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The Effectiveness of Lemon Aromatherapy on Blood Pressure in Hypertension Patients in Modopuro Public Health Center, Mojokerto

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ABSTRACT

Hypertension is systolic blood pressure increases above 140 mmHg and diastolic blood pressure increases above 90 mmHg. One of the hypertension treatments is non-pharmacological therapy by giving lemon aromatherapy, which is helpful as an antioxidant, strengthens and vasodilation of blood vessels, and controls blood pressure. This study aimed to analyze the effectiveness of lemon aromatherapy on blood pressure in hypertension patients at Modopuro Public Health Center Mojokerto. The research design used pre-experimental with a one-group pre-post test design approach. The sample used 35 respondents with a purposive sampling technique. The research instrument used a digital thermometer and a blood pressure observation sheet. Statistical analysis test used the Paired t-test. The results showed that the mean systolic blood pressure before intervention was 158.34 mmHg, and the mean systolic blood pressure after intervention was 144.42 mmHg. The results showed a significant difference between systolic blood pressure before and after giving lemon aromatherapy in hypertension patients (p -value = 0.000; α < 0.05). Lemon aromatherapy can decrease blood pressure in hypertension patients, affecting the olfactory and circulatory nervous systems. When aromatherapy is inhaled, the olfactory nerve delivers impulses to the brain and stimulates the production of endorphins, which can calm and relax the body. That mechanism can cause vasodilation of blood vessels and a decrease in heart rate so that blood pressure will decrease.

Keywords: *Lemon Aromatherapy, Blood Pressure, Hypertension*

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INTRODUCTION

Hypertension is a condition in which systolic blood pressure increases above 140 mmHg, and diastolic blood pressure increases above 90 mmHg (Al-Mira, Ramadhan, and Aryati 2021). Hypertension is not well controlled, will attack target organs and can cause heart attacks, strokes, kidney problems, and blindness. If left in the long term, it will cause death. According to data from the World Health Organization (WHO) in 2019, the prevalence of hypertension currently reaches 22% of the world population. According to Riskesdas data (2018), the majority of hypertension in Indonesia is 658,201 people or 34.11%. The prevalence of hypertension in East Java shows that 105,380 (36.32%) residents suffer from hypertension (Kementrian Kesehatan Republik Indonesia 2019). According to

the Mojokerto District Health Service, the prevalence of hypertension in the Mojokerto District in 2022 will be 345,095 people.

Hypertension can be treated with pharmacological and non-pharmacological therapy. One of the non-pharmacological is giving lemon aromatherapy. Lemon contains the compound linalool, which has an antidepressant effect and helps relieve stress, relax and stabilize the nervous system. Not only that, the flavonoid content in lemons functions as an antioxidant, strengthens and widens blood vessels, and can control high blood pressure. When aromatherapy is inhaled, the aromatherapy molecules will influence the work of the olfactory system. The olfactory (olfactory) nerve transmits impulses to the brain, stimulating the production of endorphins that regulate mood. Inhaling aromatherapy calms and relaxes the body, allowing breathing patterns and heart rate to calm and blood pressure to be controlled (Al-Mira et al. 2021; Fadlilah et al. 2021; Marhabatsar and Sijid 2021; Sani et al. 2020; Tedjasukmana 2012).

According to research results from Jihan Al-Mira, et al (2021), the results of providing non-pharmacological therapy in the form of fragrant pandan and lemon aromatherapy had a significant effect in lowering blood pressure in hypertension sufferers by giving a combination of fragrant pandan and lemon aromatherapy (p -value = 0.000; α < 0.05). Based on this analysis, the study aims to analyze lemon aromatherapy's effectiveness on blood pressure in hypertension patients.

METHOD

The research design used pre-experimental with a one-group pre-post test design approach. The sample used 35 respondents with a purposive sampling technique. The research instrument used a digital tensimeter and a blood pressure observation sheet. Statistical analysis test used the Paired t-test.

FINDING AND DISCUSSION

Univariate Analysis

Table 1: Respondent's Characteristics

	Variable	n	%
Age	Early Adulthood	2	5
	Late Adulthood	14	40
	Early Old Age	16	46
	Late Elderly	3	9
Gender	Man	2	6
	Women	33	94
Educational Level	Illiterate	6	17
	Elementary School	10	29
	Junior High School	3	8
	Senior High School	16	46
History of Treatment	Routine	35	100
	Not a Routine	0	0

Source: Primary Data

Table 1 showed that almost half of the respondents experienced hypertension in early old age, 16 respondents (46%). The majority of respondents were female, 33 respondents (94%). Almost half of the educational level respondents had senior high school, 16 respondents (46%). All respondents had a history of hypertension treatment, 35 respondents (100%).

Table 2: Systolic Blood Pressure Before Giving Lemon Aromatherapy

Variable	Mean	Median	Standard Deviation	Min-Max	95% CI	
					Lower	Upper
Systolic Blood Pressure	158.34	155.00	10.58	143.00-181.00	154.71	161.98

*Data is normally distributed

The results based on Table 2 showed that the median systolic blood pressure before being given lemon aromatherapy was 155.00 mmHg with a minimum systolic blood pressure of 143.00 mmHg and a maximum systolic blood pressure of 181.00 mmHg.

Table 3: Systolic Blood Pressure After Giving Lemon Aromatherapy

Variable	Mean	Median	Standard Deviasi	Min-Max	95% CI	
					Lower	Upper
Systolic Blood Pressure	144.42	144.00	16.22	110.00-177.00	138.86	150.00

*Data is normally distributed

The results based on Table 3 showed that the median systolic blood pressure after being given lemon aromatherapy was 144.00 mmHg with a minimum systolic blood pressure of 110.00 mmHg and a maximum systolic blood pressure of 177.00 mmHg.

Bivariate Analysis

Tabel 4: Pengaruh Aromaterapi Terhadap Tekanan Darah

Variabel	Mean		Selisih	95% CI		P Value
	Pre	Post		Lower	Upper	
Tekanan Darah Sistol	158.34	144.42	13.92	10.59	17.23	0.000*

*Significant at p-value <0.05

The results based on Table 4 showed that the mean difference in systolic blood pressure before and after giving lemon aromatherapy was 13.92 mmHg. The Paired t-test statistical analysis test showed that the Confidence Interval (95% CI) of systolic blood pressure was less than 1 with p-value = 0.000 (α 0.05), so it can be concluded that there was a significant difference in mean systolic blood pressure before and after administering lemon aromatherapy in hypertension patients.

DISCUSSION

Systolic Blood Pressure Before Giving Lemon Aromatherapy

The study results showed that the median systolic blood pressure before being given lemon aromatherapy was 155.00 mmHg, with a minimum systolic blood pressure of 143.00 mmHg and a maximum systolic blood pressure of 181.00 mmHg. Meanwhile, in hypertension conditions, systolic blood pressure will tend to rise above 120 mmHg, and the appearance of signs and symptoms will follow. High blood pressure is caused by several factors that can influence systolic blood pressure. According to Dwi Anggara and Prayitno 2013, influencing factors can increase the risk of hypertension, which is caused by the main factors in the form of genetic/hereditary factors and is supported by other factors originating from the environment, such as age, gender, education level, and history of hypertension treatment.

Nearly half of respondents with the initial early elderly age criteria had hypertension, 16 respondents (46%). In line with research by Pratama, Fathnin, and Budiono (2020), the body's blood vessels change to become broader and stiffer, which results in a decrease in blood circulation ability in the blood vessels. The largest gender is female, with 33 respondents (94%). According to research by Falah (2019), women have a higher chance of experiencing hypertension than men. Women have a higher incidence of hypertension because of the menopause phase.

Most of the educational level of respondents was senior high school, 16 respondents (46%). In line with the opinion of Mayasari et al. (2019), increasing patient knowledge about hypertension will encourage someone to behave better in controlling hypertension so that blood pressure remains within normal limits. All respondents (100%) were routinely treated for hypertension by taking anti-hypertensive medication from the Modopuro Public Health Center. Hanum et al. (2019) believe hypertension treatment can be done by adopting a healthy lifestyle and taking anti-hypertensive medicines regularly. Lemon aromatherapy is a practical step in treating hypertension.

Systolic Blood Pressure After Giving Lemon Aromatherapy

The study results showed that the median systolic blood pressure after being given lemon aromatherapy was 144.00 mmHg with a minimum systolic blood pressure of 110.00 mmHg and a maximum systolic blood pressure of 177.00 mmHg. Lemon aromatherapy is a non-pharmacological therapy used to treat hypertension. Lemon contains chemical compounds that are good for the body. The linalool compound in lemons has an antidepressant effect, which helps reduce stress and relax and stabilize the nervous system, thus providing a calming effect. The flavonoid content is an antioxidant that strengthens and dilates blood vessels and controls high blood pressure (Al-Mira et al. 2021; Fadlilah et al. 2021; Sani et al. 2020).

The chemical compounds from lemon essential oil are volatile, which will carry aromatic elements and stimulate memory and emotional responses, which cause feelings of calm and relaxation, which will cause smooth blood flow. In line with research by Kartika dkk (2018), lemon aromatherapy is inhaled, chemical compound particles from lemon

aromatherapy that stick to the cilia membrane will stimulate the hypothalamus, causing the vagus nerve to send parasympathetic nerve impulses to the heart. Stimulation of the parasympathetic nerves will cause vasodilation in the arteries, which causes a decrease in blood pressure.

Difference of Systolic Blood Pressure Before and After Giving Lemon Aromatherapy

The results showed that the mean difference in systolic blood pressure before and after lemon aromatherapy was 13.92 mmHg. There was a significant difference in mean systolic blood pressure before and after administering lemon aromatherapy in hypertension patients (p -value = 0.000; $\alpha < 0.05$). There is a decrease in blood pressure due to the effects of lemon aromatherapy. Lemon aromatherapy is given by inhalation and is considered the fastest healing method. Lemon aromatherapy is because the volatile essential oil molecules react directly to the olfactory organ and are now perceived by the brain. Regular administration of lemon aromatherapy will slowly reduce muscle tension, soothen the blood vessels, and blood pressure will return to normal limits.

CONCLUSION

Lemon aromatherapy can decrease blood pressure in hypertension patients, affecting the olfactory and circulatory nervous systems. When aromatherapy is inhaled, the olfactory nerve delivers impulses to the brain and stimulates the production of endorphins, which can calm and relax the body. That mechanism can cause vasodilation of blood vessels and a decrease in heart rate so that blood pressure will decrease.

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