

**RESEARCH ARTICLE**

**Pharmaceutical effect of Red Ginger (*Zingiber officinale var. rubrum*) on Arthritis and Gout pain in Older people at Parungkuda Public Health Center's Geriatric Polyclinic in Sukabumi Regency, Indonesia**

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**ABSTRACT:**

The efficacy of red ginger (*Zingiber officinale var rubrum*) is obtained from the content of essential oils. Essential oil is a type of volatile oil that contains high gingerol, this oil can be applied to the outside of the body to treat health conditions such as rheumatic pain, back pain, impotence, stomach pain, increase stamina, relieve asthma, treat dizziness, anti-inflammatory, anti-rheumatic, antipyretic. The purpose of this study is to find out the effect of red ginger compress (*Zingiber officinale var rubrum*) on the level of arthritis gout pain in the elderly at Geriatric Polyclinic of Parungkuda Public Health Center, Sukabumi Regency in 2021. This study used a quasi-experimental research design pre-test and post-test non-equivalent without a control group design. The population that will be used in this study is respondents who experience gout arthritis pain as many as 25 people at Geriatric Polyclinic of Parungkuda Public Health Center. Sampling uses total sampling techniques based on inclusion and exclusion criteria. There is an effect of red ginger compresses on the decrease in the level of arthritis gout pain in elderly patients at the Parungkuda Public Health Center, Sukabumi Regency with a value of  $< 0.05$   $p$ -value = 0.0001. In 2021, the Geriatric Polyclinic of Parungkuda Public Health Center, Sukabumi Regency will see an impact of red ginger compresses (*Zingiber officinale var rubrum*) on the amount of arthritis and gout discomfort experienced by the elderly.

**KEYWORDS:** Red ginger compress (*Zingiber officinale var rubrum*), pain, arthritis gout.

**INTRODUCTION:**

When a person feels pain, it is a state that identifies him as a living being.<sup>1</sup> As in Maslow's hierarchy of needs, comfort is a basic need after physical needs, so the fulfilment of comfort needs is disturbed if a person experiences pain. The Indonesian Rheumatology Association simply defines osteoarthritis as a degenerative joint disease that occurs due to chronic inflammatory processes in the joints and bones around the joints<sup>2</sup>.

According to Stanley (2006), pain is one of the complaints experienced by osteoarthritis patients. At first the pain occurs with movement, then pain can also occur when resting.<sup>3</sup>

Hyperuricemia, or high levels of uric acid in the blood, may lead to deposits of monosodium urate crystals and a buildup in the joints that can lead to gout. Gout is an inflammation that occurs due to the occurrence of monosodium urate crystal deposits in the joints. Normal uric acid levels in women are 2.4-6.0mg/dL and in men are 3.0-7.0mg/dL. People can be said to have gout if the level of uric acid in their blood exceeds the normal threshold. Gout can affect everyone with normal conditions, namely diet, unhealthy lifestyle, and women, usually after the menopause period.<sup>4</sup> According to Nasir

(2019), gout is found in the elderly, especially those who are overweight (obese). Almost 80% of elderly people aged 50 years and over have complaints in the joints.<sup>5</sup>

The elderly are a group or population that has an average age of over 60 years. The ageing process will be experienced by each individual normally and naturally. The changes can be seen from the physical, mental, and social aspects. With increasing age in the elderly, physiological functions also decrease a lot due to the ageing process, resulting in many non-communicable diseases that arise, such as hypertension, stroke, diabetes mellitus, and arthritis, or the occurrence of rheumatism.<sup>6</sup>

The number of elderly people aged 60 years in 2015 in the world amounted to 26.1%, Asia 11.6%, and Indonesia amounted to 8.1% (Ministry of Health, 2019). According to Statistics Indonesia (2020), the number of elderly in West Java in 2020 was 4.76 million. In Sukabumi Regency, the number of elderly residents amounted to 190,381.<sup>7</sup>

Based on elderly data in Sukabumi Regency, the order of diseases that are often complained of by the elderly, in addition to hypertension, is arthritis and gout pain, with a percentage of 87.5% in 2020.<sup>8</sup> There were complaints of gout arthritis pain in many elderly people, especially in the Parungkuda Public Health Center, where there was an increase of 50 elderly people complaining of gout arthritis pain.

According to Sari and Syamsiyah (2017), clinical manifestations of gout can cause a decrease in kidney function, leading to the occurrence of disability, inflammation, swelling, redness, and pain.<sup>9</sup> Pain can also be interpreted as an unpleasant sensation emotionally or sensorily due to damage to tissues or other factors, so it will interfere with daily activities and psychics. Pain is also individual and subjective.<sup>10</sup> This pain is usually felt in the joints of the fingers, backbone, knees, and pelvic joints.<sup>5</sup>

The action that can be given to gout sufferers to reduce pain can be done by giving warm water compresses with a temperature of 43°C, cold water compresses, hypnosis, and analgesic drugs.<sup>10</sup> Compressing is an independent action that can be done by a nurse. In addition to some of the things listed above, gout sufferers can use herbs like red ginger compresses (*Zingiber officinale* var *rubrum*), sea cucumber, sidaguri, brotowali, green tea, mangosteen, and legundi to ease their pain.<sup>4</sup>

The efficacy of red ginger (*Zingiber officinale* var *rubrum*) is obtained from the content of essential oils. Essential oil is a type of volatile oil that contains high amounts of gingerol. This oil can be applied to the outside of the body to treat health conditions such as

pain.<sup>11</sup> Ginger has properties that help to warm the body, relieve joint pain, stimulate appetite, straighten sweat, and prevent and treat colds. In addition, it can also be used to overcome inflammation of the throat, rheumatism, back pain, impotence, stomach pain, increase stamina, relieve asthma, treat dizziness, anti-inflammatory, anti-rheumatism, and antipyretic.<sup>12</sup>

The results of one study proved that there is the effectiveness of warm compresses of red ginger against pain reduction in patients with joint pain. Where in the experimental group the average pain before treatment was 6.5, after being given the intervention the average pain became 2.5. Then, for the control group with the provision of warm compresses, the pain scale before being given action was 6.1, while after being given the average action the pain scale became 3.4. This showed that there was a decrease in pain levels between the two groups, but in the warm compresses of red ginger, the decrease in pain levels was higher by 4 and in the control group by 2.7.<sup>13</sup>

Warm ginger compresses have been shown to have an effect on the severity of arthritic gout. The average pain value of the treatment group was 5.06, while after being given the intervention the average pain value was 1.8. Then, in the comparison group, the pain scale before being given intervention was on average 3.50, and after the action, the average pain value was 2.31. This showed that there was a decrease in pain levels between the two groups, but in the warm compress ginger, the pain level decreased by 3.26 and in the control group by 1.19.<sup>14</sup>

Based on preliminary studies conducted by researchers, they obtained data that in August 2020 at the Parungkuda Public Health Center, 51 elderly people had gout. At the Parungkuda Health Center, 25 elderly patients were complaining of pain in their joints after a gout check. The elderly often complain of pain in the joints that causes them to be uncomfortable carrying out daily activities such as eating, defecating, and walking. Because of this, researchers want to treat older people with gout by putting a red ginger compress on their joints.

Based on the exposure and existing data, researchers are interested in examining the influence of Red Ginger Shaving Compresses (*Zingiber officinale* var *rubrum*) on the level of gout pain in the elderly at the Geriatric Polyclinic of Parungkuda Public Health Center, Sukabumi Regency in 2021.

## **MATERIALS AND METHODS:**

Experimentation is the method of research used in this study. This study employed a quasi-experimental design using a pretest-posttest design with one group. Pretest and posttest without control is a single-group design that

does not need comparisons between the two groups. Post-test scores were compared to pre-test scores in this research, with the treatment group using red ginger and the control group using a pain scale. This study selected patients who have gout pain. Elderly patients began with the process of observation of the pain scale (pre-test), were then given intervention to give red ginger compresses for 15 minutes. After intervention, they reserved the pain scale (post-test) in both groups.

The population in this study was a respondent who experienced arthritis and gout pain, as many as 25 people at the Geriatric Polyclinic, Parungkuda Health Center. The type of data collected in this study is primary data, namely using data obtained from respondents who experienced gout pain at the Geriatric Polyclinic of Parungkuda Public Health Center of Sukabumi Regency. The right instrument used in this study used red ginger shaving compresses for elderly patients who experienced gout pain, and then the patient filled out a questionnaire sheet about pain. For pain scale research instruments using 1-10 pain scales (NRS), In November 2021, this study was done at the Parungkuda Public Health Center, Geriatric Polyclinic, in the Sukabumi Regency.

**RESULT:**

This study is titled "The Effect of Red Ginger Compresses on Arthritis Gout Pain Level in the Elderly at the Geriatric Polyclinic of Parungkuda Public Health Center, Sukabumi Regency in 2021". The population in this study is elderly patients who have a history of arthritis gout. The location of the study was conducted at the Parungkuda Public Health Center, Sukabumi Regency.

**Table 1: Decreased Pain Level Before and After Being Given Red Ginger Compress to the Elderly at Parungkuda Public Health Center, Sukabumi Regency**

Variable	N	Min-Max	Mean	SD
Pre Intervention	25	2-4	3.2000	0.64550
Post Intervention	25	1-4	2.0400	1.01980

**Table 2 Effect of Red Ginger Compress Before and After, On Arthritis Gout Pain Levels in Elderly Patients at Parungkuda Public Health Center**

	Average (s.b)	Difference (s.b)	IK 95%	p-Value
Pre Intervention	3.20 (0.64)	1.16 (0.74)	0.85-1.46	0.0001
Post Intervention	2.04 (1.20)			

**DISCUSSION:**

Based on table 1, the decrease in pain level before the red ginger compress is carried out on the elderly at the Parungkuda Public Health Center obtained a mean value of 3.2000 with a standard deviation result of 0.64550. Gout Arthritis is caused by a buildup of uric acid in the

joints of the body. When there is excess uric acid in the bloodstream and the amount is more than what can be excreted, the uric acid seeps into the joint tissue, causing pain and swelling. Pain is the most frequent symptom of gout.<sup>15</sup>

Based on the results of the study, the distribution of respondents according to the level of pain, as many as 19 respondents (54.3%) experienced moderate pain. Pain is a typical symptom of gout arthritis. Usually, sufferers experience severe pain in the joints. It generally occurs at night or at the time of waking up in the morning.<sup>16</sup> In this study, respondents experienced the most moderate pain. This is in line with the research conducted by Seran et al. (2016)<sup>17</sup>, respondents experienced the most moderate pain, namely around 12 people (46.7%); then in the study conducted by Chintyawati (2014)<sup>18</sup>; the category of moderate pain at most 20 people (51.3%), and in the research conducted by Abrial et al. (2020)<sup>19</sup> respondents were most in the category of moderate pain (46.7%). Arthritis Gout pain in the elderly is a very disturbing thing for the comfort of the elderly.

Musculoskeletal disorders that cause joint pain or symptoms that interfere with joint function The joint pain will usually appear uncomfortable to touch, with swelling, inflammation, stiffness, and movement restriction. Diseases of the musculoskeletal system that cause joint pain include osteoarthritis, gout arthritis, rheumatoid arthritis, and arthritis infection.<sup>17</sup> Pain is a subjective condition characterised by unpleasant sensations that vary from person to person. Only the individual experiencing the pain can explain or assess it.<sup>20</sup> A person's response to pain is influenced by emotions, level of awareness, cultural background, and past experiences of pain. Pain prevents a person from resting, concentrating, and doing activities that are commonly done.

Based on table 1, the reduction in pain after being given red ginger compress therapy in the elderly at the Parungkuda Public Health Center of Sukabumi Regency obtained a mean value of 2.0400 with a standard deviation result of 1.01980. Treatment of red ginger compresses in elderly patients who experience arthritis gout pain experiences a significant reduction in pain. This treatment is given to elderly patients by compressing red ginger for a time of 15 minutes as many as 3 times in one day.

This wet compress therapy is given to meet the need for comfort in patients, reduce pain, and improve blood circulation in the body. According to Faslah and Savitri (2013), ginger contains gingerol and shogaol compounds, which are hot and spicy. Ginger also has

non-steroidal anti-inflammatory properties where it can suppress the synthesis of prostaglandin-1 and cyclooxygenase-2, the spicy taste given from the red ginger compress will reduce inflammation, and relieve pain, and muscle spasms.<sup>11</sup>

Research by Selawati et al. (2016), with the title 'warm compress ginger or without ginger reduces elderly joint pain' found that warm compresses without additional ginger were evaluated and the resulting pain level decreased, before the pain level action (4-7), after being given a decreased action at the level (3), thus showing a decrease in the level of gout pain after a warm compress action without ginger.<sup>21</sup>

This is to the research of Rusnoto et al. (2015), warm water compresses using ginger with a duration of 20 minutes have an effect to relieve pain in the elderly with gout arthritis.<sup>22</sup> In the opinion of researcher Samsudin et al. (2016), giving a warm compress using a red ginger grater with a duration of 15-20 minutes is very effective to reduce the scale of pain in the elderly with arthritis gout.<sup>23</sup>

Arlina (2018), stated that a warm compress using grated ginger done in the afternoon can be used as an intervention to reduce the scale of pain. Because it can be done every day regularly and turns out to affect reducing the pain scale, because the warm compress provides a warm feeling to meet the needs of comfort, and reduce pain.<sup>24</sup> There is evidence to suggest that 15 - 30 minute hot/warm compresses and ginger compresses are very beneficial for relieving pain in the elderly.<sup>25</sup>

Based on table 2 above, conducted with a paired T-test where the results before being given a red ginger compress were 3.20, after being given a red ginger compress 2.04, and the result of *p*-value 0.0001, it can be interpreted that the *p*-value of 0.0001  $\alpha < 0.005$ , it is concluded that there is an effect of red ginger compress on the decrease in the level of arthritis gout pain in elderly patients in the Parungkuda Public Health Care, Sukabumi Regency. Patients with gout arthritis who get this ginger compress therapy report a decrease in pain in the form of unpleasant sensations that are very subjective since each person experiences pain in a unique way and only they can describe or assess the amount of discomfort they are experiencing.<sup>14</sup>

According to another study, the results showed that after a warm compress of red ginger, there was a change in pain levels in both subjects (respondents). In the first subject, the initial pain level is 3 (mild pain), but after red ginger compression, the pain level is 0 (painless).<sup>26</sup> The first subject's left hand (ring finger) may be utilised for non-painful activities because there is still a little

stiffness in there. Pain level 0 (no pain) was found in subject 2, who had previously been experiencing considerable pain (no pain). The second subject's right knee might be used for the exercise. Warm compresses using ginger are very effective to reduce the pain scale because the warm taste of ginger decoction can make joints and muscles relax so that pain can be reduced.<sup>27</sup> Gout is the most common painful clinical syndrome.<sup>28-</sup><sup>32</sup>With a warm water compress, use ginger for 3x15 minutes, which is done in the afternoon. On average, obtained in Marga Batin Village, with a pain scale of 4, there are 6 respondents; with a pain scale of 3, there are 4 respondents.

In line with the study by Andarmoyo (2013), there is an influence of red ginger compress therapy on pain reduction in elderly patients with the results of the *t*-Test *p*-Value 0.000 < 0.05.<sup>33</sup> Gingerol and shogaol, the active ingredients in red ginger, have a molecular weight of 150-190 Da, which makes them lipophilic enough to penetrate the skin without irritating it. In a study, ginger extract was shown to be absorbed by human skin. Cyclooxygenase (COX-2) is inhibited by ginger extract, which is absorbed by epithelial tissue. Ginger also has pharmacological benefits, such as a hot and spicy flavour that alleviates muscular spasms and discomfort and increases blood vessel dilatation.<sup>34,35</sup>

## CONCLUSION:

The average result before doing a red ginger compress on the elderly at the Parungkuda Public Health Center, Sukabumi Regency, was obtained at 3,2000. The average results after doing red ginger compress on the elderly at the Parungkuda Public Health Center, Sukabumi Regency, obtained 2,0400. There is an effect of red ginger compresses on the decrease in the level of arthritis gout pain in elderly patients at the Parungkuda Public Health Center, Sukabumi Regency, with a value of < 0.05 *p*-value > 0.0001. So it can be concluded that red ginger has a good impact on gout pain.

## CONFLICT OF INTEREST:

The authors have no conflicts of interest regarding this investigation

## ACKNOWLEDGMENTS:

The authors would like to thank Geriatric Polyclinic of Parungkuda Public Health Center, Sukabumi for their kind support during the collected data and all other lab studies

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