

# The Effect of Giving Celery Decoction on Hypertension Reduction At Mutiara Health Center

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## ABSTRACT

Hypertension has been designated a "silent killer" due to its asymptomatic nature. Hypertension is typically asymptomatic, meaning that it occurs without any noticeable symptoms. One of the herbs that has been demonstrated to possess antihypertensive properties is celery. As a hypotensive agent, celery has been demonstrated to reduce blood pressure in patients with hypertension. The objective of this research is to investigate the potential efficacy of celery in lowering blood pressure. The objective of this study is to ascertain the impact of celery boiled water on blood pressure in patients with hypertension. The research methods employed in this study are as follows: This research is quantitative and employs a quasi-experimental design with a one-group pretest-posttest. The population under investigation in this study consisted of individuals with hypertension who were attending the Mutiara Health Center. The sample size was 50 individuals, selected using a non-random sampling technique with a purposive sampling approach. The instruments utilized in this study are a sphygmomanometer and stethoscope. The results of the blood pressure examination are documented in the observation sheet. The results of the statistical tests, in the form of a paired t-test, conducted before and after the administration of celery boiled water, yielded a p-value of 0.001, which was less than the alpha value of 0.05. This indicates that there is a statistically significant difference between the two groups. Based on these findings, it can be concluded that the hypothesis (H1) is accepted, suggesting that there is an effect of celery boiled water on blood pressure in pre-elderly individuals with hypertension at Mutiara Health Center.

**Keywords:** *Celery, Hypertension, Blood pressure, Complementary, Celery boiled water*

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## 1. INTRODUCTION

As an emerging nation, Indonesia is confronted with a complex and multifaceted public health challenge, namely the reemergence of long-standing infectious diseases, the advent of new infectious agents, and an alarming rise in noncommunicable chronic illnesses. A number of factors contribute to the development of degenerative diseases, with hypertension representing one such risk factor. It is estimated that 600 million individuals worldwide are affected by hypertension, with 3 million deaths annually and 70% of cases receiving inadequate treatment (Mafaza, Wirjatmadi, & Adriani, 2018). Hypertension is a non-communicable disease that is the leading cause of death globally. The incidence of hypertension continues to increase annually. It is estimated that by 2025, there will be 1.5 billion people affected by hypertension, and it is estimated that every year, 9.4 million people die from hypertension and its complications [15].

According to data from the World Health Organization (WHO), approximately 972 million individuals, representing 26.4% of the global population, are affected by hypertension. This figure is projected to increase to 29.2% by 2022. Of the 972 million individuals with hypertension, 333 million reside in developed countries, while the remaining 639 million are distributed across developing countries, including Indonesia [2]

The Riskesdas data from 2018 indicates that the prevalence of hypertension based on the results of measurements in the 18-year-old population is 34.1%, while hypertension in the age group 31-44 years (31.6%), age

45-54 years (45.3%), age 55-64 years (55.2%), and age 65-74 years (63.2%) is significantly higher. Hypertension is the most prevalent disease among the elderly in Indonesia, with a prevalence of 55.2% among individuals aged 55-64 years, 63.2% among those aged 65-74 years, and an increasing prevalence of 69.5% among individuals aged 75 years and above [4].

According to data from the Padang City Health Office, the districts and cities with the highest prevalence of hypertension are District 50 Kota (33.5%), Bukittingi City (30.8%), Padang City (28.5%), Solok City (25%), and Padang Pariaman Regency (20.2%) [13].

According to data from the Health Social Security Organizing Agency (BPJS), the cost of hypertension services has increased annually, reaching 2.8 trillion rupiah in 2016, 3 trillion rupiah in 2017, and 3 trillion rupiah in 2018 [4].

Cardiovascular disease, encompassing conditions affecting the heart and blood vessels, represents a significant public health concern in both developed and developing countries, accounting for a substantial proportion of global mortality annually. Hypertension, or high blood pressure, is a prevalent and pervasive cardiovascular disorder within the general population [4].

Hypertension, or high blood pressure, is a condition known as a "silent killer" due to its asymptomatic nature. This means that an individual may experience an increase in blood pressure above normal, as indicated by the systolic and diastolic numbers in a blood pressure test. These tests utilize a blood pressure measuring device, such as a mercury cuff or other digital apparatus.

Hypertension typically manifests in individuals aged 40 and above, attributed to the diminished elasticity of the blood vessels. With the decline in physiological functions, the blood vessels become increasingly rigid, leading to impeded blood flow. A study revealed that the 50-64 age group exhibits the highest prevalence of hypertension. With advancing age, the risk of hypertension increases.

Hypertension is not a curable condition; however, it can be managed through routine health control measures. One method of controlling routine health is through the consumption of pharmacological and non-pharmacological drugs [2]. The pharmacological management of hypertension entails paying attention to the level of compliance and the mechanism of action, which includes the use of diuretics, vasodilators, sympathomimetics, and beta-blockers. However, the long-term use of these drugs can have adverse effects on the body.

Non-pharmacological drugs, which may be considered traditional medicine, are composed of natural ingredients that are safer and may extend life. Examples of such ingredients include noni, celery, bay leaves, cucumbers, garlic, and other herbal plants [2]. Furthermore, the WHO endorses endeavors to enhance the safety and efficacy of traditional medicines. This is due to the fact that the adverse effects associated with the use of traditional medicine are comparatively less pronounced in comparison to those observed with modern pharmacological agents. One traditional medicinal plant that has been demonstrated to lower blood pressure in individuals with hypertension is celery (*Apium graveolens*). Celery (*Apium graveolens*) is a plant that has long been used in traditional medicine. It contains numerous ingredients, including nbutylphthalide (NBP) and sedanolide, which contribute to its distinctive aroma and flavor. The properties of celery have been linked to various therapeutic effects, including anti-hypertension, kidney disease treatment, and others [2].

In accordance with the research conducted by [17] on the efficacy of celery decoction in lowering blood pressure in patients with hypertension, the findings indicated a statistically significant reduction in both systolic and diastolic blood pressure in hypertensive patients following the administration of celery decoction. The results substantiate the conclusion that the consumption of celery decoction effectively reduces blood pressure in patients with grade I and II hypertension. [17][18][19]

In accordance with the findings of Aisyah & Mulya (2020) regarding the impact of celery leaf decoction on blood pressure reduction in elderly individuals with hypertension in Bacang village, Blangkejeren subdistrict, Gayo Lues district, the results of the Wilcoxon test indicated that the Z-count value for systolic blood pressure was obtained with a p-value of 0.001, as the p-value of 0.001 is less than the alpha value of 0.05. Similarly, the Z-count value for diastolic blood pressure was obtained with a p-value of 0.000.

Additionally, Agusdarman Waruwu et al. (2020) investigated the impact of celery leaf decoction (*Apium graveolens*) consumption on blood pressure reduction in elderly individuals with hypertension at the Guna Budi Bakti Medan nursing home. Their findings revealed a p-value of 0.000x, indicating that the null hypothesis ( $H_0$ ) was rejected. It can be concluded that the ingestion of celery leaf decoction (*Apium graveolens*) has a significant impact on reducing blood pressure in elderly patients with hypertension at the Guna Budi Bakti Medan Foundation nursing home in 2020.

The initial survey conducted by researchers at the Mutiara Health Center in 2021 yielded 50 participants who met the criteria for inclusion in the study. These participants were interviewed directly to ascertain their experiences with hypertension. In light of the aforementioned background, the researcher is interested in pursuing a research project entitled "The Effect of Giving Celery Decoction on Reducing Hypertension at Mutiara Health Center in 2021."

## 2. METHOD

This research is a quasi-experimental study with a one-group pretest-posttest design. The research sample consisted of 50 individuals who had been diagnosed with hypertension at Mutiara Health Center in 2021. The sample was obtained using a non-randomized sampling technique, namely purposive sampling.

## 3. RESULTS AND DISCUSSION

### 3.1. Characteristic Respondent

**Table 1. Characteristics of Hypertension Respondents Based on Age, Education, Occupation at Mutiara Health Center in 2021**

No	Respondent Characteristic	N	%
1	<b>Age</b>		
	25 – 30 years	12	24
	35 – 50 years	16	32
	>50 years	22	44
2	<b>Education</b>		
	Did Not Finish Elementary	5	10
	Elementary School	10	20
	Junior High School	14	28
	Senior High School	15	30
	University	6	12
3	<b>Occupation</b>		
	Unemployee	8	16
	Housewives	10	20
	Civil Servant	10	20
	Employee	12	24
	Entrepreneur	10	20
	<b>Total</b>	<b>50</b>	<b>100</b>

Based on the results of Table 1, in terms of age, the majority of mothers are aged > 50 years as many as 22 people (44%) and a minority of 25-35 years old as many as 12 people (24%). The majority of respondents' education is high school as many as 15 people (30%), and the minority did not graduate from elementary school as many as 5 people (10%). The majority of private employees work as many as 12 people (24%) and the minority does not work as many as 8 people (16%).

#### 3.1.1. Univariate Analysis

Characteristics of hypertensive patients based on blood pressure before being given celery decoction.

**Table 2 Distribution of hypertensive patients based on blood pressure before being given celery decoction at Mutiara Health Center in 2021**

Blood Pressure	N	Mean	Median	Sd	Min	Max
Sistol	50	181.92	180.00	184.71	140	220
Diastol	50	99.62	100.00	11.295	80	130

Based on Table 2 shows that out of a total of 50 hypertensive patients have an average systolic blood pressure of 181.92 mmHg with the lowest systolic blood pressure of 140 mmHg and the highest of 220 mmHg. As for diastole blood pressure, it has an average of 99.62 mmHg with the lowest diastole blood pressure of 80 mmHg and the highest of 130 mmHg.

Characteristics of hypertensive patients based on blood pressure after being given celery decoction.

**Table 3. Distribution of hypertensive patients based on blood pressure after being given celery decoction at Mutiara Health Center in 2021**

Blood Pressure	N	Mean	Median	Sd	Min	Max
Sistol	50	140.46	140.00	13.542	120	170
Diastol	50	83.00	80.00	7.896	70	95

Based on Table 3 shows that out of a total of 50 hypertensive patients have an average systolic blood pressure of 140.46 mmHg with the lowest systolic blood pressure of 120 mmHg and the highest of 170 mmHg. As for diastole blood pressure, it has an average of 83.00 mmHg with the lowest diastole blood pressure of 70 mmHg and the highest of 95 mmHg.

### 3.1.2. Bivariate Analysis

Before hypothesis testing is carried out, first the data is tested for data normality. The normality test is carried out because in using the T test, the data to be processed must have normal data. Data is known to be normal or not, so a normality test must be carried out. Normality Test Requirements according to Dahlan (2008).

Table 4. Test Results of the Effect of Hypnobirthing Relaxation Techniques on Reducing Pain during Labor at the Mutiara Health Center in 2021

Variable	Coef of Variant		Skewness Ratio		Kurtosis Ratio Value	
Sistol <i>Pre-test</i>	10.15%	<30%	-0.441	>-2,<2	-1.935	>-2,<2
Sistol <i>Post-test</i>	9.64%	<30%	0.104	>-2,<2	-1.337	>-2,<2
Diastol <i>Pre-test</i>	11.33%	<30%	1.545	>-2,<2	-0460	>-2,<2
Diastol <i>Post-test</i>	9.51	<30%	-0.969	>-2,<2	-1.872	>-2,<2

Table 4 shows that all groups based on the coefficient of variance, skewness ratio, and kurtosis ratio have met the requirements of each parameter. So, it can be concluded that all four groups of data are normally distributed.

Differences in Blood Pressure in hypertensive patients before and after being given celery leaf decoction based on systole and diastole blood pressure at Mutiara Health Center in 2021.

Table 5. Differences in Blood Pressure in hypertensive patients before and after being given celery leaf decoction based on blood pressure systole and diastole at Mutiara health center in 2021.

Blood Pressure	N	Mean	STD	SE	<i>t</i>	<i>P Value</i>
Sistol <i>Pre-Post</i>	50	41.462	17.292	2.145	19.331	0.000
Diastol <i>Pre-Post</i>	50	16.615	11.696	1.451	11.453	

Based on Table 4.5, it is explained that the average systole in hypertensive patients is 41.462 mmHg and the average diastole in hypertensive patients is 16.615 mmHg. It can be concluded that there is a significant difference in the average decrease in systole and diastole blood pressure in hypertensive patients before and after being given celery leaf decoction with a p-value of 0.000 < 0.05.

## 3.2 Discussion

### 3.2.1 Univariate Analysis

Characteristics of hypertensive patients based on blood pressure before and after being given celery decoction. From the results of the study, it was found that the characteristics of hypertensive patients based on blood pressure before being given celery decoction at Mutiara Health Center in 2021 were in the hypertension category, namely showing that out of a total of 50 hypertensive patients had an average systolic blood pressure of 181.92 mmHg with the lowest systolic blood pressure of 140 mmHg and the highest of 220 mmHg. As for diastole blood pressure, it has an average of 99.62 mmHg with the lowest diastole blood pressure of 80 mmHg and the highest of 130 mmHg.

Blood pressure in hypertensive patients before being given celery decoction has an average systolic blood pressure of 181.92 mmHg which according to the Joint National Committee (JNC) is included in the category of grade 3 hypertension or severe hypertension and for diastolic it is 99.62 mmHg included in the category of grade one hypertension or mild hypertension. While blood pressure in hypertensive patients after being given celery decoction has an average systolic blood pressure of 140.46 mmHg including in the category of grade 1 hypertension or mild hypertension and for diastolic it is 83 mmHg including in the normal category.

The results of the dependent t test (paired t test) show that there is a difference in the average pre and post on systolic pressure of 41.462 mmHg, *t* count (19.331) > *t* table (2,000) and *pv* (0.000) <  $\alpha$  (0.05). And there is a difference in the average pre and post on diastolic pressure of 16.615 mmHg, *t* count (11.453) > *t* able (2,000) and *pv* (0.000) <  $\alpha$  (0.05).

The causes of hypertension in general include atherosclerosis (thickening of the arterial wall that causes loss of elasticity of blood vessels), heredity, increased amount of blood pumped to the heart, kidney disease, adrenal glands, and sympathetic nervous system, obesity, psychological pressure, stress, and tension can cause hypertension (Marzuki 2009). The treatment of hypertension according to Lenny (2008), is broadly divided into 2 types, namely treatment with drugs (pharmacology) and non-drug treatment (non-pharmacological). Pharmacological treatment consists of the administration of drugs that are diuretic, sympathetic, betabloker, and vasodilator with regard to place, mechanism of action and level of compliance. Non-pharmacological treatments include weight loss, regular exercise, low fat & salt diet, and complementary therapy.

One of the non-pharmacological treatments in curing hypertension is complementary therapy. Complementary therapy is a natural treatment therapy including herbal therapy, nutritional therapy, progressive relaxation, meditation, laughter therapy, acupuncture, acupressure, aromatherapy, bach flower remedy therapy, and reflexology [15].

The types of drugs used in herbal therapy are celery or celery (*Apiumgraveolens*), garlic or garlic (*Allium Sativum*), onion or onion (*Allium cepa*), tomato (*Lyocopercison lycopersicum*), watermelon (*Citrullus vulgaris*). [15]. The effect of giving celery decoction in this study is also supported by several factors that are not examined but may affect the effect of celery decoction in lowering blood pressure, namely internal and external factors. Internal factors or factors from within the individual may be able to influence the administration of celery decoction. Which includes internal factors are the physical and psychological state of the individual (Puspa 2009).

The internal factor related to the psychological state is the respondent's motivation to consume celery stew. It is possible that high motivation can increase respondents' desire to consume celery stew.

This opinion is in accordance with [13] who suggests that motivation represents a psychological process that causes the emergence, direction and occurrence of exactly the tension of voluntary activities directed towards a particular goal. Confounding factors that cannot be controlled by researchers are the polyamory and psychology of each respondent, due to the limitations of researchers who are difficult to control one by one, so that the results of the study are not good whether the decrease in blood pressure is caused by giving celery decoction or by other factors. In this study, researchers selected respondents and then measured their blood pressure, after hypertensive patients were willing to become respondents, celery decoction was given 2 times a day for one week. Researchers also asked for help from 2 friends to help conduct research due to limited researchers and research time. Before coming to the respondents, the researcher explained the criteria for the selected respondents and how to provide celery decoction therapy to the 2 friends.

External factors or factors from outside the individual are also possible to influence the administration of celery decoction. These external factors are all things that are outside the individual, for example, the busyness of each individual or individuals who work. Activities outside the home can result in a lack of or inappropriate schedule for consuming celery stew. Another external factor is the use of celery stew which has a bitter taste. Not all respondents liked the bitter taste. To anticipate this, celery stew is given when it is still warm.

#### 4. CONCLUSION

From the results of the study of the effect of giving celery decoction on reducing hypertension at Mutiara Health Center, it was found that the majority of hypertension before being given a decoction of celery leaves at Mutiara Health Center was in the hypertension category, indicating that out of a total of 50 hypertensive patients had an average systolic blood pressure of 181.92 mmHg with the lowest systolic blood pressure of 140 mmHg and the highest of 220 mmHg. As for diastole blood pressure, it has an average of 99.62 mmHg with the lowest diastole blood pressure of 80 mmHg and the highest of 130 mmHg. The majority of hypertension after being given celery leaf decoction at Mutiara health center is in the category showing that out of a total of 50 hypertensive patients have an average systolic blood pressure of 140.46 mmHg with the lowest systolic blood pressure of 120 mmHg and the highest of 170 mmHg. While for diastole blood pressure has an average of 83.00 mmHg with the lowest diastole blood pressure of 70 mmHg and the highest of 95 mmHg. There is an effect of giving celery decoction on reducing hypertension with a p value ( $0.000 < \alpha: 0.05$ ).

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