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Article Review

The Effect of Giving Mung Bean Extract Onblood Pressure in Hypertension Patients at The Sri Rezeki Elderly Health Care Posyandu in Mojokrapak Village, Tambelang District, Jombang Regency

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Abstract

High blood pressure, also known as hypertension, is a chronic condition in which blood flow in the arteries experiences excessive and often uncontrolled increases. Hypertension occurs due to the impact of several risk factors. Risk factors for hypertension include a family/genetic history of hypertension, advanced age, gender, diet, unhealthy diet, obesity, frequent smoking and alcohol consumption, stress, and lack of physical activity, which are the main risk factors for developing hypertension. Hypertension treatment includes not only pharmacological but also non-pharmacological methods. Providing green bean juice, rich in potassium and isoflavones, is an alternative for lowering blood pressure. Objective: At the Sri Rezeki Elderly Community Health Post (Posyandu Lansia Sri Rezeki), Mojokrapak Village, Tambelang District, Jombang Regency, this research aims to reveal the relationship between green bean juice consumption and changes in blood pressure in elderly individuals with hypertension. This study employed a comparative experimental design with a pretest-posttest model in two groups. The study population consisted of 80 elderly individuals, with a purposive sampling technique used to select 16 respondents. Information was obtained through recording on the observation sheet and checking blood circulation pressure with a sphygmomanometer, then analyzed using the paired T-test method. The study output showed that before being given the mung bean juice intervention there were 11 respondents with severe hypertension, while after the intervention a number of 6 respondents suffered from pre-hypertension. In the statistical analysis using the paired t-test method, the p value was obtained in line with 0.000 which was lower than the significance limit of 0.05. This output confirms that the consumption of mung bean juice plays an important role in lowering blood circulation pressure in the group of elderly people with hypertension who participated in Posyandu services in Mojokrapak Village, Tambelang District, Jombang Regency. Mung bean extract has been proven to be able to provide a positive effect in lowering blood circulation pressure in elderly people with hypertension, especially in individuals who are not disciplined in taking antihypertensive drugs and have an unbalanced diet.

Keywords: *Blood circulation pressure; Elderly; Green Bean Extract; Hypertension.*

Introduction

High blood pressure, or hypertension, is a long-term condition caused by unstable and excessive blood pressure in the arteries [1]. Hypertension is defined as a condition where the measurement output shows a systolic pressure exceeding 140 mmHg and a diastolic pressure exceeding 90 mmHg. This measurement is taken twice with a five-minute break during rest [2]. Symptoms of hypertension, including headaches, heart palpitations, a feeling of tightness in the neck, fatigue, visual disturbances, ringing in the ears, and sleep problems, are often referred to as the silent killer [3]. As age increases, blood circulation pressure tends to increase, thus

hypertension is often found in elderly people and the elderly [4]. Hypertension happened because Hypertension is affected by several risk factors. Age, gender, heredity, smoking, alcohol consumption, stress, and lack of physical activity are some of the risk factors for hypertension. All of these factors contribute to increased blood pressure [3].

Based on the 2023 World Health Organization (WHO) report, it was stated that hypertension is one of the important health problems that... significantly increases the risk of heart, brain, kidney, and other diseases. Globally, the WHO estimates that by 2023 the prevalence of hypertension will reach 33%, with approximately two-thirds of cases occurring in developing and low-income countries. In Indonesia, according to the 2023 Indonesian Health Survey (SKI), hypertension is highest risk factors reason fourth death with a percentage of 10.2%. According to the Annual Report of the East Java Provincial Health Office, the percentage of women suffering from hypertension is 60.4%, while the percentage of men is 39.6%. Based on service data in Jombang Regency Health Center, the percentage of hypertension sufferers in 2023 was 294,860 people out of a total of 387,550 people who had been provided with hypertension services according to standards. Based on studies introduction which is run in elderly health post Sri Rezeki in Mojokrapak Tambelang Village, Jombang, found that 32 elderly people were classified as hypertensive. The study, conducted through interviews with three respondents with hypertension, revealed that the elderly suffered from hypertension due to poor adherence to medication and food consumption, which impacted their hypertension.

The most common risk factors for hypertension related to diet are excessive salt consumption and high-fat foods. Excessive salt intake can trigger increased blood pressure due to salt's fluid-retaining properties, thereby increasing the volume of blood entering the heart and increasing blood pressure. Meanwhile, fatty foods can disrupt blood flow and narrow blood vessels, ultimately causing blockages and forcing the heart to work harder, thus increasing blood pressure [5]. Angiotensin Converting Enzyme (ACE) helps convert angiotensin I to angiotensin II. This is a crucial part of its physiological function in controlling blood pressure. The kidneys release the enzyme renin, which converts angiotensinogen to angiotensin I. This compound is then converted in the lungs by the enzyme ACE to angiotensin II. The presence of angiotensin II plays a major role in increasing blood pressure through two main mechanisms [6].

Green beans offer a variety of benefits for the body, such as boosting immunity, maintaining bone strength, being a source of plant-based protein, helping with weight management, reducing the risk of anemia, and preventing high blood pressure. According to the results of a study conducted by Rahmawati et al. [1], Green bean juice has the potential to lower blood circulation pressure because it has a fairly high iron content, namely around 9.7 mg per 100 g, depending on the variety. Based on the background and existing phenomena, the researcher is interested in conducting a study entitled "The Impact of Giving Green Bean Juice on Blood Circulation Pressure in Hypertension Patients at the Elderly Posyandu in Mojokrapak Village, Tambelang, Jombang."

Materials and Methods

This study employed a pre-experimental design and a comparative experimental method. The sample consisted of 16 elderly individuals with hypertension registered at the Sri Rezeki Elderly Community Health Post (Posyandu Lansia Sri Rezeki) in Mojokrapak Village, Tambelang, Jombang. Non-probability and purposive sampling were used for sample selection. This study enrolled individuals aged 60 and over with hypertension, registered members of the elderly health post (Posyandu), those with pure hypertension, and those willing to participate in the study and consume mung bean juice during the study period. Exclusion criteria included those with very high blood pressure (>180/110 mmHg) requiring immediate medical attention, those with other illnesses that could affect blood pressure, such as kidney or heart problems, and those allergic to mung beans.

This study was conducted from Wednesday, April 9, 2025 to Monday, April 21, 2025 at the Elderly Posyandu in Mojokrapak Village, Tambelang District, Jombang Regency. The

instruments used in this study were observation sheets and measurements of systolic and diastolic blood pressure using a sphygmomanometer and a stethoscope. The data collection process began with the researcher explaining the study's purpose to the respondents. Next, blood pressure measurements were performed using a sphygmomanometer, which took place over two weeks, with a total of seven sessions.

Bivariate analysis was used to determine how the independent and dependent variables interact with each other, while univariate analysis was used to understand the frequency distribution and percentage of each variable in this study. To assess the relationship between the variables studied, the SPSS 29th edition application was used with the paired t-test analysis method at a significance level of 5%.

Results and Discussion

Results

General Characteristics of Respondents

Participant characteristics in this study included age, gender, educational background, employment status, and duration of hypertension. Data regarding the respondents' general characteristics can be found in the following study output:

Table 1. Distribution of Respondents Based on Age at the Elderly Posyandu in Mojokrapak Village, Tambelang District, Jombang Regency, on April 9–21, 2025.

Characteristics	Green Bean Extract Group	
Age	**Amount (f)**	**Presentation**
60-69 years	10	62.5%
70-79 years	5	31.25%
>80 years	1	6.25%
Total	16	100%

Source: Primary Data, 2025

Based on Table 1, as many as 10 people from the group who received mung bean juice were aged between 60 and 69 years, or 62.5% of the total respondents.

Table 2. Distribution of Respondents Based on Gender at the Elderly Posyandu in Mojokrapak Village, Tambelang District, Jombang Regency, April 9–21, 2025.

Gender Characteristics	Green Bean Extract Group	
	Amount (f)	**Presentation**
Man	5	31.25%
Woman	11	68.75%
Total	16	100%

Source: Primary Data, 2025

Based on table 2, it shows that the majority of respondents in the group given green bean juice were female, namely 11 people (68.75%). Based on Table 3, it can be seen that nearly half of the respondents in the green bean juice intervention group had an elementary school education, namely 6 people (37.5%).

Table 3. Distribution of Respondents Based on Education Level at the Elderly Posyandu in Mojokrapak Village, Tambelang District, Jombang Regency, on April 9–21, 2025.

Characteristics of Education Level	Green Bean Extract Group	
	Amount (f)	Presentation
Elementary School	6	37.5%
Junior High School	4	25%
Senior High School	5	31.25%
PT	1	6.25%
Total	16	100%

Source: Primary Data 2025

Respondent Specific Data Characteristics

Table 4. Distribution of Blood Circulation Pressure Frequency Before Giving Green Bean Juice at the Elderly Posyandu in Mojokrapak Village, Tambelang District, Jombang Regency, on April 9–21, 2025.

Blood circulation pressure	*Pre-test*	
	Frequency	Presentation
Normal	0	0%
Pre-Hypertension	0	0%
Light HT	1	6.25%
Medium HT	4	25%
Heavy HT	11	68.75%
Total	16	100%

Source: Primary Data 2025

Based on Table 4, it can be seen that in the group that received green bean juice, before the intervention, the majority of respondents suffered from severe hypertension, namely 11 people (68.75%).

Table 5. Distribution of Blood Circulation Pressure Frequency After Giving Green Bean Juice at the Elderly Posyandu in Mojokrapak Village, Tambelang District, Jombang Regency, on April 9–21, 2025.

Blood circulation pressure	*Post-test*	
	Frequency	Presentation
Normal	3	18.75%
Pre-Hypertension	6	37.5%
Light HT	5	31.25%
Medium HT	2	12.5%
Heavy HT	0	0%
Total	16	100%

Source: Primary Data 2025

Based on table 5, it shows that in the green bean juice group, after being given the intervention, a small proportion suffered from pre-hypertension, namely 6 respondents (37.5%).

Table 6. Output of the Normality Test for Data on the provision of green bean juice

Tests of Normality			
	Shapiro-Wilk		
	Statistics	Df	Sig.
Posttest of green bean juice	.892	16	.060

Based on Table 6, the Shapiro-Wilk normality test results show that in the group given mung bean juice, the significance value for the posttest data exceeded 0.05. Therefore, the information obtained follows a normal distribution pattern.

Table 7. Data Homogeneity Test Output Giving Green Bean Juice

Test of Homogeneity of Variance					
		Levene Statistics	df1	df2	Sig.
blood circulation pressure results	Based on Mean	.200	1	30	.658
	Based on Median	.349	1	30	.559
	Based on Median and with adjusted df	.349	1	27,488	.560
	Based on trimmed mean	.207	1	30	.652

Based on Table 7, the Levene's test for data homogeneity shows a significance value of 0.658 in the posttest group. Because the Sig. value is > 0.05, it can be concluded that the variance of the posttest data in the mung bean juice group is homogeneous.

Table 8. Output of Paired T-Test Blood Circulation Pressure Before and After Intervention in the Group Receiving Green Bean Juice.

Paired Samples Test							
		Paired Differences			T	Df	Sig. (2-tailed)
		Mean	Standard Deviation	Std. Error Mean			
Pair 1	green bean juice pretest–green bean juice posttest	2,375	.885	.221	10,734	15	.000

Based on the output in Table 8, analysis using a paired t-test on the blood pressure data before and after treatment in the group receiving mung bean juice showed a p-value of 0.000 (p lower than 0.05). This finding indicates a significant difference in blood pressure reduction after the intervention compared to the initial condition.

Discussion

Identification blood circulation pressure on hypertension sufferers before being given Green bean juice at the elderly health post in Mojokrapak Village, Tambelang District, Jombang Regency.

Based on Table 4, it can be concluded that in the group that received green bean juice, before the intervention, the majority of respondents suffered from severe hypertension, namely 11 people (68.75%). Based on Armilawaty's theory in Rumaolat et al [7] High blood pressure, also known as hypertension, is a medical condition in which a person's blood pressure is consistently above normal for a prolonged period. This is consistent with the notion that hypertension is defined as a condition in which an individual's blood pressure is recorded at or above 140/90 mmHg. High blood pressure is defined as a condition in which blood pressure rises above normal limits and can cause health problems and even death. Other risk factors include advanced age, gender, an unbalanced diet, being overweight, smoking, and alcohol consumption [5].

Based on age factors, table 1 shows that most of the respondents in the mung bean juice intervention group were aged 60 to 69 years, with 10 respondents, or 62.5% of the total. The Essential Electrolyte Regulation Theory, explains that essential electrolytes such as potassium (K+) and magnesium (Mg2+) play a crucial role in regulating blood pressure, particularly in those over 60 years of age who suffer from decreased cardiovascular function. Potassium (K+): Potassium plays a role in balancing the effects of sodium, aiding in vasodilation and blood vessel dilation, and gradually lowering systolic and diastolic blood pressure. Meanwhile, magnesium (Mg2+) functions as a natural vasodilator and increases insulin sensitivity, contributing to blood pressure regulation. As a result of a study [8], in the Sukoharjo Community Health Center service area, hypertension in the elderly group was primarily impacted by the dominant risk factor of age over 60. These findings indicate that hypertension increases with age, which is impacted by physiological changes, including reduced blood vessel elasticity and decreased kidney function.

In the opinion of researchers, hypertension can affect both men and women, but several studies show that women are more at risk of developing it after the age of 60 than men. Based on the gender factor in Table 2, it can be seen that the majority of respondents in the green bean juice intervention group were women, namely 11 people (68.75%). Based on theory [4], explains the physiological differences in blood pressure regulation between men and women, namely: Women have estrogen which increases the release of nitric oxide (NO), which results in dilation and vasodilation of blood vessels, resulting in a decrease in blood pressure. The hormone testosterone in men can stimulate the sympathetic nervous system and the renin-angiotensin mechanism, thus contributing to an increase in blood pressure. In this opinion,[8], that women tend to be more suffering from hypertension compared with postmenopausal men is age >45 years. Entering the period female menopause more at risk of being exposed hypertension caused by hormonal factors.

According to researchers, hypertension can affect both men and women, but several studies show that women are at greater risk of developing it after age 60 than men. One factor that can impact this risk is hormonal changes after menopause: estrogen production in postmenopausal women decreases significantly. This decrease in estrogen can lead to increased blood pressure because estrogen protects blood vessels.

Based on table 3, it shows that nearly half of the respondents in the intervention group who were given mung bean juice were at elementary school level, namely 6 respondents (37.5%). Based on the Health Literacy Theory by [9], stated that a person's level of education has a big impact to literacy health, which is defined as the ability someone to access, understand, and use related information with health in the process of making wise health decisions. Higher education helps a person understand information about hypertension, such as maintaining a low-salt diet, exercising, taking medication regularly, and monitoring their blood pressure. Individuals with good health literacy tend to be more compliant with treatment, lead healthier lifestyles, and are more likely to have better controlled blood pressure. In the opinion of researchers, low education can be a risk factor for suffering from hypertension due to a lack of knowledge about a healthy lifestyle, people with low education do not understand the importance of living a healthy lifestyle. healthy like diet balanced and sport regular.

Identification of blood circulation pressure in hypertension patients after receiving green bean juice intervention at the Elderly Posyandu in Mojokrapak Village, Tambelang District, Jombang Regency.

Based on table 5, it shows that in the green bean juice group, after being given the intervention, a small proportion suffered from pre-hypertension, namely 6 respondents (37.5%). In the view of Functional Nutrition Theory, green beans (Vigna radiata) contain functional nutrients such as potassium: which function to lower blood cholesterol. blood circulation pressure by reducing the amount of sodium present in the blood body and relaxes blood vessel walls.

Magnesium: Naturally helps control blood circulation pressure and keeps blood vessels elastic. Flavonoids and antioxidants function to reduce oxidative stress which can cause damage to blood vessels and increase the risk of hypertension [10].

Based on a study by Marbun & Hutapea [10], consuming mung bean juice prevented an increase in blood pressure. The average systolic blood pressure (SBP), which was initially recorded at 156.8 mmHg, decreased to 140.9 mmHg after the intervention. Meanwhile, the average diastolic blood pressure (DDBP) before treatment, which was 97.9 mmHg, decreased to 88.3 mmHg. Thus, there was a decrease in SBP of 15.9 mmHg and DBP of 9.6 mmHg. The results indicate that consuming mung bean juice can lower blood pressure in the elderly. In the opinion of researchers, the treatment of hypertension with pharmacological methods is still not optimal in its therapeutic effect, thus there is a need to optimize treatment by using non-pharmacological therapy such as drinks made from green bean juice and containing potassium and magnesium which can help control blood circulation pressure so that it remains within normal limits.

Analysis of the impact of giving green bean juice on blood circulation pressure at the elderly posyandu in Mojokrapak Village, Tambelang District, Jombang Regency.

Based on the study output in Table 8, In the statistical analysis using paired t-test, the group that received the intervention in the form of consuming mung bean juice showed a p-value in line with 0.000 (p lower than 0.05). At the Elderly Posyandu in Mojokrapak Village, Tambelang, Jombang, the use of mung bean juice had an impact on the blood circulation pressure of patients with hypertension, because H1 was accepted. Based on the theory of [1] Mung bean juice contains potassium, soluble fiber, and antioxidants like flavonoids, which lower blood pressure and dilate blood vessels. In older adults, blood vessel elasticity decreases, making them more susceptible to hypertension. Regular consumption of mung bean juice can help improve vascular endothelial function and reduce peripheral resistance.

Based on studies from [1], about prevention of increase blood circulation pressure through consumption of peanut juice green, it can be concluded that consumption green bean juice can reduce stress blood from Systole in line with 156.8 mmhg, Diastole in line with 97.7 mmhg to Systole in line with 140.9 mmhg, Diastole in line with 88.3 mmhg. Then run statistical test by using Paired T-Test obtained p results are in line with 0.000 and p is less than 0.05 thus there is an impact on blood circulation pressure systolic and significant diastolic difference between before and after intervention.

According to researchers, consuming mung bean juice regularly for two weeks can significantly lower systolic and diastolic blood pressure. Mung bean juice's hypertension-reducing properties include potassium, which helps regulate heart function; magnesium helps relax blood vessel muscles; fiber plays a role in improving lipid profiles and contributing to heart health; potassium helps dilate blood vessels and reduce blood vessel tension; antioxidants (flavonoids and polyphenols) reduce oxidative damage to blood vessels and improve endothelial function; and protein plays a role in improving body fluid balance.

Conclusion

Based on the output of a study of blood circulation pressure in adults who suffered from hypertension before receiving green bean juice intervention, nine out of eleven respondents (68.75 percent) suffered from severe hypertension. Meanwhile, after being given the intervention, a small number of respondents suffered from Pre-Hypertension, namely 6 respondents (37.5%). There are indications that administering mung bean juice can affect blood pressure in elderly people with

hypertension at the integrated health post (posyandu). The paired t-test results show a p-value of 0.000 (p lower than 0.05), confirming a significant decrease in blood pressure between pre- and post-intervention conditions.

References

[1] I. Rahmawati dan D. Suryandari, "Pencegahan Peningkatan Tekanan Darah Melalui Konsumsi Sari Kacang Hijau," *J. Pengabdi. Kpd. Masy. Ungu Abdi Ke Ungu*, vol. 2, no. 3, hlm. 118–123, 2020.

[2] M. Zikra, A. Yulia, dan L. Tri Wahyuni, "Faktor-faktor yang Mempengaruhi Kejadian Hipertensi," *J. Amanah Kesehat.*, vol. 2, no. 1, hlm. 1–11, 2020, doi: 10.55866/jak.v2i1.33.

[3] B. Hanim, Zhafiirah, Ferdy, D. A. Safitri, dan P. Adelya, "Peningkatan kesehatan melalui pemantauan kesehatan dan pemberian makanan tambahan bubur sehat kacang hijau untuk menurunkan hipertensi," *J. Pengabdi. Masyrakat*, vol. 3, no. 1, hlm. 263–269, 2024.

[4] Y. Tobing Lukiyono, S. Salsabilah Zain, P. Studi DIV Analis Kesehatan, F. Kesehatan, dan U. Nahdlatul Ulama Surabaya, "Efektifitas Mengonsumsi Susu Kedelai terhadap Kadar Kolesterol pada Lansia yang Menderita Hipertensi," vol. 19, no. 2, hlm. 48–51, 2022.

[5] Amelia, G. Fajrianti, dan Murniani, "Hubungan Gaya Hidup Terhadap Kejadian Hipertensi," *J. Penelit. Perawat Prof.*, vol. 6, no. 4, hlm. 1487–1498, 2021.

[6] G. Pawana, dan Sulistri, dan J. P. Raya Telang BOX, "Pertumbuhan dan Produksi Tanaman Kacang Hijau (Vigna radiata L.) pada Berbagai Konsentrasi Osmolit Sorbitol dan Intensitas Cekaman Kekeringan Growth and Production of Mung Beans (Vigna radiata L.) at Various Sorbitol Osmolite Concentrations and Drought St," *J. Agroekoteknologi*, vol. 13, no. 2, hlm. 124–135, 2020.

[7] W. Rumaolat dan I. Soamole, "Faktor-Faktor Berhubungan Dengan Kejadian Hipertensi Pada Nelayan Desa Titawaai Kabupaten Maluku Tengah," *J. Ilmu Kesehat. Umum*, vol. 1, no. 4, hlm. 85–93, 2023.

[8] R. D. Syarpia dan K. I. Kurniati, "Potensi Susu Kedelai sebagai Anti Hipertensi," *J. Penelit. Perawat Prof.*, vol. 2, no. 1, hlm. 77–84, 2020, doi: 10.37287/jppp.v2i1.48.

[9] L. Hidayatullah, Setiyawan, dan G. Suparmanto, "Pengaruh Pemberian Susu Kedelai terhadap Tekanan Darah pada Hipertensi di Posyandu Lansia Desa Sembungan," *Naskah Publ. Univ. Kusuma Husada*, vol. 000, hlm. 1–9, 2024.

[10] W. S. Marbun dan L. M. N. Hutapea, "Penyuluhan Kesehatan pada Penderita Hipertensi Dewasa terhadap Tingkat Pengetahuan Hipertensi," *J. Keperawatan Silampari*, vol. 6, no. 1, hlm. 89–99, 2022, doi: 10.31539/jks.v6i1.4170.