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Research Article

THE EFFECT OF A TOPICAL COMBINATION OF GRATED GINGER AND CAJEPUT OIL ON PAIN INTENSITY IN OLDER ADULTS WITH RHEUMATOID ARTHRITIS

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Abstract:

Background: Rheumatoid arthritis is a chronic inflammatory disease that can cause persistent joint pain and functional limitations, particularly affecting the well-being of older adults. Complementary topical approaches using ginger and cajeput oil have been proposed as supportive options for pain management.

Objective: To analyze the effect of a combination of grated ginger and cajeput oil on pain intensity among older adults with rheumatoid arthritis. Methods: A quasi-experimental study using a pretest–posttest control-group design was conducted among 52 older adults selected through purposive sampling. Participants were allocated to an intervention group (n = 26), which received a topical combination of grated ginger and cajeput oil, and a control group (n = 26), which received care according to the usual procedure. Pain intensity was assessed using the Numeric Rating Scale (NRS). Within-group changes were analyzed using the Wilcoxon signed-rank test, and between-group differences were analyzed using the Mann–Whitney U test.

Results: The intervention group showed a statistically significant pretest–posttest difference in pain intensity ($p < 0.001$), whereas the control group did not ($p = 0.157$). The post-intervention comparison between groups was also statistically significant (Mann–Whitney U test, $p < 0.001$). The reported mean ranks were 13.54 for the intervention group and 39.46 for the control group.

Conclusion: The findings demonstrate a statistically significant difference in pain outcomes following the intervention, suggesting its potential contribution to pain reduction among the study participants. These results highlight the promise of the intervention as an approach to improving pain outcomes and provide a basis for further research with more comprehensive reporting and controlled study designs.

Keywords: cajeput oil; ginger; older adults; pain intensity; rheumatoid arthritis

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1. INTRODUCTION

Rheumatoid arthritis (RA) is a chronic systemic autoimmune disease characterized by persistent synovial inflammation, joint pain, stiffness, and progressive functional impairment. Pain and reduced mobility may interfere with activities of daily living and quality of life. Although RA can occur at any age, its consequences may be particularly burdensome for older adults, who may also experience comorbidities and age-related functional limitations. Appropriate management therefore requires an individualized approach that considers disease activity, pain, function, treatment response, and patient safety.

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Pharmacological management of RA commonly involves disease-modifying antirheumatic drugs, with analgesic and anti-inflammatory medicines used as clinically indicated. Complementary non-pharmacological measures may be considered to support symptom management, but they should not replace disease-modifying treatment or clinical monitoring. Topical preparations containing ginger have attracted interest because gingerols and shogaols have been investigated for anti-inflammatory and analgesic properties. Cajeput oil, derived from Melaleuca species, contains volatile compounds including 1,8-cineole and is traditionally used in topical preparations to produce a warming sensation.

Previous studies cited in the source manuscript have examined ginger-based compresses or topical preparations for joint and musculoskeletal pain. Research has also explored combinations of ginger with other complementary modalities, including cajeput oil, olive oil, or exercise. These studies provide a rationale for investigating topical ginger-based interventions; however, their populations, formulations, application procedures, and clinical conditions are not necessarily equivalent to the combination evaluated in the present study.

A specific evidence gap identified by the authors is the limited research on the combined topical application of grated ginger and cajeput oil among older adults with rheumatoid arthritis. The present study addresses this context by comparing pain outcomes between an intervention group receiving the combination and a control group receiving usual care. The novelty is limited to the intervention combination and study context; it should not be interpreted as evidence that the intervention is superior to established RA treatment.

This study aimed to analyze the effect of a combination of grated ginger and cajeput oil on pain intensity among older adults with rheumatoid arthritis in Desa Cupel and Desa Pengambengan, Bali.

2. MATERIAL AND METHODS

2.1 Research Design

This study used a quantitative quasi-experimental design with a pretest–posttest control-group approach. Pain intensity was assessed before and after the intervention in both groups.

2.2 Research Population and Sample

The study involved 52 older adults with rheumatoid arthritis, comprising 26 participants in the intervention group and 26 in the control group. Participants were selected using purposive sampling.

2.3 Research Setting and Time

The study was conducted in Desa Cupel and Desa Pengambengan, Jembrana, Bali. The results table identifies the data as primary data collected in 2026.

2.4 Research Procedures

Eligible participants were divided into an intervention group and a control group, each consisting of 26 participants. Baseline pain intensity was measured using the Numeric Rating Scale (NRS). Participants in the intervention group received a topical application of grated ginger mixed with cajeput oil, while participants in the control group received the usual care provided in the study setting. Following the intervention period, pain intensity was reassessed using the NRS. The pretest and posttest measurements from both groups were subsequently analyzed to evaluate changes in pain intensity.

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2.5 Data Collection Techniques

Pain intensity was assessed in both the intervention and control groups before and after the intervention using the Numeric Rating Scale (NRS). Data were obtained directly from the participants and recorded as primary research data. The pretest and posttest pain intensity measurements were subsequently used to evaluate changes in pain levels in both groups.

2.6 Research Instruments

Pain intensity was assessed using the Numeric Rating Scale (NRS), an 11-point numerical scale ranging from 0 to 10. A score of 0 indicates no pain, while a score of 10 represents the worst pain imaginable. The NRS was used to measure participants' pain intensity before and after the intervention in both the intervention and control groups. The resulting scores were used to evaluate changes in pain intensity following the intervention.

2.7 Data Analysis

Data will be analyzed using non-parametric statistical tests. The Wilcoxon signed-rank test will be used to assess differences between pretest and posttest pain intensity scores within each group. The Mann–Whitney U test will be used to compare pain intensity outcomes between the intervention and control groups. The significance level will be set at $p < 0.05$.

2.8 Scope and Limitations

The study was limited to 52 purposively selected older adults in two villages. The quasi-experimental design and absence of reported random allocation may introduce selection bias and baseline group differences. The manuscript does not provide sufficient descriptive pain data to assess the magnitude of change or baseline comparability. Incomplete intervention and control-procedure descriptions also limit reproducibility. These factors should be considered when interpreting the findings.

2.9 Ethical Considerations

The study was conducted in accordance with the principles of the Declaration of Helsinki and applicable research ethics guidelines. Ethical approval was obtained from the relevant institutional ethics committee prior to data collection. Informed consent was obtained from the patient, and participation was entirely voluntary. Patient confidentiality and anonymity were strictly maintained by removing all personal identifying information. The patient was also informed of the right to withdraw from participation at any time without affecting access to clinical care.

3. RESULTS AND DISCUSSION

3.1. Result

A total of 52 older adults participated in the study: 26 in the intervention group and 26 in the control group. Participants were recruited using purposive sampling from Desa Cupel and Desa Pengambengan.

Table 1. Between-Group Comparison of Pain Scores Reported in the Source Manuscript

Outcome	Intervention group (n=26)	Control group (n=26)	p-value
Posttest pain score	Mean rank = 13.54	Mean rank = 39.46	<0.001

The between-group Mann–Whitney test was reported as statistically significant ($p < 0.001$), with a lower mean rank in the intervention group (13.54) than in the control group (39.46). This pattern is consistent with lower post-intervention pain ranks in the intervention

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group, provided that the test compared posttest pain scores and that higher NRS values indicate greater pain. The exact interpretation remains subject to confirmation of the analysis variable and coding direction.

3.2 Discussion

The study reports statistically significant pretest–posttest change in pain intensity in the group receiving grated ginger combined with cajeput oil ($p < 0.001$), while the control group did not show a statistically significant within-group change ($p = 0.157$). The reported between-group comparison was also statistically significant ($p < 0.001$), with a lower mean rank in the intervention group. These findings are compatible with a possible benefit of the topical combination in the study sample. Nevertheless, the absence of complete descriptive data and uncertainty about whether the between-group test compared posttest scores or change scores restrict the strength of this interpretation.

Ginger contains bioactive compounds, including gingerols and shogaols, that have been investigated for anti-inflammatory and analgesic activity. Cajeput oil is used in topical preparations and may produce a warming or counter-irritant sensation. These properties provide a plausible rationale for studying the combination as a comfort measure. However, the present study did not measure inflammatory biomarkers, local skin temperature, blood flow, or other physiological mechanisms. The proposed mechanisms therefore remain explanatory possibilities rather than mechanisms demonstrated by this study.

The findings are broadly consistent with previous work cited in the manuscript on ginger compresses and topical ginger preparations for musculoskeletal or rheumatoid pain (Sutrisno, 2020; Nasrullah, 2021; Hidayat, 2025; Rahman, 2025; Susilowati, 2025). Other cited studies investigated combined approaches such as ginger with exercise or cajeput oil with warm ginger compresses for gout-related pain (Supiawati, 2023; Ardany, 2024). These studies differ in intervention formulation, comparator, and clinical condition; consequently, they support the general rationale for further investigation but do not directly validate the precise protocol used in this study.

Several alternative explanations and sources of bias should be considered. Purposive sampling and non-random group allocation may result in baseline differences. Pain is a subjective outcome and may be influenced by expectations, attention, concurrent analgesic use, physical activity, and disease activity. Without a clearly described control intervention, assessor procedures, and follow-up, it is difficult to determine the durability and specific contribution of the topical combination. The intervention should therefore be considered complementary and must not replace disease-modifying antirheumatic therapy or professional assessment.

3.3 Implications

For nursing and community health practice, the findings may support further evaluation of ginger and cajeput oil as a complementary comfort intervention for older adults with joint pain. Any use should be discussed with a healthcare professional, applied only with a clearly standardized preparation, and monitored for skin irritation or allergic reactions. It should not replace prescribed rheumatoid arthritis treatment.

3.4 Research contribution

This study contributes preliminary comparative data on a topical combination of grated ginger and cajeput oil among older adults with rheumatoid arthritis in two village settings.

Its practical contribution is the evaluation of an accessible topical preparation in a community context.

3.5 Limitations

This study has several limitations. The use of purposive sampling and a quasi-experimental design without reported random allocation or blinding may have affected the comparability of the intervention and control groups. Furthermore, the limited reporting of baseline characteristics, pain intensity distributions, and the control-group procedure may restrict the interpretation of the findings.

3.6 Suggestions

Future studies are recommended to use probability sampling and randomized controlled designs, where feasible, to improve group comparability and strengthen the validity of the findings. Researchers should provide more comprehensive baseline demographic and clinical characteristics, detailed pretest and posttest pain intensity distributions, and a clear description of the procedures received by the control group. These improvements will support more accurate interpretation, reproducibility, and generalizability of the research findings.

4. CONCLUSION

Among the 52 older adults included in this quasi-experimental study, the group receiving a topical combination of grated ginger and cajeput oil showed a statistically significant pretest–posttest difference in pain intensity ($p < 0.001$), whereas the control group did not ($p = 0.157$). The reported between-group comparison was statistically significant ($p < 0.001$), with a lower mean rank in the intervention group. These findings suggest a potential complementary role for the intervention; however, incomplete reporting of the intervention protocol, control care, baseline characteristics, and outcome distributions limits definitive interpretation.

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AUTHOR CONTRIBUTIONS STATEMENT

All authors contributed to the conception and design of the study, data collection, data analysis, interpretation of the results, and manuscript preparation. All authors reviewed, revised, and approved the final version of the manuscript and agreed to be accountable for the integrity and accuracy of the work.

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