

THE EFFECTIVENESS OF CITRONELLA (*Cymbopogon nardus*) AROMATHERAPY ON BLOOD PRESSURE IN THE ELDERLY IN KARET, PLERET, BANTUL

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Abstract

*The elderly have hypertension due to an increase in arterial pressure. Hypertension that is not treated properly can cause complications such as stroke, coronary heart disease, diabetes, kidney failure and blindness. One of the non-pharmacological treatments for hypertension in the elderly is citronella aromatherapy. Citronella (*Cymbopogon nardus*) contains monoterpene alcohol such as linalool and geraniol, which function as analgesics, calm and balance stimulation, and have a vasodilator effect. Treatment of hypertension in the elderly at the research site is still limited to administering drugs (pharmacological therapy). The provision of non-pharmacological therapy to treat hypertension has not been carried out at the research site This study aimed to determine the differences in the effectiveness of citronella aromatherapy on blood pressure in hypertensive older people in Karet, Pleret, Bantul. This study used a Quasy experimental pre-post without control group design method. In addition, the researcher used the bivariate Wilcoxon signed-rank test. The results obtained are p-value of 0.00, meaning there is a significant difference in the mean value before and after the citronella aromatherapy intervention was given. Therefore, it is hoped that this intervention can be used as a reference to reduce blood pressure in the elderly who have hypertension.*

Keywords: Citronella Aromatherapy; Blood Pressure; Elderly

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1. Introduction

Indonesia's elderly population is increasing. In 2018, the elderly represented 9.27 per cent of the population or 24.49 million people; in 2019, they represented 9.6 per cent or 25 million people; and in 2020, they represented 9.92 per cent or 26 million people. The Special Region of Yogyakarta has the greatest elderly population in Indonesia, at 64.19 per cent, putting it in the category of ageing cities (Badan Pusat Statistik, 2020). The success of health and socioeconomic development will contribute to the elderly living a good life. As the elderly population grows, a forum or place for empowering the elderly is needed; the elderly have the potential to sell or farm because this work does not have an age limit and can do it independently (Badan Pusat Statistik, 2018).

Hypertension is a common health concern among the elderly. Hypertension is a non-communicable disease that can result in premature death in Indonesia. It occurs when the pressure in the

blood vessels increases to systolic >140 mmHg and diastolic >90 mmHg. The cause of hypertension is either a primary disease or an unknown disease. This disease manifests through signs, asymptomatic symptoms, and headaches/dizziness (Kementerian Kesehatan RI Badan Penelitian dan Pengembangan, 2018). Numerous factors contribute to hypertension, including gender, with women experiencing it more frequently, and physical activity, with those who infrequently engage in activities such as walking, sitting, sweeping, cooking, cleaning the house, and working having higher blood pressure. A family history of hypertension may also play a role, as families with a history of hypertension are more prevalent than families without a history of hypertension. People over 40 are especially at risk of getting hypertension, as are frequent smokers (Tumanduk, 2019). In addition, lifestyle factors such as excessive salt consumption, obesity, stress, and mental tension might boost adrenaline chemicals,

causing the heart rate to elevate and resulting in hypertension. Prolonged hypertension can result in a stroke because it causes hypertrophy and thickening of the arteries that carry blood to the brain, reducing blood flow to the brain. Additionally, as a result of atherosclerosis, the arteries in the brain weaken and potentially rupture Sya'diyah, (2012); (Manuntung, 2018).

Hypertension is a growing problem in Indonesia. In 2018, regional health research (Riskesdas) reported that the prevalence of hypertension was 55.2 per cent among those aged 55 to 64 years, 63.2 per cent among those aged 65 to 74 years, and 69.5 per cent among those aged over 75 years. Respondents who were diligent took medication at a rate of up to 54.4 per cent, those who were not diligent took medication at a rate of 32.3 per cent, and those who did not take medication at all at 13.3 per cent. People with hypertension who do not take medication do so for a variety of reasons, including feeling healthy (59.8 per cent), not visiting health facilities regularly (31.3 per cent), taking traditional medicine (14.5 per cent), and others (12.5 per cent), who frequently forget to take medication. (11.5 per cent), are unable to purchase pharmaceuticals (8.1 per cent), are unable to tolerate drug side effects (4.5 per cent), and drugs are not available in health institutions (2.0 per cent). Special Region of Yogyakarta ranks fourth highest with a total of 11.01 per cent or more than double the national rate (8.8 per cent); hypertension is one of the ten diseases that kill Special Region of Yogyakarta residents (Balitbangkes Kemenkes, 2018; Kemenkes RI, 2018).

Chronic hypertension is an illness that requires ongoing treatment or control. Citronella aromatherapy is one of the complementary or non-pharmacological therapies that is beneficial at lowering blood pressure. Non-pharmacological treatment is treatment that is obtained from natural components; these chemicals are frequently readily available and relatively inexpensive (Pikir, 2015). According to prior research, offering foot massages with lemongrass oil at the UPTD Social Services for the Elderly "TRESNA WERDHA" Natar South Lampung resulted in a significant difference in blood pressure decrease between before and after the intervention for seven days (Iqmy & Agustina, 2018). Apart from being utilized for foot massage, lemongrass can also be employed as an aromatherapy agent to help patients with high blood pressure prior to tooth extraction (Rosyida, 2020). This study updated prior findings that aromatherapy was used to lower blood pressure in senior hypertensive patients using the aromatherapy furnace method, in order to determine whether it was beneficial in lowering blood pressure in the elderly, as previously reported.

Citronella (*Chmbopogon nardus*) is mostly composed of monoterpene alcohols such as linalool

and geraniol, which act as analgesics, calm and balance stimulant activity, and have anti-inflammatory properties (Iqmy & Agustina, 2018). Furthermore, citronella aromatherapy has an effect on psychological and physiological conditions in the autoimmune system's response, geraniol and citronella are thought to be components of citronella aromatherapy that play a role in lowering blood pressure, geraniol has the function of reducing the noradrenaline contractile response on the walls of the heart blood vessels, and citronellol can exert a direct effect that causes vasodilation of vascular smooth muscle. (Martínez, 2020; Rosyida, 2020).

Citronella is easy to find in traditional shopping centers or markets because it is relatively inexpensive; citronella cultivation is also simple because the plant can grow up to 2 meters in height, can grow in soil with low permeability, such as in narrow land such as flower pots, and can grow in dry and open conditions with a fast growth rate (Sidabutar, 2020). Citronella essential oil has a distinct odor and is commonly found in citronella oil, which is commonly utilized by the elderly.

Thirty senior persons suffer from hypertension, according to the findings of a preliminary study done by researchers in Karet, Pleret, Bantul. In that location, treating hypertension in the elderly is still restricted to the administration of drugs (pharmacological therapy). Other activities, such as geriatric exercise, are still ineffective in lowering blood pressure in the old. The research location did not provide non-pharmacological therapy to manage hypertension. Elderly cadres and families that care for the elderly in Karet, Pleret, Bantul can easily provide aromatherapy. The researcher wishes to do a study called "Effectiveness of Citronella (*Cymbopogon nardus*) Aromatherapy on Blood Pressure in Elderly with Hypertension in Karet, Pleret, Bantul" based on the information given.

2. Method

This form of research use *quantitative* methodologies and a *quasi-experimental design* with a pre- and post-test without the use of a control group. The research will take place in Karet, Pleret, Bantul in September 2021. The sample for this study consisted of elderly residents of Karet, Pleret, and Bantul. They met the research requirements, namely those with blood pressure greater than 130/90 mmHg, aged 60 years or older, willing to participate in research with informed consent, and present during the research. Purposive sampling was utilized in this investigation. Researchers collected data on hypertension through blood pressure examinations.

Research instruments are tools or facilities that researchers use to collect data in order to do research more efficiently and effectively (Swarjana, 2015). The instrument used in this study is a TensiOne

digital sphygmomanometer with type 1A Onemed that has passed the factory calibration test before being circulated. In addition, tension has a systolic and diastolic blood pressure monitor and a pulse heart rate monitor, which simplifies blood pressure measurement for researchers. Blood pressure readings are performed per Standard Operating Procedures (SOP), which include using handscoons, masks, and face shields, as well as maintaining a safe distance. Citronella aromatherapy was used in this study. It was administered via an aromatherapy furnace, candles, and essential oils. The aromatherapy procedure is carried out for ten minutes within a single day, in a closed room, in accordance with the standard operating procedures derived from existing references.

The elderly intervention will actually happen in each elderly home, and each respondent will receive a set of aromatherapy equipment (aromatherapy furnace, dropper, candles and citronella aromatherapy oil). The intervention was performed three times over a period of two weeks in each elderly home, with the condition that the room be closed, and blood pressure was taken before and after each session. Because the data were not normally distributed, the bivariate test used the Wilcoxon signed rank test.

3. Results and Discussion

Karet is located in Pleret Village, Pleret District, Yogyakarta's Bantul district. Karet has a high proportion of elderly residents, 17.81 per cent. Additionally, the majority of the population, particularly the elderly, continue to work as farmers. The majority of the elderly continue to be active participants in community activities. The presence of land and parks that are frequently used by inhabitants, particularly for gathering and weekly exercises.

However, in terms of health, education, and the economy, the community is still deficient, but it demonstrates a high level of enthusiasm and desire to implement a health or education program if given the opportunity. The aged and their families are still unaware of the dangers and consequences associated with diseases that affect the old. The aged and their family believe that disease in the old is a natural occurrence and does not require immediate treatment. Table 1 below summarizes the characteristics of respondents.

Table 1. Respondents' Characteristics

Categorical	Total	Per centage
Age		
Elderly (60-74 years)	26	74.3
Old (75-90 years)	9	25.7
Gender		
Male	12	34.3
Female	23	65.7

According to the table above, the majority of respondents are classified as elderly, between the ages of 50 and 74 years, with as many as 26 respondents falling into this category (74.3 per cent). The majority of responses are female; as many as 23 respondents are female (65.7 per cent). Age is a risk factor for hypertension. The findings of this survey indicated that the majority of respondents were between the ages of 60 and 74 years or were of advanced age (elderly), totalling 26 participants (74.3 per cent). The elderly experience increased blood pressure due to decreased blood vessel elasticity, which results in reflux from the peripheral arteries. This reflux results in a systolic pressure wave along with the heartbeat. Systolic blood pressure increases, and diastolic blood pressure decreases when the heart beats. Hypertension, or elevated blood pressure, is caused by a variety of factors, including age, stress, gender, intense activity, smoking, and an excessive salt intake (Pikir, 2015); (Potter Perry, 2017).

The characteristics of citronella (*Cymbopogon nardus*) aromatherapy respondents by gender revealed that the majority of responders, 23 in total, were female (65.7 per cent). There are no substantial differences between men and women; however, after men reach adolescence, their blood pressure typically rises, while women after menopause typically have a greater blood pressure than men (Potter Perry, 2017).

Table 2. Blood pressure normalization test for respondent

Blood pressure	Normality test *
Systolic blood pressure (pre)	0.070
Systolic blood pressure (post)	0.013
Diastolic blood pressure (pre)	0.034
Diastolic blood pressure (post)	0.094

*) Shapiro Wilk test

Table 3. Blood pressure of respondent

Blood pressure	Minimum	Maximum	Mean	Median	Std. Deviasi
Sistolik blood pressure (pre)	141	190	159.49	157	12.244
Sistolik blood pressure (post)	132	177	147.71	145	10.010
Diastolik blood pressure (pre)	81	117	95.11	94	8.502
Diastolik blood pressure (post)	73	104	89.60	90	6.222

According to the normality test results in Table 2, blood pressure data were not normally distributed except for diastolic blood pressure following the intervention. The researcher then performed the bivariate Wilcoxon signed rank test, which is explained in detail in Tables 3 and 4.

According to table 3, the mean systolic blood pressure was 159.49 prior to the intervention and 147.71 following the intervention. There was an 11.78-point decline. Before the intervention, the mean diastolic blood pressure was 95.11, whereas it was 89.60 afterwards. There was a 6.61-point decline.

Table 4. Bivariate test

Blood pressure	P value*
Sistolik	0.00
Diastolik	0.00

*) Wilcoxon signed-rank test

According to Table 4, the bivariate test for systolic and diastolic blood pressure using the Wilcoxon signed-rank test obtained a p-value of 0.00, indicating that there is a significant difference in the mean value before and after the intervention. This is consistent with an earlier study indicating that citronella aromatherapy can help lower blood pressure in elderly people who have hypertension. Citronella aromatherapy contains geraniol and citronella, both of which have a soothing impact on the body and can help lower blood pressure.

Citronella contains geraniol and citronella, both of which have an effect on the autonomic nervous system's response to psychological and physiological conditions; geraniol plays a role by inhibiting noradrenaline contractile responses on the walls of blood vessels and the heart (Elfira, 2020). Meanwhile, citronellol in citronella has a direct influence on blood pressure by causing vasodilation of vascular smooth muscle (Rosyida, 2020).

Aromatherapy begins with the inhalation of vapours from essential oil molecules, which have a direct influence on the olfactory organs and are regarded as relaxing by the brain (Elfira, 2020). Essential oils or essential oils that are often used in aromatherapy have various features, including a particular odour, a high refractive index, and special optics and rotations. These oils do not combine with water, although a small amount of essential oil can impart a scent to water (Koensoemardiyah, 2011).

Citronella (*Cymbopogon nardus*) essential oil is one of the oils that can be used since it includes geraniol (trans-citral), citronella, and niacin (Evizal, 2013). This content may have an influence on psychological and physiological factors affecting the autonomic nervous system's reaction. Geraniums contribute to this effect by inhibiting noradrenaline contractile responses on the walls of blood vessels and the heart (Iqmy & Agustina, 2018). Meanwhile,

citronellol in citronella has a direct influence on blood pressure by causing vasodilation of vascular smooth muscle (Rosyida, 2020).

According to the description above, the researcher might conclude that aromatherapy has a calming impact and helps to quiet the mind psychologically. Citronella aromatherapy (*Cymbopogon nardus*) is an alternative non-pharmacological treatment that has been shown to reduce blood pressure in hypertensive elderly patients by relaxing the body and decreasing noradrenaline contractile responses in the blood vessels and heart, as well as vasodilation of vascular smooth muscle.

4. Conclusions and suggestions

On the basis of the aforementioned research findings, it can be inferred that: The majority of respondents are classified as elderly between the ages of 50 and 74. The majority of respondents are female. The systolic value decreased by 11.78 points following the intervention. Following the intervention, the diastolic value decreased by 6.61 points. Citronella aromatherapy is effective at considerably lowering blood pressure in elderly hypertensive patients. The author hopes that this strategy can be utilized as a substitute for medications used to treat hypertension in the elderly. Additionally, it is intended that this research will be utilized to inform health centre policies aimed at lowering the prevalence of hypertension in the elderly in the community.

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