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Giving Cucumber Juice to Lower Blood Pressure in Patients with Hypertension at Sarudik Health Center

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ABSTRACT

Hypertension is still a very important problem for health in the world, even now cases of hypertension are increasing in line with changes in unhealthy lifestyles. In the past, hypertension disease was mostly found in the elderly, but now the prevalence of hypertension cases at a young age is starting to approach cases in the elderly with a still high rate of 25.8%. The impact of hypertension on blood pressure causes damage to the kidneys (kidney failure), heart damage and brain damage (causing stroke). Hypertension can be treated by starting a healthy diet that is rich in fiber and nutrients. The content of cucumber juice is Mg, K, cellulose, H2O. The results of the preliminary survey conducted by the author, obtained information that at the Sarudik Health Center the number of hypertension cases in June 2019 were 29 patients, in July 2019 there were 20 patients. From the results of interviews with 5 hypertensive patients they had never tried cucumber juice, they only avoided high-fat and high-salt foods. Vegetable mentium is not a vegetable that is difficult to find in Central Tapanuli Regency. People may not know or believe that cucumber juice does not increase systole. This study aims to determine the relationship between cucumber juice and systolic reduction in hypertensive patients at the Sarudik Health Center, Pandan District, Tapanuli Tengah District. This research will be able to help hypertensive patients lower their blood pressure. This research is a quasi experimental research. The population in this study were hypertensive patients. The data were collected using a tensimeter before and after being given cucumber juice. The data obtained will be recorded, then analyzed the dependent test pre and post test through the "Paired T-Test", discussion, conclusions and suggestions. The targeted outputs are publications in accredited national journals and teaching materials. Technology Readiness Level (TKT) of this research is at level 1, namely proving the basic principles of technology (Basic Principle Report). The research focus areas are health and medicine with the theme of developing and strengthening institutional systems, health policies, and community empowerment in supporting drug self-sufficiency. The research topic is strengthening knowledge and developing community habits in healthy behavior.

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1. Introduction

Hypertension is still a health problem in the world, even until now cases of hypertension are increasing in line with changes in unhealthy activities. In the past, hypertension disease was mostly found in the elderly, but now the prevalence of hypertension cases at a young age has begun to approach the incidence of the elderly.

Hypertension sufferers are estimated to reach 1 billion in all countries, and two among ASEAN. This figure is increasingly worrying, that around 970 million (25%) of the world's mature age suffer from hypertension. This figure continues to increase sharply and it is predicted that by 2025 around 29% of mature age in all countries suffer from hypertension. 4 The incidence of hypertension in mature age in America in 2010-2013 is around 29-31%. 2The prevalence of hypertension diagnosed by doctors in Indonesia is 25.8% according to the 2013 Health Research and Development Agency.

Nationally in Indonesia, if the current population is estimated to be 252 million, then there are 65 million people who have hypertension 4. Data and information on the results of Riskesdas 2018 measurement of blood pressure, hypertension increased from 25.8% for 2013 to 34.1% for 2018 5. The impact of an increase in blood pressure that lasts for a long time (persistence) can cause damage to the kidneys (kidney failure), heart damage (coronary heart disease) and brain damage (causing stroke) 4.Hypertension is a disease cardiovascular which is the most common and the most common 5.

Based on the WHO report, it can be seen that among 50% of patients with hypertension, only 25% of patients who get treatment, but only 12.5% of patients who receive treatment well. 4 Hypertension can be treated by starting a healthy diet that is rich in fiber and nutrients. Research states that eating cucumber can reduce high blood pressure. Cucumber contains magnesium, potassium, fiber and is high in water. The potassium content in cucumbers can maintain sodium

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levels in the body to prevent atherosclerosis which affects blood pressure regulation. Cucumbers also contain lots of fiber. Fiber functions to reducecholesteroland regulate blood pressure so that it does not rise until it is not controlled 10.

Research on the effects of cucumber juice shows that consumption of 150 ml of cucumber juice for 7 days can significantly reduce systolic and diastolic blood pressure in hypertensive men and women. Cucumber juice with a dose of 150 ml for 7 days can reduce systolic blood pressure by 12% (P = 0.000) and diastolic by 10.4% (P = 0.000). 8

The results of the preliminary survey conducted by the author at the Sarudik Health Center found that the number of hypertension cases in June 2019 was 29 patients, in July 2019 there were 20 patients. From the results of interviews with 5 hypertensive patients they had never tried cucumber juice, they only avoided high-fat and high-salt foods.

2. Research methods

This research is a quasi-experimental research with pretest and posttest with a design control group where the research subjects are divided into 2 variances consisting of the intervention and control groups. Both groups began with blood pressure measurements (pretest). Furthermore, the intervention group was given cucumber juice 2x a day, while in the control group it was given 1x daily, cucumber juice was given for 28 (twenty eight) days. Then on the 29th day, the subject's blood pressure was measured to determine the effect of cucumber juice on reducing blood pressure.

This research was conducted at the Sarudik Tapanuli Tengah Health Center in March 2020 - December 2020. The study population was all hypertension patients seeking treatment at the Sarudik Tapanuli Tengah Health Center, totaling 43 people.

Data were analyzed using the dependent test pre and post test through the "Paired T-Test" to determine the difference in the mean decrease in blood pressure between the intervention group and the control group. the mean between the intervention group and the control group, and if p> 0.05, it is concluded that there is no difference. The data analysis process was carried out with the help of SPSS.16 software

3. Results and Discussion

3.1 Systolic blood pressure before being given cucumber juice

Table 1.

Frequency distribution of systolic blood pressure in patients with hypertension before being given cucumber juice at the Sarudik Health Center, Central Tapanuli Regency, 2020.

No.	Systolic blood pressure before being given cucumber juice	Frequency	Percentage
1	140	7	16.3
2	141	1	2.3
3	143	1	2.3
4	145	4	9.3
5	146	3	7.0
6	147	1	2.3
7	148	1	2.3
8	150	9	20.9
9	155	2	4.7
10	160	5	11.6
11	162	2	4.7
12	165	1	2.3
13	170	2	4.7
14	180	4	9.3
	Average = 153.16		
	Total	43	100

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From the table above it is known that the mean systolic blood pressure is 153.16 mmHg. Systolic blood pressure with the highest value was 180 mmHg for 4 people (9.3%). Systolic blood pressure with the lowest value was 140 mmHg for 7 people (16.3%).

3.2 Systolic blood pressure after being given cucumber juice

Table 2.

Frequency distribution of systolic blood pressure in patients with hypertension after being given cucumber juice at the Sarudik Health Center, Central Tapanuli Regency, 2020

No.	Systolic blood pressure after being given cucumber juice	Frequency	Percentage
1	120	3	7.0
2	121	7	16.3
3	122	8	18.6
4	123	5	11.6
5	125	9	20.9
6	127	5	11.6
7	129	3	7.0
8	130	2	4.7
9	133	1	2.3
	Average = 124.14		
	Total	43	100

From the table above it is known that the average systolic blood pressure is 124.14 mmHg. Blood pressure with the highest systolic value was 133 mmHg for 1 person (2.3%). Systolic blood pressure with the lowest value was 120 mmHg for 3 people (7%).

3.3 Diastolic blood pressure before cucumber juice

Table 3.

Frequency distribution of diastolic blood pressure in patients with hypertension before being given cucumber juice at the Sarudik Health Center, Tapanuli Tengah Regency, 2020

No.	Diastolic blood pressure before cucumber juice	Frequency	Percentage
1	90	17	39.5
2	92	1	2.3
3	93	1	2.3
4	95	6	14.0
5	96	1	2.3
6	98	2	4.7
7	100	12	27.9
8	110	3	7.0
	Average = 95.51		
	Total	43	100

From the table above, it is known that the average diastolic blood pressure is 95.51 mmHg. Blood pressure with the highest value was 110 mmHg for 3 people (7%). Blood pressure with the lowest value was 90 mmHg in 17 people (39.5%).

3.4 Diastolic blood pressure after being given cucumber juice.

Table 4.

Frequency distribution of diastolic blood pressure in patients with hypertension after being given cucumber juice at the Sarudik Health Center, Tapanuli Tengah Regency in 2020.

No.	Diastolic blood pressure after being given cucumber juice	Frequency	Percentage
1	80	9	20.9
2	81	10	23.3
3	82	8	18.6
4	83	7	16.3
5	84	4	9.3

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No.	Diastolic blood pressure after being given cucumber juice	Frequency	Percentage
6	85	5	11.6
	Average = 82.05		
	Total	43	100

From the table above, it is known that the average diastolic blood pressure is 82.05 mmHg. Blood pressure with the highest value was 85 mmHg in 5 people (11.6%). Blood pressure with the lowest value was 80 mmHg in 9 people (20.9%).

3.5 Bivariate Analysis

a. Effect of cucumber juice on reducing systolic blood pressure.

Table 5.

The Effect of Giving Cucumber Juice on the Decrease in Systolic Blood Pressure in Patients with Hypertension at Sarudik Health Center, Tapanuli Tengah Regency, 2020

Systolic blood pressure	Mean	Don't count	P	Decision
After being given cucumber juice	124.14			
Before being given cucumber juice	153.16	16,986	.000	Ha accepted
Difference in blood pressure	29.02			

From Table 5, it is known that the statistical test results obtained the value of t count = 16.986 and t table 2.02 the value of p = 0.000. In this study, the t value is greater than the t table value. This means that the alternative hypothesis (Ha) in this study is accepted, meaning that there is an effect of cucumber juice on reducing systolic blood pressure in patients with hypertension at the Sarudik Health Center, Central Tapanuli Regency in 2020.

b. Effect of Cucumber Juice on Decreasing Diastolic Blood Pressure

Table 6.

The Effect of Giving Cucumber Juice to Decreasing Diastolic Blood Pressure in Patients with Hypertension at Sarudik Health Center, Tapanuli Tengah Regency, 2020.

Diastolic blood pressure	Mean	Don't count	P	Decision
After being given cucumber juice	82.05			
Before being given cucumber juice	95.51	15,916	.000	Ha accepted
Difference in blood pressure	13.46			

From Table 6, it is known that the results of the statistical test obtained the t value = 15,916 and t table 2.02 p value = 0.000. In this study, the t value is greater than the t table value. This means that the alternative hypothesis (Ha) in this study is accepted, meaning that there is an effect of giving cucumber juice on reducing diastolic blood pressure in patients with hypertension at the Sarudik Health Center, Central Tapanuli Regency in 2020.

3.6 Discussion

a. Effect of Cucumber Juice on Lowering Blood Pressure.

The results showed that there was an effect of cucumber juice on reducing blood pressure in hypertensive patients at the Sarudik Health Center in Central Tapanuli Regency in 2020.

The decrease in blood pressure occurs in systolic blood pressure. It can be seen that descriptively before being given cucumber juice the mean systolic blood pressure was 153.16 mmHg. Systolic blood pressure with the highest value was 180 mmHg for 4 people (9.3%). Systolic blood pressure with the lowest value was 140 mmHg for 7 people (16.3%). Meanwhile, after being given cucumber juice, the average systolic blood pressure was 124.14 mmHg. Blood pressure with the highest systolic value was 133 mmHg for 1 person (2.3%). Systolic blood pressure with the lowest value was 120 mmHg for 3 people (7%). The decrease in systolic blood pressure that occurred was 29.02 mmHg and the decrease in diastolic blood pressure was 13.46 mmHg.

The decrease in blood pressure also occurs in diastolic blood pressure. It can be seen that descriptively before being given cucumber juice the average diastolic blood pressure was 95.51

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mmHg. Blood pressure with the highest value was 110 mmHg for 3 people (7%). Blood pressure with the lowest value was 90 mmHg in 17 people (39.5%). Meanwhile, after being given cucumber juice, the average diastolic blood pressure was 82.05 mmHg. Blood pressure with the highest value was 85 mmHg in 5 people (11.6%). Blood pressure with the lowest value was 80 mmHg in 9 people (20.9%).

The effect of cucumber juice on lowering blood pressure can be explained as follows. Cucumber contains magnesium, potassium, fiber and is high in water. The potassium content in cucumbers can maintain sodium levels in the body to prevent atherosclerosis which affects blood pressure regulation. Cucumbers also contain lots of fiber. Fiber functions to reducecholesterol and regulating blood pressure (Kusumaningrum, 2016).

The decrease in blood pressure occurs because cucumbers contain potassium which causes inhibition of the Renin Angiotensin System and also causes a decrease in aldosterone secretion, resulting in decreased sodium and water reabsorption in the kidney tubules. As a result of this mechanism, there is an increase in diuresis which causes a decrease in blood volume, so that blood pressure drops. In addition, potassium will also cause vasodilation of peripheral blood vessels, resulting in a decrease in peripheral resistance, and blood pressure will also decrease (Tjiptaningrum and Erhadestria, 2016).

The results of this study are supported by research by Lebalado (2014) where it was found that consumption of 150 ml of cucumber juice for 7 days can significantly reduce systolic and diastolic blood pressure in hypertensive men and women. Cucumber juice at a dose of 150 ml for 7 days can reduce systolic blood pressure by 12% (P = 0,000) and diastolic by 10.4% (P = 0,000).

Another study by Ponggohong et al (2015) also found that there was an effect of cucumber juice on blood pressure in people with hypertension. The average blood pressure before giving cucumber juice in the intervention group was 167.50 and the average after it was lower, namely 113.13 with a standard deviation of 6.021.

Another study by Fitrina (2013) concluded that there was an effect of giving cucumber juice on reducing blood pressure in hypertension sufferers in Jorong Balerong Bunta, Sungai Tarab District, Tanah District, 2013, as evidenced by a value of p <0.05 (p = 0.000). The mean systolic blood pressure before being given cucumber juice was 158.82 mmHg with a standard deviation of 13.173 mmHg. In the second measurement (after being given cucumber juice) the mean blood pressure was 145.29 mmHg with a standard deviation of 13.284 mmHg.

4. Conclusion

a. There is an effect of giving cucumber juice on the reduction of systolic and diastolic blood pressure in patients with hypertension at the Sarudik Health Center, Tapanuli Tengah Regency in 2020 with a p value of 0,000.
b. Before being given cucumber juice, the average systolic blood pressure was 153.16 mmHg. After being given cucumber juice, the average systolic blood pressure was 124.14 mmHg.
c. Before being given cucumber juice, the average diastolic blood pressure was 95.51 mmHg. After being given cucumber juice, the average diastolic blood pressure was 82.05 mmHg.

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