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The Effect Of Giving Ginger Extract And Cucumber Juice On Changes In Blood Pressure In Hypertensive Patients In The Working Region Of Kassi-Kassi Health Center Makassar City

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Abstract

Globally, the total amount of hypertension in the world in 2020 was around 20.25%. In Indonesia, it was reported to be 34.11%. The number of people with hypertension in Makassar was 14.83%. This study aims to determine the effect of giving ginger extract and cucumber juice on changes in blood pressure in hypertensive patients. This study is an experimental quasi-experimental design with a non-randomized pre-test and post-test control with a group design. The study subjects were hypertensive patients aged 20–65 years. A total of 46 samples were collected based on the purposive sampling method. Data analysis used the Wilcoxon and Mann-Whitney tests with a 5% meaning. The results showed a decrease in blood pressure in the intervention group, with the test results obtaining a value of significance (p = 0.000). In the comparison intervention group, there was a decrease in the value of significance (p = 0.000). The intergroup test obtained p-value values in the intervention group (p =0.034) and in the value comparison intervention group (p =0.000), then H1 was accepted, meaning that there was a difference in the effect of ginger extract on the intervention group and cucumber juice in the comparison intervention group on changes in blood pressure in people with hypertension. People with hypertension are expected to continue the consumption of ginger extract and cucumber juice as an alternative treatment, and this finding is an input to the local and provincial governments in drafting policies to overcome the problem of hypertension in Makassar City.

Keywords: Ginger Extract, Cucumber Juice, Blood Pressure, Hypertension

Introduction

Hypertension, or high blood pressure, is often associated with tension, nervousness, and hyperactivity in society. Hypertension, or high blood pressure disease, is a persistent elevation of systolic blood pressure

(TDS) at 140 mmHg or more and diastolic blood pressure (TDD) at 90 mmHg or more (Black & Hawks, 2014). Hypertension is an asymptomatic disorder. Hypertension is characterized by symptoms of dizziness or headache and tension in the back of the neck (Nurarif& Kusuma, 2015).

Hypertension is a health problem with a systolic blood pressure of over 140 mmHg and diastolic blood pressure of over 90 mmHg, with symptoms that vary, ranging from headaches, blurred eye vision, irritability, difficulty sleeping, chest pain, dizziness, and a strong and fast heart rate (Anggraini, 2014). According to WHO (World Health Organization) data, hypertension is one of the health problems that puts people at risk for cardiovascular diseases like heart attack, heart failure, stroke, and kidney disease. It is often found in every country (WHO, 2018).

According to the American Heart Association (AHA) (2014), approximately 77.9 million adults in the United States suffer from hypertension, with the prevalence of hypertension in adults ≥20 years of age and the elderly increasing from 2007 to 2010. Hypertension was one of the leading causes of death for 63,119 Americans in 2010 and was listed as the leading cause of death for approximately 362,895 of the 2.5 million deaths in the U.S. in 2010. Not only abroad, but the number of people with hypertension in Indonesia is also increasing. Hypertension is one of the causes of death in non-communicable diseases.

The prevalence of hypertension in 2013 in Indonesia was 25.8% in urban areas and 21.5% in rural areas. Based on annual reports in 2012, the most common cause of hospitalization was hypertension, with 112,583 cases. (Ardiansyah, 2012). Based on Riskesdas in 2018, hypertension in Indonesia was ranked first in the group of non-communicable diseases (PTM) caused by cardiovascular disease. The prevalence of hypertension in Indonesia with blood pressure measurements at ≥ 18 years was 34.1%, with the highest hypertension in South Kalimantan at 44.1%. The prevalence of hypertension in women tends to be higher than in men, and the prevalence of hypertension in urban areas tends to be higher than in rural areas (RISKESDAS, 2018).

According to the Makassar City Health Office, the number of people with hypertension in 2020 was as high as 9,575 people. There were three health centers with the highest hypertension numbers, namely Kassi-KassiTamalate Health center and Ballaparang Health center. Kassi-Kassi Health center ranked 1st with the highest cases of hypertension out of 47 health centers in Makassar, namely the number of new cases as many as 930 cases and old cases as many as 4,510 cases

Methods

This type of research was an experimental study, in this case, quasi-experimental with a non-randomized pre-test and post-test control with group design. This research was conducted in the working area of the Kassi-Kassi Health center in Makassar City. This research starts from June to September 2021.

The population in this study was a person with hypertension who was recorded as medically recorded in the Kassi–Kassi Health center Work Area. In this study, there will be a sample that has qualified. Inclusion criteria were people with mild to moderate hypertension, aged 20–65 years, willing to be given ginger extract and cucumber juice for one week. Exclusion criteria were patients with severe hypertension, suffering from chronic diseases, and respondents who did not participate fully in the study.

The instruments used in this study were Informed Consent, Observation Sheet, SOP (Standard Operating Procedure) Blood Pressure, SOP (Standard Operating Procedure) Giving ginger extract and cucumber juice, A Questionnaire Sheet tool using a calibrated digital tension meter and the materials used, namely scales, measuring cups, spoons, powdered ginger (4 grams), cucumber (100 grams) and water

Results and Discussion

Table 1 showed that respondents' characteristics were based on the gender of the intervention group, and the most compared interventions were women at 91.3%. The greatest age group was 60–65 years, the intervention group by 69.6%, and the comparison intervention group by 52.2%. Most respondents' jobs were housewives and retired, namely for the intervention group by 87.0% and the comparison intervention group by 100%. Education respondents' intervention group was 47.8%; the comparison intervention group was 34.7%.

The history of hypertension respondents' intervention group was 82.6%, and the comparison intervention group was 82.6%. The highest number of respondents who did not have an intervention group was 69.6%. The comparison intervention group was 78.3%. The most intervention group respondents did not do the physical activity by 52.2%, while the comparison intervention group did the most physical activity by 60.9%. Respondents in the intervention group, at 91.3%, did not smoke as much as those in the comparison intervention group, at 91.3%.

The characteristics of respondents based on the most alcohol consumption showed that no one consumed alcohol in the intervention group at 100%, while the comparison intervention group was at 100%. The most coffee consumption among respondents who did not consume coffee in the intervention group was 95.7%, while the comparison intervention group was 91.3%. Fruit and vegetable consumption of the respondents consumed the most in intervention groups, 56.5%, compared to the comparison intervention group, 73.9%.

Table 1. Characteristics of Respondents.

Characteristics of Respondents	**Intervention**		**Comparison Intervention**	
	n	**%**	**n**	**%**
Gender				8,7

Men	2	8,7	2	91,3
Women	21	91,3	21	
Age Group				
50 – 59	7	30,4	11	47,8
60 – 65	16	69,6	12	52,2
Occupation				
Not Working/ Housewife/Retired	20	87,0	23	100
Self-employed	3	13,0	0	0
Education				
Not in school	3	13,0	4	17,3
elementary school	4	17,3	5	21,7
Junior High School	5	21,7	6	26,0
Senior high school	11	47,8	8	34,7
History of Hypertension				
< 1 Year	1	4,3	0	0
1 - 2 years	19	82,6	19	82,6
3 - 4 years	2	8,6	3	13,0
5 Years	1	4,3	1	4,3
Accompanying Disease				
Stomach	1	4,3	2	8,7
Gout	4	17,4	2	8,7
Cholesterol	1	4,3	0	0
Rheumatism	1	4,3	1	4,3
None	16	69,6	18	78,3
Physical Activity				
Yes	11	47,8	14	60,9
No	12	52,2	9	21,7
Smoke				
Yes	2	8,7	2	8,7
No	21	91,3	21	91,3
Alcohol Consumption				
Yes	0	0	0	0
No	23	100	23	100
Coffee Consumption				

Yes	1	4,3	2	8,7
No	22	95,7	21	91,3
Fruit and vegetable consumption				
Yes	13	56,5	17	73,9
No	10	43,5	6	26,1
Total	**23**	**100**	**23**	**100**

Table 2 showed that the blood pressure intervention group's pre-test systolic maximum-minimum blood pressure value was 144–175, the post-test systolic was 123–167, and the pre-test diastolic was 90–105; the post-test diastolic was 80–96. While in the blood comparison group, pre-test systolic maximum-minimum blood pressure value was 150–178, post-test systolic was 120–155, pre-test diastolic was 90–105, post-test diastolic was 80–91.

Table 2. Blood Pressure Before and After Intervention

Group	Variable	Mean	SD	Min-Max
Intervention	Systolic Pre Test	156.52	9.486	144-175
	Diastolic Pre Test	94.09	4.660	90-105
Comparison	Systolic Pre Test	158.35	7.631	150-178
Intervention	Diastolic Pre Test	94.43	4.357	90-105
Intervention	Systolic Post Test	144.74	11.250	123 – 167
	Diastolic Post Test	87.48	4.316	80 – 96
Comparison	Systolic Post Test	138.61	8.872	120 – 155
Intervention	Diastolic Post Test	84.61	3.893	80 – 91

Table 3 shows that in the systolic blood pressure intervention group, p= 0.000. The results showed Ha was accepted and H0 was rejected, so it can be concluded that there is a significant relationship between systolic blood pressure before and after giving the ginger extract. Diastolic blood pressure showed a value of p = 0.000, which indicated Ha was accepted and H0 was rejected, so it can be concluded that there is a significant relationship between diastolic blood pressure before and after giving the ginger extract.The comparison group for systolic blood pressure was p=0.000. The results showed Ha was accepted and H0 was rejected, so it can be concluded that there was a significant association between systolic blood pressure before and after giving cucumber juice. The diastolic blood pressure shows a value of p = 0.000, which indicates Ha was accepted and H0 was rejected, so it can be concluded that there is a significant relationship between diastolic blood pressure before and after giving cucumber juice.

Table 3. Bivariate Analysis (Wilcoxon Signed Rank Test)

Group	TD	Decrease	Increase	Same	Total	p-value
Intervention	Systolic	19 (82,6%)	0 (0 %)	4 (17,4%)	23	0,000
	Diastolic	20 (86,9%)	0 (0 %)	3 (13,1%)	23	0,000
InterventionComparison	Systolic	23 (100%)	0 (0 %)	0 (0 %)	23	0,000
	Diastolic	21 (91,3%)	0 (0 %)	2 (8,7%)	23	0,000

Table 4 shows the difference in systolic and diastolic blood pressure after giving ginger extract. It shows a value of p = 0.034, so it can be concluded that Ha was accepted and H0 was rejected, which means there is a difference in the effect of ginger extract on changes in systolic and diastolic blood pressure in people with hypertension.

The difference in systolic and diastolic blood pressure after giving cucumber juice shows a value of p = 0.000, so it can be concluded that Ha was accepted and H0 was rejected, which means there is a difference in the effect of cucumber juice on changes in systolic and diastolic blood pressure in people with hypertension.

Table 4. Bivariate Analysis (Mann Whitney U Test)

TD Intervention group	Mean Rank	Sum Of Ranks	p-value
Systolic	27.67	636.50	0,034
Diastolic	19.33	444.50	
TD Comparison Intervention group	**Mean Rank**	**Sum Of Ranks**	**p-value**
Systolic	31.15	716.50	0,000
Diastolic	15.85	364.50	

Blood Pressure Before and After Being Given Emprit Ginger Extract in Intervention Group.

The study results of 23 respondents in the intervention group before giving emprit ginger extract obtained an average blood pressure of 156.52/94.09 mmHg. If transformed into the classification of high blood pressure, it was in hypertension degree 1. After being given emprit ginger extract with 4 grams, the average blood pressure decreased to 144.74/87.48 mmHg. This change in blood pressure numbers showed that giving ginger extract with 4 grams affects blood pressure in people with hypertension.

The effect of Emprit ginger extract weighing 4 grams on changes in blood pressure in people with hypertension has been conducted with a Wilcoxon statistical test before and after being given ginger extract weighing 4 grams. In the treatment group, respondents who had changes in systolic blood pressure before and after being given Emprit ginger extract weighing 4 grams were as many as 19 respondents. In

contrast, those who had diastolic blood pressure changes before and after being given ginger extract were as many as 20 respondents, and those with the same blood pressure were 7 of 23 respondents. At the level of meaning α = 0.05 with the value of P-value obtained at 0.000 because the P-value was less than the value of α, then H1 was accepted, which means there is a significant change between ginger extract and blood pressure changes in the treatment group. This statistic concludes that Emprit ginger extract affects changes in blood pressure in people with hypertension in the treatment group.

The results of this study are supported by research from Rina, Sindi (2020) at PosyanduTua Surya KencanaBulak Jaya Surabaya. The sample used was 30 people with hypertension degree 1 who were given interventions in Emprit ginger extract for seven days. It is known that there is a difference in blood pressure shown by the Mann Whitney test with a p-value of 0.001 (<0.05). Based on the data, there is an effect of giving ginger extract on the blood pressure of elderly who experience hypertension in PosyanduTua Surya Kencana Surabaya.

Despite being the most controllable factor in cardiovascular disease, hypertension is the world's burden (Salem et al., 2018). Nonpharmacological treatment involves consuming ginger extract, which includes potassium, which inhibits the release of renin-angiotensin, increasing sodium and water excretion, lowering blood pressure, and reducing salt and water retention in the blood (Braga,2019).

Blood Pressure Before and After Being Given Cucumber Juice In Comparison Intervention Group.

The study results of 23 respondents in the comparison intervention group before being given cucumber juice obtained an average systolic blood pressure of 158.35/94.43 mmHg when transformed into the classification of high blood pressure in hypertension degree 1. After being given cucumber juice with a dose of 100 grams, the average blood pressure decreased to 138.61/84.61 mmHg. This change in blood pressure numbers shows that cucumber juice with a dose of 100 grams affects blood pressure in people with hypertension.

The effect of cucumber juice weighing 100 grams on changes in blood pressure in people with hypertension has been conducted with a Wilcoxon statistical test before and after being given cucumber juice weighing 100 grams. In the comparison intervention group, the number of respondents who had systolic blood pressure changed before and after being given cucumber juice weighing 100 grams was as high as 23 respondents.

The respondents who had changes in diastolic blood pressure before and after being given cucumber juice were as many as 21 respondents who had the same blood pressure. Namely, two respondents from 23 at the level of α (0.05) were with a p-value obtained by 0.000. Because the p-value was less than the value (α), then H1 was received. It means there was a significant change between cucumber juice and changes in

blood pressure in the comparison intervention group. This statistic concludes that cucumber juice affects changes in blood pressure in people with hypertension in the comparison intervention group.

The results of this study are supported by research from DanarGumelangWicaksana in 2019 in KersikanKeaatanGeneng Village of Ngawi Regency. The samples used were 36 people with stage 1 and stage 2 hypertension who were given the intervention of giving cucumber juice of 100 grams for seven days, obtaining systolic blood pressure of 152.22 mmHg, and diastolic blood pressure of 93.89 mmHg. After the intervention of cucumber juice, average blood pressure decreased by 133.89 mmHg and diastolic blood pressure by 82.22 mmHg. The analysis results showed a value of P = 0.000 (P<0.05). It showed an effect on reducing blood pressure in people with hypertension after being given cucumber juice.

Effectiveness of Ginger Extract and Cucumber Juice on Changes in Blood Pressure In the Working Region of Kassi–Kassi Health Center in Makassar City

The difference in systolic and diastolic blood pressure after ginger extract was given in the intervention group using the Mann Whitney test obtained a p-value (Asymp). Sig. 2-tailend) of 0.034 (<0.05) so that it can be concluded that H1 is accepted, which means there is a difference in the effectiveness of ginger extract in the intervention group against changes in systolic and diastolic blood pressure in people with hypertension in the Working Region of Kassi-Kassi Health Center in Makassar City.

The difference in systolic and diastolic blood pressure after being given cucumber juice in the comparison intervention group using the Mann Whitney test obtained a p-value (Asymp) (Sig 2-tail) of 0.000 (<0.05). So that it can be concluded that H1 is accepted, it means there is a difference in the effectiveness of cucumber juice in the comparison intervention group against changes in systolic and diastolic blood pressure in people with hypertension in the Working Region of Kassi – Kassi Health center in Makassar City.

Based on the analysis, the average decrease in systolic blood pressure with ginger extract in the intervention group was 27.67 and diastolic by 19.33 mmHg. The systolic comparison intervention group was 31.15 and diastolic by 15.85 mmHg. The results showed that cucumber juice weighing 100 grams had a greater contribution to lowering systolic and diastolic blood pressure.

The results of the blood pressure difference after being given ginger extract in the intervention group and cucumber juice in the comparison intervention group using the Mann-Whitney test obtained P-value values in the treatment group (Asymp). Sig 2-tailed) amounted to 0.034 (<0.05), while in the comparison intervention group, it obtained a P-value (Asymp). Sig 2-tailed) of 0.000 (<0.05) so that it can be concluded that H1 is accepted, which means there is a difference in the effectiveness of giving ginger extract and cucumber juice to changes in blood pressure in hypertensive patients in the Working Region of Kassi – Kassi Health center of Makassar City.

Limitations of Researchers

Researchers could not directly observe the respondents' activities, so they could not control their activities. Likewise, it was unable to observe respondents' habits such as smoking, drinking coffee, and other factors that respondents and researchers had agreed to during the study that could affect the rise or fall of respondents' blood pressure during measurements.

Abbreviation

AHA: American Heart Association, TDS: Systolic blood pressure, TDD: Diastolic blood pressure, WHO: World Health Organization, SOP: Standard Operating Procedure, KNEPK: National Commission on Health Research Ethics

Statement of Ethics

Commission for Health Research Ethics, Faculty of Public Health, Hasanuddin University on October 14, 2021, with number: 9189/UN4.14.1/ TP.01.02/2021

Conclusion

This study shows a relationship between consuming ginger extract and cucumber juice to reduce blood pressure in people with hypertension in Kassi-Kassi Health Center in Makassar.

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