Original Article

Effectiveness of a Warm Cinnamon Compress on Pain Intensity in Community-Dwelling Older Adults with Gout Arthritis: A Quasi-Experimental Study

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ABSTRACT

Background: Gout arthritis is a chronic inflammatory joint disorder in older adults that causes persistent pain and limits daily functioning. Despite growing interest in non-pharmacological pain management, most available evidence comes from clinical or hospital-based settings, while evidence from community contexts in LMICs, including Indonesia, remains limited. This study aimed to evaluate the effectiveness of a warm cinnamon powder compress in reducing pain intensity among community-dwelling older adults with gout arthritis.

Methods: This quasi-experimental study with a non-equivalent control group pretest–posttest design was conducted in accordance with the TREND reporting guideline at Pagar Agung Health Center, Lahat Regency. A total of 70 older adults with gout arthritis who met the inclusion criteria were recruited and allocated to an intervention group (n = 35) and a control group (n = 35). The independent variable was warm cinnamon powder compress therapy administered once daily for 15 minutes over seven consecutive days, while the dependent variable was pain intensity measured using the Numeric Rating Scale (NRS). The control group received routine care. Data were analyzed using the Wilcoxon signed-rank test for within-group comparisons and the Mann–Whitney U test for between-group differences.

Results: The intervention group demonstrated a marked reduction in mean pain scores from 5.11 ± 0.82 at pretest to 2.14 ± 0.93 at posttest, representing a very large within-group effect (Cohen's d = 3.38), while the control group showed only a minimal change from 5.03 ± 0.79 to 4.89 ± 0.88 (Cohen's d = 0.17). Between-group comparison indicated a significantly greater reduction in pain in the intervention group than in the control group, with a large effect size (Cohen's d = 1.54). Clinically, the intervention group predominantly shifted from moderate–severe pain to mild pain categories, indicating a meaningful improvement in pain experience.

Conclusion: Warm cinnamon powder compress therapy is effective in reducing pain intensity among older adults with gout arthritis and can serve as a safe and practical complementary intervention in community healthcare settings.

Keywords: Gout; Pain Management; Complementary Therapies; Aged; Nursing Care

Implications for Practice:

- Nurses can incorporate warm cinnamon powder compress therapy as a safe, low-cost, and non-pharmacological intervention to reduce pain in older adults with gout arthritis.
- Healthcare professionals may use the study findings to support evidence-based decisions by integrating complementary therapies alongside routine treatment.
- Health policymakers and primary care managers can consider incorporating warm cinnamon powder compress therapy into standard nursing care guidelines and community health programs to promote accessible, culturally sensitive, and sustainable pain management strategies for older adult populations.

Introduction

Gout arthritis represents a chronic inflammatory joint disease that frequently affects older adults worldwide and poses a substantial burden on public health systems (Han et al., 2025). This condition occurs when excessive uric acid accumulation forms monosodium urate crystals within synovial joints and triggers inflammatory responses (Yi et al., 2025). The disease commonly manifests as severe joint pain, swelling, stiffness, and functional limitation that progressively reduces mobility in older populations (Shi et al., 2025). Global health reports estimate that gout arthritis affects approximately three to four individuals per one thousand people in the general population. The prevalence of gout arthritis remains particularly high in developed countries, where lifestyle changes and dietary patterns contribute significantly to disease incidence (Yin et al., 2025). However, developing countries also experience a rapid increase in gout arthritis cases due to aging populations and epidemiological transitions (Wang et al., 2025). Consequently, gout arthritis emerges as a major chronic condition that demands effective and sustainable pain management strategies for older adults (Chen et al., 2025).

The burden of gout arthritis continues to rise globally, with estimates indicating that approximately one-third of the adult population experiences symptoms related to gout or hyperuricemia (Li & Bai, 2025). In developed countries such as the United States, gout arthritis affects more than one-quarter of the adult population, highlighting its widespread impact (Yin et al., 2025). This growing prevalence contributes to increased disability, reduced independence, and decreased quality of life among older adults (Liu et al., 2025). Similar trends are now evident in developing countries, including Indonesia, where gout arthritis increasingly affects community-dwelling elderly individuals (Kementerian Kesehatan RI, 2024). National health data indicate that approximately 3.35 million people in Indonesia experience joint pain associated with gout arthritis. Epidemiological projections suggest that nearly twenty-five percent of these cases will continue to rise toward 2025 due to population aging and lifestyle factors. This study advances existing evidence by situating warm cinnamon powder compress therapy within a real-world primary health care setting in a low- and middle-income country, thereby extending prior locally focused studies toward broader international relevance in community-based pain management (Qin et al., 2025).

Age-specific data further demonstrate that gout arthritis prevalence increases significantly with advancing age in Indonesia (Kementerian Kesehatan RI, 2024). Individuals aged forty-five to fifty-four years exhibit a prevalence of approximately eleven percent, indicating early disease onset (Han et al., 2025). The prevalence increases to over fifteen percent among individuals aged fifty-five to sixty-four years, reflecting disease progression.

Older adults aged sixty-five to seventy-four years show prevalence rates exceeding eighteen percent, which further rise among individuals aged seventy-five years and above (Ridwan & Pebriani, 2023). Nationally, the total prevalence of gout arthritis in Indonesia reaches more than seven percent across all age groups. These findings emphasize that older adults represent the most vulnerable population group affected by gout arthritis. As a result, targeted interventions addressing pain management in older adults become increasingly essential within community and primary healthcare settings (Mustafa et al., 2025).

Regional health data from South Sumatra Province illustrate a similar pattern of increasing gout arthritis cases. Gout arthritis ranks as the second most common disease among the ten most prevalent conditions after hypertension in the province (Dinas Kesehatan Provinsi Sumatera Selatan, 2023). Health service records indicate that more than nine thousand individuals experience gout arthritis, accounting for nearly fifteen percent of total reported cases. In Lahat Regency, recorded cases increased from over ten thousand patients in 2020 to nearly twelve thousand patients in 2021. Subsequent data demonstrate continued increases in the following years, confirming a persistent upward trend. Primary healthcare records from Pagar Agung Health Center identified thirty-five older adults living with gout arthritis in 2025 alone (Dinas Kesehatan Kabupaten Lahat, 2021). These regional data highlight the urgent need for effective, accessible, and community-based pain management interventions (Gao & Meng, 2025). In contrast to high-income countries, where access to pharmacological pain management is relatively comprehensive, older adults in low- and middle-income countries often face limited access, higher costs, and increased risk of adverse drug effects. This context underscores the importance of developing simple, affordable, and community-based non-pharmacological interventions suitable for LMIC settings (Peeler et al., 2024).

Pain management for gout arthritis commonly relies on pharmacological treatments such as analgesics and anti-inflammatory drugs. Although these medications provide temporary symptom relief, long-term use may cause adverse effects, particularly among older adults (Wang et al., 2025). Side effects such as gastrointestinal disturbances and cardiovascular risks limit the safety of prolonged pharmacological therapy. Consequently, non-pharmacological interventions gain increasing attention as complementary or alternative approaches for pain control (Audet et al., 2025). Warm compress therapy is widely recognized for its ability to enhance blood circulation, reduce muscle tension, and alleviate joint stiffness (Rahmawati & Kusnul, 2021). Cinnamon powder contains bioactive compounds with anti-inflammatory and analgesic properties that may enhance pain reduction effects. Therefore, warm cinnamon powder compress therapy presents a promising non-pharmacological intervention for managing gout arthritis pain in older adults (Putri et al., 2025). Thermal stimulation from the warm compress may enhance local blood circulation and reduce joint stiffness, while bioactive compounds in cinnamon, such as cinnamaldehyde and polyphenols, exert anti-inflammatory and analgesic effects. The combined action of heat and cinnamon is therefore expected to modulate pain pathways and reduce perceived pain intensity (Wang et al., 2025).

The Gate Control Theory of Pain explains pain modulation through thermal stimulation that activates large-diameter sensory fibers and inhibits pain signal

transmission at the spinal cord level (Melzack, 1996). The application of a warm compress reduces pain perception by closing the neurological pain gate mechanism. This theoretical framework supports the use of warm compress therapy as a complementary nursing intervention for pain management in older adults with gout arthritis (Rahmawati & Kusnul, 2021). Conceptually, the intervention variable (warm cinnamon powder compress) is hypothesized to influence the outcome variable (pain intensity) through thermal stimulation and anti-inflammatory mechanisms, thereby reducing nociceptive signaling and perceived pain among older adults with gout arthritis. Within the framework of complementary and integrative nursing care, warm compress therapy combined with herbal-based interventions aligns with holistic pain management principles that emphasize safety, accessibility, and patient-centered care for older adults.

Pain management for gout arthritis has received substantial attention in the literature. Most existing studies examine non-pharmacological interventions in hospital settings or under tightly controlled research conditions. Evidence from community primary care, particularly in low- and middle-income countries, remains limited. Current research has not clearly established whether warm cinnamon powder compress therapy can be delivered in a standardized, feasible, and effective manner for community-dwelling older adults in routine public health services. The novelty of this study lies in assessing both pain reduction outcomes and the practical applicability of a low-cost, culturally acceptable complementary nursing intervention at the community level. These contributions support broader international efforts to promote healthy ageing and strengthen primary care services. Therefore, this study aims to evaluate the effectiveness of warm cinnamon powder compress therapy in reducing pain intensity among older adults with gout arthritis.

Methods

Study Design

This study employed a quasi-experimental design using a non-equivalent control group pretest–posttest approach. The research was conducted over a three-month period from March to May 2025. The design allowed the researcher to observe changes in pain intensity over time within each group and to compare the magnitude of change between groups. A quasi-experimental design was chosen due to ethical and logistical constraints in the community setting while allowing evaluation of the intervention under real-world conditions. The study was reported in accordance with the Transparent Reporting of Evaluations with Nonrandomized Designs (TREND) guidelines (Des Jarlais et al., 2004).

Participants

x The study population consisted of community-dwelling older adults with clinically diagnosed gout arthritis in the working area of Pagar Agung Health Center, Lahat Regency, Indonesia. The sample size was determined using an a priori power analysis for a two-group comparison, assuming a statistical power of 0.80, a significance level of 0.05, and a moderate effect size (Cohen's d = 0.49). The analysis indicated that a minimum of 35 participants per group was required. Therefore, a total sample size of 70 participants was considered sufficient for this study. Inclusion criteria included older adults experiencing joint pain due to gout arthritis, the ability to communicate effectively, and willingness to participate throughout the study. Exclusion criteria included open skin lesions at the application site, known

allergies to cinnamon, severe sensory impairment, or changes in analgesic therapy during the intervention period. Group allocation was conducted using a non-random, area-based approach to minimize contamination between participants.

All participants who were enrolled at baseline completed the study and were included in the final analysis. No participant withdrew, was lost to follow-up, or was excluded during the intervention period. Baseline comparability analysis showed no statistically significant differences between the intervention and control groups (p-value > 0.05). These findings indicate that the two groups were comparable at baseline (**Table 1**).

Instruments

Data were collected using two primary instruments, namely a Standard Operating Procedure (SOP) for warm cinnamon powder compress application and a Numeric Rating Scale (NRS) pain observation sheet (Correll, 2011). The independent variable was the warm cinnamon powder compress intervention, while the dependent variable was pain intensity, which was measured using the Numeric Rating Scale (NRS). NRS has demonstrated good validity and reliability for assessing pain intensity in older adult populations. Previous studies have reported strong correlations between NRS scores and other validated pain measures, as well as acceptable test–retest reliability in older adults, supporting its use as a valid and reliable instrument for pain assessment in this population (Nimmaanrat et al., 2024).

The SOP ensured uniformity in the preparation, temperature control, duration, and application technique of the warm compress intervention. The SOP included detailed steps covering material preparation, heating procedures, temperature range, application duration, frequency, anatomical placement, and safety monitoring. The NRS, ranging from 0 to 10, was selected because it is simple, reliable, and suitable for use among older adults with varying educational backgrounds. Pain scores were categorized as mild (1–3), moderate (4–6), and severe (7–10) pain, consistent with commonly used clinical pain classification guidelines. Participants were instructed to rate their pain intensity by selecting a number that best represented their current pain level. NRS was interviewer-administered approach, with standardized verbal instructions provided to ensure consistent understanding among participants. Observational forms were also used to document participant characteristics, pain location, and adherence to intervention procedures. Data collectors received standardized training to ensure consistent explanation and recording of pain scores. These instruments facilitated accurate measurement of pain changes before and after the intervention.

Intervention

The warm cinnamon powder compress intervention was selected based on the combined principles of thermotherapy and the anti-inflammatory and analgesic properties of cinnamon (Cinnamomum spp.), which has been shown to improve local blood circulation, reduce muscle stiffness, and inhibit inflammatory mediators associated with joint pain. The intervention consisted of the application of a warm cinnamon powder compress administered to the intervention group according to the established Standard Operating Procedure (SOP). This intervention protocol, referred to as Warm Cinnamon Powder Compress Therapy (WCPCT) was administered once daily, with each session lasting 15 minutes, over a total intervention period of seven consecutive days.

Cinnamon powder was mixed with warm water to create a uniform compress medium, and the temperature range 38-42° C was adjusted to ensure safety and comfort for older adults. The compress was applied to the affected joint area using a clean cloth for a predetermined duration. Participants were monitored throughout the procedure to prevent skin irritation or discomfort. The intervention was delivered by nurses at the Pagar Agung Community Health Center consistently across all participants in the intervention group over the same intervention period.

The control group received routine care commonly provided at the health center without the application of the cinnamon compress. The control group received routine care provided at the health center, which consisted of standard pharmacological pain management as prescribed by the attending clinician, basic joint care education, and regular clinical monitoring, without any additional non-pharmacological pain interventions. Both groups were instructed to maintain their usual medication regimen to reduce confounding influences on pain outcomes.

Data Collection

Data collection was conducted over a three-month period from March to May 2025 in the working area of Pagar Agung Primary Health Center, Lahat Regency, South Sumatra Province, Indonesia. Participant recruitment was conducted by trained research assistants in collaboration with nursing staff at the study site. Potential participants were approached in person during routine care hours and screened for eligibility based on predefined inclusion and exclusion criteria. Eligible individuals received a clear explanation of the study objectives, procedures, potential benefits, and risks. Prior to data collection, all enumerators underwent standardized training on study procedures, instrument administration, and ethical considerations. To ensure consistency of data collection, inter-rater reliability was assessed during the training phase through supervised practice sessions.

The data collection process followed a standardized workflow consisting of participant screening, informed consent acquisition, baseline assessment, intervention implementation, post-intervention assessment, and data verification. After consent was secured, participants were allocated to either the intervention or control group according to the study allocation plan. Baseline data collection (pretest) was then performed prior to any intervention, including assessment of pain intensity using the Numerical Rating Scale (NRS) under standardized conditions. Quality control measures included direct supervision of data collection, routine cross-checking of completed forms, and periodic verification of entered data to minimize errors and ensure data accuracy. Participants in the intervention group received the warm cinnamon powder compress according to the established intervention protocol, while the control group continued to receive routine care. All data were recorded using standardized case report forms and subsequently entered into a password-protected electronic database accessible only to the research team. Participant identifiers were coded to ensure confidentiality.

Throughout the intervention period, adherence to procedures and any adverse reactions were monitored and documented by the research team. Posttest pain assessments were conducted using the same NRS instrument and standardized instructions to ensure measurement consistency. All data were collected by the same trained personnel under comparable conditions and were checked for

completeness and accuracy prior to analysis. During data collection, missing data were minimized through on-site verification of completed forms, and any incomplete responses were immediately clarified with participants whenever possible. If missing data remained, the case was documented and handled according to the predefined data management protocol.

Bias minimization procedures followed a predefined protocol throughout the study. The research team assessed baseline comparability between groups before the intervention. Researchers conducted all measurements at the same predefined time points for both groups. The researcher applied the same instrument and the same measurement procedures to all participants. The intervention team implemented the protocol consistently according to the standard operating procedure. The research team recorded all observations using the same documentation format. These procedures reduced measurement variation and improved internal validity.

Data Analysis

Data analysis began with descriptive statistics to summarize participant characteristics and pain intensity scores, including measures of central tendency and dispersion. All statistical analyses were performed using IBM SPSS Statistics version 26. Pain intensity was assessed using a Numeric Rating Scale (NRS), which represents ordinal data and does not assume a normal distribution. All main statistical results are presented with 95% confidence intervals to provide an estimate of precision and uncertainty around the observed effects.

Therefore, a nonparametric statistical approach was applied throughout the analysis. The Wilcoxon signed-rank test was used to examine differences in pain scores between pretest and posttest measurements within the intervention and control groups. Changes in pain intensity were calculated for each participant to quantify the magnitude of pain reduction over the study period. To compare the differences in pain score changes between the intervention and control groups, the Mann–Whitney U test was employed. Effect sizes were calculated to quantify the magnitude of the intervention effect, with values interpreted according to established benchmarks to complement statistical significance testing. Statistical significance was determined using a predefined alpha level of 0.05, allowing a robust evaluation of the effectiveness of the warm cinnamon powder compress intervention. The extent and pattern of missing data were examined prior to analysis, and appropriate handling strategies were applied according to the predefined analysis plan.

Ethical Considerations

Ethical approval for the study was obtained from the appropriate institutional review board prior to data collection. This study received ethical approval from the Health Research Ethics Committee of the Health Polytechnic of the Ministry of Health Palembang, with Ethical Approval Number 0209/KEPK/Adm2/III/2025. This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. All participants received clear explanations regarding the study objectives, procedures, potential benefits, and possible risks. Written informed consent was obtained from each participant before enrollment. Participant confidentiality was maintained by assigning unique identification codes and restricting access to data files. Participants were informed of their right to withdraw from the study at any time without consequences to their healthcare services.

Results

Baseline characteristics of participants were analyzed to describe the demographic and socio-educational profile of older adults included in the study and to assess the comparability between the intervention and control groups prior to the intervention. This analysis is essential to ensure that any observed differences in pain outcomes are attributable to the intervention rather than pre-existing disparities between groups. Variables examined included gender, educational level, marital status, and age.

Table 1. Baseline Characteristics of Participants in the Intervention and Control Groups (n = 70)

Variables	Intervention Group		Control Group		p value
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	
Gender					0.78
Male	6	17.1	7	20	
Female	29	82.9	28	80	
Education					0.95
Elementary School	18	51.4	17	48.6	
Junior High School	11	31.4	12	34.3	
Senior High School	6	171	6	17.1	
College	0	0	0	0	
Marital Status					0.82
Married	21	60	20	57.1	
Widowed/ Divorced	14	40	15	42.9	
	Mean	SD	Mean	SD	
Age	68.4	6.2	69.1	5.8	0.62

Table 1 show distribution of participant characteristics indicates that the intervention and control groups were comparable at baseline. Female participants predominated in both groups, reflecting the demographic composition of the older adult population in the study setting. Most participants had an elementary school educational background, followed by junior high school education, while none had completed college education, suggesting generally low educational attainment among respondents. The majority of participants in both groups were married, although a substantial proportion were widowed or divorced, which may influence social support and pain coping. The mean age of participants in the intervention group was 68.4 years, while the control group had a mean age of 69.1 years, with similar standard deviations, indicating minimal age variation between groups. Overall, these findings demonstrate that the two groups were well balanced in terms of demographic and socio-educational characteristics, thereby supporting the internal validity of subsequent comparisons of pain outcomes.

Table 2 presents the comparison of pain intensity scores before and after the intervention within the intervention and control groups. This analysis aims to examine changes in pain levels over time and to determine whether the warm cinnamon powder compress intervention resulted in a statistically significant reduction in pain among older adults with gout arthritis.

Table 2. Comparison of Pain Scores Before and After Intervention Using Wilcoxon Signed-Rank Test

Group	Mean ±SD	Median	Min-Max	Z	p-value	Cohen's d
Intervention						
Pretest	5.11 ± 0.82	5.0	3-6	-5.27	<0.001	3.38
Posttest	2.14 ± 0.93	2.0	1-4			
Control						
Pretest	5.03 ± 0.79	5.0	3-6	-1.36	0.174	0.17
Posttest	4.89 ± 0.88	5.0	3-6			

The results indicate a significant reduction in pain scores in the intervention group following the application of the warm cinnamon powder compress. Mean pain intensity in the intervention group decreased markedly from pretest to posttest, and this change was statistically significant. In contrast, the control group did not show a significant difference in pain scores between pretest and posttest measurements. Pain intensity in the control group remained relatively stable over time, suggesting minimal spontaneous improvement. These findings suggest that the observed reduction in pain was associated with the warm cinnamon powder compress intervention rather than routine care alone. Overall, the results support the effectiveness of the intervention in reducing pain among older adults with gout arthritis.

Table 3 presents the comparison of changes in pain intensity between the intervention and control groups following the study period. This analysis was conducted to evaluate whether the reduction in pain observed in the intervention group differed significantly from that in the control group. The comparison focuses on the magnitude of pain score change rather than absolute pain values, allowing a more accurate assessment of intervention effectiveness. Given the independent nature of the two groups and the ordinal characteristics of the pain scale, the Mann–Whitney U test was applied. This approach provides robust evidence for determining between-group differences in pain reduction. The findings clarify the comparative impact of the warm cinnamon powder compress intervention.

Table 3. Comparison of Pain Score Changes Between Groups Using Mann–Whitney U Test

Group	Mean Rank	Median (Δ Pain Score)	Z	pvalue	Cohen's d
Intervention	49.86	-3.0	-5.08	<0.001	1.54
Control	21.14	-0.1			

Table 3 showed a statistically significant difference in pain score changes between the intervention and control groups. Participants in the intervention group experienced a substantially greater reduction in pain intensity compared to those in the control group. The median decrease in pain scores was markedly larger in the intervention group, indicating a clinically meaningful improvement. In contrast, the control group showed minimal change in pain levels over the same period. These findings confirm that the warm cinnamon powder compress was more effective in reducing pain than routine care alone. Overall, the between-group analysis strengthens the evidence supporting the efficacy of the intervention for pain

management in older adults with gout arthritis.

Discussion

The findings of this study demonstrate that the warm cinnamon powder compress intervention effectively reduced pain intensity among older adults with gout arthritis. The results showed a significant decrease in pain scores in the intervention group after treatment. These findings indicate that the intervention produced a measurable therapeutic effect beyond routine care. In the context of low- and middle-income countries (LMICs), including Indonesia, the feasibility and effectiveness of non-pharmacological pain management interventions such as warm cinnamon powder compress therapy are particularly relevant due to limited access to specialized pain services, high reliance on primary health care, and the cultural acceptance of traditional and low-cost therapeutic approaches.

The significant reduction in pain observed in the intervention group suggests that thermal therapy combined with cinnamon powder produces a synergistic analgesic effect. Warm compress application increases local blood circulation in the affected joint area. Improved circulation facilitates muscle relaxation and reduces joint stiffness (Rahmawati & Kusnul, 2021; Gupta et al., 2025). Cinnamon powder contains bioactive compounds that may enhance anti-inflammatory responses at the local tissue level. The interaction between heat and cinnamon compounds likely contributes to reduced inflammatory signaling. This physiological response supports pain modulation through peripheral mechanisms (Akram et al., 2021). Therefore, the intervention plausibly influences both vascular and inflammatory pathways associated with gout arthritis pain (Nair & van Staden, 2024).

The absence of significant pain reduction in the control group highlights the limited effectiveness of routine care alone in managing chronic gout pain (Fillingim et al., 2025). Routine care without structured non-pharmacological intervention may not adequately address persistent inflammation (Thompson et al., 2021). Older adults often experience chronic pain that fluctuates but does not resolve spontaneously. The stability of pain scores in the control group reflects the chronic nature of gout arthritis. This finding strengthens the interpretation that the observed improvement in the intervention group was intervention-related (Khormi et al., 2023). The comparison underscores the necessity of adjunctive pain management strategies. Consequently, reliance on routine care alone may be insufficient for optimal pain control in older adults (Selvadurai et al., 2024).

The magnitude of pain reduction in the intervention group indicates not only statistical significance but also clinical relevance. A decrease of several points on the NRS reflects meaningful improvement in daily comfort and functional ability. Reduced pain intensity enables older adults to engage more actively in daily activities (Sumiati & Shifa, 2023; Supiawati et al., 2023; Rekawati et al., 2025). Improved mobility contributes to better psychological well-being and independence. Pain reduction also reduces reliance on pharmacological analgesics. Lower medication use may decrease the risk of adverse drug effects in older populations. Thus, the intervention demonstrates both therapeutic and practical value in geriatric pain management (Aminah et al., 2022).

The findings of this study align with the growing emphasis on non-pharmacological interventions in chronic pain management. Non-pharmacological therapies offer safer alternatives for older adults with multiple comorbidities. Warm cinnamon powder

compress therapy represents a low-cost and accessible intervention (Sumiati & Shifa, 2023). The simplicity of the procedure facilitates implementation in community and primary care settings. The intervention does not require advanced equipment or specialized training. This practicality enhances its potential for widespread adoption. Therefore, the intervention addresses both clinical effectiveness and feasibility considerations (Akbar et al., 2024; Gao & Meng, 2025).

Overall, the study contributes meaningful evidence to pain management strategies for older adults with gout arthritis (Staudt, 2022). The findings highlight the importance of integrating complementary therapies into standard care. The intervention demonstrated effectiveness in reducing pain where routine care alone did not. The results emphasize the role of nurses in implementing evidence-based non-pharmacological interventions (Monaco et al., 2021). This study expands practical knowledge in gerontological and community nursing contexts. The discussion establishes a clear link between empirical findings and clinical application. Consequently, the study supports broader adoption of warm cinnamon powder compress therapy in nursing practice.

The findings imply that warm cinnamon powder compress therapy can serve as an effective complementary intervention for gout arthritis pain management. The intervention offers a safe and non-invasive option for older adults. The simplicity of the method supports its integration into routine nursing care. However, the study has several limitations that should be considered. The quasi-experimental design limits the ability to establish full causal inference. The absence of randomization may introduce selection bias. Additionally, the study relied on self-reported pain measures, which may be influenced by subjective perception.

Implications and limitations

The findings imply that warm cinnamon powder compress therapy can serve as an effective complementary intervention for gout arthritis pain management. The intervention offers a safe and non-invasive option for older adults. The simplicity of the method supports its integration into routine nursing care. However, the study has several limitations that should be considered. The quasi-experimental design limits the ability to establish full causal inference. The absence of randomization may introduce selection bias. Additionally, the study relied on self-reported pain measures, which may be influenced by subjective perception.

Relevance to Practice

The results of this study have direct relevance for nursing practice in community and primary care settings. Nurses play a central role in pain assessment and non-pharmacological intervention delivery. Warm cinnamon powder compress therapy can be incorporated into nursing care plans for older adults with gout arthritis. The intervention empowers nurses to provide holistic pain management beyond medication administration. Nursing education programs can include this intervention as part of complementary therapy training. These findings support the integration of Warm Cinnamon Powder Compress Therapy into routine primary health care practice as a complementary non-pharmacological pain management option, particularly in resource-limited settings, and highlight the need for training health workers to implement this intervention safely and consistently.

Conclusion

This study highlights the potential value of warm cinnamon powder compress therapy as a simple, safe, and culturally acceptable non-pharmacological approach for pain management in older adults with gout arthritis. The findings suggest that this intervention may enhance comfort and support functional well-being when integrated into routine community and primary healthcare services. Given its low cost and ease of application, the therapy holds promise for broader implementation in resource-limited settings. The results highlight the importance of integrating complementary therapies into nursing care for older adults with chronic joint pain. Overall, warm cinnamon powder compress therapy represents a practical and effective approach to improving pain outcomes and enhancing quality of life among older adults with gout arthritis.

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CrediT Authorship Contributions Statement

Abdul Gani: Conceptualization, Formal Analysis, Supervision, Data Curation, Writing – Original Draft, Funding Acquisition

Dodi Aprika Farama: Methodology, Investigation, Data Curation, Visualization, Writing – Original Draft,

Gunardi Pome: Methodology, Formal Analysis, Visualization, Writing – Review & Editing

Sonlimar Mangunsong : Methodology, Data Curation, Visualization, Writing – Review & Editing

Conflicts of Interest

There is no conflict of interest.

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