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Combination of Beetroot Juice, Honey and Green Apple on Hemoglobin Levels in Anemia Pregnant Women at Payung Sekaki Health Center, Pekanbaru

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Abstract: Anemia is a condition where the hemoglobin level in the body is below normal. The adverse impact on pregnant women is the long delivery time and results in bleeding and shock due to contractions. Adverse effects on the fetus, namely the occurrence of premature, LBW, disability and even infant death. The solution to overcoming anemia in pregnant women is to consume a combination of beetroot juice and green apples. Beets have several important components that can increase hemoglobin levels. Apart from beets, green apples contain minerals and vitamin C which can increase the absorption of Fe levels. The purpose of this study was to determine the effect of a combination of beetroot and green apple juice on hemoglobin levels in anemic pregnant women. The population is 200 normal pregnant women and the sample is 15 TM III pregnant women who suffer from anemia, using purposive sampling technique. Intervention giving juice for 7 days and given every day. Data collection uses observation sheets and Easy Touch. The research design was Pre-Experimental with the One Group Pretest-Posttest design. This research was conducted in the working area of the Payung Sekaki Health Center in January-April 2022. Data analysis used the dependent T test, the average result of the hemoglobin level of TM III pregnant women before being given fruit juice was 9.7 g/dL and after being given fruit juice is 10.6 g/dL. Based on the results of the dependent T test with a 95% degree of confidence, it was found that p value = 0.000, which means that there is an effect of giving fruit juice on the hemoglobin level of TM III pregnant women who experience anemia. It is suggested to clinical midwives to be able to provide education to pregnant women about fruit juice on hemoglobin levels and in addition to giving Fe tablets.

Abstrak: Anemia adalah suatu keadaan dimana kadar hemoglobin dalam tubuh dibawah nilai normal. Dampak buruk terhadap ibu hamil yaitu waktu persalinan yang lama dan mengakibatkan perdarahan serta syok akibat kontraksi. Dampak buruk pada janin yaitu terjadinya premature,BBLR, kecacatan bahkan kematian bayi. Solusi mengatasi anemia pada ibu hamil ialah dengan menkonsumsi kombinasi jus buah bita dan apel hijau. Buah bit memiliki beberapa komponen penting yang dapat meningkatkan kadar hemoglobin. Selain buah bit, apel hijau mengandung mineral dan vit C yang dapat meningkatkan penyerapan kadar Fe. Tujuan penelitian ini untuk mengetahui pengaruh kombinasi jus buah bit dan apel hijau terhadap kadar hemoglobin ibu hamil anemia. Populasi berjumlah 200 ibu hamil normal dan sampel berjumlah 15 orang ibu hamil TM III yang menderita anemia, menggunakan teknik Purposive Sampling. Intervensi pemberian jus selama 7 hari dan diberikan setiap hari. Pengumpulan data menggunakan lembar observasi dan Easy Touch. Desain penelitian adalah Pre-Eksperimental dengan rancangan One Group Pretest-Posttest. Penelitian ini dilakukan di wilayah kerja Puskesmas Payung Sekaki pada bulan Januari-April 2022. Analisis data menggunakan uji T-dependen, hasil rata-rata kadar hemoglobin ibu hamil TM III sebelum diberikan jus buah adalah 9,7 g/dL dan sesudah diberikan jus buah adalah 10,6 g/dL. Berdasarkan hasil uji T-dependen dengan derajat kepercayaan 95% didapatkan p value = 0,000 yang artinya ada pengaruh pemberian jus buah terhadap kadar hemoglobin ibu hamil TM III yang mengalami anemia. Disarankan kepada bidan klinik agar dapat memberikan edukasi kepada ibu hamil tentang jus buah terhadap kadar hemoglobin dan disamping memberikan tablet fe.

Keywords: Betroot, Green Apples, Hemoglobin Levels, Anemia Pregnant Women

1. INTRODUCTION

Anemia is one of the most common systemic complications in pregnant women. The most common anemia in pregnant women is iron deficiency anemia. Iron deficiency is the most common micronutrient deficiency worldwide and disproportionately affects pregnant women and young children. Iron deficiency has negative effects on pregnancy outcome, immune function and neurodevelopment in children. Iron supplementation programs have been successful in reducing this health burden. The World Health Organization defines anemia as a hemoglobin concentration < 13 g/dL for men and < 12 g/dL for

non-pregnant women; whereas for pregnant women <10 g/dL (S. I. P. Sari 2020; Yueying, Yu Fan, and Jun 2020).

Iron is classified as a micronutrient. The main nutritional role of iron is to support erythropoiesis. Iron is prioritized for red blood cells over all other organ systems, including the brain. Every cell and organ system in the body requires iron for the proper development and subsequent metabolic function . The goals of maintaining adequate iron during pregnancy are to reduce maternal morbidity, improve fetal health, and prepare the newborn with adequate nutritional stores for early postnatal life (Juul, Derman, and Auerbach 2019; Yueying, Yu Fan, and Jun 2020).

The prevalence of anemia in Indonesia is more than 50%, so it is the main focus of public health problems (Indonesia Health Profile, 2018). Riskesdas (2018) shows that data on pregnant women with anemia reaches 48.9%. According to Setiowati and Nuriah (2019) there are various ways to overcome and prevent the problem of anemia in pregnant women, namely by means of pharmacology and non-pharmacology. Pharmacological treatment for the treatment of nutritional deficiency anemia is supplementation of iron tablets or Fe tablets orally given 60 mg/day. Meanwhile, non-pharmacological methods can consume protein-rich ingredients such as meat, liver and eggs. Meanwhile, vegetable sources such as vegetables, fruits, nuts, wheat, brown rice, and many others (Desta et al. 2019; Georgieff, Krebs, and Cusick 2019; Yueying, Yu Fan, and Jun 2020).

Vegetable sources containing Fe are found in fruits and vegetables. One of the fruits that contain iron is beets / beetroot. Beetroot is a fruit with a high iron content compared to other fruits such as dragon fruit and watermelon (S. I. Sari et al. 2021) . In 100 grams of beetroot contains 27.0 mg of calcium, 43.0 mg of phosphorus, 43 mg of vitamin C, 23.0 mg of magnesium, 9.6 mg of carbohydrates, 7.4 g of iron. In addition to beets, the benefits of honey have been widely recognized in the medical field because of its complete and natural nutrition. Honey contains important minerals such as calcium, phosphorus, potassium, sodium, iron (Fe), magnesium, and copper. The iron content in honey can increase the number of erythrocytes thereby increasing hemoglobin levels. In 100 grams of honey contains Calories (kcal) 304, Sodium 4 mg, Potassium 52 mg, Total Carbohydrates 82 g, Vitamin C 0.5 mg, iron 0.4 mg, Magnesium 2 mg, calcium 6 mg (Setyiyaningsih, Widayati, and Kristiningrum 2020; Utami and Farida 2022; Zamani et al. 2021).

To increase the absorption of iron in the body, sufficient vitamin C is needed. One fruit that contains vitamin C and beneficial compounds for health is the green apple. In 100 grams of green apples contain 4 mg of Vitamin C. The results of Dheny Rohmatika's research (2019) stated that giving a combination of iron supplements with vitamin C was more effective in increasing hemoglobin levels and the number of red blood cells compared to iron or vitamin C (Setyiyaningsih, Widayati, and Kristiningrum 2020; Utami and Farida 2022).

2. MATERIAL AND METHODS

2.1 Jenis dan Desain Penelitian

The type of research used in this research is pre-experimental. The approach in this research is One Group Pre Test-Post Test Design. The use of this design was adjusted to determine the effect of giving a combination of beetroot juice, honey and green apples on Hb levels of pregnant women.

This study used a One Group pre-test and post-test design without a control group, the subject group was observed before the intervention was carried out, then observed again after the intervention. This research was conducted from January to April 2022 in the Working Area of the Payung Sekaki Health Center, Pekanbaru City.

2.2 Popuasi dan Sampel

The population in this study were all TM III pregnant women in the Working Area of the Payung Sekaki Public Health Center, Pekanbaru City. Based on data for pregnant women in January 2022, it is estimated that there are 200 pregnant women with anemia. The sampling technique in this study was purposive sampling, amounting to 15 people. The data collection instrument in this study was to use an observation sheet to mark how many days it had been given a combination of beetroot juice, honey and green apple and write down the test results, a digital Hb tool to measure hemoglobin levels in third trimester pregnant women.

2.3 Analisa Data

Univariate analysis aims to describe the hemoglobin level of pregnant women before and after administration of beetroot juice, honey and green apple to anemic pregnant women. Bivariate analysis is used to determine the effect of each independent variable on the dependent variable. used T-test dependent with a degree of confidence of 95% (α = 0.05).

3. RESULTS AND DISCUSSION

3.1 Result

The research was conducted from January to April 2022 in the Working Area of the Payung Sekaki Health Center on the effect of a combination of honey beetroot juice and green apple on hemoglobin (Hb) levels of anemic pregnant women, which was carried out on 15 respondents, where all respondents were given a combination of honey beet juice and 1 x 1 green apple for 7 days.

Tablel 1. Average Hemoglobin Levels Before and After Given a Combination of Beetroot Juice and Green Apple in Anemia Pregnant Women

Group	N	Mean	SD	Min	Max
Before intervention	15	9,713	0,5330	9,1	10,7
After Intervention	15	10,680	0,4693	9,8	11,4

Table 1 shows that the average hemoglobin level before being given the combination of honey beet juice and green apple was 9.713 (SD 0.533) while the average hemoglobin level after being given the combination of honey beet juice and green apple was 10.680 (SD 0.469). The average hemoglobin level after being given the inte 44 (Post-test) is higher than the average her level before being given the intervention (Pre-test).

Table 2. The Effect of the Combination of Beetroot Juice, Honey and Green Apple on Hb Levels of Anemia Pregnant Women in the Working Area of the Paying Sekaki Health Center

Group	N	Mean	*t*	*P-Value*
Hemoglobin levels after and before	15	9,713 10,680	-17,602	0,000

Pada table 5.2 from Hb sebelum to dapat dilihat pengaruh rata-rata sesudah diberican intervensi. Berdasarkan hasil uji t-dependen, didapatkan p,value sebesar 0.000 (α = 0.05) artinia island Pengaruh Pemberian Combination Jus Buah Bit Madu Dan Apel Hijau Terhadap Kadar Hb Ibu Hamil Anemia Di Wilayah Kerja Puskemas Paying Sekaki.

3.2 Discussion

This research was conducted in the Working Area of the Payung Sekaki Health Center in Pekanbaru City with 15 Anemia pregnant women. In this study the authors used 250 grams of beets, 28 grams of honey, 100 grams of green apples. The results showed that there was an average increase in hemoglobin levels in anemic pregnant women

before being given honey beet juice and green apple, which was 9.713 (SD 0.5330) and the average hemoglobin level in pregnant women after being given honey beet juice and green apple , is 10.680 (SD 0.4693). The results of the T-dependent statistical test at 95% confidence level prove that there is an effect of giving beetroot juice, honey and green apples on hemoglobin levels in anemic pregnant women with (p=0.000 (α (0.05).

Anemia remains a significant global health problem, especially in low- and middle-income countries where up to 50% of pregnant women are diagnosed with anemia. While iron deficiency is not the only cause of anemia, it is the most common contributor. There are two kinds of ways to treat anemia, namely pharmacological and non-pharmacological treatment. One of the non-pharmacological treatments is by providing food sources of iron and high in vitamin C (Yueying, Yu Fan, and Jun 2020).

Beets or also called Beta Vulgaris L., is a tuber-like plant that has a reddish purple color. Shaped like a potato. Usually beets are consumed by juicing or processed again into food with a soft texture (Purba et al. 2021; Zakiyah and Setyaningsih 2019). Beets have many extraordinary benefits. Beets have a beneficial effect on the entire body system and can strengthen the immune system with an iron content of 7.4 grams in 100 grams compared to spinach which contains 3.9 grams of iron. Beets also cleanse and strengthen the blood so that blood can carry nutrients throughout the body and red blood cells will not be lacking in number (Georgieff, Krebs, and Cusick 2019; Juul, Derman, and Auerbach 2019; Utami and Farida 2022).

Beets have a fairly high content of folic acid and iron. Both of these substances are needed in the formation of red blood cells and new hemoglobin in the body. Several studies show the benefits of beets can increase hemoglobin levels in pregnant women (Sakdah and Idiana 2022; Zakiyah and Setyaningsih 2019). Beets have several good ingredients for the body, including 34% folic acid which functions to grow and replace damaged cells. Potassium 14.8% which functions to facilitate the balance of fluids in the body. 13.6% fiber which functions to help overcome cholesterol disorders. Vitamin C 10.2% which functions to grow tissue and normalize blood vessels. 9.8% magnesium which functions to maintain muscle and nerve function. Tryptophan 1.4%. 7.4% iron which functions as energy metabolism and the immune system. 6.5% copper which functions to form red blood cells. Phosphorus 6.5% which serves to strengthen bones. Caumarin which functions to prevent tumors. Betacyanin which functions to prevent cancer (Anggraini and Saragita 2019; S. I. Sari et al. 2021; Setyiyaningsih, Widayati, and Kristiningrum 2020).

Vitamin C reduces ferric iron to ferrous in the small intestine so that it is easily absorbed. Vitamin C inhibits the formation of hemosiderin which is difficult to mobilize to liberate iron when needed (Lestari et al. 2022; Setyiyaningsih, Widayati, and Kristiningrum 2020). Absorption of iron in non-heme forms increases four times when there is vitamin C. Vitamin C plays a role in transferring iron from transferrin in liver plasma keferritin. Pregnant women are encouraged to consume vitamin C because it can help the absorption of iron (Desta et al. 2019; Risnawati, Indanah, and Sukesih 2021; S. I. Sari et al. 2021;

Setyiyaningsih, Widayati, and Kristiningrum 2020; Utami and Farida 2022).

Beets, honey and green apples both contain iron and vitamin C which are good for health. Iron is important in the synthesis of hemoglobin and the maturation of red blood cells so that it can prevent anemia (Anggraini and Saragita 2019; Risnawati, Indanah, and Sukesih 2021; Zamani et al. 2021). Vitamin C is related to the pharmacokinetics of iron, as a promoter that helps the absorption of non-heme iron in the small intestine through the process of reducing ferric iron (Fe3+) to ferrous (Fe2+) so that it is easily absorbed and helps release iron from transferrin into body tissues and inhibits the formation of hemosiderin. blood protein) which is difficult to mobilize in iron liberation and increase blood formation. Meanwhile, antioxidants play a role in maintaining the resilience of erythrocyte membranes which are susceptible to free radicals Saula et al., (2020). Iron as an antioxidant plays a role in the formation of lymphocyte cells that prevent infection and is related to the activity of superoxide dismutase, cell respiration, and enzyme cofactors that work by preventing the formation of free radicals. Antioxidant agents are supported by active phytochemical compounds such as betacyanins and flavonoids as well as vitamin C as effective antioxidants in the immune system.

Beets, honey and green apples can be consumed in juice form. Consumption of fruit in the form of juice can increase the absorption of fruit nutrients in the body and make it easier to consume. Juice is defined as a liquid obtained from fresh fruit through a mechanical process so that it has the same color, aroma and taste as the original fruit (Syahridin, 2013). Juice consumption has increased in recent years and is widely consumed as part of a practical diet and can replace fresh fruit consumption directly and is a source of vitamins and minerals for the body (Kusuma et al., 2019). Research by Stephana et al., (2018) beetroot juice can increase hemoglobin levels in anemic pregnant women. This shows that beetroot juice is an alternative drink that has the potential to prevent and control anemia by helping to meet and increase iron intake and absorption, so that hemoglobin levels in the blood increase. Beets contain much less vitamin C than green apples and have a pleasant taste and aroma and a bland astringent taste. By combining beets, honey and green apples, it is hoped that it can disguise the unpleasant taste and smell of beets, increase the nutritional content of the juice and is expected to be a potential alternative drink that helps increase hemoglobin levels in anemia sufferers (Daru, Sobhy, and Pavord 2019; Georgieff, Krebs, and Cusick 2019; Zamani et al. 2021).

4. CONCLUSION

The nutritional content of food or drink, in this case iron and vitamin C in a combination of beetroot juice, honey and green apples, needs to be analyzed so that people can know the amount that must be consumed to meet daily nutritional needs. In addition, as an effort to prevent and control anemia, because the higher the intake of iron and vitamin C, the higher the hemoglobin level. The average Hb (Hemoglobin) level of pregnant women before being given the Combination of Beetroot Juice, Honey and Green Apples in the Working Area of the Payung Sekaki Health Center, Pekan Baru City in 2022 is 9.713 (SD 0.533). The average Hb (Hemoglobin) level after being given a combination of beetroot juice, honey and green apples in the Working Area of the Payung Sekaki Health Center in Pekan Baru City in 2022 is 10.680 (SD 0.469). There is a significant effect of the

combination of beetroot juice, honey and green apples on Hb (hemoglobin) levels in pregnant women in the Working Area of the Payung Sekaki Health Center, Pekan Baru City, in 2022, with a p value of 0.000 ($p < 0.05$).

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PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6

PAGE 7