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Knowledge levels for the prevention of gout arthritis in the elderly

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Abstract

Background: The elderly state will be faced by every human and will develop into a more diverse issue as life expectancy is expected to exceed 70 years. Consequently, the population of elderly individuals in Indonesia is likely to surpass that of young children. As people age, they become increasingly vulnerable to diseases, one of which is gout arthritis. Gout arthritis is a condition caused by the accumulation of monosodium urate crystals in the body, resulting from hyperuricemia, which is characterized by elevated levels of uric acid due to disorders in purine metabolism. This condition is marked by joint pain, which disrupts the daily activities of those affected. Purines naturally exist in the body and are found in all foods, whether from animal sources like meat and organ meats or plant sources such as vegetables, fruits, and legumes. There are foods with both high and low purine content.

Purpose: To analyze the relationship between knowledge level and efforts to prevent gout arthritis in the elderly

Method: A cross sectional approach (relationship and association), the population in this study is the elderly who have gout arthritis at the Grogol Health Center from January to February 2024 which is 150 people. The number of samples used was 60 people who came to the Grogol Health Center with Gout Arthritis and were given a questionnaire sheet.

Results: In the study, it can be assumed that the behavior of the elderly in preventing Gout Arthritis is good if the elderly's knowledge about Gout Arthritis is good, because knowledge has a great influence on the behavior of the elderly about Gout Arthritis. With the results of the analysis using the Chi Square Test, a p-value of 0.012 ($\alpha < 0.05$) was obtained, which means that there is a relationship between the level of knowledge and efforts to prevent Gout Arthritis in the elderly.

Conclusion: There is a relationship between the level of knowledge and efforts to prevent Gout Arthritis in the elderly. Good knowledge about Gout Arthritis is the main capital for preventing gout arthritis in the elderly

Suggestion: The nurses are expected to be able to provide socialization, counseling and health education related to Gout Arthritis to the elderly so that the elderly can understand how to prevent Gout Arthritis

Keywords: Elderly; Gout Arthritis; Knowledge Level; Prevention Efforts.

INTRODUCTION

The elderly condition will be faced by every human being and will develop into a more diverse problem because life expectancy will be above 70 years. As humans age, they will be more susceptible to disease, one of the diseases that is often suffered by the elderly is Gout Arthritis. Gout arthritis is the end product of purine metabolism, which consists of

carbon, nitrogen, oxygen, and hydrogen components, with the molecular formula $C_5H_4N_4O_3$. At high alkaline pH, gout arthritis forms twice as many urate ions as at acidic pH. The purine content derived from nucleic acid catabolism in the diet is converted directly into uric acid. The process of nucleotide breakdown occurs in all cells, but uric acid is mainly

produced by tissues containing xanthine oxidase, especially in the liver and small intestine. The average endogenous synthesis of uric acid is 300-600 mg per day, while intake from the diet reaches around 600 mg per day. Excess uric acid is excreted through urine about 600 mg/day and through the intestines about 200 mg/day (Lippi, Montagnana, Franchini, Favaloro, & Targher, 2008).

Gout arthritis often recurs if the sufferer often consumes foods high in purine. This recurrence occurs because it is related to the knowledge and behavior of the sufferer in preventing gout arthritis. This Gout Arthritis is a disease caused by the accumulation of high monosodium urate crystals in the body or hyperuricemia which is a condition where there is an increase in normal levels influenced by disorders of the body's purine metabolism which is characterized by joint pain that interferes with the sufferer's activities. Purine is naturally present in the body because it is contained in all foods, both those derived from meat, and animal or plant offal such as vegetables, fruits, nuts, where there are always foods that have high levels of purine and foods that are low in purine (Heggy, Galal, Shrief, & Elalem, 2018).

Knowledge is one of the factors causing gout arthritis, having minimal knowledge and not taking preventive measures about their health will increase the chances of someone experiencing gout arthritis. If the elderly already know about gout arthritis, the causes, and how to prevent it, it will reduce the levels of gout arthritis in their bodies. Prevention efforts are in the form of the elderly's daily behavior in controlling the levels of gout arthritis in their bodies. Then behavior is an activity of organisms that are interrelated with each other in this case it is a health problem including disease. Gout arthritis disease will often recur if the sufferer often consumes foods high in purine. Currently, Indonesia ranks fourth in the world in the number of people suffering from gouty arthritis, with around 35% of cases occurring in men over 45 years of age. The prevalence of joint disease in the 55-64 age group reaches 45%, in the 65-74 age group it is 51%, and in the age group over 75 it reaches 54.8%. In terms of diagnosis, as many as 7.3% of gouty arthritis cases have been identified by health workers, while 24.7% are based on existing symptoms. The percentage of diagnoses by health workers shows that women experience gouty

arthritis more, with a figure reaching 13.4%, compared to men who are only 10.3% (Fields & Batterman, 2018).

Gout arthritis is the end product of purine metabolism, which is a component of nucleic acid found in the nucleus of body cells. Every individual has a level of uric acid in the body, and in normal metabolism, this level should not be excessive. Disorders of purine metabolism can cause an increase in uric acid levels in the blood. Levels are considered high if they exceed 7 mg/dl in men and 6 mg/dl in women. This increase in uric acid levels can cause various disorders, including severe pain in the joints, which is often very painful for sufferers (Deprouw, Guignot, Bougeois-Sarran, Bougeois-Sarran, Coblentz-Baumann, & Ea, 2019).

Gouty arthritis is associated with the kidneys, and after menopause, uric acid levels may increase, similar to those in men. Hyperuricemia, which is a high level of uric acid above normal, occurs when monosodium urate concentrations exceed its solubility limit, and this condition is more common in men than in women. Hyperuricemia is also associated with various markers of metabolic syndrome, such as obesity, dyslipidemia, glucose intolerance, and hypertension, all of which can increase the risk of cardiovascular disease and kidney disorders. In addition, consumption of foods high in purines, fructose, and alcohol contributes to increased uric acid levels. From a genetic perspective, genes involved in the biosynthesis and genes related to uric acid secretion in the kidneys and gastrointestinal tract, as well as genes regulating uric acid reabsorption in the kidneys, play an important role in determining the condition of hyperuricemia (Minggawati, Fauziah, & Rusmita, 2019).

Normal values of blood levels of Gout Arthritis, in: adult men = 3.4 - 7.0 mg/dl; adult women = 2.4 - 6.0 mg/dl; men > 60 years = 4.2 - 8.0 mg/dl; women > 60 years = 2.5 - 6.5 mg/dl; children = 2.0 - 5.5 mg/dl. The most common signs and symptoms of gouty arthritis are sudden onset of joint pain. Other symptoms that may occur include redness and swelling of the affected area, fever with chills, and increased heart rate. Increased levels of gouty arthritis are caused by increased production of gouty arthritis or decreased excretion of uric acid. Gouty arthritis is associated with

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a variety of factors, including exogenous factors such as diet and use of certain medications, as well as endogenous factors including the presence of disease and genetic disorders (Lee, 2009). Other factors that are risk factors for increasing levels of Gout Arthritis are age, weight gain, family history and gender. Consumption of foods high in purine, consumption of alcoholic beverages and consumption of drugs are also thought to trigger hyperuricemia. Excessive and heavy physical activity can also increase levels of Gout Arthritis in the blood. The production of Gout Arthritis in addition to being the disposal of purine breakdown products is also needed by the body as an antioxidant at certain levels. In normal individuals, the amount of Gout Arthritis is approximately 1000 mg with a turnover rate of 600 mg/day (Nasari, Bahri, & Kamal, 2022).

Based on uric acid levels, hyperuricemia sufferers can be categorized into two groups. The first group is those who experience minor increases, with a total uric acid of around 1300 mg and a normal production rate of 650 mg per day. On the other hand, the second group includes sufferers who show significant increases, with a total uric acid of 2400 mg and a production rate of 1200 mg/day (Ramadoan & Maliya, 2016). Knowledge is one of the assets that is always attached to us, allowing us to understand various things based on the experiences we have gone through. In addition, knowledge is also obtained from information provided by others and through tradition. This cognitive domain is very important, because it influences all forms of individual action (Songgigilan, Rumengan, & Kundre, 2019). Behavior is a series of activities or activities carried out by living organisms. From a biological perspective, all living things from plants, animals, to humans have behavior, because each has a unique activity (Kussoy, Kundre, & Wowiling, 2019).

There are 2 theories about behavior, namely: Skinner's Theory (S-O-R) states that behavior is a person's response or reaction to stimuli or stimulation from the environment. In this view, human behavior is formed through a process involving three components: Stimulus-Organism-Response. Therefore, this theory is known as the "S-O-R" theory. Green's Theory A person's health is influenced by behavioral and non-behavioral factors. Behavior itself is influenced by 3 main domains, namely: 1) Predisposing factors are the process

before behavioral change that provides rationale or motivation for individual or group behavior. Factors that influence the tendency to facilitate the occurrence of a person's or group's behavior include knowledge, attitudes, beliefs, values, perceived needs, abilities and other elements found in individuals and society. 2) Supporting factors (enabling factors) are the process before behavioral change occurs, there must be supporting factors to facilitate the behavior such as the availability of facilities and infrastructure or facilities that are easy to reach. 3) Reinforcing factors, are driving factors that provide continuous support for the continuity of individual or group behavior such as family, friends, teachers, policy makers and health workers.

Previous research conducted in Ngebel District, Ponorogo Regency in 2016 entitled The Relationship between the Level of Knowledge of the Elderly and Rheumatic Arthritis Pain and research conducted in Bandung City stated that there was a relationship between the level of knowledge of the elderly and efforts to gout Arthritis. Then the results of the study that were in contrast were also obtained in a study conducted in Humbang Hasundutan Regency in 2016 and in Toba Regency in 2023 that there was no relationship between the level of knowledge of the elderly and the prevention of increased uric acid (Khormi, Basalem, Al Muaddi, Alaskar, Algahtani, Alharbi, & Altamimi, 2023).

Based on the description above, the researcher is interested in conducting research on the Relationship between the Level of Knowledge and Efforts to Prevent Gout Arthritis in the Elderly in 2023 at the Grogol District Health Center. Of the 40 elderly people met at the Health Center, 25 elderly people were affected by gout arthritis. Of the 10 people the researcher surveyed, 3 people understood what gout arthritis or gout was and understood a little about preventive behavior. The elderly said that sometimes they still consumed foods high in purines and had not stopped if the disease was not severe. 7 other people said that they understood about gout arthritis but did not understand what preventive measures were and said that almost every day they consumed high-purine foods such as offal, mlinjo, and nuts.

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RESEARCH METHOD

A quantitative research with a correlational design. The approach used is cross-sectional, which focuses on the relationship and association between variables at one point in time, the population in this study were elderly people who had gout arthritis at the Grogol Health Center from January to February 2024 totaling 150 people. The number of samples used was 60 people who came to the Grogol Health Center with Gout Arthritis and were then given a questionnaire sheet. The sampling technique used was the systematic sampling technique used to take samples was systematic random sampling using the Slovin formula.

The independent variable in this study is knowledge in elderly with Gout Arthritis, while the dependent variable is behavior in elderly with Gout Arthritis. The sample inclusion criteria used were elderly with Gout Arthritis who checked themselves into the health center, elderly who were willing to be respondents, and elderly with gout arthritis aged > 60

years, while the exclusion criteria were elderly with gout arthritis who could not read, and elderly with gout arthritis who could not see.

Before starting the study, respondents were given a questionnaire to determine their knowledge of gouty arthritis. Each question given is worth a point and will be analyzed using the Chi-Square Statistical Test to see the relationship between independent variables and dependent variables. This study was conducted through distribution using a questionnaire. The instrument to measure the level of knowledge about gout arthritis used a questionnaire consisting of 15 question items using the Guttman scale. questions with correct answers "1", and wrong "0". While to measure prevention efforts for elderly with gout arthritis using a questionnaire consisting of 10 questions if the answer is good given a score (3), moderate given a score (2), and poor given a score (1). This research has been approved by the Health Research Ethics Commission of Dr. Moewardi Hospital, with number 602/II/HREC/2024.

RESEARCH RESULTS

Tabel 1. Characteristics of Respondents N=60

Variable	Results
Age (Mean $\pm$ SD)(Range)(Years)	(72.5 $\pm$ 12.5)(60-85)
Age (n/%)	
60-70	27/45.0
71-80	30/50.0
>80	3/5.0
Gender (n/%)	
Male	29/48.3
Female	31/51.7
Education (n/%)	
No Education	5/8.3
Elementary School	16/26.7
Junior High School	14/23.3
Senior High School	10/16.7
University	15/25.0
Occupation (n/%)	
Unemployed	15/25.0
Farmer	17/28.3
Self-Employed	13/21.7
Retired	11/18.3
Other	4/6.7

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Disease (n/%)	
Hypertension	34/56.7
Diabetes Mellitus	14/23.3
Cholesterol	8/13.3
Other	4/6.7
Knowledge (n/%)	
Good	34/56.7
Poor	26/43.3
Prevention Efforts (n/%)	
Good	12/20.0
Moderate	26/43.3
Poor	22/36.7

Table 1, the majority of whom were aged 71-80 years who had Gout Arthritis disease, amounting to 30 respondents (50.0%), the average age of respondents was 72.5 years with a standard deviation value of 12.5 years, the majority of respondents were female 31 respondents (51.7%), and most respondents had completed their education at elementary school level 16 respondents (26.7%). Then Gout Arthritis disease, most commonly experienced by those who work as Farmers, namely 17 respondents (28.3). Most of them have good knowledge about gout, as many as 34 respondents (56.7%). Most of them had poor prevention efforts gout, as many as 22 respondents (36.7%).

Tabel 2. Knowledge Levels and Prevention of Gout Arthritis

Variable	Prevention of Gout Arthritis			p-value
	Poor (n=22)	Moderate (n=26)	Good (n=12)	
Knowledge (n/%)				
Poor	15/68.2	8/30.8	3/25.0	0.012
Good	7/31.8	18/69.2	9/75.0	

The purpose of this Chi-Square Statistical Test is to see the relationship between independent variables and dependent variables. The table above shows that of the 26 respondents who have poor knowledge about gout arthritis, there are 68.2% of respondents with poor gout arthritis prevention efforts, 30.8% with fairly good gout arthritis prevention efforts, and 25% with poor gout arthritis prevention efforts. Meanwhile, of the 34 respondents with good knowledge about gout arthritis, there are 31.8% of respondents with poor gout arthritis prevention efforts, 69.2% of respondents with fairly good gout arthritis prevention efforts and 75% of respondents with good gout arthritis prevention efforts. The results of the Chi-Square statistical test obtained a P-value of 0.012 ($\alpha < 0.05$).

DISCUSSION

The Chi-Square statistical test that has been done before, has obtained a p-value of 0.012 ($\alpha < 0.05$), which means that there is a relationship between the Level of Knowledge and Efforts to Prevent Gout Arthritis in the Elderly. This can be interpreted that when someone has high knowledge, they will be aware of preventing Gout Arthritis. In the research results obtained as stated in Table 1, most of the respondents in the study were 71-80 years old. Changes in metabolism in the body including changes in kidney function and trigger gout arthritis in the elderly. Where at the age of 71-80 are susceptible to changes in uric acid, increased uric acid levels cause crystallization in the blood vessels which affects joint function (Wetik & Lumintang, 2021).

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Then Gout Arthritis Disease is suffered by most women, which is 51.7%, this is influenced by significant changes in estrogen hormones that occur in women over the age of 40 and have an impact on joint health in humans, especially the elderly. Increased uric acid levels are closely related to post-menopause events due to decreased estrogen hormone levels that have an impact on urine secretion (Simamora, 2021). In the distribution of educational characteristics, the majority of education is elementary school with 16 respondents (26.7%). There are various factors that cause respondents to have elementary school education such as finance. The higher a person's level of education, the easier it is for them to receive information, so that the knowledge they have is wider. Relatively low education can have an impact on disease prevention behavior (Harrold, Mazor, Negron, Ogarek, Firmino, & Yood, 2013). Individuals with higher education tend to have a more developed and logical mindset. In addition, respondents' attitudes are also influenced by education level and age. Respondents with higher education usually show a more positive attitude, while as they get older, respondents tend to become wiser in determining their attitudes. However, low education and young age do not always mean bad attitudes, because a person's attitude is not entirely determined by higher education, older age, or employment status (Saiful & Tanonggi, 2020).

In table 1, it can be seen that the majority of the occupation is Farmers who are at 28.3%. One of the factors that can affect uric acid levels is physical activity. Heavy physical activity can cause an increase in uric acid levels (hyperuricemia) (Sety, 2018). Then other diseases suffered by the elderly in the results of this study were dominated by hypertension with a value of 56.7%. Excessive uric acid levels in the body can stimulate the activation of the angiotensin system which can cause an increase in blood pressure (Rahmawati, 2020).

From the results of this study, it can be assumed that the behavior of the elderly in preventing Gout Arthritis is good if the elderly's knowledge about Gout Arthritis is good, because knowledge greatly influences the behavior of the elderly about Gout Arthritis. Table 2 shows the results of the analysis using the Chi Square Test and obtained a value of 0.012 ($\alpha < 0.05$) which means that there is a

relationship between the level of knowledge and efforts to prevent Gout Arthritis in the elderly. This study is in line with previous studies with a value of $p < 0.006$ ($\alpha < 0.05$) which states that good knowledge about gout arthritis is the main capital for preventing gout arthritis in the elderly (Wang, Chen, Song, Chen, Guo, Ma, & Liu, 2024).

Knowledge of patients is needed to achieve high prevention efforts. Increasing knowledge requires a multidimensional approach that aims to meet the needs of patients. Knowledge will be directly proportional to the attitude to carry out prevention because the higher the knowledge, the desire to carry out prevention will also increase. In this study, respondents who have good knowledge about gout tend to be more active in carrying out prevention efforts against this disease, because they realize that failure to carry out prevention can increase the risk of developing gouty arthritis. Conversely, respondents who have inadequate knowledge about gouty arthritis will face difficulties in implementing effective prevention measures (Li, Dai, Li, Liu, Zou, Ou-Yang, & Schumacher, 2013).

The results of this study also have results that are inversely proportional to several studies that have been conducted previously where previous researchers stated that a person's knowledge is influenced by several factors so that a person's knowledge is different. According to him, a person's knowledge needs to be increased by following counseling and instructions from the Health team and the need for awareness in maintaining Health (Cai, Hu, Wang, Zhao, Du, Wang, & Song, 2024).

Then it was also found in another study that stated that there was a decrease in uric acid levels in gout arthritis sufferers after being given health education about compliance with the gout arthritis diet. This shows that health education about the gout arthritis diet has been proven to have an effect on reducing uric acid levels in sufferers (Lumintang & Wetik, 2022).

The knowledge factors mentioned are indeed different, one example is in a study conducted in 2016, The relationship between the level of knowledge about diet and attitudes towards preventing recurrence of gouty arthritis in the elderly at the Bagas Waras Kartasura Elderly Health Post showed that the better the knowledge of the elderly, the more positive their attitudes. This means that

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when the elderly have a good understanding of the importance of maintaining a diet or avoiding foods high in purine, they tend to make efforts to prevent the disease or recurrence of gout arthritis (Madyaningrum, Kusumaningrum, Wardani, Susilaningrum, & Ramadhani, 2021).

CONCLUSION

Based on the results of research and discussion on the level of knowledge and prevention efforts of Gout Arthritis and research conducted at the Grogol Health Center, Sukoharjo Regency, where in the Chi Square test there is a p value of 0.012 ($\alpha < 0.05$), which means there is a relationship between the level of knowledge and efforts to prevent Gout Arthritis in the elderly. Good knowledge of Gout Arthritis is the main capital for preventing gout arthritis in the elderly.

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