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The Relationship Between Knowledge of a Low-Purine Diet and Recurrence Among Patients with Gout Arthritis

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ABSTRACT

Background: Gout arthritis is an inflammatory joint disorder caused by the deposition of monosodium urate crystals due to hyperuricemia. Recurrent attacks may increase the risk of complications and reduce patients' quality of life. One factor that may influence recurrence is patients' knowledge of a low-purine diet. Adequate knowledge is expected to improve dietary adherence, prevent recurrent attacks, and help control uric acid levels. Objective: To examine the relationship between knowledge of a low-purine diet and recurrence among patients with gout arthritis. Methods: This study employed an analytical correlational design with a cross-sectional approach. It was conducted in the working area of Muara Satu Public Health Center, Lhokseumawe City, involving 100 patients with gout arthritis selected using accidental sampling. Data were collected using questionnaires assessing knowledge of a low-purine diet and the recurrence of gout arthritis. Data were analyzed using univariate and bivariate analyses with the Chi-square test at a 95% confidence level (α = 0.05). Results: Most respondents had poor knowledge of a low-purine diet (70.0%). Regarding recurrence severity, 52.0% experienced mild recurrence, while 48.0% experienced severe recurrence. The Chi-square test revealed a statistically significant relationship between knowledge of a low-purine diet and gout arthritis recurrence (p = 0.001). Conclusion: Knowledge of a low-purine diet was significantly associated with recurrence among patients with gout arthritis. Continuous and structured health education is needed to improve patients' knowledge and adherence to a low-purine diet, thereby helping reduce the risk of recurrent attacks.

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INTRODUCTION

Gout arthritis is an inflammatory joint disorder caused by the deposition of monosodium urate crystals due to chronic hyperuricemia. The disease is characterized by joint redness, swelling, restricted mobility, and recurrent episodes of acute pain. If not managed appropriately, gout arthritis may lead to impaired physical function, chronic kidney disease, an increased risk of cardiovascular disease, permanent joint damage, and chronic gout accompanied by tophus formation (Dalbeth et al., 2021). According to Dalbeth et al. (2021), the management of gout arthritis requires lifestyle modifications beyond pharmacological therapy, with dietary regulation serving as an essential component of long-term disease management.

Over the past three decades, the global burden of gout arthritis has continued to increase. This trend is associated with population aging, the rising prevalence of obesity, metabolic syndrome, chronic kidney disease, and changes in dietary patterns. Reports from the Global Burden of Disease study indicate that the number of people affected by gout arthritis has increased substantially, with cases more than doubling since 1990, making it an increasingly important public health concern among inflammatory joint diseases (Danve et al., 2021). In Indonesia, gout arthritis also remains a significant health problem, particularly among older adults and the adult population (Li et al., 2022). Dietary habits, including the consumption of fructose-sweetened beverages and purine-rich foods, along with low levels of physical activity, contribute to the increasing prevalence of hyperuricemia and recurrent gout attacks.

One recommended non-pharmacological approach to managing gout arthritis is the implementation of a low-purine diet (Morgan & Singh, 2021). This dietary approach aims to reduce uric acid production by limiting the consumption of purine-rich foods, such as red meat, certain types of seafood, organ meats, and meat extracts. It also emphasizes adequate water intake and the consumption of vegetables, fruits, and low-fat dairy products as part of a balanced dietary pattern. However, the success of dietary modification is strongly influenced by patients' knowledge. According to Green's health behavior theory, knowledge is a predisposing factor that influences the development of individual health behaviors. Individuals with adequate knowledge are generally more likely to adopt positive health behaviors, including adherence to recommended dietary practices.

Among patients with gout arthritis, adequate knowledge of a low-purine diet may support better food choices, improve dietary adherence, and help reduce the risk of recurrent attacks and control uric acid levels. Conversely, insufficient knowledge may limit patients' understanding of the importance of restricting purine-rich foods, potentially increasing their risk of recurrent gout attacks. Furthermore, Dalbeth et al. (2021) emphasized that comprehensive dietary management may provide greater benefits for disease control than simply avoiding selected food items. Previous studies have examined the relationships between

dietary adherence, uric acid levels, and gout arthritis recurrence. However, much of the existing research has focused on pharmacological treatment or changes in uric acid levels, while studies specifically investigating the relationship between knowledge of a low-purine diet and recurrence among patients with gout arthritis in primary healthcare settings remain limited, particularly in Aceh Province. This research gap highlights the need for further investigation to provide an evidence base for developing more effective health education programs.

The working area of Muara Satu Public Health Center in Lhokseumawe City is one of the primary healthcare settings providing services to patients with gout arthritis. Dietary patterns, including the consumption of purine-rich foods, may influence disease management and the risk of recurrence, particularly when patients have insufficient knowledge of appropriate dietary practices. Therefore, this study aimed to analyze the relationship between knowledge of a low-purine diet and recurrence among patients with gout arthritis in the working area of Muara Satu Public Health Center, Lhokseumawe City. The findings are expected to provide useful information for strengthening patient education and supporting dietary management strategies to reduce the risk of recurrent attacks.

METHOD

This study employed a quantitative approach with an analytical correlational design using a cross-sectional method to examine the relationship between knowledge of a low-purine diet and recurrence among patients with gout arthritis. The independent and dependent variables were assessed simultaneously at a single point in time.

The study was conducted in the working area of Muara Satu Public Health Center, Lhokseumawe City, Indonesia. The study population consisted of all patients with gout arthritis receiving treatment within the health center's service area. A total of 100 respondents were recruited using accidental sampling based on the following inclusion criteria: (1) diagnosed with or having a history of gout arthritis and currently receiving treatment within the working area of Muara Satu Public Health Center; (2) aged ≥18 years; (3) having suffered from gout arthritis for at least one year; (4) having experienced at least one recurrence of gout arthritis; (5) being able to read, write, and cooperate during data collection; and (6) providing informed consent by signing the consent form. The exclusion criteria were: (1) experiencing a severe or acute gout arthritis attack at the time of data collection; (2) having cognitive or communication impairments that prevented understanding of the questionnaire items; (3) having other diseases or conditions associated with impaired consciousness; (4) being unable to complete the questionnaire; and (5) refusing to complete the questionnaire or withdrawing from participation in the study.

The research instruments consisted of a questionnaire assessing knowledge of a low-purine diet and a questionnaire measuring the

recurrence of gout arthritis. Knowledge was categorized as high when the score was ≥75% and low when the score was ≤25%. Recurrence severity was classified as mild for scores of 0–10 and severe for scores of 11–20.

Data were analyzed using univariate analysis to describe respondent characteristics and the distribution of study variables in terms of frequencies and percentages. Bivariate analysis was performed using the Chi-square test, with a significance level of α = 0.05, to examine the relationship between knowledge of a low-purine diet and recurrence among patients with gout arthritis.

RESULT AND DISCUSSION

The study involved 100 respondents with gout arthritis in the working area of Muara Satu Public Health Center, Lhokseumawe City. Regarding respondent characteristics, the majority were aged 46–55 years (40; 40%), female (82; 82%), had completed senior high school (36; 36%), and had suffered from gout arthritis for 1–5 years (98; 98%). In terms of knowledge of a low-purine diet, 70 respondents (70%) had low knowledge, while 30 (30%) had high knowledge. Regarding recurrence, 52 respondents (52%) experienced mild recurrence, whereas 48 (48%) experienced severe recurrence. The bivariate analysis showed that among respondents with high knowledge, 28 experienced mild recurrence and 2 experienced severe recurrence. In contrast, among respondents with low knowledge, 24 experienced mild recurrence and 46 experienced severe recurrence. The Chi-square test revealed a statistically significant relationship between knowledge of a low-purine diet and recurrence among patients with gout arthritis ($p = 0.001$). These findings suggest that better knowledge of a low-purine diet is associated with a lower severity of recurrence among patients with gout arthritis.

Table 1. Frequency Distribution of Respondents' Characteristics

The Characteristics of Respondent	Frequency(f)	Percentage (%)
Age		
26–35 Years old	1	1
36–45 Years old	16	16
46–55 Years old	40	40
56–65 Years old	36	36
> 65 Years old	7	7
Total	100	100
Gender		
Male	18	18
Female	82	82
Total	100	100
Education Background		
SD	27	27

SMP	19	19
SMA	36	36
University	18	18
Total	100	100
Duration of Gout Arthritis		
1–5 Years Old	98	98
6–10 Years Old	2	2
Total	100	100

Table 2. Frequency Distribution of Knowledge of a Low-Purine Diet (n = 100)

No	Knowledge Level of a Low-Purine Diet	Frequency(f)	Percentage (%)
1	High	30	30,0
2	Low	70	70,0
	Total	100	100,0

Table 3. Frequency Distribution of Recurrence Among Patients with Gout Arthritis (n = 100)

No	Gout Arthritis Recurrence	Frequency(f)	Percentage (%)
1	Mild recurrence	30	30,0
2	Severe recurrence	70	70,0
	Total	100	100,0

Table 4. Relationship Between Knowledge of a Low-Purine Diet and Recurrence Among Patients with Gout Arthritis (n = 100)

Knowledge of a Low-Purine Diet	Mild Recurrence n (%)	Severe Recurrence n (%)	Total n (%)	p-value
High	28 (28.0)	2 (2.0)	30 (30.0)	0.001
Low	24 (24.0)	46 (46.0)	70 (70.0)	
Total	52 (52.0)	48 (48.0)	100 (100.0)	

The findings of this study provide an overview of respondent characteristics, knowledge of a low-purine diet, and recurrence among patients with gout arthritis in the working area of Muara Satu Public Health Center, Lhokseumawe City. Most respondents were aged 46–55 years (40%), female (82%), had completed senior high school (36%), and had experienced gout arthritis for 1–5 years (98%). These characteristics provide important context for understanding the patients' knowledge and disease management practices.

The predominance of respondents aged 46–55 years may be associated with age-related physiological changes and alterations in uric acid metabolism. As individuals age, changes in renal function may reduce uric acid excretion, increasing the risk of hyperuricemia and monosodium urate crystal deposition in the joints (Dalbeth et al., 2021). This finding is consistent with Faqih (2023), who reported that elevated uric acid levels were more common among older adults than younger individuals. However, age alone does not determine disease occurrence,

as metabolic conditions, comorbidities, lifestyle, and dietary habits may also contribute.

Most respondents were female. This finding may be partly explained by hormonal changes following menopause, when declining estrogen levels reduce the hormonal influence on renal urate excretion and increase the risk of hyperuricemia. Dalbeth et al. (2021) discussed the increased prevalence of gout arthritis among women after menopause. Nevertheless, because this study did not directly assess menopausal status or hormone levels, this explanation should be interpreted as a possible contributing factor rather than a confirmed cause in the study population.

Regarding educational background, senior high school graduates represented the largest group (36%). Although formal education may influence an individual's ability to access and understand health information, educational attainment does not necessarily guarantee adequate knowledge of disease management. Similarly, despite 98% of respondents having experienced gout arthritis for 1–5 years, prolonged experience with the disease does not automatically result in better dietary knowledge. Without continuous and appropriate health education, patients may continue to have difficulty identifying purine-rich foods and implementing recommended dietary modifications. This observation is consistent with the findings of Velda et al. (2023), who reported that knowledge of a low-purine diet remained relatively limited among patients despite their educational backgrounds.

In terms of dietary knowledge, this study found that 70% of respondents had low knowledge of a low-purine diet, while only 30% demonstrated high knowledge. This finding suggests that many patients may not fully understand the principles of dietary management, the identification of foods with high purine content, or the importance of dietary modification in reducing the risk of recurrent attacks. According to the health behavior framework described by Notoatmodjo, knowledge is an important predisposing factor that can influence health-related behavior. Adequate knowledge may help patients make informed food choices and follow dietary recommendations, whereas limited knowledge may hinder the adoption of appropriate self-management practices. These findings highlight the need for more structured and continuous patient education in primary healthcare settings.

Regarding recurrence, 52% of respondents experienced mild recurrence, while 48% experienced severe recurrence. The relatively high proportion of respondents reporting severe recurrence indicates that disease control may remain a challenge in this population. Recurrence may be influenced by multiple factors, including serum urate levels, adherence to urate-lowering therapy, dietary habits, body weight, comorbid conditions, and physical activity. The American College of Rheumatology (2020) recommends comprehensive gout arthritis management that includes appropriate pharmacological treatment, lifestyle modification, patient education, and a treat-to-target strategy

for serum urate levels. Therefore, dietary management should be considered part of an integrated approach rather than the sole strategy for preventing recurrent attacks.

The bivariate analysis revealed a statistically significant relationship between knowledge of a low-purine diet and recurrence among patients with gout arthritis ($p = 0.001$). Among respondents with high knowledge, 28 experienced mild recurrence and 2 experienced severe recurrence. In contrast, among respondents with low knowledge, 24 experienced mild recurrence and 46 experienced severe recurrence. This distribution indicates that severe recurrence was more common among respondents with low knowledge, whereas mild recurrence predominated among those with high knowledge.

This finding supports the importance of dietary knowledge in the self-management of gout arthritis. Patients who understand appropriate dietary practices may be better equipped to limit excessive consumption of purine-rich foods, maintain adequate hydration, and follow recommended treatment plans. Conversely, inadequate knowledge may contribute to less appropriate dietary choices and difficulties in managing risk factors associated with recurrent attacks. Nevertheless, because this study used a cross-sectional design, the findings establish an association rather than a causal relationship. In addition, dietary adherence, medication use, and serum urate levels were not presented in the reported results; therefore, their roles in explaining recurrence cannot be determined directly from this study.

The findings are consistent with the broader emphasis on patient education in the long-term management of gout arthritis. Dalbeth et al. (2021) highlighted the importance of comprehensive disease management, including lifestyle modification and patient education, alongside appropriate medical treatment. The findings also suggest that health education at Muara Satu Public Health Center should emphasize practical dietary guidance, including identifying foods with high purine content, selecting appropriate food alternatives, maintaining adequate hydration, and understanding the importance of treatment adherence. Educational activities should be tailored to patients' levels of understanding and reinforced through regular counseling and follow-up.

This study demonstrates that low knowledge of a low-purine diet was common among respondents and was significantly associated with more severe recurrence of gout arthritis. These findings provide a basis for strengthening health education programs in primary healthcare settings. However, because recurrence is multifactorial, educational interventions should be integrated with appropriate pharmacological management, monitoring of serum urate levels, and assessment of other relevant risk factors to support more effective long-term disease control.

CONCLUSION

This study found that most patients with gout arthritis in the working area of Muara Satu Public Health Center, Lhokseumawe City, had a low level of knowledge regarding a low-purine diet. The analysis revealed a statistically significant relationship between knowledge of a low-purine diet and recurrence among patients with gout arthritis ($p = 0.001$). These findings suggest that better knowledge of a low-purine diet is associated with less severe recurrence. Healthcare professionals in primary healthcare settings should strengthen structured and continuous education on low-purine diets as part of comprehensive gout management. Future studies should investigate other factors associated with recurrence, including medication adherence, serum uric acid levels, physical activity, nutritional status, and comorbidities, to provide more comprehensive evidence for preventing recurrent gout attacks.

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