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PENGARUH KONSUMSI BELIMBING MANIS TERHADAP KADAR HEMOGLOBIN IBU HAMIL DI PUSKESMAS SAKETI KABUPATEN PANDEGLANG TAHUN 2022

The Effect of Sweet Starfruit Consumption on Hemoglobin Levels of Pregnant Women at Saketi Public Health Center, Pandeglang Regency in 2022

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Abstrak

Tujuan: Penelitian ini bertujuan untuk mengetahui pengaruh konsumsi buah belimbing manis + tablet Fe terhadap kadar hemoglobin ibu hamil di Puskesmas Saketi Kabupaten Pandeglang. Desain: penelitian ini menggunakan pendekatan kuasi eksperimen melalui pendekatan two group pretest and posttest dimana sampel diambil dengan menggunakan total sampling yang dibagi menjadi 2 kelompok perlakuan. Metode: penelitian ini menggunakan pendekatan kuasi eksperimen melalui pendekatan two group pretest dan posttest dimana sampel diambil dengan menggunakan total sampling yang dibagi menjadi 2 kelompok perlakuan. Sampel penelitian terdiri dari 32 responden yang terdiri dari 16 orang yang diberi tablet Fe (kelompok kontrol) dan 16 orang yang diberi jus belimbing manis + tablet Fe (kelompok intervensi). Analisis data menggunakan uji t berpasangan. Hasil: Karakteristik responden berdasarkan umur sebanyak 5 (15,6%) 20 tahun, sebanyak 8 (25%) 21-25 tahun, sebanyak 7 (21,9%) 26-30 tahun, sebanyak 6 (18,8%) berusia 31-35 tahun, 3 orang (9,4%) berusia 36-40 tahun, dan 3 orang (9,4%) >40 tahun. Berdasarkan pendidikan responden, 1 (3,1%) berpendidikan SD, 13 (56,3%) berpendidikan SMP, 11 (34,4%) berpendidikan SMA, 2 (6,3%) berpendidikan Perguruan Tinggi. Berdasarkan paritas responden, 13 (40,6%) adalah primipara, dan 19 (59,4%) adalah multipara. Rata-rata kadar hemoglobin pada kelompok kontrol pretest adalah 10,38 g/dl, pada kelompok kontrol posttest adalah 11,11 g/dl, pada kelompok intervensi pretest adalah 10,53 g/dl, dan pada kelompok intervensi posttest adalah 10,53 g/dl. kelompok intervensi tes. adalah 11,97 g/dl. Berdasarkan hasil uji Paired Sample t Test diperoleh hasil dengan nilai Asymp. Sig. (2-tailed) 0,000 < 0,05 sehingga hasil ini membuktikan bahwa ada pengaruh konsumsi belimbing manis + tablet Fe terhadap kadar hemoglobin. Kesimpulan : ada pengaruh konsumsi belimbing manis terhadap kadar hemoglobin dengan (p-value 0,000 < (0,05)) pada ibu hamil di Puskesmas Saketi Kabupaten Pandeglang Tahun 2022.

Abstract

Aims: *This study aims to determine the effect of consuming sweet star fruit + Fe tablets on hemoglobin levels of pregnant women at Saketi Public Health Center, Pandeglang Regency.* ***Design:*** *this study uses a quasi-experimental approach through a two group pretest and posttest approach where the sample is taken using total sampling which is divided into 2 treatment groups.* ***Methods:*** *this study uses a quasi-experimental approach through a two group pretest and posttest approach where the sample is taken using total sampling which is divided into 2 treatment groups. The research sample consisted of 32 respondents consisting of 16 people being given Fe tablets (control group) and 16 people being given sweet star fruit juice + Fe tablets (intervention group). Data analysis used paired t-test.* ***Results:*** *characteristics of respondents based on age as many as 5 (15.6%) 20 years, as many as 8 (25%) 21-25 years, as many as 7 (21.9%) 26-30 years, as many as 6 (18.8%) 31-35 years old, 3 (9.4%) were 36-40 years old, and 3 (9.4%) >40 years old. Based on the education of the respondents, 1 (3.1%) had elementary school education, 13 (56.3%) had junior high school education, 11 (34.4%) had high school education, 2 (6.3%) had university. Based on parity of respondents, 13 (40.6%) were primiparous, and 19 (59.4%) were multiparous. The average hemoglobin level in the pre-test control group was 10.38 g/dl, in the post-test control group it was 11.11 g/dl, in the pre-test intervention group it was 10.53 g/dl, and in the post-test intervention group. is*

11.97 g/dl. Based on the results of the paired sample t test, the results obtained with the Asymp value. Sig. (2-tailed) 0.000 < 0.05 so this result proves that there is an effect of consuming sweet star fruit + Fe tablets on hemoglobin levels. ***Conclusions :*** *there is an effect of sweet star fruit consumption on hemoglobin levels with (p-value 0.000 < (0.05)) in pregnant women at Saketi Public Health Center, Pandeglang Regency in 2022.*

INTRODUCTION

The high maternal mortality rate is a problem that is still a priority in the health sector. This is a serious and worrying problem because the maternal mortality rate is one indicator that describes the welfare of the community in a country. *The World Health Organization (WHO)* in 2020 reported that the Maternal Mortality Rate (MMR) in the world was 261 per 100,000 live births (KH). The highest prevalence of maternal death caused by bleeding in developing countries is 27.1% and in developed countries 16.3% (WHO, 2020). One of the causes of bleeding is anemia in pregnancy. In 2019 WHO reported that anemia in pregnant women in developing countries was 45% higher than developed countries, which was 13%. The prevalence of anemia in pregnancy in developed countries such as America is around 17% and Turkey 28%, while in developing countries such as countries in Asia, namely Laos 57.1%, the Philippines 56.2%, India 54% and the highest prevalence is in the African region of 60%. According to *Black et al. (2018),* that 56% of pregnant women in low and middle income countries experience anemia during pregnancy. Based on data from the Basic Health Research (Riskesdas) in 2018, it was reported that the incidence of anemia in pregnant women in Indonesia nationally was 48.9%. This figure increased when compared to 2013 which was 37.1%. Pregnant women with anemia are most common in the age group 15-24 years at 84.6%, 25-34 years at 33.7%, 35-44 years at 33.6% (Kemenkes RI, 2019). This certainly needs special attention, because it means that almost half of pregnant women in Indonesia are anemic. The prevalence of anemia in pregnant women in Banten Province in 2019 was 35.2%, increasing in 2020 to 37.7%. Meanwhile, the number of pregnant women who received Fe1 tablets was 206,976 (89.10%) and the coverage of Fe3 was 185,959 (80.1%) (Banten Provincial Health Office, 2020). While the percentage of pregnant women with anemia in Pandeglang Regency for the last 5 years has fluctuated, namely in 2016 (47.15%), 2017 (35.92%), 2018 (34.20%), 2019 (37.90%) and in 2020 (41.23%) (Pandeglang District Health Office, 2020). Anemia during pregnancy is reported to have a negative impact on maternal and child health and increases the risk of maternal and perinatal mortality. Negative health impacts for mothers include fatigue, poor work capacity or performance, impaired immune function, increased risk of heart disease, and maternal death. Several studies have shown that anemia during pregnancy contributes to 23% of the indirect causes of maternal death in developing countries. Anemia in pregnancy is associated with an increased risk of premature birth, and low birth weight (LBW) babies. In addition, anemia in pregnancy also has an impact on increasing the risk of intrauterine death (IUFD), intrauterine growth restriction (IUGR), asphyxia, stunting, and stillbirth (Stephen et al, 2018). Efforts to increase hemoglobin levels of pregnant women in addition to giving Fe tablets can also be combined with complementary therapies derived from herbs, one of which is by consuming sweet star fruit juice which is rich in vitamin C. According to Fatimah (2016), to help iron absorption, mothers Pregnant women are recommended to consume vitamin C. Consumption of vitamin C can help increase iron absorption and help absorb iron from food so that it can be processed into red blood cells again. This is in line with the opinion of Hariana (2016) that the consumption of sweet star fruit by pregnant women which contains a lot of vitamin C will bring many benefits, one of which is increasing hemoglobin levels in pregnant women. Research by Langlois et al. (2018) in Germany showed that giving iron supplements together with vitamin C was more effective in increasing the hemoglobin levels of pregnant women. The research of Chaudhary et al. (2018) in Kathmandu Nepal also showed the same result that the administration of iron tablets accompanied by the administration of vitamin C could increase hemoglobin levels. Based on medical record data at the Saketi Public Health Center, Pandeglang Regency, the number of pregnant women with anemia in the last three years has increased, namely in 2018 as 278 people (61.5%) from 452 pregnant women, in 2019 many as 283 people (63.02%) from 449 pregnant women and in 2020 there were 289 people (64.22%) of 450 pregnant women (Puskesmas Saketi, 2021). A preliminary study conducted at the Saketi Health Center by interviewing 10 pregnant women showed that 7 of them were anemic. When asked about the consumption of vitamin C during pregnancy, they said they rarely consumed fruits that contain a lot of vitamin C during pregnancy. However, 3 out of 10 pregnant women who do not experience anemia

said that during pregnancy they often consumed fruits containing vitamin C, including star fruit, and as a result, they had normal hemoglobin levels. Based on the background described above, the authors are interested in researching the effect of sweet star fruit consumption on hemoglobin levels in pregnant women in the working area of Saketi Public Health Center, Pandeglang Regency in 2022.

METHODS

This study used a quasi-experimental design with a pre-post test approach in two groups. The first group is the group given Fe tablets only (control), while the second group is the group given sweet star fruit juice + Fe tablets (intervention). The population of this study was all pregnant women in the II-III trimester at the Saketi Public Health Center, Pandeglang Regency. Sampling in this study was using the total sampling technique because the population was less than 100. This study was conducted on April 01 - 30, 2022. The determination of the sample was based on inclusion criteria, namely pregnant women in the second and third trimesters who experienced mild anemia with hemoglobin levels of 10 -10.9 g/dl, has a normal pregnancy condition, consume Fe tablets, and is willing to be a respondent. As well as the exclusion criteria, namely pregnant women in the second and third trimesters who have comorbid complications such as hypertension, diabetes mellitus, hepatitis, Pregnancy-induced hypertension (PIH), asthma, stomach acid, and cardiovascular disease which are not possible to be respondents. Then 32 pregnant women were obtained who would be divided into 2 treatment groups, 16 people were given Fe tablets and 16 people were given sweet star fruit juice + Fe tablets for 30 days. The author uses an observation sheet and a compliance sheet to ensure the treatment is well received by 2 groups of respondents, and the author uses the easy-touch GCHB measuring instrument to measure hemoglobin levels before treatment and record it in the observation sheet. Furthermore, the authors gave treatment according to the treatment group for 30 days. Then proceed with checking the hemoglobin level after the treatment is given and record it on the observation sheet. The next step is to process the data using univariate analysis, while identifying the effect of sweet star fruit consumption on the hemoglobin levels of respondents using the paired t-test (p-value < (0.05)).

RESULTS

Univariate Analysis

In this method, a description of the frequency distribution of respondents' characteristics based on age, education, and parity is obtained. As well as the average hemoglobin levels in the two groups of respondents which can be seen in the following tables:

Table 1. Frequency Distribution of Respondents' Characteristics by Age

Information	Amount	Percentage
≤20 Years	5	15,6%
21-25 Years	8	25%
26-30 Years	7	21,9%
31-35 Years	6	18,8%
36-40 Years	3	9,4%
>40 Years	3	9,4%
Total	**32**	**100%**

Based on table 1, there are 5 respondents aged 20 years (15.6%), as many as 8 respondents aged 21-25 years (25%), as many as 7 respondents aged 26-30 years (21.9%), as many as 6 respondents aged 31 -35 years (18.8%), as many as 3 respondents aged 36-40 years (9.4%), and as many as 3 respondents aged >40 years (9.4%).

Table 2. Frequency Distribution of Respondents' Characteristics Based on Education

Information	Amount	Percentage
Primary school	1	3,1%
Junior high school	18	56,3%
senior high school	11	34,4%
College	2	6,3%
Total	32	100%

Based on table 2, 1 respondent has elementary school education (3.1%), 13 respondents have junior high school education (56.3%), 11 respondents have high school education (34.4%), and 2 respondents have university education (6.3%).

Bivariate Analysis

In this method, the effect of sweet star fruit consumption on hemoglobin levels was obtained using the paired t-test which can be seen in the following table:

Table 3.
Frequency Distribution of Respondents' Characteristics Based on Parity

Information	Amount	Percentage
Primipara	13	40,6%
Multipara	19	59,4%
Total	32	100%

Based on table 3, there were 13 primiparous respondents (40.6%), and 19 multiparous respondents (59.4%).

Table 4.
Average Hemoglobin Levels in the Treatment Group

Group	Average Hb . Levels
Pre-Test Control	10,38
Post Test Control	11,11
Pre-Test Intervention	10,53
Post-Test Intervention	11,97

Based on table 4 the average hemoglobin level in the pre-test control group was 10.38 g/dl, the average hemoglobin level in the post-test control group was 11.11 g/dl, the average hemoglobin level in the intervention pre-test group was 10.53 g/dl, and the average hemoglobin level in the post-test intervention group was 11.97 g/dl.

Table 5.
Paired T-Test The Effect of Sweet Starfruit Consumption on Hemoglobin Levels

Category	Giving of Fe Tablets *Pair* 1		Giving Starfruit Juice + Fe Tablets *Pair* 2	
Treatment	*Pre-Test*	*Post-Test*	*Pre-Test*	*Post-Test*
Mean	10,38	11,11	10,53	11,97
p-value	0,000		0,000	

Based on table 5 about the results of the paired sample t-test, the results were obtained with the Asymp value. Sig. (2-tailed) in pair 1 and pair 2 each 0.000 < 0.05 so this result proves that there is an effect of consuming sweet starfruit + Fe tablets on hemoglobin levels in pregnant women in the Saketi Public Health Center, Pandeglang Regency in 2022.

DISCUSSION

In conducting this study, the authors encountered several obstacles, including the limitations of controlling activities, activities, and consumption patterns that could affect the respondent's hemoglobin levels. Based on the results of the paired sample t-test, the results were obtained with the Asymp value. Sig. (2-tailed) in pair 1 and pair 2 each 0.000 < 0.05 so this result proves that there is an effect of consuming sweet starfruit + Fe tablets on hemoglobin levels in pregnant women in the Saketi Public Health Center, Pandeglang Regency in 2022. These results are in line with the research conducted by Wirawan S, et al (2015) with the title of the study, namely the effect of giving iron tablets and iron tablets plus vitamin C on hemoglobin levels of pregnant women. From the results of the study, it was found that there was a significant effect on changes in hemoglobin levels by giving Fe tablets plus vitamin C with a p-value = 0.001 <0.05. Pregnant women's need for Fe increases for the formation of the placenta and red blood cells by 200-300%. The estimated amount of iron needed during pregnancy is 1040 mg. A total of 300 mg of Fe is transferred to the fetus with details of 50-75 mg for the formation of the placenta, 450 mg to increase the number of red blood cells, and 200 mg lost during childbirth. The need for Fe during the first trimester of pregnancy is relatively small, namely 0.8 mg a day, which then increases sharply during the third trimester, which is 6.3 mg a day. Such a large amount is impossible to fulfill only through food (Arisman, 2014). Globin is formed around the ribosome while protoporphyrin is formed around the mitochondria. Iron is obtained from transferrin. At the beginning of the nucleated erythrocyte, there is a transferrin receptor. Disturbances in the binding of iron to form hemoglobin will result in the formation of erythrocytes with a small cytoplasm (microcytic) and less hemoglobin in it (hypochromic). The failure of the cytoplasm of nucleated erythrocytes to bind Fe for the formation of hemoglobin can be caused by low levels of Fe in the blood. This can be caused by malnutrition, impaired absorption of Fe (especially in the stomach), and increased iron requirements (pregnancy, bleeding, and so on). The cause of failure of nucleated erythrocytes to bind iron can also be caused by low levels of transferrin in the blood.

This is understandable because nucleated erythrocytes and reticulocytes only have transferrin receptors, not iron receptors. It should be noted that only elemental Fe can be bound to transferrin and to form 1 ml of packed red cells, 1 mg of elemental Fe is needed (Haryanto, 2014). Give iron (Fe) tablets at least 90 tablets during pregnancy with a dose of 60 mg every day (Sulistyawati, 2014). How to take Fe tablets so that it helps better absorption along with drinking vitamin C/juice/fruit or drinking together with eating meat or fish so as to stimulate stomach acid (Mandriwati, 2016). According to Rhamnosa, (2008) Vitamin C can increase the absorption of iron by the body so that the body is expected to absorb iron optimally and increase hemoglobin levels in the body. Sweet star fruit is known to contain flavonoid compounds, alkaloids, and saponins, with the possibility that the main content is flavonoids. The pharmacological impact of sweet star fruit (Averrhoa carambola Linn) is caused by a combination of several chemical compounds contained in it such as; flavonoid compounds, alkaloids, saponins, proteins, fats, calcium, phosphorus, iron, as well as vitamins A, B1 and vitamin C (Sukadana, 2015). According to Arisandi (2016) that the sweet star fruit plant has pharmacological effects such as anti-inflammation of the intestine, antimalarial, antirheumatic, analgesic, salivary laxative, urinary laxative (diuretic), relieving heat, and as a skin softener. In plain view, the star fruit can be used as a medicine for high blood pressure, lowering blood cholesterol levels, preventing cancer, increasing hemoglobin levels, facilitating digestion, cough medicine, laxative urine, fat laxative, intestinal inflammation, and influenza.

CONCLUSION

Based on the results of research on the effect of sweet star fruit consumption on hemoglobin levels in pregnant women at Saketi Public

Health Center, Pandeglang Regency, it can be concluded:

1. The average hemoglobin level of pregnant women before consuming Fe tablets was 10.38 g/dl and after consuming Fe tablets was 11.11 g/dl in the Working Area of the Saketi Public Health Center, Pandeglang Regency in 2022;
2. The average hemoglobin level of pregnant women before consuming sweet starfruit + Fe tablets is 10.53 gr/dl and after consuming sweet starfruit + Fe tablets is 11.97 gr/dl in the Working Area of Saketi Public Health Center, Pandeglang Regency in 2022;and
3. There is an effect of consuming sweet star fruit + Fe tablets on hemoglobin levels in pregnant women in the Saketi Public Health Center, Pandeglang Regency in 2022.

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