



EFFECTIVENESS OF GIVING ALOE VERA JUICE ON CHANGES IN BLOOD PRESSURE IN FAMILY MEMBERS WITH HYPERTENSION QUASI EXPERIMENTAL FAMILY NURSING

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Abstrak

Hypertension is a global health problem that increases in older adults and serves as a risk factor for cardiovascular diseases. In DKI Jakarta, the highest prevalence of hypertension occurs in the 50–70-year age group, particularly among women. Management can be carried out through pharmacological and non-pharmacological therapies, including Aloe vera juice, which contains bioactive compounds with vasodilatory and antioxidant properties. Objective this study aimed to determine the effectiveness of Aloe vera juice in altering blood pressure among family members with hypertension. Methods this research employed a quasi-experimental one-group pre-test and post-test design to evaluate the effect of Aloe vera juice on blood pressure in 25 family members with hypertension at Puskesmas Jatinegara, East Jakarta. Data were collected by measuring blood pressure before and after a 7-day intervention and from patient medical records. Data analysis was conducted using univariate and bivariate methods, applying the Wilcoxon Signed Rank Test with a significance level of $p \leq 0.05$ to determine the effectiveness of the intervention. Results The study found that Aloe vera juice reduced systolic blood pressure in family members with hypertension, from a median of 157 mmHg to 136 mmHg (Δ 21 mmHg). It also lowered diastolic blood pressure, from a median of 93 mmHg to 83 mmHg (Δ 10 mmHg). The Wilcoxon test showed that Aloe vera juice significantly reduced blood pressure in family members with hypertension ($Z = -3.962$; $p = 0.000$). Conclusion and recommendations aloe vera juice was proven to significantly reduce both systolic and diastolic blood pressure in family members with hypertension, indicating a significant difference between pre- and post-intervention blood pressure. Aloe vera juice can be used as a non-pharmacological intervention to lower blood pressure. Future studies are recommended with larger sample sizes and a randomized controlled trial (RCT) design, and family education programs can be implemented to support hypertension management at home.

Keywords: Hypertension, Aloe Vera Juice, Blood Pressure, Quasi-Experiment

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INTRODUCTION

Hypertension is a chronic health condition in which blood pressure remains above normal limits. This condition is often called a "silent disease" or "silent killer" because sufferers are often unaware of the increase in their blood pressure, whether gradual or sudden, until they undergo a test. A diagnosis of hypertension is made if the systolic blood pressure (SBP) is ≥ 140 mmHg and/or the diastolic blood pressure (DBP) is ≥ 90 mmHg. According to the World Health Organization (WHO) in the Global Hypertension Report 2025, (WHO, 2025) the estimated number of people aged 60 years and over will increase from 1 billion to 1.4 billion between 2019 and 2050. Around 60% to 70% of elderly people currently suffer from hypertension, which is the main cause of stroke and ischemic heart disease, which causes death worldwide. The prevalence rate of hypertension by province between 2018-2023 shows that the highest increase occurred in the province of DKI Jakarta, namely 13.4% (BPS, 2024). In 2021 in DKI Jakarta there were 923,451 cases of hypertension consisting of 419,500 men and 503,951 women spread across 6 districts/cities. The highest number of cases was in East Jakarta with 277,299 cases (Dinkes DKI Jakarta, 2023). According to data from the East Jakarta work area, the majority of the population is female between the ages of 17 and 89, and male between the ages of 22 and 85, with a concentration in the 50–70 age group. Residents are spread across Cipinang, East Bekasi, Prumpung, Jatinegara, Kampung Pulo, Otista, and Tanah Rendah. The increasing incidence and mortality rates due to hypertension can impact a person's quality of life. Therefore, treatment and care are crucial, both through pharmacological treatment to lower and stabilize blood pressure, and through non-pharmacological treatments that can support the effectiveness of antihypertensive drugs. Hypertension sufferers are seeking alternative, more economical treatments with minimal side effects, namely through natural remedies using natural ingredients such as fruits, vegetables, and other herbs. One recommended herbal therapy for hypertension sufferers is consuming aloe vera because it contains flavonoids, arginine, vitamins, amino acids,

enzymes, and minerals. One natural ingredient that has the potential to lower blood pressure is aloe vera. This plant contains active compounds such as aloin, saponins, and phytosterols, which have vasodilatory and antioxidant effects, thus helping to lower blood pressure. Research shows that Aloe vera extract can lower systolic and diastolic blood pressure by increasing blood vessel elasticity and reducing oxidative stress. Aging is characterized by a decline in both physical and psychological bodily functions. The rate of decline is strongly influenced by individual motivation. Elderly people with strong enthusiasm and a strong drive to remain active tend to experience a gradual decline in physical condition, while those who are less motivated usually experience a more rapid decline. Physical decline is one of the main challenges faced by the elderly. This condition often gives rise to various other degenerative diseases that cause joint pain during intense physical activities, such as carrying loads. Furthermore, sensory function also declines with age; vision becomes blurry and hearing ability decreases, making it difficult for the elderly to hear conversations clearly. Decreased immunity is also common, a factor that increases the risk of disease in the elderly. The purpose of this study was to determine the effectiveness of administering aloe vera juice on changes in blood pressure in family members with hypertension.

METHODS

The type of research used was a quasi-experimental design with a one-group pre-test and post-test design. The one-group pretest-posttest design means the experiment was conducted on only one group without a comparison group used by the researcher to conduct the research. Pre-experimental design was used with a pre-test and post-test design to determine the effects before and after treatment. The sampling technique used was purposive sampling. In this study, the number of samples used was 25 people.

RESULTS AND DISCUSSION

1. Frequency Distribution of Respondent Characteristics

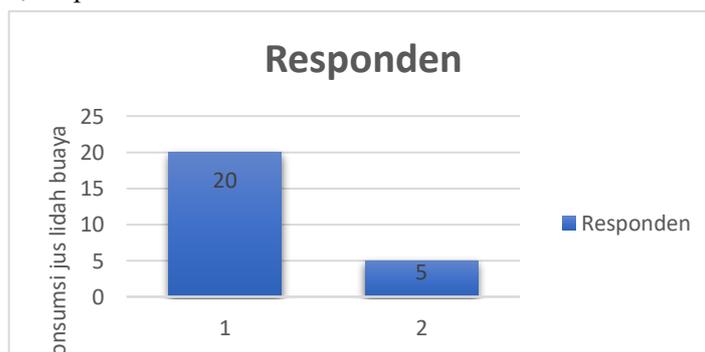
	Respondent Characteristics	Frekuences	Percent
Age	45-50 Years	2	8%
	51-55 Years	5	20%
	56-60 Years	8	40%
	61-65 Years	10	32%

	Total	25	100%
Education	Tidak tamat sekolah	2	8%
	Elementary school	5	20%
	Junior high school	6	24%
	Senior high school	8	32%
	College	4	16%
	Total	25	100%
Jobs	Retired	1	4%
	Government employees	1	4%
	Army/ Police	1	4%
	private employees	1	4%
	tradesman	1	4%
	laborer	4	16%
	Housewife	16	64%
	Other jobs	1	4%
	Total	25	100%
Gender	Man	5	20%
	Woman	20	80%
	Total	25	100%
Activity	Independent	12	48%
	Mid Assistance	7	28%
	Full Assistance	6	24%
	Total	25	100%

Based on the table above, it shows the age distribution of 25 respondents. The 61–65 age group is the largest with 10 people (40%), followed by the 56–60 age group with 8 people (32%). Next, the 51–55 age group is 5 people (20%), and the least is the 45–50 age group with 2 people (8%). Then the majority of respondents have a high school education of 8 people (32%), followed by 6 people from junior high school (24%), 5 people from elementary school (20%), 4 people from university/vocational high school (16%), and 2 people who have not graduated from school (8%). Furthermore, respondents who have

jobs as housewives (IRT) are 16 people or 64%. Labor jobs are 4 people (16%), other jobs such as pensioners, civil servants, TNI/Polri, private sector, traders, and other categories each have 1 person or 4% of the total respondents. Regarding the respondents' gender, 5 (20%) were male and 16 (64%) were female. The table above shows the respondents' activity levels. The majority of respondents, 12 (48%), were independent in their activities. Seven (28%) received partial assistance, while six (24%) received full assistance.

2. Consuming Aloe Vera Juice



Based on the graph above, it can be seen that of the 25 respondents who received 145 grams of aloe vera juice every day for 7 days of intervention, 25 respondents managed to finish it (100%), while 5 respondents only consumed

around 90% of the amount given and did not finish all the aloe vera juice.

3. Average Blood Pressure Before and After Intervention

a. Blood pressure before intervention (Pre-test)

Variabel	Mean ± SD	Min	Max
Systolic Blood Pressure	156.53 ± 10.70	140	161

Diastolic Blood Pressure	92.65 ± 7.08	81	100
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The average systolic blood pressure of the respondents was 156.53 ± 10.70 mmHg, with a minimum value of 140 mmHg and a maximum of 161 mmHg. Meanwhile, the average diastolic

blood pressure was 92.65 ± 7.08 mmHg, with a minimum value of 81 mmHg and a maximum value of 100 mmHg.

b. Blood pressure After intervention (Post-test)

Variabel	Mean ± SD	Min	Max
Systolic Blood Pressure	136.24 ± 10.94	119	158
Diastolic Blood Pressure	82.82 ± 7.35	70	99

The average systolic blood pressure of respondents was 136.24 ± 10.94 mmHg, with a minimum value of 119 mmHg and a maximum of 158 mmHg. The average diastolic blood pressure was 82.82 ± 7.35 mmHg, with a minimum value of 70 mmHg and a maximum value of 99 mmHg..

c. Systolic blood pressure before and after the intervention of giving aloe vera juice to family members with hypertension

Variabel	Initial Median (mmHg)	Final Median (mmHg)	Δ Median (mmHg)	Z	p-value
Systolic Blood Pressure	157	136	21	-4.256	<0.001*
Diastolic Blood Pressure	93	83	10	-3.421	0.001*

Based on the table, the respondents' systolic blood pressure decreased median from 157 mmHg at the beginning of the measurement to 136 mmHg after the intervention, with a median change of 21 mmHg. The Wilcoxon test results showed a Z value = -4.256 and p < 0.001, then the respondents' diastolic blood pressure decreased median from 93 mmHg at the beginning of the

measurement to 83 mmHg after the intervention, with a median change of 10 mmHg. The Wilcoxon test results showed a Z value = -3.421 and p = 0.001.

d. Differences in the effectiveness of giving aloe vera juice on changes in blood pressure in family members with hypertension

Pre-test – post test

Z	-3.962
Asymp. Sig (2-tailed)	0,000

Based on the Wilcoxon test results table, the administration of aloe vera juice to the experimental group shows that the calculated Z is -3.962b and sig is 0.000, so it can be concluded that there is a difference in the effectiveness of administering aloe vera juice to the experimental group. Pre-test and post-test treatment given.

Discussion

The results of this study indicate that administering aloe vera juice significantly reduced systolic blood pressure in family members with hypertension. These findings confirm that aloe vera juice has the potential to be an effective non-pharmacological intervention for lowering blood pressure in hypertensive populations. Reducing systolic blood pressure is important because high blood pressure is a major risk factor for cardiovascular disease, stroke, and kidney failure.

Physiologically, the effect of aloe vera juice on reducing systolic blood pressure can be explained by its bioactive compounds, such as flavonoids, polysaccharides, arginine, and potassium, which play a role in increasing vascular smooth muscle relaxation and reducing vascular resistance. Flavonoids also have antioxidant properties, which help reduce oxidative stress on the vascular endothelium, thereby improving endothelial function and blood flow. This mechanism supports the theory that bioactive plant compounds can modulate the renin-angiotensin system, increasing vasodilation, and reducing hypertension.

Research by Joko Purwanto et al. (2021) demonstrated a similar effect, where regular aloe vera consumption reduced systolic and diastolic blood pressure in elderly people with hypertension. Ramadhani (2023) also reported a

significant decrease in blood pressure after an aloe vera juice intervention at the North Pontianak Community Health Center. These findings strengthen the evidence that aloe vera juice has the potential to be an effective and safe non-pharmacological therapy, which can be implemented in public health practices. Research by Rizki Widyan Aisya et al. (2024) emphasized that the effects of aloe vera juice were more pronounced in hypertensive individuals compared to healthy populations, because vasodilation and antioxidant mechanisms work more effectively when hypertension is present. This suggests that aloe vera juice is more appropriate for use as a complementary therapy in patients with high blood pressure, rather than solely as a preventative measure in healthy populations. Saeideh Sabbaghzadegan et al. (2021) added that herbal therapies such as aloe vera juice can be a safe complementary approach for hypertensive patients, especially those who wish to gradually reduce the use of pharmacological medications. This approach is important, because long-term use of antihypertensive medications is often associated with side effects such as hypotension, fatigue, or electrolyte disturbances, so consuming aloe vera juice can be a more natural and safe alternative. In terms of practical implications, aloe vera juice consumption can be implemented in a family or community context as a simple, inexpensive, and accessible intervention. Regular morning consumption, for example, can help gradually lower blood pressure, improve cardiovascular health, and reduce the risk of long-term hypertension complications. Aloe vera juice-based interventions can also be part of a family health education program on hypertension management through diet and nutrition.

The results of the study showed that administering aloe vera juice significantly reduced diastolic blood pressure in family members with hypertension. This study confirms that aloe vera juice not only lowers systolic blood pressure but also effectively lowers diastolic blood pressure, which is an important factor in preventing cardiovascular complications such as heart failure and stroke. Physiologically, the reduction in diastolic blood pressure can be explained by the bioactive compounds in aloe vera, including flavonoids, arginine, polysaccharides, and potassium, which play a role in relaxing vascular smooth muscle and reducing peripheral vascular resistance. Flavonoids act as antioxidants, reducing oxidative stress on the vascular

endothelium, thereby increasing blood vessel elasticity and lowering diastolic pressure. This mechanism aligns with the theory that bioactive plant compounds can modulate the renin-angiotensin system, reduce vascular inflammation, and promote vasodilation.

A study by Sachin Shah et al. (2025) confirmed that aloe vera extract can lower diastolic blood pressure by 8–12 mmHg within a few weeks in hypertensive individuals. These findings support the results of this study, where the median diastolic Δ was 10 mmHg, demonstrating the consistency of aloe vera's antihypertensive effects across various populations and research settings. A study by Rizki Widyan Aisya et al. (2024) emphasized that diastolic blood pressure reduction was more pronounced in hypertensive individuals compared to healthy populations, as vasodilation and antioxidant mechanisms are more effective in chronic hypertension. This suggests that aloe vera juice is more appropriate as an adjunct therapy or to prevent the progression of hypertension in patients with pre-existing high blood pressure. The mechanism of action of aloe vera juice in lowering diastolic blood pressure can also be explained in more detail. The arginine content increases the production of nitric oxide (NO), an important endogenous vasodilator. Potassium helps balance electrolytes, reduces sodium retention, and reduces blood volume, while aloe vera polysaccharides have anti-inflammatory effects that reduce vascular damage caused by chronic hypertension. This combination of effects helps consistently lower diastolic blood pressure.

Overall, this study demonstrates that aloe vera juice is effective in lowering diastolic blood pressure in family members with hypertension. These findings are supported by the bioactive mechanisms of aloe vera, consistency with previous research, and phytotherapeutic and nutritional theories. To strengthen the scientific evidence, further research with randomized controlled experimental designs, larger sample sizes, longer intervention durations, and long-term evaluations are needed to confirm the effectiveness, safety, and optimal dosage of aloe vera juice as an antihypertensive therapy.

The results showed that administering aloe vera juice significantly reduced blood pressure in family members with hypertension. Systolic blood pressure showed a median decrease from 157 mmHg at pre-test to 136 mmHg at post-test, with a median of 21 mmHg. Meanwhile,

diastolic blood pressure decreased from 93 mmHg to 83 mmHg, with a median of 10 mmHg. This decrease was not only statistically significant but also has important clinical implications, as lower blood pressure can reduce the risk of cardiovascular complications such as stroke, coronary heart disease, and chronic kidney failure. Biologically, aloe vera juice works through several mutually supportive mechanisms. Flavonoids in aloe vera act as antioxidants, which help reduce oxidative stress on the blood vessel endothelium, increase vessel elasticity, and promote vasodilation. Arginine, an amino acid found in aloe vera, increases the production of nitric oxide (NO), which is a major endogenous vasodilator in blood pressure regulation. In addition, the potassium content in aloe vera plays a role in balancing electrolytes, reducing sodium retention, and reducing blood volume. The polysaccharides found in aloe vera have anti-inflammatory effects, which help reduce blood vessel damage caused by chronic hypertension. This combination of mechanisms supports the cardiovascular homeostasis theory, which states that blood pressure is controlled by vascular resistance, blood volume, and endothelial function.

The findings of this study align with those of Joko Purwanto et al. (2021), who found that regular consumption of aloe vera juice reduced systolic and diastolic blood pressure in elderly hypertensive patients. These results reinforce the findings of this study, demonstrating that aloe vera juice is effective across various age groups and settings, making it applicable in public health practice. Ramadhani's (2023) study also showed that aloe vera juice can significantly lower diastolic blood pressure in hypertensive patients. The consistency of these results with the current study indicates that aloe vera juice has a stable antihypertensive effect and can be routinely used as an adjunct therapy for hypertensive patients.

CONCLUSION

Administration of aloe vera juice effectively lowered systolic blood pressure in family members with hypertension, with a median decrease from 157 mmHg to 136 mmHg, confirming its potential as a non-pharmacological intervention to reduce the risk of cardiovascular disease. Administration of aloe vera juice effectively lowered diastolic blood pressure in family members with hypertension, with a median decrease from 93 mmHg to 83 mmHg, thus

helping to prevent cardiovascular complications. There was a significant difference in blood pressure in family members with hypertension before and after administration of aloe vera juice where respondents experienced a decrease in blood pressure. Administration of aloe vera juice can be used as an additional non-pharmacological intervention to lower blood pressure in family members with hypertension. Families and health professionals are advised to consider aloe vera juice as part of a healthy lifestyle to help control hypertension regularly and safely.

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