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Education and Introduction of Cucumbar Juice as a Natural Alternative for Reducing Blood Pressure among Hypertensive Patients

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Abstract: Hypertension is one of the leading non-communicable diseases contributing to high morbidity and mortality rates in Indonesia. Natural management of hypertension through lifestyle modifications and the consumption of healthy foods is increasingly favored as a complementary therapy. Cucumber juice is known to contain active compounds with the potential to lower blood pressure. This community service program aimed to provide education and introduce cucumber juice as a natural alternative for reducing blood pressure among individuals with hypertension in Ciomas, Bogor. A total of 40 hypertensive participants took part in activities that included educational sessions, demonstrations on how to prepare cucumber juice, and blood pressure measurements before and after the intervention. The results showed an average decrease of 14.8 mmHg in systolic blood pressure and 8.4 mmHg in diastolic blood pressure after consuming cucumber juice for seven consecutive days. Additionally, participants' knowledge regarding hypertension and the benefits of cucumber juice significantly improved, as evidenced by pre-test and post-test assessments. This activity demonstrates that cucumber juice can serve as an effective natural alternative to help lower blood pressure, and highlights the importance of education in raising public awareness about hypertension management. Further research with a larger sample size and extended duration is recommended to validate these findings.

Keywords: Blood Pressure, Cucumber Juice, Hypertension.

1. Introduction

Hypertension, or high blood pressure, is one of the most serious public health issues worldwide. This condition significantly contributes to the incidence of cardiovascular diseases such as stroke, kidney failure, and heart attacks, and is a leading cause of global morbidity and mortality. According to data from the World Health Organization (WHO), more than 1.28 billion people globally suffer from hypertension, with nearly two-thirds living in low- and middle-income countries, including Indonesia. Based on the 2018 Basic Health Research (Riskesdas) report, the prevalence of hypertension in Indonesia reached 34.1%, indicating a significant increase compared to previous years (Riskesda, 2018). This underscores the urgency of addressing hypertension as a priority health issue that requires comprehensive preventive and curative strategies (Whelton et al., 2018).

Although pharmacological therapy has become the standard in hypertension management, long-term use of antihypertensive medications is often associated with adverse side effects and considerable financial burden. Moreover, public awareness of natural approaches to hypertension control remains relatively low. Therefore, non-pharmacological strategies—particularly those involving lifestyle modifications and healthy dietary practices—offer a promising alternative. Simple interventions such as the consumption of local food sources, like cucumber (*Cucumis sativus*), are considered to have potential as effective and accessible complementary therapies. Cucumber is a vegetable rich in potassium, magnesium, and water, and possesses natural diuretic properties that may help lower blood pressure by promoting sodium excretion and vascular relaxation. Its high potassium content plays a crucial role in balancing sodium levels in the body, which directly contributes to blood pressure reduction. Several studies have demonstrated that regular consumption of cucumber juice can significantly reduce blood pressure within a relatively short period. This effect is also consistent with the principles of the DASH (Dietary Approaches to Stop Hypertension) diet, which emphasizes the intake of potassium-rich and sodium-restricted foods.

Research conducted by Herman (2022) in Kongkomos Village demonstrated that consuming 200 ml of cucumber juice daily for seven consecutive days significantly reduced systolic blood pressure from 150 mmHg to

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135 mmHg and diastolic pressure from 95 mmHg to 85 mmHg (p = 0.000). Similarly, Arisman et al. (2023) at the Cimahi Community Health Center and Yuliza and Solehudin (2024) in postmenopausal women also reported significant reductions in both systolic and diastolic blood pressure after one week of cucumber juice administration. Collectively, these findings provide compelling evidence that cucumber is not only nutritionally valuable but also holds promise as a natural, accessible, and effective antihypertensive agent.

Given the significant potential benefits of cucumber and the limited public knowledge regarding its preparation and therapeutic uses, there is a pressing need for an educational program to introduce cucumber juice as a natural alternative for lowering blood pressure, particularly among populations at risk of hypertension (Sudiana et al., 2017). Through this initiative, it is expected that the community will not only gain knowledge about the health benefits of cucumber but also be empowered to incorporate it into their daily lives as a safe, affordable, and self-managed approach to hypertension control. This activity serves as an initial step toward promoting sustainable healthy living practices based on the utilization of local resources (Muliani, 2021).

2. Materials and Methods

This community service activity employed a participatory educational approach, actively involving community members in the processes of education, demonstration, and evaluation regarding the benefits of cucumber juice consumption as a natural alternative to help reduce blood pressure. The program was implemented in stages, beginning with field observations and a needs assessment survey using questionnaires distributed to residents of Ciomas District, Bogor Regency, particularly those with a history of hypertension. The survey aimed to assess the community's level of knowledge about hypertension, their dietary habits, and their interest in non-pharmacological treatment options.

A total of 40 respondents were selected using purposive sampling, comprising individuals with mild to moderate hypertension based on blood pressure measurements and medical history. Baseline blood pressure values were recorded as pre-test data for evaluating the effectiveness of the intervention. Education was delivered through interactive lectures, distribution of informational leaflets, and question-and-answer sessions, with active involvement from healthcare professionals at the local community health center. Subsequently, participants engaged in hands-on practice to prepare cucumber juice using the correct procedure, which consisted of consuming 200 ml of freshly prepared cucumber juice daily without additives for seven consecutive days.

Evaluation was conducted through brief interviews, focus group discussions, and feedback questionnaires. The entire process was documented in the form of photographs, videos, and written reports. The results of the activity were compiled as evaluation material and disseminated to relevant institutions as well as the broader community. The activity was carried out in Ciomas Village, Bogor Regency.

3. Results

The community service activity entitled "**Education and Introduction of Cucumber Juice as a Natural Alternative to Lower Blood Pressure in Hypertensive Patients"** was successfully conducted and received positive responses from the community. The following is a comprehensive description of the activity's outcomes:

Table 1. Characteristics of Respondents

Characteristics	**Persons**	Percentage (%)
Gender:		
- Male	12	30%
- Female	28	70%
Age Groups:		
- 40–49 years	8	20%
- 50–59 years	15	37.5%
- 60 years and above	17	42.5%

A total of 40 participants took part in this activity, consisting of individuals with mild to moderate hypertension residing in Ciomas, Bogor. Participant selection was conducted in coordination with Posyandu cadres and the local Community Health Center (Puskesmas).

Stages of Activities Conducted

The counseling session was held on the first day of the program, covering basic information about hypertension and its risks, the role of lifestyle and healthy dietary patterns, the nutritional content and benefits of cucumber in lowering blood

pressure, and instructions on the proper and healthy preparation of cucumber juice. Following the session, participants were provided with educational leaflets and administered a pre-test.

Table 2. Community Knowledge Outcomes on Education and Introduction of Cucumber Juice as a Natural Alternative to Lower Blood Pressure in Hypertensive Patients in Ciomas Village

Knowledge Category	Score	Number of Participants Pre-Test	Number of Participants Post-Test
Poor	0 – 50	8 Participants (20%)	0 Participants (0%)
Fair	51 – 75	32 Participants (80%)	4 Participants (10%)
Good	76 – 100	0 Participants (0%)	36 Participants (90%)

The results of the community service activity indicated that the educational intervention successfully enhanced participants' understanding of hypertension and the benefits of cucumber juice. The proportion of participants categorized as having good knowledge increased from 0% to 90% following the intervention. Moreover, there were no participants remaining in the poor knowledge category after the activity. The combination of education, discussion, leaflet distribution, and cucumber juice preparation demonstration proved highly effective in raising community awareness and understanding.

Table 3. Community Pre-Test and Post-Test Blood Pressure after Consuming Cucumber Juice

Parameter	Average Pre-Test (mmHg)	Average Post-Test (mmHg)	Change (Decrease) (mmHg)
Sistole (mmHg)	148	133	-14
Diastole (mmHg)	93	85	-8

Based on the results presented in the table above, the average systolic blood pressure decreased by 14 mmHg, from 148 mmHg to 133 mmHg. Meanwhile, the diastolic blood pressure showed a reduction of 8 mmHg, from 93 mmHg to 85 mmHg. This decrease in blood pressure demonstrates the effectiveness of cucumber juice as a natural alternative that can assist in lowering blood pressure in hypertensive patients.

4. Discussion

The educational activity and administration of cucumber juice as an adjunct therapy to lower blood pressure in hypertensive patients in Ciomas demonstrated significant results. The average reduction in systolic blood pressure of 14.8 mmHg and diastolic blood pressure of 8.4 mmHg after seven days of cucumber juice consumption is consistent with findings from several previous studies

Several studies have indicated that cucumber juice can reduce blood pressure in individuals with hypertension. For example, a study by Negara et al. (2017) in Banjarbaru reported a decrease in systolic blood pressure from 149.68 mmHg to 136.65 mmHg and diastolic blood pressure from 95.99 mmHg to 80.09 mmHg following the administration of cucumber juice twice daily for one week.

Furthermore, a study by Dewi & Kusumawati (2022) also reported a reduction in blood pressure among elderly hypertensive patients following the consumption of cucumber juice, with an average decrease of 13.5 mmHg in systolic pressure and 8.2 mmHg in diastolic pressure. Cucumber is rich in potassium, magnesium, and water content. Potassium functions to balance the effects of sodium in the body, which can aid in lowering blood pressure. Magnesium contributes to vascular relaxation, while the high water content helps maintain hydration and optimize plasma volume regulation, potentially contributing to blood pressure reduction(Tankeu et al., 2017). This significant decrease in blood pressure aligns with previous studies that have demonstrated the presence of bioactive compounds in cucumber, such as flavonoids, saponins, and steroidal alkaloids, which exhibit vasodilatory and antioxidant effects that may assist in lowering blood pressure (Sudiana et al., 2017). Additionally, cucumber's potassium content plays a crucial role in regulating blood pressure by helping to balance sodium levels in the body (Herman & Sesisyana, 2022).

The education provided during this activity not only enhanced participants' knowledge about hypertension and its management but also encouraged positive behavioral changes. The increased knowledge is likely to improve participants' adherence to a healthy lifestyle, including the regular consumption of cucumber juice as part of their diet.

5. Conclusions

The community service program on education and the introduction of cucumber juice as a natural alternative to reduce blood pressure among hypertensive patients in Ciomas District demonstrated positive outcomes. The educational intervention

significantly improved participants' knowledge, with the proportion of those categorized as having good knowledge increasing from 0% to 90%. Moreover, the daily consumption of cucumber juice for seven consecutive days resulted in an average reduction of 14 mmHg in systolic and 8 mmHg in diastolic blood pressure. These findings indicate that cucumber juice can serve as an effective, accessible, and affordable natural alternative to support hypertension management. Therefore, this intervention not only enhanced community awareness of the importance of a healthy lifestyle but also contributed to the prevention and non-pharmacological management of hypertension.

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Conflict of Interest

The author declares that there are no conflicts of interest related to this research or community service activity. All processes of implementation and reporting were conducted objectively, without any influence from external parties that could affect the results or data interpretation.

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