Comparison Between the Provision of White Ambon Banana Fruit and Red Dragon Fruit on Hemoglobin Levels

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ABSTRACT

Introduction: Anemia is a factor in maternal mortality in 2020 in South Tangerang City, which is 48.8%. One of them is foods that contain iron, namely white Ambon banana juice and red dragon fruit. Rawa Buntu Health Center the incidence of anemia in pregnant women is quite high. Objective: To find out the comparison between the administration of white Ambon banana juice and red dragon fruit juice on the hemoglobin levels of pregnant women in the third trimester. Method: Quasi-experimental research design using a two group pretest and posttest design. The research sample amounted to 34 respondents each consisting of 17 respondents with purposive sampling technique. Analysis: Data were analyzed using paired t-test and Independent t-test. Research results: univariate analysis the difference in the average Hb levels of white Ambon banana juice was 2.48 and giving red dragon fruit juice 1.80. The results of bivariate analysis with a significance value of 0.000. Discussions: giving Ambon banana juice increased Hb levels of pregnant women higher than giving red dragon fruit juice. Pregnant women are expected to be diligent in consuming foods that contain iron, one of which is white Ambon banana juice and red dragon fruit juice in order to increase Hb levels in the mother's blood.

Keywords: white Ambon banana juice, red dragon fruit, hemoglobin levels of pregnant women in the third trimester

INTRODUCTION

The events of pregnancy, childbirth, postpartum, and newborns are physiological conditions, but in the process there is a possibility that can endanger the condition of the mother and baby and even cause death, one of the factors that is quite dangerous is anemia. Anemia often occurs during pregnancy because the blood undergoes hemodilution (dilution) with an increase in red blood cell volume of 30% to 40%, which peaks at 32 weeks to 34 weeks of gestation (Susiloningtyas, 2018).

The prevalence of anemia is still high as evidenced by WHO data, namely globally the prevalence of anemia in pregnant women throughout Indonesia is 41.8% (WHO, 2018), then in Asia 48.2%, Africa 57.1%, America 24.1%, and Europe 25.1%. Indonesia itself according to Riskesdas in 2018 was obtained as much as 48.9%, this has increased compared to 2013 which was around 37.1% (Ministry of Health RI 2019). Meanwhile, Banten Province has a very high incidence of anemia with a prevalence of 37.1% (Yunelasari, 2018). The incidence of anemia in 2019 in South Tangerang City was 48.8%. Anemia in pregnant women can cause bleeding which is a factor in maternal death (South Tangerang City Health Office 2019).

Pregnant women who suffer from anemia are at risk of miscarriage, premature birth, low birth weight babies, and bleeding before and after delivery. In moderate and severe anemia, the bleeding can become more severe so that there is a risk of maternal and infant mortality. The impact on children born to anemic mothers causes babies to be born with very little iron supplies in their bodies so they are at risk of developing anemia at an early age, which can result in impaired or stunted growth and development of children (WHO, 2018).

Prevention of anemia in pregnancy in addition to iron supplements can also be done by consuming foods that contain iron, folic acid and vitamin C, but this is still rarely done. One of the food ingredients that can be used to treat iron nutritional anemia is Ambon banana and red dragon fruit. Ambon banana is a fruit that can be consumed at all ages without any side effects, besides being easy to obtain and relatively cheap compared to other fruits. Every 100 grams of Ambon banana contains 72.9 grams of water, 0.5 mg of iron, 72.0 mg of vitamin C, 0.08 mg of vitamin B1, 0.08 mg of vitamin B2, 0.1 mg of vitamin B6, and 32 mg of phosphorus (Mahardika & Zuraida 2016). The presence of these
contents can increase Hb levels because the iron in Ambon bananas can help the body to form red blood cells. vitamin C plays a role in transferring iron from transferrin in plasma to liver ferritin and helps accelerate the absorption of iron in the body, as for vitamins B6 is able to neutralize stomach acid and improve digestion and plays a role in the synthesis and coenzyme for several protein metabolism reactions, especially serotonin which plays an active role as a neurotransmitter in the smooth functioning of the brain (Suyanti & Supriyadi 2018).

Research result Widayati & Aisah (2021) In his research, the intervention of giving Ambon bananas 2 times a day in the morning and evening for 7 days along with consuming Fe tablets resulted in an increase in Hb levels from 9.7 g/dl to 11.3 g/dl. The results of other research conducted by Mutoharoh et al. (2021)after being given Ambon bananas 2 times a day in the morning and evening for 14 days eaten in the morning and evening showed that there was an effect of giving Ambon bananas to the hemoglobin levels of pregnant women where before the treatment they had mild anemia and on day 14 all of them were not anemic with an increase in levels. Hb 1.8 to 2.4 g/dl.

In addition to consuming Ambon bananas, iron deficiency can also be done by consuming two dragon fruits. Various studies state that dragon fruit can overcome anemia. Dragon fruit is a non-pharmacological therapy that contains iron which is quite high compared to other fruits. This can be seen from the opinion Suryana (2018)stated that the iron content in beetroot was 0.8 mg, while the Fe content in dragon fruit was 0.55 mg/100gr. This shows that dragon fruit has a higher Fe content than beetroot. Iron is important for the formation and maintenance of healthy red blood cells so that it can ensure the circulation of oxygen and nutrients needed by pregnant women (Muzzaki, 2017).

The content of dragon fruit is not only iron and carbohydrate folates. There are many other compounds that can be obtained from this brightly colored fruit, including Vitamin C, phytochemicals, protein, potassium, fiber, carbohydrates. The benefits of dragon fruit for pregnant women are certainly a contributor to complex nutrition that is good for mother and fetus. Special again, dragon fruit also turns out to contain vitamin B1 which is very good for fetal growth, stimulates protein absorption and helps burning into energy (Idawati, 2018).

According to Linga (2016) Dragon fruit has several benefits, namely stimulating the formation of red blood cells, iron and vitamin C, which plays an important role in iron as a raw material for red blood cells, while vitamin C helps optimize iron absorption through the digestive tract and prevents anemia. The iron content in dragon fruit really helps the body to form red blood cells and reduces the risk of anemia. The need for oxygen and nutrients of pregnant women will also be fulfilled.

The results of previous research conducted Soleha et al. (2020) conducted at the Liwa Health Center, West Lampung on pregnant women with anemia, it can be seen that there is an effect of giving dragon fruit juice to the increase in hemoglobin levels in pregnant women with anemia. Likewise with the results of research conducted by Olii (2020) conducted on pregnant women with anemia in the working area of the South City Health Center, Gorontalo City, showed that consuming dragon fruit juice increased hemoglobin levels. Subsequent research was conducted by Aulya et. al. (2021) Based on the results of the Mann Whitney test, it is known that the significance value is 0.000 <0.05, so it can be concluded that Ho is rejected and Ha is accepted. Thus, it can be concluded that there is an effect of giving dragon fruit juice on hemoglobin levels in third trimester pregnant women.

The Rawa Buntu Health Center has done a lot of handling anemia through the provision of blood-boosting tablets, counseling on anemia to pregnant women and home visits to pregnant women. However, based on a preliminary survey that researchers conducted at the Rawa Buntu Health Center, it was found that the target data for pregnant women in 2019 were 221 pregnant women in the third trimester, with a prevalence of anemia of 44%, while the target data for mothers in 2020 were 267 pregnant women with a prevalence of anemia as much as 44%. 30%. In 2021, from the results of observations from September to December in the ANC book, it was known that 147 pregnant women, while the prevalence of anemia in third trimester pregnant women was known to be 34 people. This indicates that there are still many pregnant women who experience anemia.

METHOD

This quasi-experimental study used a two group pretest and posttest design. The population in this study amounted to 70 pregnant women in the third trimester of October to December 2021 in the Rawa Buntu Inpatient Health Center area, South Tangerang City. With a sample of 34 respondents for each of 17 respondents in group A and 17 respondents in group B. The sampling technique used was purposive sampling. The research instrument used an observation sheet. The data were analyzed using an Independent T-test which had previously been tested for Shapiro-Wilk normality and homogeneity.
RESULT

Univariate Analysis

Table 1. Average Hemoglobin Levels of Pregnant Women Before and After Giving White Ambon Banana Fruit Juice

<table>
<thead>
<tr>
<th>White Ambon Banana Fruit Juice</th>
<th>Mean</th>
<th>Mean Difference</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>9.64</td>
<td>2.48</td>
<td>9.40</td>
<td>9.80</td>
</tr>
<tr>
<td>Posttest</td>
<td>12.12</td>
<td>11.80</td>
<td>11.80</td>
<td>12.30</td>
</tr>
</tbody>
</table>

Based on table 1, it is known that the hemoglobin levels of pregnant women in the third trimester in the intervention group before being given white Ambon banana fruit juice obtained an average value of = 9.64, an effective increase was obtained on the 14th day with an average value of 12.12. So that the difference in the average value of hemoglobin levels before and after being given white Ambon banana juice is 2.48

Table 2. Average Hemoglobin Levels Before and After Giving Red Dragon Fruit Juice

<table>
<thead>
<tr>
<th>Red Dragon Fruit Juice</th>
<th>Mean</th>
<th>Mean Difference</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>9.64</td>
<td>1.80</td>
<td>9.50</td>
<td>9.80</td>
</tr>
<tr>
<td>Posttest</td>
<td>11.44</td>
<td>11.20</td>
<td>11.60</td>
<td>11.60</td>
</tr>
</tbody>
</table>

Based on table 2, it is known that the hemoglobin level of pregnant women in the third trimester before being given red dragon fruit juice obtained an average value of = 9.64 an effective increase after being given red dragon fruit juice which was obtained on the 14th day with an average value of 11.44. Then the difference in the average value of hemoglobin levels before and after being given red dragon fruit juice was 1.80.

Bivariate Analysis

Table 3. Differences in the Effect of Giving White Ambon Banana Juice Compared to Red Dragon Fruit Juice on Hemoglobin Levels of Pregnant Women in the Third Trimester

<table>
<thead>
<tr>
<th>Rate</th>
<th>White Ambon Banana Fruit</th>
<th>Red Dragon Fruit Juice</th>
<th>Mean Difference</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Third Trimester Pregnant Women's Hemoglobin</td>
<td>mean</td>
<td>mean</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>9.64</td>
<td>9.64</td>
<td>0.00</td>
<td>0.876</td>
</tr>
<tr>
<td>Posttest</td>
<td>12.12</td>
<td>11.44</td>
<td>0.68</td>
<td>0.000</td>
</tr>
</tbody>
</table>

The calculation of the difference in the mean (average) pretest hemoglobin levels of pregnant women in the third trimester on white Ambon banana juice and red dragon fruit juice is 0.00. The results of the Independent T-test showed a significance value of 0.876 > 0.05, so it was concluded that before being given treatment there was no difference in the effect of consumption of white Ambon banana juice and red dragon fruit juice on hemoglobin levels of pregnant women in the third trimester. The results of the calculation of the difference in the mean (average) post-test regarding the hemoglobin levels of pregnant women in the third trimester in white Ambon banana juice and red dragon fruit juice are 0.68. The results of the Independent T-test showed a significance value of 0.000 < 0.05, so it was concluded that there was a difference in the effect of consumption of white Ambon banana juice and red dragon fruit juice on the hemoglobin levels of pregnant women in the third trimester.

DISCUSSION

Based on the results of the study, it was known that the hemoglobin level of pregnant women in the third trimester in the intervention group before being given white Ambon banana juice obtained an average value of = 9.64, an effective increase was obtained on the 14th day with an average value of 12.12. So that the difference in the average value of hemoglobin levels before and after being given white Ambon banana juice is 2.48.
Thaib (2018) explained that Ambon banana has a higher nutritional content compared to several other types of fruit. This banana is also used by the community for empirical treatment, namely as the prevention of anemia. According to Wardhany (2018) bananas can overcome anemia, restore conditions after illness, high B6 content helps the body produce hemoglobin, sugar content in bananas is converted into a source of energy quickly, bananas contain high iron (Fe) so that by consuming bananas at least two bananas a day can reduce symptoms anemia.

According to Sadjikin (2018) intake of nutrients that can help meet the materials needed by the body for blood formation are folic acid and B vitamins which are the main ingredients for the formation of cell nuclei, iron is needed in the formation of hemoglobin, cobalt, magnesium, zinc, amino acids, potassium, vitamin C and B complex. Astawan (2018) explained that Ambon banana is a source of vitamin C which can increase the optimization of non-heme iron absorption so that absorption will be more in the intestines and potassium which regulates the delivery of nutrients to cells and facilitates the flow of oxygen to the brain. So that hemoglobin is able to bind oxygen which causes the number of red blood cells and hemoglobin levels in the blood to increase.

In accordance with research results Mutoharoh et al. (2021) showed that there was a change in Hb levels in pregnant women who had consumed 2 Ambon bananas for 14 days. All participants before treatment had mild anemia, and on day 14 all of them were not anemic with an increase in Hb levels from 1.8 to 2.4 g/dL. The conclusion of this study is that Ambon bananas which are consumed regularly twice a day for 14 days can increase Hb levels in third trimester pregnant women who have anemia. Likewise with the results of research conducted by Widayati & Aisah (2021) performed on pregnant women experienced an increase in Hb levels, patient I Hb from 9.7 g/dl to 11.3 g/dl and patient II Hb from 8.8 g/dl to 9.9 g/dl. Giving Ambon bananas 2 times a day in the morning and evening for 7 days along with consuming Fe tablets was able to increase the Hb levels of pregnant women in the third trimester with anemia.

Researchers assume that there is an increase in hemoglobin levels in pregnant women who consume white Ambon banana juice because of the potassium, iron and vitamin C content that can stimulate the formation of red blood cells and prevent anemia. According to information from respondents, the taste that is obtained when consuming white Ambon banana juice is sweet and not bad, so it is liked by pregnant women. Through the consumption of white Ambon bananas for 2 weeks, it was done well and the respondents obeyed the recommendations given by the researcher, so that the hemoglobin level increased. Likewise, the results of observations during consuming white Ambon banana juice before being given the intervention they admitted that they felt dizzy and weak, but by the third and fourth day pregnant women with anemia began to feel fresh, aches and pains are gone, don't feel dizzy and don't get tired easily. This indicates that banana juice is good for pregnant women, especially with anemia because it can replace damaged cells so that it can increase the Hb level of pregnant women, besides that it is easily absorbed by the body and is able to cleanse the blood of toxins and facilitate digestion, causing a feeling of discomfort. aches and pains, fatigue is reduced and even disappears.

Based on the results of the study, it is known that the hemoglobin levels of pregnant women in the third trimester before being given red dragon fruit juice obtained an average value of 9.64 an effective increase after being given red dragon fruit juice which was obtained on the 14th day with an average value of 11.44. Then the difference in the average value of hemoglobin levels before and after being given red dragon fruit juice was 1.80.

According to Kristyanasari (2017) prevention of anemia in pregnant women can be done in various ways, one of which is by consuming dragon fruit. Suryana (2018) states that the iron content in beetroot is 0.8 mg, while the Fe content of dragon fruit is 0.55-0.65 mg/100gr. This shows that dragon fruit has a higher Fe content than beetroot. Iron is important for the formation and maintenance of healthy red blood cells so that it can ensure the circulation of oxygen and nutrients needed by pregnant women (Muzzaki, 2017).

The content of dragon fruit is not only iron and carbohydrate folates. There are many other compounds that can be obtained from this brightly colored fruit, including Vitamin C, phytochemicals, protein, potassium, fiber, carbohydrates. The benefits of dragon fruit for pregnant women are certainly a contributor to complex nutrition that is good for mother and fetus. Special again, dragon fruit also turns out to contain vitamin B1 which is very good for fetal growth, stimulates protein absorption and helps burning into energy (Idawati, 2018).

In accordance with research results Soleha et al. (2020) conducted at the Liwa Health Center, West Lampung on pregnant women with anemia, showed that the average value of hemoglobin levels before administration of dragon fruit juice was 9.761 and the standard deviation was 0.5304. The average value of hemoglobin levels on the 15th day of administration of dragon fruit juice was 11.583 and the standard deviation was 0.6888. This indicates that there is an increase in hemoglobin levels in anemic pregnant women. Likewise with the results of research conducted by Olii (2020) conducted on pregnant women with anemia in the working area of the South City Health Center, Gorontalo City, showed that consuming dragon fruit juice increased hemoglobin levels, with an average of 11.17 g/dL. Research result Aulya et. al. (2021) The effectiveness of dragon fruit juice on increasing hemoglobin levels in pregnant women in the third trimester.
trimester showed that before being given dragon fruit juice, the pretest average value was 9.6 gr% and the posttest average was 11.5 gr%.

Researchers assume that there is an increase in hemoglobin levels in pregnant women with anemia because dragon fruit is rich in nutrients, including water, protein, fat, crude fiber, calcium, phosphorus, iron, niacin and vitamin C which can stimulate the formation of red blood cells and prevent anemia, and the compliance of pregnant women in drinking dragon fruit juice given by the researcher for 14 days. This can be seen from the results of observations where before being given dragon fruit juice the average hemoglobin level of pregnant women was 9.64 while after being given dragon fruit juice the average hemoglobin level was 11.44, so that the difference in the average value of hemoglobin levels before being given and after being given red dragon fruit juice of 1.80. In addition to maternal compliance in consuming dragon fruit juice, Pregnant women also avoid foods and drinks that can inhibit iron absorption. So that these habits can help prevent anemia in pregnancy.

As well as the benefits of banana juice, it turns out that dragon fruit juice is also felt to bring changes at the same time that is, towards the third and fourth days, pregnant women with anemia begin to feel fresh, aches and pains go away, don't feel dizzy and don't get tired easily, even make defecation smooth. The existence of this delicious taste, many mothers ask whether consuming dragon fruit juice can be continued even though the research process has been completed due to the benefits felt by the mother herself. This indicates that dragon fruit juice is also good for consumption for pregnant women, especially with anemia because it can replace damaged cells so that it can increase the Hb level of pregnant women, besides that it is easily absorbed by the body and is able to cleanse the blood of toxins and facilitate digestion, causing feeling sore and dizzy, tired easily reduced or even disappeared, besides that it is easy to defecate.

Based on the test of changes in hemoglobin levels of pregnant women in the third trimester with white Ambon banana fruit juice using the paired sample t-test, the results have a significant value of 0.000 (<0.05). These results mean that there is a change in the hemoglobin level of pregnant women in the third trimester before and after being given white Ambon banana fruit juice at the Rawa Buntu Health Center, South Tangerang City in 2022. Based on the test results, the changes in hemoglobin levels of pregnant women in the third trimester with red dragon fruit juice were also statistically significant. The paired sample t-test obtained results have a significant value of 0.000 (<0.05), meaning that there is a change in the hemoglobin level of pregnant women in the third trimester before and after being given red dragon fruit juice at the Rawa Buntu Health Center, South Tangerang City in 2022.

The results of the calculation of the difference in the mean (average) post-test regarding the hemoglobin levels of pregnant women in the third trimester in white Ambon banana juice and red dragon fruit juice are 0.68. The results of the Independent T-test showed a significance value of 0.000 < 0.05, so it was concluded that there was a difference in the effect of consumption of white Ambon banana juice and red dragon fruit juice on hemoglobin levels of pregnant women in the third trimester at Rawa Buntu Health Center, South Tangerang City in 2022.

According to Rifiana and Hardiani (2021) bananas affect hemoglobin in pregnant women because bananas contain potassium, phosphorus, vitamin A, vitamin B, vitamin C, iron which can help increase the number of red blood cells and hemoglobin levels in the blood. Banana is a fruit that is rich in potassium content. Potassium is a mineral that functions to increase the regularity of the heart rate, activate muscle contractions, regulate the delivery of nutrients to cells, control fluid balance in body tissues and cells, help facilitate the delivery of oxygen to the brain, and help regulate blood pressure. Consuming a lot of potassium will increase its concentration in the intracellular fluid, so it tends to attract fluid from various extracellular.

Astawan (2018) explained that the way potassium works is the opposite of sodium. The potassium content of different types of bananas varies, on average a medium-sized banana can contribute 467.28 mg of potassium per 100 grams. Unlike with potassium, sodium levels in bananas are very low. The high ratio between and sodium in bananas is very beneficial for supporting the process of muscle relaxation. The recommendation to consume potassium per day is 2,000 mg and a banana weighing 120 grams, can contribute 560 mg of potassium from daily needs.

As for the dragon fruit according to Grace (2017) Dragon fruit is a fruit that is rich in nutritional content, each content of dragon fruit has benefits for the body. Dragon fruit as a food ingredient that contains complete nutrients needed by the body where the content of protein, iron, vitamin A, vitamin B2, and vitamin C contained in dragon fruit plays a role in the body's metabolism so that it can increase hemoglobin levels in the blood. Arisman (2017) explained that the high iron and vitamin C contained in dragon fruit can increase the amount of hemoglobin. The risk of anemia and the effects of anemia can be prevented if the amount of hemoglobin in the blood is normal. The content of vitamin C in dragon fruit can help in the absorption of iron, increase blood formation, maintain endurance and immunity.

The results of the study comparing banana fruit juice with dragon fruit juice did not find any. However, based on the results of previous studies that banana juice and dragon fruit juice can increase Hb levels in anemic pregnant
women. This can be seen from the results of the research Olii (2019) showed that there was an effect of giving Ambon banana and seaweed jelly on hemoglobin levels of pregnant women. Primary et al. (2021) in his research there was a significant effect between the score of increasing hemoglobin (HB) levels before consuming Ambon bananas and after consuming Ambon bananas.

As for dragon fruit juice, it was done by Puspita & Pratiwi (2019) The results showed that pregnant women who had low anemia as much as 30% and pregnant women who had normal hemoglobin as much as 70% of pregnant women got a p-value of 0.005 (p <0.05) and it can be concluded that there is an effect of giving dragon fruit to increase hemoglobin levels, in pregnant women. Chendriany et al. (2021) showed that there was a significant difference before and after being given dragon fruit juice. Santy & Jaleha (2019) proved that there was a significant increase in hemoglobin levels between before and after being given blood-enhancing tablets and additional dragon fruit where p value = 0.000.

Researchers assume that there is a difference in the increase in Hb levels between the administration of white Ambon banana juice and red dragon fruit juice, this is due to the presence of high potassium in dragon fruit where through high potassium activates muscle contractions, regulates the delivery of nutrients to cells, controls the balance of fluids in the body's tissues and cells and helps facilitate the delivery of oxygen to the brain. This is what can accelerate the processing of the formation of red blood cells in the body so that the increase in Hb levels of pregnant women who consume white Ambon banana juice is higher than pregnant women who consume red dragon fruit juice.

CONCLUSION

The calculation of the difference in the mean (average) pretest hemoglobin levels of pregnant women in the third trimester on white Ambon bananas and red dragon fruits is 0.00. The results of the Independent T-test showed that the significance value was 0.876 > 0.05, so it was concluded that before being given treatment there was no difference in the effect of consuming white Ambon bananas and red dragon fruits on the hemoglobin levels of pregnant women in the third trimester. The hemoglobin level of pregnant women in the third trimester before being given white Ambon banana juice was an average of 9.64 and after being given white Ambon banana juice an average of 12.12 with an average difference of 2.48. The hemoglobin level of pregnant women in the third trimester before being given red dragon fruit juice was an average of 9.64 and after being given red dragon fruit juice an average of 11.44 with an average difference of 1.80. There is a difference in hemoglobin levels of pregnant women in the third trimester between the administration of white Ambon banana juice and red dragon fruit juice at the Rawa Buntu Health Center, South Tangerang City in 2022 with a significance value of 0.000.

Pregnant women are expected to be diligent in consuming foods that contain iron, one of which is white Ambon banana juice and dragon fruit juice in order to increase Hb levels in the mother's blood. Health workers, especially midwives, are expected to be able to assist mothers in motivating them to consume foods containing iron, one of which is white Ambon banana juice and red dragon fruit juice in order to increase the hemoglobin level of anemic pregnant women. This research is expected to increase students' knowledge and can be used as a reference that can be used as additional material to enrich knowledge and the needs of maternity nursing science references related to increasing Hb levels by using white Ambon fruit juice and red dragon fruit juice.

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