

## THE EFFECT OF RHEUMATIC GYMNASTICS AND COLD WATER THERAPY ON THE REDUCTION OF PAIN SCALE IN THE ELDERLY WITH GOUT ATHRITIS WORK AREAMUARA BANGKAHULU HEALTH CENTER CITY OF BENGKULU

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### ABSTRACT

Elderly is a person who has reached the age of  $\leq 60$  years which is a stage that every individual goes through in the life process. Gout Arthritis disease, also known as gout, is a type of arthritis characterized by hyperuricemia or high levels of uric acid in the blood causing symptoms of pain in various joints. World Health Organization (WHO) data reported that the number of people with gout arthritis in the world reaches 335 million people and this number continues to increase every year. One of the non- pharmacological therapies for pain that can be done is Rheumatic Gymnastics and Cold Water Therapy. This study is to determine the effect of rheumatic gymnastics and Cold Water Therapy on reducing the pain scale in the elderly with Gout Arthritis in the working area of the Muara Bangkahulu Health Center, Bengkulu City in 2025. This type of research is a *quasi experiment with a pre- post with control group* with a total sample of 52 respondents. The intervention of rheumatic gymnastics and Cold Water Therapy was carried out 3 times for 2 weeks with the instrument used being *the Numeric Rating Scale*. Statistical tests using Mann-whitney showed a p-value of 0.034 (*p value*  $\alpha$  0.05) so it can be interpreted that there is an effect  $\leq$  of rheumatic gymnastics and Cold Water Therapy on the reduction of pain scale in the elderly with Gout Arthritis in the working area of the Muara Bangkahulu Health Center.

**Keywords:** Elderly; Gout Arthritis; Pain

### INTRODUCTION

An elderly person is someone who has reached the age of 60 years or older. This is a phase of life that is affected by a decline in physical and psychological abilities and functions. Data from the World Health Organization (WHO) in 2020, cited from (Wardhani & Nisa, 2023), states that the number of people aged 60 years and above will increase from 1.4 billion in 2020 to 2.1 billion in 2050. The well-being of the elderly is closely related to their physiological condition, as they undergo comprehensive physical changes. This results in vulnerability to various diseases that can affect the decline of organ function, making the elderly prone to various chronic diseases.

The aging process is a natural decline in physical condition that occurs in most stages of life, characterized by weakness and loss of mobility. During the aging process, a person may experience various health problems, commonly referred to as degenerative diseases, such as hypertension, osteoarthritis, rheumatoid arthritis, diabetes mellitus, stroke, and one of the chronic diseases that causes disorders in the musculoskeletal system is gouty arthritis (Ningsih et al., 2024).

Gouty arthritis, also known as gout, is a type of arthritis characterized by hyperuricemia, or high levels of uric acid in the blood. Hyperuricemia is defined as uric acid levels above 7.0 mg/dl in men and 6.0 mg/dl in women. High uric acid levels cause the accumulation of monosodium urate crystals in the joints, resulting in pain in various joints such as the feet, knees, hands, and most commonly in the wrist joints and toe joints (Atika Oktaviani, 2023).

Pain is a sensory and emotional experience caused by tissue damage, resulting in discomfort due to the pain it induces. Pain can be caused by various diseases, one of which is joint pain in gouty arthritis. This joint pain has symptoms caused by a joint inflammation disease that can be acute or chronic. The World

Health Organization (WHO) reports that the number of people with gouty arthritis worldwide has reached 335 million, and this number continues to increase every year (Arifuddin et al., 2024).

The increase in gouty arthritis cases is not only occurring in developed countries, but also in developing countries, including Indonesia. The prevalence of gouty arthritis in Indonesia, based on the 2018 RISKESDAS results, shows that 53.13% of elderly people experience joint pain. In Indonesia, the prevalence of hyperuricemia based on healthcare professional diagnosis is 11.9%, while the prevalence based on symptoms and signs is 24.7%. According to doctor diagnoses, the prevalence of gout arthritis in Bali Province is 19.3%, Aceh 18.3%, and Bengkulu 12.11%. (Ministry of Health of the Republic of Indonesia, 2018).

According to data from the Bengkulu City Health Office in 2023, there were 20,847 elderly people. Among the elderly, 3,650 people suffered from gouty arthritis. Based on data from the Bengkulu City Health Office in 2023, the Lingkar Timur Community Health Center had the highest number of people suffering from gouty arthritis in 2023, with 373 people, followed by the Beringin Raya Community Health Center with 334 people and the Muara Bangkahulu Community Health Center with 228 people. (Bengkulu City Health Department, 2023).

Based on data obtained from the Muara Bangkahulu Community Health Center in Bengkulu City in 2023, there were 2,290 elderly people who visited the Muara Bangkahulu Community Health Center and 228 elderly people who suffered from gouty arthritis with joint pain in 2023. The risk factors that can increase the likelihood of gout in humans are consuming foods high in purines such as red meat, nuts, green vegetables, canned foods, consuming large amounts of alcohol, irregular physical activity, age, and obesity (Asam et al., 2024).

The impact of gouty arthritis caused by the accumulation of uric acid levels in the joints causes mild to severe joint pain and can cause difficulty in movement and complications such as joint damage, kidney dysfunction, heart problems, tophi, joint deformities, and atrophy.

Therapies that can be used to treat pain and discomfort in patients with gouty arthritis include pharmacological therapy and non-pharmacological therapy. Pharmacological therapy for gouty arthritis uses non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen, naproxen, and allopurinol (Atika Oktaviani, 2023). Non-pharmacological therapies include warm ginger compresses, warm compresses, cold compresses, warm lemongrass compresses, and rheumatic exercises. Of the many non-pharmacological therapies above, researchers are interested in rheumatic exercises and cold water therapy as therapies for treating joint pain in patients with gouty arthritis.

Rheumatic exercises are a type of non-pharmacological therapy involving physical exercises or light movements that can address issues in patients with gouty arthritis. Rheumatic gymnastics activities can stimulate the increase and release of endorphins during the exercise process, which can reduce pain levels. Rheumatic gymnastics also involves dynamic muscle contractions and engages many muscles and joints, which can lower heart rate and pulse, improve blood circulation, and rheumatic exercises can reduce joint pain and stiffness in the elderly (Masyuta et al., 2022).

*Cold Water Therapy or The use of cold water therapy is a non-pharmacological therapy that can be used to reduce pain and reduce symptoms of inflammation in patients with gouty arthritis. This treatment uses cold water at 10-15 degrees Celsius for two weeks. The cold sensation can stimulate the release of endorphins by the brain, which flow into the blood vessels, providing a relaxing sensation to the body and slowing nerve conduction, thereby reducing the number of pain impulses reaching the central nervous system. (Ono et al., 2024).*

*According to research conducted by (Hasanah et al., 2023) on the effect of rheumatic exercises on reducing pain levels in the elderly at the Harapan Kita Indralaya Social Welfare Home for the Elderly. The results of this study concluded that rheumatic exercises have an effect on the level of gout arthritis pain in the elderly at the Harapan Kita Indralaya Social Welfare Home for the Elderly in 2023.*

Based on research conducted by (Pratama et al., 2023) on the effect of Cold Relaxation therapy on pain reduction in gout patients in the Lawang area. From the results of this study, it can be concluded that Cold Relaxation therapy has an effect on pain reduction in gout patients in the Lawang area in 2023. Based on the initial survey conducted by researchers at the Muara Bangkahulu Community Health Center, it was found that out of 10 elderly people who visited, 6 elderly people suffered from gouty arthritis with joint pain. The results of interviews with the person in charge of the elderly showed that there were routine activities carried out by the Prolanis group (chronic disease management program), namely daily exercise for the elderly every Friday. However, Cold Water Therapy has not been used in combination with other treatments to address joint pain in elderly people with gouty arthritis. Therefore, the researchers were interested in conducting research on the effect of rheumatic exercises and Cold Water Therapy on reducing pain levels in elderly people with gouty arthritis in the Muara Bangkahulu Community Health Center area in

Bengkulu City.

## **MATERIALS AND METHODS**

The materials and methods section consists of the research design, data sources, data collection techniques, and data analysis conducted by the researchers. This study employed a quantitative quasi-experimental design using a pre-test and post-test control group approach to determine the effect of rheumatic exercises and cold water therapy on reducing pain levels in elderly individuals with gouty arthritis. Two groups were involved: the intervention group, which received rheumatic exercises combined with cold water therapy, and the control group, which performed ergonomic exercises. Pain levels in both groups were measured before (pre-test) and after (post-test) the intervention to assess the effectiveness of the treatment.

The research was carried out from March 17 to April 20, 2025, in the working area of the Muara Bangkahulu Community Health Center, Bengkulu City. The study population consisted of all elderly individuals aged  $\geq 60$  years suffering from gouty arthritis in the area, totaling approximately 228 people. Based on the calculation using the two-mean formula and supported by previous research data, a total of 52 respondents were selected, consisting of 26 participants in the intervention group and 26 in the control group, with an additional 10% allowance for possible dropouts. The non-probability random sampling technique was used with inclusion criteria: elderly individuals aged  $\geq 60$  years, experiencing mild to moderate joint pain, able to mobilize, and willing to participate. Exclusion criteria included elderly individuals with severe pain, mobility impairments, or those undergoing hospitalization.

The research utilized primary and secondary data. Primary data were obtained directly from respondents through interviews, identity questionnaires, and pain measurements using the Numeric Rating Scale (NRS), which has demonstrated high validity (0.90) and reliability (0.95) in previous studies. Secondary data were collected from official records at the Muara Bangkahulu Community Health Center. The stages of data processing included editing, coding, classification, processing, and tabulation to ensure the data were ready for analysis. Data analysis consisted of univariate analysis to describe respondent characteristics (age, gender, occupation, and education) and bivariate analysis to determine differences in mean pain levels. The Shapiro–Wilk test was used to test normality, while the Wilcoxon test was applied for within-group comparisons of non-normally distributed data, and the Mann–Whitney test was used for between-group comparisons.

The research procedure included administrative preparation, data collection, and intervention implementation. Before starting the study, the researchers obtained permission from relevant authorities and explained the research objectives and benefits to potential participants, who then provided written informed consent. The intervention group participated in rheumatic exercises and cold water therapy, while the control group performed ergonomic exercises. Pain levels were measured before and after each intervention using the NRS to assess changes in pain intensity. All research activities were conducted under the supervision of health professionals and in accordance with ethical standards.

Ethical approval was obtained from the Health Research Ethics Committee of the Bengkulu Ministry of Health Polytechnic (KEPK) under permit number KEPK.BKL/131/03/2025. Ethical principles, including beneficence, respect for human dignity, and justice, were upheld throughout the study. Respondents were informed of their right to refuse or withdraw from participation at any time, and the confidentiality of their personal information was guaranteed. This ensured that the study met both scientific and ethical standards, prioritizing the safety, comfort, and well-being of all elderly participants.

## **RESULTS AND DISCUSSION**

This study began with an intervention group consisting of 26 respondents. At the next meeting, a detailed and clear explanation of the research was given regarding the therapy that would be provided to the respondents, namely rheumatic exercise therapy and cold water therapy in the intervention group. Before starting the intervention, the researcher interviewed the respondents to obtain pre-test data to measure the level of pain felt by the respondents. The intervention was carried out for 30 minutes, 3 times a week for 2 weeks. In this study, each meeting included a Pre-Test pain measurement and a Post-Test to re-measure the pain level after rheumatic exercises and Cold Water Therapy.

The control group consisted of 26 respondents. At the next meeting, a detailed and clear explanation of the therapy to be given to the respondents was provided, namely ergonomic exercise therapy for the control group. Before starting the intervention, the researcher interviewed the respondents to obtain pre-test

data to measure the level of pain felt by the respondents. The intervention was carried out for 15 minutes, three times a week for two weeks.

In this study, each meeting included a pre-test to measure pain and a post-test to remeasure pain levels after ergonomic exercises were performed. Interventions in the intervention and control groups were carried out door-to-door or by visiting respondents' homes. After completing the study, the researchers obtained a letter of completion submitted to the Muara Bangkahulu Community Health Center in Bengkulu City.

Univariate analysis was performed to examine the frequency distribution of respondent characteristics based on age, gender, education, and occupation. Data presentation for each variable used tables and was interpreted based on the results obtained. The following table presents an overview of respondent characteristics:

**Table 1** Frequency Distribution of Respondents Based on Characteristics at Muara Bangkahulu Community Health Center, Bengkulu City

| No | Variable     | Group        |             | P-value |
|----|--------------|--------------|-------------|---------|
|    |              | Intervention | Control     |         |
| 1  | Age          |              |             |         |
|    | Mean         | 64.31        | 64.50       |         |
|    | Min          | 60           | 60          |         |
|    | Max          | 70           | 70          | 0.787*  |
|    | SD           | 2.710        | 2.387       |         |
|    | SE           | 0.531        | 0.468       |         |
|    | CI 95 %      | 63.21-65.40  | 63.54-65.46 |         |
| 2  | Gender       |              |             |         |
|    | Male         | 6 (23.1%)    | 6 (23.1%)   | 1.000** |
|    | Female       | 20 (76.9%)   | 20 (76.9%)  |         |
| 3  | Education    |              |             |         |
|    | JPD          | 20 (76.9%)   | 19 (73.1%)  | 1.000** |
|    | JPM          | 6 (23.1%)    | 7 (26.9%)   |         |
|    | JPT          | 0            | 0           |         |
| 4  | Occupation   |              |             |         |
|    | Housewife    | 4 (15.4%)    | 6 (23.1%)   | 0.387** |
|    | Trader       | 9 (34.6%)    | 12 (64.2%)  |         |
|    | Farmer       | 12 (46.2%)   | 7 (26.9%)   |         |
|    | Entrepreneur | 0            | 0           |         |
|    | Retired      | 0            | 0           |         |
|    | Not working  | 0            | 0           |         |

SD, Standard Deviation, \*sig  $p$  value  $> 0,05$ , \*\* sig 2 tailed Chi Square

Table 1 describes the average age characteristics of respondents in the intervention group and control group, which was 64 years. Statistical test results using the independent t-test showed a p-value of 0.787, indicating that there was no significant difference in age between the two groups ( $p > 0.05$ ). The majority of both the intervention group and control group were female (76.9%). There was no significant difference between the two groups in terms of gender, according to the results of a statistical test using Chi-Square, with a p-value of 1.000.

The educational status characteristics of the intervention group and control group showed that most respondents had a basic education, with 76.9% in the intervention group and 73.1% in the control group. There was no significant difference between the two groups, according to the results of a statistical test using Chi-Square with a p-value of 1.000. The employment status of respondents in this study in the intervention group was mostly farmers (46.2%), while in the control group, most were traders (64.2%). There was no significant difference between the two groups, according to the results of a statistical test using Chi-Square

with a p-value of 0.387. The following table shows the average gout arthritis pain scale before the intervention was carried out:

**Table 2** Overview of Gout Arthritis Pain Scores Before Intervention and Equivalence

| Variable                   | Group        |           | P-Value |
|----------------------------|--------------|-----------|---------|
|                            | Intervention | Control   |         |
| <b>Gout Arthritis Pain</b> |              |           |         |
| <b>Score</b>               |              |           |         |
| Mean                       | 4.81         | 5.04      | 0.125*  |
| Min                        | 4            | 4         |         |
| Max                        | 6            | 6         |         |
| SD                         | 0.749        | 0.344     |         |
| SE                         | 0.147        | 0.067     |         |
| CI 95 %                    | 4.51-5.11    | 4.90-5.18 |         |

\*P-Value

Table 2 shows that the results of the normality test for gouty arthritis pain scores before intervention in the intervention group and control group had a significant value of 0.000, which means that the data were not normally distributed based on the Shapiro-Wilk test results. Meanwhile, the results of the homogeneity test (variance equality test) for gout arthritis pain scores were 0.125, meaning that the gout arthritis pain scores of the respondents were the same/equal before the intervention was carried out. The following table shows the average gout arthritis pain scale before and after the intervention was carried out:

**Table 3** Overview of Gout Arthritis Pain Scores Before and After Intervention

| Variable                  | Mean | Median | Min | Max | SD    | CI        |
|---------------------------|------|--------|-----|-----|-------|-----------|
| <b>Intervention Group</b> |      |        |     |     |       |           |
| Before Intervention       | 4.81 | 5.00   | 4   | 6   | 0.749 | 4.51-5.11 |
| After Intervention        | 3.54 | 4.00   | 3   | 4   | 0.508 | 3.33-3.74 |
| <b>Control Group</b>      |      |        |     |     |       |           |
| Before Intervention       | 5.04 | 5.00   | 4   | 6   | 0.344 | 4.90-5.18 |
| After Intervention        | 4.00 | 5.00   | 3   | 5   | 0.283 | 3.89-4.11 |

\*Mean, Median, Min, Max, SD, CI

Table 3 shows that the average pain score for gouty arthritis in the intervention group was 4.81 with a standard deviation of 0.749, and it is believed that 95% of the average pain scores for gouty arthritis before the intervention were in the range of 4.51 to 5.11. After the intervention, the average gout arthritis pain scale was 3.54 with a standard deviation of 0.508, and it is believed that 95% of the average gout arthritis pain scores after the intervention were in the range of 3.33 to 3.74.

In the control group, the average gout arthritis pain score of respondents was 5.04 with a standard deviation of 0.344, and it is believed that 95% of the average gout arthritis pain scores of respondents before intervention were in the range of 4.90 to 5.18. After the intervention, the average gout arthritis pain score of the respondents was 4.00 with a standard deviation of 0.283, and it is believed that 95% of the average gout arthritis pain scores of the respondents after the intervention were in the range of 3.89 to 4.11.

The results of the normality test using the Shapiro Wilk test before and after the intervention was carried out on the intervention group and the control group showed that the p-value was  $< 0.05$ , which can be interpreted as not normally distributed. Therefore, to determine whether there was a significant difference in the average pain score before and after the intervention was carried out on the intervention group and the control group, the Wilcoxon test was used for analysis within the group, and the Mann-Whitney test to compare the results between the intervention group and the control group.

The following table shows the difference in the average gouty arthritis pain scores before and after treatment in the intervention group and the control group to see the effectiveness of the intervention in reducing pain levels in the elderly:

**Table 4** Distribution of Mean Differences in Gout Arthritis Pain Scores between the Intervention Group and the Control Group

|                                  | Mean<br>(SD) | $\Delta x$ | Median<br>(Min-<br>Max) | Z      | P-Value | In<br>Group |
|----------------------------------|--------------|------------|-------------------------|--------|---------|-------------|
| <b>Intervention Group (n-26)</b> |              |            |                         |        |         |             |
| Pre-Test                         | 4.81 (0.749) | 1,27       | 5.00 (4-6)              | -4.722 | 0.000** |             |
| Post-Test                        | 3.54 (0.508) |            | 4.00 (3-4)              |        |         |             |
| <b>Control Group I (n-26)</b>    |              |            |                         |        |         |             |
| Pre-Test                         | 5.04 (0.344) | 1,04       | 5.00 (4-6)              | -5.014 | 0.000** |             |
| Post-Test                        | 4.00 (0.283) |            | 4.00 (3-5)              |        |         |             |

\*Mean, Median, Min, Max, p-Value

Table 4 shows that the average gouty arthritis pain score for the intervention group was 4.81 (0.749), while the average gouty arthritis pain score for the control group was 5.04 (0.344). After the intervention, the gout arthritis pain score decreased in the intervention group with an average gout arthritis pain score of 3.54 (0.508), while the gout arthritis pain score in the control group was 4.00 (0.283).

The results of the Wilcoxon Signed Rank Test showed a p-value in the intervention group of 0.000 ( $p\text{-value} \leq \alpha$  0.05), which means that there was a difference in the average gout arthritis pain score before and after the intervention with a difference value of 1.27. In the control group, the p-value was 0.000 ( $p\text{-value} \leq \alpha$  0.05), which means that there was a difference in the average gout arthritis pain score before and after the intervention, with a difference of 1.0.

The following table shows the effect of rheumatic exercises and cold water therapy on reducing pain levels in elderly people with gouty arthritis in the working area of the Muara Bangkahulu Community Health Center in Bengkulu City:

**Table 5** Differences in Mean Pain Scores for Gouty Arthritis Before and After Intervention

| Variable Gouty<br>Arthritis Level | Mean (SD)    | Z      | P value |
|-----------------------------------|--------------|--------|---------|
| Intervention                      | 1.27 (0.533) | -2.025 | 0.043*  |
| Control                           | 1.04 (0.196) |        |         |

\*Mean, Median, Min, Max, p-Value

Table 5 shows that after the intervention, there was a difference or difference in the increase in the average gout arthritis pain score in the intervention group of 1.27 with a standard deviation of 0.533, while the average gout arthritis pain score in the control group decreased by 1.04 with a standard deviation of 0.196. The results of the statistical test using the Mann-Whitney U test on the gout arthritis pain scores obtained a p-value of 0.043 ( $p\text{-value} \leq \alpha$  0.05), which means that there is a difference in the decrease in the average gout arthritis pain score. Therefore,  $H_a$  is accepted, and it can be concluded that rheumatic exercise therapy and Cold Water Therapy have an effect on reducing pain levels in elderly people with gouty arthritis in the Muara Bangkahulu Community Health Center working area in Bengkulu City in 2025.

The study showed that the average age of respondents in the intervention group was 64.31 years, while in the control group it was 64.50 years. According to Agustin et al. (2024), age affects pain levels because, in the elderly, the functional capacity of organs and body metabolism decreases, leading to reduced production of the enzyme uricase and the hormone estrogen. This reduction contributes to increased uric acid levels in the body.

The respondents' characteristics based on gender showed that the majority were female in both the intervention and control groups, each accounting for 76.9%. This indicates that women are more prone to gout arthritis than men. As women age, the level of estrogen a hormone that facilitates the excretion of uric acid through the kidneys—declines. The reduction of this hormone causes an increase in uric acid levels in the blood. These findings are consistent with Dwi Pratiwi & Mustikasari (2024), who stated that women are at greater risk of developing gout arthritis because menopause leads to decreased estrogen levels.

Based on educational level, most respondents in both groups had a primary education background. This finding is in line with Aminah et al. (2022), who explained that education influences a person's knowledge and attitude toward maintaining health. The lower the education level, the more limited a person's understanding of healthy lifestyles and disease management.

In terms of occupation, most respondents in both groups were farmers and traders. This result supports the study of Lestari et al. (2021), which found that occupation is related to pain levels. Continuous heavy physical activities performed by farmers and traders, such as bending, standing, squatting, and lifting heavy loads can worsen joint pain in individuals with gout arthritis.

The study revealed that the average pain score in the intervention group before therapy was 4.81 (SD = 0.749; min = 4; max = 6). After performing *rheumatic exercise* and *cold water therapy*, the mean pain score decreased to 3.54 (SD = 0.508; min = 3; max = 4). The Wilcoxon Signed Rank Test showed a p-value of 0.000 ( $\leq 0.05$ ), indicating a significant difference between pain scores before and after the intervention, with an average reduction of 1.27.

In the control group, the average pain score before performing ergonomic exercise was 5.04 (SD = 0.344; min = 4; max = 6), and after intervention, it decreased to 4.00 (SD = 0.283; min = 4; max = 5). The Wilcoxon test also showed a p-value of 0.000 ( $\leq 0.05$ ), indicating a significant difference with an average reduction of 1.04. Thus, both the intervention and control groups experienced a decrease in pain levels after the intervention.

These findings align with Hasanah et al. (2023), who found that pain intensity in elderly individuals with rheumatoid arthritis decreased from moderate to mild after performing rheumatic exercises. The mean pain score before intervention was 4.00, which decreased to 2.00 afterward, with a p-value of 0.001 ( $<0.05$ ), indicating that rheumatic exercise effectively reduces joint pain in the elderly.

This study also supports Bila et al. (2024), who reported a decrease in pain intensity after ergonomic exercise—from moderate to mild levels with a p-value of 0.002 ( $<0.05$ ). Therefore, both physical exercises, rheumatic and ergonomic, are proven effective in reducing joint pain among older adults.

After the intervention, the average pain reduction in the intervention group was 1.27 (SD = 0.533), compared to 1.04 (SD = 0.196) in the control group. The Mann-Whitney test showed a p-value of 0.043 ( $<0.05$ ), indicating a significant difference between the two groups. Thus, rheumatic exercise combined with cold water therapy was proven more effective in reducing pain than ergonomic exercise alone.

These results demonstrate that the combined therapy effectively reduced pain levels from moderate to mild categories among elderly patients with gout arthritis in the working area of Muara Bangkahulu Public Health Center, Bengkulu City, in 2025. In the elderly, various physiological changes occur, such as decreased muscle strength, nerve function, motor ability, and alterations in the musculoskeletal system. These changes often cause inflammation and swelling in the joints, which are typical features of gout arthritis.

Rheumatic exercise plays an important role in addressing these conditions. This exercise focuses on joint movements and muscle stretching to enhance strength and flexibility. According to Hasanah et al. (2023), the Wilcoxon test showed a p-value of 0.001 ( $<0.05$ ), indicating a significant effect of rheumatic exercise in reducing pain among the elderly. This exercise helps loosen muscles and improve joint range of motion, reducing stiffness and discomfort. Additionally, physical activity stimulates the release of endorphins, which promote happiness and improve the quality of life in older adults (Suhartina, 2023).

Besides physical exercise, cold water therapy also plays a role in reducing pain. This therapy works by providing a cooling sensation to the painful area, which inhibits the inflammatory process by reducing the production of prostaglandins compounds that enhance pain receptor sensitivity. The cold effect also stimulates the release of endorphins, which act as natural analgesics, creating relaxation, improving circulation, and providing comfort to muscles and joints.

The findings of this study are consistent with Pratama et al. (2023), who examined Cold Relaxation Therapy in patients with hyperuricemia in Lawang. Before the intervention, the average pain score was 5.33 (range 4–7), which decreased to 2.33 (range 0–4) after therapy. Linear regression analysis showed a significant reduction with a p-value of 0.000 ( $<0.05$ ), indicating a notable difference before and after the cold therapy.

Physiologically, exposure to cold causes vasoconstriction, reducing blood flow to the inflamed area. This decreases edema and metabolic activity in the affected tissues, helping to alleviate pain sensations and accelerate tissue recovery.

The combination of rheumatic exercise and cold water therapy produces a synergistic effect: the exercise strengthens muscles and joints, improves flexibility and circulation, while cold therapy reduces inflammation and pain. Together, they accelerate pain reduction more effectively than either intervention alone.

Therefore, it can be concluded that the application of rheumatic exercise and cold water therapy is effective in reducing gout arthritis pain levels among elderly individuals. This therapy is simple, easy to perform, and applicable in community health services especially within elderly health programs or promotive and preventive activities at public health centers.

Furthermore, the study provides practical implications for healthcare workers to be more proactive in educating the elderly about the importance of regular physical activity and the use of complementary therapies such as cold compresses to relieve joint pain. With consistent practice, elderly individuals are expected to maintain independence and improve their overall quality of life

## CONCLUSION

The study results showed that most respondents were elderly, female, worked as farmers and traders, and had a primary education level. The average joint pain score of gout arthritis in the intervention group decreased after performing rheumatic exercise and cold water therapy, while the control group that received ergonomic exercise also experienced a reduction in pain, although not as significant as the intervention group. Statistical analysis revealed a significant difference between the two groups after the intervention, indicating that the combination of rheumatic exercise and cold water therapy was more effective in reducing gout arthritis pain levels among the elderly. Therefore, it can be concluded that the intervention had a significant effect on reducing pain levels and can serve as a non-pharmacological alternative to improve comfort and quality of life among the elderly in the working area of Muara Bangkahulu Public Health Center, Bengkulu City.

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