Effectiveness of Avocado Juice and Ambon Banana Juice Intervention to Increase the Hb Level of Pregnant Women

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ABSTRACT

Third trimester pregnant women are at risk of anaemia, which can increase the risk to the mother and fetus. Pregnant women in addition to taking Fe tablets, need to be supported by nutritional patterns that contain several intermediates for haemoglobin synthesis such as avocado/ambon banana. Avocado and banana ambon are enriched with iron which is effective in controlling iron deficiency, also contains vitamin C which helps increase iron absorption. This study was a quasi-experiment with two-group pretest-posttest. The population was anaemic pregnant women in the third trimester with a sample of 20 pregnant women. The sampling method used purposive sampling. The research instruments were SOP and observation sheet. Pregnant women consumed avocado juice or banana ambon juice once a day for 14 days. Data were obtained by measuring haemoglobin levels (Easytouch GCHb). The results showed that the average Hb level before avocado juice intervention was 9.12 g/dL and after 11.15 g/dL. The average haemoglobin level before the administration of ambon banana juice was 9.42 g/dL and after 10.78 g/dL. The effectiveness of avocado juice and ambon banana juice on increasing Hb levels in third trimester pregnant women with a ρ value of 0.025. Avocado juice increases the Hb level of pregnant women more than banana ambon juice. Anaemic pregnant women can use avocado juice or banana ambon juice to increase Hb levels.

INTRODUCTION

The number of anaemic pregnant women in Indonesia is 48.9% of all anaemic pregnant women and 84.6% of anaemia cases in pregnant women occur between the ages of 15 and 24 years (Wahyuningsih, Hartati and Puspita, 2023). The risks for anaemic pregnant women during childbirth include low fetal weight, placenta previa, preeclampsia/ eclampsia, and premature rupture of membranes (PROM). In the second and third trimesters, the risks posed by anaemia are premature birth, prenatal bleeding, inhibition of fetal growth in the womb and postnatal asphyxia (Astulti and Elrtiana 2018).

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Pregnancy anaemia can be treated pharmacologically by taking iron tablets (Fel) and non-pharmacologically by consuming iron-rich foods or drinks (Santy and Jalelha 2019). The iron requirement of pregnant women increases by 9-13 mg from the usual 26 mg. Daily iron requirements are met from food (Suldargo, Kulsmayanti, and Hidayati 2018). Alpulkat and pisang ambon are iron-source foods.

Alpulkat is very useful for pregnant women, because it contains a lot of iron and copper. These two substances can help the formation of red blood cells or red blood cells to prevent anaemia (Fransisca, 2019). Avocados contain 1.4 mg of iron per 100 grams. Research states that there is a positive effect of giving avocado juice for 14 days on increasing average HB levels (Bawazir, 2018).

Another iron-rich banana is the Ambon banana. This banana can cure anaemia because it contains iron (Delwi 2017). Ambon banana has an iron content of 0.2 mg/100 grams (Mulslikah and Sullastri 2018). Research states that there is an effect of pisang ambon on increasing haemoglobin levels in pregnant women at the FS Munggaran clinic, Garut Regency (Hardiani, Choirunissa and Rifiana, 2020).

Preliminary studies on 15 October 2021 on 15 pregnant women found that 7 people (46.6%) experienced anaemia with symptoms that were often experienced by mothers as tired, lethargic, sleepy, dizzy and pale. Pregnant women who experience anaemia mostly forget to take blood enhancers and consume less green vegetables and fruits. Pregnant women also consume fewer foods or drinks that contain iron, such as milk, green beans, soya milk, spinach vegetables and meat. In addition, pregnant women do not like to take Fe tablets because after taking Fe the mother experiences the effects of nausea, dizziness, constipation, causing pregnant women to experience anaemia.

The overall purpose of the study was to determine the difference in the effectiveness of avocado juice and banana ambon juice in increasing Hb levels in trimestelr III pregnant women at the Kebandaran Health Centre, Pemalang Regency.

RESEARCH METHODS

This type of research uses a

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quasi-experimental method. It uses a two-group pre-post-test design approach, which is a research design that tests two intervention groups for causal objects between independent and dependent variables (Setyawan 2017).

The research sample consisted of pregnant women in the third trimester who met the inclusion criteria. A purposive sampling technique was used to collect the sample, then a simple random sampling was carried out to group the respondents who received avocado juice intervention in group I and ambon banana juice intervention in group II. Sample selection was carried out using inclusion and exclusion criteria. The inclusion criteria in this study were pregnant women in the third trimester with mild anaemia (Hb 8.00 - 9.90 g%), pregnant women who regularly consumed iron tablets in accordance with PMK Number 88 of 2014. Exclusion criteria in this study were pregnant women who were allergic to avocados and Ambon bananas, pregnant women who had severe anaemia and a history of blood thinning diseases and comorbidities. The study was conducted in January 2022. This study has passed the ethics test with Number: 0054/KEP/UNKAHA/LPPM/XII/2021.

In this study, the researcher used 20 samples, each group consisting of 10 pregnant women. In group I, 10 pregnant women were given avocado juice and in group II, 10 pregnant women were given Ambon banana juice.

Before the respondents were given the intervention, the researcher checked the Hb levels of the pregnant women using Easytouch GCHb. Avocado juice (intervention group I) and Ambon banana juice (intervention group II) were given once a day every afternoon for 14 days. The juice dosage of 250 ml was made from 250 grams of Ambon banana or avocado mixed with 50 ml of water. After the respondents were given the intervention, the researchers examined the haemoglobin levels after 14 days of administering avocado juice (Group I intervention) and Ambon banana juice (Group II intervention).

In this study, the univariate analysis provided the central tendency values of haemoglobin levels before and after the intervention of avocado juice and Ambon banana juice in the form of

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mean, median, mode, standard deviation, minimum and maximum.

Before conducting a bivariate analysis, the researcher first defined the data analysis by conducting a Shapiro-Wilk normality test on Hb levels, taking into account the intervention of avocado juice and ambon banana juice. The results of the Shapiro-Wilk haemoglobin normalisation test in intervention group I, i.e. before being given avocado juice, were 0.611 and after being given avocado juice, 0.103, in intervention group II, i.e. before being given ambon banana juice, 0.070 and after being given ambon banana juice, 0.459, so that intervention I and intervention II obtained a sig value > 0.05.

Means that the distribution of research data is normal and bivariate analysis in this study uses the Paired T Test for one-group testing while the T-independent test for two-group difference testing, namely testing the effect of avocado juice and banana juice

Means that the distribution of research data is normal and the bivariate analysis in this study uses the Paired T Test for one-group testing while the T-independent test for two-group difference testing, namely testing the effect of avocado juice and Ambon banana juice on the increase in Hb levels.

RESULTS AND DISCUSSION

The research was conducted at the Kebandaran Community Health Centre in Pemalang Regency in 2021 by measuring haemoglobin levels before and after the intervention.

Table 1. Hb Levels of Pregnant Women in the Third Trimester Before and After Being Given Avocado Juice (n=10)

Avocado Juice	Mean	SD	Min-Max
Haemoglobin level before intervention I (pre test)	9,120	0,5412	8,2-9,9
Hb level after intervention I (post telst)	11,150	0,5104	10,6-12

The results showed that the average haemoglobin concentration of the respondents before being given avocado juice was 9.12 g/dl and after being given avocado juice was 11.15 g/dl. This means that haemoglobin levels increased by 2.03 g/dl.

Avocado is a fruit rich in vitamin A. One of the other functions of vitamin A is to play a role in the

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formation of red blood cells through its interaction with the mineral Fe, thus preventing anaemia. Another vitamin contained in avocados is vitamin C. The role of vitamin C in the formation of erythrocytes is related to the function of vitamin C which accelerates the absorption of Fe minerals from the small intestinal mucosa and transfers it into the bloodstream to the bone marrow which is then used to form haemoglobin (Bawazir, 2018).

The haemoglobin level in the blood can determine the health or nutritional status of pregnant women. In the third trimester, haemoglobin deficiency can cause health problems for the mother and foetus, and even lead to the death of the foetus or mother. Kebandaran Community Health Centre uses pharmacological management by providing iron tablets and providing counselling on anaemia and the nutritional needs of pregnant women in the third trimester to treat anaemia or haemoglobin deficiency in pregnant women in the third trimester.

Pregnancy anaemia can be treated pharmacologically by taking iron tablets according to PMK Number 88 of 2014 and non-pharmacologically by consuming food or drinks that contain iron according to the results of research that has been carried out. Where the iron tablets are taken at night so that they do not coincide with the schedule for the additional intervention of drinking avocado juice and ambon banana juice in the afternoon.

Supported by the results of previous research, that there is an increase in Hb levels after the intervention of giving iron tablets accompanied by the intervention of avocado fruit juice (Novita, Munawaroh and Wulandari, 2024).

The researchers in this study provided non-pharmacological management by giving avocado juice, which was administered once a day every afternoon for 14 days, with an average haemoglobin level of 11.15 g/dL compared to 9.12 g/dL or an increase of 2.03 g/dL. This is because avocados are high in iron.

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Table 2. Hb levels in pregnant women in the third trimester before and after drinking ambon banana juice (n=10)

Ambon Banana Juice	Mean	SD	Min-Max
Hb level before intervention II (pre test)	9,420	0,5203	8,7-10
Hb level after intervention II (post test)	10,780	0,8779	9,2-11,8

The results showed that the average haemoglobin level of the respondents before receiving ambon banana juice was 9.42 g/dL and after receiving ambon banana juice was 10.78 g/dL. This means that the haemoglobin level increased by 1.36 g/dL.

In respondents who received ambon banana juice, their haemoglobin increased by 1.35 g/dL from 9.42 g/dL to 10.78 g/dL.

Table 3. Difference in Haemoglobin Levels of Pregnant Women in the Third Trimester Before and After Being Given Avocado Juice (n=10)

Variable	Mean	SD	ρ *value*
Haemoglobin Level Intervention I			
Pre test	9,120	0,5412	0,0001
Post test	11,150	0,5104	

The results of the paired t test obtained a p-value of 0.001 < 0.05, Ha is accepted which means that there is a difference in the hemoglobin levels of pregnant women with triplets before and after administering avocado juice.

The haemoglobin concentration of pregnant women in the third trimester who drink avocado juice increases after administration of avocado juice because avocados contain iron which can help increase red blood cells to overcome anaemia in the third trimester. This is supported by researchers who mention that there is a significant difference in average Hb and erythrocyte levels between measurements before the intervention (pre) and measurements on the fourteenth day of the intervention. An increase of 8.77% in Hb and 7.95% in erythrocytes. This shows that routinely consuming avocado juice for 14 days can help increase haemoglobin and erythrocyte levels (Bawazir, 2018).

Iron and copper are found in avocados. These two elements can help the formation of red blood cells, preventing anaemia. Magnesium and calcium can help pregnant women's bones become stronger during pregnancy and regulate blood pressure (Kurniawan, 2014)..

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Table 4. Difference in Haemoglobin Levels of Pregnant Women in the Third Trimester Before and After Being Given Ambon Banana Juice (n=10)

Variable	Mean	SD	ρ *value*
Haemoglobin Level Intervention II			
Pre test	9,420	0,5203	0,0001
Post test	10,780	0,8779	

The results of the paired t test obtained a ρ value of 0.0001 < 0.05, Ha is accepted which means that the haemoglobin levels of pregnant women in the third trimester before and after being given ambon banana juice are different.

The Hb (haemoglobin) level of pregnant women increases in the third trimester after being given ambon banana juice because ambon bananas contain iron so that they can overcome anaemia in the third trimester (Pangestu, 2022). Ambon bananas contain iron which can increase haemoglobin levels, and vitamin C which helps the absorption of iron from food (Mahardika and Zuraida, 2016).

Table 5. Differences in the Effectiveness of Avocado Juice and Ambon Banana Juice Interventions in Increasing Hb Levels in Pregnant Women in their Third Trimester at the Kebandaran Community Health Centre in Pemalang Regency (n=20)

Variable	N	Mean	SD	ρ *value*
Haemoglobin level				
Avocado Juice	10	2,030	0,3743	0,025
Ambon Banana Juice	10	1,360	0,7849	

The results of the independent T-test obtained a ρ value of 0.025 < 0.05, so Ha is accepted, meaning that the effectiveness of administering avocado juice and ambon banana juice increases Hb (hemoglobin) concentration in pregnant women in the third trimester at the Kebandaran Community Health Center in Pemalang Regency. Avocado juice is more effective at increasing Hb (haemoglobin) levels in pregnant women in the third trimester, when the difference in average Hb (haemoglobin) levels after and before the procedure is 2.030 g/dL, greater than the difference. The average haemoglobin content of ambon banana juice is 1,360 gr/dl.

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Avocado juice is more effective at increasing haemoglobin levels in pregnant women in their third trimester, because the difference in average haemoglobin levels after and before the intervention is greater, namely 2.030 g/dL compared to that provided by Ambon banana juice, namely 1.360 g/dL. This is because the vitamin C content in 100 grams of avocado is 82 mg, while the vitamin C content in 100 grams of Ambon banana is 3 mg.

This theory is supported by the results of previous research conducted

at the Sidang Community Health Centre in Indramayu Regency. The results of this study show that there is a positive effect of administering avocado juice for 14 days on increasing the average HB level (Bawazir, 2018).

Research Limitations

In the study of the effectiveness of administering avocado juice and Ambon banana juice interventions to increase Hb levels in pregnant women, there are several limitations, where the increase in Hb levels is not only influenced by the administration of avocado juice and Ambon banana juice, but also influenced by the consumption of iron tablets. So in this study it is necessary to review how effective the increase in Hb levels is with the administration of this intervention without the provision of iron tablets.

CONCLUSION

The average haemoglobin level of the respondents before being given avocado juice was 9.12 and after being given avocado juice it was 11.15. This means that haemoglobin levels increased by 2.03. The average Hb (haemoglobin) level of respondents before the ambon banana juice intervention was 9.42 and after the ambon banana juice intervention was 10.78. This means that the Hb (haemoglobin) level increased by 1.36. There is a difference in the Hb (haemoglobin) level of pregnant women in the third trimester before and after the avocado juice intervention with a ρ value of 0.0001. The effectiveness of avocado juice and ambon banana juice interventions in increasing Hb (haemoglobin) levels in pregnant women in the third trimester at the Kebandaran Community Health Centre in Pemalang Regency is different with a ρ value of 0.025 < 0.05. Avocado juice is more effective at increasing Hb

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(haemoglobin) levels in pregnant women in the third trimester than ambon banana juice.

In the third trimester, pregnant women with anaemia can use avocado juice or Ambon banana juice to increase haemoglobin. Women should not ignore the use of iron tablets when consuming avocado juice or Ambon banana juice to accelerate the increase in haemoglobin levels before delivery. The Kebandaran Community Health Centre can consider the results of this study as an additional intervention in an effort to optimise the reduction of anaemia in pregnant women, especially at the Kebandaran Community Health Centre in Pemalang. This research can be used for study materials and innovations to increase haemoglobin levels in the development of non-pharmacological innovations to help increase haemoglobin levels because avocados and Ambon bananas are enriched with iron which is effective for controlling iron deficiency and also contain vitamin C which can help increase iron absorption.

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