Indonesian Journal of Global Health Research
Volume 6 Number S6, December 2024
e-ISSN 2715-1972; p-ISSN 2714-9749
http://jurnal.globalhealthsciencegroup.com/index.php/IJGHR

COMPARISON OF THE EFFECT OF APIUM GRAVEOLENS L DECOCTION AND ANNONA MURICATA L DECOCTION ON BLOOD PRESSURE REDUCTION IN PRE-ELDERLY

Andi Bintang*, Radiah Ilham
Universitas Andi Sudirman, JL. Yos Sudarso Cellu, Bajoe, Poros, Bone, Sulawesi Selatan 92715, Indonesia
*bintangandi794@gmail.com

ABSTRACT

Hypertension is a non-communicable disease and is a major factor in health problems in the world because of its high prevalence. In general, a person is considered to have hypertension if his blood pressure is more than 140/90 mmHg. So hypertension is a big challenge in Indonesia because it is often found in primary health services or in health centers. This study aims to determine the comparison of the Effect of *Apium Graveolens L Decoction and* Annona Muricata L *Decoction* on Reducing Blood Pressure in the Pre-Elderly at the Bajoe Health Center, Bone Regency. This study is a *quasi-experimental study* with a non-equivalent *pretest-postest design with control group*. The sample in this study is Pre-Elderly aged 45-59 years with a diagnosis of hypertension as many as 40 people at the Bajoe Health Center, Bone Regency. divided into two groups, namely the *Apium Graveolens L* decoction intervention group of 20 people and *the Annona Muricata L decoction intervention group* of 20 people according to the inclusion and exclusion criteria. Based on the *dependent t-test* statistical test, it can be seen that there is an effect of *Apium Graveolens L decoction* on the decrease in blood pressure with a p- *value* of 0.000 ($p<0.05$), while the results of the dependent t-test statistical test can be seen that there is an effect on the decrease in systolic blood pressure with a value of p 0.000 ($p<0.05$). Meanwhile, diastolic blood pressure has no effect with a value of p 0.106 ($p>0.05$). So it can be concluded that there is a comparison of the effect of *Apium Graveolens L decoction and* Annona Muricata L *decoction* on the reduction of blood pressure in the pre-elderly.

Keywords: *apium graveolens L stew*; *annona muricata L stew;* blood pressure; pre-elderly

How to cite (in APA style)
Bintang, A., & Ilham, R. (2024). Comparison of the Effect of Apium Graveolens L Decoction and Annona Muricata L Decoction on Blood Pressure Reduction in Pre-Elderly. Indonesian Journal of Global Health Research, 6(S6), 925-932. https://doi.org/10.37287/ijghr.v6iS6.4877.

INTRODUCTION

Hypertension is a big challenge in Indonesia because it is often found in primary health services or in health centers (Eriana, 2017). Hypertension can kill the sufferer secretly which is *silent killer* which is caused because it is often asymptomatic and the sufferer is rarely aware of it (Suprayitno1, 2019). Hypertension is a systolic blood pressure equal to or above 140 mmHg and diastolic blood pressure equal to or above 90 mmHg. (World Health Organization (WHO), 2013). According to WHO data, worldwide around 972 million people or 26.4% of the earth's population suffer from hypertension, this figure is likely to increase to 29.2% by 2025. Of the 972 million people with hypertension, 333 million are in developed countries and the remaining 639 are in developing countries, including Indonesia (Oktarina & Rahmawaty, 2023) . The prevalence of hypertension in the elderly in Indonesia is quite high, this is evidenced by Riskesdas data which states that people aged 55-64 years suffer from hypertension by 55.2%, aged 65-74 years by 63.2% and ≤74 years by 69.5% (Riskesdas, 2018) .

The estimated number of hypertension cases in Indonesia is 63,309,620 people, while the death rate in Indonesia due to hypertension is 427,218 deaths. Hypertension occurs in the age group of 31-44 years (31.6%), age 45-54 years (45.3%), age 55-64 years (55.2%) (Oktarina &

Rahmawaty, 2023) . Hypertension is referred to as *the silent killer* Because it is often without complaints, so the patient does not know that he has hypertension and is only known after complications occur (Riskesdas, 2018). Based on data on hypertension disease in South Sulawesi Province in 2022 as much as 25.06%, with the highest services in Bantaeng district 100% and Pinrang district 87.67%. The estimated number of hypertension patients over 15 years old in South Sulawesi is around 1,520,659 patients with services of 381,133 people or only around 25.6% of the total estimate (Health Office, 2022). Meanwhile, Bone Regency has a prevalence of hypertension of 29.33% (Bone & Dinkes, 2022).

One of the non-pharmacological treatments that can lower high blood pressure is celery (Fauziah, 2015). Apium Graveolens L contains a lot of apiin, a compound that is diuretic and is thought to be able to dilate blood vessels (Huwae et al., 2021). Celery has been widely used in the community and has been extensively researched regarding its pharmacological effects and has been proven to be able to lower high blood pressure, celery seed capsules are not only safe for hypertension patients but also cause a decrease in blood pressure values. blood, FBS, and lipid profiles (Shayani Rad, Moohebati, MohammadEbrahimi, et al., 2022). Likewise, Annona Muricata L has antioxidants that can ward off free radicals, as well as other natural ingredients, this antioxidant can flex and dilate blood vessels and lower blood pressure (Ansori, 2022). This is because the side effects of using traditional medicine are relatively few compared to modern medicine (Saputra & Fitria, 2016).

There have been many studies that discuss hypertension such as the difference between celery leaf decoction water and bay leaf decoction water on the reduction of blood pressure in pre-elderly people with primary hypertension (Badrujamaludin et al., 2020). The research conducted by Dewi, RM et al. conducted research on the difference in the effectiveness of avocado leaf decoction and Apium Graveolens L on reducing blood pressure in hypertensive elderly where this study focuses more on blood pressure in the elderly with hypertension with avocado leaf decoction (Dewi et al., 2022). And Istihora et al's research on the effect of giving a combination of chayote juice and celery on the reduction of blood pressure in hypertensive patients, where this study focuses more on blood pressure with the goal of hypertension in general by giving a combination of diagnoses *Apium Graveolens L* and Siamese squash juice (Fakultas et al., 2022). Based on data on hypertension at the Bajoe Health Center in 2021, there were 476 people. And in 2022 there are 507 people. Meanwhile, in 2023 there will be 526 people. So it can be concluded that hypertension at the Bajoe Health Center is increasing every year (Rekam Medik PKM Bajoe, 2023). Based on the above phenomenon, the researcher is interested in providing a comparison of the Effect of *Apium Graveolens L* and Annona Muricata L Decoction on Lowering Blood Pressure in Pre-Elderly which can increase knowledge in *Apium Graveolens L* and *Annona Muricata L* Decoction on Lowering Blood Pressure in Pre-Elderly. so that it can help Pre-Elderly in lowering blood pressure.

METHOD

This type of research was a quasi-experiment with a Non-Equivalent Control Group design by comparing the results of intervention group 1 and intervention group 2 which were carried out in a non-random way (Sugiono, 2014). Then a pre-test was carried out on the group that consumed boiled water *Apium Graveolens L* as many as 20 people and water *rebusan Annona Muricata L* as many as 20 people. After some time, a post test will be carried out on both groups. The population of pre-elderly people suffering from hypertension in the Bajoe Health Center Working Area is 117 respondents. The sample of this study is pre-hypertensive elderly aged 45-59 years in the Bajoe Health Center Working Area. So the sample required in this study was 40 respondents, where for intervention group 1 the provision of Apium Graveolens

L boiled water as many as 20 pre-elderly people and for intervention group 2 the provision of Annona Muricata L boiled water as many as 20 pre-elderly people with Criterion, had a history of hypertension (Nursalam, 2014).

Time and Location of the Research The research began on September 22-December 04, 2024 at the Bajoe Health Center, Bone Regency The population and population sample in this study were pre-elderly people who experienced hypertension in the working area of the Bajoe Health Center, Bone Regency. The sampling technique is by Purposive Sampling and in accordance with the inclusion and exclusion criteria. Respondents in this study must meet the following inclusion criteria: 1. Pre-Elderly Hypertension 2. Age 45-59 years 3. Willing to be the subject of research (signing informed concent), 4. Respondents can communicate well. Meanwhile, the exclusion criteria in this study are: 1. Pre-Elderly are sick so they cannot be present at the time of the intervention 2. Age >59 years 3. Pre-elderly with a history of Diabetes Mellitus 4. Pre-Elderly changed places of residence during the study.

Procedure for making boiled water *Apium Graveolens L* and *Annona Muricata L* , for each respondent. Requires as much as 200 grams of stew *Apium Graveolens L* for one respondent from 20 groups of respondents celery leaf decoction. How to make Apium Graveolens L decoction with 40 grams *Apium Graveolens L* with 400 ml of water, then boiled for 15 minutes until it becomes 200 ml, then the water is filtered and warmed and given to drink 2 times a day in the morning and evening and implemented for 1 week (Pakaya & Syamsuddin, 2018). While How to boil *Annona Muricata L* i.e. prepare 7 to 10 sheets *Annona Muricata L* and prepare 2 cups of water (400 ml), put water in a pot until it boils, put the leaves on low heat, boil until it becomes 1 cup (200 ml), then the water is filtered and warmed to be given to drink 2 times a day in the morning and evening for one respondent from 20 groups of decoction respondents *Annona Muricata L* and implemented for 1 week (Dwi, Daniel, 2019).

RESULT

Table 1.
Average blood pressure consuming *Apium Graveolens L* decoction before and after

Blood pressure		Mean	SD	Min-Max	N
To	Systolic	173.25	15.569	146-203	20
	Diastolic	92,70	7.212	74-105	20
Pos	Systolic	136,65	9.604	115-155	20
	Diastolic	83.00	5.516	76-96	20

Based on table 1, it can be seen that before consuming *Apium Graveolens L* decoction, the average systolic blood pressure was 173.25 mmHg, after consuming an average systolic 136.65 mmHg. Meanwhile, the average diastolic before consuming *Apium Graveolens L* decoction was 92.70 mmHg, and after consuming diastolic blood pressure was 83.00 mmHg which showed a decrease in blood pressure in the pre-elderly.

Table 2.
Average blood pressure consuming *Annona Muricata L* decoction before and after

Blood pressure		Mean	SD	Min-Max	N
To	Systolic	172.25	11.947	151-196	20
	Diastolic	92,50	7.797	78-105	20
Pos	Systolic	154.25	13.182	129-180	20
	Diastolic	89.30	4.473	80-98	20

Based on table 2, it can be seen that before consuming *Annona Muricata L decoction*, the average systolic blood pressure was 172.25 mmHg, after consuming an average systolic 154.25 mmHg. Meanwhile, the average diastolic before consuming *Annona Muricata L* was 92.50 mmHg, and after consuming *Annona Muricata L decoction*, the average diastolic blood pressure was 89.30 mmHg, which showed a decrease in blood pressure in the pre-elderly.

Table 3.
Effects of consuming *Apium Graveolens L decoction*

		Mean	SD	95% CI		P value
				Lower	Above	
Pre and post blood pressure	Systolic	173.25	15.569	165,96	180,54	0,000
	Diastolic	92,70	7.212	89.32	96.08	0,000
	Systolic	136,65	9.604	132.16	141.14	0,000
	Diastolic	83.00	5.516	80.42	85.58	0,000

Based on table 3, it can be seen that blood pressure before and after consuming the decoction *Apium Graveolens L* namely the systolic mean before 173.25 mmHg and the systolic mean after 136.65 mmHg, while the mean diastolic before is 92.70 mmHg and the mean diastolic after 83.00 mmHg. Based on statistical tests *t-test dependen* then it can be seen that there is an influence of the stew *Apium Graveolens L* against the decrease in blood pressure with p- *value* 0,000 (p<0,05).

Table 4.
Effect of consuming *Annona Muricata L Decoction*

		Mean	SD	95% CI		*P value*
				Lower	Above	
Pre and post blood pressure	Systolic	172.25	11.947	166.66	177.84	0,000
	Diastolic	92,50	7.797	88,85	96.15	0,000
	Systolic	154.25	13.182	148.08	160.42	0,000
	Diastolic	89.30	4.473	87.21	91.39	0,106

Based on table 4, it can be seen that the blood pressure before and after consuming *Annona Muricata L decoction* is systolic mean before 172.25 mmHg and the mean cytolic after 154.25 mmHg, while the mean diastolic before is 92.50 mmHg and the mean diastolic after is 89.30 mmHg. Based on the results of the dependent t-test statistical test, it can be seen that there is an effect on the decrease in systolic blood pressure with a p *value* of 0.000 (p<0.05). Meanwhile, diastolic blood pressure had no effect with a p *value* of 0.106 (p>0.05).

Table 5.
Comparison of the Effects of *Apium Graveolens L* Decoction and *Annona Muricata L* Decoction on Blood Pressure Reduction in Pre-Elderly

	F	T	95% CI		df	signature	*P value*
			Lower	Above			
Pretes	9.970	20.994	72.783	88.317	38	0,003	<0,05
	4.592	25.001	73.292	86.208	38	0,039	
Posts	4.157	21.664	48.637	58.663	38	0,048	<0,05
	9.666	20.866	58.649	71.251	38	0,004	

Based on table 5, it can be seen that the significant value is <0.05. Therefore, it can be concluded that consuming *Apium Graveolens L decoction and* Annona Muricata L *decoction* has an effect on reducing blood pressure in the pre-elderly.

DISCUSSION

Average blood pressure consuming *Apium Graveolens L* decoction before and after

Based on the results of the study, it can be seen that previously consuming *Apium Graveolens L decoction* had an average systolic blood pressure of 173.25 mmHg, after consuming an average systolic blood pressure of 136.65 mmHg. While the average diastolic person previously consumed *Apium Graveolens L* decoction of 92.70 mmHg, and afterwards consumed diastolic blood pressure 83.00 mmHg which showed a decrease in blood pressure in the pre-elderly. The results of this study are in line with the research conducted by Suryarinilsih, et al (2021) that previously consuming celery leaf decoction had an average systolic blood pressure of 155 mmHg, after consuming celery leaf decoction the average

systolic blood pressure was 135 mmHg. While the average diastolic previously consumed celery leaf decoction of 94.38 mmHg consumed celery leaf decoction diastolic blood pressure 85.0 mmHg which showed a decrease in blood pressure. And in line with the research conducted by (Mariyona, 2020) showed an average blood pressure before 148/91 mmHg and an average thereafter of 147/88 mmHg. So there is an effect of giving celery decoction on lowering blood pressure. and Results (Lumban Siantar et al., 2021) showed an average presistolic blood pressure of 154.4000 mmHg and an average decrease in blood pressure of 144.4000 mmHg after giving celery decoction to the elderly of 154.4000 mmHg and 144.4000 mmHg, respectively. While the TD Pre diastole value was 84,800, the TD Post diastole value was 85,400, this shows that there was a change in the average TD diastole before and after the administration of celery stew. And research conducted by (Shayani Red, Muhebati, & Mohjeri, 2022) Results In the celery group, the average arterial blood pressure changed from 108.5 ± 5.76 to 99.5 ± 4.66 mmHg, and the pulse pressure decreased from 49.0 ± 6.21 to 45.8 ± 6.01 mmHg.

Average blood pressure consuming *Annona Muricata L* decoction before and after

Based on the results of the study, it can be seen that previously consuming *Annona Muricata L decoction* had an average systolic blood pressure of 172.25 mmHg, after consuming an average systolic blood pressure of 154.25 mmHg. While the average diastolic person previously consumed *Annona Muricata L* 92.50 mmHg, and after consuming *Annona Muricata L decoction*, the average diastolic blood pressure was 89.30 mmHg which showed a decrease in blood pressure in the pre-elderly. The results of this study are in line with the research conducted by (Wasis Eko Kurniawan, 2020) that previously consuming soursop leaf decoction had an average systolic blood pressure of 169.10 mmHg, after consuming soursop leaf decoction the average systolic 142.20 mmHg. While the average diastolic previously consumed a decoction of 96.50 mmHg and consumed a decoction of a diastolic blood pressure of 81.20 mmHg which showed a decrease in blood pressure

Bivariate Analysis

Effects of consuming *Apium Graveolens L decoction*

Based on the results of the study, it can be seen that the blood pressure before and after consuming *Apium Graveolens L* decoction means systolic before 173.25 mmHg and means systolic after 136.65 mmHg, while it means that the previous diastolic is 92.70 mmHg and means diastolic after 83.00 mmHg. Based on the dependent t-test statistical test , it can be seen that there is an effect of *Apium Graveolens L* decoction on lowering blood pressure with a p- *value* of 0.000 ($p<0.05$). The results of this study are in line with the research conducted by (Huwae et al., 2021) that after being given celery leaf decoction water, there was an average decrease in sistole pressure of 19.5 mmHg. Meanwhile, the average diastolic pressure before being given celery leaf boiled water was 92.75 mmHg and the average diastole pressure after being given celery leaf boiled water was 80.25 mmHg, which means that after being given celery leaf boiled water, there was a decrease in the average diastol pressure of 12.5 mmHg. The results of the statistical test (p value = $0.000 < \alpha = 0.05$), then Ho was rejected and Ha was accepted, which means that there is an effect of giving celery leaf decoction water on reducing blood pressure in patients with hypertension at the Kairatu Health Center. And research by (Huwae et al., 2021)that the results of the statistical test (p value = $0.000 < \alpha = 0.05$), then Ho was rejected and Ha was accepted, which means that there is an effect of giving celery leaf decoction water on reducing blood pressure. And research by (Shayani Red, Muhebati, & Mohjeri, 2022) that no significant adverse events were reported in the celery group, compared to the placebo group ($P < 0.05$). The results are promising and

show the therapeutic effect of celery seed extract as a supplement in the management of hypertension.

Effect of consuming *Annona Muricata L.*

Based on the results of the study, it can be seen that blood pressure before and after consuming *Annona Muricata L decoction.* i.e. systolic before 172.25 mmHg and the average cytolic after 154.25 mmHg, while it means diastolic before 92.50 mmHg and average diastolic after 89.30 mmHg. Based on the results of the statistical test of the dependent t test, it can be seen that there is an effect on the decrease in systolic blood pressure with a *value* of p 0.000 ($p<0.05$). Meanwhile, diastolic blood pressure had no effect with a value of p 0.106 ($p>0.05$). The results of this study are in line with the research conducted by (Fathia, 2022) Based on the results of the Paired Sample test, a p-value of 0.000 was obtained on the measurement of systole $0.000 < 0.05$, which means that there was a significant influence before and after the intervention was given to measure the administration of soursop leaf decoction on the reduction of blood pressure in the elderly in the area of the Karang Tengah Health Center. While the p-value before and after the intervention was given, the p-value value on diastolic blood pressure of $0.056 > 0.05$ had no significant effect.

Comparison of the Effect of Apium Graveolens L *Decoction and* Annona Muricata L *Decoction.* Towards Reducing Blood Pressure in Pre-Elderly

Based on the results of the study, it can be seen that the significant value is <0.05. Therefore, it can be concluded that consuming *Apium Graveolens L decoction and* Annona Muricata L *decoction* has an effect on reducing blood pressure in the pre-elderly. So that it can be concluded that there is a comparison of the effects of *Apium Graveolens L Decoction and* Annona Muricata L *Decoction* on Blood Pressure Reduction in Pre-Elderly. In this study, there was a significant influence with the administration of celery leaf decoction on the reduction of systole and diastol blood pressure. This can be seen from the change in the decrease in systolic blood pressure before being given celery leaf decoction, which means systolic before 173.25 mmHg and means systolic after 136.65 mmHg, while it means that the previous diastolic is 92.70 mmHg and means diastolic after 83.00 mmHg. This study became effective in lowering blood pressure because *Apium Graveolens* or celery is used in traditional medicine as an anti-hypertensive agent, containing chemical compounds such as apiin, apigenin, isoquercitrin, and sesquiterpene. Because the content of apiin is a compound that is diuretic and able to dilate blood vessels, so it is able to lower blood pressure. This study can have an effect on lowering blood pressure because there are several risk factors for hypertension that have been controlled such as BMI, not smoking, gender and observation of the types of foods that can and cannot be consumed during the study. During the research process, the respondents carried out the rules and procedures well. By consuming 200 grams of celery leaves, then washing them thoroughly, boil the celery leaves with 400 ml of water until it becomes 200 ml, pour them into a glass or bottle, drink them every morning and evening after breakfast, and drink them for 7 days regularly. *Apium Graveolens L* decoction has been proven to lower systolic and diastolic blood pressure. So that Apium Graveolens L *decoction can be applied and socialized to hypertensive patients to lower blood pressure.*

CONCLUSION

Based on the results of the research that the researcher has conducted, it can be concluded that the average blood pressure of the previous boiled person consumed *Apium Graveolens L* systolic 173.25 mmHg, after that the average systolic consumption was 136.65 mmHg. Meanwhile, the average diastolic person previously consumed a decoction *of Apium Graveolens L* 92.70 mmHg, and afterwards consumed a diastolic blood pressure of 83.00

mmHg. Furthermore, previously consuming *Annona Muricata L decoction* had an average systolic blood pressure of 172.25 mmHg, after that consuming an average systolic blood pressure of 154.25 mmHg. Meanwhile, the average diastolic person previously consumed *Annona Muricata L* 92.50 mmHg, and after consuming *Annona Muricata L decoction*, the average diastolic blood pressure was 89.30 mmHg. Based on the dependent t-test statistical test, *it can be seen that there is an effect of* Apium Graveolens L decoction *on the decrease in blood pressure with a p-* value *of 0.000 (p<0.05), while the results of the statistical test of the dependent t-test can be seen that there is an effect on the decrease in systolic blood pressure with* a value of p 0.000 (p<0.05). Meanwhile, diastolic blood pressure had no effect with a value of p 0.106 (p>0.05). So it can be concluded that there is a comparison of the effects of *Apium Graveolens L decoction and* Annona Muricata L *decoction* on the reduction of blood pressure in the pre-elderly. So that *Apium Graveolens L* decoction has more effect on reducing blood pressure in the pre-elderly.

ACKNOWLEDGEMENTS

The author expresses his deepest gratitude and appreciation to the Academic Directorate of Vocational Higher Education, Ministry of Education, Culture, Research, and Technology for providing opportunities for researchers to develop their abilities, especially in terms of research because they have provided BOPTN BATCH III POM PTV Beginner Lecturer Research funds. Thank you to the Chairman of LPPM Universitas Andi Sudirman for his input and direction during the preparation of the research grant. And the head of the Bajoe Health Center and all the staff of the Bajoe PKM UPT who have donated their time with kindness and generosity have given permission to the author to carry out the research.

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