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Effectiveness of Acupuncture Therapy in Combination with Rosella Tea on Changes in Blood Pressure in Hypertension Cases in Krajan, Mojosoongo

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ABSTRACT

Hypertension is high blood pressure with systolic values above 140 mmHg and diastolic values above 90 mmHg. Acupuncture therapy with a combination of rosella tea steeping is a nonpharmacological treatment that has been shown to have an effect in lowering blood pressure. The purpose of this study was to determine the effect of acupuncture therapy with a combination of Rosella tea steeping on changes in blood pressure in cases of hypertension in Krajan Hamlet, Mojosoongo. This study used a "Quasi-Experimental Design" research design with a nonequivalent control group design method. The number of research subjects was 32 people with a purposive sampling technique, which was divided into a control group (consumption of rosella tea brew) and an experimental group (acupuncture combination of rosella tea brew). The results of the Mann-Whitney test obtained a significance value of $p < 0.001$, so H_a is accepted and H_0 is rejected. In conclusion, acupuncture therapy with a combination of rosella tea brewing shows significant results in reducing blood pressure in cases of hypertension in Krajan Hamlet, Mojosoongo.

I. INTRODUCTION

Hypertension or high blood pressure is a type of Non-Communicable Disease (NCD) where the blood pressure is higher than the normal limit, namely systolic blood pressure ≥ 140 mmHg and diastolic blood pressure ≥ 90 mmHg. Hypertension is a concern for everyone because it has an impact both in the short and long term, this disease will attack various organs and cause other diseases such as stroke, kidney, heart attack and blindness ⁽¹⁾. There are several risk factors that affect

the increase of blood pressure, such as age, gender, family history of the disease, obesity, excessive salt consumption, as well as smoking and drinking alcohol⁽²⁾. The WHO notes that by 2023, approximately 1.28 billion adult individuals aged 30-70 years worldwide are expected to have hypertension, from this data, it is estimated that 46% of adults who have hypertension are unaware of their condition, meanwhile, 42% of those with hypertension have been diagnosed and received treatment and only 21% of those with hypertension successfully control

their condition⁽³⁾. The prevalence of hypertension in Indonesia reported by the Indonesian Health Survey (IHS) in 2023 is around 29.5%.

Patients know that they are diagnosed with hypertension based on a doctor's diagnosis as much as 8.2% while patients who know hypertension based on measurements are 29.2%⁽⁴⁾. Central Java ranks thirteenth with hypertension cases as much as 31.3%. These results are also seen from data on the number of hypertension sufferers in 2023 in Surakarta city, as many as 67,355 people with hypertension⁽⁵⁾. Based on primary data obtained from the Sibela Public Health Center in 2024 from January to October, the number of people with hypertension in Mojosongo Village was 7,494.

Effective treatment of high blood pressure involves two methods, namely comprehensive and complementary approaches. Comprehensive or drug treatment often involves the use of anti-hypertensive drugs such as the drug amlodipine. In addition, complementary treatment can also be complemented by using alternative therapies such as meditation and yoga, music therapy, reflexology, aroma therapy, and acupuncture⁽⁶⁾.

Acupuncture therapy can help change hypertension cases because it can increase autonomic nerve stimulation, which causes inhibition of sympathetic stimulation, resulting in inhibition of vasoconstrictor nerves which results in vasodilation. Stabbing at LV point 3 Taichong causes changes in blood pressure accompanied by a decrease in plasma angiotensin II. This suggests that the renin angiotensin system plays an important role in lowering blood pressure with acupuncture⁽⁷⁾.

In addition to acupuncture therapy, other complementary therapies such as herbal therapy can be used, which can be an alternative option to reduce hypertension, which is very attractive to people,

especially in the form of tea, such as rosella tea⁽⁸⁾.

Rosella flower tea (*Hibiscus sabdariffa*) is known to have many health benefits, one of which can lower blood pressure. Rosella contains antioxidants, such as flavonoids and polyphenols. Through active components that directly impact blood vessels and blood pressure, consuming rosella flower tea can provide changes in blood pressure. The part used is rosella flower petals, in rosella flower petals contain active compounds of organic acids and flavonoids that can reduce blood viscosity. If the blood viscosity decreases, the heart will work lightly so that blood pressure will decrease⁽⁹⁾.

Based on preliminary studies conducted by researchers through interviews and data collection from the elderly posyandu regarding hypertension, it was found that 32 people had high blood pressure. Of these, 13 people realize that they suffer from hypertension but do not take regular medication, and only take generic drugs such as Paramex, 11 people suffer from hypertension who do not regularly take medication and do controls, and 8 people who suffer from hypertension and regularly take medication and do controls every month. The purpose of this study was to determine the effect of acupuncture therapy with a combination of Rosella tea steeping on changes in blood pressure in cases of hypertension in Krajan Hamlet, Mojosongo

II. METHODS

This study employed a quantitative approach with a quasi-experimental design. A quasi-experimental study is a type of experimental research in which the researcher does not have full control over all variables in the study. The design used was a nonequivalent control group design, where both the experimental and control groups were measured before (pretest) and after (posttest) the intervention to determine the treatment effect.

This research was conducted in Krajan Hamlet, Mojosongo, beginning with a preliminary study in October 2024 and continuing until April 2025.

The population in this study consisted of residents of Krajan Hamlet, Mojosongo, who were diagnosed with hypertension, with a total of 32 participants selected according to predetermined inclusion and exclusion criteria. The inclusion criteria were male and female subjects aged 40–70 years, diagnosed with mild hypertension (systolic 140–159 mmHg, diastolic 90–99 mmHg) or moderate hypertension (systolic 160–179 mmHg, diastolic 100–109 mmHg) based on a preliminary assessment, able to communicate effectively, willing to undergo 10 therapy sessions with a frequency of 2–3 times per week, and agreeing to participate by signing informed consent. The exclusion criteria included subjects with severe hypertension ($\geq 180/\geq 110$ mmHg), those who experienced a sudden decline in health status, pregnant women, subjects receiving other antihypertensive therapy or medication, those who withdrew during the study, and subjects who did not comply with the therapy schedule.

The independent variable in this study was acupuncture therapy at points GV20 (Baihui), GB20 (Fengchi), EX-HN5 (Taiyang), and LV3 (Taichong) combined with rosella tea infusion, while the dependent variable was the change in blood pressure before and after the intervention. The instruments used in this study included an informed consent form, sphygmomanometer, stethoscope, 1 cun acupuncture needles, 70% alcohol swabs, lancet needles, sterile gloves, nierbekken (kidney tray), rosella tea (*Hibiscus sabdariffa* L.) infusion prepared according to standard brewing procedures, and stationery for data recording.

Both groups received 10 therapy sessions over five weeks with a frequency of two to three sessions per week. Blood pressure measurements were taken

before (pretest) and after (posttest) each intervention session. The control group received acupuncture therapy only, while the experimental group received acupuncture therapy combined with rosella tea infusion. Before conducting the main analysis, the normality of the data was tested using the Shapiro–Wilk test. If the data were normally distributed, the paired sample t-test was used to analyze the pretest–posttest differences within each group, while the Wilcoxon signed-rank test was applied if the data were not normally distributed. To compare posttest results between groups, the independent sample t-test was used for normally distributed data or the Mann–Whitney U test for nonparametric data, with the level of significance set at $p < 0.050$.

III. RESULT

The subjects of this study amounted to 32 people who would be divided into two groups, with a total of 16 people in each group. The first group was treated with acupuncture therapy combined with rosella tea brewing, and the second group was given consumption of rosella tea brewing, which will be carried out 10 times a week, with 2-3 times the frequency.

Table 1. Characteristics of Respondents

Characteristics	Group I		Group II	
	N	%	N	%
Gender				
Female	6	37.5	3	18.8
Male	10	62.5	13	81.3
Age (years)				
41–50	4	25.0	3	18.8
51–60	7	43.8	6	37.5
61–70	5	31.2	7	43.8
Occupation				
Labor	3	18.8	0	0.0
Housewife	6	37.5	8	50.0
Driver	0	0.0	1	6.2
Merchant	3	18.8	3	18.8
Self-employed	4	25.0	4	25.0

Syndrome Diagnosis				
Kidney Liver Yin Deficiency	7	43.8	7	43.8
Rising Flame of the Heart	4	25.0	2	12.5
Hyperactivity of the Heart	2	12.5	5	31.2
Liver Qi Stagnation	3	18.8	2	12.5

Based on Table 1, it is known that of the 32 research subjects, the most common gender is female, 23 people, the most common age range is 51-60 years, 13 people, 14 people work as housewives, and the most common syndrome is Kidney Liver Yin Deficiency, 14 people.

Table 4. The Average Blood Pressure Before and After Therapy

Intervention	Blood Pressure	Min	Max	Mean
Acupuncture and Rosella Tea	Systole	120	150	136.25
	Diastole	70	90	81.35
Rosella Tea	Systole	120	150	134.38
	Diastole	70	90	82.50

Table 2. The average diastolic blood pressure before treatment in group I was 96.25 mmHg after treatment became 81.25 mmHg, while in group II, it was 95.63 mmHg after rosella tea consumption to 82.50 mmHg

Table 3. The Result of the Wilcoxon Test

Group	N	p
I	Pretest	16
	Posttest	16
II	Pretest	16
	Posttest	16

Table 3 shows the results of the Wilcoxon test, which assessed differences in pain scale scores before and after the intervention within each group. The analysis revealed a significant decrease in

blood pressure in both the acupuncture group, with $p=0.001$ (<0.05). This indicates that both interventions effectively reduced the blood pressure among participants.

Table 4. The Result of Mann-Whitney Test

Group	Blood Pressure	Mean Rank	p
I	Systole	136,25	<0.001
	Diastole	81.25	
II	Systole	134,38	<0.001
	Diastole	82,50	

Table 4. explains that the results of the Mann-Whitney test show a significance $p < 0.001$, it can be concluded that there is a difference between the two groups with a median value of group I systolic 140.00, diastolic 80.00 and the median value in group II systolic 130.00 and diastolic 80.00 which means that the acupuncture therapy group combined with rosella tea obtained a higher median value in reducing blood pressure compared to the single rosella tea consumption group.

IV. DISCUSSION

Based on previous research, women tend to have a higher risk of developing hypertension because women are concerned with emotional factors that can affect their physical and psychological conditions. Besides that, women's anxiety levels are also much higher than men's in any case, including facing themselves who are sick, so that some of these factors can increase the incidence of hypertension cases in women⁽¹²⁾.

The largest number of ages is around 51-60 years. because this age enters the late elderly period, so that the immune system decreases and the body's lack of response in preventing disease, and experiences a decline and causing the elderly to fall into a sick condition, this is

called the generative process⁽¹³⁾. The most common occupation is housewife work, as a housewife tends to cause high blood pressure due to stress. Sources of stress at work include workload, inadequate work facilities, unclear job roles, unclear responsibilities, problems in relationships with others, work demands, and family demands⁽¹⁴⁾.

In this study, non-parametric analysis was performed using the Wilcoxon test for paired data, given that the data analyzed were not normally distributed. The results of the Wilcoxon test showed a sig. value <0.050 . In the Mann-Whitney test, the results show a sig value <0.050 , which means H_0 is rejected and H_a is accepted because of the effectiveness of acupuncture therapy combined with rosella tea steeping. It can be concluded that there is a difference between the two groups, with the median value of group I systolic 140.00, diastolic 80.00, and the median value in group II systolic 130.00 and diastolic 80.00, which means that the acupuncture therapy group combined with rosella tea obtained a higher median value in reducing blood pressure compared to the single rosella tea consumption group.

Acupuncture therapy can improve microcirculation due to vasodilation of capillaries and arterioles. This effect can occur in the needling area and surrounding areas, as well as areas away from the needling. Sticking stimulates collateral axons that contain CGRP (calcitonin gene-related peptide) and synapse between axons with sympathetic nerve endings around the blood vessel. The release of acetylcholine by activated sympathetic nerve endings causes local vasodilatation around the puncture site. The occurrence of vasodilatation and the

increase in capillary permeability cause various metabolic wastes to be transported, supplying ATP, nutrients, and oxygen smoothly⁽¹⁴⁾.

This study is also in line with a study entitled The Effect of Rosella Flower Decoction (*Hibiscus sabdariffa*) on Decreasing Blood Pressure in Hypertension Patients, with the results of the effect of giving rosella tea brew on blood pressure in hypertensive patients⁽⁸⁾. Based on the discussion above, it can be concluded that acupuncture and rosella tea have a significant effect on changes in blood pressure in patients with hypertension. This is because acupuncture can regulate the nervous system, reduce stress levels, protect blood vessels, and potentially reduce hypertension. On the other hand, rosella contains diuretic substances and antioxidants that can increase urine production, which has the potential to reduce blood pressure and protect blood vessels from damage. So the results of this study indicate that acupuncture therapy combined with rosella tea brewing influences changes in blood pressure in patients with hypertension.

V. CONCLUSION

Statistically, the provision of acupuncture interventions in combination with rosella tea brewing proved to be more effective in providing changes in blood pressure compared to the single rosella tea consumption intervention alone, based on the significance value of the Wilcoxon and Mann-Whitney tests with the results of $p < 0.05$, so that the use of acupuncture therapy combined with rosella tea brewing has a high effectiveness in reducing blood pressure in patients with hypertension.

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