Jurnal Penelitian dan Kajian Ilmiah Kesehatan
Politeknik Medica Farma Husada Mataram
Volume 9 Issue 1, April 2023
DOI : 10.33651/jpkik.v8i1.504
Website : https://jurnal.poltekmfh.ac.id/index.php/JPKIK

COMPARISON OF BASIL LEAF EFFECTIVITY WITH CUCUMBER ON BLOOD PRESSURE IN ELDERLY HYPERTENSION AT PKU MUHAMMADIYAH KOTA BOGOR CITY IN 2022

Shafa Salsabila[1], Bunga Tiara Carolin[2*], Vivi Silawati[3]

[1,2,3] Midwifery Study Program, Faculty of Health Sciences, National University, Jakarta

Corresponding Author: bunga.tiara@civitas.unas.ac.id

ARTICLE INFO

Article History:
Received: 17-02-2023
Accepted: 14-03-2023
Published online: 23-06-2023

Keywords:
Aged
basil leaves
blood pressure
cucumbers
hypertension

ABSTRACT

Background: Hypertension is one of the problems in the elderly. According to the Indonesian Ministry of Health in 2018 hypertension in the elderly was 55.2%. One alternative treatment is using basil leaves (Ocimum Basilicum) and cucumber (Cucumis Sativus L). Objective: to determine the comparison of the effectiveness of basil leaves with cucumber on blood pressure in elderly hypertension. Methodology: Research using quasi-experiment with two groups pretest and posttest. Sampling using a nonprobability sampling technique with as many as 40 respondents and a simple random sampling technique to determine both groups. The analysis used paired t-test and independent t-test: Average systolic and diastolic blood pressure pretest 147.50 / 94 mmHg and on cucumber 154.90 / 94.00 mmHg. In the post-test, it decreased in basil leaves 134.15/83.60 and cucumberp135.25 / 82.25. Obtained p-value of systolic blood pressure 0,86> α (0.05) and ρ-the value of diastolic blood pressure 0,49. The results of the independent t-test showed no significant difference in the mean blood pressure in the intervention group given both basil and cucumber leaves. Conclusion: Cucumber jelly is more effective in reducing blood pressure for people with hypertension. Suggestion: This study is expected that patients who experience hypertension can consume cucumber jelly as an additional therapy for hypertension and it is hoped that the results of the study can be useful in dealing with high blood pressure in the elderly.

INTRODUCTION

The elderly is the last period of development in human life. A person is said to enter the elderly if they have reached the age of 45 years or more. Based on the age category of the elderly, the elderly can be divided into three, namely the early elderly period 46-55 years, the late elderly period 56-65 years, and the elderly 65 years and over. Entering the elderly phase, individuals

experience various changes. Changes experienced by the elderly include changes in physiological, psychological, and socio-economic status (Windiri et al., 2019). The elderly are susceptible to diseases associated with the aging process, one of which is high blood pressure, or called hypertension. Hypertension is a condition in which blood pressure rises above the normal range, causing illness and even death. A person is said to have hypertension if their blood pressure is above the normal range, which is 140/90 mmHg. Blood pressure increases with increasing systolic blood pressure, and the level varies for each person affected, and blood pressure fluctuates within a certain range depending on posture, age, and stress experienced (Fitri et al., 2021).

According to the World Health Organization (2018), non-communicable diseases have become the biggest cause of death in the world. It is stated that nearly 17 million people die prematurely every year due to the non-communicable disease epidemic. Based on WHO data from 50% of people with hypertension, it is known that only 25% receive treatment, and only 12,5% are treated properly. WHO estimates that 600 million people in the world currently suffer from hypertension and 3 million of them die each year because of it (WHO, 2018). WHO states that developing economies have 40% of hypertensive patients while developed countries are 35%, the African region holds the top position of hypertensive patients, which is 40%. The American region is 35% and Southeast Asia is 36%. The Asian region has killed 1,5 million people every year. This indicates that one in three people suffer from hypertension. While in Indonesia it is quite high, reaching 32% of the total population.

According to Riskesdas (2018), the prevalence of hypertension based on measurement results in the population aged 18 years was 34.1%, the highest in South Kalimantan (44.1%), while the lowest in Papua was (22.2%). Hypertension occurs in the age group 31-44 years (31.6%), age 45-54 years (45.3%), and age 55-64 years (55.2%) (Ministry of Health RI 2018). Meanwhile, in 2018, West Java ranked second as the province with the highest hypertension cases in Indonesia at 39.6% after South Kalimantan at 44.1% (Riskesdas, 2018). Based on data from the Bogor City Health Office 2018, Hypertension is included in the top ten most common diseases in Bogor City, to be precise the second most after acute Nasopharyngitis disease. Data on hypertension visits increased to 47,373 or 19% in 2018 (Bogor City Health Office, 2018).

Hypertension is one of the most dangerous health problems worldwide because hypertension is a major risk factor leading to cardiovascular diseases such as heart attack, heart failure, stroke, and kidney disease (Fakhriyah, 2021). Hypertension control is inadequate even though effective drugs are widely available. Hypertension can be treated with pharmacological therapy by administering drugs such as diuretics, sympathetic, beta-blockers, and vasodilators. Monotherapy is rarely able to control blood pressure, and many patients require more than 1 anti-hypertensive drug, so people with hypertension need the right combination of drugs that are safe to take for a long time. This can trigger other side effects. In non-pharmacological therapy in the form of lifestyle modification, reducing body weight, limiting sodium intake, modifying a low-fat diet, limiting alcohol, limiting caffeine, relaxation techniques, elderly exercises, and stopping smoking habits.

Nonpharmacological therapy, also known as herbal medicine, uses natural ingredients whose benefits are not inferior to chemical drugs, one of which is consuming basil leaves. Basil plants are plants that are easily found in gardens, yards, and rice fields. Most basil leaves are consumed as fresh vegetables or used to eliminate the fishy smell of cooking. The characteristic of basil leaves is that it has a fragrant odor and a bitter taste. Basil leaves contain eugenol, flavonoids, potassium, and magnesium compounds that make basil leaves have an antioxidant function to dilate blood vessels and improve blood circulation. Basil leaves are known to contain eugenol, magnesium, and flavonoid compounds that can have a vasodilating effect on blood vessels that help improve heart function and reduce arterial strength (Ageng et all., 2022).

Besides basil, cucumber is also expected to be a breakthrough in overcoming hypertension problems. Cucumber can treat hypertension because of its mineral content, namely potassium, magnesium, and phosphorus which are diuretics with a high water content that helps lower blood pressure. Potassium is

generally found in several fruits and vegetables. Fruits and vegetables that contain potassium are very good for consumption by people with high blood pressure (Tukan, 2018).

Based on research conducted by Efa (2007) from Maranatha University Bandung on the role of basil leaf decoction in adult women against normal blood pressure. With a decoction of 1 gram of basil and cucumber leaves for 7 days every 1x day, it can reduce normal blood pressure in adult women aged 18-25 years by 9% in systolic pressure and 8% in diastolic pressure. Based on research conducted by Siagian (2015) from the Adventist University of Indonesia on the role of basil leaf infuse in adult women on normal blood pressure. With the infusion of 5,6 gr of basil leaves and drunk for 6 days, it can reduce normal blood pressure in adult women aged 35-60 years by 9% in systolic pressure and 8% mmHg in diastolic pressure.

In a study conducted by et Danang (2020), it was found that blood pressure dropped by 9% in systolic. While in a study conducted by Yantina et all., (2019) the blood pressure of hypertensive patients before and after giving cucumber juice in the experimental group, namely systolic dropped by 12%, and diastolic dropped to 14% With the intervention carried out by giving cucumber juice as much as 200cc of water mixed with 100 grams of cucumber or the equivalent of 1 glass of cucumber juice, then given for a week twice a day, namely in the morning and evening.

The results of a survey conducted by the author at the PKU Muhammadiyah Clinic in Bogor City, conducted interviews with several patients still experiencing high blood pressure, also seen from the results of blood pressure measurements, namely 140/90 mmHg, 150/100 mmHg, even though the patient has taken anti-hypertensive drugs given by the doctor and the clinic has also provided an elderly exercise program (Prolanis). In 2020 there were 174 people affected by hypertension and in 2021 it increased to 526 people in total age. Problem identification was carried out at PKU Muhammadiyah Bogor City which has hypertension patients, and the elderly in November 2022, which is around 40 people. Related to this phenomenon, the researcher conducted a study Comparing the Effectiveness of Basil Leaves with Cucumber on Blood Pressure in Elderly Hypertension at PKU Muhammadiyah Bogor City. The virtue of this research is to increase the use value of basil and cucumber leaves as anti-hypertensive drugs. Basil and cucumber leaves are expected to. The priority of this research is to increase the use value of basil and cucumber leaves as anti-hypertensive drugs. Basil and cucumber leaves are expected to be a solution for people with hypertension without dependence on antihypertensive drugs by utilizing local plants that are around.

MATERIAL AND METHOD

The research used a quasi-experiment with two groups pretest and posttest. Sampling using a nonprobability sampling technique with as many as 40 respondents and a simple random sampling technique to determine both groups. The analysis used paired t-tests and independent t-tests.

Blood pressure measurements were taken before and after treatment. The instruments in this study were Sphygmomanometer, observation sheet, and Standard Operating Procedure (SOP) for making basil leaf jelly and cucumber jelly. Processing of basil leaves using 200 grams of basil leaves and 250ml of water boiled at a temperature of 90° for 15 minutes so that 125 cc of boiled water is obtained and mix jelly powder Stir well while heating until boiling. How to consume is taken 1 time a day in the morning. Similarly, cucumber with 200 grams of basil leaves and 250ml of water is boiled at 90° for 15 minutes so that 125 cc of boiled water is obtained and mix jelly powder Stir well while heating to a boil. How to consume is taken 1 time a day in the morning.

RESULTS

Table 1. Average blood pressure values before and after intervention in the elderly at Klinik PKU Muhammadiyah Bogor City Clinic in 2023

Basil leaves						
Blood pressure	**group**	**N**	**Min.**	**Max.**	**Mean**	**SD**
Systolic	Pretest	20	140	161	147.50	6.833
	Posttest	20	120	154	134.15	9.566
Diastolic	Pretest	20	90	102	94.30	4.612
	Posttest	20	70	97	83.60	6.369
Cucumber						
Blood Pressure	**group**	**N**	**Min.**	**Max.**	**Mean**	**SD**
Systolic	Pretest	20	140	170	154.90	9.851
	Posttest	20	120	150	135.25	7.518
Diastolic	Pretest	20	80	100	94.00	5.982
	Posttest	20	70	92	82.25	6.034

Based on Table 1. It is known that the minimum value of systolic blood pressure before being given basil leaf jelly is 140 mmHg, maximum 161 mmHg, mean 147.5 mmHg, and standard deviation 6.833 and after being given basil leaf jelly the minimum value is 120 mmHg, maximum 154 mmHg, mean value 134.15 mmHg and standard deviation 9.566. The average value of diastolic blood pressure before being given basil leaf jelly is a minimum value of 90 mmHg, a maximum of 102 mmHg, a mean of 94.30, and a standard deviation of 4.612 while the minimum value after being given basil leaf jelly is 70 mmHg, a maximum of 97 mmHg, a mean of 83.60 mmHg, and a standard deviation of 6.369 which means there is a decrease in systolic and diastolic blood pressure after being given basil leaf jelly.

Then in the cucumber treatment, it is known that the minimum value of systolic blood pressure before being given cucumber jelly is 140 mmHg, a maximum of 170 mmHg, a mean of 154.90 mmHg and a standard deviation of 9.851 and after being given cucumber jelly the minimum value is 120 mmHg, a maximum of 150 mmHg, a mean value of 135.25 mmHg and a standard deviation of 9.851. The average value of diastolic blood pressure before being given cucumber jelly is a minimum value of 80 mmHg, a maximum of 100 mmHg, a mean of 94.00, and a standard deviation of 5.982 while the minimum value after being given cucumber jelly is 70 mmHg, a maximum of 92 mmHg, a mean of 82.25 mmHg, and a standard deviation of 6.034 which means there is a decrease in systolic and diastolic blood pressure after being given cucumber jelly.

Table 2. The effect of giving basil leaf jelly to reduce blood pressure

Blood pressure	**Mean**		**Difference Mean**	**ρ-value**
	Pretest	**Posttest**		

Systolic	147.50	134.15	13.35	0.000
Diastolic	94.30	83.60	10.70	0.000

Based on Table 2, the average blood pressure in the systolic group before being given basil leaf jelly was 147.50 mmHg, after being given it decreased to 134.15 and a mean difference of 13.35, while in the diastolic group before being given basil leaf jelly was 94.30 mmHg and after being given it decreased to 83.60 mmHg and a mean difference of 10.70.

Based on the paired t-test the systolic group obtained a p-value of 0.000, which means that if p-value (0.000) <0.005 then H0 is rejected and Ha is accepted which means that there is an effect of giving basil leaf jelly on reducing the systolic blood pressure of the elderly at the PKU Muhammadiyah Clinic Bogor city in 2023. In the diastolic group, the p-value of 0.000 was obtained, which means that if the p-value (0.000) <0.005 then H0 is rejected and Ha is accepted, which means that there is an effect of giving basil leaf jelly on reducing diastolic blood pressure in the elderly at the PKU Muhammadiyah Clinic in Bogor City in 2023.

Table 3. The effect of cucumber jelly on lowering blood pressure

Blood pressure	Mean		Difference Mean	P - Value
	Pretest	Posttest		
Systolic	154.90	135.53	19.37	0.000
Diastolic	94.00	82.25	11.75	0.000

Based on Table 3, the average blood pressure in the systolic group before being given cucumber jelly was 154.90 mmHg, after being given it decreased to 135.53 and a mean difference of 19.37, while in the diastolic group before being given cucumber jelly was 94.00 mmHg and after being given it decreased to 82.25 mmHg and a mean difference of 11.75.

Based on the paired t-test in the systolic group, the p-value is 0.000, which means that if the p-value (0.000) <0.005 then H0 is rejected and Ha is accepted, which means that there is an effect of giving cucumber jelly on reducing the systolic blood pressure of the elderly at the PKU Muhammadiyah Clinic in 2023. In the diastolic group, the p-value is 0.000, which means that if the p-value (0.000) <0.005 then H0 is rejected and Ha is accepted, which means that there is an effect of giving cucumber jelly on reducing diastolic blood pressure in the elderly at the PKU Muhammadiyah Clinic in Bogor city in 2023.

Table 4. Comparison Of Daun Basil Leaf Evectivity With Cucumber To TekananBlood Pressure In Hipertensi Elderly Hypertension At Pku Muhammadiyah Bogor City TahunIn 2022

Blood pressure	Mean		Difference Mean	P-Value
	Basil Leaf Jelly	Cucumber Jelly		

Posttest Systolic	134.15	135.25	-1.1	0.86
Posttest Diastolic	83.60	82.25	1.35	0.49

Based on the statistical results p-value systolic is 0.86> 0.05 which means that there is no difference between the administration of basil leaf jelly and cucumber jelly on blood pressure and the results p-value diastolic is 0.49> 0.05 which means that there is no difference between the administration of basil leaf jelly and cucumber jelly on diastolic blood pressure in the elderly at the PKU Muhammadiyah clinic Bogor City in 2023.

DISCUSSION

Based on statistical results, the mean difference between pretest and posttest systolic in basil leaf jelly is 13.35 mmHg, and the mean difference between pretest and posttest diastolic is 10,70. Based on the research table, the difference in mean pretest and posttest systolic in cucumber jelly is 19,37 and the difference in mean pretest and diastolic posttest is 11,75.

Based on the statistical results p-value systolic is 0,86> 0,05 which means that there is no difference between the administration of basil leaf jelly and cucumber jelly on blood pressure and the results p-value diastolic is 0,49> 0,05 which means that there is no difference between the administration of basil leaf jelly and cucumber jelly on diastolic blood pressure in the elderly at the PKU Muhammadiyah clinic Bogor City in 2023.

Previous research was conducted by Syapitri and Edriyani (2019) from USM Indonesia regarding the Comparison of the Effectiveness of Cucumber and Starfruit Against Changes in Blood Pressure. With the average difference in Mean Arterial pressure (MAP) before and after the cucumber intervention at 13,11 and the average difference in MAP before and after the star fruit intervention at 10,00. Statistical analysis of the Independent t-test test obtained a p-value of 0,653 (p>0,05). While in the research of Ageng et all., (2022), namely in the intervention group obtained p-value systole 0,001 and p-value diastole 0,002 (p-value <0,05) meaning Ho is rejected so that the administration of basil jelly is effective in reducing blood pressure in hypertensive patients. The results of the analysis using the Man Whitney test obtained the results p-value systole after treatment (post-test) is 0,000 (ρ-value < 0.05) and p-value diastole after treatment (post-test) is 0.018 (p-value < 0.05) meaning Ho is rejected so that there are differences in systole and diastole blood pressure in the intervention and control groups after treatment. While in the research of Winata et all., (2022), obtained a result that there was different blood pressure among the hypertension sufferer before and after the consumption of cucumber juice in the intervention group.

This is because potassium and compounds contained in basil and cucumber leaves can reduce the secretion of antidiuretic hormone (ADH) and thirst. ADH is produced in the hypothalamus (pituitary gland) and acts on the kidneys to regulate urine osmolality and volume. As ADH decreases, more urine will be excreted out of the body (Astawan, 2018). The antidiuretic hormone affects diastolic work, resulting in a decrease in diastolic blood pressure.

According to researchers, there is no difference in blood pressure between the basil leaf jelly group and the cucumber. Both groups of basil leaf jelly and cucumber jelly have effects that can help reduce or control blood pressure in the elderly with hypertension because both have potassium compounds that help lower blood pressure. But judging from the mean difference, cucumber jelly is more effective for reducing high blood pressure in the elderly.

Advice

In the implementation of this research, several limitations and obstacles are recognized by researchers, including no gender separation

between women and men, researchers only examined 1 area, and the sample used was only a few.

Conclusion And Recommendation

Conclusions

From the results of the research that has been done, it can be concluded as follows:

1. The average value of blood pressure before consuming basil leaf jelly is a systolic blood pressure of 147,50 mmHg and diastolic blood pressure of 94,30 mmHg.
2. The average value of blood pressure after consuming basil leaf jelly is the systolic blood pressure of 134,15 mmHg and diastolic blood pressure of 83,60 mmHg.
3. The average value of blood pressure before consuming cucumber jelly is the systolic blood pressure of 154,90 mmHg and diastolic blood pressure of 94,00 mmHg.
4. The average value of blood pressure after consuming cucumber jelly is the systolic blood pressure of 135,25 mmHg. While the diastolic pressure was 82,25 mmHg.
5. There is an effect of giving basil leaf jelly on reducing systolic and diastolic blood pressure in the elderly at the PKU Muhammadiyah clinic in Bogor City in 2023 with a value of p-value 0,000
6. There is an effect of giving cucumber jelly on reducing systolic and diastolic blood pressure in the elderly at the PKU Muhammadiyah clinic in Bogor City in 2023 with a value of p-value 0,000.
7. Cucumber jelly is more effective for reducing high blood pressure in the elderly at the PKU Muhammadiyah Clinic in Bogor City in 2023.

Recommendations

This research is expected that patients who experience hypertension can consume cucumber jelly as an additional therapy for hypertension and it is hoped that the results of the study can be useful in dealing with high blood pressure in the elderly.

Ethical Considerations

The research has gone through a review by the ethics commission.

Acknowledgment

Thank you to all parties involved.

Conflict of Interest

No conflict of interest.

Author contribution

This study expected that patients who experience hypertension can consume cucumber jelly as an additional therapy for hypertension and expected the results of the study are expected to be useful in dealing blood pressure with high blood pressure in the elderly.

References

1. Ageng, Y. P.S. Et All., (2022). Effectiveness of Basil Jelly in Lowering Blood Pressure in Hypertensive Patients, Scientific Journal of Permas: Scientific Journal of Stikes Kendal 12 No 4 (Hypertension): 1-10. Http://Journal2.Stikeskendal.Ac.Id/Index.Php/Pskm/Article/View/454/34.
2. Astawan, M., (2018), Family Health Series: Healthy with Fruit. Jakarta: Dian Rakyat
3. Fakhriyah, F., Athiyya, N., Jubaidah, J., & Fitriani, L. (2021). Hypertension Counseling Through Whatsapp Group as an Effort to Control Hypertension. Selaparang: Journal of Progressive Community Service, 4(2), 435-442.

4. Dafriani, P., & Prima, B., (2019), Herbal Approach in Overcoming Hypertension, Blessing Prima, Padang.
5. Danang, G. W., (2020), The Effectiveness of Giving Cucumber Juice to Changes in Blood Pressure in Hypertensive Patients in Kersikan Village, Geneng District, Ngawi Regency, Thesis (Doctoral Dissertation, Stikes Bhakti Husada Mulia Madiun).
6. Bogor City Health Office (2018) Hypertension Rate 2018
7. Efa, Y., (2007) The Role of Basil Leaves on Normal Blood Pressure in Adult Women. Other Thesis: Maranatha Christian University.
8. Fitriani, D., Hasbie, N. F., & Fuadiyah, Z. (2021). Literature Study on the Effect of Administration of Basil Extract (Ocimum basilicum L.) on Total Cholesterol Levels in Male Wistar Rats (Rattus norvegicus) Given a High-Fat Diet. Journal of Medicine and Health Sciences, 8(2).
9. Fitri, T. F., et al., (2021), Pocket Guide to Hypertension, the Silent Killer, Let's Recognize Prevention and Handling, Pusdikra Mitra Jaya, Medan
10. Syapitri, H., & Simanjuntak, E. Y. (2019). Comparison of the effectiveness of cucumber and star fruit on changes in blood pressure. Mutiara Ners Journal, 2(2), 210-215.
11. Ministry of Health Ri, (2018) Publishing Institute of Health Research and Development Agency West Java Province Riskesdas Report. Https://Litbang.Kemkes.Go.Id.
12. Siagian, N., Eliysabet, A. M., & Sudharmo, U. (2015). The Effect of Basil Leaf Infusa (Ocimum Basilicum) on Decreasing Blood Pressure in Women with Stage One Hypertension, Journal of Scholastic Nursing, 1(1), 1-6.
13. Tukan, R. A., (2018), Effectiveness of Cucumber Juice in Lowering Blood Pressure in Hypertensive Patients, Journal of Borneo Holistic Health 1(1): 43-50.
14. WHO (World Health Statistics) (2018) Hypertension Rates, World Bank, 2018.
15. Winata, N. P., Indrayani, T., & Carolin, B. T. (2020). The Effect of Cucumber Juice on the Elderly Hypertension in Citalahab Village, Pandeglang District in 2020. Journal of Global Research in Public Health, 5(2), 177-182.
16. Yantina, Y., and Saputri, A., (2019), The Effect of Elderly Gymnastics on Blood Pressure in Elderly Women with Hypertension in the North Metro Banjarsari Health Center Working Area in 2018, Journal of Pharmacy Malahayati, 2 (1), 112-121