JOURNAL OF CURRENT RESEARCH IN FOOD SCIENCE

E-ISSN: 2709-9385
P-ISSN: 2709-9377
JCRFS 2023; 4(1): 30-34

www.foodresearchjournal.com
Received: 08-10-2022
Accepted: 16-11-2022

Muzakar
Department of Nutrition, Politeknik Kementerian Kesehatan Palembang, Palembang, Indonesia

Susyani
Department of Nutrition, Politeknik Kementerian Kesehatan Palembang, Palembang, Indonesia

Listrianah
Department of Dental Health, Politeknik Kementerian Kesehatan Palembang, Palembang, Indonesia

Anggun Taristi
Department of Nutrition, Politeknik Kementerian Kesehatan Palembang, Palembang, Indonesia

Sriwiyanti
Department of Nutrition, Politeknik Kementerian Kesehatan Palembang, Palembang, Indonesia

Hendawati
Department of Midwifery, Politeknik Kementerian Kesehatan Palembang, Palembang, Indonesia

Corresponding Author:
Muzakar
Department of Nutrition, Politeknik Kementerian Kesehatan Palembang, Palembang, Indonesia

Soursop pudding with boiled moringa leaves as a healthy snack can lower uric acid levels in hyperuricemia

Muzakar, Susyani, Listrianah, Anggun Taristi, Sriwiyanti and Hendawati

Abstract
Hyperuricemia is a condition of increasing uric acid levels which exceed than normal values. The normal value of uric acid levels for women is 6,0 mg/dL and 7,0 mg/dL for men. The prevalence of hyperuricemia in Indonesia in 2018 was 7,3%, in South Sumatra 6,48%, and in Pagar Alam City 6,34%. Uric acid levels can be affected by food intake. Foods that are low in purines, high in vitamin C and flavonoids can make uric acid become lower levels. The type of this research is a quantitative research with a quasi-experimental design. Data analysis used paired sample t-test, independent sample t-test, and multiple linear regression. The results of the independent sample t-test obtained p-value = 0.004 which indicates that there is an effect of giving soursop pudding with Moringa leaf stew on reducing uric acid levels in hyperuricemic patients. The decrease in uric acid levels is also influenced by the intake of purines and vitamin C. Soursop pudding with Moringa leaf stew which contain vitamin C and flavonoids can reduce uric acid levels in hyperuricemic patients.

Keywords: Hyperuricemia, uric acid levels, soursop pudding with Moringa leaf stew

Introduction
Hyperuricemia is a condition when the uric acid level is higher than the normal value (Anastesya in Sholihah, 2014) [27]. Normal uric acid levels for women are 6,0 mg/dL and for men 7,0 mg/dL (Noormindhawati, 2013) [21]. Risk factors cause increased uric acid levels, namely consuming foods high in purines, age, obesity, drugs, excessive alcohol consumption, and lack of physical activity (Andry *et al*., 2009 in Sholihah, 2014) [3, 27].
According to World Health Organization (2017) [32], the prevalence of gout globally is 34,2%. According to results Basic Health Research (2018) [24], the average prevalence of hyperuricemia in Indonesia based on doctor's diagnosis is 7,3%, with the highest prevalence in Aceh with a percentage of 13,3% and the lowest in West Sulawesi province at 3,2%. The prevalence of hyperuricemia based on age group, the highest prevalence was found at >75 years old, which was 18,9%. The highest prevalence by gender was in women, namely 8,5%. For housing, the prevalence in rural areas is higher at 7,8%. Meanwhile, according to the level of education, the highest prevalence is found in the group that has not/never been to school with a percentage of 13,7%, and the highest prevalence for this type of work is found in farmers/farm laborers with a ratio of 9,90%.
The prevalence of hyperuricemia in South Sumatra, based on the results of a doctor's diagnosis in 2018, was 6,48%, and in the city of Pagar Alam, it was 6,34% (Health Research and Development Agency, 2019).
Data from laboratory examination of uric acid levels at the Sidorejo Public Health Center, Pagar Alam City in 2020, it was found that 347 people out of 595 people who examined uric acid levels had uric acid levels that exceeded normal limits.
Treatment of hyperuricemia can be done pharmacologically and non- pharmacologically. There are two main goals in the pharmacological treatment of hyperuricemia, namely overcoming pain and controlling and stabilizing blood uric acid levels in the body (Sutanto, 2013) [30]. Non-pharmacological treatment can use natural ingredients such as soursop and Moringa leaves.
Soursop (*Annona Muricata* L) has a soft fruit texture with a sour and sweet taste, the fruit's skin is green, while the flesh is white, and has a distinctive aroma (Hermawan & Laksono, 2013) [9].

Soursop fruit contains micronutrients, namely vitamin C. Vitamin C in soursop can provide an antioxidant effect and help inhibit the production of xanthine oxidase, so that soursop can hinder the formation of uric acid in the body. Isoquinoline alkaloid compounds contained in soursop can provide analgesic function and anti-inflammatory effects (Noormindhawati, 2013 in Yantina, 2016) [21, 33].

According to research conducted by Sani & Afni (2019) [35], with a target of 30 older people. Before giving soursop juice, the respondents average uric acid level was 9,213 mg/dL. Meanwhile, the intermediate uric acid level after administration of soursop juice was 6,807 mg/dL. The decrease in the respondent's uric acid level was 2,406 mg/dL. This proves that there is an effect of giving soursop juice on the reduction in the respondent's uric acid level.

Besides soursop, one of the plants that have a therapeutic effect in reducing blood uric acid levels is Moringa leaf. Moringa leaves function as antioxidants, anti-inflammatory, and others (Suphachai, 2014) [29].

One of the compounds contained in the Moringa plant is flavonoids. The type of flavonoid present in Moringa leaves quercetin which is helpful in reducing blood uric acid levels by inhibiting the work of xanthine oxidase, which converts hypoxanthine into xanthine and then into uric acid enzymes (Rahmawati & Kusumastuti, 2015) [23].

According to Krisnadi (2015), Moringa leaves contain various kinds of nutrients that are pretty high such as carbohydrates, protein, calcium, potassium, iron, vitamin C, and vitamin A. Moringa leaves have vitamin C, which is seven times greater than oranges (Rockwood *et al*., 2013) [25].

Research result Dewi (2020) [5], with the title the effect of giving Moringa leaf flour pudding on uric acid levels in the elderly and the elderly in the working area of the Rawa Tembaga Public Health Center, it was found that the substitution of 5% Moringa leaf flour with seven days of the administration, it was able to reduce 1.3 mg/dL uric acid levels in the intervention group. The results of statistical tests obtained p=0.000, so it can be concluded that there is an effect of giving Moringa leaf flour pudding on reducing uric acid levels of respondents.

Based on the description above, the hyperuricemia rate in South Sumatra is 6.48%, while the prevalence of hyperuricemia in Pagar Alam is 6.34%. According to data on the prevalence of hyperuricemia, which is still high in the city of Pagar Alam, and the availability of natural ingredients that have the potential to help reduce uric acid levels, such as in soursop there is vitamin C which is useful as an antioxidant and can become an inhibitor in the production of xanthine oxidase enzymes and Moringa leaves contains flavonoids, which is helpful as a competitive inhibitor of hypoxanthine and xanthine. Which can reduce the production of uric acid in the body. So, researchers are interested in making a study of the effectiveness of soursop pudding from Moringa leaf decoction on reducing uric acid levels in patients with hyperuricemia.

Material and Methods

This research was conducted in 2 stages. The first stage was carried out using a completely non-factorial randomized study, the second stage was carried out using a quasi-experiment with a pre-test and post-test design with a control group. This study used two groups, namely the intervention group was given soursop pudding boiled in Moringa leaves and anti-gout drugs, while the comparison group was given anti-gout drugs.

Sampling using purposive sampling technique with Accidental Sampling technique based on specific criteria. The sample size in the study was calculated using the formula for estimating the proportion of Lemeshow (1997) [15], the results obtained as many as 60 people, with each group consisting of 30 people.

Results

Characteristics of respondents consisting of age, gender, nutritional status, and physical activity are shown in table 1; intake of nutrients (Energy, Protein, Fat, Carbohydrates, Purines, and Vitamin C) is shown in table 2; the average uric acid levels before and after treatment in the intervention and comparison groups are shown in table 3; differences in uric acid levels before and after treatment are shown in table 4; the effect of giving soursop pudding boiled in Moringa leaves shown in table 5; and the results of the multiple linear regression hypothesis testing are shown in table 6.

Table 1: Characteristics Respondent

Characteristics of Respondents	Intervention		Comparator	
	n	%	n	%
Age				
45-60 years	24	80	22	73.3
61-75 years old	6	20	8	26.7
Gender				
Man	11	36.7	13	43.3
Woman	19	63.3	17	56.7
Nutritional status				
Normal	17	56.7	19	63.3
Overweight	12	40	11	36.7
Obesity	1	3.3	0	0
Physical Activity				
Low	2	6.7	2	6.7
Currently	23	76.7	22	73.3
Heavy	5	16.7	6	20

Table 2: Average Intake Nutrients

	n	%	n	%
Energy				
Not enough	0	0	0	0
Well	30	100	30	100
Protein				
Not enough	1	3.3	14	46.7
Well	29	96.7	16	53.3
Fat				
Not enough	16	53.3	11	36.7
Well	14	46.7	19	63.3
Carbohydrate				
Not enough	0	0	0	0
Well	30	100	30	100
Purine				
Well	25	83.3	6	20
More	5	16.7	24	80
Vitamin C				
Not enough	0	0	30	100
Well	30	100	0	0

Table 3: Average levels gout

Group	Uric Acid Level		
	Min	max	Mean
Before			
Intervention	6.2	9.90	7.8
Comparison	6.2	10.4	7.8
After			
Intervention	5	9.10	6.9
Comparison	5.5	10.4	7.4

Table 4: Difference average uric acid level before and after treatment

Group	Initial Mean ± SD	Final Mean ± SD	p-value
Intervention	7.8±1.02	6.9±1.03	0.000
Comparison	7.8±1.26	7.3±1.41	0.000

Table 5: The effect of giving soursop pudding decoction of leaves moringa against decline uric acid level

Group		p-value
Intervention	0.3800	0.004
Comparison		

Table 6: Multiple linear regression t-test

Independent Variable	Unstandardized Coefficients	t	Sig
	B		
(Constant)	2.042	3,565	0.001
Energy intake	8.184	0.198	0.844
Protein intake	0.001	0.269	0.789
Fat intake	0.001	0.455	0.651
Carbohydrate intake	0.001	0.306	0.761
Purine intake	0.015	-6,820	0.000
Vitamin C intake	0.004	3,078	0.003

Discussion

The results of research on 60 respondents with gout mainly were found in respondents in the 45-60 year age category, the average gender was female, the average nutritional status was expected, and had moderate physical activity.

The incidence of hyperuricemia becomes the same between the sexes after the age of 60 years (Weaver, AL 2008 in Firdayanti *et al*., 2019) [31, 7]. However, women will experience an increased risk of hyperuricemia after female menopause at the age of 45 years due to a decrease in the hormone estrogen. This is the cause why gout is rare in young women (Roddy E & Doherty, 2010 in Firdayanti *et al*., 2019) [26, 7].

This research is in line with research Lioso *et al*., (2015) [16], which found that the proportion of respondents with high uric acid levels was more at the age of >40 years compared to those who had the age of <40 years. The results of statistical tests showed p- value = 0.001, so it was concluded that there was a relationship between age and uric acid levels.

This study shows that the respondents are more dominant female gender. This occurs when the female hormone estrogen decreases, causing uric acid levels to increase. The hormone estrogen has one of the most significant components called estradiol. Estradiol has a role in helping the process of removing uric acid through the kidneys, and then being excreted in the urine. Decreased estradiol levels occur when women enter menopause and this is the cause of increased uric acid levels (Mumford *et al*., 2013) [19].

This research agrees with the study by Mahendra & Arum (2021), with the title The Effect of Giving Cherry Fruit Juice on Uric Acid Levels in Hyperuricemia Patients, it was found that from the two research groups, both intervention, and comparison, most the respondents were women.

High uric acid levels in respondents with normal nutritional status were caused by high purine intake. High purine intake can also occur in respondents with more nutritional status. This situation can occur because the nutritional status does not describe the information of purines but only the intake of fat, carbohydrates, and uric acid clearance status (Ikrimah, 2020) [10].

Research conducted Fitriana (2019) [8], stated that the results of the Pearson Product Moment test obtained p=0.417 and r=0.126, so it was concluded that there was no relationship between nutritional status and uric acid levels in the elderly at Posyandu Ngaliyan Simo Boyolali.

Physical activity is an activity of moving body parts that produce energy is very important to maintain physical and mental health and can keep quality of life to stay healthy and fit. Physical activity is part of productive activities for the elderly that can have a positive impact on the body (Fajarina, 2011) [6].

This research is in line with research A'ini & Baihaqie (2021), the average respondent has moderate physical activity 71.4%. The results of the chi-square test obtained p=0.148, so it was concluded that there was no relationship between physical activity and uric acid levels in the elderly. This is also in line with research by Nursilmi (2013) [20], which states that there is no significant relationship between physical activity and uric acid levels in older women.

The results are from table 2. the average intake of energy, protein, fat, carbohydrates in each information is regular, purine intake in the intervention group is good but in the comparison group is still more, and vitamin C intake in the intervention group is good in contrast the comparison group it is less.

The results of this study indicate that the average purine intake of respondents in the intervention group before treatment was 158,7 mg/day after treatment, the purine intake of respondents became 134,3 mg/day. Meanwhile in the comparison group, the average purine intake before treatment was 160,4 mg/day after treatment the purine intake decreased to 130,3 mg/day.

Vitamin C is a micronutrient that has a role in various enzymatic and non-enzymatic reactions. Increased intake of vitamin C can help inhibit uric acid reabsorption. The process of uric acid and vitamin C absorption will be through anion exchange in the proximal renal tubule. Through its uricosuric effect, vitamin C can modulate the concentration of uric acid in the blood. The results of previous studies conducted by administering vitamin C to humans and animals were increase renal plasma flow and glomerular filtration rate, attenuate increased arterial pressure, and reduce inflammation, and oxidative stress. The study respondents' vitamin C was mostly high, namely >80

mg/day, while the normal intake was ±60 mg/day (Pursriningsih & Panunggal, 2015) [22].

This research is in line with Pursriningsih & Panunggal (2015) [22], the statistical test results of vitamin C intake had a relationship with uric acid levels (p = 0,000). Based on table 4. the test results (t-dependent) obtained p value = 0,000 in the intervention group and the comparison group p = 0,000 so that it can be concluded that there is a difference in the average uric acid levels before and after treatment in the intervention and comparison groups. To better know the level of effect of giving soursop pudding boiled in Moringa leaves, the researchers conducted an independent t-test.

Based on table 5. The results of the test (t-independent) it was found that the p-value = 0,004, which can be concluded that there is an effect of giving soursop pudding boiled with Moringa leaves on patients with hyperuricemia in the Work Area of the Sidorejo Pagar Alam Health Center.

Results of research conducted by Ladako (2020) [14], with the title the effect of giving soursop pudding with celery stew on reducing blood uric acid levels in hyperuricemic patients in the work area of the social health center, it was found that 50 grams of soursop with seven days of administration was able to reduce 0,6 mg/dL uric acid levels in the intervention group. The results of statistical tests obtained p-value = 0,044, so it can be concluded that there is an effect of giving soursop pudding boiled with celery leaves on reducing uric acid levels.

Results of research Dewi (2020) [5], with the title the effect of giving Moringa leaf flour pudding on uric acid levels in the elderly and the elderly in the working area of the Rawa Tembaga Public Health Center. The results obtained from the substitution of 5% Moringa leaf flour for seven days of administration were able to reduce 1,3 mg/dL of uric acid levels of respondents in the intervention group. The results of statistical tests showed p-value = 0,000, so it can be concluded that there is an effect of giving Moringa leaf flour pudding on reducing uric acid levels. Results from table 6. Multiple linear regression hypothesis testing. Intake that affects the intake of purines and vitamin C.

Purines are found in almost all foods that contain protein. The maximum limit of purines consumed by patients with gout is 100-150 mg/day. However, this needs to be adjusted to the level of uric acid levels of each patient (Soeroso & Algristian, 2011) [28].

Vitamin C is helpful in helping to inhibit the absorption of uric acid by the kidneys, as well as an increase the fractional clearance of uric acid in the kidneys, which will increase the rate of work of the kidneys in the process of excreting uric acid through urine, this is due to the uricosuric properties of vitamin C (Zulies & Ranggabumi, 2010 in Mahendra & Arum, 2021) [34, 18].

This study agrees with the research conducted by Listiani, (2020) [17], which states that the results of the Spearman test obtained p=0.001 so that H1 is accepted, meaning that there is a relationship between purine intake and increased blood uric acid levels in the Polindes, Kepel Village, Kare District, Madiun Regency.

This study agrees with previous research, the results of the correlation test show that there is a relationship between vitamin C intake and blood uric acid levels in women after menopause. Increased vitamin C intake from food or supplementation can increase the glomerular filtration process which can then accelerate the excretion of uric acid through urine (Kensarah & Azzeh, 2012) [12].

Conclusion

There was an effect of giving soursop pudding boiled with Moringa leaves on the decrease in uric acid levels of respondents in the intervention group with a p-value of 0,004 (α<0,005). This is because soursop pudding boiled in Moringa leaves contains vitamin C and flavonoids which can increase the glomerular filtration rate and increase the secretion of uric acid through urine.

Acknowledgement

Thank you to the Sidorejo Health Center Pagar Alam City for allowing my research.

References

1. A'ini ZF, Baihaqie AD. Analysis of consumption patterns and physical activity with uric acid levels in the elderly in Kramat Jati, East Jakarta. Sinasis (National Seminar on Science). 2021;2:177-181. http://www.proceeding.unindra.ac.id/index.php/sinasis/article/view/5335
2. Anastesya W. Arthritis of gout (Gout) and its management. Jakarta: Faculty of Medicine, Krida Wacana Christian University; c2009.
3. Andry Saryono, Arif Setyo Upoyo. Analysis of Factors Affecting Uric Acid Levels in Office Workers in Karang Turi Village, Bumiayu District, Brebes Regency. Sudirman Journal of Nursing (The Sudirman Journal of Nursing), 2009 Mar, 4(1).
4. Health Research and Development Agency. South Sumatra Province Riskesdas 2018 report. 2019;9:1-7.
5. Dewi HS. The Effect of Giving Moringa Leaf Flour Pudding on Uric Acid Levels in the Elderly and Elderly in the Work Area of the Rawa Tembaga Health Center, [Thesis], Binawan University; c2020.
6. Fajarina E. Analysis of Consumption Patterns and Activity Patterns with Uric Acid Levels in Elderly Women Participants in Elderly Empowerment in Bogor; c2011.
7. Firdayanti Susanti, Setiawan MA Differences in gender and age on uric acid levels in patients with hyperuricemia. Udayana Medical Journal. 2019;8(12):2597-8012. https://ojs.unud.ac.id
8. Fitriana L. The Relationship between Nutritional Status and Waist Circumference with Uric Acid Levels in the Elderly Posyandu in Ngaliyan Simo Boyolali Village; c2019. http://repository.itspku.ac.id/id/eprint/51%0ahttp://repository.itspku.ac.id/51/1/2015030 079.pdf
9. Hermawan GP, Laksono H. Extraction of Soursop Leaves (*Annona Muricata* L) Using Ethanol Solvent. Journal of Chemical and Industrial Technology. 2013;2(2);111-115.
10. Ikrimah K. The Relationship between Protein Consumption Patterns and Nutritional Status with Hyperuricemia Incidence in the Work Area of the Kampung Bali Health Center, Bengkulu City in 2020. In Bengkulu Health Polytechnic. 2020, 1(69).
11. Karuniawati B. The Effectiveness of Giving Moringa Leaf Tea on Reducing Uric Acid Levels in Adult Women. Samodra Health Journal; c2019. https://stickes-yogyakarta.e journal. id/jksi/article/view/36
12. Kensarah OA, Azzeh FS. Implementing High Vitamin C Treatments to Decrease Blood Uric Acid Levels in

Hyperuricemic Saudi Patients. Journal of America Science. 2012;8(5):462-467.
13. Krisnadi. Revised Edition March Super Nutrition Moringa; c2015. p. 1-164.
14. Ladako MZ. The Effect of Giving Soursop Pudding Celery Stew on Reducing Blood Uric Acid Levels in Hyperuricemic Patients in the Work Area of the Social Health Center. In Thesis. 2020, 21(1).
15. Lemeshow. Large Sample in Health Research. Yogyakarta: UGM; c1997.
16. Lioso JP, Sodakh RC, Ratag BT. The Relationship Between Age, Gender, And Body Mass Index With Uric Acid Levels In People Who Come To Visit The Paniki Bawah Public Health Center Manado City. Journal of Health. 2015;05(3):2-6.
17. Listiani, RFDA. The Relationship between Purine Intake and Increased Blood Uric Acid Levels in Pre-Elderly at Polindes, Kare District, Madiun Regency. Thesis. 2020;1(1):1-102.
18. Mahendra HI, Arum P. Effect of Giving Cherry Fruit Juice on Uric Acid Levels in Hyperuricemia Patients. Journal of Nutrition. 2021;10(1):1. https://doi.org/10.26714/jg.10.1.2021.1-13
19. Mumford SL, Dasharathy SS, Pollack AZ, Perkins NJ, Mattison DR, Cole SR, *et al*. Serum Uric Acid In Relation To Endogenous Reproductive Hormones During The Menstrual Cycle: Findings From The Biocycle Study. Human Reproduction (Oxford, England). 2013;28(7):1853-1862. https://doi.org/10.1093/humrep/det085
20. Nursilmi. Relationship between consumption patterns, nutritional status, and physical activity with uric acid levels in elderly women participating in Posbindu Sinarsari. Thesis; c2013.
21. Noormindhawati Lely. Sakti Juice Eradicates Gout. Prosperous Library; c2013.
22. Pursriningsih SS, Panunggal B. The Relationship of Purine Intake, Vitamin C and Physical Activity to Uric Acid Levels In Adolescent Boys. Journal of Nutrition College. 2015;4(1):24-29. https://doi.org/10.14710/jnc.v4i1.8617
23. Rahmawati R, Kusumastuti AC. Effect of infusion of Moringa Leaves (Moringa Oleifera Lamk) on Uric Acid Levels in White Rats (*Rattus Norvegicus*). Journal of Nutrition College. 2015;4(4):593-598. https://doi.org/10.14710/jnc.v4i4.10167
24. Basic Health Research. Report_Nasional_Rkd2018_Final.Pdf. In the Agency for Health Research and Development; c2018 p. 221-222. http://labdata.litbang.kemkes.go.id/images/download/laporan/rkd/2018/laporan_nasiona l_rkd2018_final.pdf
25. Rockwood JL, Anderson BG, Casamatta DA. Potential Uses Of Moringa Oleifera And An Examination Of Antibiotic Efficacy Conferred By M. Oleifera Seed And Leaf Extracts Using Crude Extraction Techniques Available To Underserved Indigenous Populations. International Journal of Phyto therapy Research. 2013;3(2):61-71.
26. Roddy E, Dan Doherty M. Epidemiology of Gout, Arthritis Research and Therapy Sani, FN, & Afni, ACN. Effect of Giving Soursop (*Annona Muricata* Linn) Juice on Uric Acid Levels in Elderly with Gout. Health Dynamics Journal of Midwifery and Nursing. 2010;10(2):634-645. https://doi.org/10.33859/dksm.v10i2.488
27. Sholihah FM. Diagnosis and Treatment of Gouty Arthritis. Postgraduate Medicine. 2014;5(5):386-393. https://doi.org/10.1080/00325481.1949.11693819
28. Soeroso J, Algristian H. Uric Acid. Depok Jakarta: Spreader Plusa; c2011.
29. Suphachai C. Antioxidant and Anticancer Activities of Moringa Oleifera Leaves. Journal of Medicinal Plants Research. 2014;8(7):318-325. https://doi.org/10.5897/jmpr2013.5353
30. Sutanto T. Gout Detection, Prevention, Treatment. Yogyakarta: Smart Books; c2013.
31. Weaver Al. Epidemiology Of Gout, Cleveland Clinic Journal Of Medicine. 2008;75(5):S9-S10 6.
32. World Health Organization (Who). Methods And Data Sources Global Burden Of Disease Estimates 2000-2015; c2017.
33. Yantina Y. The Effect of Soursop Juice on Reducing Uric Acid Levels. Journal of Holistic Health. 2016;10(1):32-35.
34. Zulies Ikawati, Ranggabumi NA. Intelligent in Recognizing Drugs: Yogyakarta; Canisius; c2010.
35. Sani FN, Afni AC. Pengaruh Pemberian Jus Sirsak (Annona Muricata Linn) Terhadap Kadar Asam Urat Pada Lansia Dengan Gout. Dinamika Kesehatan: Jurnal Kebidanan Dan Keperawatan. 2019 Dec 29;10(2):634-45.