



# Managing Pain Related Gout Arthritis in Elderly: An Intervention Using Ergonomic Exercise and Warm Lemongrass Compress in Joyotakan Village, Surakarta

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## Abstract

**Background:** Gouty arthritis is a degenerative joint disease that affects many elderly people, characterized by severe pain that can interfere with daily activities. Non-pharmacological treatments are an essential alternative in reducing this pain. **Objective:** To determine the effectiveness of ergonomic exercises and warm compresses of lemongrass on pain levels in elderly people with gouty arthritis in RT 03 RW 02 Joyotakan Village, Serengan District, Surakarta City. **Method:** The research method employs a descriptive approach with observation sheets monitored by two respondents. **Results:** The study showed a decrease in pain levels in both respondents, from moderate to mild pain, and this improvement persisted after the intervention. Pain reduction was achieved through increased muscle relaxation and improved blood circulation, resulting from a combination of gymnastic movements and the analgesic effect of lemongrass leaves. **Conclusion:** Ergonomic gymnastics and warm compresses made from lemongrass leaves are effective in reducing pain levels in the elderly with gouty arthritis and can be applied as an alternative non-pharmacological therapy in the community.

**Keywords:** Elderly, Gout Arthritis, Ergonomic Exercise, Pain, Warm Compress, Lemongrass

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## 1. BACKGROUND

Elderly, or commonly referred to as senior citizens, are part of the natural growth and development process of every human being. This condition does not occur suddenly, but instead progresses through stages including infancy, childhood, adolescence, adulthood, and

finally old age (Wulandari et al., 2023).

Cellular decline in the elderly is a natural consequence of the aging process, which can lead to weakened organs, physical deterioration, and the development of various diseases, such as increased uric acid levels (Anwar & Yulia, 2020). As age increases, structural and functional

changes occur in cells, tissues, and organ systems. These changes contribute to the decline in physical health, ultimately making individuals more susceptible to diseases (Akbar et al., 2020).

According to the World Health Organization (2020), the most common diseases among people aged over 60 years include hypertension at 22% affecting 7.7 billion seniors, diabetes mellitus at 17% affecting 537 million seniors, and gout arthritis ranked third at about 12%, affecting 429 million seniors. According to Riskesdas (2022), it was found that uric acid disease affects 11.9% of the population, 24.7% of the population based on age groups, and 54.8% of the population above the age of 75. Based on an epidemiological survey conducted by the Central Java Provincial Health Office, which included a sample size of 4,683 individuals, the prevalence of uric acid was found to be 11.75% in women and 24.3% in men. Each year, the number of people suffering from uric acid continues to increase significantly. Uric acid ranks second in terms of the number of patients, following heart disease and hypertension (Dinkes Jateng, 2021). Meanwhile, according to Dinkes Surakarta (2022), the prevalence of gout arthritis diagnosed by doctors among residents aged 15 years and above in

Surakarta City is 4.96% out of a total weighted sample of 1,069 individuals. The prevalence of gout arthritis at Kratonan Community Health Center is reported to be 129 elderly individuals suffering from gout arthritis.

Uric acid is the end product of purine metabolism, which is one component of nucleic acids found in the cell nucleus. The cause of crystal accumulation in the joints is due to purine content, which can raise uric acid levels in the blood between 0.5–0.75 g/ml when consumed. Gout arthritis is a degenerative disease that affects the joints and is most commonly found in society, particularly among the elderly (Irdiansyah et al., 2022). The typical symptom of gout is joint pain that causes inflammation in the joints. Gout can attack any joint in the body and may result in swelling, burning sensations, and mild to severe pain (Rahmawati & Kusnul, 2021).

Several risk factors can contribute to the occurrence of gout arthritis, including excessive purine consumption, alcohol intake, stress, medication use, obesity, hypertension, and genetic predisposition (Sueni et al., 2021). According to Zhang et al. (2022), other risk factors causing someone to develop gout arthritis include age, high intake of purine compounds, excessive alcohol consumption,

overweight (obesity), lack of physical activity, high blood pressure and heart disease, certain medications (especially diuretics), and impaired kidney function. High levels of uric acid in the blood can lead to crystal deposition in joint areas, causing physical disturbances such as joint pain and interfering with the daily activities of individuals with gout (Barao et al., 2022).

There are pharmacological and non-pharmacological treatments for managing gout and joint pain. Pharmacological therapy for gout encompasses two categories of drugs used in treating hyperuricemia: those that increase the elimination of uric acid (uricosuric) and those that reduce the formation of uric acid (uricostatic) (Wulandari et al., 2023). Non-pharmacological therapy for managing joint pain in gout arthritis includes dietary modifications, physical exercise, ergonomic gymnastics, relaxation techniques, and warm compresses using lemongrass (Loka & Sumadja, 2021).

Based on preliminary studies conducted in April 2025 in Joyotakan Village, data showed 53 elderly individuals suffering from gout arthritis. Two respondents in RT 3/RW 2 Joyotakan Village met the inclusion criteria. They had never previously received interventions of

ergonomic gymnastics and lemongrass warm compresses to reduce pain levels in patients with gout arthritis. The interview results showed that one person experienced pain in the left foot due to gout, rated 8, while another reported pain in the right foot during movement. Based on this background, the researcher decided to examine The Application of Ergonomic Gymnastics and Warm Lemongrass Compress on Pain Levels in Elderly Individuals with Gout Arthritis in RT 03 RW 02 Joyotakan Village, Serengan Subdistrict, Surakarta City.

## 2. METHODS

The study employed a case study design with a pre-experimental approach using a one-group pretest-posttest design. This method aimed to implement ergonomic gymnastics and warm compresses made from lemongrass stems to assess their impact on pain levels among elderly individuals suffering from gout arthritis in Joyotakan Village.

The study took place in RT 3 RW 2, Joyotakan Village, Serengan, Surakarta City, and was conducted between June 7 and 9, 2025. The study subjects were selected based on specific inclusion and exclusion criteria. The inclusion criteria required participants to be aged between

60 and 85 years, be cooperative and able to communicate effectively, have gout with a pain scale above 6, not have taken uric acid medication within the hour prior to the experiment, and not have taken analgesics within the hour before the experiment. Exclusion criteria excluded those suffering from hypertension, those unable to stand, those unwilling to participate, those with foot injuries, and others who did not meet the research requirements.

The first patient was Mrs. M, aged 80 years, with a history of gout for 5 years, and she regularly visited the doctor for check-ups. She complained of joint pain during movement, particularly in her left foot, with a pain scale of 7 before the intervention. Her dietary pattern was considered unhealthy as she often consumed chicken offal and peanut crackers. During the general examination, her overall condition was categorized as moderate, with a blood pressure reading of 155/90 mmHg. No significant abnormalities were found during the physical examination, except for redness and swelling around the left knee.

The second respondent was Mrs. W, aged 69 years, who had suffered from gout for the past two years and consistently took prescribed gout medication. She complained of joint pain in her right foot when moving, accompanied by a feeling of

heat in the affected area. Her initial pain level was rated at 8 before the intervention. Her diet was more controlled, following medical advice, and she adhered to a low-purine diet. During the physical examination, her general condition was also categorized as moderate, with a blood pressure reading of 130/80 mmHg. Redness and tenderness were observed around the right knee. Both respondents did not suffer from comorbidities such as hypertension or diabetes mellitus, thus fulfilling the inclusion criteria to receive ergonomic gymnastics and warm lemongrass stem compress treatments.

Data collection methods primarily consisted of interviews and observations. Interview techniques (autoanamnesis) were used to gather information such as the level of pain before and after the interventions. Observations were also conducted directly to monitor clinical conditions and patient responses before and after the implementation of the interventions. Data analysis was conducted by analyzing responses obtained from in-depth interviews to address the research questions. The data were then presented descriptively in both text and tabular forms to facilitate an understanding of the results of the therapy implementation, which involved ergonomic gymnastics and warm compresses with lemongrass.

Ethical considerations were strictly followed throughout the study. These included obtaining informed consent, ensuring benefits for participants, avoiding harm, maintaining participant anonymity, reporting findings honestly, ensuring fairness in subject selection, and maintaining the confidentiality of all collected information. All ethical guidelines ensured that the rights and dignity of the participants were respected and upheld throughout the study.

**3. RESULTS**

The case study was conducted on two respondents in RT 03/RW 02, Joyotakan Village, Serengan Subdistrict, Surakarta City. The ergonomic gymnastics and warm lemongrass stem compresses were carried out three times a week, and the researcher accompanied the respondents during each 20-minute session of ergonomic gymnastics.

**Table 1.** Pain Levels Before Implementation of Ergonomic Gymnastics and Warm Lemongrass Stem Compress

Date	Respondent	Pain level
June 7, 2025	Mrs. M	7 (Severe)
	Mrs. W	8 (Severe)
June 8, 2025	Mrs. M	6 (Moderate)
	Mrs. W	6 (Moderate)
June 9, 2025	Mrs. M	5 (Moderate)
	Mrs. W	4 (Moderate)

On Day 1, Mrs. M had severe pain with a score of 7, while Mrs. W had severe pain with a score of 8. On Day 2, both showed moderate pain levels Mrs. M

scored 6, and Mrs. W also scored 6. By Day 3, Mrs. M's pain level remained moderate with a score of 5, while Mrs. W improved slightly to a score of 4.

**Table 2.** Pain Levels After Implementation of Ergonomic Gymnastics and Warm Lemongrass Stem Compress

Date	Respondent	Pain level
June 7, 2025	Mrs. M	6 (Moderate)
	Mrs. W	6 (Moderate)
June 8, 2025	Mrs. M	5 (Moderate)
	Mrs. W	4 (Moderate)
June 9, 2025	Mrs. M	3 (Mild)
	Mrs. W	2 (Mild)

After the intervention, on Day 1, both Mrs. M and Mrs. W still experienced moderate pain, scoring 6 each. On Day 2,

Mrs. M's pain level decreased to a score of 5 (moderate), and Mrs. W's pain level dropped to a score of 4 (also moderate). By

Day 3, Mrs. M's pain level further improved to a score of 3 (mild), while Mrs. W's pain level was 2 (mild).

**Table 3.** Comparison of Pain Levels Before and After Implementation of Ergonomic Gymnastics and Warm Lemongrass Stem Compress

Date	Respondent	Pre-Implementation Score	Post-Implementation Score	Difference
June 7, 2025	Mrs. M	7 (Severe)	6 (Moderate)	1
	Mrs. W	8 (Severe)	6 (Moderate)	2
June 8, 2025	Mrs. M	6 (Moderate)	5 (Moderate)	1
	Mrs. W	6 (Moderate)	4 (Moderate)	2
June 9, 2025	Mrs. M	5 (Moderate)	3 (Mild)	2
	Mrs. W	4 (Moderate)	2 (Mild)	2

Table 3 shows that after implementing ergonomic gymnastics and warm lemongrass stem compresses over 3 days, there was a decrease in pain levels, from severe to mild. Both respondents experienced improvements in their conditions, indicating the effectiveness of the interventions.

#### 4. DISCUSSION

##### Pain Levels of Respondents Before Implementation of Ergonomic Exercise and Warm Lemongrass Compress

The results before implementing ergonomic exercise and warm compress with lemongrass on day 1 showed that respondent Mrs. M had severe pain with a score of 7, while respondent Mrs. W had severe pain with a score of 8. On day 2, Mrs. M had moderate pain with a score of 6 and Mrs. W also had moderate pain with a score of 6. On day 3, Mrs. M still had moderate

pain with a score of 5 and Mrs. W had moderate pain with a score of 4.

The data obtained during the assessment of both respondents showed that before being given ergonomic exercises and warm compresses with lemongrass, they experienced severe pain, characterized by joint pain, redness, and discomfort when moving due to gout arthritis.

A similar study conducted by Hastutik et al. (2022) found that before implementing ergonomic exercise and warm compress with lemongrass for 3 days in two patients, the pain levels were categorized as severe on day 1. Patient Mrs. M had severe pain on the first day, and patient Mrs. W also had severe pain. Both respondents had severe pain because of their age and previous history of gout arthritis.

According to Andri & Yudha (2020), hyperuricemia is one of the risk factors for various diseases, including gout arthritis. In addition, uric acid levels can serve as a biomarker for worsening glucose metabolism, kidney function, and inflammation. There is a relationship between high uric acid levels (hyperuricemia) and the occurrence of gout arthritis. The symptoms commonly experienced by gout sufferers include sudden severe pain, often occurring at night. Other symptoms include continuous joint pain, redness in the affected joints, joint swelling, joint stiffness, a burning sensation in the joints, and softness when pressing the joints (Sandra, 2022).

#### **Pain Levels of Respondents After Implementation of Ergonomic Exercise and Warm Lemongrass Compress**

After implementation of ergonomic exercise and warm compress with lemongrass, on day 1, Mrs. M had moderate pain with a score of 6 and Mrs. W also had moderate pain with a score of 6. On day 2, Mrs. M had mild pain with a score of 5 and Mrs. W had mild pain with a score of 4, by day 3, Mrs. M had mild pain with a score of 3 and Mrs. W had mild pain with a score of 2.

A similar study conducted by Hastutik et al. (2022) showed that after

applying ergonomic exercises and warm compresses with lemongrass for 3 days to two patients, Mrs. M and Mrs. W had moderate pain on day 1, moderate pain on day 2, and mild pain on day 3.

Preventive measures for high uric acid levels can be done pharmacologically and non-pharmacologically. Non-pharmacological methods include physical activity, which varies for each elderly individual depending on their physical condition (Prihananto et al., 2022). One form of exercise that individuals with gout arthritis can perform to reduce uric acid levels and pain is ergonomic exercise combined with warm compresses using lemongrass. Efforts to reduce uric acid levels can also involve non-pharmacological therapy using various methods such as exercise, stretching, and active range-of-motion exercises (Anggraeni & Mujahid, 2020).

Ergonomic exercise and warm compress with lemongrass are very effective for health protection because these gentle movements are easy for the elderly to perform. Regular and balanced ergonomic exercises, combined with hydrotherapy, can help reduce the accumulation of uric acid in the body. These ergonomic exercises, combined with a warm compress and lemongrass, are highly effective in reducing uric acid

concentration in the blood and pain levels (Meyta et al., 2023).

The researcher opines that the implementation of ergonomic exercises and warm compresses with lemongrass is quite effective in helping to reduce uric acid concentration in the blood and the level of pain experienced.

#### **Final Comparison Results of Pain Levels Before and After Implementation of Ergonomic Exercise and Warm Lemongrass Compress**

The final comparison results, over 3 days of implementing ergonomic exercises and warm compresses with lemongrass, showed a decrease in pain levels from severe to mild. The reduction in pain levels between Mrs. M and Mrs. W differed because Mrs. M experienced less pain reduction than Mrs. W. This was due to dietary factors; Mrs. M consumed more chicken offal and snack foods such as peanut brittle.

Other factors influencing pain levels, besides diet, included the age of the respondents. Mrs. M belonged to the "Old" senior category, so her exercise movements were limited and not maximally performed, whereas Mrs. W fell into the "Elderly" category, making her more active and able to perform the exercises more effectively. Physical strength significantly influenced

the effectiveness of ergonomic exercises and the resulting reduction in pain.

The size of the lemongrass used also affected the outcomes, as the researcher did not use a scale and only relied on the number of stalks, which influenced the effectiveness of the lemongrass water compress applied.

Another similar study by Hastutik et al. (2022) showed that both respondents experienced a reduction in pain levels after performing ergonomic exercises for 15–20 minutes daily for 3 days. Mrs. H experienced a decrease in moderate pain to mild pain, and Mrs. D also showed reduced pain levels from moderate to mild.

According to Fitriani et al. (2021), factors triggering gout arthritis pain include uncontrolled eating habits, such as consuming purine-rich foods like legumes, meat, offal, and alcoholic beverages.

Physical activity involves body movement caused by skeletal muscle activity, leading to energy expenditure. The physical activities performed by humans are related to uric acid levels in the blood. Physical activities such as exercise or physical movement reduce uric acid excretion and increase lactic acid production in the body (Ditte et al., 2022). The warm lemongrass compress provides warmth, meets comfort needs, alleviates or

reduces pain, and prevents or reduces muscle spasms (Toto & Nababan, 2023).

Ergonomic exercises and warm compresses with lemongrass are efficient in protecting health because these gentle movements are easy for seniors to perform. Regular and balanced ergonomic exercises, combined with hydrotherapy, help reduce uric acid buildup in the body. These ergonomic exercises, combined with a warm compress and lemongrass, are highly effective in lowering uric acid concentration in the blood and reducing pain levels (Meyta et al., 2023).

## 5. CONCLUSION

Based on a literature review of 10 research journals, there is evidence of a strong relationship between parenting and adolescent mental health, which is revealed in this study. A total of 7 out of 10 journals examined showed an association between parenting patterns and adolescents' mental and emotional health. The research identified several parenting styles that influence adolescents' mental health, namely democratic, authoritarian and permissive parenting. To mitigate the negative effects of less-than-ideal parenting, parents are advised to adopt more democratic parenting approaches by providing emotional support, fostering open communication, and establishing

clear yet non-stressful boundaries. In addition, improving parents' understanding of the importance of adolescent mental health through family education and counselling programs can also help create a more positive environment for their children.

## AUTHOR CONTRIBUTIONS

The author contributes in conceptualization, data collection and analysis Fernanda Ayu Dentaningtyas, Didik Iman Margatot, Nur Haryani. Writing and manuscript revisions: Fernanda Ayu Dentaningtyas.

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## CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest in this research.

## DATA AVAILABILITY STATEMENT

The data are available from the corresponding author upon reasonable request.

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