

Article

The Effect of Giving Watermelon Fruit on Increasing HB Levels in Adolescents

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A B S T R A C T

Research Background : Watermelon is known to be one of the best fruits for increasing haemoglobin level. It is rich in vitamin C and iron content, which help in better absorption of iron. As per USDA, 100 grams of watermelon contains 0.2 milligrams of iron. In young women, iron is also needed to replace iron during menstruation.

Research Objective: to determine the effect of giving watermelon fruit to increasing HB levels in adolescents.

Research Methods: Quantitative research uses the quasy-experiment method with a pre-test-post test design. The number of samples in this study were 14 adolescents according to the inclusion criteria using a purposive sampling technique. Intervention in the form of 200 grams of watermelon flesh for 14 days. Analysis using paired t-test.

The results of the study: It is known that the average HB level in adolescents before giving watermelon is 12.41 g/dl, while the hemoglobin level in adolescents after giving watermelon is known to be 13.01 g/dl. The data obtained were analyzed by Free T test with a significance level of <0.05 and obtained p 0.271. The results of the difference in the average hemoglobin level before and after giving the watermelon showed an increase of -1.71 ± 0.52 gr/dl.

Conclusion: So it can be concluded that there is no effect of giving watermelon fruit to increasing HB levels in adolescents.

I. INTRODUCTION

Based on basic health research data in 2007, 2013 and 2018, there is a trend of increasing prevalence of anemia in adolescents. In 2018, there were 32% of teenagers in Indonesia who experienced anemia. This means that there are approximately 7.5 million Indonesian youth who are at risk of experiencing obstacles in growth and development, cognitive abilities and are susceptible to infectious diseases (Kemenkes, 2018).

One of the interventions carried out in an effort to reduce the prevalence of anemia in adolescents is supplementation of iron and folic acid through iron supplementation tablets (TTD). In 2018, there were 76.2% of young women who had received blood supplement tablets in the last 12 months. However, only 2.13% of them took iron supplements as recommended (as many as ≥ 52 tablets in one year). Taking iron-containing supplements is one way to keep Hb levels normal. WHO also recommends consuming elemental iron supplements of 30 mg to 60 mg per day for adult women (Kemenkes, 2013).

Apart from that, there have also been a number of efforts that have been made to increase the scope of giving iron supplements to young women, including the existence of technical guidelines for health services in health facilities during a pandemic issued by the Ministry of Health. In addition, there are several innovation programs in the regions implemented by development partners and CSOs (Civil Society Organizations). One of them is the Aksi Bergizi program implemented by UNICEF and Nutrition International. Going forward, various innovative and strategic efforts are needed as well as strengthening collaboration with all stakeholders in efforts to prevent anemia in adolescents in Indonesia, especially during this pandemic. Let's make Indonesian youth healthy and free of anemia (Kemenkes, 2018).

Prevention of anemia in young women can also have a positive impact on preventing stunting. Ha was conveyed by the chairman of the BKKBN Dr. (HC) dr. Hasto Wardoyo, Sp. OG (K) at the Healthy Before Marriage Talkshow Series held by SKATA and BKKBN with the theme Premarital Health Test for the sake of the Golden Generation, Thursday (07/04/2022) (bkkbn.co.id).

Efforts to prevent anemia apart from giving iron supplements can also be done by consuming fruits that contain lots of iron. Watermelon can be the solution. Watermelon can be used to increase Hb which is very refreshing, it contains iron as well as vitamin C. Apart from being fresh and high in water, watermelon is also a type of fruit that has high iron. Watermelon is also a good natural source of vitamin C, which helps the body absorb iron. Thus, consumption of watermelon also provides good benefits for increasing Hb. In one serving of watermelon, there are about 0.2 milligrams of iron. (<https://dinkes.kalbarprov.go.id/sederet-dinding-penambah-hemoglobin-yang-aman-dikonsumsi/>)

This is also supported by the results of previous research on the effect of giving red watermelon juice (*Citrus lanatus*) on hemoglobin levels in mice (*Mus musculus*), found that the hemoglobin levels of mice were known to mean that the average hemoglobin level in mice without watermelon juice was 11.0125 g/day. dl, whereas hemoglobin levels in mice with red watermelon juice were found to have hemoglobin levels of 14.775 g/dl. The data obtained were analyzed by Free T test with a significance level <0.05 . So it can be concluded that there is an effect of giving red watermelon juice (*Citrus lanatus*) on hemoglobin levels in mice (*Mus musculus*) (Komariyah, et al 2016).

Based on the background above, the researcher is interested in conducting research on "The Effect of Giving Watermelon Fruit on Increasing HB Levels in Adolescents in the Public Health Study Program, Faculty of Health Sciences, University of Respati Yogyakarta". So that adolescents who experience anemia can get appropriate care for anemia problems.

This study aims to determine the effect of giving watermelon fruit to increasing Hb levels in adolescents. And it is hoped that it can increase efforts to prevent anemia in adolescents including promotive and preventive efforts in relation to anemia in adolescents in the Public Health Study Program, Faculty of Health Sciences, University of Respati Yogyakarta.

II. METHODS

The research was conducted at the Public Health Study Program, Faculty of Health Sciences, Respati University, Yogyakarta. This type of research is quantitative research using experimental methods with a quasi-experimental design using the Pre-test Post-test approach. Respondents were young women, namely 14 respondents who were selected by purposive sampling with specified inclusion and exclusion criteria. The instruments used were GCHb and observation sheets. The analysis performed is analysis the bivariate data analysis technique used in this study was a paired test to see differences in initial and final Hb levels and changes in Hb levels in adolescents.

III. RESULT

Univariate analysis

Table 1. Frequency Distribution of Hemoglobin Levels Before Watermelon Consumption

Kadar Hb	Frekuensi	Mean	Min	Max	std.deviation	%
≥12 gr/dl	9	12.41	9.6	15.9	1.694	64.29
≤12 gr/dl	5					35.71
Total	14					100

Based on table 1 data, it shows that of the 14 respondents, the average hemoglobin level before being given the treatment of watermelon consumption was 12.41 g/dl with a std. deviation of 1,694 g/dl, the lowest hemoglobin level was 9.6 g/dl and the highest was 15.9 g/dl. And as many as 5 (35.71%) respondents experienced anemia.

Table 2. Frequency Distribution of Hemoglobin Levels After Watermelon Consumption

Kadar Hb	Frekuensi	Mean	Min	Max	std.deviation	%
≥12 gr/dl	11	13.01	11.40	15.20	1.160	78.57
≤12 gr/dl	3					21.43
Total	14					100

Based on table 2 data, it shows that of the 14 respondents, the average hemoglobin level after being given treatment obtained an average hemoglobin level of 13.01 g/dl with a std. deviation of 1.160 g/dl, the lowest hemoglobin level was 11.40 g/dl and the highest was 15.20 g/dl. And there are still 3 respondents who have anemia (21.43%).

Table 3. Data Normality

Hb Levels	Uji Kolmogorov-Smirnov	Uji Shapiro-Wilk
Pre Test	0.071	0.338
Post Test	0.200	0.582

Based on the table above, it can be seen that the sig value for both pre-test and post-test is greater than 0.05. The sig value before being given treatment was 0.338 and after being given treatment was 0.582. This matter indicates that the research data is normally distributed data

Table 4. Analysis of the Effect of Giving Watermelon on Increasing Hb Levels in Adolescents

Kadar Hb	Mean	SD	95% Confidence Interval of the Difference	P
Pre Test	-0.592	1.930	-1.71 sd $\pm$ 0,52 gr/dl	0.271
Post Test				

Based on the table above, it can be seen that the results of the paired t-test for hemoglobin levels before and after giving watermelons obtained $p = 0.271$ so that there was no difference in hemoglobin levels before and after giving watermelons. This was reinforced by the results of the average difference in hemoglobin levels before and after administration of watermelon which showed an increase of -1.71 ± 0.52 gr/dl.

IV. DISCUSSION

Respondents in this study were young women, most of whom were 20 years old (50%). Teenagers are individuals, both men and women who are in the period between children and adults. Physical changes due to growth that occur during adolescence will affect the health and nutritional status of adolescents. A balanced intake of nutrients in accordance with the needs of adolescents will help adolescents achieve optimal growth and development (Sulistiyoningsih, 2012).

Young women are usually very concerned about body shape, so many limit food consumption and abstain from many foods. Adolescent girls need as much as 26 mg of iron / day. Adolescent girls tend to consume less sources of iron and experience menstruation so they need more iron, because a lot of iron is lost from the body during menstruation. Therefore, if the need for iron cannot be met, the possibility of iron deficiency anemia is quite large (Almatsier S, 2009).

Some things that can cause Hb levels to decrease include diet and physical activity. Diet is a person's behavior in meeting food needs which include attitudes, beliefs and food choices (Khumaidi, 2009). Unhealthy eating patterns in adolescents can occur due to a lack of nutritional knowledge, so that adolescents cannot fulfill the diversity of nutrients needed for the process of forming Hb. This will occur over a long period of time, causing Hb levels to continue to decrease and cause anemia (Brown, et al., 2011).

The results showed that the average Hb level of female adolescents before being given treatment was 12.41 gr/dl. The lowest Hb level is 9.6 gr/dl and the highest Hb level is 15.9 gr/dl. The normal Hb standard for young women aged > 14 years is 12 gr/dl. After being categorized, 5 (35.71%) female adolescents experienced anemia. Iron deficiency in the long term can cause various disorders in organs and body systems. For example, organ growth disorders that make the body look small compared to its age, skin and mucous membrane disorders, digestive system disorders, movement muscle disorders so that the body gets tired and lethargic, immune system disorders that make it easy to get sick and cognitive function disorders, among others, less able to learn and less intellectual abilities (Kusmiran, 2011).

After being given the watermelon treatment, the average Hb level for female adolescents was 13.00 gr/dl. The lowest Hb level is 11.4 gr/dl and the highest Hb level is 15.2 gr/dl. After being treated

with watermelon fruit, 3 female adolescents experienced anemia (21.43%). Based on these data there was an increase in HB levels before and after being treated with red watermelon.

Watermelon (*Citrullus lanatus*) is a fruit plant that belongs to the cucumber tribe (*Cucurbitaceae*). Watermelon contains water, calories, protein, fat, carbohydrates, calcium, phosphorus, iron, fiber and sodium. The iron content in watermelon is 0.20 mg per 100 grams. Iron is a very important element for the body to form hemoglobin. Daily intake of iron is necessary to replace iron lost through feces, urine and skin. The iron contained in watermelon can be used as an alternative intake during pregnancy, besides that the content of vitamin C in watermelon can also help the absorption of iron. According to research conducted by Komariah, et al (2016) concerning the effect of giving red watermelon juice on hemoglobin levels, it is known that the average Hb level without giving it is 11.0 g/dl while the hemoglobin level with giving red watermelon juice is known to have a hemoglobin level of 14.7 g/dl. The data obtained were analyzed by Free T test with a significance level <0.05 . So it can be concluded that there is an effect of giving red watermelon juice (*Citrullus lanatus*) on hemoglobin levels.

Besides that, watermelon is also one of the fat-free fruits because the sugar content contained in watermelon is also limited but has an abundance of water. Water content and potassium contained in watermelon as well as antioxidants and vitamin C, provitamin A. Watermelon fruit contains citrulline and carotenoids which contain lycopene which functions as an antioxidant as an antidote to free radicals. This fruit has minerals, both macro minerals and micro minerals. The macro minerals it contains are calcium, potassium, magnesium and sodium, while the micro minerals include iron. The level of vitamin C in watermelon is 8.1 mg/100 g, the iron level is 0.2 mg/100g (Setiawan, 2020).

Watermelon contains iron and vitamin C (ascorbic acid). The iron content in watermelon can increase Hb levels in the blood. In addition, vitamin C (ascorbic acid) in watermelon acts as an anti-oxidant and prevents damage to erythrocytes and also facilitates the absorption of iron (Ali Shahid, 2019). This is what causes an increase in Hb levels in young women by giving watermelon meat.

Increased Hb levels can be influenced by several factors, including food intake, food variety and meal frequency. Variation is defined as the variety of foods consumed by different groups during a given reference period, as a useful measure of the overall quality and nutritional adequacy of the diet that may affect blood formation (Saaka M and Galaa SZ, 2017).

V. CONCLUSION

Based on the results of research on the effect of giving watermelon fruit to hemoglobin levels in adolescents, it can be concluded that:

- The average hemoglobin level before treatment was 12.41 ± 0.45 gr/dl.
- The average hemoglobin level after treatment was 13.00 ± 0.31 gr/dl.
- There is no effect of giving watermelon fruit to increasing HB levels in adolescents ($p = 0.271$)

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