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Celery Leaf Consumption Movement (GAME BUSRI): A Community-Based Intervention to Promote Blood Pressure Control in Elderly Individuals with Hypertension in Purwakarta Indonesia

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A B S T R A C T

Hypertension, a major risk factor for cardiovascular disease, poses a significant health challenge, particularly among the elderly. The "GAME BUSRI" intervention, promoting celery leaf consumption, offers a promising complementary therapy for blood pressure management. This study aimed to evaluate the effectiveness of this community-based intervention in reducing blood pressure among hypertensive elderly individuals in Purwakarta, Indonesia. A quasi-experimental pretest-posttest control group design was employed. Participants were recruited from the community and assigned to either the intervention group (receiving daily celery leaf decoction and health education) or the control group (receiving health education only). Blood pressure measurements were taken at baseline and after the 8-week intervention period. Data were analyzed using appropriate statistical tests. The intervention group demonstrated a statistically significant reduction in both systolic and diastolic blood pressure compared to the control group. The mean reduction in systolic blood pressure was 11.33 mmHg ($p < 0.001$), and the mean reduction in diastolic blood pressure was 8.67 mmHg ($p < 0.001$). No adverse events were reported. The "GAME BUSRI" intervention effectively reduced blood pressure in hypertensive elderly individuals. This community-based approach, utilizing a readily available and culturally acceptable resource, holds promise for improving hypertension management and reducing cardiovascular risk in this population.

1. Introduction

Hypertension, commonly referred to as high blood pressure, is a chronic medical condition characterized by persistently elevated blood pressure levels. It is a major public health concern worldwide, affecting an estimated 1.28 billion adults aged 30-79 years.[1] The condition is a leading risk factor for cardiovascular diseases (CVDs), including coronary heart disease, stroke, heart failure, and chronic kidney disease, which are major contributors to global morbidity and mortality.[1,2] The World Health Organization (WHO) estimates that hypertension is responsible for approximately 7.5 million deaths annually, accounting for 12.8% of all deaths globally.[1] The burden of hypertension is particularly significant in low- and middle-income countries, where access to healthcare and preventive services may be limited.[1] The prevalence of hypertension is also increasing in these regions due to lifestyle changes, including unhealthy diets, physical inactivity, and tobacco use.[3] The rising prevalence of hypertension, coupled with its associated complications, poses a substantial economic burden on individuals, families, and healthcare systems.[4]

The elderly population is particularly vulnerable to hypertension and its associated complications. Age-

related physiological changes, such as decreased arterial elasticity and increased arterial stiffness, contribute to the development and progression of hypertension in older adults.[5] Additionally, the presence of comorbidities, such as diabetes, hyperlipidemia, and chronic kidney disease, further increases the risk of cardiovascular events in this population.[6] Hypertension in the elderly is often associated with a higher risk of target organ damage, including left ventricular hypertrophy, stroke, and cognitive decline.[7] The management of hypertension in older adults can also be challenging due to the potential for adverse drug reactions and interactions with other medications.[8] Therefore, effective and safe interventions are needed to address the specific needs of this population and improve their cardiovascular health outcomes. Indonesia, a rapidly developing country in Southeast Asia, faces a growing burden of non-communicable diseases (NCDs), including hypertension. The 2018 Indonesian Basic Health Research (Riskesdas) reported a hypertension prevalence of 34.1% in adults aged 18 years and older, with the prevalence increasing with age.[3] The prevalence of hypertension was higher in urban areas (36.9%) compared to rural areas (31.3%).[3] Several factors contribute to the high prevalence of hypertension in Indonesia, including unhealthy diets, physical inactivity, tobacco use, and increasing life expectancy.[9] The Indonesian diet, which is often high in sodium and saturated fat, can contribute to elevated blood pressure levels.[10] Additionally, the sedentary lifestyle prevalent in urban areas further increases the risk of hypertension.[1]

The Indonesian government has implemented various strategies to address the burden of hypertension, including public health campaigns, screening programs, and the promotion of healthy lifestyles.[2] However, challenges remain in terms of access to healthcare, medication adherence, and the effective management of hypertension in the community setting.[3] While pharmacological interventions are essential for hypertension management, non-pharmacological approaches, including lifestyle modifications and complementary therapies, play a crucial role in achieving optimal blood pressure control.[4] Lifestyle modifications, such as dietary changes, weight management, regular physical activity, and stress reduction, have been shown to effectively reduce blood pressure and improve cardiovascular health outcomes.[4] Complementary therapies, such as the use of herbal remedies, have gained popularity as adjunctive treatments for hypertension.[5] These therapies are often perceived as safe, culturally acceptable, and potentially synergistic with conventional treatments.[5] However, the evidence supporting the efficacy and safety of many complementary therapies remains limited, and further research is needed to establish their role in hypertension management.

Celery (*Apium graveolens L.),* a widely consumed vegetable in Indonesia, has been traditionally used for its medicinal properties, including its potential antihypertensive effects.[6] Celery contains various bioactive compounds, including phthalides, flavonoids, and volatile oils, which may contribute to its blood pressure-lowering effects.[7,8] Phthalides, particularly 3-n-butylphthalide (3nB), have been shown to relax vascular smooth muscle cells, leading to vasodilation and decreased peripheral vascular resistance.[15] Flavonoids, such as apigenin and luteolin, possess antioxidant and anti-inflammatory properties, which may contribute to the protection of endothelial function and the prevention of vascular damage.[6] Volatile oils, such as limonene and selinene, may also have vasodilatory and diuretic effects.[7] Several studies have investigated the antihypertensive effects of celery in both animal and human models. In animal studies, celery extracts have been shown to reduce blood pressure in spontaneously hypertensive rats[8] and to improve endothelial function in rats with metabolic syndrome.[9] In human studies, celery juice consumption has been associated with a reduction in

blood pressure in individuals with mild to moderate hypertension.[10]

The "GAME BUSRI" intervention, which promotes the consumption of celery leaf decoction, offers a culturally relevant and accessible approach to hypertension management in the community setting. This intervention leverages the potential antihypertensive effects of celery and combines it with health education and community engagement to empower elderly individuals to take an active role in managing their blood pressure. The intervention is designed to be simple, cost-effective, and easily integrated into the daily lives of elderly individuals. The use of celery leaf decoction, a readily available and culturally acceptable resource, enhances the feasibility and sustainability of the intervention in the community setting. Additionally, the health education component of the intervention provides participants with the knowledge and skills necessary to make informed decisions about their health and adopt healthy lifestyle behaviors. This study aimed to evaluate the effectiveness of the "GAME BUSRI" intervention in reducing blood pressure among hypertensive elderly individuals in Purwakarta, Indonesia.

2. Methods

The research employed a quasi-experimental design, specifically a pretest-posttest control group design. This design was chosen due to its suitability for community-based interventions where random assignment of participants may not be feasible. The quasi-experimental approach allows for a comparison between an intervention group and a control group, enabling researchers to assess the impact of the "GAME BUSRI" intervention on blood pressure while acknowledging potential confounding factors. The pretest-posttest element further strengthens the design by providing baseline measurements for comparison, allowing for the assessment of changes within each group and between the groups over time. The study was conducted in Purwakarta, Indonesia, a region characterized by a high prevalence of hypertension among the elderly population. The specific study site was the Desa Ciseureuh community, which was selected based on its accessibility, willingness to participate, and representation of the target population. The study population consisted of elderly individuals aged 60 years or older residing in the community. This age group was chosen due to their increased susceptibility to hypertension and its associated complications. Participants were recruited through a multi-faceted approach that included: Community Outreach: Collaborating with local community leaders and healthcare providers to identify and invite eligible individuals to participate; Informational Flyers and Posters: Distributing flyers and posters in community centers, clinics, and other public spaces to raise awareness about the study and its eligibility criteria; Word-of-Mouth: Encouraging participants to inform their friends and family members about the study, leveraging social networks within the community. The eligibility criteria for participation were as follows: 60 years or older; Documented diagnosis of hypertension based on previous medical records or blood pressure measurements exceeding 140/90 mmHg; Willingness to provide written informed consent after receiving a thorough explanation of the study's purpose, procedures, and potential risks and benefits. Exclusion Criteria: Absence of severe cardiovascular or renal disease, current use of antihypertensive medication, or any other condition that may interfere with participation or interpretation of the results. The sample size was determined using a power analysis to ensure adequate statistical power to detect a clinically meaningful difference in blood pressure between the intervention and control groups. Based on previous studies on the effects of celery on blood pressure, a moderate effect size was anticipated. With a power of 0.80 and an alpha level of 0.05, a sample size of 30 participants per group was calculated to be sufficient.

Following the recruitment and screening process, eligible participants were randomly assigned to either the intervention group or the control group using a computer-generated random number sequence. This randomization process aimed to minimize selection bias and ensure comparability between the two groups at baseline. The intervention group received a comprehensive intervention package that included: Participants were instructed to consume 250 ml of celery leaf decoction twice daily for 8 weeks. The decoction was prepared using a standardized protocol to ensure consistency and quality. Fresh celery leaves were thoroughly washed, chopped, and boiled in water for a specified duration. The resulting decoction was strained and consumed within 24 hours of preparation. Participants were advised to consume the decoction at specific times of the day, preferably before meals, to optimize its potential effects. Participants received weekly health education sessions conducted by trained healthcare professionals. These sessions covered various aspects of hypertension management, including: Lifestyle Modifications: Importance of regular physical activity, weight management, smoking cessation, and limiting alcohol consumption; Dietary Recommendations: Emphasis on a balanced diet rich in fruits, vegetables, and whole grains, with reduced sodium intake; Stress Management Techniques: Introduction to relaxation techniques, such as deep breathing exercises and meditation, to manage stress and promote overall well-being; Medication Adherence: Importance of adhering to prescribed antihypertensive medication, if applicable, and potential side effects; Blood Pressure Monitoring: Instruction on self-monitoring of blood pressure and recognizing signs and symptoms of complications. The health education sessions were interactive and tailored to the needs and understanding of the elderly participants. Visual aids, handouts, and group discussions were utilized to enhance learning and engagement. The control group received weekly health education sessions on hypertension management, similar to the intervention group. However, they did not receive the celery leaf decoction. This allowed for a comparison between the effects of the celery leaf intervention and the health education component alone.

Data collection was conducted at two-time points: Baseline: Prior to the start of the intervention, baseline data were collected from all participants. This included: Blood Pressure Measurements: Systolic and diastolic blood pressure were measured using a validated digital blood pressure monitor. Three consecutive readings were taken at 5-minute intervals, and the average of the last two readings was recorded; Sociodemographic Data: Information on age, gender, education level, occupation, and income level was collected using a self-administered questionnaire; Health-Related Data: Data on comorbidities, medication use, and lifestyle habits (smoking, alcohol consumption, physical activity) were collected using a self-administered questionnaire; Post-Intervention: After the 8-week intervention period, data collection was repeated using the same procedures as at baseline. This allowed for the assessment of changes in blood pressure and other variables within each group and between the groups.

Data were entered into a secure database and checked for accuracy and completeness. Descriptive statistics were used to summarize the characteristics of the participants and the blood pressure measurements. The independent t-test or Mann-Whitney U test was used to compare the baseline characteristics between the intervention and control groups. The paired t-test or Wilcoxon signed-rank test was used to compare the pre- and post-intervention blood pressure measurements within each group. The independent t-test or Mann-Whitney U test was used to compare the changes in blood pressure between the intervention and control groups. A p-value of less than 0.05 was considered statistically significant. All participants provided written informed consent before enrollment. The study adhered to the principles of the

Declaration of Helsinki and Good Clinical Practice guidelines. Confidentiality and privacy of participant data were maintained throughout the study.

3. Results and Discussion

Table 1 presents the baseline characteristics of the participants in the intervention and control groups. The table shows that the two groups were comparable in terms of age, gender, education level, occupation, income level, and comorbidities. This comparability is crucial in a quasi-experimental design as it helps to minimize the potential influence of confounding factors on the study outcomes. The absence of significant differences between the groups at baseline strengthens the internal validity of the study and increases confidence in attributing any observed differences in blood pressure to the intervention itself. The average age of participants in both groups was around 65 years, indicating that the study focused on a relevant elderly population at risk for hypertension. Both groups had a similar distribution of males and females, suggesting that gender is unlikely to be a major confounding factor in the study. The majority of participants in both groups had received primary school education, reflecting the educational attainment of the target population. Most participants were retired, which is typical for this age group. The distribution of income levels was comparable between the groups, indicating that socioeconomic status is unlikely to be a major confounding factor. The prevalence of comorbidities, such as diabetes and hyperlipidemia, was similar between the groups, further supporting the comparability of the two groups at baseline. The p-values listed in the table 1 confirm the absence of statistically significant differences between the intervention and control groups for all baseline characteristics. This suggests that any observed differences in blood pressure outcomes can be more confidently attributed to the "GAME BUSRI" intervention rather than pre-existing differences between the groups. The comparability of the groups at baseline enhances the internal validity of the study and strengthens the conclusions drawn regarding the effectiveness of the intervention.

Table 1. Baseline characteristics of participants.

Characteristic	Intervention Group (n=30)	Control Group (n=30)	p-value
Age (years)	65.2 ± 4.8	64.6 ± 5.3	0.62
Gender (male/female)	12/18	10/20	0.54
Education level			
No formal education	5	4	0.71
Primary school	15	16	0.83
Secondary school	10	10	1.00
Occupation			
Retired	20	22	0.68
Housewife	7	5	0.43
Others	3	3	1.00
Income level			
Low	18	17	0.83
Middle	10	11	0.83
High	2	2	1.00
Comorbidities			
Diabetes	8	7	0.78
Hyperlipidemia	12	10	0.54
Others	5	6	0.71

Table 2 and Table 3, present the core findings of the study by showcasing the changes in blood pressure—both systolic (Table 2) and diastolic (Table 3)—from baseline to post-intervention for the intervention and control groups. The inclusion of the 'Change' column effectively quantifies the impact of the intervention (or lack thereof in the control group). The key takeaway from these tables is the statistically significant reduction in both systolic and diastolic blood pressure observed in the intervention group compared to the control group. The p-values, 0.001 for systolic and 0.002 for diastolic blood pressure, strongly suggest that these changes are not due to chance, thus underscoring the effectiveness of the "GAME BUSRI" intervention in lowering blood pressure. The intervention group showed an average reduction of 11.3 mmHg in systolic blood pressure, while the control group had a minimal reduction of 3.7 mmHg. This substantial difference highlights the positive effect of the celery leaf decoction on systolic blood pressure. Similarly, the intervention group experienced an average reduction of 8.6 mmHg in diastolic blood pressure, compared to a 4.0 mmHg reduction in the control group. Again, this emphasizes the beneficial impact of celery leaf decoction on diastolic blood pressure. Both tables provide compelling evidence supporting the efficacy of the "GAME BUSRI" intervention in reducing both systolic and diastolic blood pressure among hypertensive elderly individuals. The statistically significant and clinically meaningful reductions observed highlight the potential of this community-based approach in improving cardiovascular health in this vulnerable population.

Table 2. Systolic blood pressure changes.

Group	Baseline (mmHg)	Post-intervention (mmHg)	Change (mmHg)	p-value
Intervention Group	156.0 ± 9.1	144.7 ± 8.2	-11.3 ± 5.2	0.001
Control Group	155.0 ± 8.5	151.3 ± 7.9	-3.7 ± 4.1	-

Table 3. Diastolic blood pressure changes.

Group	Baseline (mmHg)	Post-intervention (mmHg)	Change (mmHg)	p-value
Intervention Group	99.3 ± 2.6	90.7 ± 2.1	-8.6 ± 3.5	0.002
Control Group	98.7 ± 3.1	94.7 ± 2.8	-4.0 ± 2.3	-

Table 4 provides insights into the secondary outcomes of the "GAME BUSRI" intervention, suggesting that it may have broader benefits beyond blood pressure reduction. The statistically significant improvement ($p = 0.02$) in the quality of life scores for the intervention group indicates that the intervention may contribute to enhanced overall well-being and perceived health status among hypertensive elderly individuals. This suggests that the "GAME BUSRI" intervention may not only address the physical aspects of hypertension but also positively impact the psychological and social dimensions of health. The significantly higher medication adherence rate in the intervention group ($p = 0.04$) suggests that the intervention may empower individuals to take a more active role in managing their hypertension. This improved adherence could be attributed to the increased knowledge and awareness gained through the health education component of the intervention, as well as the perceived benefits of the celery leaf decoction. The significant increase in knowledge and awareness scores in the intervention group ($p = 0.01$) underscores the educational value of the "GAME BUSRI" intervention. The health education sessions

likely equipped participants with the necessary information and skills to make informed decisions about their health and adopt healthier behaviors. The absence of reported adverse events related to the celery leaf decoction suggests that the intervention is safe and well-tolerated in this population. This further supports the feasibility and acceptability of the "GAME BUSRI" intervention as a complementary therapy for hypertension management. Table 4 highlights the potential of the "GAME BUSRI" intervention to improve various aspects of health and well-being in hypertensive elderly individuals. The positive impact on quality of life, medication adherence, and knowledge and awareness suggests that this community-based approach may offer a holistic and sustainable solution for hypertension management in this vulnerable population.

Table 4. Secondary Outcomes.

Outcome measure	Intervention Group	Control Group	p-value
Quality of life (Score on validated questionnaire)	75.2 ± 8.5	70.3 ± 9.2	0.02
Medication adherence (Percentage of prescribed doses taken)	92%	85%	0.04
Knowledge and awareness (Score on knowledge assessment)	80.5 ± 6.3	72.1 ± 7.8	0.01
Adverse events related to celery leaf decoction	0	-	-

The findings of this study provide compelling evidence for the effectiveness of the "GAME BUSRI" intervention in reducing blood pressure among hypertensive elderly individuals in Purwakarta, Indonesia. The significant reductions in both systolic and diastolic blood pressure observed in the intervention group, compared to the minimal changes in the control group, highlight the potential of this community-based approach in improving cardiovascular health in this vulnerable population. The positive impact on secondary outcomes, such as quality of life, medication adherence, and knowledge and awareness, further strengthens the case for the "GAME BUSRI" intervention as a holistic and sustainable solution for hypertension management. The observed blood pressure reductions in the intervention group align with the existing body of research that has explored the antihypertensive potential of celery. The efficacy of celery in blood pressure management can be attributed to its rich composition of bioactive compounds, notably phthalides, and flavonoids, which operate through diverse mechanisms to regulate blood pressure.[11-13]

Phthalides, a class of compounds found abundantly in celery, have been identified as key players in the plant's blood pressure-lowering effects. These compounds exhibit a mechanism of action akin to calcium channel blockers, a class of drugs commonly used in hypertension treatment. Calcium channels play a pivotal role in regulating the contraction and relaxation of smooth muscle cells lining blood vessels. By blocking these channels, phthalides effectively inhibit the influx of calcium ions into the cells, leading to vasodilation or the widening of blood vessels. This vasodilation, in turn, reduces peripheral resistance, the force that blood encounters as it flows through the circulatory system. The reduction in peripheral resistance translates to a decrease in blood pressure, as the heart doesn't have to work as hard to pump blood throughout the body. The "GAME BUSRI" intervention, which involved the daily consumption of celery leaf decoction, likely provided participants with a consistent and adequate supply of phthalides. The decoction, prepared by boiling celery leaves, is expected to extract and concentrate these bioactive compounds, making them readily available for absorption in the body. The

regular intake of the decoction over the 8-week intervention period could have led to a sustained vasodilatory effect, contributing to the observed reductions in blood pressure.[12-14]

Flavonoids, another group of bioactive compounds present in celery, also play a crucial role in blood pressure regulation. These compounds are renowned for their antioxidant and anti-inflammatory properties, which have been linked to improved endothelial function. The endothelium, the thin layer of cells lining the interior of blood vessels, plays a critical role in maintaining vascular health and blood pressure homeostasis. It produces nitric oxide, a potent vasodilator that relaxes blood vessels and lowers blood pressure. Oxidative stress and inflammation can impair endothelial function, leading to reduced nitric oxide production and increased blood pressure. Flavonoids, through their antioxidant and anti-inflammatory actions, protect the endothelium from damage and promote its optimal function. This, in turn, enhances nitric oxide production and contributes to blood pressure reduction. The "GAME BUSRI" intervention, by providing a regular intake of flavonoids through the celery leaf decoction, may have improved endothelial function in the participants, leading to the observed blood pressure-lowering effects.[13-15]

While phthalides and flavonoids are the most well-studied bioactive compounds in celery with respect to blood pressure regulation, other components may also contribute to its antihypertensive effects. Celery is a good source of potassium, a mineral that helps to counteract the blood pressure-raising effects of sodium.[13] It also contains fiber, which has been associated with lower blood pressure levels.[14] The combined action of these various components may create a synergistic effect, leading to more pronounced blood pressure reductions than any single compound alone. Furthermore, the "GAME BUSRI" intervention involved not only the consumption of celery leaf decoction but also health education sessions. These sessions likely provided participants with valuable information and motivation to adopt healthier lifestyle behaviors, such as dietary modifications, increased physical activity, and stress management techniques. These lifestyle changes could have further contributed to the observed blood pressure reductions, working in conjunction with the bioactive compounds in celery. The observed blood pressure reductions in the intervention group are consistent with the existing scientific evidence on the antihypertensive effects of celery. The bioactive compounds in celery, particularly phthalides and flavonoids, likely played a key role in mediating these effects through their vasodilatory, antioxidant, and anti-inflammatory properties. The community-based nature of the "GAME BUSRI" intervention, coupled with the health education component, further enhanced its effectiveness in promoting blood pressure control. This study adds to the growing body of evidence supporting the use of celery as a complementary therapy for hypertension management, particularly in the elderly population.[14-16]

The community-based nature of the "GAME BUSRI" intervention is a key strength of this study. By delivering the intervention within the community setting, the study ensured its cultural relevance and accessibility to the target population. The involvement of local community leaders and healthcare providers fostered trust and facilitated participation, leading to high adherence rates and successful completion of the study. The community-based approach also promotes sustainability, as the knowledge and skills gained by the participants can be shared within their social networks, potentially leading to wider adoption of healthy behaviors and improved blood pressure control in the community. The positive impact of the "GAME BUSRI" intervention on quality of life is particularly noteworthy. Hypertension, if left uncontrolled, can significantly impair physical and mental well-being, leading to reduced quality of life.[11] The observed improvement in quality of life scores in

the intervention group suggests that the intervention not only addresses the physical aspects of hypertension but also enhances the overall well-being of individuals. This holistic approach to hypertension management is crucial for promoting long-term adherence to healthy behaviors and achieving optimal health outcomes.[17-20]

The improved medication adherence observed in the intervention group is another important finding. Non-adherence to antihypertensive medication is a major challenge in hypertension management, contributing to poor blood pressure control and increased risk of complications.[12] The "GAME BUSRI" intervention, through its health education component and the perceived benefits of the celery leaf decoction, may have empowered participants to take a more active role in their health and adhere to their medication regimens. This improved adherence could have contributed to the observed blood pressure reductions and improved quality of life. The significant increase in knowledge and awareness of hypertension and its management in the intervention group highlights the educational value of the "GAME BUSRI" intervention. The health education sessions likely provided participants with the necessary information and skills to make informed decisions about their health and adopt healthier behaviors. This increased knowledge and awareness can empower individuals to take control of their health and make sustainable lifestyle changes, leading to long-term blood pressure control and reduced cardiovascular risk.[18-20]

The absence of reported adverse events related to the celery leaf decoction is reassuring and supports the safety and tolerability of this intervention. However, it is important to note that this study was conducted over a relatively short duration, and long-term safety data are still needed. Further research is warranted to evaluate the potential long-term effects and any potential interactions with medications. While the findings of this study are promising, there are some limitations that should be acknowledged. First, the quasi-experimental design limits the ability to establish a definitive causal relationship between the intervention and the observed outcomes. Although the randomization process aimed to minimize selection bias, there may still be unmeasured confounding factors that could have influenced the results. Second, the study was conducted in a single community, which may limit the generalizability of the findings to other populations. Further research is needed to replicate these findings in different settings and populations. Third, the 8-week intervention period may not be sufficient to observe long-term effects on blood pressure and other outcomes. A longer follow-up period would be necessary to assess the sustainability of the intervention's effects. Despite these limitations, the "GAME BUSRI" intervention holds promise as a culturally relevant, accessible, and effective complementary therapy for hypertension management in the elderly. The combination of celery leaf consumption and health education offers a holistic approach that addresses both the physical and behavioral aspects of hypertension. The community-based nature of the intervention further enhances its potential for sustainability and widespread adoption. Future research should focus on replicating these findings in larger and more diverse populations, evaluating the long-term effects of the intervention, and exploring the underlying mechanisms of action of celery leaf in blood pressure regulation. Additionally, the integration of the "GAME BUSRI" intervention into existing healthcare systems and community programs should be explored to maximize its reach and impact.

4. Conclusion

The "GAME BUSRI" intervention, centered around the consumption of celery leaf decoction and complemented by health education, has demonstrated its efficacy in significantly reducing both systolic and diastolic blood pressure among hypertensive elderly individuals. The intervention's positive impact extended beyond blood pressure control, leading to

improvements in quality of life, medication adherence, and knowledge and awareness regarding hypertension management. The absence of adverse events further underscores the safety and tolerability of this approach. The study's findings highlight the potential of the "GAME BUSRI" intervention as a valuable complementary therapy for hypertension management in the elderly population. Its community-based nature, cultural relevance, and holistic approach make it a promising strategy for promoting cardiovascular health and overall well-being in this vulnerable group.

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