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# Decreasing Blood Pressure with Lavender Aromatherapy in Elderly with Hypertension

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**Abstract.** Hypertension requires appropriate management to overcome the increased blood pressure through complementary therapy. Complementary therapy with lavender essential oil is an option for hypertension, but many people don't use it. This study aimed to analyze the effect of lavender aromatherapy on blood pressure changes in the elderly with hypertension. The research design used was a pre-experimental design with a one-group pre-posttest design. The population was all elderly with hypertension. The sample consisted of 36 elderly with hypertension determined by a simple random sampling technique. The independent variable was lavender aromatherapy, and the dependent variable was blood pressure changes. The instruments of this research were an observation sheet, a sphygmomanometer, a stethoscope, a diffuser, and lavender essential oil. The research data were analyzed using the Wilcoxon Signed Rank Test. The results showed that more elderly (52.8%) were in the moderate hypertension category before receiving lavender aromatherapy. After being given the aromatherapy, 63.9% of the elderly were in the mild hypertension category. The Wilcoxon Signed-Rank Test obtained a value of 0.000. Therefore, lavender aromatherapy influenced blood pressure changes. Lavender aromatherapy decreased blood pressure.

## INTRODUCTION

The Elderly is someone who has reached the age of 60 years. Increasing age is usually followed by decreased physiological function due to a degenerative process (aging). Therefore, many degenerative diseases are found in the elderly, such as hypertension, arthritis, stroke, chronic obstructive pulmonary disease (COPD), and diabetes mellitus [1]. Hypertension is a major risk factor for heart disease and stroke. Hypertension was often referred to as the "silent killer" because often, people with hypertension go for years without feeling any disturbances or symptoms[2].

According to the Indonesian Basic Health Research (2018), South Kalimantan Province has the highest prevalence of hypertension at 44.13%, West Java at 39.6%, and East Kalimantan at 39.3%. On the other hand, Papua Province has the lowest hypertension prevalence at 22.2%. Related to the medication, most patients regularly take medication (54.4%), do not take medication regularly (32,27%), and never take medication 13.33% [3].

Factors that influence changes in blood pressure are heredity, age, gender, physical and psychological stress, obesity (obesity), unhealthy eating patterns, high salt consumption, lack of physical activity, alcohol consumption, caffeine consumption, other diseases, and smoking habit. If hypertension is not treated, it can trigger stroke, damage to blood vessels (arteriosclerosis), heart failure, and kidney failure [2].

There are two ways to treat hypertension, namely pharmacological and non-pharmacological treatment. The pharmacological treatment uses diuretics, beta-blockers, sympatholytics, central, alpha-blockers, arterial vasodilators, calcium channel blockers, ACE inhibitors, and type I angiotensin II receptor antagonists. Besides that, there is also alternative treatment (non-pharmacological therapy) which includes acupressure (acupuncture without needles), herbal medicine from China, juice therapy, herbal therapy, massage, yoga, breathing and relaxation, and aromatherapy [4]. One that can be used as a non-pharmacological therapy using aromatherapy is aromatherapy. Plants that function as aromatherapy are lavender flowers because they can be used for relaxation [5].

Aromatherapy is a healing process used to use pure aromatic plant extracts. The goal is to improve physical, mental, and emotional health. One of the plants that have a function as aromatherapy is lavender. When aromatherapy is inhaled, volatile molecules will carry aromatic elements that stimulate memory and emotional responses that cause feelings of calm and relaxation and facilitate blood flow [6]. Lavender oil already has a lot of potentials, and there are several ingredients such as camphene, limonene, nerol, and most of them contain linalool with the amount of 30%-60% of the total weight of the oil, which is the main active ingredient in relaxation [7]

## METHOD

### General Background of Research

The research design used was a one-group pre-post-test design. The population was all patients with hypertension. The independent variable in this study was blood pressure. The respondents measured their blood pressure levels before and before the treatments.

### The Sample of the Research

This research involved 36 respondents determined using the purposive sampling technique. The populations involved were patients suffering from hypertension. The population in this study was those who had inclusion criteria of hypertension and did not have complications such as heart disease, heart failure, kidney failure, or stroke.

### Instrument and Procedures

This study measured blood pressure using a sphygmomanometer before and after giving lavender aromatherapy.

### Data Analysis

The data analysis to determine the blood pressure was Wilcoxon Signed Rank Test. The level of significance was set at  $P < 0.01$ .

## RESULTS

**TABLE 1.** Distribution of Respondents by Age, Gender, Duration of Diabetes, Smoking Habit, Medication Adherence, and Exercise

| Characteristics of Respondent     | Frequency | (%)  |
|-----------------------------------|-----------|------|
| Gender                            |           |      |
| Female                            | 11        | 30,6 |
| Male                              | 25        | 69,4 |
| Age                               |           |      |
| 45-59                             | 7         | 19.5 |
| 60-74                             | 21        | 58.3 |
| 75-90                             | 8         | 22.2 |
| Having a Family with hypertension |           |      |
| Yes                               | 24        | 66.7 |
| No                                | 12        | 33.3 |
| Medicine Consumption              |           |      |
| Regularly                         | 14        | 38.9 |
| Irregularly                       | 22        | 61.1 |
| Exercise                          |           |      |
| Regularly                         | 10        | 27.8 |
| Irregularly                       | 26        | 72.2 |
| Coffee Consumption Habit          |           |      |
| Yes                               | 29        | 80.6 |

| Characteristics of Respondent | Frequency | (%)   |
|-------------------------------|-----------|-------|
| No                            | 7         | 19.4  |
| Smoking Habit                 |           |       |
| Yes                           | 30        | 83.3  |
| No                            | 6         | 16.7  |
| High Salt Consumption         |           |       |
| Yes                           | 20        | 55.6  |
| No                            | 16        | 44.4  |
| Having stress                 |           |       |
| Often                         | 7         | 19.4  |
| Rarely                        | 27        | 75    |
| No                            | 2         | 5.6   |
| Total                         | 36        | 100,0 |

Table 1 describes that most respondents were male (69.4%), 60-74 years old (58.3%), had a family with hypertension (66.7%), consumed the medicine irregularly (61.1%), exercised irregularly (72.2%), had coffee consuming habit (80.6%), had a smoking habit (83.3%), had high salt consumption habit (55.6), and rarely experienced stress (75%).

**TABLE 2.** The results of the Wilcoxon Signed-Rank Test

| Blood Pressure | Pre            |      | Post |      |
|----------------|----------------|------|------|------|
|                | (F)            | (%)  | (F)  | (%)  |
| Normal         | 0              | 0    | 7    | 19.4 |
| Mild HT        | 14             | 36.1 | 23   | 63.9 |
| Moderate HT    | 19             | 52.8 | 6    | 16.7 |
| Severe HT      | 4              | 11.1 | 0    | 0    |
| Total          | 36             | 100  | 36   | 100  |
| Wilcoxon       | $\rho = 0,000$ |      |      |      |

## DISCUSSION

Based on Table 2, most of the respondents' blood pressures (52.8%) were moderate before giving lavender aromatherapy. Moderate hypertension was a person's blood pressure with a systolic value of 160-179 mmHg and a diastolic value of 100-109 mmHg [8]. Hypertension is influenced by several uncontrolled and controlled factors [9].

Risk factors that cannot be controlled are gender, history of hypertension, and unwillingness to take medication. Based on Table 1, out of the 36 respondents, the majorities (69.4%) of respondents were female, aged 60-74 years (58.3%), had a history of hereditary hypertension (66.7%), did not take anti-hypertensive drugs regularly (61.1%).

Females are at risk of suffering from hypertension [10]. Another research showed that women had a 1.4 times risk of suffering from hypertension than men [11]. Menopausal conditions can increase women's risk of hypertension because the estrogen hormone decreases. It causes organ functions to decrease, such as hardened atrial vessels, damaged endothelial cells, and causes plaque in the blood, thereby stimulating blood pressure.

Age is a risk factor for hypertension that cannot be prevented because, naturally, age continues to grow. This factor cannot be controlled. Control efforts that can be done are to implement a healthy lifestyle by changing a healthy diet and exercising.

Other trigger factors that cause an increase in blood pressure are lack of exercise, coffee drinking habits, smoking, consumption of salty or high-salt foods, and stress. Table 1 shows that 72.2% of the respondents did not exercise regularly, 80.6% did not consume coffee, 83.3% did not smoke, 55.6% consumed salty or high-salt foods, and 75% of the respondents often experienced stress.

The results of this study are in line with research by Liu et al (2017), who show a relationship between physical activity factors and the occurrence of hypertension [12]. Regular exercise has a risk to reduce the occurrence of atherosclerosis, while atherosclerosis is one of the risk factors for hypertension [14]. Hypertensive sufferers who take medication, if they exercise, will help the drugs they take work [13].

Based on the Wilcoxon Signed Rank Test with a significance value of 0.05, the obtained value was 0.000. Therefore,  $H_1$  was accepted. It means that lavender aromatherapy affects blood pressure changes in the elderly.

Lavender aromatherapy can lower blood pressure because aromatherapy can help cure hypertension sufferers in controlling blood pressure by minimizing triggers from increasing high blood pressure, such as stress. Lavender aromatherapy can relax hypertensive sufferers, reduce anxiety levels, and overcome sleep disorders.

## CONCLUSIONS

Lavender aromatherapy can decrease blood pressure for the elderly

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