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# Effectiveness of Celery (*Apium Graveolens*) on Hypertension in The Elderly

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## ABSTRACT

Hypertonia, after stroke and tuberculosis, is the third leading cause of death. It is a degenerative condition in the elderly when nearly everyone sees a rise in blood pressure as they age. Treatment of hypertension may be pharmacological or nonpharmacological. Pharmaceutical therapy is often deemed prohibitively costly by others, prompting some to seek nonpharmacological care, including herbal medicine, which includes the use of celery. Celery is the most frequently seen plant in the neighborhood. Celery contains apigenin, which is beneficial for reducing blood flow narrowing and hypertension. This study aims to determine the efficacy of celery in treating hypertension, especially in elderly patients, at the Matraman District Health Center. The study employed an unconventional one-group pretest-posttest setup with a control group. The sample size was five individuals, and the research was conducted using comparative analysis and paired t-tests using computerized statistical tools. The findings indicated a discrepancy in blood pressure both before and after the elderly were given celery, although the difference was not statistically meaningful.

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## 1. Introduction

Hypertension is still a big issue in the world today. Hypertension is sometimes referred to as the invisible killer because it is lethal without presenting any signs to victims (Alhuda et al., 2018). The WHO notes the normal blood pressure range is 120-140 mmHg and the diastolic level is 80-90 mmHg. Hypertension is said to occur if anyone is more than 140/90 mmHg in the blood (Budianto & Harlyanto, 2017). Hypertension is a cause of stroke, coronary attacks as well as cardiovascular disease such as arterial aneurysm and a disease that raises blood pressure is the main cause of chronic heart dysfunction and high blood pressure (Nuraini, 2015).

According to the WHO's 2010 Non-Communicable Diseases Global Status Report, 40% of emerging countries have hypertension than 35% of industrialized countries. Africa is the most hypertensive continent, with up to 46% of the population suffering from hypertension. Meanwhile, America receives 35%. 36% of adults in Southeast Asia suffer from hypertension. This disease claims 1.5 million lives per year in the Asian region. There was an increase in the number of patients for men and women, respectively, from 18% to 31% and 16% to 29%. According to the WHO, only 50% of hypertension sufferers are identified, only 25% seek care, and only 12.5% are receiving adequate treatment (case of adequacy). Hypertension cases are expected to rise by approximately 80% in 2025, especially in developed countries, from 639 million cases in 2000 to 1.5 billion points in 2025. Treatment of hypertension is prohibitively expensive. This is a significant financial strain on individuals, neighborhoods, and the nation as a whole (Afifah, 2009)

In Indonesia, the average hypertension level was very high, at 83 per 1,000 population, according to the 2009 Household Health Survey (SKRT). According to the 2008 Center for Research and Development and Health Policy Report, hypertension represents 34.9 percent of the population of Indonesia. In the province of Riau Islands (45.0%), Papua (24.7%), Java and Bali (22.24%), and Sumatra were found to be a significant prevalence (9.17 percent). (Switzerland, 2007).

Recent nonpharmacological advancement in the treatment of hypertension using one of the medicinal plants, celery. Celery, or celery root (*Apium graveolens*), is a herbal remedy used to treat hypertension. Celery includes apigenin, which is exceptionally beneficial for reducing blood flow narrowing and hypertension (Pratiwi et al., 2019).

This research aims to determine how effective the Matraman health center is to provide celery floral infusion for elderly patients with hypertension. The objective of these studies was to assess the effective management of celery in elderly patients alone.

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## 2. Literature Review

### 2.1 Hypertension

Hypertension is a condition in which blood pressure increases abnormally and continuously over time due to one or more risk factors that do not work correctly in maintaining normal blood pressure (Staessen et al., 2003; Messerli et al., 2007).

Symptoms of hypertension that are easily observed include (Dalimartha et al., 2008), namely:

- a. Headache
- b. Often restless
- c. Red face
- d. The nape feels sore
- e. Irritable
- f. Ears buzzing
- g. Having trouble sleeping

The factors that can cause hypertension (Sugiharto, 2007), among others:

- a. Factors that can cause hypertension are :

- 1) Genetic
- 2) Age
- 3) Gender
- 4) Profession

- b. Controllable Risk Factors Obesity

- 1) Lack of exercise
- 2) Smoking Habits
- 3) Consuming excess salt
- 4) Drinking alcohol
- 5) Drinking coffee
- 6) Stress

Management of Hypertension

- a. Pharmacological. The central management of primary hypertension is medication.
- b. Nonpharmacology. The nonpharmacological approach is the initial treatment before adding hypertension drugs, in addition to the need to be considered by someone who is currently in drug therapy.

### 2.2 Celery (*Apium graveolens*)

Celery (*Apium graveolens* L) is a vegetable and leaves of medicinal plants commonly used as a cooking spice (Triana, 2020). Celery comes from Europe and Asia's subtropical regions and is a highland plant found at altitudes above 900 m asl. In this area, the growing celery has thickened petioles. For growth, celery requires humid weather (Dalimartha, 2000). Celery can also be planted in lowlands. It's just that the size of the stalks is smaller and is used as a food flavoring. Celery consists of three types: leaf celery, cut celery, and tuberous celery (Dalimarta, 2000). ).



Figure 1 Celery (*Apium graveolens*)

In 1 serving or about 100 grams of celery, it contains at least 14 calories and various nutrients, such as:

- a. 1.5 grams of fiber
- b. 2.5–3 grams of carbohydrates
- c. 0.7 grams of protein
- d. 80 milligrams of sodium
- e. 260 milligrams of potassium

- f. 1.3 grams of sugar
- g. 40 milligrams of calcium
- h. 29–30 micrograms of vitamin K

M Besides, celery leaves also contain antioxidant flavonoids and various vitamins and minerals, including zinc, copper, choline, iron, magnesium, folate, vitamin A, vitamin B, vitamin C, and vitamin K, which can play a role in fat metabolism, diuretic effect. And maintain the elasticity of blood vessels (Savitri, 2016).

Celery is a type of vegetable that contains lots of potassium and antioxidants. This substance is known to prevent the buildup or deposition of minerals in the kidneys, reducing the risk of kidney stone formation. Besides, celery also contains lots of water. Thanks to its high potassium and water content, celery can make the body get rid of more waste and toxins through urine. This effect makes celery suitable for the detoxification process while preventing kidney stones (Rusdiana, 2018).

A kidney disorder is inextricably linked to hypertension (hypertension). Uncontrolled hypertension will ultimately cause damage to the blood vessels in the body. This condition can damage various organs of the body, including the kidneys. If kidney function is impaired or damaged, different kidney functions such as filtering blood from toxic substances, helping with hormone production, and regulating the balance of electrolytes and salts in the body will be disturbed. It is to control blood pressure to remain stable to maintain kidney health. This can be done in several ways, from following a healthy diet, limiting salt and sugar intake, drinking lots of water, to exercising regularly (Arifa et al., 2017).

One type of food that is good for controlling blood pressure is celery. This is due to potassium, antioxidants, and phthalide substances in celery which can lower blood pressure and keep it stable. Celery can be processed into juice or made brewing to get the various benefits of celery for controlling blood pressure. The trick first washes 3-4 celery stalks, cut into pieces, put in a blender, then add a little water. After processing it into juice, it is advisable to consume it immediately. Celery leaves do have health benefits. However, the claims for the help of celery leaves for the kidneys still need further investigation. Therefore, celery has not been proven to be used as a treatment for kidney disease.

According to Aulia (2010), steeping celery for the elderly resulted in a more significant blood pressure reduction than cucumber juice. Meanwhile, Asmawati et al. (2016) explained that celery infusion provision could reduce blood pressure in hypertensive patients in Sidanegara village, Central Cilacap district. Fazal & Singla (2012) also argued that celery could lower cholesterol and blood pressure.

### 2.3 Research Hypothesis Formulation

**H0** = There is no discernible increase between presystolic and post systolic blood pressure after celery administration.

**H1** = The amount of presystolic blood pressure after celery administration increases significantly.

**H0** = After cellular administration there is no significant difference from pre-diastolic to post-diastolic blood pressure levels.

**H2** = There is a substantial increase in pre-diastole and post-diastole blood pressure after celery administration.

## 3. Method

This is an ongoing study on natural ingredients to assess the effect of celery on hypertension. The sample size is five individuals. The Matraman District Health Center was the site of this study. The time needed to research for one year is effective from January to December 2020. Data analysis uses comparative analysis with the Paired T-Test, using SPSS computerized statistical software. The data will be analyzed at a level of significance of 95%.

## 4. Result and Discussion

The respondents in this study were seniors, totaling five individuals, three of whom were female (60 percent) and two males (40 percent). According to RISKESDAS (2013), the female gender has a higher prevalence rate than the male gender, as estrogen levels decline and the risk of hypertension increases as women reach menopause (MOH, 2013).

Tambayong (2000) states that while men experience hypertension at a higher rate than women, the prevalence of hypertension in women starts to rise in middle age and later life, reaching a peak at the age of 65 years. This is due to work. In middle-aged people, estrogen levels tend to decrease, and this hormone is responsible for rising HDL (High-Density Lipoprotein) levels, which is a risk factor for atherosclerosis.

**Table 1**  
With Celery Steeping Treatment

No	Name	TD Pre		TD Post	
		Systole	Diastole	Systole	Diastole
	Mr Lbn				
1	Tungkup	140	73	121	74
2	Mr Hasibuan	178	81	179	91
3	Mrs Siahaan	155	82	130	79
4	Mrs Rajagukguk	168	104	154	103
5	Mrs Situmeang	131	84	138	80

Source: Processed by Researchers

The data will be tested using comparative analysis with paired t-test using SPSS statistical software, including pre-test and post-test blood pressure, namely for systole and diastole, as shown in the table below.:

**Table 2**  
Paired Samples Statistics Systole

Pair 1		Mean	N	Std. Deviation	Std. Error Mean
		Pre_Systole	154.4000	5	19.34683
	Post_Systole	144.4000	5	22.83200	10.21078

In table 2 above, it can be seen the results of descriptive statistics from the two samples studied, namely the pre\_systole and post-systole values. For pre-systole, the mean value was 154.4000, while for the post-systole, the mean value was 144.4000. The std deviation value for pre\_systole is 19.34683 and for post\_systole is 22.83200. Finally, for the std error, the mean pre\_systole value is 8.65217, and the post\_systole value is 10.21078.

Because the average value of pressure measurement in the systolic area between before and after the celery treatment was obtained Pre\_systole TD 15,4000 > 144.4000 Post\_systole TD, it can be seen descriptively that there is a difference in the mean result of systolic BP after infusion of celery.

**Table 3**  
Paired Samples Test Systole

Pair 1	Pre_Systole - Post_Systole	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
		10.00000	13.52775	6.04979	-6.79692	26.79692	1.653	4	.174

According to Table 3, the Sig (2-tailed) value is 0.174. According to Singgih Santoso (2014), the paired-sample t-decision-making test's instructions are dependent on the significance meaning (Sig.) If the Sig. (2-tailed) The SPSS performance effects are less than 0.05, H0 is refused, and H1 is accepted, and vice versa. Because the Sig (2-tailed) value is more significant than 0.05, H0 is accepted, and H1 is refused.



**Table 4**

Paired Samples Statistics Diastole					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre_Diastole	84.8000	5	11.51955	5.15170
	Post_Diastole	85.4000	5	11.63185	5.20192

In table 4 above, we can see the descriptive statistics of the two samples studied, namely the pre-diastole and post-diastole values. For pre-diastole, an average or mean weight of 84.8000 was obtained, while for the post-diastolic value, the mean value was 85.4000. The std deviation value for pre\_diastole is 11.51955 and for post\_diastole is 11.63185. Finally, for the std error, the mean pre\_diastole value is 5.15170, and the post\_diastole value is 5.20192.

Because the average value of pressure measurement in the systolic area between before and after the treatment of celery, it was found that the Pre\_diastole TD was 84.8000 <TD 85.40000 Post\_diastole, it can be seen descriptively that there is a difference in the average diastolic BP results after infusion.

**Table 5**

Paired Samples Test Diastole									
Pair 1	Pre_Diastole - Post_Diastole	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
		-.60000	5.59464	2.50200	-7.54666	6.34666	-.240	4	.822

According to table 5, the Sig (2-tailed) value is 0.822, which implies that, as stated in table 3, if the sig (2-tailed) value is more significant than 0.05, H0 is agreed, and H2 is refused.

The results showed a mean pre-systolic blood pressure of 154,4000 mm Hg and an average blood pressure drop of 144,4000 mm Hg after the administration of celery decoction in the elderly was 154,4000 mm Hg and 144,4000 mm Hg. Whereas the value for TD Pre diastole was 84.800, TD Post diastole's value was 85.400, indicating that there is a gap in the average TD diastole before and after celery steeping.

The sig (2-tailed) value for systolic blood pressure was 0.174 > 0.05, indicating that H0 is accepted and H1 is refused. This suggests that there is no discernible change in terms of systolic blood pressure reduction. Meanwhile, the Sig. (2-tailed) for diastole is 0.822 > 0.05, indicating that H0 is accepted and H2 is refused. Additionally, there is no significant variation in the supply of celery to the elderly for Diastole TD. The above study's findings dispute prior reports indicating that celery substantially impacted blood pressure reduction (Nugroho, 2010; Fazal, 2012; Fiqri, 2013).

**5. Conclusion**

According to the findings of a study on the effects of celery infusion on elderly hypertension at the health center of Matraman, there were discrepancies between pre-and post-steeping celery. However, the disparity was not substantial, with significance values greater than 0.05 for both systole and diastole.

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