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Dates and guava to increase hemoglobin levels in adolescent girls

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ABSTRACT

Iron deficiency causes decreased learning enthusiasm, tired and insomnia in adolescent girls. The purpose of this study was to determine the differences in the effect of dates and guava fruit on increasing haemoglobin levels on adolescent girls. This type of research is pre experiment with the design of two groups pretest and posttest desaign. The study was conducted in November 2019–11 April 2020 at the Bina Harapan Salido Foundation, Padang, Indonesia. The sampling used purposive sampling technique and the Roscoe formula with a sample of 20 adolescent girl. The instrument used was Hb digital hemosmart and observation sheets. Processing of test data T test dependent and independent. The average levels of haemoglobin before being given dates 11.200 g/dl (minimum 10.3 g/dl, maximum 11.9 g/dl) and after being given dates 12.500 g/dl (minimum 11.5 g/dl, maximum 13.6 g/dl), while the average haemoglobin level before being given guava was 11.190 g/dl (minimum 10.6 g/dl, maximum 11.8 g/dl) and after being given guava 12.170 g/dl (minimum 11.2 g/dl, a maximum of 13.1 g/dl). There was different of haemoglobin levels before and after being given dates (Mean different= 1.300; SD= 0.563; 95% CI =0.89-1.10; p-value=0.000). There was different of haemoglobin levels before and after being given guava (Mean different= 0.980; SD= 0.367; 95% CI =0.71-1.24; p-value=0.000). There was no difference in the effect of dates and guavas on the increase in haemoglobin levels (p-value=0.150). There was an effect of dates and guavas on increasing haemoglobin levels, but there was no difference in the effect of dates and guavas on increasing haemoglobin levels.

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INTRODUCTION

Adolescence is a period of transition from childhood to adulthood which is marked by a number of biological, cognitive and emotional changes. Biological changes are height growth, hormonal changes and sexual maturity. Therefore, adolescence is a period that requires more nutrients and requires optimal food intake for growth and development. The

diversity of food substances needed by adolescents is very important in the process of synthesis of hemoglobin formation. [1]

Hemoglobin is a protein rich in iron that functions to bind oxygen. Anemia is a health problem throughout the world, especially developing countries where an estimated 30% of the world's population suffers from anemia. Anemia is common in the community, especially in adolescents and pregnant women. According to the *World Health Organization* (WHO), the prevalence of anemia in the world ranges from 40-88%. The prevalence of anemia in Indonesia reaches 23%. This figure is higher than other Southeast Asian countries such as Brunei (20%), Malaysia (21%), Singapore (22%) and Vietnam (14%). [2.3]

According to the results of Riskesdas in 2018, the prevalence of anemia in Indonesia in adolescent girls increased by 48.9% in the age group 15-24 years, compared to the results of Riskesdas in 2013 which was only 27.1%. This indicates that anemia is a health problem in adolescents that occurs in Indonesian society. [4.5]

West Sumatra Province has anemia prevalence above the national prevalence, which according to the SK Menkes reference is 14.8% and the Riskesdas reference is 11.9%. The results of the prevalence of anemia based on the Decree of the Minister of Health were obtained, namely 29.8% for women, 27.6% for men and 17.1% for children. Meanwhile, Riskesdas obtained 16.6% women, 25.8 men, and 19.0% children. [5]

Young women have a ten times greater risk of suffering from iron deficiency compared to young men, this is because young women experience menstruation every month. Iron deficiency in adolescent girls is caused by the increased need for iron in adolescent girls which is needed for physical growth, adolescent girls also have irregular eating habits, and their high desire to diet so that it affects the intake of nutrients including sources of iron. Every day humans lose 0.6 mg of iron which is excreted through feces. Teenage girls experience menstruation every month, where iron deficiency is 1.25 mg per day. [6]

For young women, iron deficiency can cause decreased enthusiasm for learning, concentration, drowsiness and can interfere with growth such as imperfect height and weight. In addition, it also causes a decrease in the body's resistance so that it is susceptible to disease and infection. In addition, especially if the anemia experienced by young women is not handled properly, it will have a more serious impact, considering that they are prospective mothers who will become pregnant and give birth to a baby, so that it will contribute greatly to maternal mortality, premature birth or infants. with low birth weight. [7]

To overcome the problem of iron deficiency, pharmacologically, women generally consume iron mineral supplements in the form of blood-added tablets, but can have side effects such as nausea, headaches and loss of appetite that make teenagers lazy to consume them. However, there are many things that can be done naturally, one of which is by consuming a balanced nutritious diet with adequate intake of nutrients to meet the body's needs. Like consuming vegetables and fruits that are rich in iron. [8]

Foods that contain iron include dates. Dates fruit (*Phoenix dactylifera)* is a food that contains the highest energy with an ideal composition, which contains carbohydrates (73.51 g), energy (275 cal), fiber 7.5 g), potassium (32 mg), manganese (35 mg).), phosphorus (40 mg), iron (13.7 mg), calcium (103 mg) and magnesium (35 mg) which are very good for consumption. [9]

Research conducted by Roselyn, Ary and Annisa in 2018 about giving dates (*Phoenix dactylifera*) to anemia sufferers in adolescent girls on hemoglobin levels in SMA Negeri 1 Natar, Natar District, South Lampung Regency. The results showed that there was a

difference in the average hemoglobin level after being given dates compared to the control group that was not given any treatment. [11]

In addition to dates, fruits that have a high iron content that are easily available and the price is also very cheap are found in guava. Guava (*Psidium guajava)* is a tropical plant originating from Brazil. Guava has green fruit with white or red flesh. In 100 g of red guava contains calories 59 kcal, water 74.3 g, protein 0.9 g, fat 0.4 g, carbohydrates 23.8 g, calcium 0.6 mg, phosphorus 34 mg, vitamin C 158 mg, 26 mg iron, 11 mg thiamin. [9]

Research conducted by Rusdi, Fadil and Eva in 2018 on the effect of giving red guava juice (*Psidium guajava)* on hemoglobin and serum *ferritin* levels of anemic patients in adolescent girls at the Tri Murni Orphanage, Padang Panjang City, found that there was an effect of giving guava juice red seeds on hemoglobin and *ferritin* serum levels of anemic adolescent girls with *p* value = 0.001. [14]

A preliminary survey that the author conducted at the Bina Harapan Salido Foundation, Pesisir Selatan Regency, some of the students at the Foundation complained that they were often tired and had trouble sleeping, even though all students received the same food intake at the Foundation. Based on the measurement of hemoglobin levels from 6 students, there were 4 students who had anemia.

Based on the problems above, the researchers are interested in researching further about, "The Differences in Effect of Dates and Guavas on Increasing Hemoglobin Levels in Adolescent Girls at the Bina Harapan Salido Foundation, Pesisir Selatan Regency."

METHOD

This study aims to determine the difference in the effect of dates and guava on increasing hemoglobin levels. This research was conducted at the Bina Harapan Salido Foundation, Pesisir Selatan Regency. The research was carried out in November 2019 – June 2020 and data collection was on 3 – 11 April 2020. This type of quantitative research used a *pre-experimental two group pretest and posttest design method* , using a *purposive* sampling technique. Data were analyzed univariately and bivariately using a computerized test with *dependent* and *independent T-test .*

RESULTS AND DISCUSSION

Table 1. Average Hemoglobin Levels of Adolescent Girls Before Giving Dates at the Bina Harapan Salido Foundation, Pesisir Selatan Regency

	n	mean	SD	Min	Max
Before being given dates	10	11,200	0.6092	10.3	11.9

Based on table 1, it is known that the average hemoglobin level of respondents before being given dates at the Bina Harapan Salido Foundation, Pesisir Selatan Regency was 11.200 g/dl with a standard deviation of 0.6092, a minimum value of 10.3 g/dl and a maximum value of 11.9 g/dl.

Average Hemoglobin Levels of Female Adolescents After Giving Dates

Table 2. Average Hemoglobin Levels of Female Adolescents After Giving Dates in Yayasan Bina Harapan Salido South Coast District

	N	mean	SD	Min	Max

After being given dates	10	12,500	.6218	11.5	13.6

Based on table 2, it is known that the average hemoglobin level of respondents after being given dates at the Bina Harapan Salido Foundation, Pesisir Selatan Regency is 12,500 g/dl with a standard deviation of 0.6218, a minimum value of 11.5 g/dl and a maximum value of 13.6 g/dl. dl.

Average Hemoglobin Level of Young Women Before Giving Guava

Table 3. Average Hemoglobin Levels of Female Adolescents Before Giving Guava in Salido's Bina Harapan Foundation South Coast District

	N	mean	SD	Min	Max
Before being given guava	10	11,190	0.4040	10.6	11.8

Based on table 3, it is known that the average hemoglobin level of respondents before being given guava at the Bina Harapan Salido Foundation, Pesisir Selatan Regency is 11.190 g/dl with a standard deviation of 0.4040, a minimum value of 10.6 g/dl and a maximum value of 11.8 g/dl. dl.

Average Hemoglobin Levels of Young Women After Giving Guava

Table 4. Average Hemoglobin Levels of Female Adolescents After Giving Guava in Salido's Bina Harapan Foundation South Coast District

	N	mean	SD	Min	Max
After being given guava	10	12,170	0.4990	11.2	13.1

Based on table 4, it is known that the average hemoglobin level of the respondents after being given guava at the Bina Harapan Salido Foundation, Pesisir Selatan Regency is 12.170 g/dl with a standard deviation of 0.4990, the minimum value is 11.2 g/dl and the maximum value is 13.1 g/dl. dl.

Bivariate

The Effect of Dates on Increasing Hemoglobin Levels in Adolescent Girls

Table 5. The Effect of Dates on Increasing Hemoglobin Levels in Young Girls at the Bina Harapan Salido Foundation, Pesisir Selatan Regency

	n	Mean ± SD	Difference Mean ± SD	95% CI	*p*
Hb level before the given date palm	10	11.200±0.609	1.300±0.563	0.89-1.70	0.000
HB levels after being given dates	10	12,500±0.621			

From Table 5 shows that the test results *paired samples T test* on girls in Bina Harapan Salido had done hemoglobin before and after the palm fruit is obtained *p value* was 0.000 (*p* <0.05). When *p <0.05* means Ha accepted, This shows that there is the effect of palm fruit to an increase in hemoglobin of girls in Bina Harapan Salido South Coastal District.

The Effect of Guava on Increased Hemoglobin Levels in Adolescent Girls

Table 6. The Effect of Giving Guava on Increasing Hemoglobin Levels in Young Girls at the Bina Harapan Salido Foundation South Coast District

	n	Mean ± SD	Difference Mean ± SD	95% CI	*P*
Hb levels before being given guava	10	11.190 ± 0.404	0.980 ± 0.367	0.71-1.24	0.000
HB levels after being given guava	10	12.170±0.4990			

From Table 6 shows that the test results *paired samples T tests* on girls in Bina Harapan Salido had done hemoglobin before and after administration of guava obtained *p value* was 0.000 (*p* <0.05). When *p <0.05* means Ha accepted. This shows that there is the effect of guava to an increase in hemoglobin of girls in Bina Harapan Salido South Coastal District.

Differences in the Effect of Dates and Guava on Increasing Hemoglobin Levels in Young Women

Table 7. Differences in the effect of giving dates and guava fruit to increase hemoglobin levels in adolescent girls at the Bina Harapan Salido Foundation, Kabupaten South Coast

	N	mean	SD	*p*
Increase in hemoglobin levels after giving dates	10	1.30	0.56	0.150
Increased hemoglobin levels after administration of guava	10	0.98	0.36	0.150

Based on table 12, the results of statistical tests using the *independent T test* showed that the average increase in hemoglobin levels after giving dates was 1.30 with a standard deviation of 0.56 and the average increase in hemoglobin after giving guava was 0.98 with a standard deviation of 0. ,36. Value *significancy* is 0.150 where the value of $p > 0.05$ means Ha rejected, thus no significant difference in the effect of palm fruit and guava to an increase in hemoglobin of girls in Bina Harapan Salido South Coastal District. So it can be concluded that both dates and guava can increase hemoglobin levels.

DISCUSSION

Univariate Analysis Discussion

Average Hemoglobin Levels of Female Adolescents Before Giving Dates.

This study is in line with research conducted by Roselyn, Ari and Annisa in 2018 about giving dates (*Phoenix dactylifera)* to anemia sufferers in adolescent girls on hemoglobin levels in Natar High School, Natar Regency, South Lampung Regency, the average value of hemoglobin levels in the group before given dates is 10,560 g/dl. [11] Research conducted by Harmoko in 2018 on the effectiveness of giving dates to hemoglobin levels in anemic adolescent girls at MA Tahfizh Nurul Iman Karanganyar Surakarta found the average value before giving dates was 10.62 g/dl. [35] Research conducted by Ridwan, Sri and Gangsar in 2018 on the consumption of dates increases hemoglobin levels in adolescent girls at Madrasah Aliyah in Metro City. The average value of hemoglobin levels before being given dates is 10.45 g/dl. [36]

Hemoglobin is one of the components in red blood cells or erythrocytes that functions to bind oxygen and deliver it to all body tissue cells. Hemoglobin is formed from the combination of protein and iron and forms red blood cells. [16] Hemoglobin is the most frequently used to detect anemia. Hemoglobin in the blood carries oxygen from the lungs to all body tissues and carries carbon dioxide back from all cells to the lungs to be removed from the body. Hemoglobin acts as an oxygen reservoir that is receiving, storing and releasing oxygen in muscle cells.

Hemoglobin levels use units of g/dl which means the number of grams of hemoglobin in 100 milliliters of blood. If the hemoglobin level is low or less than normal, it is known as anemia. In this study, out of 10 respondents there were 2 (two) teenagers with moderate anemia, and 8 (eight) people with mild anemia.

The researcher assumed that the average hemoglobin level of the respondents before the intervention was 11.200 g/dl indicating mild anemia. This is related to the lack of iron intake in the body because the food menu is less diverse, such as only consuming fish in small pieces and most young women in the foundation consume less vegetables or fruit.

Average Hemoglobin Levels of Female Adolescents After Giving Dates.

This study is the same as the research conducted by Roselyn, Ari and Annisa in 2018 regarding the administration of dates (*Phoenix dactylifera)* to anemia sufferers in adolescent girls on hemoglobin levels in Natar High School, Natar District, South Lampung Regency, the average value of hemoglobin levels in the group after given dates is 12.492 g/dl with a standard deviation of 0.683 g/dl. [11] Research conducted by Harmoko in 2018 on the effectiveness of giving dates to hemoglobin levels in anemic adolescent girls at MA Tahfizh Nurul Iman Karanganyar Surakarta found the average value after giving dates was 11.81 g/dl. [35] Research conducted by Ridwan, Sri and Gangsar in 2018 on the consumption of dates increases hemoglobin levels in adolescent girls at Madrasah Aliyah in Metro City. The average value of hemoglobin levels after being given dates is 11.170 g/dl. [36]

For Muslims, the benefits of dates have been known for a long time, even this fruit is recommended in the hadith as an appetizer during the month of Ramadan. This suggestion is not unfounded, Middle Eastern people believe that dates can relieve pain. This is due to the presence of potassium and salicylic acid, which act as pain relievers. Dates (Phoenix dactylifera) are one of the foods that contain 13.7 mg of iron. In 100 g of dates contain the highest energy with ideal composition, it contains carbohydrates (73.51 g), energy (275 cal), potassium (32 mg), manganese (35 mg), phosphorus (40 mg), iron (13). 7 g), calcium (103 mg) and magnesium (35 mg) which are very good for consumption. Dried dates have a higher iron content than ripe fresh dates and raw dates. [9]

Dates have features including dates containing natural sugar. The sugar concentration in dates reaches 70% by weight of the fruit, while in other fruits the sugar content is only 20-30%. The sugars found in dates in the form of fructose, glucose and sucrose are able to supply energy for the body quickly. That's why dates are suitable for use as an iftar meal. In addition, dates have a high carbohydrate content that can provide energy for the body, which is why dates are practical travel provisions for the desert or for mountaineers. The potassium content in dates is the richest among fruits, even more than that found in bananas. Potassium is an essential mineral that the body needs for muscle contraction, including the heart muscle. Potassium is also needed to maintain a healthy nervous system and help the body's metabolism. Maintaining potassium is important for active individuals because potassium is quickly excreted from the body through sweat. Selenium contained in dates is believed to help prevent cancer and is important for immunity. Vitamin B Complex in dates consists of Thiamin, Riboflavin, Niacin, vitamin B-6 and pantothenic acid. All of them play an important role in maintaining a healthy body because they help the process of carbohydrate metabolism, maintain the availability of blood sugar and fatty acids for energy. Vitamin B complex is also important in the formation of hemoglobin, white blood cells and red blood cells. Thus, dates are the right food for people with anemia. [29]

The researcher assumes that an increase in hemoglobin levels after giving dates is due to the respondent's compliance in carrying out the 7-day intervention given by the researcher, and the respondent's preference for dates, because in 100 g of dates contains 13.7 mg of iron so that by consuming dates as much as 100 g for 7 days increased hemoglobin levels of adolescent girls.

Average Hemoglobin Levels of Young Women Before Giving Guava.

This study is the same as the research conducted by Damayanti, Riska and Wahyu in 2019 on the effectiveness of giving guava juice on changes in hemoglobin levels in adolescent girls at the Nurul Jadid Kumpai Islamic Boarding School, Kubu Raya Regency, West Kalimantan, where the average value of hemoglobin levels was obtained before being given guava juice. seeds was 12.3 g/dl with a standard deviation of 0.851 g/dl. [37] Research conducted by Hardimarta, Yuniarti, and Nur in 2016 on the effect of red guava juice in increasing hemoglobin levels of students at the Health Analyst Academy on 17 August 1945 Semarang found that the average hemoglobin level before consuming guava juice was 12.97 g/dl. [38] Research conducted by Listiani, Susi and Ria regarding the administration of blood-added tablets and guava juice on increasing hemoglobin levels in adolescent girls at SMP PGRI 01 Semarang found the average value before administration of guava was 10.7 g/dl. [39]

Therapy of iron deficiency anemia can be done by improving a healthy diet with the fulfillment of micronutrients. Fulfillment of micronutrients such as vitamins, minerals and

phytochemicals can be done by consuming healthy foods such as fruits that contain lots of minerals and phytochemical compounds needed by the body. Foods that contain iron, vitamins B12, B6, folic acid and vitamin C are foods that can increase blood hemoglobin levels. Red guava fruit contains iron as much as 23 g / dl in 100 g of guava fruit. [38]

So far, guava with red flesh is very popular because of its properties to treat and prevent dengue fever, but this fruit is not only efficacious for increasing blood platelets. There are a myriad of other benefits, such as cleansing the intestines, maintaining stamina, overcoming canker sores, preventing constipation, as an anti-oxidant and anti-cancer, increasing energy but also preventing anemia. [38]

The researcher assumed that the average hemoglobin level of the respondents before the intervention was 11.190 g/dl indicating mild anemia. This is related to a lack of iron in the body caused by low intake of iron consumed by girls. The average diet in the Foundation does not vary, which serve only a little vegetable consumed by the girls.

Average Hemoglobin Levels of Female Adolescents After Giving Guava.

This study is the same as the research conducted by Damayanti, Riska and Wahyu in 2019 on the effectiveness of giving guava juice on changes in hemoglobin levels in adolescent girls at the Nurul Jadid Kumpai Islamic Boarding School, Kubu Raya Regency, West Kalimantan, the average value of hemoglobin levels was obtained after being given guava juice. seeds was 13.4 g/dl with a standard deviation of 0.732 g/dl. [37] Research conducted by Hardimarta, Yuniarti, and Nur in 2016 on the effect of red guava juice in increasing hemoglobin levels of students at the Health Analyst Academy on August 17, 1945 Semarang, found that the average hemoglobin level after consuming guava juice was 14.20 g/dl. [38] Research conducted by Listiani, Susi and Ria regarding the administration of blood-added tablets and guava juice on increasing hemoglobin levels in adolescent girls at SMP PGRI 01 Semarang found the average value after 11.4 g/dl. [39]

Guava is a super fruit that is rich in health benefits. Several types of minerals contained in the leaves and fruit can ward off several types of degenerative diseases and maintain a healthy body. Guava contains high iron content which is easily available and the price is very cheap. In 100 g of red guava contains calories 59 kcal, water 74.3 g, protein 0.9 g, fat 0.4 g, carbohydrates 23.8 g, calcium 0.6 mg, phosphorus 34 mg, vitamin C 158 mg, 23 mg iron, 11 mg thiamin. [9]

Consuming guava, the body will get vitamin C intake which can be an antioxidant in the body. Not only the fruit, guava leaves also contain lots of vitamin C. Antioxidants have a function to protect the body from free radicals that can damage cells in the body. With sufficient antioxidants, the body will be able to prevent free radicals from causing and triggering cancer. So so that cancer cells do not appear, get anti-oxidants by consuming guava fruit. The iron content in guava can prevent anemia. [30]

The researcher assumed that there was an increase in hemoglobin levels after giving guava due to the respondent's compliance in carrying out the 7-day intervention given by the researcher, and the respondent's preference for guava. In 50 g of guava contains 13 mg of iron, by consuming 50 g of guava for 7 days, young women in the foundation experience an increase in hemoglobin levels.

Discussion of Bivariate Analysis

The Effect of Dates on Increasing Hemoglobin Levels

This is in accordance with research conducted by Roselyn, Ari and Annisa in 2018, with a *p* value of 0.000 (*p* value <0.05), meaning that there is a difference in the effect of giving dates to patients with anemia in adolescent girls on hemoglobin levels in SMA Negeri 1 Natar. Natar District, South Lampung Regency. [11] Research conducted by Cholifah in 2016 obtained research results with a *p* value of 0.005 (*p <0.05),* this shows that there is an effect of giving dates as an effort to increase hemoglobin levels in adolescent girls who experience anemia at Raden Umar Said Kudus Vocational School . [13]

Foods that contain iron include dates. Dates fruit (*Phoenix dactylifera)* is a food that contains the highest energy with an ideal composition, which contains carbohydrates (73.51 g), energy (275 cal), fiber 7.5 g), potassium (32 mg), manganese (35 mg).), phosphorus (40 mg), iron (13.7 mg), calcium (103 mg) and magnesium (35 mg) which are very good for consumption. [9]

It is also known that dates are a practical solution for iron supplement therapy in cases of anemia during childhood, pregnancy and in cases of *hemorrhage* arising from menstruation, *parturition* or injury. This method has advantages over the iron supplementation method in tablet form which can cause various side effects such as nausea, headaches and loss of appetite. [10] A date contains about 23 calories. as much as 5 or 6 dates is equal to 1 serving of fruit. The US National Cancer Institute recommends consuming 5 servings of fruits and vegetables every day to improve health and reduce cancer risk. Dates are low in fat and rich in fiber to meet these needs. Eating lots of dates helps meet the needs of 5 servings of fruits and vegetables daily. [29]

The researcher assumes that the effect of giving dates on increasing hemoglobin levels in young women at the Bina Harapan Salido Foundation, Pesisir Selatan Regency is due to the respondent's compliance in the research study, namely by consuming 100 g of dates in 7 days, because 100 g of dates contain iron. as much as 13.7 mg.

Effect of guava on increasing hemoglobin levels

This is in accordance with research conducted by Rusdi, Fadil and Eva in 2018 regarding the effect of giving red guava juice (*Psidium guanjava*) on hemoglobin and serum *ferritin* levels of anemia sufferers in adolescent girls at the Tri Murni Orphanage, Padang Panjang City. the effect of giving guava juice on increasing hemoglobin and *serum ferritin levels* in anemic adolescent girls with a *p value of* 0.001 . [14] Research conducted by Hardimarta, Yuniarti, and Nur in 2016 obtained the results of research with a *p value of* 0.000, indicating a significant difference between hemoglobin levels before and after administration of guava juice to students of the Academy of Health Analysts August 17, 1945 Semarang. [35] Research conducted by Maheasy in 2019 on the effect of giving guava juice on the increase in hemoglobin levels in adolescent girls in the female dormitory of SMA Muhammadyah 2 Yogyakarta obtained the results of research with a *p value of* 0.000 which means that there is an effect of giving guava juice on the increase in hemoglobin levels. [40]

Guava is a fruit that has a high iron content that is easily available and the price is also very cheap. Guava (*Psidium guajava)* is a tropical plant originating from Brazil. Guava has green fruit with white or red flesh. In 100 g of red guava contains calories 59 kcal, water 74.3 g, protein 0.9 g, fat 0.4 g, carbohydrates 23.8 g, calcium 0.6 mg, phosphorus 34 mg, vitamin C 158 mg, 26 mg iron, 11 mg thiamin. [9]

Iron is a mineral needed to carry oxygen throughout the body. Lack of iron in the body can make a person experience a decreased immune system and often feel lethargic. Iron with vitamin C forms a complex iron ascorbate that is soluble and easily

absorbed by organs in the human body. The conversion of non-heme iron in the form of ferric inorganic compounds ($Fe3^{+}$) to ferrous ($Fe2^{+}$) will be greater if the pH in the stomach will be more acidic. Vitamin C can increase acidity so that it can help the absorption of iron in the body. [38]

Researchers assume that there is an effect of giving guava to increasing hemoglobin levels in young women at the Bina Harapan Salido Foundation, Pesisir Selatan Regency due to the compliance of respondents in research by consuming 50 g of guava in 7 days, because 50 g of dates contain iron. as much as 13 mg.

Differences in the Effect of Dates and Guava on the Increase in Hemoglobin Levels

The results of statistical tests using the *independent T test* showed that the average increase in hemoglobin levels after administration of dates was 1.30 with a standard deviation of 0.56 and the average increase in hemoglobin after administration of guava was 0.98 with a standard deviation of 0.36. The *significance* value is 0.150 where the *p* value > 0.05 or Ha is rejected. It can be concluded that there is no difference in the effect of giving dates and guava fruit to increase hemoglobin levels in adolescent girls at the Bina Harapan Salido Foundation, Pesisir Selatan Regency.

Until now, no researcher has found a study that compares the difference in the effect of dates and guava in increasing hemoglobin levels. Even so, research on the effect of giving dates to increasing hemoglobin levels has been carried out. As research conducted by Ekasari, Eko and Sutrisni in 2017 about the effect of date consumption on hemoglobin levels in class XI students at SMA 1 Grogol, Kediri Regency, the *p value of* 0.000 means that there is an effect of consumption of dates on hemoglobin levels in class XI students at SMA 1 Grogol. Kediri Regency. [41] Research conducted by Purmilasari in 2017 about the difference in the increase in hemoglobin levels before and after consuming dates in PSIK students at the University of Muhammadiyah Malang obtained a *p value of* 0.000, meaning that there was a difference in the increase in hemoglobin levels before and after consuming dates in PSIK students at the University of Muhammadiyah Malang. [42]

Likewise, research on guava has also been carried out by several researchers, such as research conducted by Damayanti, Riska and Wahyu in 2019 which obtained a *p* value of 0.000 or *p <0.005* meaning Ha is accepted. It can be concluded that guava juice is effective against changes in hemoglobin levels in adolescent girls at the Nurul Jadid Kumpai Islamic Boarding School, Kubu Raya Regency. [37] Research conducted by Astari in 2019 on differences in hemoglobin levels before and after giving red guava juice to young women at SMA NU Ungaran, it was found that the *p* value was 0.000, meaning that there was a difference in hemoglobin levels before and after giving red guava juice. [43] studies conducted by Purnama and Luluk on the effect of guava juice consumption on increasing hemoglobin levels in adolescent girls at AMP Ma'arif Gamping Yogyakarta obtained a *p value of* 0.002 meaning that there is an effect of guava juice consumption on increasing hemoglobin levels. [44]

To overcome the problem of iron deficiency, pharmacologically, women generally consume iron mineral supplements in the form of blood-added tablets, but can have side effects such as nausea, headaches and loss of appetite that make teenagers lazy to consume them. However, there are many things that can be done naturally, one of which is by consuming a balanced nutritious diet with adequate intake of nutrients to meet the body's needs. Like consuming vegetables and fruits that are rich in iron. [8]

Foods that contain iron include dates. Dates fruit (*Phoenix dactylifera)* is a food that contains the highest energy with an ideal composition, which contains carbohydrates (73.51 g), energy (275 cal), fiber 7.5 g), potassium (32 mg), manganese (35 mg).), phosphorus (40 mg), iron (13.7 mg), calcium (103 mg) and magnesium (35 mg) which are very good for consumption. [9]

It is also known that dates are a practical solution for iron supplement therapy in cases of anemia during childhood, pregnancy and in cases of *hemorrhage* arising from menstruation, *parturition* or injury. This method has advantages over the method of iron supplementation in tablet form which can cause various side effects such as nausea, headaches and loss of appetite. [10]

In addition to dates, fruits that have a high iron content that are easily available and the price is also very cheap are found in guava. Guava (*Psidium guajava)* is a tropical plant originating from Brazil. Guava has green fruit with white or red flesh. In 100 g of red guava contains calories 59 kcal, water 74.3 g, protein 0.9 g, fat 0.4 g, carbohydrates 23.8 g, calcium 0.6 mg, phosphorus 34 mg, vitamin C 158 mg, 26 mg iron, 11 mg thiamin. [9]

Researchers assumed that there was no difference in the effect of dates and guava on increasing hemoglobin levels in adolescent girls at the Bina Harapan Salido Foundation, Pesisir Selatan Regency, because the iron content was almost the same. In addition, it is also because researchers do not control too tightly about the outside food consumed by young women. And the absence of a control group from this study. However, when compared with the large number of interventions carried out, more dates must be consumed than guava. Because in 100 g of dates contains 13.7 g of iron, while in 100 g of guava contains 26 g of iron. So it can be concluded that guava contains 2 (two) times more iron than dates. In addition, in terms of the price of guava also has a much cheaper price than dates, 1 kg of guava costs only Rp. 10,000 to Rp. 20,000 while the price of dates, especially Ajwa dates, the price in 1 kg reaches Rp. 340,000. In terms of the ease of getting it, guava is easier to get than dates.

CONCLUSION

Based on the results of research and discussion, it can be concluded as follows:

1. The average hemoglobin level in adolescent girls before giving dates at the Bina Harapan Salido Foundation was 11.200 g/dl (minimum value 10.3 g/dl and maximum value 11.9 g/dl.
2. The average hemoglobin level in adolescent girls after giving dates at the Bina Harapan Salido Foundation is 12,500 g/dl (minimum value 11.5 g/dl and maximum value 13.6 g/dl).
3. The average hemoglobin level in adolescent girls before giving guava at the Bina Harapan Salido Foundation was 11.190 g/dl (minimum value 10.6 g/dl and maximum value 11.8 g/dl)
4. The average hemoglobin level in adolescent girls after giving guava at the Bina Harapan Salido Foundation is 12.170 g/dl (minimum value 11.2 g/dl and maximum value 13.1 g/dl)
5. There is an effect of dates on increasing hemoglobin levels in young women at the Bina Harapan Salido Foundation, Pesisir Selatan Regency with p value = 0.000 ($p < 0.05$)
6. There is an effect of guava on increasing hemoglobin levels in adolescent girls at the Bina Harapan Salido Foundation, Pesisir Selatan Regency with p value = 0.000 ($p < 0.05$)

7. There was no difference in the effect of dates and guava on increasing hemoglobin levels in adolescent girls at the Bina Harapan Salido Foundation, Pesisir Selatan Regency with *p* value = 0.150 (*p* > 0.05).

REFERENCES

1. Briawan, Dodik. *Anemia Masalah Gizi Pada Remaja Wanita*. Jakarta : Kedokteran EGC. 2012
2. Word Health Organization. *Promoting Adolescent Sexsual and Reproductive Health Throurh School in Low Income Concries* : an information brief. 2009. Diunduh dari http://wholibdoc.who.int/hq/2009/WHO.pdf. [diakses tanggal 14 Februari 2019]
3. Word Health Organization. *The Global Prevelence of Anemia in 2011*. Ganeva : WHO.2015
4. Kementerian Kesehatan RI. *Riset Kesehatan Dasar Tahun 2013.* Jakarta : Kementerian Kesehatan RI. 2013
5. Departemen Kesehatan RI. *Riset Kesehatan Dasar, Badan Penelitian dan Pengembangan Kesehatan Kementrian Kesehatan RI*. Jakarta : Depkes RI. 2018
6. Tim Penulis Poltekkes Depkes Jakarta. *Kesehatan Remaja : Problem dan solusinya*. Jakarta : Salemba Medika. 2012
7. Departemen Kesehatan RI. Kenali Masalah Gizi yang Ancam Remaja Indonesia. Tersedia di URL : http://www.depkes.go.id/article/kenali-masalah- gizi-yang-ancam-remaja-indonesia.html. [diakses 15 Mei 2019]
8. Departemen Kesehatan RI. *Pedoman Penanggulangan Anemia Gizi Untuk Remaja Putri.* Jakarta : Depkes RI. 2013
9. Satuhu, Suyanti. *Kurma Khasiat dan Olahannya.* Jakarta : Penebar Swadaya. 2010
10. Aprilistiyowati. *Buah sakti dari surga*. Yogyakarta : balqist Yogyakarta. 2014
11. Roselyn, Arini Pradita, dkk. *Pemberian Buah Kurma (phoenix dactylifera) ke penderita anemia pada remaja putri terhadap kadar hemoglobin di SMA negeri I Natar Kecamatan Natar Kabupaten Lampung Selatan*. Tersedia di URL: http://jambs.poltekkesmataram.ac.id/index.php/home/article. 2018
12. Febriansyah, Hendri. *Pengaruh Pemberian Kurma (Phoenix Dactilifera) dan madu (apex dorsalis) Terhadap Kadar Hemoglobin Pada Kelompok Usia 16-18 Tahun*. Digilib Fakultas Kedokteran UMY. 2007
13. Cholifah, dan Amalia. *Aplikasi Pemberian Kurma Sebagai Upaya Peningkatan Kadar Hemoglobin Pada Remaja Putri yang Mengalami Anemia*. 2017. Tersedia di URL : http://lpp.uad.ac.id [diakses 18 februari 2017]
14. Rusdi, Fadil dan Eva. *Pengaruh pemberian jus jambu biji merah (Psidium guajava) terhadap kadar hemoglobin dan ferritin serum penderita anemia pada remaja puteri di Panti Asuhan Tri Murni Kota Padang Panjang*. 2018
15. Fitriani, Ardi dan Tarsikah. *Pengaruh pemberian jus jambu biji terhadap peningkatan kadar hemoglobin pada ibu hamil trimester III di Polindes Krebet Kecamatan Bululawang Kabupaten Malang*. 2017
16. Kementerian Kesehatan RI. *Pedoman Pencegahan dan Penanggulangan Anemia pada Remaja Putri danWanita Usia Subur (WUS)*. Jakarta : Kementerian Kesehatan RI. 2016
17. Simarmata RR. *Ektivitas Jus Buah Terong Belanda Terhadap Kadar Hemoglobin, Jumlah Eritrosit dan Nilai Hematokrit Terhadap Anemia*. Semarang. 2016. Tersedia di URL : http://lib.unnes.ac.id/28028
18. Kiswari, Lukman. *Hematologi & Transfusi*. Jakarta : Erlangga. 2014
19. Fikawi S, dkk. *Gizi Anak dan Remaja*. Depok : PT Raja Grafindo. 2017
20. Yusnaini. *Pengaruh Konsumsi Jambu Biji Terhadap Peningkatan Kadar Hb Ibu Hamil Anemia yang Mendapat Tablet Tambah Darah*. Diunduh dari URL: http://nasuwakesaceh.ac.id. [Di aksestanggal 24 Desember 2014]

21. Syaifuddin. *Anatomi Fisiologi*. Jakarta : EGC. 2016
22. Gibney, M.J, dkk. *Gizi Kesehatan Masyarakat.* Jakarta : EGC. 2010
23. Yuni NE. *Kelainan Darah.* Yogyakarta : Nuha Medika. 2015
24. Almatsier, Suneta. *Prinsip Dasar Ilmu Gizi.* Jakarta : Gramedia Pustaka Utama. 2001
25. Sarwono, Sarlito W. *Psikologi Remaja Edisi 15.* Jakarta : PT. Raga Grafindo Persada. 2012
26. Departemen Kesehatan RI. Pendekatan dan Penanganan Pada Remaja Risiko Tinggi. 2009. Tersedia di URL: http://www.depkes.go.id/index.php. [di akses tanggal 4 Februari 2019]
27. Shinta, Annisa. *Hubungan Antara Kadar Hemoglobin dengan Prestasi Belajar Siswi SMP N 25* Semarang. 2015. Tersedia di URL : http://digilib.unnes.ac.id/gsdl/collect/skripsi/archives/HASHS363/eloabeat.dir/doc.pdf. [di akses tanggal 15 Februari 2019]
28. Kadafi, dkk. *Pengaruh Pemberian Tablet Besi DAN Vitamin C Terhadap Kadar Hemoglobin Mahasiswi S1 Keperawatan Universitas Muhamadyah Surakarta*. 2005. Tersedia di URL : http://eprints.ums.ac.id. [Di akses tanggal 15 Februari 2019]
29. Rostita. *Khasiat dan Keajaiban Kurma.* Bandung : PT Mizan Pustaka. 2009
30. Parimin. *Jambu Biji, Budidaya dan Ragam Manfaatnya.* Bogor : Penebar Swadaya. 2005
31. Hadiati, Sri, dkk. *Bertanam Jambu Biji Di Pekarangan.* Jakarta : Agriflo. 2015
32. Setyawan, Febri. *Pedoman metodologi Penelitian (statistika praktis) hal.103.* Sidoarjo : Jifatama Jawara. 2017
33. Notoatmodjo, Suekidjo. *Metode Penelitian Kesehatan.* Jakarta : Rineka Cipta. 2010
34. Sugiono. *Metode Penelitian Kuantitatif dan Kualitatif*. Bandung : Alfabeta. 2015
35. Harmoko*. Efektivitas Pemberian Kurma Terhadap Kadar Hemoglobin Pada Remaja Puteri Anemia di MA Tahfizh Nurul Iman Karanganyar Surakarta 2017.* Tersedia di http://repository.itspku.ac.id
36. Ridwan, Sri dan Gangsar. *Konsumsi Buah Kurma Meningkatkan Kadar Hemoglobin Pada Remaja Puteri.* 2018. Tersedia di http://www.ejurnal.poltekkes-tjk.ac.id/index.php/JKM/article.
37. Damayanti, Rizka dan Wahyu. *Efektivitas Pemberian Jus Jambu Biji Terhadap Perubahan Kadar Hemoglobin Pada Remaja Puteri di Pondok Pesantren Nurul Jadid Kumpai Kabupaten Kubu Raya.* 2019. Tersedia di http://ejurnal.poltekkes-pontianak.ac.id/index.php/JKK/articl
38. Hardimarta, Yuniarti dan Nur. *Pengaruh Jus Jambu Biji Merah Dalam Meningkatkan Kadar Hemoglobin Pada Mahasiswa Akademi Analisis Kesehatan 17 Agustus 1945 Semarang.* 2016. Tersedia di http://stifar.ac.id/ojs/index.php/MFI/article
39. Listiani O, Susi.T, dan Ria.A. *Pengaruh Pemberian Tablet Tambah Darah dan Jus jambu Biji Merah Terhadap Peningkatan Kadar Hemoglobin Pada Remaja Puteri SMP PGRI 01 Semarang 2018.* Tersedia di http://ejounal.poltekkes-smg.ac.id
40. Mahmudah R. *Pengaruh Pemberian Jus Jambu Biji Merah Terhadap Kenaikan Kadar Hemoglobin Pada Remaja Puteri di Asrama Puteri SMA Muhammadiyah 2 Yogyakarta 2019.* Tersedia di hhtp://digilibz.unisayogya.ac.id
41. Ekasari D, Eko W, Sutrisni. *Pengaruh Konsumsi Kurma Terhadap Kadar Hemoglobin Pada Siswi Kelas XI di SMA 1 Grogol Kabupaten Kediri 2017.* Tersedia di http://publikasi.dinus.ac.id
42. Purmilasari LB. *Perbedaan peningkatan Kadar Hemoglobin Sebelum dan Sesudah Mengkonsumsi Kurma Pada Mahasiswa PSIK Universitas Muhammadiyah Malang 2017*. Tersedia di http://eprints.umm.c.id
43. Astari Y. *Perbedaan Kadar Hemoglobin Sebelum dan Sesudah Pemberian Jus Jambu Biji Merah Pada Remaja Puteri di SMK NU Ungaran 2019.* Tersedia di http://reponsitory2.unw.ac.id

44. Purnama O, Luluk K. *Pengaruh Konsumsi Jus Jambu Biji Terhadap Peningkatan Kadar Hemoglobin Pada Remaja Puteri di SMP Ma'arf Gamping Yogyakarta 2019.* Tersedia di http://digilib2.unisayogya.ac.id