Uric Acid Levels Are Lowered by Traditional Boiling Water from Leaves at Elderly Posyandu Jonggon Jaya Kutai Kartanegara

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Abstract: Purpose of study: To know that there are some benefits of some leaves (bay leaves, soursop leaves and celery leaves) which are boiled and then drunk every day to reduce uric acid levels in the body. Methodology: Quasi-Experimental Design which was carried out by Pretest–Posttest Control Group Design. The number of samples was 90 people, namely 15 people in the intervention group with boiled bay leaves, 15 people in the intervention group with boiled soursop leaves, 15 people in the intervention group with boiled celery leaves and 15 people as controls in each treatment. Data collection uses observation with the new GCU tool. Univariate and bivariate analysis with the tests used were the Paired T Test. Results: Based on the test results obtained the effect of traditional boiled water of bay leaves, soursop leaves and celery leaves to reduce uric acid levels in the blood (P value: 0.000) so that it can be stated that H0 is rejected and HA is accepted which can be said to have the effect of boiling bay leaves, soursop leaves and celery leaves on decreasing uric acid levels in the elderly Applications: Traditional boiled water of bay leaves, soursop leaves and celery leaves can be drunk to help reduce blood uric acid levels in the elderly Posyandu Jonggon Jaya Kutai Kartanegara.

Keywords: Uric Acid, Traditional Boiling Water, Elderly

1. Introduction

Elderly is defined as decline, weakness, increased susceptibility to various diseases and environmental changes, loss of mobility and dexterity, and physiological changes associated with age (Aru W, 2009). Gout is a disease that is often found in the elderly (Nurhayati, 2018)

From research that has been carried out, the incidence of uric acid, which has been reported by the World Health Organization in 2016, reaches 20% of the world's population, or around 335 million people in the world who experience Gout Arthritis. The prevalence of Gout Arthritis is 0.5% -1% of a population. Geographically, the distribution of Gout Arthritis is uneven and mostly experienced by the female sex. The age range that often experiences it is usually 45-65 years old (Cahyani et al., 2019)

Herbal medicine that is often carried out in Indonesian society is like consuming traditional plants that are effective in treating diseases such as gout or gout arthritis (Ndede et al., 2019).

One of them is bay leaves (Ningtiyas & Ramadhian, 2016) soursop leaves (Nursoleha et al., 2019) and celery leaves (Usman et al., 2018). which is boiled and drunk every day which can lower uric acid in the blood.

Based on previous research, it is proven that the content in bay leaves is highly recommended for hyperuricemia sufferers (Ningtiyas & Ramadhian, 2016). Soursop leaves contain antioxidants which can inhibit the enzyme xhantine oxidase to oxidize hypoxhantine to

xhantine which then becomes uric acid (Sangging, PRAH, & Utama, 2017). The results of the analysis show that giving celery infusion containing flavonoids, 3-n butylphthalide (3nB), epigenin, apiin, alkaloids, tannins, and saponins has a significant effect on reducing uric acid levels in gout arthritis sufferers ((Djunaedy. Edy. Yulianti, S. dan Rinata, 2013)

2. Materials and Methods

The method used is Quasi-Experimental with Pretest – Posttest Control Group Design. The population is elderly respondents who have gout at the Jonggon Jaya Kutai Kartanegara Elderly Health Center as many as 120 patients out of a total of 301 patients at the Jonggon Jaya Elderly Posyandu. Samples were taken by means of probability sampling with the type of simple random sampling and based on the type of experimental research, the researchers used 90 respondents with 15 interventions giving boiled bay leaves, 15 interventions giving soursop leaf decoction. 15 interventions giving boiled celery leaves and 15 controls. The research instrument used observation sheets, stationery, 3 in 1 GCU measurement tools, digital scales, measuring cups and boiling equipment. This study received an ethical eligibility approval letter from the health research ethics commission, Faculty of Medicine, University of Mulawarman number 72/KEPK-FK/VIII/2021. Univariate analysis by presenting the characteristics of respondents and variables and for bivariate tests using the Paired T Test.

3. Results and Discussion

3.1 Subsection Univariate Analysis of Characteristics

3.1.1 Age

Table 1 Frequency Distribution Based on Age Respondents at Jonggon Jaya Kutai Kartanegara Elderly Posyandu in 2021

	Age	Frequency	%
	46-59	22	48.9
Intervention	60-74	23	51.1
	46-59	19	42.2
Control	60-74	26	57.8
	Total	45	100

Table 1 shows that most of the intervention and control groups were in the 60-74 year category, namely 23 respondents (51.1%) and 26 respondents (57.8%).

3.1.2 Gender

Table 2 Frequency Distribution Based On Gender Respondents at Jonggon Jaya Kutai Kartanegara Elderly Posyandu in 2021

	Gender	Frequency	%
	Male	14	31.1
Intervention	Female	31	68.9
	Male	11	24.4

Control	Female	34	75.5
	Total	45	100

Table 2 above shows the results that in the intervention and control groups the majority were female, namely 31 respondents (68.9%) and 34 respondents (75.5%)

3.2. Univariate Analysis of Uric Acid Levels in the Intervention and Control Groups
3.2.1. Descriptive Data of Uric Acid Levels before Intervention and Control Groups

Table 3 Descriptive Analysis of Uric Acid Levels before Intervention in the Bay leaf water Intervention and the Control Group at Jonggon Jaya Kutai Kartanegara Elderly Posyandu in 2021

	Mean	Median	SD	Min-Maks
Pre Intervention	9.693	9.400	2.1546	6.2-13.4
Pre Control	8,247	7.800	1.9493	6.2-13.1

Table 4 Descriptive Analysis of Uric Acid Levels before Intervention in the Soursop Leaf Water Intervention Group and the Control Group at Jonggon Jaya Kutai Kartanegara Elderly Posyandu in 2021 (n1:n2=15)

	Mean	Median	SD	Min-Maks
Pre Intervention	8.9533	8.400	1.75535	7.00-12.70
Pre Control	9.3867	8.900	1.52356	6.90-12.70

Table 5 Descriptive Analysis of Uric Acid Levels before Intervention in the Celery Leaf Water Intervention and the Control Group at Jonggon Jaya Kutai Kartanegara Elderly Posyandu in 2021 (n1:n2=15)

	Mean	Median	SD	Min-Maks
Pre Intervention	9.920	9.700	1.6467	7.8-13.4
Pre Control	7.953	7.800	1.2176	6.3-10.5

Data collection was carried out on the first day. Table 3 above illustrates the mean value of uric acid levels before the bay leaf intervention was 9,693, the median value was 9,400 in the control group, the mean value was 8,247, the median value was 7,800. Table 4. The results of examining the mean value of uric acid levels before the soursop leaf intervention was 8.9533, the median value was 8.400 in the control group, the mean value was 9.3867, the median value was 8.900. Table 5. The results of examining the mean value of uric acid levels before the intervention in celery leaves was 9,920, the median value was 9,700 in the control group, the mean value was 7,953, the median value was 7,800

3.2.2. Descriptive Data on Uric Acid Levels after Intervention and Control

Tabel 6 Descriptive Analysis Uric Acid Levels After Intervention in The Bay Leaf Decoction Water Intervention and the Control Group at Jonggon Jaya Kutai Kartanegara Elderly Posyandu in 2021 (n1:n2=15)

	Mean	Median	SD	Min-Maks
Post. Intervention	6.533	6.600	0.8926	4.9-8.5
Post Control	8,480	7.900	1,8610	6.2-12.9

Table 7 Descriptive Analysis Uric Acid Level After Intervention in the Soursop Leaf Water Intervention and the Control Group at Jonggon Jaya Kutai Kartanegara Elderly Posyandu in 2021 (n1:n2=15)

	Mean	Median	SD	Min-Maks
Post. Intervention	6.0733	6.000	0.76762	5.00-7.80
Post Control	9.1333	9.000	1.43062	6.50-12.10

Table 8 Descriptive Analysis of Uric Acid Levels After Intervention in the Celery Leaf Water Intervention Group and the Control Group at Jonggon Jaya Kutai Kartanegara Elderly Posyandu in 2021 (n1:n2=15)

	Mean	Median	SD	Min-Maks
Post. Intervention	5.367	5.200	1.3367	3.4-8.9
Post Control	8.147	8.200	1.0013	6.1-9.8

Collection is done on the last day or the seventh day. Table 6 above shows the mean value of uric acid levels after the bay leaf intervention was 6,533, the median value was 6,600 in the control group, the mean value was 8,480, the median value was 7,900. Table 7 above shows the mean value of uric acid levels after the soursop leaf intervention was 6.0733, the median value was 6.000 in the control group the mean value was 9.1333, the median value was 9.000. Table 8 above shows the mean value of uric acid levels after the soursop leaf intervention was 5,367, the median value was 5,200 in the control group, the mean value was 8,147, the median value was 8,200.

3.3. Bivariate Analysis

3.3.1.Results of measurements before and after the intervention in the intervention (given bay leaf boiled water) and control (without being given bay leaf boiled water)

Table 9 Results of measurements before and after the intervention in the intervention (given bay leaf boiled water) and control (without being given bay leaf boiled water)

	Pre	Post	Difference	95% CI	t	df	p Value
Pre-Post Intervention	9.693	6.533	3.160	1.9103 - 4.4097	5.423	14	0.000*
Pre-Post Control	8.247	8.480	-0.233	-0.5044 - 0.0377	-1.846	14	0.086

Table 9 above describes the mean in the intervention group before the action was 9.693 and after was 6.533 and the difference from the mean was 3.160, the interval coefficient was 1.9103 to 4.4097. It is also known that the t count is 5,423 > t table, which is 2,145 and the P value results show a result of 0,000 <0.05 so the conclusion from the results of the Paired T Test is that there is an effect of boiled bay leaf water on decreasing uric acid levels in the blood at the Jonggon

Jaya Elderly Posyandu Kutai Kartanegara. In the control group as a comparison with no bay leaves, the mean on the first day was 8.247 and on the first day it was 8.480 and the difference from the mean was -233 with an interval coefficient of -0.5044 to 0.0377. It is also known that the t count is -1.846 > t table which is 2.145 and the P value results: 0.086 <0.05, it is concluded that the Paired test shows that there is no decrease in uric acid levels in the blood at the Jonggon Jaya Elderly Posyandu Kutai Kartanegara.

The results of this study are supported by a theory that explains the benefits of bay leaves themselves, where according to (Trubus, 2009) that bay leaves are very useful for treating joint pain due to hyperuricemia. The compounds in it are very effective in reducing uric acid levels. The same opinion was explained by (Herliana, 2013), the properties contained in these leaves can inhibit the formation of uric acid because it is excrete d through urine, besides that anti-pain is also present in the bay leaf which reduces pain in sufferers who drink the decoction of the leaves.

Acute arthritis can heal by itself without treatment, but it takes quite a long time, about 10-14 days (Ningtiyas & Ramadhian, 2016). People who are sick can use water boiled bay leaves as traditional medicine. Apart from that, this disease can also be overcome by keeping the food eaten, which is low in purine content and increasing drinking. Another way of prevention is to reduce it by modifying your lifestyle by managing healthy food and getting used to drinking 2 liters of water a day to maintain kidney health. The same thing was stated by researchers (Ruoff & Edwards, 2016) who stated that the right diet to prevent gout would gradually restore this disease. According to the assumption that researchers can overcome this disease by adjusting lifestyle, utilizing natural plants that are around us (Back to nature) using medical drugs.

Table 9 shows the mean score of the intervention group, namely 9,693, and that of the control group, 8,247. The difference is 1.466 where the estimation results are in the range of 0.0900-0.0907. The test results showed that there was no significant difference between the intervention group and the control before giving the bay leaf drink (p>α), namely 0.064 > 0.05. After the intervention in the treatment group the mean value was 6,533. and in the control is 8,480, with a difference of 1,947, the estimate with a range is 3.0383-0.8551. The results of the mean difference test (p>α) were 0.001 <0.05, it was concluded that the differences between the two groups illustrated that by giving bay leaf boiled water to hyperuricemia patients there was a significant decrease in uric acid levels, compared to hyperuricemia patients who did not given boiled bay leaf water, even though the two groups had been educated by the same researchers to keep their food from being high in purines by explaining the types of foods high in purines and the impact of foods high in purines on increasing uric acid levels.

In line with research conducted by (Setianingrum et al., 2019), which explained that of the 18 respondents in the intervention group who drank boiled bay leaves, almost all of them, namely 14 respondents (77.8%) had uric acid levels down and 4 respondents had uric acid levels up. Whereas in the control who did not drink boiled bay leaves, almost all of the 18 respondents, namely 15 respondents (83.3%) who rose and 3 respondents who fell. Hyperuricemia is known

by abnormal uric acid levels in the blood, which are obtained from unhealthy eating patterns, for example, often eating fried foods, nuts excessively (Ningtiyas & Ramadhian, 2016)

The buildup of these crystals makes the joints painful. To overcome this, various types of plants can be used, one of which is bay leaf (Syzygium polyanthum Wight) (Ningtiyas & Ramadhian, 2016). This leaf is believed to be able to reduce blood uric acid, because it contains various compounds that can provide healing to sufferers, one of which is the antioxidants present in flavonoid compounds (Usman et al., 2018)(Kaurinovic & Vastag, 2019)

The researcher's assumption in this case is that bay leaves are very effective in reducing uric acid levels in the blood because they contain tannins, flavonoids, saponins, triterpenes, polyphenols, alkaloids, and essential oils. In Indonesia, this plant is easy to find and not difficult to cultivate as a non-pharmacological agent for diseases, one of which is hyperuricemia. It is suggested to health workers that not all people know about the benefits of bay leaves as a non-pharmacological drug for hyperuricemia, so it is very important to educate people with hyperuricemia to use them in their daily lives.

3.3.2. Results of measurements before and after the intervention (given soursop leaf boiled water) and control (without soursop leaf boiled water)

Table 10. Results of measurements before and after the intervention (given soursop leaf boiled water) and control (without soursop leaf boiled water)

| | Mean | | | | | | |
	Pre	Post	Difference	95% CI	t	df	p Value
Pre-Post Intervention	8.953	6.073	2.8800	2.0723 - 3.6877	7.647	14	0 .000
Pre-Post Control	8.775	9.133	-3.587	-1.6849 - 9.675	-0.580	14	0 .571

In table 10. It was found that the average uric acid level during the pre test was 8.953 mg/dl while the average uric acid level during the post test was 6.073 mg/dl, meaning that the average uric acid level during pre test is higher than the average uric acid level at the time of the post test. It can be seen that the t value for the assumed equal variances is 7,647 with a significant probability of 0.000, which means less than <0.05.

The results of this study are in line with research conducted by Ilkafah (2017) concerning the Effectiveness of Soursop Leaves in Reducing Uric Acid Values and Pain Complaints in Gout Sufferers in Tamalanrea Village, Makassar, the results of his research in the group given soursop leaves resulted in a decrease. The results of this study are also supported by the theory that changes in blood uric acid levels in soursop leaf water are affected by the acetogenin content and flavonoid compounds. Acetogenin itself can act as an antioxidant which can reduce the formation of uric acid through inhibition of the xanthine oxidase enzyme. While the content of flavonoid compounds itself has a mechanism similar to allopurinol, namely by inhibiting the xanthine oxidase enzyme which plays a role in the process of changing hypoxanthine to xanthine

and finally to uric acid. This is also supported by the results of research from Setyarini (2018) which states that decoction of soursop leaves is effective in reducing uric acid levels in the blood.

The conclusion of this study shows that there is a difference in uric acid levels after soursop leaf water decoction therapy. Based on the analysis, the study showed that after being given soursop leaf decoction therapy, there was a decrease in uric acid levels between before and after the soursop leaf decoction therapy. From table 10 it can be seen that the t value for the assumed equal variance is 7,647 with a significant probability of 0.000, meaning less than <0.05. So it can be concluded that there is a significant difference between the average uric acid level of the intervention group and the average uric acid level of the control group. Based on the results of research conducted soursop leaf boiled water therapy proved effective because it contains ingredients that affect uric acid levels. So that people with high uric acid require therapy by giving soursop leaf water decoction to reduce uric acid levels.

3.3.3. Results of measurements before and after the intervention in the intervention (given celery leaf boiled water) and control (without being given celery leaf boiled water)

Table 11. Results of measurements before and after the intervention in the intervention (given celery leaf boiled water) and control (without being given celery leaf boiled water)

	Mean						
	Pre	Post	Difference	95% CI	t	df	p Value
Pre-Post Intervention	9.92	5.37	4.55	3.613-5.494	10.387	14	0.000
Pre-Post Control	7.95	8.15	-0.19	-0.433-0.047	-1.728	14	0.106

Table 11 above shows that the mean in the group before the intervention was 9.92 and after the intervention was 5.37, the mean difference before and after being given celery leaf boiled water in the intervention group was 4.55 with a confidence interval of 3.613 to 5.494. and t count is 10,387. In the results of the p value showing 0.000, it can be concluded that there was an effect before and after being given celery leaf boiled water on a decrease in uric acid levels in the Jonggon Jaya Elderly Health Center, Kutai Kartanegara. In the control group on the first day the mean was 7.95 and on the seventh day 8.15 the difference was -0.19 and the confidence interval was -0.433 to 0.047 and the t count was -1.728 and the p value showed 0.106 which is smaller than 0.05 so it can be concluded that the test results The paired t-test showed that there was no decrease in uric acid levels in the control group at the Jonggon Jaya elderly Posyandu Kutai Kartanegara. This is in line with Lestari et al (2018) regarding Celery (Apium graveolens L) as an Anti Hyperuricemia in Patients with Gout Arthritis. From the results of the analysis it is known that the administration of celery infusion containing flavonoids, 3-n butylphthalide (3nB), epigenin, apiin, alkaloids, tannins, and saponins has a significant effect on reducing uric acid levels in patients with gout arthritis. Based on the analysis of test results

from several studies looking at the effect of celery stew on uric acid levels, it is proven that celery leaf decoction has effectiveness and potential as an anti hyperuricemia in gout arthritis sufferers and can be used as a traditional alternative therapy to lower uric acid levels. Compounds contained in celery can provide benefits in reducing symptoms and uric acid levels with its ability to inhibit factors that play a role in the occurrence of gout arthritis.

Based on the description above, the researcher assumes that someone who has reached the age of pre-elderly or the elderly has a greater risk of developing gout because the organs in the elderly have begun to decline, so it is necessary to monitor uric acid by giving boiled celery leaves as a therapy so that uric acid levels in the elderly are not tall. And from the results of the study it can be concluded that there is an effect of giving boiled celery leaves to reducing uric acid levels in the elderly.

4. Conclusion

From the description and discussion above, it can be concluded that the statistical test results obtained a p value of $0.000 < 0.05$ so that it can be stated that H0 is rejected and HA is accepted, which can be said to have the effect of boiling the effect of boiling water on bay leaves, soursop leaves and celery leaves on decreasing levels of uric acid in the elderly.

Conflict of Interest
All Authors declare no conflict of interest and agree with the content of the manuscript.

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