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The Effect Of Giving Watermelon Citrullus Lanatus And Cucumus Sativus Juice On Reducing High Blood Pressure In Elderly People With Hypertension

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Abstract

Hypertension is a silent killer, because often people with hypertension do not feel any symptoms for years. Hypertension treatment consists of 2 therapies: pharmacological and non-pharmacological. In pharmacological therapy, hypertension can be treated with antihypertensive drugs, and in non-pharmacological therapy, a combination of watermelon and cucumber juice can be consumed. Watermelon contains the amino acid citrulline, which helps lower blood pressure, while cucumber contains minerals such as potassium, magnesium, and phosphorus. This study aims to determine the effect of a combination of watermelon juice (Citrullus Lanatus) and cucumber (Cucumis Sativus) on reducing blood pressure in elderly individuals with hypertension in RW 004, Sabajaya Village, in 2024. The research Design used is quantitative with a quasi-experimental approach. The sampling technique in this study was purposive sampling, with a sample size determined using the Frederer formula. Statistical tests used the Wilcoxon test. The sample in this study was 20 elderly respondents with hypertension. The results of the study showed a p-value of 0.001 < α (0.05), indicating that the combination of watermelon and cucumber juice reduced blood pressure in the elderly in RW 004 Sabajaya Village. This evidence supports the potential of non-drug approaches as valuable additions to hypertension treatment, encouraging clinicians and researchers to explore and adopt such alternatives.

INTRODUCTION

The word hypertension indicates extraordinary stress or pressure since it is derived from the Latin words hyper, which means super or unusual, and tensio, which means tension or pressure. Today, it's referred to as hypertension or high blood pressure (Telaumbanua & Rahayu, 2021). According to the WHO, hypertension is a major global risk factor for both death and disability. It claims that one in three persons globally suffer from hypertension, which is defined as a blood pressure of 140/90 mmHg or greater. Heart failure, stroke, heart attack, and kidney damage are a few health issues that may result from this illness (WHO, 2023). One of the leading causes of morbidity worldwide is hypertension. By 2025, there will be 1.5 billion people with hypertension, and 9.4 million people could die from it (Adrian, 2019). According to WHO (World Health Organization) figures from 2019, 22% of people worldwide today have hypertension (Susanti et al., 2022).

The Indonesian Ministry of Health (2019) estimates that about 65 million Indonesians have high blood pressure. From 8.4% in 2013 to 26% in 2018, the prevalence of hypertension has increased dramatically. The highest prevalence of hypertension is found in seniors over

75 (69.5%), followed by seniors between the ages of 65 and 74 (63.2%), and seniors between the ages of 55 and 64 (55.2%) (Hidayati et al., 2023). The prevalence of hypertension in West Java was 41.6% in the 2019 West Java Provincial Health Profile, up from 29.4% in the 2013 Riskesdas figure and 39.6% in the 2018 Basic Health Research (Riskesdas) figure. West Java Province's Karawang Regency has a 19.2% prevalence of hypertension (Profil Kesehatan Provinsi Jawa Barat, 2019). The Pedes Community Health Center work area has the highest frequency of hypertension in Karawang Regency (10.6%), according to data from the Karawang Regency Health Service in 2020 (Maulidah et al., 2022).

There are a number of risk factors for hypertension, including non-modifiable characteristics including gender, age, and inheritance. Obesity, cutting back on salt, coffee, cholesterol, exercise, stress, smoking, and hormonal contraception use are all modifiable variables (Telaumbanua & Rahayu, 2021). Herbal medicines or non-pharmacological treatments can be used to control hypertension. Herbal treatments have a number of benefits, such as comparatively low side effects, multiple pharmacological effects from a single plant, synergistic effects within a single concoction of several components, and increased efficacy for degenerative and metabolic disorders (Lestari & Nuraeni, 2020). Giving cucumber juice, watermelon juice, and different fruits and vegetables is one example. For older people, complementary therapies are seen to be sufficient for decreasing blood pressure (Putri & Mazarina, 2022).

Potassium, vitamin C, carbs, and lycopene are all found in watermelon and can effectively decrease blood pressure. Potassium, magnesium, and phosphorus found in cucumbers are useful in the treatment of hypertension. Additionally, because of its high water content, cucumbers have a diuretic effect that lowers blood pressure. Potassium is a major intracellular electrolyte; in fact, cells contain 98% of the body's potassium, with the remaining 2% being found outside (Suhartini & Nuraeni, 2022). Based on research conducted by Putri and Mazarina (2022), People with hypertension frequently have no symptoms for years, making it a silent killer. Pharmacological and non-pharmacological therapy are used to treat hypertension. Watermelon juice can be used as a non-pharmacological treatment. Citrulline, an amino acid found in watermelon, lowers blood pressure. According to the study, giving elderly people watermelon juice therapy lowered their blood pressure.

Research conducted by Suhartini and Nuraeni (2022) found that hypertension is characterized by high blood pressure. High blood pressure can lead to stroke, which can even increase mortality. One way to prevent high blood pressure in hypertensive patients is by administering cucumber juice.

While prior research has shown that either watermelon or cucumber juice alone can lower blood pressure in hypertensive patients, there is still little data on the combined use of watermelon (Citrullus lanatus) and cucumber (Cucumis sativus) juice in older adults. Specifically, very few studies have used a pretest–posttest design in Indonesian community settings to assess the short-term benefits of this combination intervention.

Thus, the purpose of this study was to assess how mixed watermelon and cucumber juice affected the systolic and diastolic blood pressure of older people with hypertension. In comparison to baseline readings, we predicted that administering juice for seven days in a row would considerably lower systolic and diastolic blood pressure.

This trial provides early evidence for a straightforward, low-cost, food-based supplemental intervention for managing hypertension in older individuals living in the community. Systolic and diastolic blood pressure were assessed before and after the intervention in a one-group pretest–posttest quasi-experimental trial with twenty senior hypertensive patients.

RESEARCH METHODS

A quasi-experimental, quantitative method was employed. Additionally, the researchers used a One-Group Pretest and Posttest Design, which involved an intervention for a single group without a control group. Data was gathered twice: once prior to the intervention (pretest) and once following the intervention (posttest). Purposive sampling, utilizing the Frederer formula, was the sampling strategy employed in this investigation. The Wilcoxon test was employed in statistical tests. Twenty elderly respondents with hypertension made up the study's sample size. For experimental experiments, the Federer formula was used to estimate the minimal sample size. Twenty participants met the minimum threshold and finished the preliminary study, which is exploratory in nature.

IBM SPSS Statistics version 25.0 was used to analyze the data. The Shapiro-Wilk test was used to determine normality. The two-sided Wilcoxon signed-rank test was used to examine differences between pretest and posttest blood pressure because the data were not regularly distributed. The threshold for statistical significance was set at $p<0.05$. Multiple comparisons were not adjusted for since only two main outcomes were examined.

Changes in systolic and diastolic blood pressure (mmHg) before and after seven days of intervention were the main results. A calibrated digital sphygmomanometer was used to take blood pressure after a five-minute sitting rest. Measurements were taken on Day 0, the baseline, and Day 7, the end of the intervention. Elderly people 60 years of age or older, with a diagnosis of hypertension, the ability to communicate properly, willingness to participate, and signed informed consent were all requirements for inclusion. Severe cardiovascular problems, renal failure, cucumber or watermelon allergies, incapacity to eat the intervention, and insufficient follow-up data were among the exclusion criteria.

RESULTS

Table 1 Mean Systolic and Diastolic Blood Pressure Pre and Post Intervention

Blood Pressure	Systolic	Diastole
Pre test	149,5	91
Post test	133,5	84

The blood pressure readings before and after giving 20 participants a mixture of watermelon and cucumber juice are shown in Table 1. The average diastolic blood pressure was 91, and the average systolic blood pressure was 149.5. The study's findings demonstrated that giving older persons with hypertension a mixture of watermelon and cucumber juice for seven days in a row reduced their average systolic and diastolic blood pressure. The average diastolic blood pressure was 84, while the average systolic blood pressure was 133.5.

After receiving watermelon and cucumber juice together for seven days, the mean systolic blood pressure dropped from 149.5 mmHg prior to the intervention to 133.5 mmHg, an absolute decrease of 16.0 mmHg (10.7%). A statistically significant decrease was shown by the Wilcoxon signed-rank test ($Z = -4.021$, $p = 0.001$).

The absolute drop in mean diastolic blood pressure was 7.0 mmHg (7.7%), from 91.0 mmHg to 84.0 mmHg. A statistically significant difference was also revealed by the Wilcoxon signed-rank test ($Z = -3.742$, $p = 0.001$).

Table 2 The Effect of Intervention of Giving a Combination of Watermelon and Cucumber Juice on Reducing Blood Pressure in the Elderly

Blood Pressure		N	Mean Rank	Sum Of Ranks	Z	*P Value*
Sistolic	Pretest-Post test	20	7,50	105,0	-4.021	0.001
Diastolic	Pretest-Post test	20	10,5	210,0	-3.742	

Using the Wilcoxon test, systolic and diastolic blood pressure differed before and after the watermelon-cucumber juice intervention in 20 respondents. The mean pretest-posttest systolic rank was 7.50 with a Z-score of -4.001, while the mean pretest-posttest diastolic rank was 10.5 with a Z-score of -3.742 and a P-value of 0.001<α (0.05), indicating that the watermelon and cucumber juice combination significantly reduced blood pressure in older adults with hypertension in RW 004, Sabajaya Village.

DISCUSSION

This study used a one-group pretest–posttest design without a control group, it should be viewed as preliminary evidence. As so, it is impossible to establish causal inference. Uncontrolled factors such as nutritional intake, physical activity, sleep quality, medication adherence, stress, and age-related physiological changes may have contributed to the observed drops in blood pressure. Additionally, the results' generalizability is limited by the very small sample size and intentional sampling. To validate the efficacy of mixed watermelon and cucumber juice as a supplemental intervention for hypertension, more randomized controlled trials with larger samples and longer follow-up are needed.

According to study by Dina et al. (2023), hypertension is a condition marked by an abnormal and continuous rise in blood pressure on several blood pressure readings, which is brought on by one or more risk factors that aren't working correctly to maintain normal blood pressure. Increases in systolic, diastolic, or both pressures are indicative of hypertension. Total peripheral resistance and stroke volume have an impact on blood pressure. Hypertension may result from an uncompensated rise in any of these factors. By preserving long-term blood pressure stability, the body's mechanism aids in preventing sudden swings in blood pressure. The system for controlling blood pressure is quite intricate.

According to research by Anjani et al. (2020), failing to consume the recommended daily amount of potassium can lead to hypertension in the elderly. If the elderly do not control their daily sodium consumption, this becomes even more noticeable. Due to diminished gastrointestinal function in the elderly, inadequate potassium intake is made worse by decreased absorption and metabolic efficiency. As a result, the potassium requirements of the elderly rise or at least match those of young individuals.

blood pressure, both systolic and diastolic. A person is diagnosed with high blood pressure when their blood pressure is consistently elevated. Elderly people frequently have high blood pressure. This is due to the tendency for blood pressure to rise with age. The majority of elderly people seldom become aware that they have high blood pressure. They don't become aware of their hypertension until they develop symptoms and receive a high blood pressure diagnosis. This is because older people don't realize how important it is to have their health checked and their blood pressure monitored by a healthcare professional.

According to Suhartini and Nuraeni's (2022) research findings, the diastolic blood pressure dropped by an average of 87 mmHg and the systolic blood pressure was 152 mmHg prior to the intervention, which fell by 4 mmHg. To assess changes in measures, blood pressure was taken both before and after the intervention. The average drop in blood pressure

was 4 mmHg for systolic and 3 mmHg for diastolic, so there was no difference in the amount of time needed to complete the intervention over a period of 7 (seven) consecutive days or evaluations of 2 (two) weeks twice.

This research aligns with research conducted by Firdaus and Suryaningrat (2020), which explains that diet is one of the main modifiable risk factors for hypertension. A diet high in red and processed meat, fast food, fatty foods, foods with excessive salt content, and sweet desserts can lead to increased blood pressure. This research is in line with research conducted by Hamzah et al (2021), which explains that many older adults who still work in daily activities such as fishing in the sea and farming or gardening are one of the triggers for hypertension because usually the elderly carry a mental burden that causes stress, resulting in increased blood pressure. After all, when someone is under stress, several hormones are released, which can narrow blood vessels. According to research conducted by Nurul Ilmi et al. (2023), the recommended diet for people with hypertension is low in salt, with reduced consumption of table salt (NaCl). It is also recommended to eat lots of vegetables and fruits that have been proven to lower blood pressure, such as watermelon and cucumber.

Consuming vegetables and fruits can lower and control blood pressure due to their natural potassium content. This aligns with research by Aniatur (2023) on the effects of watermelon and cucumber juice on blood pressure reduction, which found that these juices can lower blood pressure in people with high blood pressure due to their potassium content. The high water content of watermelon and cucumber also has a diuretic effect, which increases urine excretion. Based on the researcher's assumptions, which decreased, the results show a significant effect of consuming a combination of watermelon and cucumber juice on lowering blood pressure. The decrease in blood pressure occurs because of the consumption of fiber from vegetables and fruits beyond the daily food intake. Respondents who did not experience a decrease in blood pressure in the standard category may be due to the condition of the elderly body rather than to the respondents themselves. At the same time, at home, a lack of rest (among the majority of farmers), not maintaining a diet, and difficulty sleeping at night (reported by several elderly), so that when blood pressure was measured, some respondents still had uncontrolled hypertension. Efforts need to be improved.

CONCLUSION

The present study observed significant reductions in systolic and diastolic blood pressure following seven days of combined watermelon and cucumber juice administration among elderly individuals with hypertension. However, because this study employed a single-group pretest–posttest design, these findings should be interpreted as preliminary evidence. Larger randomized controlled studies are needed to confirm the effectiveness of this intervention.

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