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HYPERTENSION EDUCATION AND COMPLEMENTARY THERAPY USING PINEAPPLE PEEL EXTRACT BALM TO SUPPORT BLOOD PRESSURE CONTROL IN THE ELDERLY

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ABSTRACT

Hypertension remains one of the most prevalent non-communicable diseases globally and in Indonesia. Interventions such as education combined with complementary therapies utilizing local wisdom (pineapple peel extract) have not been widely implemented, making them necessary to address the problem of hypertension in patients. This community service project aims to implement health education and the use of complementary therapies to support hypertension management in the community. Community service was conducted using health education methods combined with complementary therapy training based on local wisdom (pineapple peel extract balm) in Kalijati District, Subang. The education was provided for one day, while the pineapple peel extract balm was applied for seven days. Knowledge scores were measured before and after the health education, while blood pressure measurements were taken before and after the pineapple peel extract balm application. The results showed that there were positive changes in the knowledge of hypertension patients from 4.775 to 6.825 (Mean Difference: 2.05), systolic blood pressure from 145.15 to 143.25 (Mean Difference: 1.9), and diastolic pressure from 87.5 to 85.9 (Mean Difference: 1.6). This community service activity increases patient knowledge regarding hypertension and reduces both systolic and diastolic blood pressure.

Keywords: Blood Pressure Management, Complementary and Alternative Medicine, Health Education, Hypertension, Pineapple Peel Extract Balm.

1. INTRODUCTION

High blood pressure or hypertension, which constitutes a Non-communicable Disease (NCD), is a serious health problem when systolic and diastolic pressure increase from a normal baseline. It causes the development of cardiovascular disease, including coronary artery disease, heart failure, atrial fibrillation, stroke, dementia, and chronic kidney disease(Hinkle & Cheever, 2018; Jones et al., 2025; D. N. Khasanah, 2022).

The incidence of hypertension has been identified. Hypertension affects approximately one billion adults worldwide, with more than 9 million deaths annually(Mohammadi et al., 2023). Meanwhile, in Indonesia, research

results indicate that the average incidence of hypertension in each city reaches 31.18% of the population (Wahidin et al., 2025). Another study showed that the prevalence of uncontrolled hypertension was 61.7% among all participants(Farhadi et al., 2023). This indicates a problem that needs to be addressed, as more than half of the sample had uncontrolled hypertension.

Hypertension patients experience various problems. Research conducted by U. Khasanah et al (2024) found that hypertensive patients experience several problems, one of which is a lack of knowledge about hypertension. This finding is supported by Yanti et al (2025), who stated that hypertensive patients do not know exactly when they first developed hypertension. Most hypertensive patients only discover they have hypertension when they seek medical attention due to dizziness and shoulder pain, and after their blood pressure is checked, it is discovered that their blood pressure is already high. This is a problem that must be addressed immediately in the hypertensive community, as it can have negative consequences if left untreated.

Interventions to improve patient knowledge need to be addressed. Health education interventions have a significant impact on improving knowledge among hypertension patients(Kurnia et al., 2020). Complementary therapy is also necessary, using therapies proven to help lower blood pressure, including traditional plant remedies. Existing complementary therapies are one treatment option in the community(Agus et al., 2021).

Based on this, health education interventions and the use of complementary therapies are essential. This community service project aims to implement health education and the use of complementary therapies to support hypertension management in the community.

2. PROBLEMS FORMULATION

Hypertension is a major non-communicable disease associated with serious cardiovascular and renal complications and remains a significant global and national health problem. In Indonesia, the prevalence is high, with a substantial proportion of cases remaining uncontrolled. Limited knowledge regarding hypertension and its long-term management contributes to poor blood pressure control, as many individuals are unaware of their condition until symptoms occur. Health education has been shown to improve patient understanding, and complementary plant-based therapies are commonly used in communities as supportive strategies for blood pressure management. Therefore, integrating hypertension education with culturally relevant complementary therapy may support community-based blood pressure control.

Based on this context, the research question is: How can the integration of hypertension education and complementary therapy utilization support blood pressure control in the community.

3. LITERATURE REVIEW

Hypertension

High blood pressure, or hypertension, is the most common and modifiable risk factor for the development of cardiovascular disease, including coronary artery disease, heart failure, atrial fibrillation, stroke, dementia, chronic kidney disease, and all-cause mortality. The primary goal in blood pressure treatment is a blood pressure of <130/80 mm Hg for all adults. Blood pressure is divided into several classifications as follows: normal blood pressure is defined as <120 mm Hg systolic and <80 mm Hg diastolic; high blood pressure as 120 to 129 mm Hg systolic and <80 mm Hg diastolic; stage 1 hypertension as 130 to 139 mm Hg systolic or 80 to 89 mm Hg diastolic; and stage 2 hypertension as ≥140 mm Hg systolic or ≥90 mm Hg diastolic(Jones et al., 2025).

	SBP		DBP
BP Category			
Normal	<120 mm Hg	and	<80 mm Hg
Elevated	120 to 129 mm Hg	and	<80 mm Hg
Hypertension			
Stage 1	130 to 139 mm Hg	or	80 to 89 mm Hg
Stage 2	≥140 mm Hg	or	≥90 mm Hg

Figure 1. Classification of Hypertension (Jones et al., 2025)

Transcultural Nursing

Transcultural nursing is a theory that emphasizes the importance of culture in Nursing care. Transcultural competence in nurses is used to overcome barriers when providing care to patients from diverse cultural backgrounds. Professional organizations should clearly define indicators of transcultural competence among nurses. All nurses need to be aware of and meet these evolving standards of transcultural competence(Rahayu et al., 2024). The Transcultural Nursing Theory, developed by Madeleine Leininger, emphasizes the importance of understanding cultural values, beliefs, and practices in delivering effective nursing care. Leininger introduced the Culture Care Diversity and Universality Theory, which is visually represented through the Sunrise Model. This model illustrates how cultural and social structure dimensions influence health, illness, and care practices within individuals, families, and communities(Alligood, 2014).

Leininger distinguishes between two major healthcare systems: the generic (folk) care system, which includes traditional and culturally rooted practices, and the professional care system, which refers to formal healthcare services provided by trained professionals. Effective nursing practice requires understanding and integrating both systems rather than disregarding culturally embedded practices. Based on this understanding, nurses make transcultural care decisions through three modes of action: (1)

culture care preservation or maintenance, which supports beneficial cultural practices; (2) culture care accommodation or negotiation, which adapts or negotiates cultural practices to achieve positive health outcomes; and (3) culture care repatterning or restructuring, which assists individuals or communities in modifying harmful health behaviors while respecting cultural values. The ultimate goal of these processes is to achieve culturally congruent care that promotes health, well-being, or a peaceful dying process(Alligood, 2014).

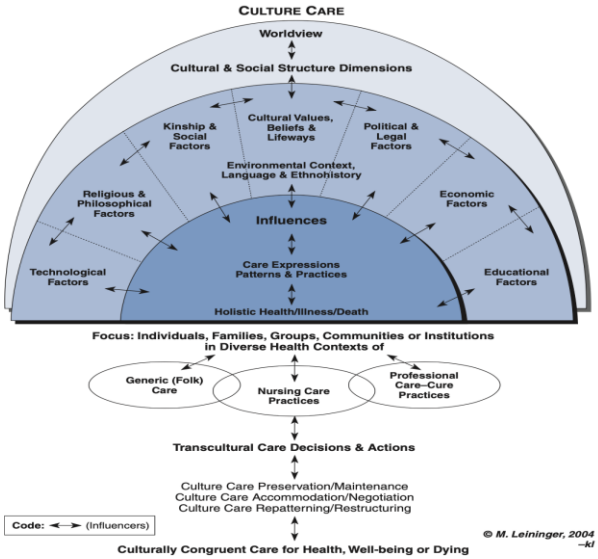

Figure 2. Transcultural Nursing Theory
(Alligood, 2014)

4. METHODS

This community service program utilizes health education methods related to hypertension and complementary therapy training using pineapple peel extract balm in Kalijati District, Subang.

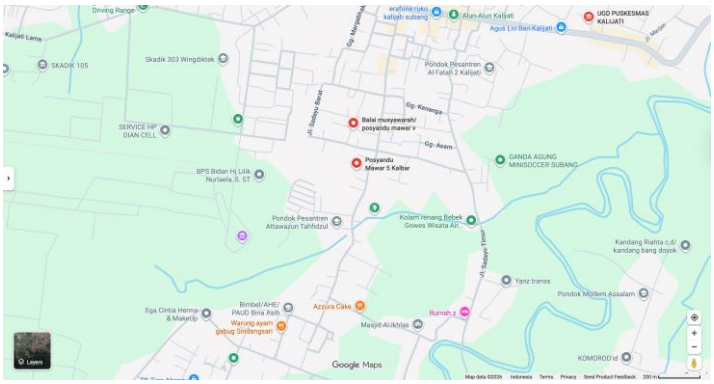

Figure 3. Location of Community Service Activities

This community service program is based on transcultural nursing theory (see Figure 3).

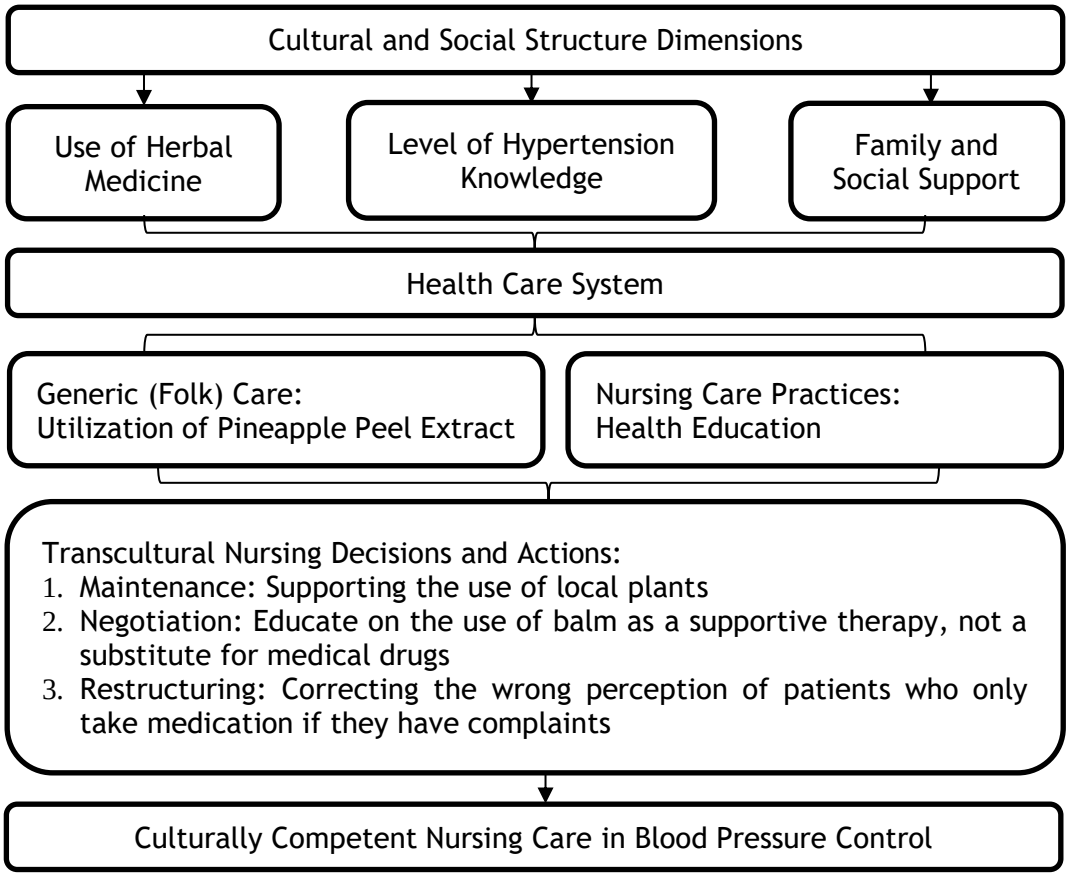

Figure 4. Community Service Implementation Framework

Community service was conducted with 20 hypertension patients accompanied by health cadres. The activity involved measuring blood pressure. They were asked to sit and rest for 15 minutes while filling out an attendance list. After their rest, their blood pressure was measured. Hypertension patients gathered in the hall for a 30-minute health education session on hypertension. The material covered the definition, complications, management, and prevention of hypertension according to the previous research conducted by (Kurnia et al., 2020). Patients were given time to ask questions and clarify the material.

The intervention continued with training on the use of pineapple peel extract balm. Each hypertensive patient was given pineapple peel extract balm. The balm was applied three times daily for seven days to the right and left temporal regions. The authors emphasized that this intervention is a supplement to, not a substitute for, oral medications, which must be taken regularly. This community service measured patient knowledge before and after receiving health education. Additionally, blood pressure was measured before and after applying the pineapple peel extract balm.

Figure 5. Pineapple Peel Extract Balm

5. RESULTS AND DISCUSSION

The results of community service resulted in an increase in public knowledge about hypertension, from an initial average of 4.775 to 6.825 (See in Figure 5). This indicates a 2.05 point increase in knowledge regarding definition, complication, management, and prevention of hypertension. This result align with previous research conducted by Chrismilasari & Negara (2022) who stated that there is a significant diferences between family knowledge before and after health education. This is supported by Vasantha & Hemavathy (2022) on educational interventions for patients with hypertension. This study showed a 65.72% increase in knowledge to an adequate level. This community service activity combines health education and complementary therapy, including applying a pineapple peel extract balm. Increasing knowledge is crucial because it impacts patient compliance with treatment. This is supported by research conducted by Marseille et al (2021) which stated that there was an increase in medication compliance after an educational session was given to hypertension patients.

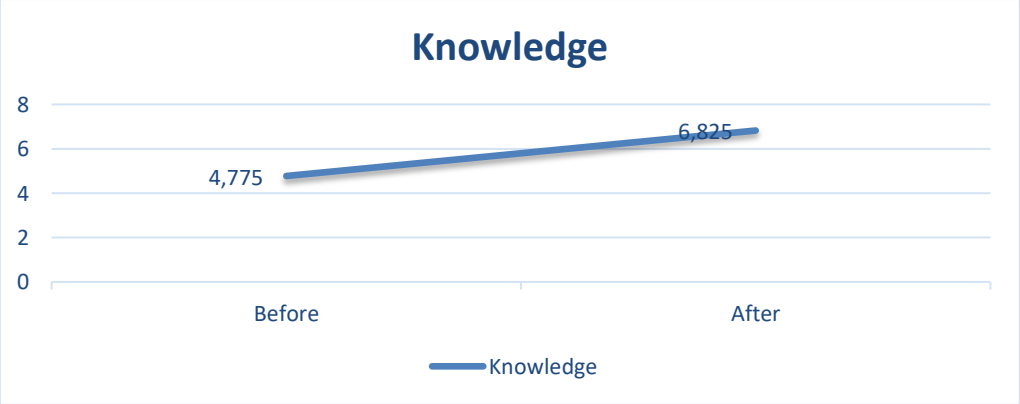

Figure 6. Participant Knowledge Improvement

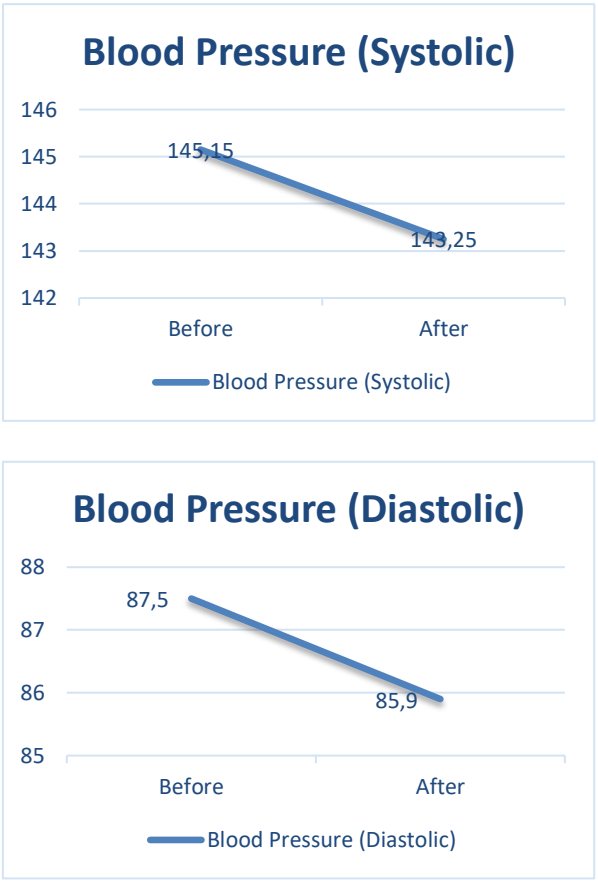

Figure 7. Systolic and Diastolic Blood Pressure

Other community service results also showed a decrease in both systolic and diastolic blood pressure. The average systolic blood pressure among participants decreased from 145.15 to 143.25, representing a decrease of 1.9 mmHg. Meanwhile, the average diastolic blood pressure decreased from 87.5 to 85.9 (See in Figure 6). Pineapple peel has a high potassium content, making it a potential non-pharmacological treatment for hypertension. One of the pathophysiological mechanisms of hypertension is that it occurs due to increased extracellular sodium concentration. High potassium levels regulate fluid balance in the body, which can help lower blood pressure(Safriani et al., 2018).

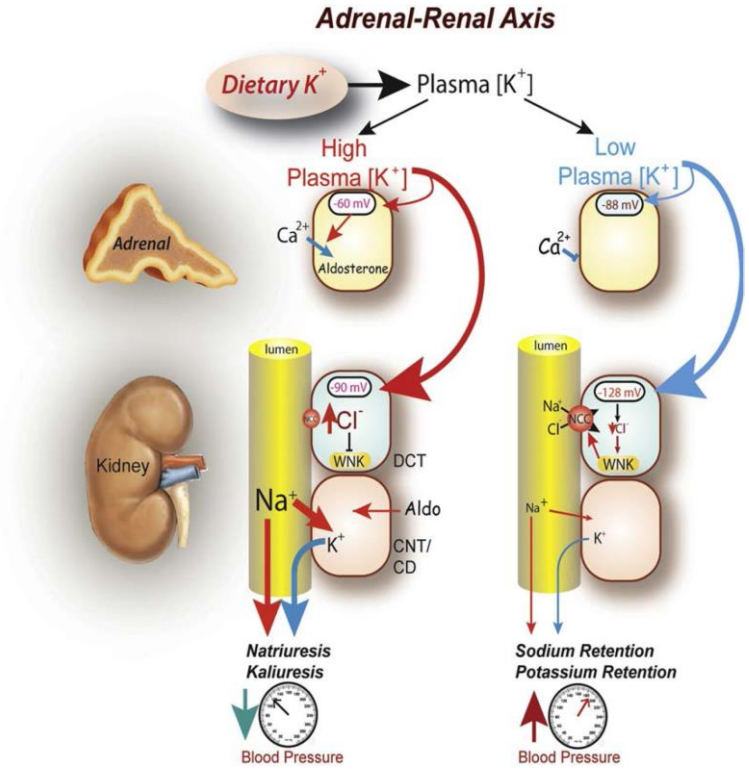

Figure 8. Mechanism of The Correlation Between Potassium and Blood Pressure

First, when potassium enters the arteries, blood flow increases, ultimately causing vasodilation. Furthermore, high potassium intake can decrease intracellular sodium ion concentration through activation of the Na^+/K^+/ATP-ase pump, thereby lowering blood pressure, especially in hypertensive patients with high sodium intake. This pump plays a role in regulating the balance of Na^+ ions (3 ions) and the release of K^+ ions (2 ions) within cells, thus impacting vascular smooth muscle, which affects blood flow and blood pressure. Another mechanism, high potassium intake increases urinary excretion, thus its mechanism of action is similar to diuretic drugs. Furthermore, potassium intake reduces vasoconstriction and the pressure of norepinephrine (NE) to enter the sympathetic nervous system, which can increase relaxation of vascular smooth muscle and increase blood flow(Chan et al., 2024; Haddy et al., 2006; Safriani et al., 2018).

The results of the activity indicate that structured education on hypertension and self-care can improve the elderly's understanding of blood pressure control. This emphasizes the role of nurses as educators in improving health literacy and patient self-management, especially in the elderly population with chronic diseases. The use of pineapple peel extract balm as a complementary therapy also shows potential to support non-pharmacological blood pressure control. This implication encourages nurses to integrate evidence-based complementary therapy into nursing care plans, while still considering safety and contraindications.

6. CONCLUSION

Community service in the form of hypertension education and the administration of pineapple peel extract balm is one form of culture-based care that can be implemented. Providing education increases understanding of hypertension. The administration of pineapple peel extract balm supports interventions to control blood pressure in patients. However, in its implementation, it is important to ensure that this intervention does not replace routine medication. This activity was carried out in a relatively short period of time (7 days), so that further implementation of research or community service over a long period of time is very necessary.

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