

EFFECTIVENESS OF HIBISCUS SABDARIFFA ON BLOOD PRESSURE OF HYPERTENSION PATIENTS

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Abstract

To prevent the dangers of hypertension, it is necessary to maintain blood pressure. Natural ingredients for non-pharmacological hypertension therapy are rosella flowers. Rosella (*Hibiscus sabdariffa*) contains flavonoids, as a diuretic, lowers blood pressure, lowers blood viscosity and stimulates bowel movements. The anthocyanins contained in rosella have an antihypertensive effect. This study aims to determine the effect of rosella flowers on blood pressure in hypertensive patients. This type of research is a quasy experiment with a Pre Test and Post Test Nonequivalent Control Group. The sample was 18 people in the control group and 17 people in the intervention group. The intervention sample was given a decoction of 2 gr roselle petals every day for seven days. The research instrument used a digital sphygmomanometer, observation sheets, and Standard Operating Procedures. Statistical test using Paired T Test. The control group had an increase in systolic and diastolic mean of 6.3 mmHg and 2.0 mmHg. In the roselle flower group, there was a decrease in the systolic and diastolic mean of 12.64 mmHg and 11.58 mmHg. The difference between the changes in the mean posttest-pretest systolic and diastolic control and roselle groups was 18.94 mmHg and 13.58 mmHg. The bivariate results of the systolic and diastolic pretest-posttest in the roselle flower group obtained p-values of 0,000 and 0,000. Comparison of systolic and diastolic blood pressure in the control group and rosella flowers obtained p-values of 0.000 and 0.000. Rosella flower is effective in reducing systolic and diastolic blood pressure in hypertensive patients.

Keywords: Blood pressure; *Hibiscus sabdariffa*; Hypertension

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1. Introduction

Hypertension is the leading cause of cardiovascular disease in the world. World Health Organization / WHO, the highest prevalence of hypertension in Africa 46% and the lowest in America 35% (World Health Organization, 2013). According to WHO, there are about 80 million adults suffering from hypertension in Sub-Saharan Africa (SSA) but their projections from epidemiological data show that by 2025 more than 150 million people will suffer from hypertension (World Health Organization, 2017). Based on Basic Health Research, the prevalence of hypertension in Indonesia based on measurement results at ≥ 18 years of age is 25.8%, the highest is in Bangka Belitung (30.9%), South Kalimantan (30.8%), East Kalimantan (29.6%), and West Java (29.4%). The prevalence of hypertension in D.I. Yogyakarta in 2007 ranked 6th with 35.8% (Kemenkes, 2013).

To prevent the dangers of hypertension, efforts to maintain blood pressure are needed. As the community's need for safe, effective, selective and economical medicine increases, people are starting to

turn to treatments that use natural or traditional medicine for health maintenance and help treat diseases (Badan Pengawas Obat dan Makanan, 2010). One of the plants that can be used to treat blood pressure is rosella flowers (Nucahyati, 2014). Rosella (*Hibiscus Sabdariffa*) contains flavonoids. The flavonoid content possessed by roselle petals consists of gossipetin, anthocyanin, and mucilago compounds (Badan Pengawas Obat dan Makanan, 2010). These substances function as diuretics, lower blood pressure, reduce blood viscosity and stimulate bowel movements. The anthocyanins contained in rosella have an antihypertensive effect (Kusumastuti, 2014).

Based on a preliminary study conducted by researchers, when measuring blood pressure using a digital sphygmomanometer, 3 respondents obtained high blood pressure results, namely 142/88 mmHg, 138/81 mmHg, 130/83 mmHg. A total of 2 respondents with low blood pressure, namely 87/66 mmHg, 91/62 mmHg. A total of 10 respondents had normal blood pressure with an average systolic blood pressure of 109 mmHg and an average diastolic pressure of 77.5 mmHg. Efforts are made to maintain

blood pressure by resting, sleeping, maintaining diet and exercise. Of the 15 respondents, they have never used non-pharmacological therapy to prevent disease in blood pressure

2. Method

This type of research is a quasi-experiment, with the design of this study using a Pre-Test and Post-Test Nonequivalent Control Group using a time series. Data collection was carried out in the Banjeng Maguwaharjo Depok Sleman Hamlet in August-September 2020. The study consisted of 2 groups, namely control and intervention. Samples were selected according to the inclusion criteria, namely willingness to be respondents, aged 25-55 years, following the entire research process, and not taking blood pressure drugs. While the exclusion criteria were illness during the study, consuming alcohol, and suffering from diabetes mellitus. The intervention group received rosella flower infusion to the respondents. Rosella flower infusion is made by using 2 grams of dried roselle petals and adding 150 ml of hot water. Then let the brew stand for 5 minutes. After that, strain and drink it once a day in the morning. The infusion of rosella flowers was given for 7 days. The control group did not get intervention. Pretest blood pressure was measured on the first day before being given roselle drink. Posttest blood pressure was measured on day eight. The research instrument consisted of a digital sphygmomanometer, observation sheets, and Standard Operating Procedures. Bivariate analysis used Paired T-Test. All respondents signed informed consent as evidence of consent to participate in the study. The research was carried out in accordance with the ethical eligibility permit number 164.3/FIKES/PL/VIII/ 2020.

3. Result And Discussion

Table 1. Characteristics of Respondents Based on Gender and Age in Patients with Hypertension in Banjeng Maguwaharjo Depok Sleman

Characteristics of Respondents	Control		Intervention	
	f	%	f	%
Gender				
Male	10	55.6	5	29.4
Female	8	44.4	12	70.6
Total	18	100.0	17	100.0
Age				
Early Adult	7	38.9	7	41.2
Middle Adult	11	61.1	10	58.8
Total	18	100.0	17	100.0

Table 1 shows that in the rosella flowers the majority of respondents were male and female as many as 12 people (70.6%). Whereas in the control group most of them were male, namely 10 people (55.6%). All groups were mostly middle adults,

namely 11 people (61.1%) in the control group and 10 people (58.8%) in the roselle group.

Table 2. Systolic and Diastolic Blood Pressure of Rosella Flower Group in Patients with Hypertension in Banjeng Maguwaharjo Depok Sleman

Blood Pressure (mmHg)	Min	Max	Mean	Standard Deviation
Systole				
Pretest	135	165	148.88	9.407
Posttest	118	155	136.24	12.427
Diastole				
Pretest	85	107	97.76	5.557
Posttest	75	96	86.18	6.521

Based on table 2, it is known that the average pretest and posttest systolic blood pressure values are 148.88 mmHg and 136.24 mmHg, respectively. The mean pretest and posttest diastolic blood pressure values were 97.76 and 86.18 mmHg, respectively.

Table 3. The Effect of Rosella Flower on Blood Pressure in Patients with Hypertension in Banjeng Maguwaharjo Depok Sleman

Blood Pressure (mmHg)	Mean	Difference of Mean	p-value
Systole			
Pretest	148.88	-12.64	0.000
Posttest	136.24		
Diastole			
Pretest	97.76	-11.58	0.000
Posttest	86.18		

Table 3 shows that in the Rosella flower group the average blood pressure for the pretest systole was 148.88 mmHg and posttest was 136.24 mmHg with a decrease of 12.64 mmHg. In the roselle flower group, the average pretest diastolic blood pressure was 97.76 mmHg and posttest was 86.18 with a decrease of 11.58 mmHg. The results of statistical tests using the Paired T-Test showed a p-value of 0,000 and 0,000 (p-value <0.05), which means that roselle flowers are effective in reducing systolic and diastolic blood pressure.

Table 4 shows that the results of statistical tests showed that the control systolic blood pressure in the roselle flower group was 0,000, meaning that there was a difference in systolic blood pressure in the control group compared to systolic blood pressure in the roselle flower group. The result of diastolic blood pressure in the control group with the roselle flower group was 0,000, meaning that there was a difference in the diastolic blood pressure of the control group compared to the diastolic pressure in the roselle flower group.

Blood pressure is the force exerted by blood on the vessel wall, depending on the volume of blood contained in the vessel and the compliance or distensibility of the vessel wall. Factors that affect blood pressure are: arterial wall elasticity, blood

volume, heart motion, blood viscosity, cardiac output, blood vessel capacity (Sherwood, 2002). Blood pressure classification for adults: normal systolic blood pressure <120 mmHg and diastolic <80 mmHg, prehypertension systolic blood pressure 120-139 mmHg and diastolic 80-90 mmHg, hypertension grade 1 systolic blood pressure 140-159 mmHg and diastolic 90-99, hypertension grade 2 systolic blood pressure ≥ 160 and diastolic ≥ 100 (JNC VII, 2003). Based on table 2 in the control group, it is known that

the mean pretest systolic blood pressure was 135.5 mmHg and the pretest diastolic blood pressure was 86.11 mmHg, the mean pretest systolic and diastolic blood pressure were included in the prehypertensive blood pressure category. The mean posttest systolic blood pressure was 141.8 mmHg and posttest diastolic blood pressure was 88.11 mmHg. The mean posttest systolic and diastolic blood pressure in the control group in the category of hypertension grade 1 blood pressure.

Table 4. Differences in the Effectiveness of Rosella Flowers on Systolic and Diastolic Blood Pressure in Hypertension Patients in Banjeng Maguwoharjo Depok Sleman

Blood Pressure (mmHg)	Group	Mean Posttest-Pretest	Difference of Mean	P-Value
Systole	Control	6.3	18.94	0.000
	Intervention	-12.64		
Diastole	Control	2.0	13.58	0.000
	Intervention	-11.58		

Table 3 in the Rosella flower group shows that the mean pretest systolic blood pressure was 148.88 mmHg and the pretest diastolic blood pressure was 97.76 mmHg. The average pretest systolic and diastolic blood pressure of the roselle flower group was included in the hypertension grade 1 blood pressure category. The average posttest systolic blood pressure was 136.24 mmHg and posttest diastolic blood pressure 86.18 mmHg. The mean posttest systolic and diastolic blood pressure in the bay leaf group in the category of prehypertension blood pressure.

Factors that affect blood pressure are age, gender, heredity, stress, obesity, exercise, smoking, excess alcohol consumption, excess salt consumption (Departemen Kesehatan, 2006). The pretest blood pressure measurement in this study was conducted in the morning. Systolic and diastolic blood pressures were measured in the left arm in a sitting position after the respondent had rested for 5 minutes. Measurement of blood pressure using a digital sphygmomanometer.

Based on table 3 in the Rosella flower group, the average value of systolic blood pressure in the pretest was 148.88 mmHg and posttest was 136.24 mmHg, which decreased by 12.64 mmHg. The minimum value of systolic blood pressure pretest 135 mmHg and posttest 118 mmHg. The mean value of diastolic blood pressure pretest was 97.76 mmHg and posttest was 86.18 mmHg with a decrease of 11.58 mmHg. The maximum value for the pretest diastolic blood pressure was 107 mmHg and the posttest was 96 mmHg. The minimum value for the pretest diastolic blood pressure was 85 mmHg and the posttest was 75 mmHg. It can be concluded that the average blood pressure has decreased after being given the roselle flower intervention. Table 3 is known based on the statistical test of systolic and diastolic blood pressure pretest-posttest using Paired T-Test, the p-value is 0.000 and 0.000 (p-value

<0.05). These results indicate that rosella flowers are effective in reducing systolic and diastolic blood pressure of hypertensive patients in Dusun Banjeng Maguwoharjo, Sleman. These results indicate that the hypothesis H_a accepted rosella flowers have a significant effect on blood pressure after being given 7 days every morning. Table 4.9 shows that the results of statistical tests of differences in systolic and diastolic blood pressure in the control group and the roselle flower group were 0,000 and 0,000 (p-value <0,000).

Rosella flower or Hibiscus sabdariffa has important ingredients contained in roselle petals: gossy peptin, anthocyanin and glucoside hibiscin. Rosella flowers contain magnesium, omega 3, vitamin A, vitamins, C, vitamin D, B1 and B12, iron, potassium, beta caroteen and essential acids (JNC VII, 2003). Rosella consists of gossipetin, anthocyanin and mucilage compounds (Badan Pengawas Obat dan Makanan, 2010). These substances function as diuretics, lower blood pressure, lower blood viscosity and stimulate bowel movements. Anthocyanins contained in rosella flowers have an antihypertensive effect (Kusumastuti, 2014).

Rosella flowers are clinically proven to be able to reduce plaque that sticks to the walls of blood vessels. Not only that, rosella also has the potential to reduce low density lipoprotein (LDL) in the body. This suggests that rosella is beneficial for reducing blood pressure in hypertensive patients and improving blood circulation (Apriyanti, 2012). The mechanism of action of flavonoids as a vasodilator is flavonoids can inhibit ACE. behind ACE plays a role in the formation of angiotensin II which is one of the causes hypertension. Angiotensin II causes narrowed blood vessels, which can raise blood pressure. ACE blockers cause vessels more blood flow to the heart, lead to a decrease in blood pressure (Ismarani et al., 2011).

4. Conclusion

The results showed that rosella flowers were effective in reducing systolic and diastolic blood pressure in hypertensive patients. Rosella flowers can be used as an alternative for non-pharmacological management of hypertension sufferers. The process of using rosella flowers as a therapeutic agent is also easy and the price is also cheap, so hypertension sufferers have no difficulty when applying it.

5. Suggestion

Patients with hypertension are advised to use hibiscus sabdariffa to be consumed in the initial treatment of hypertension so that there is no increase in blood pressure.

6. References

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