

The Effectiveness of Chinese Betel Leaf Decoction (*Peperomia pellucida* L. Kunth.) as a Complementary Therapy for Lowering Uric Acid Levels in Elderly Women

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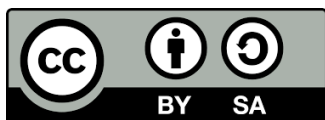
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Keywords:

Gout; Elderly; Chinese betel leaves.

Abstract

This study aimed to evaluate the effectiveness of Chinese betel leaf (*Peperomia pellucida* (L.) Kunth) decoction as a complementary therapy for reducing blood uric acid levels in older women over a seven-day intervention period in Karang Sawo Hamlet, Neighborhood Unit 07/Community Unit 02 (RT 07/RW 02), Bongsari Urban Village, West Semarang District, Semarang City, Indonesia. The study employed a quasi-experimental design using a one-group pretest–posttest approach. Blood uric acid levels were measured before and after the intervention. Ten older women were selected through purposive sampling based on predefined inclusion and exclusion criteria. Before the intervention, all 10 participants (100%) had elevated blood uric acid levels, with a mean concentration of 6.84 mg/dL. Following seven days of Chinese betel leaf decoction consumption, the mean blood uric acid level decreased to 4.01 mg/dL, with all participants (100%) exhibiting levels within the normal range according to the study's classification criteria. A paired-samples t-test revealed a statistically significant difference between preintervention and postintervention uric acid levels ($p < 0.001$). These findings indicated that the administration of Chinese betel leaf (*Peperomia pellucida* (L.) Kunth) decoction was associated with a significant reduction in blood uric acid levels among older women in the study population. However, given the small sample size and the absence of a control group, the findings should be interpreted cautiously, as they do not establish a definitive causal effect. Further controlled studies are needed to confirm the effectiveness and safety of this complementary intervention.



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INTRODUCTION

Gout is a form of inflammatory arthritis caused by the deposition of monosodium urate crystals in joints and surrounding tissues, typically associated with persistently elevated serum uric acid levels. Uric acid is the end product of purine metabolism, originating from both endogenous purine turnover and dietary sources (Faqih et al., 2023; Andriani et al., 2023). Elevated serum uric acid levels, clinically referred to as hyperuricemia, occur when uric acid production exceeds its elimination or when renal uric acid excretion is impaired. Several factors contribute to hyperuricemia, including genetic predisposition, dietary habits, alcohol consumption, obesity, certain medications, sex, age, and physical activity (Sueni et al., 2021; Bortolotti et al., 2021).

According to the World Health Organization (WHO), older adults are commonly categorized as individuals aged 60 years and above in various public health contexts. Aging is associated with physiological changes, including alterations in immune function, metabolic regulation, and organ function, which may increase susceptibility to chronic and degenerative diseases (Tian et al., 2021; Adipura, 2019; Alves et al., 2019). Common health conditions

affecting older adults include diabetes mellitus, hypertension, osteoarthritis and other rheumatic diseases, stroke, and gout. These conditions can negatively affect functional independence, mobility, and quality of life, emphasizing the importance of appropriate preventive measures and disease management strategies among older populations (Suiraoaka, 2012).

Gout represents a significant public health concern worldwide, with its prevalence varying according to age, sex, geographical location, and population characteristics. Previous epidemiological estimates have reported a gout prevalence of approximately 1–4% in the general population, with higher prevalence among men than women. Reported prevalence estimates among men range from 3% to 6%, while the prevalence may increase substantially in older age groups, reaching approximately 10% among men and 6% among women aged over 80 years in certain populations (Yasin et al., 2023). In Indonesia, some studies have reported a substantial burden of gout and hyperuricemia among women, particularly in older age groups (Angelina et al., 2014; (Chen et al., 2021). However, differences in diagnostic criteria, study populations, and assessment methods should be considered when interpreting these findings.

National health survey data have highlighted the burden of joint disorders in Indonesia. According to the Basic Health Research (Riset Kesehatan Dasar, Riskesdas) report cited in previous research, the prevalence of joint diseases was reported to be 11.9% based on diagnoses by health professionals and 24.7% based on reported symptoms (Riskesdas, 2015). Other estimates have suggested that gout-related conditions affect approximately 12–34% of certain Indonesian study populations, although these figures may include hyperuricemia or broader joint disorders rather than clinically confirmed gout. In Central Java Province, the reported prevalence of diagnosed joint diseases reached 6.78%. The occurrence of gout and hyperuricemia among working-age individuals has also raised concerns regarding reduced physical functioning, work productivity, and overall quality of life (Pujiningsih, 2023).

An epidemiological study conducted in Bandung, Central Java, in collaboration with the WHO reportedly examined 4,683 individuals aged 15–45 years and identified gout-related conditions in 24.3% of men and 11.7% of women (Angelina, Kusmiadi, & Wirawanni, 2014). Differences in uric acid metabolism between men and women are partly associated with hormonal influences, particularly the uricosuric effects of estrogen, which promotes renal uric acid excretion. Premenopausal women generally have lower serum uric acid concentrations than men; however, declining estrogen levels during menopause may contribute to increased serum uric acid concentrations and a higher risk of hyperuricemia and gout. Additional risk factors, including obesity, dietary patterns, alcohol consumption, and metabolic disorders, may further increase susceptibility among postmenopausal women (Suiraoaka, 2012).

The management of gout generally involves pharmacological treatment to control acute inflammation and long-term urate-lowering therapy when clinically indicated. Conventional medications are used to relieve acute gout attacks and maintain serum uric acid concentrations within recommended therapeutic targets. Complementary herbal interventions have also attracted research interest because certain medicinal plants contain bioactive compounds with potential anti-inflammatory, antioxidant, and urate-lowering properties. One such plant is Chinese betel, *Peperomia pellucida* (L.) Kunth, which contains phytochemical constituents such as flavonoids, alkaloids, tannins, saponins, and terpenoids. These compounds have been

investigated for their potential biological activities, including antioxidant and anti-inflammatory effects. Certain flavonoids may also inhibit xanthine oxidase, an enzyme involved in purine catabolism that catalyzes the conversion of hypoxanthine to xanthine and subsequently to uric acid. This mechanism provides a potential biochemical rationale for investigating the urate-lowering properties of *Peperomia pellucida*, although its clinical effectiveness and safety require further investigation (Binawati & Amilah, 2013).

Previous experimental investigations have examined the potential antihyperuricemic properties of *Peperomia pellucida*. (Noer et al., 2022) reported that ethanolic extracts of *Peperomia pellucida* exhibited uric acid-lowering activity in rabbits (*Oryctolagus cuniculus*), suggesting that the plant contains bioactive constituents with potential effects on uric acid metabolism. Furthermore, (Jannah et al., 2024) reported reductions in uric acid levels following the administration of Chinese betel leaf preparations among individuals with gout-related conditions. These findings provide preliminary evidence supporting further investigation of *Peperomia pellucida* as a potential complementary intervention. Nevertheless, results obtained from animal experiments and small-scale human studies cannot establish its effectiveness in broader clinical populations.

The present study was conducted in Karang Sawo Hamlet, Neighborhood Unit 07/Community Unit 02 (RT 07/RW 02), Bongsari Urban Village, West Semarang District, Semarang City, Indonesia, where several older women were identified as having elevated blood uric acid levels. This local health concern provided the rationale for investigating a potentially accessible plant-based complementary intervention. Chinese betel leaves used in the study were obtained from the Simongan area of West Semarang. The selection of *Peperomia pellucida* was based on its reported phytochemical properties and previous findings suggesting potential uric acid-lowering activity.

This study focused on changes in blood uric acid levels among older women following a seven-day intervention involving Chinese betel leaf decoction. Specifically, the research examined mean uric acid concentrations before and after the intervention and evaluated whether the observed differences were statistically significant. The study was situated within the field of complementary and traditional medicine, with particular emphasis on the potential application of medicinal plants in managing elevated uric acid levels. Its findings were expected to contribute preliminary evidence regarding the use of Chinese betel leaf decoction and provide information relevant to future investigations of plant-based complementary interventions.

Several previous studies have investigated the potential uric acid-lowering properties of betel-related medicinal plants. (Alfitria & Sonlimar, 2014) reported that extracts of betel leaf (*Piper betle* L.), including combination extracts, reduced uric acid levels in experimental rats. However, *Piper betle* and *Peperomia pellucida* are botanically distinct species, and findings involving one species cannot be directly generalized to the other. (Noer et al., 2022) demonstrated that ethanolic extracts of *Peperomia pellucida* exhibited uric acid-lowering activity at specific doses in rabbits. Meanwhile, (Jannah et al., 2024) reported that Chinese betel leaf decoction was associated with a reduction in mean uric acid concentrations from 8.61 mg/dL before administration to 6.447 mg/dL after administration among individuals with gout-related conditions. Although these studies suggested potential antihyperuricemic activity,

evidence specifically examining short-term changes in uric acid levels following Chinese betel leaf decoction consumption among older women remained limited. The present study therefore focused on this population and a seven-day intervention period.

To address this research gap, the study investigated changes in blood uric acid levels following the administration of Chinese betel leaf (*Peperomia pellucida* (L.) Kunth) decoction as a complementary intervention among older women in Karang Sawo Hamlet, RT 07/RW 02, Bongsari Urban Village, West Semarang District, Semarang City. The specific objectives were to determine mean blood uric acid concentrations before the intervention, measure mean concentrations after seven days of decoction consumption, and evaluate the statistical significance of the observed changes. The findings were expected to provide preliminary evidence regarding the potential uric acid-lowering effects of Chinese betel leaf decoction, contribute to the scientific literature on complementary approaches to hyperuricemia management, and inform future controlled clinical investigations. Given the study's one-group pretest–posttest design, its findings were intended to identify associations rather than establish definitive treatment effectiveness.

METHOD

Types of Research

This study employed a quasi-experimental design with a one-group pretest–posttest approach to evaluate changes in blood uric acid levels following the administration of Chinese betel leaf (*Peperomia pellucida* (L.) Kunth) decoction. The study involved 10 older women selected through purposive sampling based on predefined inclusion and exclusion criteria. Blood uric acid levels were measured before and after the intervention. The research was conducted from March to May 2025 in Karang Sawo Hamlet, RT 07/RW 03, Bongsari Urban Village, West Semarang District, Semarang City, Indonesia.

Research Design

The design in this study is Quasy Experiment with One Group Pre – Post test Design design. Uric acid levels were measured before and after treatment.

Table 1. Research Design Scheme 1

Subject	Pre - Test	Treatment	Post – Test
K	O1 Time 1	X Time 2	O2 Time 3

Description :

K : Subject

O1 : Initial measurement before treatment (Pre – Test)

X : Treatment (Giving kersen leaf decoction) O2 : Final treatment after measurement (Post – Test)

Research Variables

1. Independent Variables

The independent variable in this study was the administration of boiled water of Chinese betel leaves (*Peperomia pellucida* L. Kunth).

2. Bound Variables

The bound variable in this study was a decrease in uric acid levels in elderly women.

Variable Operational Definition

Table 2. Operational Definition

Variabel	Operational Definition	Indicator	Measuring Instruments	Data Scale	Score
Independent variables Chinese betel leaf decoction	This Chinese betel leaf decoction contains alkaloids, flavonoids, tannins, saponins, and terpenoids that are useful for lowering uric acid levels that exceed normal limits.	20 grams of Chinese betel leaves are equivalent to ± 50 leaves, add 220 mL of hot water, then heat to a boil until 200 mL of water remains. After that, it is left to warm up, then ready to brew and drink 1 time a day in the morning for 7 days.	Star fruit glass 200 mL.	Nominal	Chinese betel leaf decoction 50 g/200 mL water.
Bound variables Decreased uric acid levels	A decrease in uric acid levels has a result of metabolism in the body.	Measuring uric acid levels is done before and after the procedure.	The uric acid measuring device uses GCU (Glucose, Cholesterol, Uric Acid), venipuncture for blood collection, and uric acid strips.	Ratio	According to the results of the EasyTouch GCU (Glucose, Cholesterol, Uric Acid) Test with mg/dL.

Population and Sample

The population in this study is all elderly women who suffer from high gout in Kampung Karang Sawo RT 07/RW 02 Kel. Elderly woman suffering from gout in Kampung Karang Sawo RT 07/RW 02 Kel. Random sampling that determines the sample by inclusion and exclusion criteria.

1. Criteria for inclusion
 - a. Willing to be a respondent
 - b. Filling out the questionnaire
 - c. Elderly women over 60 years old
 - d. Suffering from gout with a level of ≥ 6
2. Exclusion criteria
 - a. Not present at the time of the study
 - b. Not filling out the questionnaire
 - c. Elderly women under 60 years old
 - d. Does not suffer from gout

Tools and Materials

The tools used in this study are, venipuncture, Easy Touch GCU (Glucose, Cholesterol, Uric Acid) Test, stove, pot, measuring cup, plastic cup, filter, digital scale, and spoon. The material used was a green Chinese betel leaf sample with a length of 1 - 6 cm, a width of 1.5 - 4 cm and water.

Data Collection Techniques

The stages of this research include:

1. Licensing Stage

Before conducting the research, it began with a permit equipped with a letter from the Health Academy on August 17, 1945 Semarang, then the letter was submitted to the Neighborhood Circle (RT). After obtaining permission, the researcher continued his steps by providing an explanation to the respondents regarding the purpose and purpose as well as the consent form. The respondent has the right to accept or reject the offer of such research. If the respondent is willing then the respondent signs and fills out the consent form provided.

2. Preparation Stage

How to make Chinese betel leaf decoction: Chinese betel leaves are processed by boiling 20 grams that have been washed thoroughly and boiled with 220 mL of boiling water until the water becomes 200 mL, left to warm then ready to brew, drunk 1 time a day in the morning for 7 days (Fauziah & Arianti, 2023).

3. Stages of Treatment

- a. Measuring uric acid levels is carried out 1 day before the administration of Chinese betel leaf boiled water. The results of the measurement are then recorded in the action sheet.
- b. Respondents daily drank a glass of Chinese betel leaf decoction as much as 200 mL in the morning. During the 7 days of the study, respondents are expected to obey the predetermined rules, namely: reducing foods that contain high purines, maintaining food portions, not consuming alcohol, and not taking certain medications.
- c. After that, measure uric acid levels on 1 day after giving Chinese betel leaf decoction water. The measurement procedure is carried out at the beginning of treatment.
- d. The results of uric acid measurements are recorded on the action sheet.
- e. Data processing and analysis is carried out after all data is collected.

Data Collection Instruments

The data of this study includes:

1. This literature research is quoted from various scientific articles, reports on research results related to the research to be conducted.
2. Observations are carried out in accordance with implementation procedures.
3. The questionnaire contains several questions that have been well arranged, respondents give answers and certain signs as answers.

Data Processing

Data processing steps:

1. Data Checking

The researcher examined the observation sheet related to the completeness, clarity, and suitability of uric acid levels in the data that had been recorded.

2. Encoding Data

The data is coded to easily track information by giving a sequence or initials to the observation sheet.

3. Entering Data

The data was then analyzed by moving from the observation data to the table, processed using SPSS.

4. Cleaning Data

The data in the table is checked again to find out if there are data errors or not.

Data Analysis

The processing of data that has been collected and entered in the table for the data normality test with the Shapiro-Wilk Test, followed by the Paired T-Test parametric test. Abnormal data was tested by the Wilcoxon Sigh Rank Test. This test is used using the SPSS program.

Research Code of Ethics

1. Respect for the personal

Safeguarding the rights of the subject and respecting the right to vote is a personal ethic.

2. Benefits

Maximizing profits and minimizing losses of the subject studied.

3. Anonymous

This research provides a guarantee to censor the names of respondents.

4. Confidentiality

A guarantee for researchers to maintain research results, both news and conflicts.

5. Fair

Balanced disadvantages and benefits when contributing to research.

RESULTS AND DISCUSSION

Based on the results of the research carried out from March to May 2025 in Kampung Karang Sawo RT 7 / RW 2, West Semarang District, Semarang City with a total of 10 respondents who met the inclusion and exclusion criteria.

Uric Acid Measurement Results

Table 3. Results of Uric Acid Measurement

No.	Name (initial)	Age (yr)	Gender	Before Treatment	After Treatment
1.	X1	61 th	Women	7,1 mg/dL	3,2 mg/dL
2.	X2	65 th	Women	6,8 mg/dL	4,1 mg/dL
3.	X3	60 th	Women	7,5 mg/dL	5,3 mg/dL
4.	X4	63 th	Women	6,7 mg/dL	5,0 mg/dL
5.	X5	68 th	Women	6,5 mg/dL	3,7 mg/dL
6.	X6	70 th	Women	7,0 mg/dL	2,8 mg/Dl
7.	X7	73 th	Women	6,9 mg/dL	5,5 mg/dL
8.	X8	62 th	Women	6,4 mg/dL	4,0 mg/Dl
9.	X9	64 th	Women	7,3 mg/dL	3,5 mg/Dl
10.	X10	60 th	Women	6,2 mg/dL	3,0 mg/dL
Average				6,84 mg/dL	4,01 mg/dL

Based on the table above, it can be seen that the average uric acid level before the administration of the Chinese betel leaf water decoction was completely abnormal, which was 6.84 mg/dL and the average uric acid level after the administration of normal Chinese betel leaf decoction water was 4.01 mg/dL.

Characteristics of Respondents by Gender

The characteristics of respondents by gender can be seen in the table below:

Table 4. Characteristics by Gender

Gender	Frequency	Presentase (%)
Male	0	0
Female	10	100
Quantity	10	100

Based on the table above, it is known that all respondents are female as many as 10 elderly (100%).

Characteristics of Respondents by Age

Features they respond by age according to WHO in (Bandiyah, 2009) can be seen in the table below:

Table 5. Characteristics Based on Age

Age	Frequency	Presentase (%)
Age 60-65 years old	7	70
Age 66-70 years old	2	20
Age 71-75 years old	1	10
Age >75 years old	0	0
Quantity	10	100

Based on the table above, it is known that all respondents aged 60-75 years are 10 elderly women (100%).

Characteristics of Respondents Based on Gout History

The characteristics of respondents based on gout history can be seen in the table below:

Table 6. Characteristics Based on Gout History

History of Gout	Frequency	Presentase (%)
None	0	0
	10	100
Quantity	10	100

Based on the table above, it is known that all respondents have a history of gout as many as 10 elderly women (100%).

Characteristics of Respondents Based on Diet

The characteristics of respondents based on diet can be seen in the table below:

Table 7. Characteristics Based on Diet

Diet	Frequency	Presentase (%)
No Purine Diet	3	30
Diet Purin Ketat	7	70
	0	0
Quantity	10	100

Based on the table above, it is known that there are 7 elderly women (70%) who do a purine diet and there are 3 elderly women (30%) who do not do a diet.

Characteristics of Respondents Based on Uric Acid Levels Before Giving Chinese Betel Leaf Boiling Water

The distribution of respondent frequencies based on uric acid levels before treatment is as follows:

Table 8. Distribution of Respondent Frequency Based on Uric Acid Levels Before Treatment

Until Asam Urat	Frequency	Presentase (%)
Normal	0	0
Abnormal	10	100
Quantity	10	100

Based on the table above, it can be seen that before the administration of Chinese betel leaf decoction, all respondents had abnormal uric acid levels as many as 10 elderly women (100%).

Characteristics of Respondents Based on Uric Acid Level After Giving Chinese Betel Leaf Boiled Water

The distribution of respondent frequencies based on uric acid levels after treatment is as follows:

Table 9. Distribution of Respondent Frequency Based on Uric Acid Levels After Treatment

Until Asam Urat	Frequency	Presentase (%)
Normal	10	100
Abnormal	0	0
Quantity	10	100

Based on the table above, it is known that after giving kersen leaf decoction for 7 days, there are 10 elderly women (100%) who have normal uric acid levels and there are no elderly women who have abnormal uric acid levels.

Normality Test of Gout Levels

Normality Test of uric acid content data on the Effect of Chinese Betel Leaf Stew (*Peperomia pellucida* L. Kunth.) on gout in elderly women in Karang Sawo Village RT 7/RW 2, Bongsari Village, West Semarang District, Semarang City.

Table 10. Normality Test of Uric Acid Levels

Tests of Normality						
Kolmogorov-Smirnova				Shapiro-Wilk		
Statistic		Df	Say.	Statistic	Df	Say.
PRETEST	0.099	10	0.200*	0.989	10	0.995
POSTTES	0.163	10	0.200*	0.922	10	0.370

The results obtained from the normality test on the research data were obtained with a value of $P = 0.995$ for the pre-treatment group and $P = 0.370$ for the post-treatment group and the results can be interpreted that the data is normally distributed because the value is ($P > 0.05$) so that in analyzing the data using the Paired Sample T-Test to determine the effect of Chinese betel leaf decoction (*Peperomia pellucida* L.Kunth.) on uric acid of elderly women in Kampung Karang Sawo RT 7 / RW 2 Bongsari Village, West Semarang District, Semarang City.

Paired Sample T-Test Uric Acid Level

Paired Sample T-Test Results on Uric Acid Levels Effect of Chinese Betel Leaf Stew (*Peperomia pellucida* L. Kunth.) Against Gout in Elderly Women in Karang Sawo Village RT 7/RW 2 Bongsari Village, West Semarang District, Semarang City.

Tabel 11. Uji Paired Sample T-Test

Paired Differences								
Mean		Hours Deviation	Std. Error Mean	95% Confidence Interval of the Difference		T	Df	Sig. (2-tailed)
				Lower	Upper			
Pre Test - Post Test	2.83000	0.94405	0.29853	2.15467	3.50533	9.480	9	0.000

The results obtained from the Paired Sample T-Test data for uric acid levels before and after the above treatment were known to be Sig. (2-tailed) values of $P = 0.000$ ($P < 0.05$) then H_0 was rejected and H_1 was accepted, meaning that there was an influence or significant difference between the groups compared, namely the administration of Chinese betel leaf decoction (*Peperomia pellucida* L.Kunth.) on the reduction of uric acid levels in elderly women in Kampung Karang Sawo RT 7/ RW 2 Bongsari Village, West Semarang District, Semarang City.

The results of the study conducted on 10 elderly women in Kampung Karang Sawo RT 7/RW 2, before the administration of boiled water of betel leaves of china obtained abnormal uric acid levels and after the administration of boiled water of 200 mL of Chinese betel leaves (equivalent to 1 cup) for 7 days was obtained from the results of most of the respondents whose uric acid levels had decreased to normal with a percentage of 100% of respondents. This shows that the administration of Chinese betel leaf decoction is effective in reducing uric acid levels in people with gout.

The selection of Chinese betel leaves as a complementary therapy was carried out in this study because it can be found easily and at no cost. In addition, Chinese betel leaves also have many beneficial properties such as analgesics, antibacterial, antipyretic, anti-inflammatory, antioxidant, antihypertensive, (Zulkarnain & Hamdayani, 2022). The anti-inflammatory properties of Chinese betel leaves can prevent inflammation in the joints so that it can reduce pain in the joints of the sufferer (Ilkafah, 2018).

Chinese betel leaves are effective in relieving pain in people with gout and arthritis because the anti-inflammatory content in the form of flavonoids and saponins stimulates the release of chemical compounds for the body's immunity so that pain subsides slowly. In addition, flavonoid compounds work by inhibiting oxidase enzymes that are processed in accelerating and aggravating inflammation in gout sufferers thereby reducing uric acid levels in the blood (Ilkafah, 2018).

In addition to many benefits for body health, betel leaves are also useful for lowering uric acid levels, but it is possible that betel leaves also have side effects if consumed in excess. The side effects of the Chinese betel leaves can cause an increase in asthma (Fauziah & Arianti, 2023).

Data on uric acid levels in people with gout in elderly women have been tested for normality. The results obtained from the normality test on the research data were obtained with a value of $P = 0.995$ for the pre-treatment group and $P = 0.370$ for the post-treatment group and the results can be interpreted that the data is normally distributed because the value is ($P > 0.05$) so that in analyzing the data using the Paired Sample T-Test to determine the effect of Chinese betel leaf decoction (*Peperomia pellucida* L.Kunth.) on uric acid of elderly women in Kampung Karang Sawo RT 7 / RW 2 Bongsari Village, West Semarang District, Semarang City.

The results obtained from the Paired Sample T-Test data for uric acid levels before and after the above treatment are known to be Sig. (2-tailed) values of $P = 0.000$ ($P < 0.05$), then it can be concluded that H_1 is accepted, namely the administration of Chinese betel leaf decoction (*Peperomia pellucida* L.Kunth.) is effective in reducing uric acid levels in elderly women in Kampung Karang Sawo RT 7 / RW 2 Bongsari Village, West Semarang District, Semarang City.

It is known that the average level of respondents uric acid levels before the administration of Chinese betel leaf water decoction was completely abnormal, which was 6.84 mg/dL and the average uric acid level after the administration of normal Chinese betel leaf decoction was 4.01 mg/dL. The decrease in uric acid levels is quite significant, this is caused by different hormones and metabolism of the respondents.

Based on table 4 of the respondent data, it is known that all respondents are female as many as 10 elderly women (100%). Although women have the hormone estrogen that helps remove uric acid, elderly women or those who have gone through menopause have the same risk factors for increased uric acid levels as men. Other risk factors also result in increased uric acid levels such as poor dietary habits, lack of exercise, aging, and metabolic syndrome (Arlinda et al., 2021).

In table 5, the data of all respondents aged 60-73 years are 10 elderly women (100%). With increased uric acid levels related to aging in the elderly because they undergo physical, mental, and psychological changes. Decreased kidney function, which means that the kidneys do not lower purine so that there is a continuous accumulation of purines, is one of the physical changes of the elderly (Bandiyah, 2009).

The urikinasase enzyme is disrupted due to the aging process, so the processing of uric acid is also inhibited, causing an increase in uric acid in the blood. The filtration process of the kidneys inhibits absorption due to decreased excretion in the renal tubules and increased reabsorption, while two-thirds of uric acid is excreted from the kidneys through urine so that decreased kidney function can inhibit the removal of uric acid (Suiraoaka, 2012). After the age of 40, the risk of gout in women increases. Women have the hormone estrogen which can help remove uric acid levels, so the risk factors for gout increase in menopausal women are the same as men (Suiraoaka, 2012).

Respondent characteristics data based on diet (table 6), from the questionnaire it was found that 7 elderly (70%) did a purine diet and 3 elderly (30%) did not diet. Regulating diet is one of the important roles in increasing uric acid levels, caused by the absorption of purine from the outside into the body. To keep uric acid levels normal, you should set a diet that does not contain purines.

Increased uric acid production is caused by excessive intake of protein- and purine-rich foods such as offal, seafood, and thick broths. The purine diet should be done naturally because if the diet is too strict and done in a fasting state, the body breaks down more muscles than fat, and more ketones are formed in the body, thus increasing uric acid levels in the blood (Suirakka, 2012).

This research is useful and can be applied to the people of Kampung Karang Sawo RT 7 RW 2 and is useful by the community in general. After giving Chinese betel leaf decoction water for 7 days to the respondents, the respondents became healthier, reduced pain in the joints, especially in the legs, sleep became restful, reduced tingling, cramps and so on.

Based on research that has been carried out for 7 days, significant results were obtained on the reduction of uric acid levels in elderly women, from the results of the study showed that 10 elderly (100%) who had abnormal uric acid became 10 elderly (100%) with normal uric acid. The administration of Chinese betel leaf decoction (*Peperomia pellucida* L. Kunth.) is effective in reducing uric acid levels in elderly women in Karang Sawo Village, RT 7, RW 2, Bongsari Village, West Semarang District, Semarang City.

This study is supported by previous research conducted by (Noer et al., 2022) with the title "Ethanol Activity Test of Chinese Betel Leaf Extract (*Peperomia pellucida* L. Kunth) on Reducing Uric Acid Levels in Rabbits (*Oryctolagus cuniculus*)". The results obtained that Chinese betel leaf ethanol extract has activity on reducing uric acid levels in rabbits, then in a study (Alfitria & Sonlimar, 2014) entitled "The Effect of Betel Leaf Extract (*Piper betle* L.) on Reducing Serum Uric Acid and Urea Levels in White Rats" the results were obtained that *P. betle* L. leaf extract and a combination of dapper extract reduced uric acid levels, So it has the potential to be a hypoglycemia material.

The obstacle in this study is the respondent's agreement that the respondent had normal uric acid at the beginning of the check, so that the sample was not used and replaced by a sample that had abnormal uric acid levels, then the results of the study with the results of the questionnaire were not appropriate, at the time of the study the sample had abnormal uric acid levels, but the questionnaire showed that the respondents did not have a history of gout.

There were limitations in the research in the researcher because the researcher could not control the activities of the respondents every day. Likewise, the researcher could not observe the respondents' diet, whether the respondents consumed foods and drinks high in purines, or even the respondents consumed vitamin C, fruits containing vitamin C and other factors agreed by the respondents and researchers during this study could affect the respondents' uric acid levels during the measurement.

CONCLUSION

The findings of this study indicated that the administration of Chinese betel leaf (*Peperomia pellucida* (L.) Kunth) decoction was associated with a reduction in mean blood uric acid levels among older women in Karang Sawo Hamlet, RT 07/RW 02, Bongsari Urban Village, West Semarang District, Semarang City, Indonesia. The mean uric acid concentration decreased from 6.84 mg/dL before the intervention to 4.01 mg/dL after the seven-day intervention, representing an absolute reduction of 2.83 mg/dL. These findings suggested that Chinese betel leaf decoction may have potential as a complementary intervention for managing

elevated uric acid levels. However, given the small sample size and the absence of a control group, the observed reduction could not be attributed conclusively to the intervention. Further controlled investigations are necessary to establish its clinical effectiveness and safety.

Future research should involve larger sample sizes, appropriate control groups, and longer intervention and follow-up periods to evaluate the effectiveness and safety of Chinese betel leaf decoction in managing hyperuricemia. Additional studies should investigate different plant parts, preparation methods, dosage regimens, and potential adverse effects, particularly among individuals with preexisting medical conditions, including asthma. Until sufficient clinical evidence is available, Chinese betel leaf decoction should not replace established medical treatments, and its use as a complementary intervention should be discussed with qualified health care professionals. The findings may serve as preliminary scientific evidence for subsequent research on plant-based complementary therapies and contribute to academic knowledge in traditional medicine and clinical health sciences.

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