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ORIGINAL RESEARCH

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## EFFECT OF FRUIT DECOCTION OF PHALERIA MACROCARPA ON URIC ACID LEVELS IN ELDERLY

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### Abstract

**Background:** The incidence of gout is rising both in the developed and developing countries not only in the elderly but also in young adults. Thus, the effort to reduce its incidence is necessary.

**Objective:** To determine the effect of fruit decoction of phaleria macrocarpha on the levels of uric acid in the elderly.

**Methods:** This was a pre-experimental study with pretest and posttest design. This study was conducted at Sei Semayang Village North Sumatra from April to May 2017. There were 10 elderly selected using purposive sampling. Urid acid levels were measured using monitoring system of Easy Touch GCU. Independent t-test were used for data analysis.

**Results:** Findings of this study showed that there was a significant difference in the mean value of the levels of uric acid before and after given fruit decoction of phaleria macrocarpa ( $p=0.004$ ).

**Conclusion:** There was a significant effect of fruit decoction of phaleria macrocarpa to decrease the level of uric acid in elderly. It is suggested that fruit decoctions of phaleria macrocarpa can be one of alternative therapies to prevent the increase of uric acid.

**Keywords:** uric acid, phaleria macrocarpa, elderly

## INTRODUCTION

Uric acid is a waste (breakdown) of a substance of purine which is one of the substances nucleic acids contained in the nucleus of body cells. There are two sources of the formation of purines that are produced by the body and obtained from food intake. Purines derived from food is the result of the breakdown of nucleoprotein food made by the wall of the gastrointestinal tract, so consuming foods high in purines will increase the uric acid blood called hyperuricemia. Hyperuricemia is a situation which there is increased levels of uric acid above normal. In most epidemiological studies, hyperuricemia is if uric acid levels in serum of adults more than 7.0 mg/dl and more than 6.0 mg/dl in women

([Damayanti, 2012](#); [Novianti, 2015](#)). Previous research ([Willy, 2012](#)) estimated that 230 million people in the world suffering of the uric acid disease. The prevalence of gout in the world varied and its incidence increased especially in developed countries. According to WHO, high uric acid in the developed countries because the majority of people are consuming food containing fat and high levels of purines ([Willy, 2012](#)).

The prevalence of gout in Indonesia is also moving up from year to year. Many of the patients are in the group of elderly as well as in the group of productive age. The prevalence of gout based on the doctor's diagnosis and

symptoms increased along with increasing age, but tends to decrease at the age of  $\geq 55$  years. Generally, uric acid in males tends to be higher than in women, and tends to be higher in urban areas than in the countryside ([BADULESCU, Macovei, & REZUS, 2014](#); [Haryono & Setianingsih, 2013](#)). Thus, the effort to reduce the prevalence of gout is needed.

Indonesia is famous with its traditional herbal medicine to deal with any kind of diseases, including for the treatment of gout. As we know that herbal medicine is affordable and easily to find, thus this study aims to provide an alternative therapy to decrease uric acid levels with the consumption of phaleria macrocarpa fruit. According to previous study, phaleria macrocarpa fruit is able to lower the uric acid levels ([N. Fariza et al., 2014](#)). Supported by another study stated that consuming stew of phaleria macrocarpa fruit could reduce uric acid from 9 mg/dl to 7.3 mg/dl ([Junaidi, 2012](#)). The water extract of the decoction of the fruit of phaleria macrocarpa is able to fight cancer, tumors, eczema, diabetes mellitus, hypertension, hepatitis, rheumatism, gout, heart disease and kidney disorders ([I. N. Fariza et al., 2012](#)). Therefore this study aims to examine the effect of water decoction of phaleria macrocarpa fruit to decrease uric acid levels in elderly.

## METHODS

### *Study design*

This was a pre-experimental study with pretest and posttest design. This study was conducted at Sei Semayang Village North Sumatra from April to May 2017. There were 10 elderly selected using purposive sampling who had a history of hiperuricemia. It is assured that each respondent had not received any treatment for their uric acid levels.

### *Intervention*

The intervention was done by the researcher by giving phaleria macrocarpa fruit with a weight of 5 gr per pack. The fruit decoction was used and each respondent drank 250 ml of

water decoction of the fruit per day with the period of 3 x 250 ml per day in  $\frac{1}{2}$  hour before eating (morning, noon and night) for 3 consecutive days. Uric acid levels were measured everyday before and after given the intervention.

### *Instrument*

Uric acid levels were measured using monitoring system of Easy Touch GCU. Uric acid level is still being debated but in many countries, 7 mg/dL for men and 6 mg/dL for women are accepted as the upper limits of normal, and approximately 2 mg/dL for men and women is the lower limit. However, these values have been adopted for individuals without clinical evidence of gout. Studies proposed that a threshold of  $<6.0$  mg/dL should be adopted as the normal reference value for uric acid based not on its physiological role and pathophysiological involvement in human disease, not on the distribution of its circulating levels in the general population, as this value is also adopted in this study ([Ekpenyong & Akpan, 2014](#)).

### *Ethical consideration*

This research has been approved by the Research Ethics Committee of the Government Health Polytechnic of Medan with approval number: 065/KEPK/POLTEKESMEDAN/2017. Each respondent signed an informed consent and was explained about the objective and procedures of the study.

### *Data analysis*

The Independent t-test was used to measure the effect of water decoction of the phaleria macrocarpa fruit on uric acid levels in the elderly.

## RESULTS

Table 1 shows that the characteristics of the respondents are in the group age of 61-65 years (40%), 55-60 years (30%) and 66-70 years (30%). The majority of respondents is females (60%) followed by males (40%).

**Tabel 1** Characteristics of respondents based on age and gender (N= 10)

Characteristics of respondents		
<b>Age</b>	N	%
55 - 60	3	30
61 - 65	4	40
66 - 70	3	30
<b>Gender</b>	N	%
Male	4	40
Female	6	60
Total	10	100

**Tabel 2** Effect of water decoction of phaleria macrocarpa fruit to decrease uric acid levels in the elderly using independent t-test (N=10)

Day	Intervention	N	Mean	SD	Std. Error Mean	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
										Lower	Upper
1	Before	10	9.940	1.422	.450	22.102	9	.001	9.94	8.92	10.96
	After	10	9.290	1.482	.469	19.822	9	.001	9.29	8.23	10.35
2	Before	10	8.950	1.440	.455	19.653	9	.000	8.95	7.92	9.98
	After	10	8.310	1.466	.463	17.922	9	.000	8.31	7.26	9.35
3	Before	10	7.980	1.852	.585	13.620	9	.000	7.98	6.65	9.30
	After	10	7.470	1.449	.458	16.292	9	.000	7.47	6.43	8.50

Table 2 shows that there was a significant difference in uric acid levels before and after given intervention from the first until the third day, with  $p$ -value=0.00 ( $<0.05$ ). The mean of uric acid levels on the third day before intervention was 7.98 and after intervention was 7.47.

## DISCUSSION

Findings of this study reveal that there was statistically significant difference of the mean of uric acid levels from the first day to the third day. There was a significant decrease of uric acid level before and after given intervention with  $p$ -value .001 ( $< .05$ ), which indicated that there was a significant effect of water decoction of phaleria macrocarpa fruit on the decrease of uric acid levels in the elderly.

These results are in line with the previous study ([Setyarini & Kusmiwiyati, 2017](#)) which indicated that there was a significant influence

of administration of water decoction of phaleria macrocarpa fruit to decrease the blood uric acid levels in menopause women with  $p$ -value .001 ( $p<.005$ ). Similar with another study ([Sutrisna, 2010](#)) showed a significant influence of consumption the water decoction of phaleria macrocarpa to decrease uric acid levels in elderly (women and men), and it also revealed that 87.5% of respondents had decreased levels of uric acid in postmenopausal women ([Setyarini & Kusmiwiyati, 2017](#)).

This study employed an extraction method with the phalerin concentration using water as solvent, which was optimum when operating at 1:20 (g/ml) solid-to-solvent ratio, particle size of  $<250 \mu\text{m}$  and temperature of  $70^\circ\text{C}$  ([N. Fariza et al., 2014](#)).

The findings of this study provides the insight of knowledge about the effect of effect of water decoction of phaleria macrocarpa fruit to decrease uric acid levels in elderly. However, as this study was just a pre-experimental study,

some of biases might occur. Thus, further study is needed to have a control group to reduce the bias. Bigger sample size is also necessary to generalize the effect of the study.

## CONCLUSION

Based on these results, it can be concluded that there is a significant effect of water decoction of phaleria macrocarpa fruit to decrease uric acid levels in the elderly at Sei Semayang Sunggal of North Sumatra with p-value .00. Therefore, it is recommended to the elderly to consume water decoction of Phaleria macrocarpa fruit to reduce their levels of uric acid in the blood.

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