

## **Implementation of Tomato Juice in Hypertension with Readiness to Improve Health Management in Farmers: Case Report**

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### **ABSTRACT**

**Introduction:** Hypertension is a major concern in global health due to its high incidence rate. To overcome this problem, there needs to be a strong desire to manage the problem of readiness to improve health management. Efforts that can be made by maintaining a lifestyle in this case are strengthened by providing foods high in potassium, one of which is tomato juice. The purpose of this final project report is to describe the implementation of tomato juice in hypertensive.

**Method:** This report uses a case study design, with participants including 1 member of the farmer group who has hypertension, is 45 years old, has no complications, meets 80% of the symptoms, and has major signs of readiness to improve health management. The study was conducted on June 1-7, 2024 using interview, observation, and documentation techniques.

**Result:** Tomato juice was given for 7 days with a dose of 1 time a day, after meals. The results of the case study showed a decrease in systolic blood pressure of 5.3 mmHg and diastolic blood pressure of 4.8 mmHg and the evaluation criteria for readiness to improve health management increased with participants being able to take action to reduce risk factors, implementing care programs, fulfilling daily activities, not experiencing difficulties in implementing health programs and receiving family support.

**Conclusion:** Providing tomato juice can be educational material for farmer groups and health management in the community can improve healthy eating patterns by providing tomato juice to control blood pressure.

**Keywords:** *Hypertension; Health Management; Tomato Juice*

## Introduction

Hypertension is a major concern in global health due to its high incidence rate and association with increased risk of cardiovascular diseases such as heart attack, stroke, heart failure, and kidney disease (Arum, 2019). Hypertension affects almost 26% of the world's population, even in 2025 it is estimated that 29% (1.56 billion adults) will experience hypertension, and it is estimated that 9.4 million people will die from hypertension every year (Hamria et al., 2020).

According to the World Health Organization (2018), hypertension in the world is 26.4% or 972 million people suffer from hypertension, this figure will increase in 2021 to 29.2%, it is estimated that 9.4 million people die each year due to complications of hypertension, and in Indonesia there has been an increase of 50% of the 15 billion people who experience hypertension (Mashuri et al., 2022). According to data from the Lumajang Regency Health Service (2022), the prevalence of hypertension sufferers at the Jatiroto Health Center in 2018 was 11,823 people and increased in 2023 to 12,306 people and in 2024, those experiencing hypertension in the "Harapan Tani" farmer group were 60% of the 30 people who had been screened by the Jatiroto Health Center.

Hypertension is divided into two types based on its cause, namely primary and secondary. Approximately 95% of hypertensive participants suffer from primary hypertension, the cause of which is unknown (Kemenkes RI, 2019). Meanwhile, secondary hypertension is hypertension caused by medical conditions such as kidney disease, sleep apnea, tumors in the adrenal glands, thyroid disorders, or congenital abnormalities in the blood vessels (Susanti et al., 2021). Hypertension occurs due to increased blood volume and peripheral resistance. If one of these factors increases, blood pressure will increase. The incidence of hypertension in agricultural areas often occurs. Farmers are a group that is often exposed to pesticides (Maisyaroh et al., 2019). Exposure to chemicals, namely pesticides that enter the body, can interfere with the breakdown of acetylcholine, when acetylcholine accumulates, it will cause irregular and harmonious movements, and this movement will affect the movement of blood vessels which can produce high blood pressure (Istiqomah, I. N & L. N. Azizah, 2022) while the workload factor can affect blood pressure because the duration is more than 35 hours per week, it can cause increased physical and emotional fatigue in farmers so that it can be a risk factor for hypertension (Andriani et al., 2021). Most hypertensive

patients do not check themselves with health services because they have no complaints, if this continues without treatment it will cause complications such as heart disease, kidney failure, and stroke (Fitri et al., 2018).

Efforts to control complications can be made by maintaining a healthy lifestyle, reducing excessive sodium consumption, and a high-potassium diet (Widianto et al., 2022). To implement a healthy lifestyle, strong determination, and consistency are needed so that the problem of nursing readiness to improve health management (Fibriansari, Maisyaroh, 2022) can be overcome. According to the Indonesian Nursing Intervention Standards (SIKI, 2018), 39 interventions can be carried out on the problem of nursing readiness to improve health management and one of them is nutritional management (PPNI, 2018) Nutritional management can be done with a potassium diet.

Various types of fruits contain potassium such as bananas, tomatoes, avocados, jackfruit, durian, guava, water guava, soursop, melon, and kiwi. Tomatoes contain 245 mg of potassium in 100 grams of tomatoes (Tang et al., 2023). Tomatoes are easy to get, relatively cheap, and can be cultivated by local farmers. Potassium content can reduce the capacity of the blood vessel wall membrane, which in turn can cause hypertensive patients to experience a decrease in blood pressure (Roslim et al., 2024). The results of (Maternity et al., 2021) study at the Kaliasin Health Center 2021 on 132 hypertensive patients showed that before giving tomato juice the average blood pressure was 164.09 / 100.91 mmHg, and after giving tomato juice the average blood pressure was 132.73 / 85.45 mmHg. This shows the effect of giving tomato juice on reducing high blood pressure in elderly patients suffering from hypertension with a p-value of 0.000 ( $\alpha < 0.05$ ).

## Method

The design of this study is qualitative with descriptive, and the method used is case report. This study explores the implementation of tomato juice in hypertensive patients with a readiness to improve health management. Patients undergoing complementary therapy treatment, namely tomato juice with various indications, namely as an antioxidant, heart health, eye health, eye health, skin health, bone health (bone loss, calcification), hypertension, hemorrhoids, and constipation.

Participants, in this case, the study included 1 patient (Mrs. F) including one of the members of the "Harapan Tani" Farmer Group, meeting the criteria for the characteristics that arise in the problem of readiness to improve health management (expressing a desire to manage health problems and prevention, daily life choices are right to meet the goals of the health program), aged 40 years and over, having a history of hypertension, and blood pressure above normal ( $> 140$  mmHg), compliments condition, not taking antihypertensive drugs, including an independent family level III, willing to be a participant by signing informed consent.

Patients are given comprehensive nursing care through a nursing process approach consisting of assessment, data analysis, nursing diagnosis, nursing action plan, intervention, implementation, and evaluation. It is expected that improving health management can maintain a diet by providing tomato juice as an effort to improve community health management that can be done independently and sustainably. Comprehensive Nursing Implementation was carried out on Mrs. F from 1-10 July 2024.

## Results

Hypertension Participant (NyF) aged 45 years, the action of giving tomato juice because of blood pressure of 158/108 mmHg, the participant knows the problem of his illness but needs to improve his lifestyle. Major symptoms and signs must meet 80%, for minor symptoms there are no guidelines for how many percent to meet. Of the 3 minor criteria in the SDKI, participants only meet two criteria. The minor criteria that do not appear are describing a reduction in risk factors for health problems, namely hypertension. In participants, the risk factors for hypertension have decreased, but what has not decreased in participants is only body weight. Individuals who are overweight also tend to have higher blood pressure than those who are thin.

Table 1. Assessment of Mrs. F's hypertension

Patient identity	Patient initials	Mrs. F
	Age	45 years
	Ethnicity/nation	Madurese
	Religion	Islam
	Education	High School
	Occupational	Farm laborer, cake seller
	Marital status	Married
	Address	Kaliboto Lor, Kec. Jatiroto, Kab. Lumajang

Husband's occupational Assessment		Farm laborer July 1, 2024
Current History	Health	Current Health History
		Mrs. F said she did not have any signs and symptoms such as dizziness, chest pain, anxiety, or restlessness. Mrs. F said that she had known she had hypertension for the past 5 years when she was checking her health at the Jatiroto Health Center. Since then, Mrs. F has maintained a healthy lifestyle, Mrs. F participates in activities such as elderly gymnastics once a week in the Gerbang Mas Durian group. Mrs. F wants to know how to improve the health problems she is experiencing.
		Family History
		Mrs. F has hypertension from hereditary factors, namely from her biological mother who has died.
		Health nursing function
		Mrs. F said she understands the disease she is suffering from, but her understanding is still not specific enough. If one of the family members is sick, Mrs. F usually goes straight to a health facility, namely the Jatiroto Health Center. Mrs. F said that when someone in Mr. R's family is sick, other members should reduce their activities, get enough rest, and eat vegetables and fruits.
Physical examination	General condition	
	Good	
	Consciousness	
	Compomentis	
	Vital signs:	
	Blood pressure	
	158/108MmHg	
	Pulse	
	90x/minute	
	Weight	
	74,60 kg	
	Height	
	150 cm	

From the characteristic limitations, not all characteristic limitations continue to appear in patient Mrs. F, only 3 characteristic limitations appear, namely the characteristics of major symptoms and signs in the problem of readiness to improve health management. From the results above, the characteristic limitations found are as follows: expressing verbally or reporting pain with gestures, positions to avoid pain, changes in appetite, expressive behavior, guarding behavior or protective attitudes, and evidence of pain that is very observable.

Table 2. Data Analysis

Data	Problem
<p>Subjective Data:</p> <p>Mrs. F said she wanted to improve the management of her health problems, Mrs. F said she understood the problems that had occurred, Mrs. F did activities, namely, she did gymnastics once a week.</p> <p>Objective Data:</p> <ol style="list-style-type: none"> <li>1. Blood pressure 158/108 mmHg</li> <li>2. Pulse 90 x / minute,</li> <li>3. The client does not eat salty foods</li> <li>4. Does not have symptoms of health problems such as dizziness, anxiety, restlessness</li> <li>5. Does not have comorbidities</li> </ol>	<p>Readiness for improving health management</p>

Readiness to improve health management related to Mrs. F from Mr. R's family can recognize health problems, Mrs. F said she wanted to improve how to manage her health problems, namely hypertension. Mrs. F said she did not consume salty foods, Mrs. F said she did exercise once a week, blood pressure of 158/108 mmHg, did not have symptoms of dizziness, chest pain, anxiety, restlessness, and did not have comorbidities. According to the priority of the problem, comprehensive nursing interventions are planned.

## Discussion

The results of the assessment of risk factors experienced by participants are age type, and hereditary history. In terms of age type, the participant is 45 years old, hypertension often occurs at the age of 40 years and over (Febrianora, 2024). This is following the theory and facts obtained. Then in terms of hereditary history of hypertension, the participant has a hereditary history of hypertension experienced by the participant's biological mother. This is following the statement of Ina et al. (2020) that if one parent has hypertension, then the possibility of the child having hypertension is 60%.

The history of the closest family suffering from hypertension is also at risk of hypertension, especially primary hypertension (Metungku et al., 2021). Risk factors for hypertension problems greatly influence education. Participants have a high school education. In this case, sufficient education can receive good and fast information, and

even help individuals filter information from various sources related to health problems (Sriyono, 2019).

The intervention given to participants according to (SIKI, 2018) is nutritional management. In nutritional management, one of the things taught is to provide foods high in potassium to lower blood pressure. High-potassium foods used include consuming fruits and vegetables. One of the fruits that is high in potassium is tomatoes. In 100 grams of tomatoes, there is a potassium content of 245 mg (Basri et al., 2023). Giving tomato juice to participants as much as 150 grams, for 7 days. In terms of giving tomato juice, no type of tomato is significant for participants to consume. According to research by Widyarani, (2019) did not mention the type of tomato used when given to participants, but the tomatoes given were 150 grams of red tomatoes. In this case, the researcher gave 150 grams of tomato juice and the tomatoes were red. So it can be concluded that the provision of tomato juice was appropriate when given to participants.

Nursing evaluation is the final process of nursing care which aims to measure the final results of all nursing actions that have been carried out. Changes in readiness to improve health management must follow the evaluation criteria in SLKI. According to (PPNI & Tim, 2018), the criteria for achieving health management are taking action to reduce risk factors, implementing a high-potassium diet program by administering tomato juice, effective daily activities to meet health goals, and difficulties in undergoing the care/treatment program. Evaluations conducted on Mrs. F were carried out every 3 visits. On the first visit, the researcher said that the goals had not been achieved and the problems were partially resolved, so the intervention needed to be continued. On the second visit, the researcher said that there was a change in that the participant was able to carry out a hypertension care program by administering tomato juice as a high potassium diet with her family, but the goals and problems were still partially resolved so further intervention was needed. On the third visit, the participant was able to carry out daily activities to improve her health management. The goals and problems could be resolved, so the intervention was stopped.

## **Conclusion**

The interventions that have been designed by researchers for pain nursing problems have been able to be resolved with participants saying they can distinguish

between side dishes consumed by themselves and their family members, participants can easily manage their meals because these participants prepare their food. Mrs. F can do a high-potassium diet independently. According to this statement, it can be concluded that participants are ready to improve health management so that the objectives of this case study are achieved and the problem is resolved. This study expects nurses to conduct routine screening in each farmer group, so that knowledge about hypertension problems increases and the implementation of tomato juice can be given as educational material for non-pharmacological therapy, to lower blood pressure.

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