

The effect of giving soursop (*Annona Muricata* Linn) juice with bay leaf (*Eugenia Polyantha* Wight) decoction on uric acid levels in pre-elderly women in the working area of the sukamerindu public health center, Bengkulu city

Abstract

Gout is a term used for a group of metabolic disorders characterized by increased concentrations of uric acid (*hyperuricemia*). This study aimed to determine the effect of soursop (*Annona muricata linn*) juice with bay leaf (*Eugenia polyantha wight*) Decoction on uric acid levels in pre-elderly women. This type of research is a quasi-experimental design with a non-equivalent control group design. The subjects of this study were pre-elderly women with uric acid levels >6 mg/dl divided into 2 treatment groups, namely the intervention group and the control group. The dose given was 500 ml/day. The intervention was carried out for 7 days. The measurement of uric acid levels using the easytouch glucose, cholesterol and uric acid tool, blood was taken the day before the intervention and on the 8th day after the intervention. Normality test was conducted by using Shapiro-wilk. Statistical analysis used paired test and independent t-test. The result shows that the average uric acid level before the intervention was 6.913 mg/dl and after the intervention was 6.088 mg/dl with p value =0.00. It can be concluded that there was an effect of giving soursop juice with boiled bay leaves on uric acid levels in pre-elderly women in the working area.

Keywords: soursop juice, bay leaf, uric acid level, pre elderly women

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Introduction

Elderly is seen as a period of biological degeneration accompanied by various kinds of diseases along with the aging process. The decline in the ability of various organs, functions and body systems is natural or physiological in nature. This decrease is caused by a reduce in the number and ability of body cells. In general, signs of the aging process begin to appear from the age of 45 and will cause problems around the age of 60. Broadly speaking, the diseases commonly experienced by the elderly are infectious diseases including influenza, diarrhea, pneumonia, and urinary tract infections, as well as non-communicable/degenerative diseases including diabetes mellitus, coronary heart disease, hypertension, and joint disease.¹

The research has demonstrated these activities, including anti-cancer, anti-convulsant, anti-rheumatic, anti-parasitic, anti-malarial, hepatoprotective, and anti-diabetic activities. The fruit is used as a natural remedy for rheumatic pain, neuralgia, arthritis, diarrhea, dysentery, fever, malaria, parasites, rheumatism, itching and intestinal worms, and is eaten to facilitate breastfeeding after childbirth. The leaves are used to treat cystitis, diabetes, headaches and insomnia.²

Soursop fruit is rich in vitamin C content so it is very good for increasing endurance. The vitamin C content in soursop juice functions as an antioxidant and has the ability to inhibit the production of the enzyme xanthine oxidase. Soursop juice can inhibit the process of uric acid formation in the body.³ Bay leaf is one that can be used to reduce uric acid levels. Essential oils, tannins, polyphenols, alkaloids, and flavonoids are chemical contents found in this plant.⁴ The leaves, bark, roots and fruit of this plant can be used as medicine, with side effects as diuretics and analgesics.⁵

The impact in the combination of soursop juice with bay leaf Decoction on reducing uric acid levels has never been known. Therefore, the authors are interested in examining the effect of giving soursop juice with bay leaf Decoction on reducing uric acid levels in pre-elderly women in working area of the Sukamerindu Public Health Centre.

Methods

The design used in this study was quasi experiment with nonequivalent control group design. The treatment given was soursop juice as much as 500 ml for 7 days while the control group was given orange juice as much as 500 ml for 7 days⁶ in pre-elderly women in the Sukamerindu Public Health Centre area. The samples in this study were pre-elderly women with uric acid levels > 6 mg/dl. The technique used in sampling is purposive sampling, which means that samples are taken based on predetermined inclusion and exclusion criteria.

Besar sampel yang diperlukan dalam penelitian ini menggunakan rumus The number of samples needed in this research employed the formula (Lemeshow et al,1997):

$$\left[\frac{\alpha 2 \left(ZI - \frac{\alpha}{2} + ZI - \beta \right) 2}{(\mu 1 - \mu 2) 2} \right]$$

Note:

N = Quantity of samples

$$ZI - \frac{\alpha}{2} = \text{normal deviation standard for } \alpha \text{ (deviation standard } \alpha = 0.05 = 1.96)$$

$$ZI - \beta = \text{normal deviation standard for } \beta \text{ (deviation standard } \beta = 1.64)$$

μ_1 = mean value for post group obtained from literature

μ_2 = mean value for pre group obtained from literature

α = Estimation of deviation standard from the gap of *mean pretest* dan *posttest* based on literature (Ndede,2019)

Therefore the number of obtained samples:

$$N = \left[\frac{(1.24)^2(1.96 + 1.64)^2}{(7.97 - 9.18)^2} \right]$$

$$= \frac{19,93}{1,46}$$

$$= 13,65$$

$$= 14 \text{ sample}$$

$$N = 14 + 10\%$$

$$= 16 \text{ sample}$$

The research location was carried out in the Sukamerindu Public Health Center area conducted on May 24 -June 31, 2021. The research implementation stage begins with data collection starting from April 6, 2021, research data taken in the form of primary data, namely the identity of the respondents and uric acid. Respondent identity includes name, date of birth, age, and address data collected through interviews, while uric acid data is taken using the easy touch GCU tool. Furthermore, the intervention group was given soursop juice with bay leaf Decoction which was given as much as 500 ml and the control group was given orange water as much as 500 ml for 7 consecutive days.

During the intervention, purine and pyrimidine intake was also observed using 3 x 24-hour food recall during the intervention. After the intervention, measurements were taken again on day seven using the easy touch GCU tool.

The analysis used was uni-variate analysis for numeric data used to find the mean, median, maximum and minimum values as well as standard deviation. For bivariate analysis using an independent t-test which aims to determine the difference between two groups of data.

Results and discussion

Hasil statistik gambaran asam urat sebelum dan sesudah diberikan intervensi dapat dilihat pada grafik di bawah ini.

The picture of statistical results of the uric acid before and after the intervention can be seen in the graph below Figure 1.

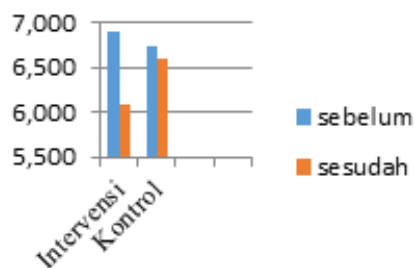


Figure 1 The decrease of uric acid levels on intervention and control groups.

Based on the graph above, it shows that in the intervention group the average uric acid levels before and after decreased by a mean difference of 0.7 mg/dl, while in the control group the average uric acid levels before and after decreased by a mean difference of 0.1 mg/dl.

Based on the results of the analysis in the intervention group, the maximum value of uric acid levels before being given the juice is 7.5 mg/dl and the minimum value is 6.5 mg/dl while the maximum value of uric acid levels after being given the juice is 6.4 mg/dl and the minimum value is 5.8 mg/dl and obtained a mean difference Mean ± SD 0.825 ± 2.732 with p value = 0.000 (<0.05) which means there is an effect of giving soursop juice with bay leaf Decoction on uric acid levels in pre-elderly women.

In the control group, the maximum value of uric acid levels before being given orange juice is 7.5 mg/dl and the minimum value is 6.3 mg/dl while uric acid levels after being given orange juice, the maximum value is 7.1 mg/dl and the minimum value is 6.2 mg/dl and the mean difference is Mean ±SD 0.136 ± 0.1661. The table of statistical analysis results can be seen in Table 1.

Table 1 The effect of giving soursop juice with bay leaf decoction on uric acid levels of pre-elderly women in working area of the sukamerindu public health center, Bengkulu city

Urid acid level	Intervention Mean±SD	Control Mean±SD	P value
Bofore	6.913±0.2941	6.738±0.4704	0.149
Post	6.088±0.178	6.606±0.3043	0
P value	0	0.006	

Based on table 1, it can be seen that in the intervention group there is a significant effect on uric acid before and after intervention with a mean difference of Mean ± SD 0.88 ± 0.178 with p value = 0.000 (<0.05) which means there is an effect of giving soursop juice with bay leaf Decoction on uric acid levels in pre-elderly women. And there is a significant difference between the intervention group and the control group with a p value = 0.000 (<0.05) which means there is a difference between the intervention group and the control group.

Giving soursop juice with 500 ml of bay leaf Decoction with 126.5 mg of vitamin C for 7 days has an effect on reducing uric acid levels. This is because consumption of food sources of vitamin C can increase uric acid excretion, thereby reducing the formation of uric acid crystals. Vitamin C can inhibit the reabsorption of uric acid by the kidneys, thereby increasing the speed of kidney work to excrete uric acid through urine.⁷

The mechanism of soursop on uric acid levels is that there is vitamin C content in soursop juice which functions as an antioxidant that can reduce the formation of uric acid by inhibiting the production of Xanthine Oxidase Enzyme. Xanthine oxidase enzyme functions to catalyze the change of purine into uric acid. By inhibiting the xanthine oxidase enzyme, the formation of uric acid will be inhibited as well. In addition to antioxidant content, soursop contains Isquinolin Alkaloid compounds that function as analgesics that can relieve pain due to gout.⁸

The high capacity of soursop in reducing uric acid levels may be related to the presence of polyphenolic compounds and vitamin C which act as xanthine oxidase inhibitors and antioxidant agents.⁹ Xanthine oxidase is a type of enzyme that catalyzes the oxidation of hypoxanthine to xanthine and further catalyzes the oxidation of xanthine to uric acid, and is considered an important biological source of superoxide radicals.¹⁰ Many studies have confirmed the positive

relationship between polyphenols and vitamin C as antioxidant agents and decreased uric acid levels in patients with hyperuricemia.¹¹

Limiting high purine consumption or by doing a low purine diet will be able to prevent or reduce uric acid levels in the blood so that there is a decrease in pain scale.¹² Several studies have also shown the same thing that patients with gout obtained a significant relationship between high purine source foods and joint pain in patients with gouty arthritis.¹³

Various studies have been conducted to find out the actual content of bay leaves (*Syzygium polyanthum*) scientifically, namely the discovery of several ingredients in bay leaves such as flavonoids, tannins, and essential oils with citral oil content and eugenol which are thought to be able to reduce uric acid in the blood. Essential oil contained in bay leaves of 0.05 percent is antibacterial and has a savory aroma.⁴

Other elements also found in bay leaves are citral, eugenol, tannins and flavonoids. The flavonoid content in bay leaves also has activity as an antioxidant that can inhibit the work of the enzyme xanthine oxidase so that the formation of uric acid is inhibited. In addition, bay leaves are also useful as urinators (diuretics) and pain relievers (analgesics). As a diuretic, bay leaves are able to increase urine production so that it can reduce blood uric acid levels.⁴

The decrease in uric acid levels in this research sample is in line with¹⁴ research on the provision of soursop juice to elderly uric acid levels where the average uric acid level of intervention group respondents before being given soursop juice was 8.550 mg/dl and the average uric acid level of respondents in the control group was 8.370 mg/dl, and the average uric acid level of respondents in the intervention group after being given soursop juice was 5.680 mg/dl and the average uric acid level of respondents in the control group was 6.830 mg/dl. This study is also in line with Marlinda's research (2009) that giving bay leaf boiled water as much as 100 cc for 1 week reduces uric acid levels by an average of 2.3 mg/dl.¹⁵⁻¹⁹

Conclusion

The mean uric acid level in the intervention group before being given soursop juice with bay leaf Decoction was 6.913 mg/dl and the mean uric acid level in the control group was 6.738. The mean uric acid level in the intervention group after being given soursop juice with bay leaf Decoction was 6.088, while the uric acid level in the control group was 6.606 mg/dl. There is an effect of giving soursop juice with bay leaf Decoction on uric acid levels of pre-elderly women in the working area of the Sukamerindu Public Health Center, Bengkulu City, which means that giving soursop juice with added bay leaf decoction can be a non-pharmacological treatment for people with gout.

Acknowledgments

None.

Conflicts of interest

The authors declare that there are no conflicts of interest.

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