

The Effect Of Combination Of Super Red Dragon Fruit Extract (*Hylocereus Costaricensis*) + Fe Tablets On Increasing Hemoglobin Levels In Pregnant Women In Trimester Iii With Anemia

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ABSTRACT

Anemia in pregnancy, namely hemoglobin <11gram/dl for the first and third trimesters, and <10.5 grams/dl for the second trimester. Super red dragon fruit (*Hylocereus costaricensis*) is one of the many alternatives used to help prevent anemia in pregnancy. Objective: To determine the effect of the combination of super red dragon fruit extract + Fe tablets on the average increase in hemoglobin in third trimester pregnant women with anemia. Objective To determine the effect of the combination of super red dragon fruit extract + Fe tablets on the average increase in hemoglobin of pregnant women in the third trimester with anemia. The results of the intervention group were the pretest hemoglobin level of 9.352 grams/dL and the post-test hemoglobin level of 10.845 grams/dL with p value <0.05, while the pretest control group had a hemoglobin level of 9.202 grams/dL and a posttest hemoglobin level of 10,635 grams/dL with a p value <0.05. There is an effect of the combination of super red dragon fruit extract + Fe tablets on the increase in hemoglobin levels.

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1. Introduction

Anemia occurs due to a decrease in the capacity of the blood to carry oxygen due to a normal red blood cell count or a decrease in the concentration of hemoglobin levels caused by a decrease in erythrocyte production or a lot of blood loss in the body.(Oliver & Olufunto, 2012). The group most prone to iron deficiency anemia is pregnant women. Anemia in pregnancy is a condition or state of hemoglobin levels in the blood below 11 grams/dl for the first and third trimesters or below 10.5 grams/dl in the second trimester.(Oliver & Olufunto, 2012). A very important health problem worldwide is anemia with 51% of pregnant women suffering from anemia, which is higher than women who are not pregnant(Cunningham et al., 2010).

In the world, according to World Health Organization (WHO) data, the prevalence of anemia in pregnant women in 2018 experienced iron deficiency anemia of around 35-75%, while in Indonesia the incidence of anemia in pregnant women according to the Basic Health Research (Riskesdas) in 2018 experienced deficiency anemia. iron about 48.9%(Riskesdas, 2018).

In Indonesia, the coverage of giving blood tablets to pregnant women in Indonesia in 2020 is 83.6%. this number increased compared to 2019 of 64%. Problems caused by anemia if not treated immediately can cause premature labor, abortion, uterine inertia, uterine atony, prolonged labor, and bleeding and even shock occurs. In addition, anemia also has an impact on the fetus, namely miscarriage, Intrauterine Fetal Distress (IUFD), Low Birth Weight Babies (LBW), prematurity, perinatal death, congenital defects, fetal death at birth, Intelligence Quotient (IQ) is not optimal, infants easily infected, and poor nutrition(Indonesia, 2021).

Iron (Fe) is an essential microelement of the body needed in the formation of hemoglobin and can be obtained from various types of foods such as red meat, spinach, kale, beans, fruits and others. The iron needed during pregnancy is ±1000 milligrams, including ±500 milligrams used to increase the volume of erythrocytes, ±300 milligrams used as a means of transporting blood to

the fetus during ± 12 weeks of gestation and ± 200 milligrams used to replace lost body fluids. Iron (Fe) during the first trimester of pregnancy was relatively low at ± 0.8 milligrams per day, then increased more rapidly during the second and third trimesters of pregnancy, ± 6.3 milligrams per day. (Prawirohardjo, 2012).

Super red dragon fruit (*Hylocereus Costaricensis*), is a species of dragon fruit plant with a super red fruit color. This fruit plant morphologically can be described as an incomplete plant because it does not have leaves like other plants. However, this plant also has roots, stems, branches, seeds and flowers (Idawati, 2012).

Dragon fruit contains iron (for blood booster), vitamin B1 (helps convert food into energy, important in neurological function), vitamin B2 (helps in energy production and other chemical processes in the body, helps maintain healthy eyes, skin and nerve function.), vitamin B3 (helps convert food into energy and maintain brain function), and vitamin C (helps the absorption of iron by the body thus preventing anemia) (Mayuri, Smita and Merchant, 2018).

This study aims to determine the effect of the combination of super red dragon fruit extract (*Hylocereus costaricensis*) + Fe (iron) tablets on the average increase in hemoglobin in third trimester pregnant women with anemia.

2. Method

In this study, the method used was quasi-experimental, using a pretest-posttest control group design. The study was conducted in February–May 2022 at the Balinggi Public Health Center, Parigi Moutong Regency, Central Sulawesi Province with a sample of 40 respondents as the intervention group and 40 respondents as the control group. Statistical analysis using the data normality test with Shapiro-Wilk, then because the data is not normally distributed using Mann Whitney.

2.1 Statistic analysis

Univariate analysis is a descriptive analysis of the score of the effect of the combination of super red dragon fruit extract + Fe tablets on the increase in hemoglobin levels. Data by presenting the statistical size of the average and standard deviation, while for categorical data by presenting the number of percentages. Bivariate analysis is an analysis conducted to determine the relationship between two variables. Data analysis begins with prerequisite tests, then continues with hypothesis testing. Before analyzing the data, homogeneity test and normality test were carried out using the Saphiro Wilk test, provided that the number of subjects was 50. If the data is normally distributed then use an independent t-test and if the data is not normally distributed use the Mann-Whitney test.

3. Results and Discussion

3.1 Characteristics of Respondent Subjects

Table 1
Characteristics of Research Subjects

Characteristics	Intervention Group N=40		Control Group N=40	
	N	%	N	%
Age				
< 20 Years	2	5%	10	25%
20–35 Years	34	85%	26	65%
>35 Years Old	4	10%	4	10%
Education				
Sd	3	7.5%	8	20%
Junior High School	8	20%	8	20%
Senior High School	18	45%	13	32.5%
College	11	27.5%	11	7.5%
Work				
Working	11	27.5%	9	22.5%
Doesn't Work	29	72.5%	31	77.5%

Description: n = Respondents, % percentage

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Based on Table 1. it can be explained that the characteristics of respondents based on the age of the intervention pregnant women were mostly (85%) at the age of 20-35 years and most of the controls (65%) were 20-35 years. Most of the intervention pregnant women (45%) were senior high school and control (32.5%) were high school. Most of the intervention pregnant women (73.5%) did not work and most of the controls (77.5%) did not work.

3.2 Bivariate Analysis

Bivariate analysis aims to determine the effect of the combination of super red dragon fruit extract + Fe tablets on increasing hemoglobin levels in third trimester pregnant women in the Balinggi Public Health Center, Parigi Moutong Regency, Central Sulawesi Province using the Mann Whitney test with $p < 0.05$.

Table 2.

Effect of a combination of super red dragon fruit extract + Fe tablets on increasing hemoglobin levels

Measurement Group	Pretest		Posttest		Difference	p value
	mean	SD	mean	SD		
Intervention group	9,352	0.3434	10,845	0.1568	1,493	< 0.05
control group	9,202	0.4610	10,635	0.3034	1,433	< 0.05

Table 3.

Frequency Distribution of Knowledge of Pregnant Women TM III About Birthing Ball Therapy to Reduce Pain in the Process Childbirth At Helen's Clinic dance Based on Age in 2022.

No. _ Age	Knowledge level						Amount	
	Good	%	Enough	%	Less	%	f	%
1 < 20	f		f		f		f	
2 20-35	0	0	0	0	0	0	0	0
3 > 35	7	29	16	67	1	4	24	100
	0	0	2	100	0	0	2	100

Description: Mann Whitney test

The statistical test data using the Mann Whitney test related to the increase in hemoglobin levels in third trimester pregnant women with anemia showed that there was an increase in hemoglobin levels in both the intervention group and the control group. The pretest intervention group got an average hemoglobin level of 9.352 g/dL and the posttest got an average hemoglobin level of 10.845 g/dL with a difference of 1.493, $p < 0.05$ in the pretest and $p < 0.05$ in the posttest which was significant. there was an effect but not significant between the pretest and posttest administration of a combination of super red dragon fruit extract + Fe tablets. The pretest control group got an average hemoglobin level of 9.202 g/dL and the posttest got an average hemoglobin level of 10.635 g/dL with a difference of 1.433, $p < 0.05$ in the pretest and $p < 0.05$ in the posttest which was significant. there was an effect but not significant between the pretest and posttest administration of Fe tablets alone. Based on Table 2. there is an effect of the combination of super red dragon fruit extract + Fe tablets on increasing hemoglobin levels in third trimester pregnant women with anemia.

3.2 Discussion

a. Characteristics of Research Subjects (Age, Education, Occupation)

Based on the results of the study, most of the respondents belonged to a healthy reproductive age (20-35 years). Pregnant women who are included in the healthy reproductive age group are mothers who are pregnant between the ages of 20-35 years. Pregnant women in this age group already have reproductive organs that function properly. This proves that age has no effect on the incidence of anemia, so the age factor cannot show an influence on the incidence of anemia.

The occurrence of anemia in pregnancy can be overcome through the provision of health education to pregnant women by taking into account the level of education. Mothers with basic education can be done through the provision of counseling and two-way communication in order to achieve a better understanding of the material. Mothers with secondary education can do health education and socialization. Mothers who are highly educated can be done by providing

Information and Education Communication (IEC). A good understanding of pregnant women about preventing anemia and overcoming anemia will affect the formation of good behavior in preventing and overcoming anemia in pregnancy in accordance with their knowledge. In this study, most of the respondents did not work, so there is no work relationship with the incidence of anemia that occurs in pregnant women.

b. The effect of the combination of super red dragon fruit extract + Fe tablets on increasing hemoglobin levels

The results showed that there was an effect of the combination of super red dragon fruit extract + Fe tablet on increasing hemoglobin levels in third trimester pregnant women with anemia, with the results of the data in the intervention group obtained the results of the pretest measurement of giving a combination of super red dragon fruit extract + Fe tablets on average hemoglobin levels of 9.352 g/dL, and post-test combination of super red dragon fruit extract + Fe tablets with an average hemoglobin level of 10.845 g/dL with a difference of 1.493, p-value $0.002 < 0.05$ in pretest and p-value $0.000 < 0.05$ in the posttest, while the pretest control group obtained an average hemoglobin level of 9.202 g/dL and the posttest obtained an average hemoglobin level of 10.635 g/dL with a difference of 1.433, p-value $0.002 < 0.05$ in pretest and p-value $0.000 < 0.05$ on the posttest. Based on the results of the study, there is a combination effects super red dragon fruit extract (*Hylocereus costaricensis*) + Fe tablets to increase hemoglobin levels in pregnant women third trimester with anemia, with p-value and significant difference value, there is a slightly faster increase in hemoglobin levels by consuming a combination of super red dragon fruit extract + Fe tablets than taking only Fe tablets.

This research is in line with research Widyaningsih et al., showed that there was a statistically significant effect of red dragon fruit juice (*Hylocereus Costaricensis*) on hemoglobin levels. (Widyaningsih A, 2017)

The prevalence of anemia in pregnant women in the world according to the World Health Organization (WHO) in 2013 who experienced iron deficiency was around 35-75%, in Indonesia according to the Basic Health Research (Riskesmas) in 2018 pregnant women who experienced iron deficiency anemia were around 48.9%. Iron deficiency anemia is more likely to occur in developing countries and is generally caused by nutritional deficiencies, infection, bleeding, and hemoglobinopathies.

The need for iron during the first trimester is relatively small, around 0.8 mg a day, which then increases sharply during the second and third trimesters, which is 6.3 mg a day. This is because during pregnancy there is a progressive increase in blood volume starting from the 6th to the 8th week of gestation and reaches a peak at 32 to 34 weeks with small changes after that week. (Prawirohardjo, 2012)

During pregnancy, changes in the circulatory system occur where the volume of blood plasma increases compared to the increase in erythrocytes, resulting in a decrease in hemoglobin (Hb) concentration due to hemodilution. Therefore, the need for oxygen is higher and stimulates an increase in erythropoietin production and this is what causes iron deficiency anemia during pregnancy. (Winkjosastro H, 2011)

Research results Ridayanti et al., stated that pregnant women with anemia are also caused by primigravida factors. Primigravida mothers who experienced pregnancy anemia were 44.6% while multigravida mothers who experienced pregnancy anemia were 12.8%. This is because primigravida mothers do not have the experience to maintain a healthy pregnancy from previous pregnancies because this is the first time they are pregnant. (Ridayanti et al, 2012)

Handling of anemia in third trimester pregnant women can be done by consuming foods that contain lots of iron and additional foods. Nutritional problems in pregnant women can be overcome by increasing the need for iron intake in daily food.

Giving a combination of super red dragon fruit extract + Fe tablets to respondents every day for 14 days can help increase hemoglobin levels because super red dragon fruit is rich in iron and vitamin C which is beneficial for pregnant women. Super red dragon fruit contains iron which has benefits for preventing anemia and vitamin C is useful for helping the absorption of iron by the body so as to prevent anemia.

Dragon fruit is a type of cactus tree. Super red dragon fruit (*Hylocereus costaricensis*) is a species of dragon fruit plant that has a dense red fruit color (super red). The advantages of the super red dragon fruit compared to other fruits are: red dragon fruit is super rich in nutrients, can

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provide great benefits to the body, namely maintaining digestive health, preventing cancer, boosting the immune system, preventing diabetes, preventing heart disease, slowing premature aging, maintaining cholesterol levels, repairing body cells, preventing anemia, keeping bone strength, reduce arthritis pain, maintain eye health, improve brain function, accelerate wound healing. Super red dragon fruit contains vitamin B1, vitamin B2, vitamin B3, vitamin C, and contains iron. The content of the super red dragon fruit can increase hemoglobin levels in the blood.

This research is in line with research conducted by Mayuri et al., showing that dragon fruit contains iron (for blood booster), vitamin B1 (helps convert food into energy, important in neurological function), vitamin B2 (helps in energy production and chemical processes). other substances in the body, helps maintain healthy eyes, skin and nerve function.), vitamin B3 (helps convert food into energy and maintain brain function), and vitamin C (helps absorption of iron by the body thereby preventing anemia). (Mayuri, 2018).

4. Conclusion

Based on the results of the study, there was an effect of the combination of super red dragon fruit extract (*Hylocereus costaricensis*) + Fe tablets on the average increase in hemoglobin levels of pregnant women in the third trimester with anemia, with the p value and the difference value which means that there is an increase in hemoglobin levels slightly faster with consuming a combination of super red dragon fruit extract + Fe tablets compared to only consuming Fe tablets.

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