



RISK FACTORS FOR GOUT ARTHRITIS AMONG PATIENTS AT BUKIT KANGKA COMMUNITY HEALTH CENTER, SIOMPU DISTRICT, BUTON SELATAN REGENCY

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ABSTRACT	Keywords
Gout arthritis ranks among the ten most frequently reported diseases in the past three years, with multiple risk factors influencing its incidence. This study investigates the impact of dietary patterns, physical activity, and nutritional status on the occurrence of gout arthritis among patients at Bukit Kangka Community Health Center, Siompu District, Buton Selatan Regency. This quantitative research employed a case-control design. Purposive sampling yielded 102 participants, comprising 51 individuals with gout arthritis and 51 controls. Data collection involved questionnaires assessing dietary patterns, physical activity, and body mass index measurements. The chi-square test and odds ratio (OR) were used to determine the magnitude of risk. The findings demonstrate that dietary patterns are a significant risk factor for gout arthritis, with an odds ratio (OR) of 3.143 (95% CI: 1.171–8.437). Physical activity is similarly associated with increased risk (OR: 2.670, 95% CI: 1.141–6.247), and nutritional status shows a comparable association (OR: 3.559, 95% CI: 1.541–8.219). In summary, individuals with a high-risk diet are approximately 3.1 times more likely to develop gout arthritis than those with a low-risk diet. Similarly, high-risk physical activity and adverse nutritional status increase the likelihood by approximately 2.6 and 3.5 times, respectively. These results suggest that adopting a low-purine diet, engaging in regular physical activity appropriate to individual capacity, and maintaining normal nutritional status are effective strategies for the prevention and management of gout arthritis.	Dietary Patterns, Physical Activity, Nutritional Status, Gout Arthritis

INTRODUCTION

Gout arthritis is a metabolic disease with a rising global prevalence. It is recognized as a significant health concern due to its association with other metabolic

disorders and its role in premature mortality (Dehlin et al., 2020). According to the World Health Organization (WHO), the number of gout patients worldwide has reached 44 million, corresponding to a global

prevalence of 0.56% (Cross et al., 2024). In Indonesia, the prevalence of gout arthritis in 2022 was 1.7% of the population, or approximately 4.6 million individuals (Kemenkes RI, 2022).

Key risk factors for gout arthritis include ethnicity, age, sex, obesity, high-purine diets, alcohol consumption, specific medications, low physical activity, and kidney disorders (Badri et al., 2020; Fitriana, 2015). Excessive purine intake increases serum uric acid levels and promotes urate crystal deposition in the joints. Additionally, insufficient physical activity contributes to obesity and insulin resistance, both of which increase susceptibility to gout (Jablonski et al., 2020).

Effective management of gout arthritis involves both pharmacological and non-pharmacological interventions, including dietary regulation and physical activity. Avoidance of high-fat and purine-rich foods, combined with regular exercise such as ergonomic gymnastics, has been shown to reduce uric acid levels, enhance joint health, and prevent recurrent inflammation (Ramadhani & Nilawati, 2025).

Medical records from Bukit Kangka Community Health Center indicate that gout arthritis has consistently ranked among the top ten most prevalent diseases over the past three years, with 202 cases reported in 2024 and 51 cases in 2025. Patient interviews identified contributing factors including obesity, high-purine diets, and limited physical activity. These findings underscore that gout arthritis remains a significant public health concern, particularly in the context of family-level health management.

Although dietary habits, physical activity, and obesity are recognized as important contributors to gout arthritis, limited case-control studies have simultaneously evaluated these factors among patients attending primary health

care centers in rural Indonesian settings. Therefore, this study focuses on these three risk factors to provide a more specific overview. The rationale for selecting only these three risk factors is that they represent modifiable lifestyle variables and are relevant to public health interventions. Nevertheless, it should be noted that gout arthritis is also influenced by various other variables, such as age, sex, renal disease, alcohol consumption, medication use, and family history.

This study aims to examine dietary patterns, physical activity, and nutritional status as risk factors for gout arthritis among patients in the service area of Bukit Kangka Community Health Center, Siompu District, Buton Selatan Regency.

METHOD

This case-control study was conducted at Bukit Kangka Community Health Center, Siompu District, Buton Selatan Regency, from December 2025 to January 2026. A total of 102 participants were purposively recruited, consisting of 51 cases and 51 controls. Cases were determined based on clinical diagnostic criteria, physician confirmation, and medical record verification, while controls were confirmed free of gout arthritis through clinical examination and diagnostic assessment. Data were collected using structured questionnaires on dietary patterns and physical activity, along with body mass index measurements. Validity and reliability were tested using validity coefficients and Cronbach's alpha. Dietary patterns, physical activity, and nutritional status were categorized into risky and non-risky groups. Statistical analysis employed Chi-square tests and Odds Ratios, with a 95% confidence level and 80% statistical power. Ethical approval was obtained, and all participants provided written informed consent.

RESULTS

Table 1. Respondents' Frequency Distribution Based on Age.

Age	Case		Control	
	f	%	f	%
50-53	15	29.4	21	41.2
54-57	16	31.4	11	21.6
58-61	5	9.8	8	15.7
62-65	7	13.7	4	7.8
66-69	5	9.8	3	5.9
70-73	2	3.9	1	2.0
74-77	1	2.0	3	5.9
Total	51	100	51	100

Table 1 indicates that the 54–57 years age group had the highest number of cases, with 16 respondents (31.4%), whereas the 74–77 years age group had the lowest, with 1 respondent (2.0%). In the control group, the 50–53 years age group exhibited the highest frequency, with 21 respondents (41.2%), while the 70–73 years age group had the lowest, with 1 respondent (2.0%).

Table 2. Respondents' Frequency Distribution Based on Gender.

Gender	Case		Control	
	f	%	f	%
Male	28	54.9	24	47.1
Female	23	45.1	27	52.9
Total	51	100	51	100

Table 2 presents the gender frequency distribution. In the case group, males comprised the majority with 28 respondents (54.9%), and females constituted 23 respondents (45.1%). Conversely, in the control group, females represented the majority with 27 respondents (52.9%), while males accounted for 23 respondents (47.1%).

Table 3. Respondents' Frequency Distribution Based on Education Level.

Education Level	Case		Control	
	f	%	f	%
No formal education	0	0	3	5.9
Elementary School	36	70.6	43	84.3
Junior High School	9	17.6	4	7.8
Senior High School	6	11.8	1	2.0
Total	51	100	51	100

Table 3 presents the frequency distribution of education levels. In the case group, most respondents had elementary school education (36 respondents, 70.6%), whereas a minority had senior high school education (6 respondents, 11.8%). In the control group, the majority also had elementary school education (43 respondents, 84.3%), while only one respondent (2.0%) had senior high school education.

Table 4. Respondents' Frequency Distribution Based on Occupation.

Occupation	Case		Control	
	f	%	f	%
Housewife	9	17.6	5	9.8
Farmer	5	9.8	10	19.6
Fisherman	22	43.1	21	41.2
Weaver	10	19.6	15	29.4
Livestock Farmer	5	9.8	0	0
Total	51	100	51	100

Table 4 presents the frequency distribution of occupations. In the case group, most respondents were fishermen (22 respondents, 43.1%), whereas the fewest were farmers and livestock farmers (5 respondents, 9.8%). In the control group, fishermen also constituted the majority (21 respondents, 41.2%), while housewives represented the minority (5 respondents, 9.8%).

Table 5. Respondents' Frequency Distribution Based on Dietary Patterns.

Dietary Patterns	Case		Control	
	f	%	f	%
At risk	17	33.3	7	13.7
Not at risk	34	66.7	44	86.3
Total	51	100	51	100

Table 5 presents the frequency distribution of dietary patterns. In the case group, 34 respondents (66.7%) were not at risk, whereas 17 respondents (33.3%) were at risk. In the control group, 44 respondents (86.3%) were not at risk, while 7 respondents (13.7%) were at risk.

Table 6. Respondents' Frequency Distribution Based on Physical Activity.

Physical Activity	Case		Control	
	f	%	f	%
At risk	23	45.1	12	23.5
Not at risk	28	54.9	39	76.5
Total	51	100	51	100

Table 6 presents the frequency distribution of physical activity. In the case group, 28 respondents (54.9%) were not at risk, whereas 23 respondents (45.1%) were at risk. In the control group, 39 respondents (76.5%) were not at risk, while 12 respondents (23.5%) were at risk.

Table 7. Respondents' Frequency Distribution Based on Nutritional Status.

Nutritional Status	Case		Control	
	f	%	f	%
At risk	28	54.1	13	25.5
Not at risk	23	45.1	38	74.5
Total	51	100	51	100

Table 7 presents the frequency distribution of nutritional status. In the case group, 28 respondents (54.9%) were classified as at risk, whereas 23 respondents (45.1%) were not at risk. In contrast, the

control group comprised 38 respondents (74.5%) who were not at risk and 13 respondents (25.5%) who were at risk.

Table 8. Respondents' Frequency Distribution Based on Gout Arthritis Incidence.

Gout Arthritis Incidence	Case	
	f	%
Case	51	50
Control	51	50
Total	51	100

Table 8 presents the frequency distribution of gout arthritis incidence, indicating that both the case and control groups each comprised 51 respondents (50%).

Table 9. Dietary Patterns Risk Factors for the Incidence of Gout Arthritis.

Dietary Patterns	Incidence of Gout Arthritis				Total		Asymp. Sig. (2-sided)	OR (95% CI)
	Case	Control	Case	Control				
		n	%	n	%	n		
At risk	17	70.8	7	29.2	24	100	0.020	3.143 (1.171-8.437)
Not at risk	34	43.6	44	56.4	78	100		
Total (n)	51	50	51	50	102	100		

Table 9 shows that among 24 respondents with risky dietary patterns, 17 (70.8%) were classified in the case group with gout arthritis, while 7 (29.2%) were in the control group without gout arthritis. In contrast, among 78 respondents with non-risky dietary patterns, 34 (43.6%) were in the case group, and 44 (56.4%) were in the control group.

Analysis of the 2x2 contingency table using the chi-square test yielded a value of $X^2 = 5.449$, which exceeds the critical value of 3.841. The p-value was 0.020, which is less than the significance level of 0.05. These results indicate that the alternative hypothesis is accepted and the

null hypothesis is rejected, demonstrating that dietary patterns are a risk factor for the incidence of gout arthritis among patients in the Bukit Kangka Health Center area, Siompu District, Buton Selatan Regency.

The Odds Ratio (OR) was 3.143, with a 95% Confidence Interval (CI) of 1.171 to 8.437. Because the confidence interval does not include 1, dietary patterns are identified as a significant risk factor for gout arthritis. Respondents with risky dietary patterns were 3.1 times more likely to develop gout arthritis compared to those with non-risky dietary patterns.

Table 10. Physical Activity Risk Factors for the Incidence of Gout Arthritis.

Physical Activity	Incidence of Gout Arthritis				Total		Asymp. Sig. (2-sided)	OR (95% CI)
	Case	Control	Case	Control				
	n	%	n	%	n	%	0.022	2.670 (1.141-6.247)
At risk	23	65.7	12	34.3	35	100		
Not at risk	28	41.8	39	58.2	67	100		
Total (n)	51	50	51	50	102	100		

Table 10 shows that among 35 respondents classified as engaging in risky physical activity, 23 (65.7%) were in the gout arthritis case group and 12 (34.3%) were in the control group. In contrast, among 67 respondents with non-risky physical activity, 28 (41.8%) were in the case group and 39 (58.1%) were in the control group.

Analysis of the 2x2 contingency table using the Chi-square test yielded a value of $X^2 = 5.263$, which exceeds the critical value of $X^2 = 3.841$. The p-value was 0.022, which is less than the significance level of $\alpha = 0.05$. These results indicate that the alternative hypothesis is accepted and the null hypothesis is rejected, demonstrating that physical activity is a risk factor for the incidence of gout arthritis among patients in the Bukit Kangka Health Center area, Siompu District, Buton Selatan Regency.

The Odds Ratio (OR) was 2.670, with a 95% Confidence Interval (CI) of 1.141 to 6.247. Because the confidence interval does not include 1, physical activity is identified as a risk factor for the incidence of gout arthritis. Respondents with risky physical activity were 2.6 times more likely to develop gout arthritis compared to those with non-risky physical activity.

Table 11. Nutritional Status Risk Factors for the Incidence of Gout Arthritis.

Nutritional Status	Incidence of Gout Arthritis				Total		Asymp. Sig. (2-sided)	OR (95% CI)
	Case	Control	Case	Control				
	n	%	n	%	n	%	0.002	3.559 (1.541-8.219)
At risk	28	68.3	13	31.7	41	100		
Not at risk	23	37.7	38	62.3	61	100		
Total (n)	51	50	51	50	102	100		

Table 11 shows that among 41 respondents with a risky nutritional status, 28 (68.3%) were classified in the case group with gout arthritis, while 13 (31.7%) were in the control group without gout arthritis. In contrast, among 61 respondents with non-risky nutritional status, 23 (37.7%) were in the case group, and 38 (62.3%) were in the control group.

Analysis of the 2x2 contingency table using the Asymp. Sig. (2-sided) test yielded a Chi-square value of $X^2 = 9.176$, which exceeds the critical value of $X^2 = 3.841$. The p-value was 0.002, which is less than $\alpha = 0.05$. These results indicate that the alternative hypothesis is accepted and the null hypothesis is rejected, demonstrating that nutritional status is a risk factor for the incidence of gout arthritis among patients in the Bukit Kangka Health Center area, Siompu District, Buton Selatan Regency.

The Odds Ratio (OR) was 3.559, with a 95% Confidence Interval (CI) of 1.541 to 8.219. Because the confidence interval does not include 1, nutritional status

is identified as a risk factor for the incidence of gout arthritis. Respondents with risky nutritional status were 3.5 times more likely to develop gout arthritis compared to those with non-risky nutritional status.

DISCUSSION

1. Dietary Patterns Risk Factors for the Incidence of Gout Arthritis

This study demonstrates that dietary patterns are a risk factor for the incidence of gout arthritis among patients in the Bukit Kangka Health Center area, Siompu District, Buton Selatan Regency. Respondents with risky dietary patterns were 3.1 times more likely to suffer from gout arthritis compared to those with non-risky dietary patterns. The consumption of purine-rich foods such as offal, dried fish, shellfish, shrimp, anchovies, and spinach has been shown to increase uric acid levels, thereby triggering hyperuricemia and joint inflammation. These findings are consistent with the purine metabolism theory, which posits that excessive purine intake is metabolized into uric acid, which subsequently deposits in the joints (Dalbeth, N., Merriman, T. R., & Stamp, 2016).

While adherence to a healthy diet appears to be protective, the study also found that some individuals with non-risky dietary patterns still developed gout arthritis. This suggests that additional factors, including advanced age, genetic predisposition, obesity, hypertension, diabetes, and insufficient physical activity, contribute to disease risk. Therefore, although a healthy diet can reduce the likelihood of gout arthritis, it does not eliminate the risk when other contributing factors are present (Richette, P., & Bardin, 2017).

These findings are consistent with previous research demonstrating a significant association between dietary patterns and gout arthritis (Geneo et al., 2025). Consequently, preventive strategies

should prioritize community education regarding low-purine diets, increased consumption of fiber, fruits, and vegetables, and maintaining adequate hydration. Community-based promotive and preventive interventions, such as nutritional counseling at health facilities, are anticipated to sustainably reduce the risk of gout arthritis.

2. Physical Activity Risk Factors for the Incidence of Gout Arthritis

The present study demonstrates that physical activity is a risk factor for the incidence of gout arthritis among patients in the Bukit Kangka Health Center area, Siompu District, Buton Selatan Regency. Individuals engaging in risky physical activity exhibited a 2.6-fold increased likelihood of developing gout arthritis compared to those participating in non-risky physical activity. Heavy, excessive, or prolonged physical activity without sufficient rest may increase mechanical stress on joints, accelerate inflammatory processes, and exacerbate urate crystal deposition. These results align with the findings of McArdle et al. (2015), who reported that excessive physical activity can induce microtrauma and accelerate local joint inflammation.

While non-risky physical activity appears to be protective, the study identified cases of gout arthritis among respondents in this group. This suggests the involvement of additional risk factors, including high-purine diets, advanced age, genetic predisposition, obesity, hypertension, diabetes, and unhealthy lifestyle habits. Furthermore, irregular engagement in light-to-moderate physical activity may diminish its protective effects on purine metabolism and uric acid excretion. Hall and Guyton (2021) corroborate these findings, noting that regular physical activity supports metabolic balance, whereas excessive activity

increases uric acid production and the risk of hyperuricemia.

The findings of this study are consistent with those of Meilianty et al. (2025), Magfira and Adnani (2021), and Yushoffa and Ruhana (2025), all of whom reported a significant association between physical activity and uric acid levels. Consequently, preventive strategies should prioritize the promotion of appropriate, regular, and balanced physical activity. Community education regarding safe types, intensity, and duration of physical activity, combined with nutritional counseling and healthy lifestyle interventions at health facilities, is anticipated to sustainably reduce the risk of gouty arthritis.

3. Nutritional Status Risk Factors for the Incidence of Gout Arthritis

The present study demonstrates that nutritional status is a risk factor for the incidence of gout arthritis among patients in the Bukit Kangka Health Center area, Siompu District, Buton Selatan Regency. Individuals with risky nutritional status exhibited a 3.5-fold increased likelihood of developing gout arthritis compared to those with non-risky nutritional status. Overweight and obesity contribute to elevated uric acid levels by enhancing purine metabolism and reducing renal excretion, ultimately resulting in hyperuricemia, which is the primary trigger for gouty arthritis. This finding aligns with the theory proposed by Choi et al. (2005), which underscores the role of obesity in increasing the risk of gout arthritis.

While normal nutritional status appears to be protective, the study identified cases of gout arthritis among respondents with normal nutritional status. This suggests that additional risk factors, including high-purine diets, advanced age, genetic predisposition, hypertension, diabetes, and unhealthy lifestyle habits, contribute to disease development. Furthermore, a history

of obesity may continue to influence uric acid metabolism even when current nutritional status is within the normal range. The chronic inflammation theory supports this observation, indicating that excessive adipose tissue produces pro-inflammatory cytokines that intensify joint inflammation resulting from urate crystal deposition (Richette & Bardin, 2017).

The findings of this study are consistent with previous research by Verawati et al. (2020) and Tane et al. (2023), both of which reported a significant association between nutritional status and gout arthritis. Consequently, preventive strategies should prioritize improving nutritional status through balanced diet education, portion control, and the selection of low-purine, low-fat foods to prevent overweight and obesity. Regular monitoring of nutritional status and individualized counseling at health facilities, in conjunction with appropriate physical activity, are recommended to achieve and maintain ideal body weight. Community-based promotive and preventive programs focused on obesity control are anticipated to contribute to a sustainable reduction in the risk of gouty arthritis.

CONCLUSIONS

The results of this study demonstrate that dietary patterns, physical activity, and nutritional status are significant risk factors for gout arthritis among patients in the Bukit Kangka Health Center, Siompu District, Buton Selatan Regency. Individuals exhibiting risky dietary patterns, insufficient physical activity, and poor nutritional status were 3.1, 2.6, and 3.5 times more likely, respectively, to develop gouty arthritis. These findings support the importance of lifestyle modification as part of gout prevention strategies. Future prospective studies using multivariable analysis are recommended to confirm these associations.

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