

Giving Rosella (*Hibiscus sabdariffa*) Beverage to Overcome Hypertension in Pregnant Women

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Keywords: Rosella Beverage, blood pressure, pregnant women, hypertension

Abstract: Rosella flowers have been used as herbal food and beverage in the form of herbal beverage with hot and cold serving as traditional medicine. The purpose of this study was to determine the effect of rosella beverage on blood pressure changes in hypertensive pregnant women. This research is a quasi-experimental study using a non probability sampling design using a control group. The number of samples is 30 people, divided into two groups, 15 intervention groups and 15 control groups. To find out the difference in blood pressure before and after the intervention in the treatment group and the control group, the analysis that used was paired sample t-test and to determine the difference in blood pressure between the treatment group and the control group using independent t-test. The results showed that there were differences in systolic blood pressure of 39.67 mmHg and diastolic of 22.33 mmHg before and after intervention in the treatment group. The results of the analysis about the differences of blood pressure between the control group and the treatment group with a p-value of 0.00 <0.005 with a difference in healing time of 2 days in the experimental group and 3-4 days in the control group. Giving rosella (*hibiscus sabdariffa*) beverage can be used as an herbal beverage to reduce blood pressure in pregnant women with hypertension with an average healing time of 2 days.

1 INTRODUCTION

Hypertension in pregnancy is defined as a blood pressure of 140 mmHg or more after 20 weeks' pregnancy in women who were previously normotensive, or an increase in systolic pressure of 30 mmHg and a diastolic pressure of 15 mmHg above normal values. Hypertension is a medical problem, which often appears during pregnancy and can also cause complications of 2-3% of pregnancies. Besides hypertension in pregnancy is also still a major source of death in mothers.

Maternal mortality in Indonesia is still dominated by 3 main causes, namely bleeding, hypertension and infection. Bleeding and infections tend to decrease while hypertension is increasing in proportion, > 25% of maternal deaths in Indonesia in 2014 due to hypertension.

AKI is one indicator of the health status of a country that indicates the ability and quality of health services, education and public knowledge, environmental health, social culture, and barriers to accessing health services. According to WHO

(2013) the MMR every year is estimated at 210 / 100,000 live births.

Research by Andika, Rompas and Mulyadi (2014) showed a decrease in blood pressure after hypertension sufferers with captopril therapy were given rosella flowers, a decrease in average systolic and diastolic blood pressure after 2 hours of administration was 19.3333 mmHg and 10.00 mmHg.

Hypertension or better known as high blood pressure is a condition where a person experiences an increase in blood pressure above normal. According to WHO hypertension is a condition that shows a person's blood pressure ≥ 140 mmHg for systolic pressure and ≥ 90 mmHg for diastolic pressure. Stage 1 hypertension if systolic blood pressure is 140 - 159 mmHg or diastolic 90 - 99 mmHg and stage 2 hypertension if systolic blood pressure is ≥ 160 mmHg and diastolic ≥ 100 mmHg. Blood pressure is affected by cardiac output and peripheral resistance, because blood pressure requires blood flow which is determined by the strength of the heart pump (cardiac output)

Dried roselle calyx contains flavonoid compounds consisting of anthocyanin, gassypetin and glucoside hibiscin. Flavonoids work directly on the smooth muscle of the arteries that stimulate or activate endothelium driven relaxing factor (EDRF) causing vasodilation and inhibiting angiotensin converting enzyme (ACE). So that angiotension I cannot be changed to angiotension II which functions to increase the sympathetic nervous system, vascular smooth muscle vasoconstriction and increase water and sodium retention.

Rosella is an annual herb that can reach heights of 0.5 - 3 m, round, woody, and red stems. Single leaf, egg-shaped, looping fingers, blunt edges, jagged edges, and grooved base. The leaf length is 6 - 15 cm and the width is 5- 8 cm. round leaf stalks green with a length of 4-7 cm. Roselle flower is a single flower that comes out of the axillary leaves that fall within 24 hours after blooming, on each stem there is only one flower. Flowers have 8-11 strands of hairy petals.



figure1. rosella flower



figure2. Dried Rosella flower

The process of drying rosella flowers can be done naturally or artificially. Naturally, rosella petals are dried by being spread out on palm trees or bamboo tkar, so they don't get sunburn which causes their quality to decrease. Drying is done in the morning at 09.00 - 11.00 noon and afternoon at 14.00 - 16.00.

artificial drying using an oven with a temperature not more than 60 - 70°C.

2 METHODS

This research was done at the GrandmedLubukPakam General Hospital. Respondents in the study were divided into 2 groups: a control group of 15 people and a treatment group of 15 people. The sampling technique in this study is non-probability sampling with consecutive sampling technique.

This research is a quantitative research with a Quasi Experimental design in the design of the non-equivalent control group Design. Blood pressure is measured twice, at the beginning before the intervention and after the intervention.

The instrument which used in this study was an observation sheet measuring blood pressure before, and after intervention in both groups

- Data collection tools

The data which was taken is primary and secondary data. Secondary data consisted of the identity and characteristics of the respondent, age, parity, pregnancy rimayat, history of childbirth, past childbirth history and family history obtained from medical records. Primary data consisting of blood pressure values before and after the intervention were obtained through measurement of blood pressure values using mercury blood pressure meters and stethoscopes. The instrument that used for primary data collection was a blood pressure assessment sheet before and after the intervention.

- Assessment method

- a. Administrative Procedure

- Submit research ethics to the ethics committee after the proposal exam
- Submit a research permit application letter issued by the head of the study program

- b. Technical procedures, stage 1 selection of the *Enumerator*

- To guide researchers in the research process, researchers chose to be assisted by enumerators who were midwives / nurses on duty in the midwifery room at Grandmed Public Hospital, LubukPakam
- The enumerators that researchers need are those in the morning service, the number of enumerators in this research are 3 people per hospital to anticipate shifts and holiday schedules
- Enumerators who are selected and willing to help researchers are then equated to perceptions regarding the research process

- Activities carried out by the enumerator will be included in the attendance sheet of the enumerator
- c. Case selection
 - Conducted socialization by researchers or enumerators to the study population in order to obtain understanding and be willing to become a sample in voluntary research. This is supported by the signing of an informed consent
 - Determination of samples that fit the research inclusion criteria is based on medical diagnosis (sample treatment status)
 - The sample is divided into two experimental groups and a control group
- d. Intervention Allocation
 - Measurement of blood pressure values of the two groups before being given an intervention (pre-test). The procedure used was to explain to both groups that blood pressure measurements would be taken before intervention was given. Measurement of blood pressure used mercury blood pressure meters and stethoscopes conducted by enumerator researchers. The results of blood pressure measurements in both groups were entered into the observation sheet and blood pressure values before the intervention.
 - Provision of intervention, giving roselle drink given to the experimental group. Previously, researchers had provided a rosella flower drink made from 10 grams of dried petals of rosella flowers (*hibiscus sabdariffa*) brewed with 200 ml of hot water at 90°C, allowed to stand for 5 minutes and filtered .
- e. Procedure for giving rosella beverage to the experimental group
 - Respondents in the experimental group were given a Rosella flower drink
 - Interventions are given every day until blood pressure returns to normal. Roselle drinks are taken directly in front of researchers or enumerators
 - Observation of blood pressure values is carried out after 6-8 hours of drinking rosella flowers to assess the significant decrease in blood pressure every day and recorded in the observation sheet of blood pressure values after the intervention.
 - Measurement of blood pressure values in the experimental group after the intervention was given (posttest).

a. Data processing

Data processing is carried out with the SPSS (Statistical Product and Service) program through the stages of editing, coding, data entry, data cleaning.

b. Data analysis

• Univariate

This analysis describes the data in the form of a categorical table. The data that has been processed will be presented in the form of tables or graphs and narrated

• Bivariate

If the Shapiro Wilks test is normally distributed then a bivariate analysis is performed for comparative analysis of paired numerics, two groups of pairs and not pairs. Bivariate analysis aims to look at two variables that are thought to be related or correlated. Bivariate analysis was carried out to identify the relationship between the two variables, namely to identify the relationship between the administration of dried rosella flower petals (*Hibiscus Sabdariffa*) with these changes in blood pressure in pregnant women with hypertension. Paired t-tests were performed to compare blood pressure in each group before and after the intervention and unpaired t-tests to compare differences in blood pressure changes between the control group and the experimental group. If the data are not normally distributed the value of Shapiro wilks is significant ($p, 0.05$), the median is used as a measure of concentration and the minimum and maximum values as a measure of spread. The Wilcoxon parametric test was used instead of the paired t test and the Mann-Whitney nonparametric test as a substitute for the unpaired t-test. The p value is considered significant if the p value <0.05 and 95% CI.

3 RESULTS AND DISCUSSION

3.1 Paired Sample t Test Analysis in Case Groups

Table 1 shows that the systolic blood pressure normality test results before and after the intervention obtained significantly greater than the alpha value (0.05), namely 0.237 and 0.191, and then H_0 was accepted. Then it can be concluded that the data obtained are normally distributed.

Table .1: normality test results for systolic and diastolic blood pressure before and after the intervention

Group I	Mean	SD	Sig.
Systolic			
Before intervention	158,67	14,573	0,375
After intervention	119	6,036	0,140
Systolic Difference	39,67	11,255	0,978
Diastolic			
Before intervention	95	7,071	0,237
After intervention	73,33	7,715	0,191
Diastolic Difference	21,67	9,759	0,698

Table 2 shows that the difference in systolic and diastolic blood pressure is greater than the alpha level (0.05), which is 0.698. Based on the results of normality analysis, systolic and diastolic blood pressure data before and after the intervention and the difference are normally distributed and both are interrelated, so the analysis uses a parametric test paired sample t test and obtained a significant value

of systolic blood pressure before and after the intervention $P = 0,000 (<0,05)$ and $t = 13,650$ and the significance of diastolic blood pressure before and after the intervention $P = 0,000 (<0,05)$ and $t = 8,599$. From this analysis it can be concluded that there are differences in systolic and diastolic blood pressure values before and after the dry roselle flower petals are given in group I (case).

Table 2: results of analysis of differences in systolic and diastolic blood pressure before and after the intervention

	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
				Paired Differences				
Systolic								
air 1	39,7	11,255	2,906	33,434	45,899	13,650	14	.000
Diastolic								
air 2	21,7	9,759	2,520	16,262	27,071	8,599	14	.000

3.2 Paired Sample t Test Analysis in the Control Group

Table 3 shows that the results of systolic and diastolic blood pressure normality tests before and after the intervention obtained significance values greater than alpha (0.05) ie 0.219 and 0.171 then H_0 was accepted. Then it can be concluded that the data obtained are normally distributed.

Table 3: normality test results for systolic and diastolic blood pressure before and after the intervention.

Kelompok II	Mean	SD	Sig.
Systolic			
Before intervention	155,67	12,743	0,219
After intervention	120	5,669	0,171
Systolic difference	35,33	8,756	0,694
Diastolic			
Before intervention	92,33	5,627	0,113
After intervention	75,33	5,164	0,293
Diastolic difference	17,00	6,761	0,038

In table 4 the results of parametric analysis of paired sample t test and obtained significant values of systolic blood pressure before and after the intervention $P = 0,000 (<0.05)$ and $t = 16,102$, and the significance of diastolic blood pressure before

and after the intervention $P = 0,000 (<0,05)$ and $t = 9,738$. From this analysis it can be concluded that there are differences in systolic and diastolic blood pressure values before and after the intervention in the control group.

Table 4: The Results of analysis about differences in systolic and diastolic blood pressure before and after the intervention in the control group.

		Mean	Std. Deviation	Paired Differences		95% Confidence Interval of the Difference	t	df	Sig. (2-tailed)
				Std. Error Mean					
				Lo	Upper				
P air 1	Systolic intervention group - after intervention case group	3	8.338	2.153	30.049	39.284	16.102	1	.000
	Diastolic intervention group - after intervention case group	1	6.761	1.746	13.256	20.744	9.738	1	.000

In table 5: before analysing the difference in systolic and diastolic blood pressure values between the case and control groups, the normality of the systolic and diastolic pressure values before and after the intervention in the two groups was done using Shapiro Wilk to determine the distribution of the data obtained and determine test to be used. The data shows that the significant value of systolic blood pressure before and after the intervention in both groups <0.05 namely 0.047 and 0.019 then H_0 is rejected, and significant diastolic blood pressure before intervention in both groups <0.005 namely 0.037 then H_0 is rejected, while the significance of diastolic blood pressure after intervention in both groups > 0.05 , H_0 was accepted. So it can be concluded that the systolic blood pressure before and after the intervention and diastolic blood pressure before the intervention is not normally distributed and the

two groups are not interconnected so that the statistical analysis used is the Mann-Whitney nonparametric test, whereas the diastolic blood pressure data after the intervention is normally distributed and the two groups not interconnected, the statistical analysis used is the parametric independent sample test.

Table 5: Normality systolic and diastolic blood pressure test results of the control and intervention groups.

Kelompok/Idan II	Mean	SD	Sig.
Systolic			
Before intervention	156,67	13,604	0,047
After intervention	119,50	5,776	0,019
Diastolic			
Before intervention	93,67	6,424	0.037
After intervention	74,33	6,530	0,079

Table 6 shows that the systolic blood pressure pre-test and post-test were significantly greater than the alpha value (0.05, 0.450 and 0.762, then H_0 was accepted, meaning that there was no difference in average systolic blood pressure before and after the intervention between the case and control groups.

Significant diastolic blood pressure pre-test and post-test is greater than alpha (0.05), that is 0.280 and 0.411 then H_0 is accepted, meaning that there is no difference in average diastolic blood pressure before and after intervention between the case and control groups..

Table 6: The results of analysis about differences in systolic and diastolic blood pressure before and after the intervention between the control group and the treatment group.

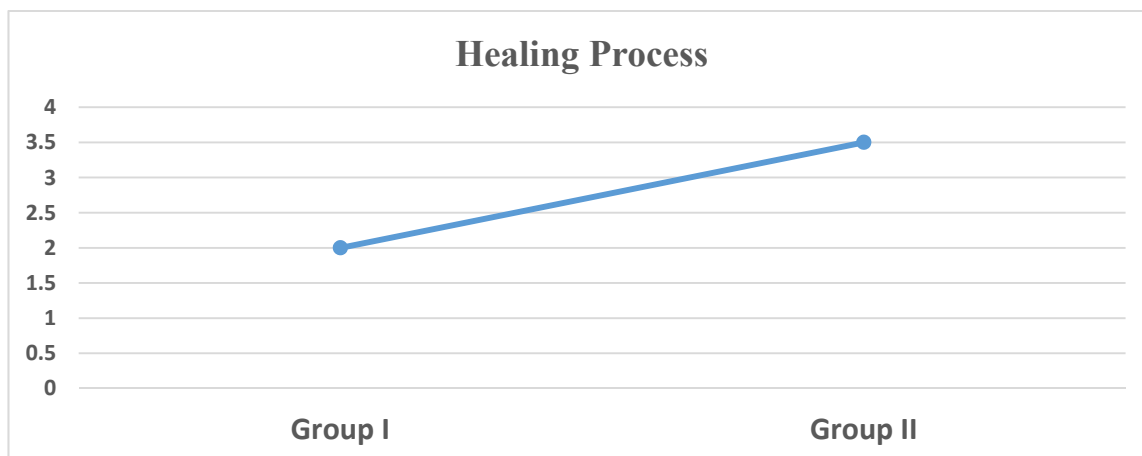
Variable	Group I (n=15)	Group II (n=15)	P value
Systolic			
<i>Pre test</i>	158,67	154,67	0,450
<i>Post test</i>	119	120	0,762
Diastolic			
<i>Pre test</i>	95	92,33	0,280
<i>Post test</i>	73,33	75,33	0,411

Before analysing the differences in healing time between case and control groups, the normality of the data based on the duration of healing was done using Shapiro wilk to determine the distribution of data and determine the test to be used. The results of normality test data on healing time in both groups. The data shows that the significant value of healing time in the case and control group is smaller than the alpha value (0.05) which is 0.005 then H_0 is rejected, meaning that the data based on healing time is not normally distributed and the two groups are not interconnected, then the analysis used is the non-parametric Mann-Withney test. The results of analysis about difference in healing time are between the case and control groups

4 CONCLUSION

The provision of rosella beverage is effective for overcoming hypertension in pregnant women with an average healing time of 2 days faster than hypertensive pregnant women who do not take rosella which is an average healing time of 3-4 days.

Table 7: Results of analysis of healing time between the treatment and control groups.



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