

## Effectiveness of Combination Herbal Drink *Morinda Citrifolia* and *Apium Graveolens* on Reducing Blood Pressure in Hypertension Sufferers

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### Abstract

**Background:** Hypertension is The Silent Killer because it occurs without complaints, so patients don't know they have hypertension. The purpose of this study was to determine non-pharmacological therapy in the form of a combination drink of *Morinda citrifolia* and *Apium graveolens* to reduce blood pressure.

**Methods:** Quantitative research with pre-experimental design and one group pretest-posttest design. Selection of sample by purposive sampling with inclusion and exclusion criteria of 18 respondents. Respondents had their blood pressure monitored with a digital sphygmomanometer for 2 weeks, amounting to 315 ml per week. Give 3 x 1 shot of *Morinda citrifolia* and *Apium graveolens* 15 ml before meals per day. Data analysis using the *Wilcoxon test*.

**Results:** The *Wilcoxon Test* Results show calculated Z value blood pressure systole and diastole equal to p-value 0.000. Therefore p-value  $0.000 < \alpha (0.05)$  then  $H_0$  is rejected. The research entitled Effectiveness Combination Herbal Drink *Morinda citrifolia* and *Apium graveolens* to Reducing Blood Pressure in Patients Hypertension.

**Conclusion:** The herbal drink combination of *Morinda citrifolia* and *Apium graveolens* is effective in reducing blood pressure in hypertension patients because it contains the substance scopoletin which has a vasodilator effect that can widen blood vessels so that blood pressure and heart pumping will decrease. Hypertension patients can consume *Morinda citrifolia* and *Apium graveolens* herbal drinks if there is an increase in blood pressure because it can lower blood pressure so that the health of hypertension patients improves.

**Keywords:** *Morinda citrifolia*, *Apium graveolens*, blood pressure, hypertension

### INTRODUCTION

Hypertension is often also referred to as *The Silent Killer* because this disease often occurs without complaints, so sufferers do not know that they have hypertension, but later find that they already have a disease complication from hypertension (Wahyudin, 2021). Hypertension or high blood pressure is a condition when blood pressure is 140/90 mmHg or more (Buana, Tri, 2021). Factors causing hypertension that often occur are age, medication, gender, unhealthy lifestyles such as food, physical activity, stress, smoking, consuming excess salt, and consuming alcohol, even though If not treated immediately, it will cause complications such as heart disease, stroke and can even cause death (Ekasari, 2021).

*The World Health Organization* (WHO) states that 1 billion people in the world suffer from hypertension and it is estimated that 7.5 million deaths or around 12.8% of all deaths are caused by hypertension (WHO, 2021). *The World Health Organization* (WHO) estimates that currently, the global prevalence of hypertension is 22% of the world's total population, with less than one-fifth making efforts to control their blood pressure (Asmah, 2022). The Ministry of Health said that people with hypertension as a non-communicable disease (NCD) continues to increase in Indonesia (Kemenkes RI, 2021). According to Riskesdas Kemenkes, (2021) the prevalence of hypertension in Indonesia is 34.1% and has increased compared to the prevalence of hypertension in the 2013

Riskesmas of 25.8%. Hypertension sufferers in Indonesia are estimated to reach 15 million, but only 4% have controlled hypertension (Kemenkes RI, 2019). The prevalence of hypertension sufferers in Jember Regency in 2020 was 74,164 and in 2021 the number of hypertension sufferers was 146,098 (Kusworini, Dyah et., 2020). The prevalence of hypertension sufferers in Jember in 2022 will be 169,892 (Dinkes Jember, 2022). Based on data from the Jember Regency NCD surveillance report, hypertension experienced a fairly high increase, namely 23,794 sufferers.

From this data, it was recorded that 13.3% of hypertension sufferers did not take antihypertensive medication, and 32.3% did not comply with taking antihypertensive medication. According to research from Nompoto, (2020). by interviewing 10 respondents, it showed that 3 respondents were compliant in taking antihypertensive medication by doctor's recommendations and 7 respondents took hypertension medication if they started to feel signs and symptoms if their blood pressure started to rise again. Therefore, most people with hypertension still need to take blood pressure control medication. If hypertension is not treated routinely it can cause the risk of damage to the heart, brain, and kidneys (Kemenkes, 2021).

Griya Acupuncture is a complementary therapy clinic located in the Jember Regency with various types of independent treatment. A preliminary study conducted in December 2023 found that hypertension sufferers were the first in the ranking after other diseases. From data for the last 6 months, hypertension has increased with a total of 62 hypertension sufferers checking themselves at the Griya Akupuntur Clinic. Interviews with 5 hypertension sufferers said that they did not understand how to treat hypertension and they did not check their blood pressure regularly. They will only check their blood pressure when they

feel signs and symptoms of hypertension appear.

Treatment of hypertension is influenced by patient compliance with taking antihypertensive medicine. Compliance with hypertension sufferers in undergoing treatment is very necessary to obtain a better quality of life for hypertension sufferers (Nurridho et al., 2023). Hypertension can be treated in two ways, namely pharmacological and non-pharmacological treatment. The type of treatment without using medicine is a complementary therapy (Rahmawati, 2023). The National Center for Complementary and Alternative Medicine of the National Institute of Health has classified various therapies and treatment systems into five categories. One category is Biologically based practice (BBP) (Maurida, Nurul & Yuwanto, 2022). BBP is a type of complementary therapy that uses ingredients such as herbs (15). One non-pharmacological treatment for hypertension sufferers is a combination herbal drink of *Morinda citrifolia* and *Apium graveolens*.

*Morinda citrifolia* is known to have many benefits for human health. The effects of *Morinda citrifolia* include thrombolytic which functions to break down blood clots that block blood vessels that cause blood flow disorders. *Morinda citrifolia* extract can widen blood flow so that blood pressure decreases (Ramadhani and Haeriyah, 2023). This is because *Morinda citrifolia* contains the substance scopoletin. Scopoletin functions to widen blood vessels that have narrowed blood vessel walls and accelerate blood delivery throughout the body, thereby reducing blood pressure. Meanwhile, *Apium graveolens* contains flavonoids, and apigenin has hypotensive properties that can prevent the narrowing of blood vessels, as a beta blocker, it can slow the heart rate and reduce the strength of

heart contractions so that less blood flow is pumped and blood pressure is reduced.

The apigenin contained in *Apium graveolens* is a vasorelaxation or vasodilator (widens blood vessels) with a mechanism of inhibiting contractions caused by the release of calcium (a mechanism of action such as a calcium antagonist). Calcium antagonists work by lowering blood pressure by blocking the entry of calcium into the blood. If calcium enters a muscle cell, it will contract. By inhibiting the contraction of the muscles that surround the blood vessels, the blood vessels will widen so that blood flows smoothly and blood pressure will decrease (Anwar, 2023). Contains Phthalides which can relax artery muscles or relax blood vessels. This substance regulates blood flow, causing blood vessels to dilate and reducing blood pressure. Mannitol and apiin, which are diuretics, help the kidneys remove excess fluid and salt from the body so that reducing fluid in the blood will lower blood pressure. Potassium (potassium) can increase intracellular fluid by attracting extracellular fluid, resulting in changes in the balance of the sodium-potassium pump which will cause a decrease in blood pressure (Saputra and Fitria, 2021).

The ingredients contained in *Morinda citrifolia* and *Apium graveolens* can lower blood pressure. Based on the research, it was found that several alternative non-pharmacological treatments were used to reduce high blood pressure, including boiled water from *Apium graveolens* leaves and *Morinda citrifolia* (Waruwu *et al.*, 2021). Research by Selvia, (2022). it was found that consuming *Morinda citrifolia* can lower blood pressure. Research by Aisyah and Mulya, (2022). consuming celery leaves can lower blood pressure. The way these two plants work in reducing high blood pressure is by providing a dilating effect on blood vessels and inhibiting

*angiotensin-converting enzyme* (ACE) so that they can reduce high blood pressure in hypertension sufferers.

The herbal drink product combination of *Morinda citrifolia* and *Apium graveolens* has code P. IRT No. 109350912023-19, a herbal drink product produced since 2003 by the Griya Akupuntur Clinic Jember located at St. Karimata II Nm. Gunung Agung 4 RT 01/RW 01 Summersari Village, Summersari District, Jember Regency. According to data from an interview with Mr. Achwan, the content of the *Morinda citrifolia* and *Apium graveolens* drink contains 60% noni (*Morinda citrifolia* L.), 10% garlic, 5% ginger, 5% cloves, 5% celery, 5% corn sugar, benzoate. 0.4%. This drink has been proven safe for hypertension sufferers. Apart from that, there has been no research on the combination of *Morinda citrifolia* fruit and *Apium graveolens* to lower blood pressure.

## METHOD

This research uses quantitative research methods

### *Design*

The research design uses a *pre-experimental* with *one group pretest-posttest design*. This research design was carried out on one group only. Data collection using observation sheets.

### *Samples*

The sampling design used is *nonprobability sampling* with a sampling technique using *purposive sampling* with inclusion and exclusion criteria with a total of 18 samples. Determination method sample with use criteria inclusion and exclusion. Criteria inclusion study This is Hypertension sufferers who check themselves at the Griya Acupuncture Clinic, suffer from hypertension with systolic blood pressure

of 140-179 mmHg and diastole of 90-109 mmHg. Patients without medical treatment, hypertension sufferers who are cooperative and fully aware, hypertension sufferers without complications, and hypertension sufferers who are willing to become respondents without coercion.

### Data analysis

Respondents had their blood pressure monitored using a device called a digital *sphygmomanometer* before being given the herbal drinks *Morinda citrifolia* and *Apium graveolens*. (pretest) and the pressure was monitored again after being given *Morinda citrifolia* and *Apium graveolens* (posttest) for 2 weeks as much as 315 ml per week. Give a herbal drink of a combination of *Morinda citrifolia* and *Apium graveolens* 3 x 1 shot before meal per day. Blood pressure measurements were carried out at the beginning of the study and the end of the study. During the research process, researchers measured blood pressure in a way structured to respondents in the Griya Clinic Acupuncture, after data was collected researcher processed data using the SPSS version 27 computer program. Analysis of research data used the *Wilcoxon statistical test* For test difference blood pressure in groups before and after intervention

## RESULTS

### Sociodemographic data

This data serves characteristics of respondents based on type gender, education, occupation, and age

1. Characteristics Sufferer Hypertension Based on Gender, Education, Occupation, and Age

**Table 1. Characteristics Sufferer Hypertension Based on gender, education, occupation, and age at Griya Clinic Acupuncture**

Characteristics	Category	Frequency (f)	Percentage (%)	Total
Gender	Man	8	44.4%	100%
	Woman	10	55.6%	
Education	Noneducated	3	16.7%	100%
	Elementary	7	38.9%	
		5	27.8%	

	Junior High School	3	16.7%	100%
	High School	0	0.0%	
	College			
Work	Self-employed	3	16.7%	100%
	Laborer	1	5.6%	
	Farmer	5	27.8%	
	Housewife	9	50.0%	
Age	20-40 Years	2	11.1%	100%
	41-60 Years	16	89.9%	

Table 1. shows that most of the sufferers is a Woman total of 10 people (55.6%), and the rest is men total of 8 people (44.4%). Data from education show that most of the respondents were elementary school graduates, 7 people (38.9%), junior high school graduates, 5 people (27.8%), high school/vocational school graduates, 3 people (16.7%), and never school as many as 3 people (16.7%). Data from work show that most of the respondents work as housewives, ladders as many as 9 people (50%), farmers as many as 5 people (27.8%), entrepreneurs as 3 people (16.7%), and 1 worker (5.6%). Data from age show that most of the respondents are aged 41-60 years as many as 16 people (89.9%), and 20-40 years as many as 2 people (11.1%).

### Before and After Data Intervention

1. Blood pressure before giving a combination of herbal drinks *Morinda citrifolia* and *Apium graveolens* at Griya Clinic Acupuncture Jember

Following results study against 18 respondents before given a combination herbal drink *Morinda citrifolia* and *Apium graveolens* at Griya Clinic Jember Acupuncture

**Table 2. Blood pressure before giving a combination of herbal drinks *morinda citrifolia* and *apium graveolens* at Griya Clinic Jember Acupuncture**

Blood pressure	N	Mean	Median	Standard Deviation	Min-Max	CI-95%
Systole	18	156.33	158.50	9,701	142-174	151-161
Diastole	18	96.72	98.00	4,240	90-103	94-98

Based on the data in Table 2, shows that pressure systole and diastole before intervention combination of the herbal drink *Morinda citrifolia* and *Apium graveolens* with an average of 156.33 mmHg/96.72 mmHg, as well as median blood pressure systole and diastole 158.50 mmHg/98 mmHg, meanwhile pressure lowest blood pressure systole 142 mmHg and highest 174 mmHg, pressure the lowest diastolic blood is 90 mmHg and the highest is 103 mmHg. With standard deviation blood pressure systole of 9.701 and diastole of 4.240 mmHg with a level of 95% confidence pressure systole believed to range 151-161mmHg and diastole of 94-98 mmHg.

2. Blood pressure after giving an herbal drink combination of *Morinda citrifolia* and *Apium graveolens* at Griya Clinic Acupuncture Jember

Following results study against 18 respondents after given a combination herbal drink *Morinda citrifolia* and *Apium graveolens* at Griya Clinic Acupuncture Jember

**Table 3. Blood Pressure after given a combination of herbal drink *morinda citrifolia* and *apium graveolens* at Griya Clinic Jember Acupuncture**

Blood pressure	N	Mean	Median	Standard Deviation	Min-Max	CI-95%
Systole	18	144.39	138.50	10,376	130-159	139-149
Diastole	18	90.39	88.50	5,658	80-99	87-93

Based on the data in Table 3, shows that pressure systole and diastole after done giving intervention combination of the herbal drink *Morinda citrifolia* and *Apium graveolens* has an average of 144.39 mmHg/90.39 mmHg, as well as median blood pressure systole and diastole 138.5 mmHg/88.5 mmHg, meanwhile pressure lowest blood

pressure systole 130 mmHg and highest 159 mmHg, pressure the lowest diastolic blood is 80 mmHg and the highest is 99 mmHg. With standard deviation blood pressure systole of 10.376 and diastole of 5.658 mmHg with a level of 95% confidence pressure systole believed to range from 139-149 mmHg and diastole of 87-93 mmHg.

3. Analysis of the effectiveness of giving an Herbal drink combination of *Morinda citrifolia* and *Apium graveolens* to decline blood pressure in patients' hypertension

**Pressure data normality test results pre-systole, pre-diastole, and blood pressure post-systole and post-diastole blood**

	Shapiro-Wilk		
	statistics	Df	Sig.
Pre Systole BP	,934	18	,228
Pre Diastole BP	,842	18	,004
Post Systole BP	,907	18	,077
Post Diastole BP	,935	18	,240

Based on data normality test results the researcher uses the *Shapiro-Wilk test* To know whether the data is normally distributed or abnormal. For sig data pre systole .228, pre diastole .004, post systole .077, post diastole .240 the data results are distributed not normally so the researcher used the alternative *Wilcoxon test*.

**Table 5. Analysis Results Systole before and after giving a combination herbal drink *morinda citrifolia* and *apium graveolens* in sufferers of hypertension**

		N	Mean Rank	Sum of Ranks	Z	p-value
Systole_ post	Negative Ranks	18 <sup>a</sup>	9.50	171.00	-3,730	0,00
Systole_ pre	Positive Rank	0 <sup>b</sup>	.00	.00		0
	Ties	0 <sup>c</sup>				
	Total	18				

Based on the results analysis sufferers experiencing hypertension declined blood pressure before and after being given an intervention combination of the herbal drink *Morinda citrifolia* and *Apium graveolens* with mark systole 18 which means all respondents experience decline blood pressure. Statistic test *Wilcoxon Rank Test* shows systole p value = 0.000 <  $\alpha$  = 0.05, p This means H0 is rejected and Ha is accepted which means There is a significant difference between blood pressure systole before and after giving combination herbal drink *Morinda citrifolia* and *Apium graveolens* with thereby combination herbal drink *Morinda citrifolia* and *Apium graveolens* effective to decline blood pressure systole in patients hypertension.

**Table 6. Diastole analysis results before and after giving a combination of herbal drinks *morinda citrifolia* and *apium graveolens* in sufferers of hypertension**

		N	Mean Rank	Sum of Ranks	Z	p-value
Diastole _post	Negative Ranks	18 <sup>a</sup>	9.50	171.00	-3,731	0,00
Diastole _pre	Positive Rank	0 <sup>b</sup>	.00	.00		0
	Ties	0 <sup>c</sup>				
	Total	18				

Based on the results analysis sufferers experiencing hypertension declined blood pressure before and after being given an intervention combination of herbal drink *Morinda citrifolia* and *Apium graveolens* with diastole value 18 and mean all respondents experience decline blood pressure. Statistic test *Wilcoxon Rank Test*

shows systole p value = 0.000 <  $\alpha$  = 0.05, p This means H0 is rejected and Ha is accepted which means There is a significant difference between pressure diastolic blood before and after giving combination herbal drink *Morinda citrifolia* and *Apium graveolens* With thereby combination herbal drink *Morinda citrifolia* and *Apium graveolens* effective to decline pressure diastolic blood in patients hypertension.

The conclusion from *the Wilcoxon Test results* shows that the calculated Z value for blood pressure systole is as big as the p-value 0.000. Therefore p-value 0.000 <  $\alpha$  (0.05), and Z count for pressure diastolic blood amount with p -value 0.000. Therefore second p-value If 000 <  $\alpha$  (0.05), then H0 is rejected and Ha is accepted, thus there is a significant difference between the combined herbal drink therapy of *Morinda citrifolia* and *Apium graveolens* in reducing blood pressure in hypertension sufferers.

## DISCUSSION

The research result of blood pressure work done at the Griya Clinic Acupuncture Jember in the month of February 2024, with a sample of 18 people.

### 1. Blood Pressure Before Given Therapy Combination Herbal Drink *Morinda Citrifolia* and *Apium Graveolens* in Patients Hypertension

Results of research conducted on 18 respondents with blood pressure systole and diastole before therapy combination of herbal drink *Morinda citrifolia* and *Apium graveolens* with an average mean systole and diastole of 156.33/96.72 mmHg. According to WHO pressure normal blood is <130/85 mmHg, whereas blood pressure systole and diastole in the study exceed the normal value of 130/80 mmHg.

Blood pressure can cause an increasing risk of stroke, failure heart attack heart, and damage kidney (Lukitaningtyas, 2023). Blood pressure is influenced by factors, namely age, stress, medication, education, occupation, and gender. Men have a risk more experiencing hypertension more beginning. Men have them too more risk big to morbidity and mortality several diseases cardiovascular, while those above 50 years old have hypertension more Lots happen to women. High exposure to cigarette smoke, mothers, children, or Women as passive smokers also have the potency to experience disease hypertension. The weight of those who have more weight tend to have higher blood pressure more tall compared to those who have a thin body. In obese people, the heart will work harder to pump blood (Wati *et al*, 2024)

Based on the type of sex it is known that part big respondents who experienced hypertension manifold sex women as much compared to men. This matter is in line with the opinion of Perry, (2010). Women tend to own pressure more blood-tight than men of the same age. The results above can conclude that Women more easily experience high blood pressure.

Based on the majority of education respondents' history education low that is Elementary School (SD). A with a level of education will find that more easy To learn and save information (Azizah, 2023). According to Taiso *et al* , (2021). states that people with education low are prone to low blood pressure. This matter related to influencing knowledge awareness will behavior prevention hypertension. In other words, the more and more knowledge about hypertension, then the more the possibility is greater somebody For to avoid reason hypertension. So the research results show that Elementary School (SD) is more risky to catch hypertension.

Based on the work can be known that part big respondents suffer from blood pressure is the Mother House ladder. According to Cortas (2008) in Ridwan *et al* , (2022). which states a person whose activity is low risk caught hypertension 30-50 % more than active. Lack of activities carried out Mother House ladder Where most they only silent themselves at home with a routine that makes them too late, so can cause stress. Research results This shows that the Mother House ladder is more risky to catch hypertension.

Based on age can is known part most respondents who suffer from hypertension are of age mature mid or age between 41- and 60 years compared to age mature beginning between 20 and 40 years. According to Yusuf and Andi, (2021). with increased age, the blood pressure also increases. After 45 years old, wall arteries will experience thickening Because exists an accumulation substance collagen in the layers of muscles, so vessels blood will gradually narrow and become stiff. Blood pressure systolic increases Because flexibility vessels blood the amount decreases with increased age until decade fifth and sixth Then stay tends to decrease. Enhancement age will cause several changes physiological, at age carry on happen enhancement resistance peripheral and activity sympathetic.

Discussion of the results study blood pressure systole and diastole before giving therapy combination of herbal drink *Morinda citrifolia* and *apium graveolens* are subduing part big respondents experience enhancement blood pressure because of several factors like type gender, age, and occupation.

## 2. Blood Pressure After Given Therapy Combination Herbal Drink *Morinda Citrifolia* and *Apium Graveolens* Sufferer Hypertension

Research results show that results research conducted on 18 people with blood pressure systole and diastole after a therapy combination of herbal drink *Morinda citrifolia* and *Apium graveolens* with mean systole amounting to 144.39/90.39 mmHg. Blood pressure systole and diastole after given therapy combination herbal drink *Morinda citrifolia* and *Apium graveolens* experienced an average decrease in value blood pressure low from blood pressure before given therapy combination herbal drink *Morinda citrifolia* and *Apium graveolens*

*Morinda citrifolia* lowers blood pressure Because contains thrombolytics. it can also reduce blood pressure and vasodilate blood vessels (Ramadhani and Haeriyah, 2023). The extract can widen blood flow so that blood pressure decreases. This is because it contains the substance scopoletin. Scopoletin functions to widen blood vessels that have narrowed blood vessel walls and accelerate blood delivery throughout the body, thereby reducing blood pressure. Meanwhile, celery contains flavonoids which can function as antioxidants that can prevent oxidation in the body. The higher the oxidation of cells in the body, the higher a person suffers from hypertension. Apigenin has hypotensive properties which can prevent the narrowing of blood vessels, as a beta blocker which can slow the heart rate and reduce the strength of heart contractions so that less blood flow is pumped and blood pressure is reduced.

The apigenin contained in celery is a vasorelaxation or vasodilator (widens blood vessels) with a mechanism of inhibiting contractions caused by the release of calcium (a mechanism of action

such as a calcium antagonist). Calcium antagonists work by lowering blood pressure by blocking the entry of calcium into the blood. If calcium enters a muscle cell, it will contract. By inhibiting the contraction of the muscles that surround the blood vessels, the blood vessels will widen so that blood flows smoothly and blood pressure will decrease (Anwar, 2023).

The herbal drink product combining *Morinda citrifolia* and *Apium graveolens* has the same content as noni fruit and celery because the herbal drink product combining *Morinda citrifolia* and *Apium graveolens* with maintained safety. Providing herbal drink therapy with a combination of *Morinda citrifolia* and *Apium graveolens* is expected to reduce systolic blood pressure in hypertension sufferers by 11.3% mmHg and diastole by 5.75% at the Jember Griya Acupuncture Clinic.

## 3. Effectiveness Therapy Herbal Drinks Combination of *Morinda citrifolia* and *Apium Graveolens* to Decline Blood pressure

Studies prove that There is a change between blood pressure systole and diastole are completely given therapy in combination with herbal drinks. The results analysis of the data described that with 18 samples average blood pressure is 144.39/90.39 mmHg. Change This shows that the therapy combination of the herbal drinks *Morinda citrifolia* and *Apium graveolens* is very effective in declining blood pressure in patients with hypertension. Effectiveness therapy combination herbal drink *Morinda citrifolia* and *Apium graveolens* in sufferers hypertension. The *Wilcoxon Statistical Test* was carried out. *Wilcoxon Statistical Test Results* show that there is a significant difference between the combined herbal drink therapy of *Morinda citrifolia* and *Apium graveolens*

in reducing blood pressure in hypertension sufferers.

The effect of combined herbal drink of *Morinda citrifolia* and *Apium graveolens* lowers blood pressure because it contains thrombolytics and can also reduce blood pressure and vasodilate blood vessels (Ramadhani and Haeriyah, 2023). *Morinda citrifolia* extract can widen blood flow so that blood pressure decreases. This is because it contains the substance scopoletin. Scopoletin functions to widen blood vessels that have narrowed blood vessel walls and accelerate blood delivery throughout the body, thereby reducing blood pressure. Meanwhile, *Apium graveolens* contains flavonoids which can function as antioxidants that can prevent oxidation in the body. The higher the oxidation of cells in the body, the higher a person suffers from hypertension. Apigenin has hypotensive properties which can prevent the narrowing of blood vessels, and as a beta blocker which can slow the heart rate and reduce the strength of heart contractions so that less blood flow is pumped and blood pressure is reduced (Anwar, 2023).

The apigenin contained in *Apium graveolens* is a vasorelaxation or vasodilator (widens blood vessels) with a mechanism of inhibiting contractions caused by the release of calcium (a mechanism of action such as a calcium antagonist). Calcium antagonists work by lowering blood pressure by blocking the entry of calcium into the blood. If calcium enters a muscle cell, it will contract. By inhibiting the contraction of the muscles that surround the blood vessels, the blood vessels will widen so that blood flows smoothly and blood pressure will decrease.

The results of this research are supported by research from Selvia, (2022). in the working area of the Andalas Health Center, data was obtained from 16 people suffering from hypertension, consisting of mothers, menopause, and men, the results showed that the blood pressure before being given therapy was an average of 151.88/88.81. The average mmHg of blood pressure after therapy was an average of 108.44/64.25 mmHg. The results of the study showed that there was a decrease in blood pressure after being given noni juice with a *p-value* of 0.000, so it can be concluded that there is a difference between blood pressure. Systolic and diastolic hypertension sufferers before and after being given noni juice.

According to research results by Ramadhani and Haeriyah, (2023). in Kutabumi Pasar Kemis, data obtained from 30 people with hypertension, consisting of women and men, showed that the average blood pressure before therapy was 150.67/89.8 mmHg. after therapy, the average was 139.67/78.28 mmHg, the results of the study showed that there was a decrease in blood pressure after being given noni juice with a *p-value* of 0.000 < 0.05, so it can be concluded that there was an effect of giving noni juice on the decrease blood pressure

Results of research conducted by Suryarinilsih, (2021). data obtained from 16 people with hypertension consisting of mothers, menopausal women, and men showed that blood pressure before therapy was 155/94.38 and after therapy was 135/85 mmHg. The results of the study showed that there was a decrease in blood pressure after being given boiled *Apium graveolens* with a *p-value* of 0.000 < 0.05, so it can be concluded that consuming boiled *Apium* is effective in lowering blood pressure in hypertensive patients.

The herbal drink combination of *Morinda citrifolia* and *Apium graveolens* can be said to be a therapy that does not require large amounts of money because this product can save costs in the manufacturing process and safety standards. The results of research conducted by researchers from February 29 2024 to March 13 2024 also showed changes in blood pressure before and after being given herbal drink therapy with a combination of *Morinda citrifolia* and *Apium graveolens*. Researchers applied it by giving herbal drinks for two weeks with one shot of one product a week and drinking one shot 3 times a day. The results of these differences were obtained from the results of observation sheets carried out on respondents and then analyzed using statistical tests, so that there were differences in blood pressure before and after being given herbal drink therapy with a combination of *Morinda citrifolia* and *Apium graveolens*, namely 156.33/96.72 mmHg and after 144.39/90.39 mmHg, so there was a decrease in systolic blood pressure of 11.94% mmHg and diastole of 6.33%. mmHg. So you can see the difference in blood pressure reduction from the results of previous research Selvia, (2022). systolic blood pressure was 43.44% mmHg and diastole was 24.56% mmHg, according to research results by Ramadhani and Haeriyah, (2023). systolic blood pressure was 11% mmHg and diastole was 11.52% mmHg, research results by Suryarinilsih, (2021). systolic blood pressure was 20% mmHg and diastole was 9.38% mmHg and the results of the current study showed a reduction in systolic blood pressure of 11.3% mmHg and diastole of 5.75% mmHg.

From the discussion it is concluded that the herbal drink combination of *Morinda citrifolia* and *Apium Graveolens* is effective for lowering blood pressure in hypertension sufferers because it contains

substances such as scopoletin, flavonoids and Apigenin which have hypotensive properties and the effect of *Morinda citrifolia* and *Apium Graveolens* is as a thrombolytic which functions to break up blood clots. block blood vessels which experience disruption of blood flow in the body and the results of this research have been measured and carried out statistical analysis tests which have met valid standards in research.

## CONCLUSION

The results of the research entitled Effectiveness Combination Herbal Drink *Morinda citrifolia* and *Apium graveolens* to Reducing Blood Pressure in Patients Hypertension at Griya Clinic Acupuncture Jember concluded as follows

1. Blood pressure in patients of 18 respondents before giving the combination herbal drink *Morinda citrifolia* and *Apium graveolens* that is blood pressure systolic 156.33 mmHg and average blood pressure diastolic 96.72 mmHg.
2. Blood pressure in patients with hypertension in 18 respondents after given a combination of the herbal drink *Morinda citrifolia* and *Apium graveolens* is blood pressure systolic 144.39 mmHg and average blood pressure diastolic 90.39 mmHg. So there was a decrease in systolic blood pressure by 11.94% mmHg and diastole by 6.33%. mmHg.
3. *Wilcoxon* Test Results show that the calculated Z value For blood pressure systole is as big as the *p-value* 0.000. Therefore  $p\text{-value } 0.000 < \alpha (0.05)$ , and the Z count For pressure diastolic blood volume with *p* -value 0.000. Therefore second *p-value* is  $000 < \alpha (0.05)$  then  $H_a$  was accepted and  $H_0$  was rejected, thus there was a significant difference between the combined herbal drink therapy of *Morinda citrifolia* and *Apium*

*graveolens* in reducing blood pressure in hypertensive sufferers.

## SUGGESTIONS

From the research that has been done, the researcher wants to convey some suggestions as follows:

1. For Sufferers Hypertension  
Research result This can make non-pharmacological treatment for patients that is appropriate and practical in lower blood pressure by consuming an herbal drink combination of *Morinda citrifolia* and *Apium graveolens*
2. For Dr. Soebandi Jember University Institutions  
Expected thesis This got it made reference and used for students who will study next, so students will be learning to give therapy herbal drinks combination of *Morinda citrifolia* and *Apium graveolens* to reduce blood pressure in hypertension sufferers.
3. For Future Researcher  
For researchers Furthermore, a longer period range and large number of respondents as well as design and methods of different research so can tell more about the effectiveness of an herbal drink combination of *Morinda citrifolia* and *Apium graveolens* to reduce wider blood pressure.

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