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The Effectiveness of Red Onion Compresses in Reducing Joint Pain Intensity in Elderly Patients with Gout Arthritis

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ABSTRACT

Background & Objective: *Gout arthritis* is a condition that occurs due to elevated uric acid levels in the blood beyond normal limits, commonly seen in the elderly, characterized by joint pain. Based on data from the Natar Elderly Care Home, there are 15 elderly individuals with *gout arthritis* experiencing joint pain. Pain associated with *gout arthritis* can be managed through pharmacological therapy, such as medication, as well as non-pharmacological therapy, one of which is red onion compresses. This non-pharmacological approach is considered safer and has fewer side effects, particularly for the elderly. This study focuses on evaluating the effectiveness of red onion compresses in reducing joint pain in elderly individuals with gout arthritis at the Natar Elderly Care Home. **Method:** The method used in this study is a quantitative method with a quasi-experimental design, specifically a *single-group pre-post test*. The sample consists of 15 elderly individuals selected using purposive sampling. Pain levels were measured using the Numeric Rating Scale (NRS), and data were analyzed using a paired sample t-test. **Result:** Statistical analysis revealed a p-value of 0.000 ($p < 0.05$), indicating a significant difference between *pre-* and *post*-application pain levels. This indicates that the intervention is effective in reducing joint pain in elderly gout patients. **Conclusion:** The application of red onion compresses has been proven effective as a non-pharmacological therapy for managing joint pain in elderly individuals with *gouty arthritis*. It is hoped that this intervention can be implemented sustainably at the Natar Elderly Care Home as an alternative pain management option for the elderly.

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Introduction

Gout arthritis or uric acid is a chemical produced when the body breaks down waste. The kidneys normally excrete this uric acid through urine. Under certain conditions, the kidneys are unable to excrete uric acid optimally, leading to its accumulation. Over time, this buildup can crystallize and form crystals in various parts of the body, particularly in the joints and kidneys. It is these crystals in the joints that cause pain, swelling, and inflammation (Susanti, 2020).

Gout arthritis often occurs in the elderly, usually due to a decrease in kidney function to remove excess uric acid from the blood. Normal uric acid levels in men range from 3.5-7 mg/dl and in women from 2.6-6 mg/dl. If levels exceed these limits, it is called hyperuricemia (Susanti, 2020).

According to the World Health Organization (WHO), the global prevalence of *gout arthritis* reaches 34.2%. In the United States, the prevalence of gout arthritis is recorded at 13.6%. Meanwhile, in countries like China and Taiwan, *gout arthritis* has seen a significant increase each year. This disease is also one of the leading causes of global mortality, contributing to approximately 68% of all deaths, including 700,000 cases in the United States and the United Kingdom (WHO, 2020).

In Indonesia, the number of gout patients continues to rise. According to data from healthcare professionals, approximately 11.9% of the population has been diagnosed with gout, and when considering the symptoms experienced, the figure reaches 24.7%. This disease primarily affects the elderly, particularly those aged 75 and above, with a prevalence rate of 54.8%. Additionally, the prevalence of gout is higher in women, at 8.46%, compared to men, who have a prevalence of 6.13%. In Lampung Province, the prevalence of gout is recorded at 7.61%, or approximately 22,171 people (Riskesdas, 2018).

Gout arthritis can cause joint pain that interferes with a person's activities. Pain from *gout arthritis* typically occurs at night until morning and is often felt in joints such as the feet, ankles, wrists, knees, and elbows (Dr. Rika Amran *et al.*, 2024).

Gout Arthritis causes pain that can be managed through medical approaches based on medication as well as through alternative management without the use of medication. Pain management with medication is typically done in collaboration with a doctor or other medical professionals. Meanwhile, non-medication management can be done through simple methods, such as applying a compress to the painful area using red onions (R. A. Fadila, 2024).

Red onions contain active flavonoid compounds with anti-inflammatory properties, which help reduce inflammation in the body, as well as kaempferol compounds that act as analgesics or pain relievers. Applying a red onion compress creates a warm sensation in the treated area, stimulating vasodilation or the widening of blood vessels. This process triggers muscle relaxation and increases blood flow in the area. Additionally, the flavonoids in red onions act as anti-inflammatory agents by inhibiting the cyclooxygenase enzyme, which is involved in prostaglandin synthesis. This inhibition reduces blood vessel dilation in the area around the inflammation, while also limiting the movement of immune cells to the inflamed tissue. Thus, joint pain caused by inflammation can be reduced (Aisah *et al.*, 2022).

Objective

This scientific study focuses on examining the effectiveness of red onion in reducing joint pain symptoms in elderly people suffering from gouty arthritis at the Natar Nursing Home.

Method

This study applied a single-group pretest-posttest quasi-experimental design with 15 respondents selected through purposive sampling. Pain levels were measured using the *Numeric Rating Scale* (NRS) instrument. Data were analyzed using a *paired sample t-test.* The study was conducted at the Natar Nursing Home in April 2025.

Results

Univariate analysis

TABLE 1. Distribution of Respondent Characteristics Based on Gender

Gender	Frequency	Percentage (%)
Male	7	**46.7**
Female	8	**53.3**
Total	15	**100**

Table 1 shows that the majority of respondents were female, with 8 respondents (53.3%), while the number of male respondents was 7 (46.7%).

TABLE 2. Distribution of Respondent Characteristics Based on Age Group

Age	Frequency	Percentage (%)
60-70	8	**53.3**
71-80	7	**46.7**
Total	15	**100**

Based on Table 2, 8 people (53.3%) were in the 60–70 age group, and 7 people (46.7%) were in the 71–80 age group.

TABLE 3. Distribution of Pre-Intervention Pain Scale for Red Onion Compresses in Elderly People with Gout Arthritis at the Natar Nursing Home

Characteristics	Frequency	Percentage (%)
Mild pain (1-3)	3	**20.0**
Moderate pain (4-6)	9	**60.0**
Severe pain (7-10)	3	**20.0**
Total	15	**100**

Based on Table 3, it can be seen that the majority of respondents experienced moderate pain, namely 9 people (60.0%).

TABLE 4. Distribution of Pain Scale Post-Intervention with Red Onion Compress on Elderly People with Gout Arthritis at the Natar Elderly Care Facility

Characteristics	Frequency	Percentage (%)
Mild pain (1-3)	11	**73.3**
Moderate pain (4-6)	3	**20.0**
Severe pain (7-10)	1	**6.7**
Total	15	**100**

Based on Table 4, it can be seen that respondents who experienced mild pain had a higher percentage, namely 11 people (73.3%).

Bivariate Analysis

TABLE 5. Effectiveness of Red Onion Compresses in Reducing Joint Pain in Elderly People with Gout Arthritis at the Natar Nursing Home

Characteristics	Frequency Pre	Percentage (%)	Frequency Post	Percentage (%)
Mild pain (1-3)	3	20.0	11	**73.3**
Moderate pain (4-6)	9	60.0	3	**20.0**
Severe pain (7-10)	3	20.0	1	**6.7**
Min	1		1	
Max	3		3	
SD	0.655		0.617	
Mean	2.00		1.33	
p-value (*paired sample T-test* statistical test) 0.000				

Based on Table 5, there was a change in pain scale between the pre- and post-intervention conditions of red onion compresses on elderly people with gouty arthritis at the Natar Nursing Home. Before the intervention, 60.0% of respondents experienced moderate pain. After the red onion compress intervention, the percentage of respondents with moderate pain decreased to 20.0%. The results of the analysis using a paired sample t-test showed a p-value of 0.000 ($p < 0.05$), indicating that the application of red onion as a compress significantly influenced pain intensity in the joints of elderly individuals with *gout arthritis*.

Discussion

Pre-Intervention Pain Level of Red Onion Compress Therapy

Based on the research results, it was found that the intensity of pain after red onion compress therapy intervention in elderly people with gouty arthritis showed that most respondents experienced pain with a score of 5, which falls into the moderate pain category. Meanwhile, the smallest number of respondents was recorded on a pain scale of 7, which is classified as severe pain. Additionally, the majority of respondents were in the 60 to 70 age group.

According to the study by Adinda *et al* (2024), the age range of individuals at risk of developing gout typically exceeds 40 years. This is attributed to a decline in metabolic capacity as age increases. Besides age, there are several other risk factors that can trigger gout, including a family history of similar conditions, consumption of high-purine foods, use of certain medications, and an unhealthy lifestyle.

The elderly are in the high-risk age group for gout. This is due to a decline in metabolic function, particularly in the breakdown and management of protein levels, which can increase purine production. The accumulation of purines contributes to elevated uric acid levels in the bloodstream (Marlinda dan Putri, 2019).

This study found that female respondents had a higher prevalence of gout, at 53.3%, compared to male respondents. This aligns with a study by Niva Juliana *et al* (2023), which explains that older women tend to experience increased uric acid levels due to a decrease in estrogen during menopause. Estrogen plays a role in aiding the excretion of uric acid through the kidneys, so a decrease in this hormone also triggers an increase in uric acid levels in the blood. Putu Sintya Arlinda *et al* (2021) also noted that young adult women are relatively more protected from the risk of hyperuricemia, but uric acid levels tend to increase significantly after entering menopause.

Post-Intervention Pain Levels with Red Onion Compress Therapy

The study results showed that at the post-intervention stage, the average joint pain intensity among respondents was 1.33%. This value indicates a decrease of 0.67% compared to the pain level at the pre-intervention stage. The red onion compress therapy was administered consecutively over three days.

The results of the study by Safira dan Hamidi (2022) also showed a decrease in joint pain intensity in the elderly after the intervention. The average intensity of joint pain complaints before the intervention using red onion as a compress was 5.00, and decreased to 2.43 after the intervention was performed.

Based on the cross-tabulation results, nearly all respondents showed changes in pain levels, with pain that was initially in the moderate category decreasing to mild pain after the red onion compress intervention was performed. The red onion intervention was proven to be optimal in reducing joint pain in elderly individuals with gouty arthritis. The active compounds and heat effects of red onions can improve blood circulation and stimulate muscle relaxation (Iin Alizzah *et al.*, 2024).

Effectiveness of Red Onion Compresses in Elderly Individuals with *Gouty Arthritis*

The study results showed that before the red onion compress therapy intervention, 3 respondents (20.0%) were in the mild pain category (scale 1-3), 9 respondents (60.0%) in the moderate pain category (scale 4-6), and 3 respondents (20.0%) in the severe pain category (scale 7-10). After receiving the red onion compress intervention, there was a decrease in pain, with 11 respondents (73.3%) falling into the mild pain category, 3 respondents (20.0%) in the moderate pain category, and 1 respondent (6.7%) in the severe pain category. This reduction in pain levels indicates the effectiveness of red onion therapy as a compress in reducing the intensity of pain in respondents.

The results of this study indicate a reduction in joint pain levels in elderly individuals with *gouty arthritis* after receiving red onion therapy intervention. The average pain intensity score before the intervention was 5.00 and decreased to 2.43 after the intervention. This finding is consistent with the study conducted by Saputro *et al* (2023), which stated that there was a decrease in joint discomfort levels in elderly gout patients after topical red onion therapy was administered. The statistical analysis in this study showed a significance value of $p = 0.002$ ($p < 0.05$), indicating that red onion therapy has a significant effect on reducing joint pain in patients with *gouty arthritis.*

According to Nurjannah *et al*, (2025) red onions contain the compound allylcysteine sulfoxide (alliin), which can produce a heating effect, making them commonly used in compress therapy. The use of red onion compresses is known to alleviate pain experienced by gout sufferers. This is attributed to the presence of various active compounds in red onions, such as allylcysteine sulfoxide, flavonoids, and kaempferol. Kaempferol has pharmacological effects as an anti-inflammatory and analgesic, playing a role in reducing inflammation and alleviating pain, particularly in joint areas.

Conclusion

The results of this study indicate that most elderly individuals with gouty arthritis at the Natar Nursing Home are in the 60–70 age range, with a higher prevalence among women (53.3%) than men (46.7%). Analysis using a paired sample

t-test revealed a significant difference between joint pain levels before and after the intervention, with a p-value of 0.000. This demonstrates that red onion therapy is highly effective in reducing joint pain in elderly individuals with gout arthritis. This success is attributed to the anti-inflammatory, anti-inflammatory, and analgesic properties of the flavonoids, kaempferol, and alliin found in red onions. As such, this therapy can be considered as a non-pharmacological alternative in the management of joint pain in the elderly.

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