamin C due to poor economic conditions.

Based on the description, the authors are interested in conducting a study entitled "Effectiveness of Beetroot Juice to Increase Hemoglobin Levels among Pregnant Women with Anemia at Kertajati Community Health Center in 2024".

2. METHODOLOGY

This study applied pre-experimental research design in the form of one group pre-test post-test. Such design doesn't require comparison group (control), but the first observation can be performed to test changes that occur after the experiment. This research uses a pre-experimental research design in the form of one group pretest posttest. The population in this study was all anemic pregnant women in the working area of the Kertajati Community Health Center, totaling 66 people, the total sample was 40 people. This sampling procedure uses purposive sampling. Data analysis used univariate with central tendency distribution and bivariate using the sanded t- test.

3. RESULTS

The study entitled "Effectiveness of Beetroot Juice to Increase Hemoglobin Levels among Pregnant Women with Anemia at Kertajati CHC in 2024" obtained the following results:

3.1. Description of Hb Levels among Pregnant Women with Anemia Before the Administration of Beetroot Juice

Table 3.1 Central Tendency Distribution of Hemoglobin Levels among Pregnant Women with Anemia Before the Administration of Beetroot Juice at Kertajati CHC

No.	Variable	Mean	Median	Min- max	SD

1	Hb levels of pregnant women with anemia	10.28	10.20	10 – 10.9	0.24

Based on Table 4.1, the mean Hb Level of pregnant women before the administration of beetroot juice was 10.28, the median value was 10.20 with a standard deviation of 0.24. The lowest Hb level of pregnant women was 10.00 and the highest Hb level was 10.9. The mean Hb level of pregnant women before the administration of beetroot juice was categorized as mild anemia.

Based on the study results, it was found that the mean Hb Level of pregnant women before the administration of beetroot juice was 10.28, the median value was 10.20 with a standard deviation of 0.24. The lowest Hb level of pregnant women was 10.00 and the highest Hb level was 10.9. The mean Hb level of pregnant women before the administration of beetroot juice was categorized as mild anemia. There were still pregnant women who did not consume Fe tablets due to nausea, lack of food intake in pregnant women, and some pregnant women rarely controled their Hb levels.

Such finding is in line with the theory of Prawirohardjo (2018) which states that anemia in pregnant women is a condition of maternal hemoglobin levels of below 11 gr% in the first and third semesters, or maternal hemoglobin levels of below 10.5 gr% in the second semester. Anemia in pregnant women is divided into four categories namely: a) Non-anemia (Hb levels >=11 gr%); b) Mild anemia (Hb levels 9-10 gr%); c) moderate anemia (Hb levels 7-8 gr%); and d) severe anemia (Hb levels <7 gr%).

Anemia in pregnancy is known as a potential danger for mothers and children. Therefore, all parties involved in health services must pay special attention to such condition. Anemia is basically a national problem and also occurs throughout the world. Pregnant women should consume FE tablets of at least 1 tablet every day up to 90 tablets. However, this method is often disliked since it causes nausea and vomiting due to the iron odor. Therefore, a healthy and safe breakthrough through non-pharmacological therapy is required (Setyiyaningsih, Widayati & Critiningrum, 2020).

The study finding is in line with a study conducted by Panca Nursela (2021) at Sudimoro CHC of Lampung. The study found the mean Hb levels before the administration of beetroot juice of 9.835 with a standard deviation of 0.5689, which was categorized as mild anemia. Similar study conducted by Nessi Meilan (2023) among 35 respondents Pondok Udik Village RT02/04 Bogor District further showed that before the administration of beetroot juice among pregnant women, the mean Hb levels was 10.2 gr%.

Researchers argued that there was no gap between theory and similar previous study that the mean Hb levels of pregnant women before the intervention of beetroot juice was 8.88, which was categorized as moderate anemia. In this study, pregnant women who experienced moderate anemia need proper care during treatment at home as an effort to prevent further decline in Hb levels of pregnant women.

One effort to manage anemia in pregnancy is by non-pharmacological therapy through beetroot consumption. Beetroots are also recommended by Naturopati experts as intestinal cleansers. Beetroot is also known as red bit which contains copper and folic acid which is very good for helping the formation of the baby's brain and management of anemia.

3.2. Description of Hb Levels among Pregnant Women with Anemia After the Administration of Beetroot Juice

Table 3.2 Central Tendency Distribution of Hemoglobin Levels among Pregnant Women with Anemia After the Administration of Beetroot Juice at Kertajati CHC

No.	Variable	Mean	Median	Min-Max	SD
1.	Hb levels of pregnant women with anemia	12.83	12.80	11.90 – 14.00	0.54

Based on Table 4.2 the mean Hb Level of pregnant women after the administration of beetroot juice was 12.83, the median value was 12.80 with a standard deviation of 0.54. The lowest Hb level of

pregnant women was 11.90 and the highest Hb level was 14.00. The mean Hb level of pregnant women after the administration of beetroot juice was categorized as non anemia or normal.

Based on the study results, it was found that the mean Hb Level of pregnant women after the administration of beetroot juice was 12.83, the median value was 12.80 with a standard deviation of 0.54. The lowest Hb level of pregnant women was 11.90 and the highest Hb level was 14.00. The mean Hb level of pregnant women after the administration of beetroot juice was categorized as non anemia or normal. Such finding can be understood since the pregnant women were administered with beetroot juice for seven days. Beetroot contains a lot of iron which is useful for increasing Hb levels.

Such finding is in accordance with a study conducted by Ainiyati et al, (2022) which found an increase in hemoglobin levels of pregnant women who only consumed Fe tablets by 0.4 gr/dl. Meanwhile, the hemoglobin levels of pregnant women who consumed Fe tablets and Beetroot juice increased by 0.7 gr/dl. This indictated that the combination of Fe and Beetroot juice was more effective in increasing hemoglobin levels of pregnant women with anemia compared to pregnant women who only consumed Fe tablets.

Beetroot have many advantages for health and treatment. The content of betasinin in beets is useful as an anti-cancer, since the substance can destroy tumor and cancer cells. A study conducted by Sundari & Happinasari (2014) regarding the increase in Hb levels of pregnant women in the work area of South Purwokerto CHC who were administered with Fe tablets and beetroot juice, there were differences between the administration of Fe tablet and Fe tablet+ Beetroot juice of 500 ml for 7 consecutive days.

The study finding is in line with a study conducted by Panca Nursela (2021) which found that the mean Hb levels after the administration of Beetroot juice was 11.71 which was included in the normal category and standard deviation of 1.2164. The study finding is also in line with a study conducted by Nessi Meilan (2023) which revealed an increase in Hb levels in both groups of respondents after beetroot consumption. The evaluation of respondents showed a mean increase in Hb levels by 0.8 g/dL per week after routine and scheduled beetroot consumption. Beetroot consumption is recommended for pregnant women in the second semester to prevent anemia.

The study finding is in line with a study conducted by Anggraini and Saragita (2020) which showed that there was a significant effect of beetroot juice on the increase in Hb levels among pregnant women in the third semester at Plosoarang Village, Blitar District. The study finding is also in line with a study conducted by Indrayani, Choirunissa and Tambunan (2020) which found that there was an effect of beetroot juice on the increase in hemoglobin levels among pregnant women with anemia at Private Midwife Miftah Wahyudi, Jatijajar SubDistrict, Depok.

Researchers argued that there was no gap between theory and previous similar studies that there was a significant increase in the mean hemoglobin level of pregnant women with anemia after the administration of beetroot juice (post-test) in the experimental group.

Healthcare workers are intended to recommend beetroot juice consumption in addition to Fe tablets for pregnant women in the management of anemia, according to recommendations. Pregnant women are recommende to perform routine ANC visits and consultation with midwives or physicians regarding the management of anemia during pregnancy.

3.3 Data Normality Test

Table 3.3 Results of Data Normality Test

Variable	Statistic	Sig	Informatio
Pre-Test of Hb Levels	0.200	0.091	Normal

Post-Test of Hb Levels	0.077	0.086	Normal

Based on Table 4.3 it can be seen that in the significant column (Sig) of pre-test, Hb level of pregnant women was 0.200 or had a probability of higher than 0.05. Thus, H0 was accepted which meant that the population was normally distributed. Furthermore, in the significant column (Sig) of post-test, Hb level of pregnant women was 0.077 or had a probability of higher than 0.05. Thus, H0 was accepted which meant that the population was also normally distributed.

3.4.Effectiveness of Beetroot Juice to Increase Hemoglobin Levels among Pregnant Women with Anemia at Kertajati CHC

Table 3.4 Effectiveness of Beetroot Juice to Increase Hemoglobin Levels among Pregnant Women with Anemia at Kertajati CHC

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pre-Test of Hb Levels Post-Test of Hb Levels	2.55	.59700	.09439	2.74343	2.36157	27.041	39	.000

Based on the results of the study, it can be observed that there was an increase in hemoglobin levels among pregnant women with anemia between before and after the administration of beetroot juice by 2.55. Based on the parametic test result of paired samples test, the t count value was 27.041 with a p value (asymp. Sig 2 tailed) of 0.000 which was lower than the research critical limit of 0.05. Thus, it can be concluded that beetroot juice was effective to increase hemoglobin levels among pregnant women with anemia at Kertajati CHC in 2024.

Based on the results of the study, it can be observed that there was an increase in hemoglobin levels among pregnant women with anemia between before and after the administration of beetroot juice by 2.55. Based on the parametic test result of paired samples test, the t count value was 27.041 with a p value (asymp. Sig 2 tailed) of 0.000 which was lower than the research critical limit of 0.05. Thus, it can be concluded that beetroot juice was effective to increase hemoglobin levels among pregnant women with anemia at Kertajati CHC in 2024. The effectivenes of intervention was due to routine administration of beetroot juice for pregnant women for seven days, which was always monitored and reminded by the researchers to confirm that the beetroot juice was properly consumed. Beetroot has many benefits, especially regarding the high content of folic acid and iron.

The study finding is in accordance with Anggraini & Saragita theory (2020) which states that the benefits of beetroot for pregnant women not only for anemia treatment, but can be used to prevent anemia. Beetroot contains high enough folic acid and iron. Both of these substances are needed in the formation of new red blood cells and hemoglobin in the body. 34% folic acid functions to grow and replace damaged cells. Some previous studies showed the benefits of beetroot which could increase hemoglobin levels among pregnant women.

Beetroot have many advantages for health and treatment. This plant also has benefits for pregnant women, among others, the 34% content of folic acid which can help the process of growth and repair of damaged cells, 13.6% content of fiber to prevent constipation, and 7.4% content of iron as metabolic energy and as a tissue repair agent, which can normalize blood vessels and help iron absorption in the

body. Such substances make beetroot effective in increasing hemoglobin levels among pregnant women (Wijayakusuma, 2018).

The study finding is in accordance with a previous study conducted by Risnawati (2021) which revealed a difference in the mean increase in hemoglobin levels of pregnant women with anemia between the group that consumed FE tablets by 0.16 gr/dl and the group that consumed FE tablets plus beetroot juice by 0.88 gr/dl. It indicated that the administration of beetroot juice was effective in increasing hemoglobin levels of pregnant women with anemia at Tayu I CHC.

Furthermore, Anggraini, et al. (2019) conducted a study among 16 pregnant women by adminstering 200 ml beetroot juice for 7 days. This intervention also revealed significant increase in hemoglobin levels of pregnant women. Similar study conducted by Stephana, et al. (2018) which provided beetroot juice intervention for 7 days also showed an increase in hemoglobin levels of pregnant women

A study conducted by Nessi Meilan (2023) further revealed that there was an increase in Hb levels in both groups of respondents after consuming beetroot. The evaluation of respondents showed a mean increase in Hb levels by 0.8 g/dL per week after routine and scheduled beetroot consumption. Beetroot consumption is recommended for pregnant women in the second semester to prevent anemia. Researchers assumed that there was no gap between theory and the study findings that the administration of beetroot juice was significantly effective in increasing the Hb levels of pregnant women, as hypothesically proven. Healthcare worker are recommended to apply non -pharmacological therapy to increase Hb levels of pregnant women with anemia through the administration of beetroot as a non-medical alternative treatment. Pregnant women are expected to regularly consume Fe tablets along with beetroot juice in order to increase hemoglobin levels during pregnancy.

4. CONCLUSIONS

1. Before the administration of beetroot juice, the majority of pregnant women had Hb levels that were categorized as mild anemia (10 – 10.9 gr/dL)
2.After the administration of beetroot juice, the majority of pregnant women had Hb levels that were categorized as non anemia or normal (11.90 – 14.00 gr/dL)
3.Administration of beetroot juice was significantly effective to increase the Hb levels of pregnant women with anemia at Kertajati CHC in 2024, with the p value = 0.000 <0.05

REFERENCES

Amilia, M, S. (2021) Mengenal Si Cantik Bit dan Manfaatnya. Edited by Y. Umaya. Malang.

Anggraini DD, Purnomo W, Trijanto, B. (2016). Effect of pregnant women's knowledge and therapy regimentation towards compliance in consuming iron (Fe) tablets and anemia degree in South Kediri Public Health Center year 2016. Majalah Obstetri & Ginekologi. 24(2): 61-63.

BKKBN, BPS, Kementrian Kesehatan RI. Survei Demografi dan Kesehatan Indonesia. 2017 Provinsi DKI Jakarta. 2018; 271.

Dina Dewi Anggraini, Noveni Saragita. (The Effect of Giving Bit Fruit Juice on Increasing Levels of Hb in Third-trimester Pregnant Women). Jurnal Darul Azhar Vol 8, No.1 Agustus 2019 – Februari 2020 : 7 – 14.

Erlinawati, Apriza, Parmin Joria, E. C. M. (2020) 'Pengaruh Pemberian Air Jahe terhadap Frekuensi Mual Muntah pada Ibu Hamil di Wilayah Kerja Puskesmas Kuok', Jurnal Doppler.

Elvi Era Liesmayani, Nurrahmaton , Mey Elisa. Pengaruh Pemberian Jus Buah Bit Pada Ibu Hamil Terhadap Peningkatan Kadar Hemoglobin di Wilayah UPTD Puskesmas Peulumat Kecamatan Labuhanhaji Timur. Journal of Healtcare Technology and Medicine Vol. 8 No. 2 Oktober 2022 Universitas Ubudiyah Indonesia e-ISSN : 2615-109X. https://jurnal.uui.ac.id/index.php/JHTM/article/view/2440

Garcia-Bailo, B., Toguri, C., Eny, K.M., and El-Sohemy, A.(2011).Genetic variation in taste and its influence on food selection. A Journal of Integrative Biology. 13(1),69-80.

Hani,U. (2011) Asuhan Kebidanan Pada Masa Kehamilan Fisiologis. Jakarta : Salemba Medika Manuaba,I.(2010) 'Memahami Kesehatan Reproduksi Wanita'.Jakarta : Arcan

Nugroho, T,dkk (2014) ' Buku Ajar Asuh Kebidanan I: Kehamilan'Yogyakarta: Nuha Medika

Nugroho,T. (2012) 'Patologi Kebidanan' Kehamilan'Yogyakarta: Nuha Medika

Ibraheem, N. J., Hasan, M. M. and Hasan, W. S. (2018) 'Status of calcium homeostasis accompanied by anti- Mullerian hormone level in some primary infertile women in Babylon province', International Journal of Research in Pharmaceutical ,I

Indah Risnawatia, Indanah , Sukesih. Efektivitas Pemberian Jus Buah Bit Terhadap Kadar Hemoglobin Ibu Hamil Dengan Anemia Di PUSKESMAS TAYU I. Indonesia Jurnal

Kebidanan Volume 5 Nomor 1 (2021). http://dx.doi.org/10.26751/ijb.v5i1.1334

Kementerian Kesehatan RI. Profil Kesehatan Indonesia Tahun 2016. Jakarta: Kemenkes RI; 2016. Kementerian Kesehatan RI. Profil Kesehatan Indonesia Tahun 2017. Jakarta: Kemenkes RI; 2017.

Kusmiyati, Y. (2019) Perawatan Ibu Hamil (Asuhan Ibu Hamil). EGC.

Liananiar Fatma Sylvana Dewi Harahap Elvi Era Liesmayani. Analisis Pengaruh Konsumsi Buah Bit Terhadap Peningkatan Kadar Hemoglobin Pada Ibu Hamil I. Published June 30, 2020. https://doi.org/10.36763/healthcare.v9i1.49.

Nastuti A. Angka Kematian Ibu dan Bayi di Kabupaten Cilacap Masih Tinggi [Internet]. Cilacap; (2020). Available from: https://cilacapkab.go.id/v3/angka-kematian-ibudan-bayi-di- kabupaten-cilacap-masih-tinggi/.

Nursalam. (2020). Konsep dan Penerapan Metode Penelitian Ilmu Keperawatan. Jakarta: Salemba Medika.

Rabbania Hiksas, Rima Irwanda, Noroyono Wibowo. Anemia Defisiensi Besi. Persatuan Obstetri dan Gynekologi Indonesia. Jakarta; 2021:p.58-43.

Riduwan (2015). Metode dan Teknik Menyusun Skripsi dan Tesis, Bandung: Alfabeta.

Septiyaningsih R, Indratmoko S, Yunadi FD. Identifikasi faktor risiko kejadian anemia pada ibu hamil di wilayah kerja puskesmas cilacap tengah 1 Tahun 2019. Jurnal Kesehatan Ibu dan Anak Akademi Kebidanan An-Nur, 2019; 4(1): 54–62. 10. Padmi DRKN. Faktor-Faktor yang Mempengaruhi Kejadian Anemia pada Ibu Hamil di Puskesmas Tegalrejo Tahun 2017. J Mater Process Technol. 2018;1(1):1–8.

Simbolon, P. et al. (2018) 'Hubungan Indeks Massa Tubuh Dengan Lama Siklus Menstruasi Pada Mahasiswi Angkatan 2016 Fakultas Kedokteran Universitas Lampung', Majority.

Stephana, Wenda., Utami, Sri., Elita, Veny. Efektivitas Pemberian Jus Buah Bit Terhadap Kadar Hemoglobin Ibu Hamil Dengan Anemia. Universitas Riau; 2017. https://jom.unri.ac.id/index.php/JOMPSIK/article/view/19306/18659

Sugiyono (2020). Metode penelitian kuantitatif kualitatif dan r&d. intro (PDFDrive).pdf',

Bandung Alf, p. 143.

Syah, D. (2017). Metode Penelitian Kualitatif Dan Kuantitatif. Jakarta: Haja Mandiri.

Wahyu A. Analisa Faktor yang mempengaruhi kejadian anemia pada ibu hamil di wilayah kerja puskesmas cilacap selatan 1. Skripsi. 2019;138–55.

World Health Organization. Prevalence of anaemia in women aged 15 – 49, by pregnancy status.

Geneva: WHO: 2021.

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. Irwanti Gustina, Mella Yuria R.A , Putri Sarah Dita. https://ejournal.ibi.or.id/index.php/jib/article/view/214/95