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The Effect of Avocado Consumption on Increasing Hemoglobin Levels in Pregnant Women at PMB Nellyana Working Area of the Sitinjo Sidikalang Health Center in 2023

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ABSTRACT
Anemia in pregnancy is a national problem reflecting well being social economic of public. Anemia in pregnancy potentially dangereous for mother and fetus because defisiensi Hb in blood can cause serious complication.Treatment pharmacology for treat anemia with consuming Fe tablet supplements and non-pharmacological with consuming fruit juice avocado. Avocado is fruit that is rich in vitamin A which plays a role in formation cell blood red through the interaction with Fe minerals so that prevent anemia occurs. This is Quantitative with design quasi experiment with design Two Group post test control design. Sample use purposive sampling technique with amount sample 16 respondents use 2 groups treatment and group control. Research statistical analysis this using the paired sample T- test , based on paired t- test Hb levels in respondents before and after given avocado juice obtained value Sig. (2-tailed) i.e. 0.00 or more small of p <0.05, while for respondents who do not given avocado obtained value Sig. (2-tailed) before and after i.e. 0.351 or more big from p>0.05. Based on results the could concluded that there is influence fruit juice _ avocado significant on the increase respondent 's Hb level compared with respondents who do not given avocado.

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INTRODUCTION

Anemia is one of the nutritional problems that needs attention and is one of the public health problems in Indonesia. Anemia, which is commonly called anemia, is a condition when the body lacks red blood cells or hemoglobin (Hb), where Hb in the blood is at a level lower than its normal limit. Pregnant women are a group that is very susceptible to anemia, this is due to the increasing need of the mother's body for iron, along with increasing gestational age (Dinkes Kalbar, 2022)

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Anemia in pregnant women is generally caused by physiological changes during pregnancy and is exacerbated by malnutrition. Anemia that is often found in pregnancy is the result of iron deficiency. This occurs due to the increasing need for iron to supply the fetus and placenta, in order to enlarge the tissue and the period of red blood cells. The impact of anemia on pregnant women can cause inhibition in fetal growth, both body cells and brain cells, abortion, the length of delivery time due to lack of uterine thrust, bleeding, and infection. Anemia in pregnancy can be affected by gestational age factors. Nutritional status is also widely associated with the incidence of anemia in pregnancy. Anemia is higher in pregnant women with Chronic Energy Deficiency (LILA< 23.5 cm) compared to well-nourished pregnant women. (Hidayah Pramesty Dewi et al, 2021)

The signs that can be seen if a pregnant woman experiences anemia are 5 L's, namely weakness, fatigue, lethargy, fatigue and lethargy. Often, pregnant women who experience anemia will have a pale-looking face, eyelids, tongue and lips and eyes that are glowing. If a pregnant woman experiences anemia, it can cause several impacts such as miscarriage/abortion, bleeding during pregnancy which can cause maternal death, premature delivery, fetal disorders, problems during childbirth and postpartum and low birth weight babies. Meanwhile, if the mother experiences severe anemia, it can cause the risk of death in the baby (Dinkes jogjaprov, 2023)

The effects of anemia in pregnancy can be fatal if not addressed immediately, including increasing the risk of premature birth, maternal and child death, and infectious diseases. Iron deficiency anemia in pregnant women can affect the growth and development of the fetus or baby during pregnancy and afterwards. In addition, in developing countries, many low birth weight babies (BBLR) with Intrauterine Growth Retardation (IUGR) because the mother is malnourished, anemic, malaria and suffers from sexually transmitted diseases (STDs) before conception or during pregnancy (Sarl et al., 2020)

According to Feriyal in his 2019 research, there are various ways to overcome and prevent anemia problems that occur in pregnant women, namely pharmacological and non-pharmacological methods. Pharmacological treatment for the treatment of nutritional deficiency anemia is the administration of iron tablet supplementation or Fe tablets orally given 60 mg/day, while the non-pharmacological method can consume protein-rich ingredients that can be obtained from animals and plants and consume those rich in iron and nutrients such as avocados which can form red blood cells and hemoglobin.

The avocado content has important nutrients, namely vitamin C, vitamin E, vitamin K, iron, folic acid, potassium and quite high levels of calories and fats which are useful as a source of energy. The iron contained in avocados is beneficial for the formation of red blood cells, increasing the flow of oxygen throughout the body, preventing and treating anemia. Vitamin C can help the body to absorb iron and calcium. The iron and vitamin C content in avocados can prevent or treat anemia (Utami, 2020)

Avocado is a fruit rich in vitamin A. Vitamin A has a role in erythropoesis related to its function of synthesizing proteins so that it will affect the growth of bone cells. Bone marrow is the site of the formation of erythrocytes. Vitamin A is needed in several essential processes

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in the body such as metabolism, hematopoesis, erythropoosis, regulation of cell differentiation, and plays a role in the immune system. One of the other functions of vitamin A is to play a role in the formation of red blood cells through its interaction with the mineral Fe so as to prevent anemia. Another vitamin contained in avocados is vitamin C. Vitamin C's role in erythrocyte formation is related to the function of vitamin C which accelerates the absorption of the mineral Fe from the small intestinal mucosa and moves it into the bloodstream towards the bone marrow which is further used to form hemoglobin (Kasturi Amelia, 2021).

METHODS

The type of research used in the study is a quasi experiment with a design design (Two Group pretest-posttest), which is to determine the effect on the treatment group by comparing it with the control group. This design uses 2 groups, namely the treatment group and the control group. The treatment group was given avocados while the control group was not given avocados to pregnant women who received Fe tablets at PMB Nellyana Working Area of the Sitinjo Sidikalang Health Center

RESULTS AND DISCUSSION

Table 1 Distribution of hemoglobin levels in the treatment group and control group before and after the experiment

Analisis Univariat				Mean	N	Std. Deviation
Variabel	Mean	N	Std. Deviation			
Hb Pretest (X)	9.0	8	.7050			
Hb Post test (X)	10.5	8	5806			
Hb Pre test (0)	9.5	8	.5339			
HB Posttest (0)	9.6	8	.5071			

Based on Table 1, it was obtained that the average (Mean) level of Hemoglobin (Hb) in the treatment group was 9.0 and the level of Hemoglobin (Hb) after being given the treatment (Consumption of Avocado) for 7 days, the level of Hemoglobin (Hb) increased, which was an average of 10.5. Meanwhile, the average level of Hemoglobin (Hb) in the control group that was not given treatment (before) was 9.5 and only experienced a slight average increase of 9.6

Table 2. Paired t test Analysis of the effect of avocado consumption on increasing Hb levels in pregnant women

	Paired Differences			
	Mean	Std. Deviation	t	Sig. (2-tailed)
Hb level before administration - hb level after administration/treatment	-1.4375	.6093	-6.673	0,00

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Hb levels not given (before) - hb levels after 7 days are not given avocado juice/control	-.0250	.0707	-1.000	0,351

Based on table 2, the results of the paired test of Hb levels in the treatment group before and after avocado were given, a Sig. (2-tailed) value was obtained, which was 0.00 or less than p<0.05, so it can be concluded that there was a significant increase in Hb levels from before avocado administration and after avocado administration. Meanwhile, respondents who were not given avocados obtained a Sig value. (2-tailed) before and after is 0.351 or greater than p>0.05 so it can be concluded that there is no significant increase in Hb in respondents who are not given avocados.

Based on these results, it can be concluded that Ha is meaningful, which means that there is an effect of avocado consumption on increasing Hb levels of pregnant women discussion Based on Table 1, the average (mean) hemoglobin (Hb) level of pregnant women in the treatment group is 9.06 and the average hemoglobin (Hb) level of pregnant women in the control group is 9.75. The data showed that all pregnant women who were respondents in this study experienced anemia with an Hb level of < 11 gr/dl. According to WHO, the classification of anemia based on the Hb level of pregnant women, pregnant women with Hb levels of 8-10 gr % are categorized as mild anemia

Anemia in pregnant women is a condition experienced by all mothers who show the results of a blood Hb test below 11 gr%. Anemia is a lack of quality and quantity of blood cells that carry oxygen around the body in the form of hemoglobin, later this will cause a reduction in the capacity of red blood cells to carry oxygen for the mother and fetus (Manuaba, 2015).

Anemia that often occurs in pregnant women is anemia due to iron deficiency (Fe) or called iron nutritional anemia (AGB). About 95% of anemia cases during pregnancy are due to iron deficiency. Diversity of food consumption plays an important role in helping to increase the absorption of Fe in the body. Insufficient intake of iron and protein due to not consuming iron-containing foods can cause iron deficiency anemia (Melorys Lestari Purwaningtyas, et al., 2017).

Anemia in pregnancy can have a bad effect, especially during pregnancy, childbirth and postpartum. The effects of anemia during pregnancy can be in the form of abortion, premature delivery, premature rupture of membranes (KPD)

Efforts to overcome iron deficiency anemia in pregnant women are carried out through increasing the coverage of iron tablet supplementation. Another effort that can be made by paying attention to the consumption patterns of pregnant women must still refer to a healthy and balanced diet contained in the general message of balanced nutrition (PUGS). Dietary regulation in pregnant women is not in quantity or quantity but in the quality or composition of nutrients, because this factor is more effective and functional for the health of the mother

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and fetus. For example, to increase the consumption of high-iron foodstuffs such as milk, meat, and green vegetables and fruits (Heliyani, 2017).

Avocado is a fruit rich in vitamin A. Vitamin A has a role in erythropoesis related to its function of synthesizing proteins so that it will affect the growth of bone cells. Bone marrow is the site of the formation of erythrocytes. One of the other functions of vitamin A is to play a role in the formation of red blood cells through its interaction with the mineral Fe so as to prevent anemia. Another vitamin contained in avocados is vitamin C. Vitamin C's role in erythrocyte formation is related to the function of vitamin C which accelerates the absorption of Fe minerals from the small intestinal mucosa and moves it into the bloodstream towards the bone marrow which is further used to form hemoglobin. (Feriyal, 2019)

Based on Table 1, it was shown that the average Hb levels of respondents in the treatment group and control group from the independent t statistical test were obtained the average value of changes in hemoglobin levels before and after the group given Fe Tablets (control group), namely before (9.5) and after being carried out for 7 days (9.6).

The results of the data analysis are in line with the research conducted by Sari (2016) in her research on the effectiveness of giving Fe tablets on increasing Hb levels in pregnant women in the third trimester, in the study stated that the administration of Fe tablets was effective in increasing Hb levels in pregnant women in the third trimester.

According to the researcher, low hemoglobin levels in pregnant women who were respondents in this study could be caused by hemodilution. Hemodilution occurs at 16 weeks of gestation and the peak of hemodilution is at 32-36 weeks of gestation and will decrease after that. The hemodilution process is a physiological adjustment of the self to ease the heavy workload of the heart as a result of an increase in blood volume so that cardiac output increases. The hemodilution process that occurs in pregnant women can cause physiological anemia with hemoglobin levels of 9.5-10 gr/dl.

According to researchers, an unbalanced and diverse diet required for the process of absorption and formation of blood as well as lack of iron intake and iron absorption disorders are the causes of mothers experiencing anemia in addition to many factors that can cause problems in the process of iron absorption to the process of blood formation. For example, chronic diseases and parasites. To be able to overcome anemia in a pregnant woman, it is necessary to carry out an approach and examination to find out what causes anemia in the pregnant woman, considering that there are many factors that can cause anemia in a person.

Based on table 1, it shows that the average Hb level of pregnant women who received treatment (control group) before giving was 9.06 while the Hb level after being given increased by an average of 10.50. This showed that the administration of Fe tablets significantly increased the average Hb level when added by drinking avocado juice for 7 days.

Anemia management in pregnant women can be done by giving iron tablets and improving the quality of daily food. Giving avocado juice to respondents every day for 7 days can help increase hemoglobin levels because avocados are rich in iron and copper which are beneficial for pregnant women. Avocados contain iron which has benefits including lowering cholesterol levels, balancing blood sugar, strengthening kidney and bone function, improving

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brain work, as a blood enhancer, and reducing the risk of cancer. The iron and copper found in avocados greatly help the formation of red blood cells. The natural nutrient content of avocados stimulates the body to produce blood platelets according to the amount needed by the body.

Avocado is a fruit rich in vitamin A. Vitamin A has a role in erythropoesis related to its function of synthesizing proteins so that it will affect the growth of bone cells. Bone marrow is the site of the formation of erythrocytes. Vitamin A is needed in several essential processes in the body such as metabolism, hematopoesis, erythropoosis, regulation of cell differentiation, and plays a role in the immune system. One of the other functions of vitamin A is to play a role in the formation of red blood cells through its interaction with the mineral Fe so as to prevent anemia. Another vitamin contained in avocados is vitamin C. Vitamin C's role in erythrocyte formation 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 towards the bone marrow which is further used to form hemoglobin (Kasturi Amelia, 2021)

Based on the paired test of Hb levels in respondents before and after being given avocado juice, a Sig. (2-tailed) value was obtained, which was 0.00 or less than $p<0.05$ so it can be concluded that there is a significant difference in Hb levels from before avocado administration and after avocado administration. Meanwhile, in respondents who were not given avocados, the Sig. (2-tailed) value before and after was 0.351 or greater than $p>0.05$ so it can be concluded that there was no significant difference in Hb in respondents who were not given avocados. This difference shows that avocado consumption affects the increase in hemoglobin levels in pregnant women. Avocados have nutritional content that is quite important for pregnant women, especially in helping to increase hemoglobin and erythrocyte levels. Based on these results, it can be concluded that there is a significant effect of avocado consumption on the increase in respondents' Hb levels compared to respondents who are not given avocados. So Ha means which means that there is an effect of avocado consumption on the increase in hemoglobin levels of pregnant women

The results of this study are in line with the results of research conducted by Feriyal in his research entitled The Effect of Avocado Juice on Increasing Hemoglobin Levels and the Number of Erythrocytes in Pregnant Women. The conclusion of the study was that there was a positive effect of 14-day avocado juice administration on the increase in Hb levels and average erythrocyte count but there was no difference between the group and the intervention.

CONCLUSION

Based on the results of the research and discussion on the effect of avocado juice on the increase in hemoglobin levels in pregnant women at PMB Nellyana Working Area of the Sitinjo Sidikalang Health Center, namely: Based on the results of the study, the average hemoglobin level of repondent (pregnant women) included in the experimental group was 9.06 and the average hemoglobin level of pregnant women included in the control group was

9.75. There was a difference in the average Hb level before being given was 9.06 while the Hb level after being given increased by an average of 10.50. Meanwhile, the average Hb level in respondents who were not given (before) was 9.75 and only experienced a slight average increase after being given, namely 9.60. Based on the paired test of Hb levels in respondents before and after being given avocado juice, a Sig. (2-tailed) value was obtained, which was 0.00 or less than $p<0.05$ so it can be concluded that there is a significant difference in Hb levels from before avocado administration and after avocado administration. Meanwhile, in respondents who were not given avocados, the Sig. (2-tailed) value before and after was 0.351 or greater than $p>0.05$ so it can be concluded that there is no significant difference in Hb in respondents who are not given avocados. There is an effect of avocado consumption on the increase in hemoglobin levels of pregnant women at PMB Nellyana Working Area of the Sitinjo Sidikalang Health Center.

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