

THE EFFECTIVENESS OF GIVING BOILED EGGS AND PAPAYA FRUIT AGAINST CHANGES IN HEMOGLOBIN LEVELS IN PREGNANT WOMEN AT PMB F BEKASI

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Abstract

Background: Anemia in pregnant women is categorized as a global health problem. One of the factors for the high maternal mortality rate is the existence of high-risk pregnancies, diseases that are included in high-risk pregnancies, including anemia. The impact of anemia on pregnant women can cause obstacles to the growth of the fetus, both body cells and brain cells, abortion, prolonged labor due to lack of uterine thrust, bleeding, and infection.

Purpose: To determine the effectiveness of boiled eggs and papaya fruit on changes in hemoglobin levels in pregnant women at PMB Fitria Wulandari, Bekasi in 2023.

Methods: This study used a quasi-experimental pretest-posttest control group design. The research sample consisted of 30 respondents consisting of 15 people in the intervention group and 15 people in the control group. Sampling was done by using total sampling.

Result: The average hemoglobin level of the control group before administration of Fe tablets was 10.687 gr/dl and after consuming Fe tablets was 10.773 gr/dl. While the average hemoglobin level in the intervention group before being given FE plus boiled eggs and papaya fruit was 10.473 gr/dl and after consuming Fe tablets plus boiled eggs and papaya fruit was 11,313 gr/dl. The statistical test results obtained p value: 0.000.

Conclusion: There is an effectiveness in changing hemoglobin levels in pregnant women after consuming boiled eggs and papaya fruit at PMB Fitria Bekasi in 2023. Pregnant women can use eggs and papaya fruit as an alternative option to help increase hemoglobin levels.

Keywords: Anemia, Boiled eggs and papaya fruit, Hemoglobin levels, FE tablets

Introduction

Hemoglobin is a protein in red blood cells that functions to transport oxygen from the lungs throughout the body. A decrease in the level of hemoglobin in the blood is called anemia. Anemia is caused by many factors including bleeding, low nutrition, iron levels, folic acid, low vitamin B12. The symptoms are weak body, lethargy of firefly eyes and pallor, especially in the conjunctiva, while the increase in hemoglobin levels in the blood is called polycytemi.¹

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The prevalence of anemia globally occurred in 204 countries from 1990 – 2019. Based on data from the World Health Organization (WHO), anemia in pregnant women is categorized as a global health problem with a prevalence of 29.6% in 2018, where in Indonesia itself the latest data from Riskesdas 2018 which states that 48.9% of pregnant women experience anemia. As many as 84.6% of anemia in pregnant women occurs in the age group of 15-24 years.²

One of the factors for the high mortality rate of childbirth is the existence of high-risk pregnancies, namely, pregnancies that are accompanied by diseases or conditions that can have a bad impact on the mother or the fetus. The diseases included in high-risk pregnancy include anemia, hypertension, heart disease and diabetes.³

Anemia in pregnant women is generally caused by physiological changes during pregnancy and is aggravated by malnutrition. This happens because of the increasing need for iron to supply the fetus and placenta, in order to enlarge tissues and the period of red blood cells.

The treatment and prevention of anemia can be done by consuming foods that contain vitamins and minerals that support the formation of red blood cells as prevention, fortification of foodstuffs with iron, and iron supplementation. The mother's iron requirement during pregnancy is 800 mg of iron including 300 mg for the placental fetus and 500 mg for the increase of maternal erythrocytes, for that pregnant women need 2-3 mg of iron every day.⁴ Consume diverse foods rich in iron, folate, vitamin B12, and vitamin C such as those found in the liver, meat, nuts, dark green vegetables, fruits, etc.

Iron in food can take the form of heme and nonheme. Heme iron is iron that binds to proteins, widely found in animal foods such as meat, poultry, and fish. Nonheme iron is commonly found in herbs such as cereals, nuts, vegetables, and fruits. Heme iron is absorbed by 20-30%, while nonheme iron is only absorbed by 1-6%. The results of a study showed that as much as 37% of heme substances and 5% of nonheme substances present in the diet can be absorbed and increased by the intake of vitamin C.⁵

Based on preliminary observations on November 13, 2022 at PMB Fitria Wulandari Bekasi, the number of pregnant women in the 1st – third trimester in the last 3 months was 84 pregnant women. Data obtained as many as 50% of pregnant women experience mild to severe anemia. Based on this description, researchers are interested in researching "The Effectiveness of Giving Boiled Eggs and Papaya Fruit against Changes in Hemoglobin in Pregnant Women at PMB Fitria Wulandari Bekasi in 2023".

Method

1. Research design

The type of research used in this study is a quasi-experimental type of research . The research design used is Pretest-Posttest Control Group Design. This design can involve more than two groups although the basic design involves only two groups. Both groups were observed at the beginning and end of treatment ⁶.

2. Settings and samples

The study was conducted in January 2023 at PMB Fitria Wulandari. The population in

this study was all hamis mothers who conducted examinations at PMB Fitria Wulandari which amounted to 84 people and obtained a total sample of 30 people who had met the inclusion and exclusion criteria with the total sampling technique.

3. Measurement and data collection

The research instrument used in this study was in the form of an observation sheet on hemoglobin levels in pregnant women using digital hb. The assessment of both groups of respondents was carried out before and after the treatment. Standard Operating Procedure (SOP) for making boiled eggs and papaya fruit, namely chicken eggs boiled until ripe and for papaya fruit, papaya fruit is peeled off the skin and then washed thoroughly and cut into pieces after that the papaya fruit is weighed with a weight of 200 grams. The method of consumption is 1 boiled egg and papaya fruit consumed in the morning with a consumption distance of 15 minutes.

4. Data analysis

Data analysis using SPSS (Statistical Package for the Social Sciences) software with tests using independent statistical t-tests with p Value $0.000 < 0.05$ which means that statistical tests show an influence on the intervention group given the treatment.

Result

Based on the results of data analysis in this study, the following results are known:

Table 1.
Hemoglobin Levels Before Intervention

Hemoglobin Levels	N	Mean	SD	Min	Max
Intervention	15	10,473	0,4431	9,5	11,0
Control	15	10,687	0,2949	10,4	12,3

Based on table 1, the average value of hemoglobin levels before being given intervention in the intervention group with a total of 15 respondents had a mean value of 10.473 with a standard deviation of 0.4431 while the average value of hemoglobin levels in the control group with the number of 15 respondents had a mean value of 10.687 with a standard deviation of 0.2949. From the two data, there is no difference in the average value which is very different because in the two groups both have not been given treatment and monitoring.

Table 2.
Hemoglobin Levels After Intervention

Hemoglobin Levels	N	Mean	SD	Min	Max
Intervention	15	11,313	0,6198	10,2	11,3
Control	15	10,773	0,4114	10,0	10,5

Based on table 2, the average value of hemoglobin levels after being given intervention in the intervention group with a total of 15 respondents had a mean value of 11.313 with a standard deviation of 0.6198 while the average value of hemoglobin levels in the control group with the number of 15 respondents had a mean value of 10.773 with a standard deviation of 0.4114. Thus, the monitoring results of the two groups showed the effectiveness of giving boiled eggs and papaya fruit in the intervention group (treatment group)

Table 3.
Effectiveness of Giving Boiled Eggs and Papaya Fruit against Changes in Hemoglobin Levels in Pregnant Women

Group	Hemoglobin Levels	N	Mean	Std. deviasi	Sig. (2-tailed)
Intervention	Before	15	10,473	0,4431	0,000
	After	15	11,313	0,6198	
Control	Before	15	10,687	0,2949	0,255
	After	15	10,773	0,4114	

Based on the data above, the results of pretest analysis were obtained in the intervention group with a total of 15 respondents having a mean value of 10.473 with a Standard deviation value of 0.4431, while in the control group with a total of 15 respondents, a mean value of 10.687 was obtained with a standard deviation value of 0.2949 and the results of the analysis in the posttest were obtained a mean value in the intervention group of 11.313 with a standard deviation value of 0.6198, while the mean value in the control group was 10.773 with a standard deviation value of 0.4114.

The results of the paired t-test analysis can be concluded that the value of significant values in the intervention group obtained a p-value of 0.000 ($p < 0.05$) which means that there is effectiveness in giving boiled eggs and papaya fruit against changes in hemoglobin levels in pregnant women.

Table 4.
Average Difference in Hemoglobin Levels of Intervention Group and Control Group

Variable	Group	N	Mean	Sig. (2-tailed)
Hemoglobin Levels	Intervention	15	11,313	0,009
	Control		10,773	

Based on table 5 after an independent T-test obtained the results of the difference in the average hemoglobin level in the intervention group of 11,313 while the results of the analysis from the control group obtained the average result of changes in hemoglobin levels of 10.773 with a p-value of $0.009 < 0.05$ so that H_0 was rejected and H_1 was accepted, it can be concluded that there was a difference after the intervention between the intervention group and the control group. Because there is a significant difference, it can be said that there is an effectiveness in giving boiled eggs and papaya fruit against changes in hemoglobin levels in pregnant women

Discussion

Based on the results, it was found that the intervention group had an average hemoglobin value of 10.473 gr / dL with a standard deviation value of 0.4431, while in the control group an average value of 10.687 gr / dL was obtained with a standard deviation value of 0.2949. The most common anemia experienced by pregnant women is anemia due to iron deficiency. This is not surprising because protein deficiency leads to reduced hemoglobin formation and red blood cell formation. Anemia in pregnancy is defined as a mother with Hb levels < 11.0 gr / dl.⁷

The impact of anemia during pregnancy for the mother can cause abortion, premature delivery, inhibition of fetal growth and development in the womb, increased risk of infection, threat of cardiac decompensation if Hb is less than 6.0 g / DL, mola hidatidosa, hyperemesis gravidarum, antepartum bleeding, or premature rupture, while the impact of anemia on the fetus can occur abortus, low birth weight and low infant intelligence levels.⁸

One way to prevent anemia or increase Hb levels for pregnant women is to consume foods that are high in iron and rich in vitamin C such as chicken eggs and fruits. The nutritional content of eggs is rich in high-grade protein. The average protein content of eggs is 12-16% or about 7-8 grams of protein in one fairly large egg.⁹

The results of the study in the intervention group had an average hemoglobin value of 11.313 gr / dL with a standard deviation value of 0.6198, while in the examination of hemoglobin levels of the control group obtained an average value of 10.773 gr / dL with a standard deviation value of 0.4114, which means that there is an increase in Hemoglobin levels in pregnant women after the intervention of papaya fruit and boiled eggs for 7 days.

In line with the study in 2021 on India where 30 people with iron deficiency anemia were selected to consume papaya twice a day and the results were obtained there was an increase in Hb values of 0.6 gm / dl and 0.4 gm / dl and the researcher concluded that papaya fruit was proven to be more efficient in the treatment of iron deficiency anemia.¹⁰ As for other research on the benefits of papaya fruit conducted in 2020.¹¹

Also supported by research in 2020 shows that pregnant women who consume boiled eggs have hemoglobin levels before treatment on average 9.21 gr% and hemoglobin levels after treatment are 10.99 gr%. The results of the statistical test obtained a p value of 0.001 where the p value < 0.05 so that there is an influence of purebred chicken egg consumption on the hemoglobin levels of pregnant women.¹²

The results of the analysis based on the paired t-test showed that the average nilsi after intervention in the intervention group was 11.313 with a standard deviation value of 0.6198. When viewed from the results of these statistical calculations, the average respondent is in the category of normal hemoglobin levels. Normal hemoglobin levels in pregnant women are not < 11.

Meanwhile, the average in the control group that was not treated had an average value of 10.687 with a deviation standard of 0.2949 and these results were seen from the statistical results, the average respondent was in the category of mild anemia.

Based on the analysis in the intervention group, sig results were obtained. $0.000 < 0.05$ so that it can be concluded that there is an effectiveness of giving boiled eggs and papaya fruit against changes in hemoglobin levels in pregnant women. This is in line with research conducted on 2022) in the Taminabuan Health Center Working Area, Sorong Regency, where based on the results of the analysis of statistical test results using an independent t-test, a Sig value was obtained. (2-tailed) of 0.006 is smaller than the alpha value of 0.05 ($p < \alpha 0.05$), then according to the basis of decision making with the test results, it means that there is a significant difference between papaya fruit and boiled eggs against the increase in levels hemoglobin.⁹

Anemia is a medical condition in which the number of red blood cells or hemoglobin is less than normal. Anemia is mostly caused by iron deficiency. There are many ways that can be done in reducing the incidence of anemia in pregnant women, one of which is by taking Fe tablets, or by eating additional foods that contain vitamin C such as papaya fruit and boiled eggs.

Vitamin C itself plays an important role in the process of iron absorption, namely by converting ferrous iron (Fe^{3+}) into ferrous (Fe^{2+}) in the intestine so that it is easily absorbed.⁹

While the nutritional content of boiled chicken eggs is rich in high-grade animal protein. Boiled eggs also contain very important and quite high substances, namely iron 6.5 mg, the iron content of chicken eggs is 6.5 mg in whole eggs, 0.2 mg in egg whites and 6.3 mg in egg yolks. The zinc content in chicken eggs is 6.0 mg of whole eggs and 0.2 mg of egg yolks and egg whites of 5.8 mg and the content of selenium substances in chicken eggs is 5.8 mg of whole eggs, 1.6 mg of egg whites and 4.2 mg of egg yolks.¹³

Limitations

In the implementation of this study, there were several limitations and obstacles experienced by researchers, namely requiring a longer time, requiring complete experimental equipment and finding research respondents for quite a long time because respondents had to get interventions, namely boiled eggs and papaya fruit.

Conclusion

There is an effectiveness of giving boiled eggs and papaya fruit against changes in hemoglobin levels in pregnant women at PMB Fitria Wulandari Bekasi in 2023, with an independent t test obtained a p value of 0.000 (< 0.05). It is recommended that pregnant women can consume boiled eggs and papaya fruit as another option to be able to help increase hemoglobin levels in addition to consuming Fe tablets.

Ethical Approval

The study has gone through a review from the ethics commission.

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Conflict of Interest

No conflict of interest.

Authors contribution

AHP Compiles and designs research, conducts analysis and interprets data and compiles the draft manuscript. AHP, PA and VS are involved in the analysis, interpretation of data. PA and VS critically reviewed the manuscript. All authors read and agree on the final manuscript.

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