



THE EFFECT OF GIVING SNAKE FRUIT SEED AND SOURSOP LEAF DRINK ON REDUCING URIC ACID LEVELS IN MENOPAUSED ELDERLY WITH HYPERURICEMIA AT JAJAG COMMUNITY HEALTH CENTER

Dwi Merlisa Arsyilia¹, Efina Amanda², Alfian Abdul Rajab³

¹ S1 Nutrition Study Program, STIKES Banyuwangi, Indonesia.

² Lecturer of S1 Nutrition Study Program, STIKES Banyuwangi, Indonesia.

³ Lecturer of S1 Nutrition Study Program, STIKES Banyuwangi, Indonesia.

Email: dwi.202009001@stikesbanyuwangi.ac.id¹, Amanda.efina03@gmail.com²,
alfianabdulrajab@gmail.com³

ABSTRACT

*Background:*Hyperuricemia is a condition influenced by high levels of uric acid in the blood. The prevalence of hyperuricemia occurrence ranked second among diseases related to elderly health problems in Indonesia. This study aimed to discover the effect of giving snake fruit seed and soursop leaves drinks on reducing uric acid levels in menopausal elderly with hyperuricemia at Jajag community health center. *Research method:*This study is quantitative research with quasi-experimental design and using nonequivalent control group design. It used purposive sampling technique with population of 90 people and sample of 50 respondents which is then divided into a control group to receive mineral water and a treatment group to receive a drink made of snake fruit seeds and soursop leaves, totaling 100 ml with 4 grams of snake fruit seed powder and 3 grams of soursop leaf powder for 7 days. *Research results:*Mann Whitney test obtained a value of pre-test results was 0.001 ($\alpha < 0.05$), and of the post-test results was 0.000 ($\alpha < 0.05$). Both of which mean there was a significant difference between the uric acid levels of the pre-test and post-test. Wilcoxon test showed a value of control group was 0.000 ($\alpha < 0.05$) and of treatment group was 0.000 ($\alpha < 0.05$), which mean there was effect of drinking snake fruit seeds and soursop leaves on reducing uric acid levels. *Conclusion:*There is effect of giving drinks of snake fruit seeds and soursop leaves on uric acid levels.

Keywords: Hyperuricemia; Elderly; Snake fruit seeds; Soursop leaves

ABSTRACT

Latar belakang : Hiperurisemia merupakan suatu kondisi yang dipengaruhi oleh kadar asam urat yang tinggi dalam darah dengan prevalensi kejadian menduduki urutan kedua penyakit yang berkaitan dengan masalah kesehatan lansia di Indonesia. Tujuan penelitian ini adalah pengaruh pemberian minuman biji salak dan daun sirsak terhadap penurunan kadar asam urat pada lansia menopause dengan hiperurisemia di Puskesmas Jajag. *Metode penelitian :* Jenis penelitian kuantitatif dengan desain quasi experimental design dan menggunakan rancangan nonequivalent control group design. Teknik sampling yang digunakan purposive sampling dengan populasi 90 orang dan sampel sebanyak 50 responden yang kemudian dibagi menjadi

kelompok kontrol dengan pemberian air mineral dan kelompok perlakuan dengan minuman biji salak dan daun sirsak sebanyak 100 ml dengan berat 4 gram bubuk biji salak dan 3 gram bubuk daun sirsak selama 7 hari. Hasil penelitian : uji mann whitney didapatkan hasil pre test $\alpha = 0,001$ ($\alpha < 0.05$), dan hasil post test $\alpha = 0,000$ ($\alpha < 0.05$) yang keduanya mengartikan adanya perbedaan yang bermakna antara nilai kadar asam urat pre test dan post test. Uji wilcoxon menunjukkan kelompok kontrol $\alpha = 0,000$ ($\alpha < 0.05$) dan kelompok perlakuan yakni $\alpha = 0,000$ ($\alpha < 0.05$) yang artinya ada pengaruh antara minuman biji salak dan daun sirsak terhadap penurunan kadar asam urat. Kesimpulan : Terdapat pengaruh dari pemberian minuman biji salak dan daun sirsak terhadap kadar asam urat.

Keywords: Hiperurisemia; Lansia; Biji Salak; Daun Sirsak

INTRODUCTION

Hyperuricemia is a condition influenced by high levels of uric acid in the blood (Badri, 2020). Uric acid can be produced from purine residues, where the main source of purine in the body comes from food resulting from the breakdown of nucleoproteins as well as from the metabolism of deoxyribonucleic acid (DNA) in the body (Pratiwi, 2022). WHO stated that Indonesia has the highest incidence of hyperuricemia in Asia, with a prevalence of 18% (Urbaningrum et al., 2023). Riskesdas data in 2018 proved that the prevalence of hyperuricemia in Indonesia has increased again, namely to 18.9% and in East Java to 26.1%. The prevalence of hyperuricemia based on data from the Banyuwangi Health Office for the period January to July 2023 shows that the total number of elderly hyperuricemia sufferers is 6.2%. Data obtained from the Banyuwangi Health Office shows that the elderly with the highest hyperuricemia in Banyuwangi Regency are in the Jajag Community Health Centre work area with a prevalence of 8.5%.

Data from the results of a preliminary study at the Jajag Community Health Centre strengthens the statement that the prevalence of hyperuricemia in the Jajag Community Health Centre is 8.5% of elderly people who are then grouped by gender. In the group of elderly men with hyperuricemia, there are 4.2% of the total prevalence of hyperuricemia in the elderly in the Jajag Community Health Centre work area, while in the group of elderly women with hyperuricemia, there are 4.3% of the total prevalence of hyperuricemia in the elderly in the Jajag Community Health Centre work area. These data show that hyperuricemia sufferers based on gender are more common in elderly women compared to elderly men (Primary data, 2023).

Metabolism of uric acid levels in elderly women has the potential to experience higher cases of hyperuricemia than men, this is due to the presence of oestrogen hormones in women that are uricosuric, which trigger excess uric acid excretion through urine (Marlina, 2022). Preventive efforts in dealing with gout are chosen with this non-pharmacological method because, in addition to being able to reduce the side effects of using chemical drugs, it is also an easier alternative to apply (Nursafitri, 2022).

One of the basic ingredients that can be a solution for non-pharmacological therapy is snake fruit seeds and soursop leaves. Tannin and alkaloid compounds from snake fruit seeds (I Wayan Karta et al., 2015) are combined with secondary metabolite compounds of phenol, flavonoids, saponins, and acetogenins from soursop leaves, which function as anti-inflammatories, analgesics, and antioxidants to control excessive uric acid levels (Hasmila, 2019). So that the two ingredients will be combined to complement each other's compound content needed to make alternative drinks for people with hyperuricemia as a form of non-

pharmacological therapy innovation for elderly women with menopause. So the purpose of this study was to determine the effect of providing interventions of snake seed and soursop leaf drinks on reducing uric acid levels in elderly menopausal women with hyperuricemia at the Jajag Community Health Centre.

METHODS

The research that has passed the ethical review with the number 197/01/KEPK-STIKESBWI/VII/2024 was conducted in the Jajag Health Centre area from June to July 2024. The research design used in this study was a quasi-experimental study with a nonequivalent control group design. Sampling used a purposive sampling method where the selection of samples depended on the choice of the researcher or evaluator regarding the most effective and representative sample. The population of elderly hyperuricemic mothers in the Jajag Community Health Centre area was 90 people, then a sample of 50 respondents was taken, which was divided into a control group with the provision of mineral water and a treatment group with the provision of 100 ml of snake fruit seed and soursop leaf drinks with a weight of 4 grams of snake fruit seed powder and 3 grams of soursop leaf powder for 7 days. Before being given as an intervention, the snake fruit seed and soursop leaf drinks were tested for their bioactive compound content at the Central Laboratory of the University of Muhammadiyah Malang and the Batu Herbal Materia Medica Laboratory UPT.

Data collection during the research was conducted by gathering elderly individuals who met the inclusion criteria and then dividing them into two groups, namely the control group and the treatment group. The next step taken is a pre-test by measuring uric acid levels using the Easy Touch GCU meter device and then recording the measurement results in the observation sheet, as well as conducting an interview to fill out the SQ-FFQ form. In the next stage, the research samples were treated (the control group samples were given mineral water, while the treatment group samples were given a drink made from salak seeds and soursop leaves, 100 ml per day) for seven consecutive days. Control of variable intake during the study was conducted by examining the 24-hour food recall form given daily after the intervention to record the sample's eating history. After being treated for seven days, the researchers will conduct a post-test by measuring uric acid levels again using the Easy Touch GCU meter device, and the measurement results will be recorded in the observation sheet. After observing the provision of intervention drinks, data analysis was carried out using Mann-Whitney and Wilcoxon statistical analysis.

RESULTS

The independent variables observed in this study were snake fruit seed and soursop leaf drinks, to see if there was an influence on the dependent variable, namely uric acid levels.

Table 1. Qualitative test results of bioactive compounds of snake fruit seed and soursop leaf drinks

Test Sample	Test Parameters	
	Alkaloids	Tannins
Snake fruit seed drink and soursop leaves	Positive (+)	Positive (+)

Source: *primary data, 2023*

In testing bioactive compounds using the Harborne, J.B., 1996 coloring and precipitation method, a sample of 20 ml is needed for the solution sample to then obtain the results listed in table 1, it is known that snake fruit seed and soursop leaf drinks positively contain alkaloid and tannin compounds. While the flavonoid compounds are known by quantitative tests using the spectrophotometry method. The results obtained are presented in the following table.

Table 2. Quantitative test results of bioactive compounds of snake fruit seed and soursop leaf drinks

Test Sample	Flavonoid (ppm)
Snake fruit seed drink and soursop leaves	63,0735

Source: *primary data, 2023*

In testing flavonoid compounds using the spectrophotometry method, a sample of snake fruit seed and soursop leaf drink solution of 100 ml/wet sample is required. Based on table 2, it is known that this snake fruit seed and soursop leaf drink contains 63.0735 ppm of flavonoid compounds per 100 ml.

Table 3. Results of uric acid level examination in the elderly in the Jajag Community Health Center area.

Group	Category (person)				
	Normal (<6,0)	I (6,0 – 8,9)	II (9,0 - 11,9)	III (≥12,0)	
Pre test	Control	0	19	5	1
	Treatment	0	16	7	2
Post test	Control	0	18	6	1
	Treatment	1	24	0	0

Source: *primary data, 2023*

Based on table 3 above, it is known that the results of the examination carried out in the Jajag Community Health Center area using the GCU meter easy touch tool obtained the highest uric acid levels in the range of 6.0 mg/dL to 8.9 mg/dL.

Table 4. The effect of snake fruit seed and soursop leaf drinks on reducing uric acid levels in postmenopausal elderly with hyperuricemia

Group	Mean ± SD (mg/dL)		P ¹
	Pre test	Post test	
Control	7.5200 ± 1.74881	7.9800 ± 1.80924	0.000
Treatment	8.8520 ± 1.74335	6.6280 ± 0.58774	0.000
P ²³	0.001	0.000	

Source: *primary data, 2023*

Based on table 4. it is known that the SPSS output results in analyzing differences using the Mann Whitney statistical test are due to the data not being normally distributed and heterogeneous. The Mann Whitney test results obtained pre-test results with a value of $\alpha < 0.05$ which can be concluded that before treatment there was a significant difference between the treatment group and the control group. While the post-test results with the Mann Whitney test on the examination of uric acid levels obtained a value of $\alpha < 0.05$ which concluded that after treatment was carried out on the treatment group and the control group there was a significant difference $\alpha < 0.05$.

The Wilcoxon test was conducted to determine the effect of giving snake fruit and soursop leaf drinks on uric acid levels given to the elderly with menopause in the Jajag Community Health Center area. The Wilcoxon test results in the control group showed a value of $\alpha < 0.05$ which concluded that after treatment was carried out on the control group there was a significant effect. Meanwhile, the results of the Wilcoxon test in the treatment group showed the same results, namely $\alpha < 0.05$, which concluded that after the treatment was carried out, there was also a significant influence on the treatment group.

DISCUSSION

The results of the test of the compound content in snake fruit seed and soursop leaf drinks when reviewed based on the Harborne, J.B., 1996 coloring and precipitation test method stated that snake fruit seed and soursop leaf drink contains alkaloids and tannins, and the test using the spectrophotometry method, it is known that the snake fruit seed and soursop leaf drink has a flavonoid content of 63.0735 ppm per 100 ml. Research by I Wayan Karta (2015), shows that snake fruit seeds contain flavonoids, tannins and a little alkaloids. The same is true for soursop leaves, which in the results of observations by Feby Purnamasari's research, (2021) showed that by comparing several solvents through maceration, the bioactive compound content in soursop leaf extract was obtained alkaloids, tannins, saponins, steroids, and flavonoids. Working like allopurinol, it is very important to know the amount of flavonoids in a serving of this snake fruit seed and soursop leaf drink. Flavonoid compounds function as competitive inhibitors that compete with xanthine substrates to bind to the active site of the enzyme. Flavonoids act as competitive inhibitors in inhibiting xanthine oxidase activity because the C-5 and C-7 dihydroxyl groups in ring A have groups similar to xanthine oxidase. Research conducted by Cos et al. in 1998, found that flavonoids (especially flavones and flavonols) have

double bonds at the C2 and C3 atoms of ring C. As a result, ring B is coplanar with ring A due to conjugation. This results in increased inhibition of xanthine against oxidase activity (Raharjo, 2022).

The results of the uric acid level examination before being given treatment in the study conducted in the Jajag Community Health Center area showed that uric acid levels in the elderly were in the range of 6.0 to > 12.0 which was detected as high on the easy touch GCU meter device. This figure can be interpreted as high for the size of uric acid in women. This is based on the user manual / guidebook of the easy touch GCU meter which lists the parameters of normal uric acid levels for women, namely between 2 - 6 mg / dL (176.58 - 530.4 μ mol / L) and is reinforced by the results of previous research by Dian Faqih, et al (2023) which stated that blood and urine test results are the best way to find out uric acid levels. Normal levels for men are 3.4-7.0 mg / dl, for women are 2.4-6.0 mg / dl, and for children are 2.8-4.0 mg / dl. Meanwhile, the results of the uric acid level examination carried out after being given treatment were divided into two groups, namely the control group and the treatment group. In the control group, the results of the uric acid level examination after seven days of monitoring showed results that were not much different from the examination before monitoring. The results obtained tended to show an increase from before. However, in the treatment group, different results were obtained, out of 25 people who were intervened, there was one person whose uric acid level was below the limit of 6.0 mg/dL, which indicates that the uric acid level is normal.

The results of the statistical analysis in this study are presented in table 4. regarding the effect of snake fruit seed and soursop leaf drinks on reducing uric acid levels in postmenopausal elderly with hyperuricemia. This hyperuricemia occurs when uric acid levels in the body exceed normal limits due to increased uric acid production, decreased excretion, or both occurring simultaneously (Velda Maylica Miracle Sitanggang, et al., 2023). Uric acid production is caused by things related to dietary patterns obtained by consuming foods high in purines such as alcohol (especially beer), bacon, beef, lamb, veal, venison, organ meats, and certain fish and shellfish (anchovies, cod, tuna, sardines, herring, mussels, shrimp, lobster, codfish, scallops, trout, and haddock). There is also a result of hepatic fructose metabolism which can produce uric acid through the aldolase reductase pathway which causes hyperuricemia. Other causes are due to purine metabolism errors such as hypoxanthine-guanine phosphoribosyl-transferase deficiency (HPRT or HGPRT), or too much phosphoribosylpyrophosphate synthase (PRPP) activity. Likewise, high cell damage or turnover occurs due to lymphoproliferative disease, myeloproliferative disease, polycythemia vera, Paget's disease, psoriasis, tumor lysis, hemolysis, rhabdomyolysis, heavy exercise,

chemotherapy (George C, Leslie SW, Minter DA. 2023). While decreased uric acid excretion can be caused by age and gender factors. Females are more susceptible to hyperuricemia after menopause, then the risk increases at the age of 45 with decreased estrogen levels because it can affect uricosuric. As a result, young women rarely experience hyperuricemia. Increasing age in both men and women can be a significant risk factor (Fidayanti, 2019).

Based on the results of the Mann Whitney statistical test, the pre-test results (before treatment) were obtained with a value of $\alpha = 0.001$ ($\alpha < 0.05$), while the post-test results (after treatment) were obtained with a value of $\alpha = 0.000$ ($\alpha < 0.05$). The Mann Whitney statistical results show that if the α value is less than the critical limit of 0.05, there is a significant difference between the pre-test and post-test uric acid levels, thus there is a difference in the average or mean between the pre-test and post-test uric acid levels. This shows that the first research hypothesis stating that there is an effect of snake fruit and soursop leaf drinks on reducing uric acid levels is accepted. The Wilcoxon test is used to determine whether there is a difference in the average between two paired samples, namely the same sample but has two data. In this study, the second research hypothesis is proven by using pre-test and post-test uric acid level data, which come from the same sample, which means that the two samples are paired. Therefore, to test the second hypothesis that corresponds to the type of paired sample, namely the Wilcoxon test. This is because the Wilcoxon test is included in the category of nonparametric statistics and has a requirement that the data is not normally distributed (Rahmadhani, et al., 2023).

Through the Wilcoxon test, it can be seen that there are 25 people from the control group who get a post-test score greater than the pre-test. This shows that 25 people from the control group experienced an increase in uric acid levels from before the review. While in the treatment group, it is known that the pre-test results are higher than the post-test results. These results indicate that the treatment group gave positive results, namely a decrease in uric acid levels after being given the intervention. Table 4 presents data that shows a significant difference between the two samples, namely the pre-test and post-test data of the control group and the treatment group. If the Sig. value < 0.05 then the difference is very significant between the two data. Based on the data, it is known that the control group value $\alpha = 0.000$ ($\alpha < 0.05$) which means that there is an influence between the pre-test and post-test values. Likewise with the value of the treatment group, namely $\alpha = 0.000$ ($\alpha < 0.05$) which can also be concluded that there is an influence between the pre-test and post-test values. This can happen because the treatment given is a drink of snake fruit seeds and soursop leaves, which has been tested for its bioactive compound content with the results of the drink of snake fruit seeds and soursop leaves

containing flavonoids, alkaloids, and tannins. A study conducted by Putri and Santoso in 2019 on snake fruit seeds showed that there was flavonoid and tannin content, which was indicated by a yellow flavonoid test and a black tannin test. In the alkaloid test, drops of 2N sulfuric acid were added to the test solution and then shaken, so that no alkaloid compounds were found. This finding is reinforced by previous research by I Wayan Karta (2015), which found that snake fruit seeds contain flavonoids, tannins, and a little alkaloids. Just like soursop leaves, research by Feby Purnamasari (2021) showed that, by comparing various solvents by maceration, the content of bioactive compounds in soursop leaf extract consists of alkaloids, tannins, saponins, steroids, and flavonoids. Flavonoids stop the function of xanthine oxidase and xanthine dehydrogenase, which act as anti-inflammatories and stop the production of uric acid (Abdulkadir et al., 2022). The antioxidant activity of tannin compounds inhibits the xanthine oxidase enzyme, which can reduce excess uric acid production and prevent oxidative stress (Julians et al., 2021).

CONCLUSION

Giving snake fruit seed and soursop leaf drinks showed an effect on uric acid levels as seen from the p-value ($\alpha < 0.05$) which indicates that the hypothesis is accepted. Suggestions for further research are that the results of this study can be used as a reference in developing further research and in further research, quantitative further tests can be carried out to review the content of other bioactive compounds such as alkaloids and tannins that can be beneficial for health.

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