Alternative Therapy of Moringa Leaves and Dates in Reducing Uric Acid Levels

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Abstract

Uric acid, both in the world and in Indonesia, is currently increasing, even at a young age who is still productive, so that it interferes with work productivity due to pain from gout. Gout therapy can be done with medical or non-medical therapy. Non-medical therapy can be carried out with alternative therapies, including the use of Moringa leaves and dates, which until now have not been widely known by the people of Indonesia, so socialization of health education is needed. This study was to determine the difference in knowledge before and after being given health education socialization of alternative gout therapy in Sokaraja District, Banyumas Regency. The method used is quasi-experimental with the control group. The research population is the entire community from the age of teenagers in the Sokaraja District, amounting to 89,184 people. The sampling technique used was random sampling with a total sample of 438 respondents which were divided into 2 groups, namely the intervention group and the control group, each with 219 respondents. The research instrument was a questionnaire. Data analysis using Wilcoxon test. Results There was a difference between the intervention group and the control group before and after the educational outreach intervention for gout alternative therapy with p value = 0.000.

Keywords: *Knowledge, Alternative Therapy, Gout.*

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A. INTRODUCTION

Uric acid is a nitrogen compound produced from purine catabolism processes both from diet and from endogenous nucleic acids, namely deoxyribonucleic acid (DNA). Uric acid is mostly excreted through the kidneys and only a small part through the gastrointestinal tract. Hyperuricemia is a level of uric acid that is too high in the body. Patients will experience gout if they experience prolonged hyperuricemia (Yao et al., 2020).

The prevalence of gout or hyperuricemia from 1990-2010 in the world has doubled in the number of sufferers (Tran & Maalouf, 2020). Meanwhile, according to WHO (World Health Organization) in 2013 the prevalence of gout in the United States was around 13.6 cases per 1000 men and 6.4% cases per 1000 women. Based on the results of a study conducted in Thailand, which was carried out from July 1999 to February 2000, from 1381 patients with gout, it was found that 18.4% of men and 7.8% of women had gout. While in China in 2011 the prevalence of increased uric acid levels was 21.6% in men and 8.6% in women (Simanullang, 2018).

Gout or hyperuricemia in Indonesia ranks second after osteoarthritis which is estimated at 1.6-13.6/100,000 people, this prevalence increases with increasing age (Daoudui et al., 2020). The prevalence of gout based on the diagnosis of Health Workers (Nakes) is the highest in Bali, namely 19.3%, followed by Aceh 18.3%, West

Java 17.5% and Papua 15.4%. Based on the prevalence of gout at the age under 34 years which is 32% and at the age above 34 years it is 68%. Of the 81% of gout sufferers in Indonesia, most sufferers have a tendency to directly consume over-the-counter pain relievers, which is 61% and 20% of those who take treatment to the doctor (Chen et al., 2019).

The human body produces uric acid as the end product of purine metabolism. Purine intake in the human body is obtained from food, both animal and vegetable sources are consumed. Uric acid mostly comes from the metabolism of endogenous purine nucleotides, Guanylic Acid (GMP), Inosinic Acid (IMP), & Adenylic Acid (AMP). The enzyme that helps in this reaction is an enzyme called xanthine oxidase. This enzyme can convert hypoxanthine and guanine into xanthine that comes from the kidneys and intestines. If there is a disturbance in the kidneys caused by high intake of purines in food, there will be an increase in uric acid in the body, especially the blood (Rodriguez et al., 2020; Faizal et al., 2019). The result of this disorder is called hyperuricemia which can trigger nephrolithiasis, and also the formation of needle-like crystals in body tissues resulting in swelling and joint pain that develops into gouty arthritis (Suhendi, Nurcahyanti, Muhtadi, & Sutrisna, 2011; Cendrianti, Muslichah, & Ulfa, 2014). Hyperuricemia is a disease that often occurs in Indonesian society. People with hyperuricemia have high uric acid levels that exceed the normal limit, namely in women more than 6 mg/dl and for men more than 7 mg/dl (Eso et al., 2014).

The results of a study found that one of the strong predictors of death due to cardiovascular damage is due to an increase in uric acid levels or hyperuricemia. The factors that are thought to influence this disease are diet, weight and lifestyle. While the risk factors that cause a person to develop gout include age, excessive intake of purine compounds through food, excessive alcohol consumption, obesity, hypertension, heart disease, certain drugs (especially diuretics) and impaired kidney function (Sutriyono et al., 2019).

One of the chemical drugs used to lower uric acid levels in the blood is allopurinol. This drug works by inhibiting the enzyme that produces it, namely the xanthine oxidase enzyme (Zhao et al., 2021). However, the use of chemical drugs also needs to be considered because it can cause problems, for example regarding the long-term effects on the health of the liver and kidneys. Therefore, now a lot of research is being done on the discovery of drugs that are derived from natural ingredients (herbs) that are not widely known.

One of the plants that is thought to have a therapeutic effect in reducing uric acid levels is Moringa leaves. This plant is widely used by the general public, especially in Indonesia. Moringa leaves are widely used as traditional medicine to cure several medical and non-medical diseases. Chemical compounds contained in Moringa leaves include tannins, steroids, triterpenoids, flavonoids, saponins, anthraquinones and alkaloids (Bassi & Fattoruso, 2020). Parashar et al. (2022) reported that Moringa leaves have anti-inflammatory, antioxidant, antitumor, antiallergic, antiviral, and antiangiogenic activities.

Some researchers state that flavonoid compounds are thought to be effective in inhibiting the formation of uric acid and have anti-inflammatory and analgesic properties. This is because flavonoids can inhibit the activity of the xanthine oxidase enzyme through interactions with these enzymes on side groups and competitive inhibition mechanisms. In vitro, several flavonoid compounds can inhibit xanthine oxidase enzymes including luteolin, apigenin, quercetin, miresetin and flavonoids (Liu et al., 2021). Flavonoids, carotenes and phenolic acids are also owned by dates which can also be used as strong antioxidants (Tsaturyan et al., 2020).

Knowledge is one of the domains of Health behavior. Knowledge is the result of "knowing", and this occurs after people have sensed certain objects. Knowledge (cognitive) is a very important domain for the formation of one's actions (over behavior). Because from experience and research it turns out that behavior based on knowledge will be more lasting than behavior that is not based on knowledge (Notoatmodjo, 2012).

Based on the results of previous research by Runtuwene, Purba R., and Kereh, (2016) stated that the lack of knowledge in gout arthritis sufferers is influenced by information. Many of the respondents have not received information about their illness. This shows that there is still a lack of knowledge in patients with gout arthritis. Another study conducted in Cianjur Regency, West Java Province, the average knowledge of uric acid in rural communities was categorized as low, namely < 60 (Rosdiana, 2018). Therefore, we need a way to increase knowledge to the public. As for one way that can be done to provide understanding to the public about alternative therapies for gout is to do it by socializing health education. Based on several studies, it is stated that through the socialization of health education will be able to increase knowledge. Based on the description above, the researcher is interested in examining the effect of leaflet method education on the level of knowledge of alternative therapies for gout in Sokaraja District, Banyumas Regency, Central Java.

B. METHOD

This research was conducted in the Sokaraja District. The research design in this study was a quasi-experimental with a pretest control group and a post-test design. This research intervention is in the form of socialization of gout and alternative therapy for gout given after the pre test, then followed by a post test to see the success of the research intervention.

The socialization of the research provided was in the form of understanding gout, normal values of uric acid, causes of gout, symptoms and signs of gout, gout drugs, alternative therapies, efficacy of Moringa leaves and efficacy of dates by giving leaflets and ending with a post test. The independent variable in this study was the socialization of gout and the dependent variable in this study was knowledge.

The population of this study is the entire community from the age of teenagers in the Sokaraja District, amounting to 89,184 people. The sample selection

technique was carried out by random sampling and to determine the number of samples in the study the researchers calculated based on the Slovin formula with 5% precision so that the number of samples was 398 with the addition of a sample reserve of 10% so that the total sample was 438 respondents who were divided into 2 groups, namely the intervention group and the intervention group, each control group 219 respondents.

The measuring instrument of the research is a questionnaire using an ordinal scale, which consists of 15 questions that have been validated with the value of Crochbach's alpha = 0.970. After that the data will be inputted and processed with the SPSS application to be analyzed using the Wilcoxon Sign Pre-Post Test with a significance value of p 0.05.

C. RESULT AND DISCUSSION

The results of research on knowledge of alternative therapies for Moringa leaves and dates in reducing uric acid levels in Sokaraja District which was carried out from March to September 2022. Data collection in this study used a knowledge level questionnaire based on a theoretical review and validity and reliability tests were carried out using Alpha Crombach's with p = 0.721. Based on the results of research using questionnaires given to respondents, the results of the characteristics of respondents are obtained as shown in table 1 below, namely:

1. Characteristics of Respondents

Respondents in this study amounted to 438 which were divided into 2 groups, namely the intervention group and the control group which in detail can be seen in table 1 below:

Table 1. Frequency Distribution of Respondents Characteristics

No	Characteristics	Intervention Group		Control Group	
		Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
1	Gender				
	Male	68	31.1	75	34.2
	Female	151	68.9	144	65.8
	Total	219	100	219	100
2	Age				
	Late adolescence (17-25 years)	28	12.8	21	9.6
	Early adulthood (26-35 years)	39	17.8	27	12.3
	Late adulthood (36-45 years)	40	18.3	39	17.8
	Early elderly (46-55 years)	30	13.7	44	20.1
	Late elderly (56-65 years)	82	37.4	88	40.2
	Total	219	100	219	100
3	Education				
	Elementary School/Junior High School	47	21.5	56	25.6
	High School	138	62.1	130	59.4
	College	36	16.4	33	15.1
	Total	219	100	219	100
4	Work				
	Laborer	14	6.4	16	7.3
	Private sector employee	18	8.2	16	7.3
	Student	21	9.6	18	30.1

Civil Servant	23	10.5	21	8.2
Farmer	21	9.6	17	9.6
Entrepreneur/Trade	74	33.8	65	7.8
Etc	48	21.9	66	29.7
Total	219	100	219	100

Source: data proceed

The results of the characteristics of respondents based on the results of the analysis in table 1 of the total number of respondents 438 consisting of the intervention group 219 respondents, where in the intervention group the female gender was 151 (68.9%), the most common age was found in the late elderly age, namely 82 (37 ,4%), the final education owned by the intervention group was mostly Senior High School equivalent, namely 138 (62.1%) while the majority of occupations were dominated by entrepreneurs, namely 74 (33.8%). Meanwhile, in the control group consisting of 219 respondents, it was found that the female sex was 144 (65.8%), with the highest age being in the late elderly age of 88 (40.2%), the last education possessed by the control group was 130 (59.5%) at the level of Senior High School Education and occupations held by the control group were dominated by others 66 (29.7%).

2. Respondent's Knowledge Level Before and After Intervention

Based on the results of the analysis on the level of knowledge of alternative therapies, Moringa leaves and dates in reducing uric acid levels of respondents before and after the intervention can be seen in table 2 below:

Table 2. Knowledge Level of Pre and Post Intervention Respondents

No	Knowledge Variable	Pre intervention		Post intervention	
		Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
1	Intervention Group				
	Good	96	43.8	213	97.3
	Enough	104	47.5	6	2.7
	Less	19	8.7	0	0
		219	100	219	100
2	Control Group				
	Good	97	44.3	95	43.4
	Enough	102	46.6	100	45.7
	Less	20	9.1	24	10.9

Source: data proceed

Based on the results of the analysis in table 2 regarding the level of knowledge of alternative therapies of Moringa leaves and dates in reducing uric acid levels of respondents before and after the intervention, there are three categories, namely good, sufficient and low in both the intervention group and the control group. In the intervention group, the level of knowledge before health socialization was mostly found in the sufficient knowledge category, namely 104 (47.5%) and after the health socialization action the respondent's knowledge level was dominated in the good category, namely 213 (97.3%). While in the control group before the health

socialization intervention was carried out the level of knowledge was in the sufficient category, namely 102 (46.6%) and after the intervention was still dominated at the level of sufficient knowledge, namely 100 (45.7%) which had no tendency to change the level category. the knowledge of the control group was either in the good, sufficient, or less category, this was due to the control group not receiving the health socialization intervention.

3. The Relationship between Knowledge of Alternative Gout Therapy Before and After Being Given Educational Outreach

The results of the analysis used to determine the relationship between knowledge of alternative gout therapy between the intervention group and the control group used Wilcoxon test analysis can be seen in Table 3 below:

Table 3. Differences in knowledge of alternative gout therapy in the intervention group and the control group

No	Variable	N	p
1	Knowledge before and after the intervention group education socialization	219	0.000
2	Knowledge before and after control group education socialization	219	0.23

Source: data proceed

Based on Table 3. it can be seen that the relationship between health socialization and the level of knowledge of alternative therapies of Moringa leaves and dates, from the results of the analysis there is a significant relationship between knowledge before and after the educational socialization of the intervention group with p = 0.00. While the relationship between knowledge before and after the control group's educational socialization was not related to the p value = 0.23.

4. Differences in the level of knowledge of alternative gout therapy before and after being given educational socialization between the intervention group and the control group

The results of the analysis used to determine the difference in knowledge of alternative gout therapy between the intervention group and the control group used Wilcoxon test analysis can be seen in the following table:

Table 4. Differences in the level of knowledge of alternative gout therapy between the intervention group and the control group

No	Variable	Z	Asymp. Sig. (2-tailed) p
1	Before and after being given health education socialization between the intervention group and the control group	-12.421	0.000

Source: data proceed

Based on Table 4, the alpha value in this study was 0.05. From the data in the table above shows the value of Asymp. Sig. (2-tailed) p 0.00 < 0.05, it can be concluded that there is a difference in the level of knowledge about alternative gout

therapy before and after being given educational outreach between the intervention group and the control group.

The results of the characteristics of the respondents based on the results of the analysis in table 1 of the total 438 respondents who were divided into 2 groups, namely the intervention group and the control group, each of which was 219 respondents for gender, most commonly found in women in both the intervention group and the control group, namely 68.9% in the intervention group while in the control group 65.8% and 31.1% men in the intervention group and 34.2% in the control group. For the age in the two groups the most found in the late elderly category (56-65 years) namely 37.4% in the intervention group while in the control group 40.2% and the least in both the intervention group and the control group was found in the adolescent age category, the final age of 17-25 years is 12.8% in the intervention group and 9.6% in the control group. As for education in the intervention group Elementary School and Junior High School 21.5%, Senior High School 62.1% and Higher Education 16.4% while in the control group who have elementary school education and Junior High School 25.6%, Senior High School 59.4% and Higher Education 15.1%. Based on the occupations held by the respondents, the results for the intervention group were found to be 6.5% laborers, 8.2% private employees, 9.6% students, 10.5% civil servants, 9.6% farmers, entrepreneurs/ trade 33.8% and others 21.9% while in the control group labor 7.3%, private employees 7.3%, students 30.1%, Civil Servants 8.2%, farmers 9, 6%, self-employed/trading 7.8% and others 29.7%.

A person's knowledge is influenced by several factors, including age, gender, education, occupation, culture, experience, interests and information. Interest in question is a high desire for something that makes you want to try and get the results of a deeper knowledge. Besides, someone can get new things that are not yet known can also be obtained from information (Husain et al., 2020; Dhanesha et al., 2018).

Education greatly affects a person in interpreting something, that is, if knowledge is low, it will be very difficult to accept new things or new knowledge, but on the contrary, if someone has higher education, someone will be able to understand more about the development of knowledge and it is easy to receive information about new values in knowledge.

According to Soares & Roscha (2021), the factors that can influence the client's knowledge to be good at diet or treatment programs, one of which is influenced by supporting factors, namely education. Thus it can be said that the patient's education level can increase knowledge if the education is an active education, namely from elementary school to college.

Based on the results of the analysis in table 2 regarding the level of knowledge of alternative therapies on gout before and after the intervention in both groups, it was found that in the intervention group before the intervention was given there were three categories, namely good knowledge 43.8%, sufficient 47.5% and less than 8.7% while after the health socialization intervention there were two

categories, namely good knowledge 97.3% and sufficient knowledge 2.7% while in the control group both before and after the intervention there were still three categories, namely before the intervention good knowledge 44.3%, enough 46, 6% and less 9.1% while after intervention in the control group in the good category 43.4%, 45.7% enough and 10.9% less.

The results of this study indicate that the two groups, both the intervention group and the control group, for the level of knowledge before the intervention both had three categories, namely good, sufficient and lacking and most were found in the sufficient category, while after the intervention there were differences in the categories in the intervention group into two categories, namely good and sufficient categories, while in the control group there are still three categories, namely good, sufficient and less. This is because the control group was not given health education socialization, while the intervention group was given health education socialization intervention about alternative gout therapy.

The results of this study are in line with research conducted in Humbang Hasundutan Regency in 2021, namely that the majority of respondents have sufficient knowledge about gout, as many as 20 people (57.1%). Due to the lack of health education carried out by health workers, which causes the elderly to not know information about gout (Humbang Hasundutan District Government, 2021). The results of research conducted in Kerambitan District in 2018, that the level of knowledge of the elderly about gout, the majority have moderate knowledge of 35 respondents (61.40%). The results of research conducted at the Pancur Batu Public Health Center in 2019, obtained from 41 respondents with the level of knowledge of the elderly about gout, the majority had sufficient knowledge of 24 (58.5%) (Runtuwene et al., 2016). While the results of research by Singh et al. (2019), it was found that the level of knowledge of the elderly about gout was good for 25 people (64.1%).

Sufficient knowledge can also be influenced by a lack of awareness of information about health, health issues, and also the best health solutions, a lack of understanding of the information obtained, causing the wrong assumption to occur in the information (Sattui et al., 2016). Knowledge is a part that must exist in the creation of a person's behavior. Based on research and experience, it is found that behavior that starts with knowledge is able to understand faster than behavior that is not based on knowledge (Sarafino & Smith, 2019).

Knowledge is the result of tau, and this occurs after people have sensed a certain object. Sensing occurs through the five human senses, namely the senses of sight, hearing, smell, taste and touch. Most human knowledge is obtained through the eyes and ears (Schlesinger, 2017). Knowledge is a continuous formation by someone who is constantly reorganizing because of new understandings. However, it should be emphasized that a person with low education does not mean absolutely low knowledge. Increased knowledge is not absolutely obtained in non-formal education (Husain et al., 2020). Someone who is said to have less knowledge if the person just knows and understands it, while someone who has sufficient knowledge

tends to have not only know and understand but also can apply and analyze, and someone is said to have good knowledge if he has reached the level of /synthetic stages and evaluation. Therefore knowledge/cognitive is a very important domain for the formation of one's actions (overt behavior).

Based on the results of table 3 about the relationship between educational socialization and knowledge of alternative gout therapy in the intervention group before and after the intervention was associated with a p value = 0.000 while in the control group there was no relationship between educational outreach and knowledge of alternative gout therapy between before and after intervention with p value = 0.230. The results of the analysis in table 4 about the differences between the intervention group and the control group before and after the intervention of education socialization of gout alternative therapy there are significant differences with p value = 0.000.

This study is in line with the results of previous research conducted by Daodi et al. (2020), stating that information obtained by gout sufferers affects the elderly's knowledge about gout disease, the results of the research he has done show that the elderly who suffer from gout who are given health information or education can affect the knowledge of the elderly and improve their lifestyle in controlling good uric acid levels.The results of Engel's research (2020) state that there are there is a significant difference between the knowledge of the residents before and after health education using leaflets. The results of the research conducted by Dalbeth & Stamp (2014) stated that there was an increase in knowledge after the provision of health education in Rawasari. There was a significant effect before and after being given socialization where there was a difference in values respondents from before being given health socialization and after health socialization (Lusiana, 2022).

Knowledge is the output of knowing. Tofu can occur if there is a sensing process by a person through his five senses which include the sense of touch, the sense of taste, the sense of smell, the sense of hearing and the sense of sight (Faizal et al., 2019). The basis for doing or not doing something can come from knowledge. Knowledge of the importance of alternative gout therapy can be the basis for whether or not a person does or does not carry out alternative gout therapy, which becomes the foundation for the persistence of this behavior.

Health education intervention is one of the actions that can increase the knowledge and behavior of individuals, groups or communities. Health education is a collection of experiences that support habits, attitudes, and knowledge related to the health of individuals, communities and races. This is also supported in Notoatmodjo's (2012) theory that health education can change a person's knowledge, the community in taking health-related actions. Health education in general is all planned efforts to influence other people, whether individuals, groups, or communities and educators or education actors. The information media used, namely leaflets, can influence changes in behavior where the leaflet media contains the understanding, causes, signs and symptoms, drugs, alternative therapies and the efficacy of Moringa leaves as alternative therapy for gout can be used as a

respondent's step to determine alternative therapy. Using health promotion media such as leaflets can affect behavior change for the better where leaflet media can be used as a complement when respondents ignore billboards or other information facilities, thus respondents will understand better and improve their behavior to be better.

Gout is an important problem for public health because the disease has high morbidity, disability, complications and costs (Engel, 2017; Scesinger, 2017). The problem that often occurs in the community, especially in patients with gout, is the lack of knowledge about gout. Socialization or counseling about gout can be one solution to increase public knowledge about the disease. Socialization is an effort to change human behavior through an educational approach (Petrie, 2018; Sattui, 2016). The educational approach is defined as a series of activities carried out in a systematic, planned, group, or community way to solve problems by taking into account local social, economic and cultural factors. Talking about counseling cannot be separated from how so that the target of counseling can understand, understand, be interested, and follow what we teach properly, correctly, and on his own consciousness trying to apply new ideas in his life (Dalbeth, 2014; Singh, 2019).

A good level of knowledge directs a person to act towards a more healthy lifestyle. To realize good knowledge into good attitudes and lifestyles, continuous education and socialization support is needed to the community. Community leaders consisting of Neighborhood Association, Citizens Association and Family Welfare Development (PKK in Bahasa) activators are expected to be a source of information as the spearhead regarding the delivery of information about gout. Knowledge about gout has proven to be an important predictor factor for the prevention and treatment of gout in the future. Health socialization given to community leaders aims to transfer knowledge which in the future can change thinking patterns with full awareness and understanding so that they can apply a healthy lifestyle to avoid gout. With the provision of socialization, respondents are expected to receive learning that results in a change in themselves that was previously unknown to be known, as well as having a positive impact on respondents and the communication process that supports behavioral changes to a healthy life. Efforts that need to be made to increase the role of community leaders in increasing public knowledge about gout are to carry out continuous socialization with various socialization methods such as distributing pamphlets, banners or regular monthly meetings with the community.

According to Sarafino (2019), good knowledge supports patients in carrying out treatment methods and behaviors recommended by doctors or other people. A person's knowledge is greatly influenced by the education of a person who has a higher education and is expected to have extensive knowledge. However, it does not mean that people with low education absolutely have low knowledge. Given that knowledge is not only obtained from formal education. Rather than from non-formal education or from experience.

D. CONCLUSION

Based on the results and discussion of the research, it can be concluded that the level of knowledge of alternative therapy on gout in both the intervention group and the control group for the level of knowledge before the intervention both had three categories, namely good, sufficient and lacking and most were found in the moderate category, while after the intervention there were differences in the categories in the intervention group into two categories, namely good and sufficient categories, while in the control group there were still three categories, namely good, sufficient and poor.

The relationship between educational socialization and knowledge of alternative gout therapy in the intervention group before and after the intervention was related to the p value = 0.000 while in the control group there was no relationship between educational socialization and knowledge of alternative gout therapy between before and after the intervention with p value = 0.230. There is a difference between the intervention group and the control group before and after the intervention of education socialization of alternative gout therapy there is a significant difference with p value = 0.000.

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