

Original Research

Effect of Red Ginger Oleoresin Compress (*Zingiber officinale*) on Joint Pain in the Elderly



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Article Info	Abstract
<p>Article history: Received: 12 November 2023 Accepted: 29 January 2024</p>	<p><i>Introduction:</i> Elderly people will experience physical, social, and psychosocial changes. One of the complaints resulting from physical changes in the elderly is joint pain. Joint pain in the extremities experienced by the elderly is one of the most prevalent. Pain therapy using non-pharmacological techniques is an effective pain treatment and has minimal side effects for the elderly. One non-pharmacological technique that can be used to reduce pain in the elderly is using a red ginger compress. The content of red ginger can help reduce pain and act as an anti-inflammatory.</p> <p><i>Methods:</i> This research utilized a quantitative Quasi-Experimental method with a Non-Equivalent Control Group Design approach. The sample size was 70 respondents, chosen using a purposive sampling technique, and divided into two groups, a control group of 35 respondents and an intervention group of 35 respondents. The intervention involved applying red ginger compresses to painful joints for 7 days, and evaluation was conducted on the third, fifth, and seventh days using the Numeric Rating Scale (NRS). The research results were analyzed using the Multiple Linear Regression Test.</p> <p><i>Results:</i> The results of the multivariate analysis of a simple linear regression test showed that there was an effect of simultaneously administering red ginger compresses with a p-value of 0.000.</p> <p><i>Conclusion:</i> Providing a red ginger compress intervention has obtained significant results or has an effect on pain in the elderly. It is hoped that the elderly can take advantage of this intervention to reduce the symptoms and impact of musculoskeletal pain.</p>
<p>Keywords: elderly, joint pain, red ginger</p>	

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INTRODUCTION

Old age is the final stage of the life cycle and is a process of change that occurs gradually, is experienced by all individuals without exception, and cannot be avoided. Elderly people are more susceptible to experiencing various kinds of complaints due to the decline in function they experience [1-3]. World population data in 2050 according to the United Nations shows that the number of people aged over 65 years in the world will reach 16%, higher than in 2019 which is 11% [4]. In 2020, East Java had an elderly population structure reaching 10%, as much as 13.38% [5].

The increase in the number of elderly people also has an impact on increasing the problems faced by the elderly, especially the quality of life of the elderly. The morbidity rate for the elderly in Indonesia has almost reached 24.35% of the total number of elderly people. Illnesses suffered by the elderly cause incapacity and disability so that the elderly cannot carry out daily activities [5]. Inability and disability to meet daily living needs, as well as a decrease in the quality of life, are influenced by pain complaints. Pain is often one of the main factors that elderly patients seek treatment for.

As individuals age, joint pain can have a significant impact on their physical functionality, leading to a loss of independence in performing essential daily tasks and self-care. Additionally, it can increase the likelihood of injuries, falls, sleep disturbances, depression, and a decrease in overall health-related quality of life [6].

Pain management using pharmacological therapy is more widely used, however, non-pharmacological techniques are an effective pain treatment and have minimal side effects for the elderly [2,6]. Pain therapy can use red ginger compress therapy. Red ginger contains oil which contains several compounds, including gingerol, shogaol, and zingerone, which provide pharmacological and physiological effects such as antioxidant, anti-inflammatory, analgesic, anticarcinogenic, and cardiotoxic effects [7-10]. Red ginger is known for its oil content which does not evaporate or oleoresin, giving it a bitter and spicy taste. Oleoresin, a compound found in red ginger, has strong anti-inflammatory, analgesic, and antioxidant properties. When a warm compress containing red ginger is applied, oleoresin penetrates the skin without causing irritation or peripheral circulation damage [12,13]. Furthermore, oleoresin's content, such as zingerone, can help inhibit prostaglandin synthesis, which results in pain relief and reduction [10]. It is hoped that non-pharmacological pain management with red ginger compress will provide positive results for the elderly, so that the long-term impact of reducing the joint pain felt by the elderly, and the quality of life of the elderly in their later years will increase.

METHODS

Study Design

The research design used a quantitative Quasi-Experimental method using a Non-Equivalent Control Group Design approach

with an intervention group and a control group. The Numeric Rating Scale (NRS) is an instrument used to evaluate the intervention group and control group.

Study Population

The population in this study were all elderly people with joint pain at the LKS-LU Tresno Mukti Turen, Malang Regency, and LKS-LU Pangesti Lawang, Malang Regency

Sample: Sample Size and Sampling

Technique

The sample in this study was 70 respondents with the following criteria: elderly who complained of pain in the joints, pain scale according to the NRS pain score of at least 2, cooperative, respondents with or without pain medication, willing to take part in the intervention for 7 days. The sampling technique uses purposive sampling. The number of samples involved according to the inclusion and exclusion criteria was 70 respondents, divided into the intervention group of 35 respondents and the control group of 35 respondents.

Instrument for Data Collection

The instrument used to assess changes in the pain scale is the Numeric Rating Scale (NRS). Apart from data regarding this assessment, an assessment will also be carried out regarding age, gender, BMI, and extent of pain.

Intervention

The intervention given in this study was

giving a compress of grated red ginger mixed with 100°C hot water, leaving it for 45 minutes, then compressing the painful joint area using a tissue for 20 minutes, then evaluating it using the Numeric Rating Scale (NRS) on the third, fifth and seventh day.

Statistical analysis

The analysis was carried out in three stages. The first stage was univariable analysis. In this analysis, the research variables were analyzed descriptively to get a picture of the frequency distribution of respondents, including age, gender, BMI, and extent of pain. In the second stage, bivariate analysis was carried out to determine the effect of the independent variable on the dependent variable using the Paired T-test. The multivariable factors that influence the administration of red ginger compresses are analyzed using a Multiple Linear Regression Test.

Ethical Consideration

The implementation of this research has received permission from LKS-LU Tresno Mukti Turen, Malang Regency, with number 21/LKSLU-TM/Sos/V/2023, which was issued on May 8, 2023, and has received permission to carry out research from LKS-LU Pangesti Lawang, Malang Regency, with number 24/LKSLU-P/V/2023, which was issued on May 8, 2023.

The principles of research ethics are (1) respect for persons, (2) beneficence, and (3) justice. This research ethical principle is used when human participants or respondents are

involved in research. The rights of participants must be protected.

RESULTS

Univariate Analysis

Based on the Table 1, it was found that the majority of respondents were female, namely 38 respondents (54.3%), the majority of respondents' BMI was in the normal category, namely 40 respondents (57.1%), the majority of respondents had 2-sided pain, namely 47 respondents (67.1%) and the average age of respondents was 73.9 years.

Bivariate Analysis

Based on Tables 2,3 and 4, The results of the Paired T-test analysis of pain values in the intervention group and the control group

showed that the difference in pain was $0.000 < 0.05$, so H_0 was rejected or there was a difference between the pain values in the intervention group and the control group with a mean difference of -2.25714.

Multivariate Analysis

Based on Table 5, the results of the multivariate analysis test using Simple Linear Regression showed that factors that influenced pain scores were the administration of red ginger compresses and BMI. Providing the red ginger compress intervention had a positive effect on the pain score with a value of $B = 2.249$ with a sig. (2-tailed) 0.000 or <0.05 , while BMI had a positive effect on the pain score with a value of $B = 0.934$ with a sig. (2-tailed) 0.000 or <0.05 .

Table 1
Distribution of Research Respondent Characteristics

Respondent Characteristics	Frequency (n)	(%)	Total
Gender			
▪ Male	32	45.7	70
▪ Women	38	54.3	
BMI			
▪ Normal	40	57.1	70
▪ Overweight	20	28.6	
▪ Obesity	10	14.3	
Extent of Pain			
▪ 1 Side	23	32.9	70
▪ 2 Side	47	67.1	
	Mean	Std. Deviation	
Age	73.9	8.8762	

Table 2

Difference Test Results Paired t-test (P Value <0.05) Pain Values in the Intervention Group

	Intervention Group	Mean	Std. Deviation	Sig. (2-tailed)
Pain	Differences in Pre Test and Post Test Pain	2.48571	1.14716	0.000

Table 3

Difference Test Results Paired t-test (P Value >0.05) Pain Values in the Control Group

	Control Group	Mean	Std. Deviation	Sig. (2-tailed)
Pain	Differences in Pre Test and Post Test Pain	0.02857	0.38239	0.661

Table 4

Independent t-test Difference Test Results (P Value <0.05) Pain Values in the Intervention and Control Groups

	Mean Difference	Sig. (2-tailed)
Differences in Post Test Pain Scores for Intervention and Control Groups	-2.25714	0.000

Table 5

Multiple Linear Regression Test : Test Results of the Effect of Giving Red Ginger Compress, Gender, Age, BMI, and Area of Pain on Pain

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
	(Constant)	-4.151	1.065		-3.896	.000
	Gender	-.388	.242	-.123	-1.605	.113
	Age	.021	.013	.119	1.591	.117
1	BMI	.934	.155	.433	6.012	.000
	Extent of Pain	.194	.232	.058	.834	.407
	Red Ginger Compress	2.249	.221	.715	10.190	.000

DISCUSSION

Based on Table 3, the difference in pain values in the control group before and after the research activities showed a sig (2-tailed) value of $0.661 > 0.05$ or H_0 was accepted or it could be said that there was no difference in pain values before and after the research activities took place with a mean of 0.02857. Table 2 shows the difference in pain scores in the intervention group before and after being given the red ginger compress. The sig value (2-tailed) is $0.000 < 0.05$ or H_0 is rejected or it can be said that there is a difference in pain scores before and after being given the red ginger compress with a mean of 2.48571. Based on Table 4, it was found that the difference in post-test pain scores in the intervention group and the control group was $0.000 < 0.05$, so H_0 was rejected or there was a difference between the pain scores in the intervention group and the control group with a mean difference of -2.25714. The control group showed no change in pain levels before and after the study. This could be due to factors such as age, severity of illness, and activity which can affect the respondent's condition. In the intervention group, there was a significant reduction in pain after being given the red ginger compress.

Red Ginger compress therapy is a compress therapy made from herbal ingredients that is used to reduce pain. The content of red ginger can help reduce pain and act as an anti-inflammatory. Red ginger contains oleoresins such as zingerone, gingerol, and shogaol. Oleoresin has a strong anti-inflammatory, analgesic, and antioxidant function. When a warm compress with red

ginger is applied, oleoresin will penetrate the skin without causing irritation or damage to the peripheral circulation [11,12]. Apart from that, the content of oleoresin such as zingerone can help inhibit prostaglandin synthesis so that it can relieve and reduce pain [9]. The effect of red ginger has the same effect as ibuprofen in treating symptoms of joint pain, which is supported by research that shows that red ginger has a significant effect in reducing OA pain [11].

The results of Therkleson's (2014) research showed that the average score for Group 1 and Group 2 showed a significant decrease after 1 week of topical ginger treatment. Pain, fatigue, global effect, and functional status scores were reduced by 48%, 49%, 40%, and 31%, respectively, while health satisfaction increased from 80% dissatisfied to 70% satisfied [13]. As supported by the research results of Rahayu et al. (2017), research results showed that both groups showed a decrease in the pain scale before and after the intervention, where the red ginger compress was able to reduce the pain scale from an average of 6.5 to 2.5. The Independent t-test between the red ginger compress and the warm compress had a sig value of 0.037 ($p < 0.05$) showing that there was a statistically significant difference in effectiveness in reducing the scale of joint pain in the elderly after 1 week of administration [14].

Joint pain in the elderly is influenced by several factors including age, gender, BMI, the extent of pain, the exercise habits, or physical activity. In this study, the factor that had the most influence on joint pain experienced by the elderly was BMI. Table 5 shows that BMI

has a positive effect on pain scores with a value of $B = 0.934$ with sig. (2-tailed) 0.000 or <0.05 . Body Mass Index (BMI) is a factor that can influence musculoskeletal pain, particularly in the lower extremities among the elderly, especially those who are obese or overweight. The increased joint pressure on the knees caused by excess weight is often the cause of this pain [15]. Studies have shown that being overweight can lead to abnormal accumulation of adipose tissue, which triggers fat deposition and, in turn, causes joint tissue pain. Obesity and a high BMI have also been linked to impaired functional capacity and reduced quality of life in patients with chronic pain conditions [16,17]. According to research conducted by Septiana et al. (2023), there is a significant relationship between body mass index and rheumatoid arthritis, as evidenced by the results of the Chi-Square test conducted on the incidence of rheumatoid arthritis in the Tanjung Rejo Village Health Center in Pesawaran Regency. The p-value obtained was 0.014 , which indicates a significant relationship between body mass index and rheumatoid arthritis.

CONCLUSION

BMI influences the incidence of joint pain in the elderly. Elderly people in the obese or overweight category are prone to experiencing joint pain in the lower extremities, so it is necessary to reduce weight and provide red ginger compress intervention. It is hoped that this intervention can be utilized by the elderly and their families to reduce the symptoms and impact of musculoskeletal pain, without the need for

long-term use of pharmacological therapy. This can ultimately lead to an improvement in the quality of life of the elderly population.

STRENGTH AND LIMITATIONS OF THE STUDY

One of the strengths of this research is the diverse background and location of the respondents, which adds to the validity of the findings. However, a potential weakness of this intervention is the need for high-quality red ginger material and consistent preparation of the compress over a period of 7 days. Nonetheless, the non-pharmacological nature of this intervention makes it a safe option for elderly patients.

RECOMMENDATION

The content of red ginger has several impressive benefits, including reducing pain and acting as an anti-inflammatory. It is comforting to know that this therapy is safe and does not cause irritation or damage to the skin's peripheral circulation. It would be wonderful if this research could provide a solution for the elderly and their families to manage pain and improve their overall well-being.

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