

# The Effect of Alpinia Galanga Warm Compress in Reducing Rheumatoid Arthritis Pain Intensity in the Elderly: A Quasi-Experimental Study

Parida Hanum<sup>1</sup>, Rahmaini Fitri Harahap<sup>2</sup>, Elis Anggeria<sup>3</sup>, Kristina L Silalahi<sup>4</sup>,  
Verawaty Fitrinelda Silaban<sup>5</sup>, Debi Novita Siregar<sup>6</sup>, Rotua Lenawati Tindaon<sup>7</sup>

<sup>1</sup>Midwifery Tutor, <sup>2</sup>Midwifery Tutor, <sup>3</sup>Nursing Tutor, <sup>4</sup>Nursing Tutor, <sup>5</sup>Midwifery Tutor,  
<sup>6</sup>Midwifery Tutor, <sup>7</sup>Midwifery Tutor, Faculty of Nursing and Midwifery, Universitas Prima  
Indonesia, Medan, Indonesia.

**How to cite this article:** Parida Hanum, Rahmaini Fitri Harahap, Elis Anggeria et. al. The Effect of Alpinia Galanga Warm Compress in Reducing Rheumatoid Arthritis Pain Intensity in the Elderly: A Quasi-Experimental Study. Indian Journal of Forensic Medicine and Toxicology 2022;16(4).

## Abstract

**Backgrounds:** Rheumatoid arthritis is a chronic inflammatory disease that causes inflammation and swelling of the synovial membrane. In patients with advanced stages, it will make the patient unable to carry out daily activities and his quality of life decreases. The study is to know the effect of Alpinia Galanga Warm Compress in Reducing Rheumatoid Arthritis Pain Intensity in the Elderly.

**Methods:** The method of the research was used quasi experiment by using one group pre-test and post-test design without control group. This study was conducted on 45 patients with Rheumatoid Arthritis in Guna Bakti Foundation in Medan, Indonesia. The research process began with measuring the intensity of pain in all of patient using an observation sheet and numerical pain intensity scale before being given a warm galangal compress (pretest), then a warm galangal compress was carried out for 20 minutes, after which it was measured again (post-test) the intensity of the pain scale.

**Results:** Based on the results of the study, 80% of respondents experienced a decrease in the Rheumatoid arthritis pain scale as a result of giving warm galangal compresses. From the significance value of the Wilcoxon test results obtained p-value <0.001 which value is smaller than the error level ( $\alpha$ ) 0.05 or with a significance of 95%, then the hypothesis  $H_0$  is rejected while  $H_a$  is accepted. The conclusion of this study is the effect of Alpinia galanga warm compress in reducing rheumatoid arthritis pain ( $p < 0.001$ ).

**Conclusion:** Galangal warm compresses are effective in reducing Rheumatoid Arthritis pain. Therefore, such interventions are recommended for these patients.

**Keywords:** Alpinia Galanga, Warm Compress, Rheumatoid Arthritis

## Introduction

The prevalence of rheumatoid arthritis (RA) was 0.4%, 0.37%, 62%, 1.25% and 0.42% in Southeast

Asia, Eastern Mediterranean, Europe, America and the Western Pacific<sup>1</sup>. RA is a chronic multi-system inflammatory autoimmune disease of indefinite

etiology<sup>2</sup> and the disease is more common among women and elderly<sup>3</sup>. The current treatment with immunosuppression aims to reduce symptoms and to prevent further joint destruction<sup>4</sup>.

RA is a chronic inflammatory disease that causes inflammation and swelling of the synovial membrane. Inflammation is characterized by redness, burning, pain, and swelling. RA generally attacks the joints of the fingers, wrists, shoulders, knees, and feet. In patients with advanced stages, it will make the patient unable to carry out daily activities and his quality of life decreases<sup>5</sup>. Patients with RA often ask their physician for specific dietary advice and many report that different food items improve or worsen the disease symptoms. Experimental results demonstrate a positive effect of the proposed anti-inflammatory diet on disease activity in patients with RA<sup>6</sup>.

According to Andriani (2016), the results showed that giving warm compresses such as lemongrass leaves can be used as an alternative to reduce the intensity of pain felt by elderly people suffering from rheumatoid arthritis<sup>7</sup>. Meanwhile, the results of the research conducted by Olviani and Sari (2020) found that there was an effect of lemongrass compresses on reducing the intensity of RA pain in the elderly<sup>8</sup>. The results of another study from Margowati showed the effect of cinnamon compresses to change the level of pain in rheumatoid arthritis<sup>9</sup>. In addition, a study conducted by Cho, et al, in 2018 found that Korean red ginseng can also reduce the rate of progression of RA<sup>10</sup> and there is concern that its immune-enhancing effects may negatively affect patients with rheumatoid arthritis (RA).

Alpinia Galanga can be used in the world of health because it contains transconiferil disacetate which is useful for preventing cancer and inflammation<sup>11</sup>. Alpinia Galanga is a member of the Zingiberaceae family which is used in several countries as herbal medicine. This plant in Thailand is used as an additive in food and other countries in Asia Alpinia galanga has long been used to cure rheumatic pain, inflammation, nasal mucous membranes, bronchial, colds, coughs, throat infections and fever. The content of Alpinia Galanga and Acetoxychavicol acetate in galangal has spicy properties and excellent antimicrobial properties<sup>12</sup>.

Traditionally, Alpinia Galanga has anti-bacterial and anti-fungal properties. Alpinia Galanga also increases appetite, warms and cleanses the body. While the chemical content of galangal, namely galangun, astiri oil, kaempferol and eugenol is effective in overcoming digestive disorders, treating tumors, and rheumatoid arthritis. In addition, galangal juice at a concentration of 90% has maximum potential in inhibiting the growth of *Staphylococcus aureus* ATCC 25923 with an inhibition zone diameter of 16 mm<sup>13</sup>. Several research results regarding the effect of giving warm compresses can affect the intensity of RA pain, from the results of Santosa's research it was found that there was an effect of ginger warm compresses therapy on pain intensity in the elderly suffering from RA<sup>14</sup>. So that researchers are interested in conducting research on warm galangal compresses for reducing the intensity of RA pain in the elderly because previously no one has done this research.

## Materials and Methods

This study uses a quasi-experimental design<sup>15</sup>. This research was conducted at Guna Budi Bakti Foundation, Medan. The population in this study was 45 elderly people suffering from RA. The sampling technique used was total sampling, and the research sample was 45 people.

The research process began with measuring the intensity of pain in all elderly people using an observation sheet and a NRS (numeric rating scale) which is divided based on the classification of mild pain (numbers 1-3), moderate (numbers 4-6) and severe (numbers 7). -10) before being given a warm galangal compress (pretest), then a warm galangal compress was carried out for 20 minutes, after which it was measured again (post-test). Before compressing, first prepare the tools and materials, boil the galangal, namely prepare 350 grams of Alpinia Galanga, peel the Alpinia Galanga and then wash it thoroughly, then grate the galangal, turn on the stove fire, prepare a pot and fill with enough clean water, about two liters for 350 grams of Alpinia galanga, heat the water until it boils, then mix the grated Alpinia galanga,

The compressing process starts from informed consent, then washes hands, First clean the painful area to be compressed, then pour warm water in a

thermos into the basin, mix a little clean water into a basin that has been filled with boiled Alpinia galanga water, with a temperature of 40-50 degrees celsius, this is done so that the galangal water is not too hot, then put a towel into the warm water, wait a few seconds before the towel is squeezed, then squeeze the towel and stick it on the painful joint area, lift a small towel when it feels cold, compressing is done for 20 minutes at room temperature 20-25 degrees celsius, then change the warm compress every 5 minutes.

### Results

The results of this study obtained univariate and bivariate analysis of data. The pain experienced before being given warm ginger compresses in Table 1 shows that the majority of respondents had a moderate pain scale of 26 people (57.8%) and the minority had a mild pain scale of 2 people (4.4%). After the intervention by giving warm ginger compresses, the results showed that the majority of the mild pain scale were 29 people (64.4%) and the majority of severe pain scales were 5 people (11.1%) as shown in Table 2.

**Table 1: Pain Scale before Applying Warm Alpinia Galanga Compress (Pre Test)**

No	Pain Scale	Frequency (f)	Percentage (%)
1	Mild pain	2	4.4

**Table 4: Effectiveness of Alpinia Galanga Warm Compress in Reducing Pain Intensity in RA**

Self-care	N	mean	Std. Deviation	Z	P-value
Pre-Test	45	2.33	0.603	-5,688	< 0.001
Post Test	45	1.56	0.755		

### Discussion

The results of this study found that there is effectiveness Alpinia Galanga Warm Compress in Reducing Pain Intensity in RA. RA is a chronic inflammatory autoimmune disease influenced by both genetic, epigenetic and environmental factors. Over the last few years, particular attention has been given to novel genes polymorphisms associated with disease susceptibility and with different stages of the disease<sup>16</sup>. That is characterized by symmetric

2	Moderate pain	26	57.8
3	Severe pain	17	37.8
	Total	45	100

**Table 2: Pain Scale Prior to Alpinia Galanga Warm Compress (Post Test)**

No	Pain Scale	Frequency (f)	Percentage (%)
1	Mild pain	29	64.4
2	Moderate pain	11	24.5
3	Severe pain	5	11.1
	Total	45	100

Based on the analysis of the pre-test data, the Mean value was 2.33 and the Standard Deviation was 0.603 and in the intervention group (post-test) the Mean value was 1.56 and the Standard Deviation was 0.755. This can be seen in Table 3 below.

**Table 3: Data Analysis of Pretest and Posttest Experimental Group**

	N	mean	Standard Deviation
Pre-Test	45	2.33	0.603
Post Test	45	1.56	0.755

Based on the results of the study, it was found that the significance value of p-value = <0.001, then H0 was rejected. This means that there is a the effectiveness of Alpinia Galanga Warm Compress in Reducing Pain Intensity in RA which can be seen in Table 4 below.

inflammation of the synovial joints, which may lead to damage to the cartilage and bone, and a progressive loss of function<sup>17</sup>. It typically manifests as poly articular pain with a symmetric distribution mainly affecting the hands and the feet. In the hands, it has a preference for the wrists, as well as the metacarpophalangeal and proximal interphalangeal joints. These joints are not only painful but also often swollen and warm<sup>18</sup>.

Alpinia Galanga is an important genus that

has complex taxonomic diversity and contains bioactive molecules that can act as natural enzyme inhibitors for several deadly diseases and can block metabolic activity pathways. The results highlight the little-known facts of the *Alpinia* genus in terms of bioactive molecules and their significant therapeutic applications to help fight major human diseases<sup>19</sup>. *Alpinia Galanga* also contains flavonoids which can help prevent or treat allergies, bacterial infections, arthritis, and certain inflammatory conditions<sup>20</sup>.

According to research by Grzanna, et.al., ginger extract from *Zingiber officinale* (family Zingiberaceae) and *Alpinia galanga* (family Zingiberaceae) has a better therapeutic profile and has fewer side effects than non-steroidal anti-inflammatory drugs. *Zingiber officinale* (family Zingiberaceae) and *Alpinia galanga* (family Zingiberaceae) inhibit the induction of several genes involved in the inflammatory response. These include genes encoding for cytokines, chemokines, and the inducible enzyme cyclooxygenase-2. These findings provide the first evidence that ginger and galangal modulate activated biochemical pathways in chronic inflammation<sup>21</sup>. Based on the results of research by Latha, et.al., crude extract of acetone rhizome *Alpinia galanga* showed antiplasmid activity against *Salmonella typhi*, *Escherichia coli* and vancomycin-resistant *Enterococcus faecalis* with efficiency of 92%, 82% and 8%, respectively at 400 g/ml SIC. The content of 1-Acetoxychavicol acetate mediated R-plasmid curing significantly reduces the concentration of inhibitory antibiotics required to inhibit bacterial growth, thereby making antibiotic treatment more effective<sup>22</sup>.

The content of *Alpinia Galanga* and Acetoxychavicol acetate in galangal has spicy properties and excellent antimicrobial properties (12). Traditionally, *Alpinia Galanga* has anti-bacterial and anti-fungal properties. *Alpinia Galanga* also increases appetite, warms and cleanses the body. While the chemical content of *Alpinia galanga*, namely galangun, essential oils, kaempferol and eugenol are effective in overcoming digestive disorders, treating tumors, and rheumatoid arthritis<sup>23</sup>.

Giving a warm compress to the body area will give a signal to the hypothalamus through the spinal cord. When heat-sensitive receptors in the hypothalamus

are stimulated, the effector system signals the onset of sweating and peripheral vasodilation. Changes in the size of blood vessels are regulated by the vasomotor center in the medulla oblongata of the brain stem, under the influence of the anterior hypothalamic so that vasodilation occurs<sup>7</sup>.

Based on research conducted by Hillyard et. al. (2018), it is explained that complications that can occur in patients with chronic rheumatoid arthritis can result in insufficiency fractures, although this frequency is very rare, it will be very risky for the sufferer. For this reason, an accurate examination is needed to detect the occurrence of insufficiency fractures in patients with rheumatoid arthritis<sup>24</sup>. MRI examination is a very appropriate choice in detecting the occurrence of multiple fluorid insufficiency and lesions that occur on the feet and ankles in patients with RA. A radiological examination can only see signs and symptoms and complications that occur. Frequent radiological examinations can even worsen the condition of patients with RA<sup>25</sup>.

## Conclusion

The conclusion of this study is that there is an effectiveness of *Alpinia galanga* warm compresses on reducing the intensity of the RA pain scale in the elderly by 80%. This is because the warm water of galangal is effective for reducing pain in RA and the content of *Alpinia galanga*, alpine, camphor, galangin, methycinnamate, has anti-bacterial and fungal properties.

**Ethical Clearance:** Ethical clearance taken from Ethic Committee in Universitas Prima Indonesia, Indonesia with registration number 125/KEPK/UNPRI/IV/2021

**Conflicts of Interest:** None declared.

**Source of Funding:** Self

## References

1. Rudan I, Sidhu S, Papana A, Meng SJ, Xin-Wei Y, Wang W, et. al. Prevalence of rheumatoid arthritis in low- and middle-income countries: A systematic review and analysis. *J Global Health*. 2015;5(1):010409-010409.
2. Mohammed RHA. Rheumatoid Arthritis - Google

- Books. In: Other Perspectives Towards a Better Practice. London: IntechOpen; 2020.
- Buckwalter JA, Lappin DR. The Disproportionate Impact of Chronic Arthralgia and Arthritis Among Women. 2000;52(372):159–68.
  - Smolen JS, Landewé RBM, Bijlsma JWJ, Burmester GR, Dougados M, Kerschbaumer A, et. al. EULAR recommendations for the management of rheumatoid arthritis with synthetic and biological modifying antirheumatic drugs : 2019 update. 2020;1–15.
  - Carpenter RG. Cases on higher education spaces: Innovation, collaboration, and technology. Cases High Education Spaces Innov Collab Technol. 2012;5:1–424.
  - Vadell AKE, Bärebring L, Hulander E, Gjertsson I, Lindqvist HM, Winkvist A. Anti-inflammatory Diet In Rheumatoid Arthritis ( ADIRA ) – a randomized , controlled crossover trial indicating effects on disease activity. Orig Res Commun. 2020;1–11.
  - Andriani M. Effect of Warm Lemongrass Compress on Reduction of Rheumatoid Arthritis Pain Intensity in the Elderly. J Applied Science and Technology. 2016;10(1).
  - Olviani Y, Sari EL. Effect of Warm Compress Boiled with Lemongrass Water on Reduction of Rheumatoid Arthritis Pain in the Elderly at Tresna Werdha Budi Sejahtera Social Home Banjarbaru, South Kalimantan Province. Din Kesehatan J Midwifery and Nursing. 2020;11(1).
  - Margowati S, Priyanto S. Effect of Cinnamon (Cinnamomum Burmani) Compress Use on Pain Reduction in Gouty Arthritis Patients. 5th Urecol Proceeding [Internet]. 2016;12-42-7. Available from: <http://lpp.uad.ac.id/wp-content/uploads/2017/05/75.-sri-margowati-598-607.pdf>
  - Cho SK, Kim D, Yoo D, Jang EJ, Jun JB, Sung YK. Korean Red Ginseng exhibits no significant adverse effect on disease activity in patients with rheumatoid arthritis: a randomized, double-blind, crossover study. J Ginseng Res [Internet]. 2018;42(2):144–8. Available from: <http://dx.doi.org/10.1016/j.jgr.2017.01.006>
  - Aidah SN. Galangal Encyclopedia Description, Philosophy, Benefits, Cultivation, and Business opportunities. Yogyakarta: Indonesian KBM; 2020.
  - Sulistianingsih E, Sugiarti M. The Effectiveness of Boiling Water and Juice of Red Galangal (*Alpinia purpurata* K.schum) in Inhibiting the Growth of *Trichophyton rubrum* the Fungus That Causes Water Fleas (*Tinea pedis*). J Health. 2018;9(3):382.
  - Ekawati ER, Handriyanto P. Test of Variation of Galangal (*Alpinia Galanga*) Juice on the Growth of *Staphylococcus aureus*. None. 2017;1(1):23–9.
  - Muhammad A, Gumerti, AY, Mahmud. The Effect of Emprit Ginger Warm Compress on Reduction of Rheumatoid Arthritis Knee Joint Pain in the Elderly at the Tresna Werdha Social Home (PSTW) Bondowoso. J Health Dr. Soebandi [Internet]. 2018;6(1):517–22. Available from: <http://garuda.ristekbrin.go.id/documents/detail/1075622>. Accessed Oct 1, 2020
  - Polit, DF, & Beck CT. Nursing research: Generating and assessing evidence for nursing practice. Lippincott Williams and Wilkins.; 2012.
  - Croia C, Bursi R, Sutera D, Petrelli F, Alunno A, Puxeddu I. One year in review 2019: pathogenesis of rheumatoid arthritis. ClinExp Rheumatol. 2019;37.
  - van Vollenhoven RF. Biologics for the Treatment of Rheumatoid Arthritis. Biologics for the Treatment of Rheumatoid Arthritis. Springer International Publishing; 2016.
  - Chancay MG, Guendeschadze SN, Blanco I. Types of pain and their psychosocial impact in women with rheumatoid arthritis. Women’s Midlife Heal. 2019;5(1).
  - Dash S, Panda MK, Singh MC, Jit BP, Singh YD, Patra JK. Bioactive Molecules from the *Alpinia* Genus: A Comprehensive Review. Curr Pharm Biotechnol. 2020;21(14):1412–21.
  - Bian MQ, Wang HQ, Kang J, Chen RY, Yang YF, Wu HZ. Flavonoids from the seeds of *Alpinia galanga* Willd. YaoXueXueBao. 2014;49(3):359–62.
  - Grzanna R, Lindmark L, Frondoza CG. Ginger - An herbal medicinal product with broad anti-inflammatory actions. JMed Food. 2005;8(2):125–32.
  - Latha C, Shriram VD, Jahagirdar SS, Dhakephalkar PK, Rojatkar SR. Antiplasmodial activity of 1'-acetoxychavicol acetate from *Alpinia galanga* against multi-drug resistant bacteria. J Ethnopharmacol. 2009;123(3):522–5.
  - Medan City Government. Benefits and Efficacy of Galangal for Health [Internet]. 2013. Available from: <https://pemkomedan.go.id/article-11334-benefits-dan-khasiat-lengkuas-untuk-kesehatan.html>
  - Hillyard KCL, Shabbir S, Sirisena UN, Hogarth M, Sahu A. Insufficiency fractures: A rare cause of foot and ankle pain in three patients with rheumatoid arthritis. Radiol Case Reports [Internet]. 2018;13(4):855–61. Available from: <https://doi.org/10.1016/j.radcr.2018.05.016>.
  - Andersen L. Your Life with Rheumatoid Arthritis: Tools for Managing Treatment, Side Effects and Pain eBook: Andersen, Lene: Kindle Store [Internet]. Two North Books; 2013. Available from: <https://www.amazon.com/Your-Life-Rheumatoid-Arthritis-Treatment-ebook/dp/B00BGVJHAG>