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The Effectiveness of Rosella Flowers to the Changes of Hemoglobin Levels of Third Trimester Pregnant Women in The Area of The Ratu Agung Community Health Center in 2020



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Abstract

Anemia during pregnancy is one of the most common disorders in pregnant women in Indonesia. The Government has made efforts to overcome this problem, however, the rate of anemic mothers remains high. Rosella (*Hibiscus Sabdariffa*) is considered able to increase the hemoglobin levels in pregnant mothers. To analyze the effect of Rosella flower on the increase of Hemoglobin level in pregnant women receiving Fe tablet. This study was a quasy experiment with pretest-posttest control group design conducted in January 2020 in the working area of Ratu Agung Community Health Center. Thirty-two participants were selected using accidental sampling, which assigned in the experiment and control group. All samples were pregnant women in the third trimester and receiving iron tablets. Independent t-test and paired t-test were used for data analysis. The paired t-test obtained a p-value of 0.00 (<0.05), indicated that there was an increase of hemoglobin levels in both experiment and control group. The mean increase of hemoglobin levels in the control group was 0.59 gr and in the experiment group was 1.11. The hemoglobin levels in the experiment group were higher than the levels in the control group. The independent t-test obtained a p-value of 0.241 (> 0.05) indicating that there wasn't a significant difference of mean of hemoglobin levels between the control group and the treatment group. The consumption of rosella combined with Fe tablet showed a significant increase of hemoglobin levels compared of pregnant women. Therefore,

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INTRODUCTION

According to the World Health Organization (WHO) Anemia is a nutritional problem that affects millions of people in developing countries and remains a major challenge for human health. The prevalence of anemia is estimated at 9 percent in developed countries, while in developing countries the prevalence is 43 percent. Children and women of childbearing age (WUS) are the groups most at risk, with an estimated prevalence of anemia in children under five at 47 percent, in pregnant women at 42 percent, and in non-pregnant women aged 15-49 years at 30 percent. WHO targets to reduce the prevalence of anemia in WUS by 50 percent by 2025 (Profile of Nutritional Consumption, Wijayanti E, Fitriani, 2019).

Based on the results of the Basic Health Research (Riskesdas) in 2018, the prevalence of anemia in pregnant women in Indonesia is 48.9%, namely pregnant women with Hb levels less than 11.0 grams / dl, with almost the same proportion in urban areas (36.4%) and rural areas (37.8%). Although the government has implemented an anemia control program in pregnant women, namely by giving 90 Fe tablets to pregnant women during the pregnancy period with the aim of reducing the anemia rate of pregnant women, the incidence of anemia is still high (Ministry of Health, 2014).

Bengkulu province health data in 2018 found iron nutrition anemia in pregnant women by 45%. There were 168 cases of iron nutrition anemia in pregnant women in Bengkulu city, 2016 as many as 279 cases, in 2017 there were 1,398 cases and in 2018 there were 1,162 cases of iron nutrition anemia in pregnant women, consisting of 20 health centers in Bengkulu city. According to the Bengkulu City Health Office the highest incidence of anemia in Bengkulu City in 2018 was in the Sawah Lebar Puskesmas, 39.6%, Padang Serai Puskesmas 35.8% and Ratu Agung Health Center 23.1% (Bengkulu Province Health Center Profile, 2018).

Anemia is a decrease in the blood's ability to carry oxygen. The result of a decrease in the number of red blood cells or a decrease in the concentration of hemoglobin in the blood circulation, namely the concentration of hemoglobin (Hb) <11 g / dl in the first and third trimesters, and <10 g / dl in the second trimester. Along with hemodilution that occurs at 24 weeks of age and peaks at 28-32 weeks of gestation, the Hb level in the mother's body decreases (FaridHusin, 2015). Anemic pregnant

women will increase the risk of abortion, premature birth, LBW, stillbirth, perinatal death, prolonged labor and postpartum hemorrhage. (Wirawan, et al, 2015).

The iron supplementation program is an effort that has been made by the Indonesian government to prevent anemia in pregnancy, which is given in the form of iron ferrous sulfate pills 200 mg daily for 90 days in the third trimester of pregnancy but the rate of anemia in pregnancy is still high. This is because there are several factors that make it easier and inhibit the absorption of iron in the body. Consumption of fruits that contain vitamin C plays a very important role in the absorption of iron by increasing the absorption of non-heme by four times. These mechanisms include reducing ferrite to a ferrous form in the stomach that is easily absorbed (Wirawan et al. 2016).

Giving iron tablets together with other micronutrients is more effective in increasing iron status compared to providing iron supplementation alone in the form of a single dose. Therefore, to increase the absorption of iron in the body it is necessary to provide a combination of vitamin C micronutrients, this is because iron which is effective and efficient is iron in ferrous form so it dissolves easily. Vitamin C can change the acidic atmosphere in the stomach by converting ferric into ferrous, which is easily soluble so that it is easily absorbed. One source of vitamin C is rosella flowers (Wirawan, et al, 2015).

Rosella (*Hibiscus Sabdariffa*) is one of the easiest growing herbs in many areas. Generally, this plant is known to have benefits as an anti-hypertensive drug, diabetes, and antimetastasis. This plant also has the highest mineral content (Fe) and vitamin C among other plants, such as spinach, cassava leaves, and katuk leaves. In 100gr of Rosella flower petals, it has 8.98 mg of iron and 244.4 mg of vitamin C (Haidar, 2016).

The results of research by Nisa R (2017) in a study of the effectiveness of roselle extract on changes in hemoglobin levels in pregnant women who consume Fe found that there was a significant increase in hemoglobin levels when consuming rosella extract combined with Fe tablets compared to consuming Fe tablets alone with a P-0,00 (<0.05). The results of Munawaroh's (2009) study showed that Rosella flower petal extract had an effect on increasing erythrocytes and hemoglobin (Hb) levels in the blood of white rats. The optimal dose of Rosella to increase the number of

erythrocytes and hemoglobin (Hb) levels in the blood of white rats was 0.72 g / head / day, followed by doses of 0.36 and 0.18 g / head / day.

METHOD

The design used in this study is a Quasi-experimental using the pre-test and post-test non-equivalent control group approach. This study aims to determine the level of hemoglobin changes in pregnant women who consume Fe tablets with rosella flower stew and pregnant women who consume Fe without rosella flower stew.

The population in this study were third trimester pregnant women at RatuAgung Public Health Center for the period of January 2020.

The number of samples in the study were 16 people for each group. To anticipate drop out, add 10% of the sample from each group, so each group has 17 respondents so that the total sample size is 34 respondents. The sampling technique in this research is accidental sampling, namely by taking cases or respondents who happen to exist or are available in a place according to the context of the study. The instrument in this study was a questionnaire sheet, a consent sheet to be a respondent.

Data analysis was carried out in stages, namely univariate and bivariate analysis. Univariate analysis

was performed to identify the characteristics of pregnant women and hemoglobin levels of pregnant women before and after treatment in the intervention and control groups. Bivariate analysis is used to see the effect of the independent variable on the dependent variable. The analysis in this study used the dependent T test if the data distribution was normal using the wilcoxon test if the distribution was not normal. To see changes in the hemoglobin level of pregnant women between the intervention group (pregnant women who consumed roselle flower stew) and the control group (pregnant women who did not consume roselle flower stew), an Independent T test was performed if the data distribution was normal or the Mann Whitney test if the distribution was not normal.

RESULTS

Based on Table 1, it can be seen that the results of the characteristics of the respondents show that in the group of pregnant women who consume iron, most of them (50%) are high-risk pregnant women, most of them are multiparous (87.5%) and most of the nutritional intake is fulfilled (62.5%). While in the group given rosella flowers, most (93.8%) were pregnant women who were not at high risk, most were multiparous mothers (93.8%) and most of the nutritional intake was fulfilled (62.5%).

Table 1 Distribution of Frequency Characteristics of Pregnant Women (Age, Parity and Nutritional Intake) in Ratu Agung Health Center Area

No.	Variable	Group		Percent
		Fe (N16)	Fe and roselle (N = 16)	
1	Age			
	< 20 and > 35 years	8	1	62
	20 - 35 years	8	15	93.8
2	Parity			
	> 3	2	1	62
	≥ 3	14	15	93.8
3	Nutritional intake			
	Not enough	6	6	37.5
	Sufficient	10	10	62.5

Based on Table 2, it is known that in the group of pregnant women before being given rosella flowers the average Hb level was 11.33 gr / dl and after being given rosella flowers 12.44 gr / dl. the mean difference between the two groups was 1.11

gr / dl. In the group of pregnant women before being given Fe tablets the average Hb level was 11.45 gr / dl and after being given Fe tablets was 12.04 gr / dl. so that the mean difference between the two groups is 0.59 gr / dl.

Table 2 Average Hemoglobin Before and After Giving Rosella Flowers to Pregnant Women Who Consume Fe Tablets in The Ratu Agung Health Center Area in 2020

HB	N	Min	Max	Mean	Different Mean	SD
Intervention group						
Rosella flower + Fe tablet						
Before the Intervention	16	10	13	11.33	1.11	0.936
After the intervention	16	11	14	12.44		0.940
Control group						
Fe tablet only						
Before intervention	16	10	13	11.45	0.59	1.061
After the intervention	16	10	14	12.04		0.923

Table 3 Differences in Hemoglobin Before and After roselle Flowers in Pregnant Women in The Ratu Agung Health Center Area in 2020

HB	Mean	Different Mean	N	SD	P value
Intervention group					
Rosella flower + Fe tablet					
Before the Intervention	11.33	1.11	16	0.936	0.000
After the intervention	12.44		16	0.940	
Control Group					
Fe Tablet Only					
Before intervention	11.45	0.59	16	1.061	0.000
After the intervention	12.04		16	0.923	

Based on Table 3, it can be concluded that there is an effect of giving rosella + fe flowers with an average Hb level before and after the intervention which can be seen from the statistical test of $P = 0.000$ with a mean difference of 1.11, this means that the addition of roselle flowers has an effect on increasing hemoglobin levels in pregnant women who consume Fe tablets. In the control group that

was only given Fe tablets, the average results of Hb levels before and after the intervention can be seen from the statistical test of $P = 0.000$ with a mean difference of 0.59, this means that administration of Fe tablets alone has an effect on the increase in hemoglobin levels in pregnant women.

Table 4 The Effectiveness of The roselle Flower Group and The Fe Group on Hemoglobin Levels in Pregnant Women in The Ratu Agung Health Center Area in 2020

Group	Mean	Different Mean	N	SD	P value
Fe	12.04	0.39	16	0.923	0.241
Fe and rosella flowers	12.43		16	0.940	0.241

Based on Table 4, it can be seen that there is no difference Hemoglobin levels between pregnant women who consumed Fe + Rosella flower tablets and pregnant women who took Fe tablets only, because the p value in both groups was $p = 0.241$. This means that both groups are equally effective at increasing hemoglobin levels in pregnant women.

DISCUSSION

Judging from the characteristics of respondents in this study most of them were in the age group < 35 years in the intervention group, namely 15 people and in the control group 8 people. In the parity variable, most of them were Multiparous mothers, namely in the intervention group there were 15

people, while in the control group there were 14 people.

Variable Nutritional intake of most respondents, most of them have adequate nutritional intake. However, it is still found that mothers whose nutritional intake is not sufficient, if viewed from the insufficient nutritional intake, are pregnant women who are anemic. In line with Sumiyarsih's research, et al. (2018) stated that nutritional intake is very influential on the hemoglobin of third trimester pregnant women because each family is expected to be able to meet food needs in sufficient quantities and nutritional quality, pregnant women whose nutritional intake is lacking can result in the mother's immune system, less so that it can cause disease. ⁶

The results of this study showed that in the intervention group the average increase in Hb levels before treatment was 11.33 gr / dl with a standard deviation of 0.936 and after treatment 12.44 gr / dl with a standard deviation of 0.940. the mean difference before and after treatment is 1.11 gr / dl. So it can be concluded that giving rosella flowers which have high vitamin C can help the absorption of Fe in pregnant women (Haidar, 2016).

In the control group the average increase in Hb levels before treatment was 11.45 gr / dl with a standard deviation of 1.061 and after treatment 12.04 gr / dl with a standard deviation of 0.923. the mean difference between the two groups was 0.59 gr / dl. So it can be concluded that Fe tablets can also increase the hb in pregnant women. In an effort to prevent nutritional anemia in pregnant women, the government provides supplementation with blood booster tablets with a dose of 1 tablet (60 mg of Elemental Iron and 0.25 mg of folic acid) consecutively for at least 90 days during pregnancy (Amalia, Ajeng, et al. 2016).

This study showed that there was a significant effect of adding roselle flowers to changes in hemoglobin levels in pregnant women who consumed Fe with a value of $P = 0.241$ and in the control group there was also a significant effect on changes in hemoglobin levels in pregnant women. This means that statistical tests in both groups are equally effective in increasing hemoglobin levels in pregnant women. But in clinical trials in both groups, the intervention group was more effective by being given additional rosella flowers than given Fe tablets alone.

CONCLUSIONS AND SUGGESTIONS

From the discussion, it can be concluded that Rosella flower is effective in increasing hemoglobin in pregnant women who consume Fe tablets.

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