EFFECTIVENESS OF COMBINATION OF MASSAGE WITH GINGER OIL AND EXERCISE ON JOINT PAIN IN THE ELDERLY

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ABSTRACT

Joint pain in the elderly is still not resolved independently in the community. When the elderly do heavy workloads, the joint capsule ruptures, and the collagen present in the connective tissue increases progressively. The result can be inflammation and pain in the joint area. So it needs independent treatment using non-pharmacological management in the form of massage and ginger compresses. Objective to elderly with complaints of joint pain and without complications. This study used an experimental method to compare before and after skeletal muscle massage and ginger compress for joint pain in the elderly. The subjects in the study consisted of a population of 20 respondents and a sample of 20 respondents. This research was conducted in the Tritih Kulon Region, Cilacap Regency from March to May 2021. Samples were taken using purposive sampling. The analysis of this study used the t-test. The result is that t count > t table, namely t count 9.886 and t table 2.045, then Ho is rejected and Ha is accepted. This means that there are benefits of skeletal muscle massage and ginger compresses for joint pain in the elderly. The conclusion from this study is that there are benefits of skeletal muscle massage and ginger compresses for joint pain in the elderly.

Keywords: elderly; exercise; ginger; joint pain; massage

INTRODUCTION

According to the World Health Organization (WHO), an elderly person is someone who has entered the age of 60 years and over. The elderly are a group of humans who have entered the final stage of their life phase. This group which is categorized as elderly will experience a process called Aging Process or commonly referred to as aging (Kementerian Kesehatan RI, 2018; Manafe LA, 2022). According to the United National, the world's elderly population in 2019 reached 703 million people and by 2050 it is estimated that the number of elderly people will increase to 1.5 billion people. The elderly population in Asia is the largest elderly population in the world, which has reached 260 million population (World Population Aging, 2019). Based on the 2019 Indonesian population census, the percentage of elderly people reached 9.60% or reached 25.66 million people (Handayani & Riyadi, 2022; Wood et al., 2016).

The problem that often occurs in the elderly is joint pain. In general, the cause of joint pain is caused by using the joints in a monotonous way for a long time and due to wrong movements. The lower extremities, especially the knees, are parts of the body or joints that often

experience pain, especially in those who have entered old age. This situation is due to the knee or knee joint carrying out its function, around 50-60% of it supports the weight of the body/body, so it is prone to experiencing pain (Rasyid D, 2022). Joint pain that arises will be different for each individual because the perception of pain is very subjective (Aminah et al., 2022). This problem should be addressed immediately because joints play an important role in the body. In the musculoskeletal system, the body experiences movement and physical mobility, and the dominant supporting component is bone. The bones in the skeletal system are connected by joints. The skeleton also acts as a lever for movement and provides a latch surface for muscles (Aminah et al., 2022). So that if there is joint pain in the body, movement will be disrupted and will hurt bones and muscles.

The first solution to the problem of joint pain is to know how pain in the body arises. Pain is a warning sign that tissue damage has occurred, which should be the primary consideration for nursing when assessing pain (Clancy and Mc Vicar, 1992). Pain-producing stimuli send impulses through peripheral nerve fibers. Pain fibers enter the spinal cord and follow one of several nerve routes and finally arrive at a gray mass in the spinal cord. There are pain messages that can interact with inhibitory nerve cells, preventing pain stimuli from reaching the cerebral cortex, so the brain interprets the quality of pain and processes information about past experiences and knowledge as well as cultural associations to perceive pain (McNair, 1990).

Nerve fibers C and A are smooth deltas, which carry sharp and acute pain, respectively slow chronic, synapses in the substantial gelatin cornu dorsalis, crosses the spinal cord, and ascend to the brain in the neo-spinothalamic or paleospinothalamic branches of the anterolateral spinothalamic tract. The neo spinothalamic tract is primarily activated by peripheral afferents A delta, synapses in the Ventro Posterolateral Nucleus (VPN) of the thalamus and continues onward directly to the somatosensory cortex of the post-central gyrus, where the pain is perceived as a sharp, well-defined sensation. The paleospinothalamic branch, which is primarily activated by peripheral afferents of C-nerve fibers, is a diffuse pathway that sends collaterals to the brainstem reticular formation and other structures. These fibers affect the hypothalamus and limbic system as well as the cerebral cortex (Bahrudin, 2018).

When the elderly do heavy workloads, the joint capsule ruptures, and the collagen present in the connective tissue increases progressively. The result can be inflammation and pain in the joint area. To reduce the pain, you can gently massage the painful area. Massage is a soft tissue manipulation technique with the aim of relaxing muscles, improving blood circulation, and improving flexibility by reducing pain in an effort to help speed up the healing process for several types of diseases. Massage has specific goals or targets related to muscle problems and the impact of suboptimal muscle function (Almanika et al., 2022).

Furthermore, to reduce joint pain, non-pharmacological efforts are used, namely giving ginger compresses. Ginger compresses can be done alone without having to come to a health worker, it is more efficient because of the use of local cultivation. Ginger belongs to the Zingiberaceae (finding) tribe which has medicinal properties. The most widely used part of the ginger plant is the rhizome. In Indonesia, the most widely cultivated and utilized ginger can be divided into 3 (three) varieties, namely red ginger, elephant ginger, and ginger. Red ginger is most widely used, because of its high content of essential oils and gingerols, so it is believed to be more effective in curing various types of diseases (Sari & Nasuha, 2021). Ginger contains various types of nutrients that are beneficial to the body, including energy, carbohydrates,

fiber, protein, sodium, iron, potassium, and vitamin C. In addition, ginger rhizome also contains magnesium, phosphorus, zinc, folate, vitamin B6, vitamin A, riboflavin, and niacin (Sari & Nasuha, 2021; Ware et al., 2017). Ginger is believed to be anti-inflammatory, analgesic and can reduce joint pain due to the hot effects of ginger. The technique will be more efficient if followed by physical exercise (O'Brien et al., 2018; Rahayu et al., 2017).

Warm ginger compresses contain cyclo-oxygenation enzymes which can reduce inflammation in rheumatoid arthritis sufferers, besides that ginger also has a pharmacological effect, namely a hot and spicy taste, where this hot feeling can relieve pain, stiffness, and muscle spasm or cause vasodilation of blood vessels, maximum benefits will be achieved within 30 minutes after hot application (Dwipayanti et al., 2018; Waryantini, 2018). Another opinion regarding the treatment of joint pain is by compressing ginger and Kinesio taping techniques (Syukkur et al., 2020).

Based on the description above, it can be said that this research is very important to prove the truth of previous research. So that the actions or treatments given to the elderly with joint pain can be used as preventive care for more serious diseases. Furthermore, this research can increase public knowledge about various information in the management of joint pain problems. This introduction ends with an explanation of the ultimate goal of the study, namely to determine the effectiveness of the combination of giving massage, foot exercises, and ginger compresses for joint pain in the elderly. The novelty of this research is that action research techniques are carried out simultaneously and are structured or not separately. So it is hoped that this independent variable can be used as material for policy management of joint pain after the research is completed.

METHOD
The research was conducted in the Tritih Kulon Sub-District, Cilacap Regency, targeting the elderly at the Elderly Posyandu services at the North Cilacap II Health Center. The time needed to collect research data is from March to May 2021. The research method is an experimental one-group pretest-posttest design method with a quantitative approach in collaboration with an analytic observational form. This method focuses more on the analysis of the process of conclusions based on deductive and inductive and analyzes how the relationship between the actions given to the impact of the phenomenon observed. In order for the research results or the research process to run optimally, the researcher conducts a direct assessment of the respondents. This activity is referred to as participant observation (participation observation).

One elderly group of 20 peoples was randomly selected for the elderly with hypertension. The sampling technique used was purposive sampling using inclusion and exclusion criteria. The inclusion criteria that the researchers used were 1) the elderly over 50 years of age; 2) have problems with joint pain; 3) the elderly without indication of serious comorbidities; 4) the selected family or elderly agree to take action. While the exclusion criteria were 1) the elderly with comorbidities; 2) toddlers with a diagnosis of stroke or heart disease; 2) elderly families who refuse to take action. The number of samples or respondents in this study was 20 elderlys.

The research instrument used consisted of 2 kinds of actions, namely 1) instruments in making ginger compote or standard operating procedure soup; 2) instruments for measuring joint pain with pain scales, notebooks, and stationery. The technique for giving action in the form of skeletal muscle massage and ginger compresses is as follows

1. Method of skeletal muscle massage

   This technique is by placing both thumbs on the area that feels spasm with a circular motion. After the spasm begins to decrease, continue the massage to other skeletal areas. Pay attention to the respondent's expression during the massage. Slow down the massage when the respondent shows an expression of pain. Stop the massage when the respondent's face shows a pale appearance or the respondent complains of dizziness and weakness.

2. Leg exercises

   This leg exercise activity with a tight sitting position for the elderly. Then the elderly are made to relax first. one leg raised up to 90 degrees. Do a strength assessment on the elderly first. Because if the joints have experienced calcification, then the pain will increase when doing this exercise. Next, alternate between the right and left legs. This action is carried out for 10 minutes.

3. Making ginger compresses

   Making begins with choosing ginger that is still fresh and smells good. Then wash it clean, peel the skin of the ginger so that all that's left is the flesh of the ginger. The ginger is cutting until it becomes a slab. Then prepare it in a bowl, ginger is ready to be used to compress the painful part. In addition, ginger is mixed with massage oil that will be used for massage.

Research quality will increase when research data collection is in accordance with research standards. So that before conducting the research, the instrument was tested for validity and reliability. According to Golafshani, contained in the validity book by Budiastuti in 2018, it states that validity is research related to the extent to which a researcher measures what should be measured. In particular, the validity of quantitative research is rooted in the view of empiricism which emphasizes evidence, objectivity, truth, deduction, reason, facts, and numerical data (Budiastuti, 2018). There are three types of validity that are often discussed by statisticians, namely content validity, criterion-related validity, and construct validity.

Content validation in this study was carried out on a joint pain scale instrument using the VAS model. According to experts, the Visual Analog Scale (VAS) is the most widely used way to assess pain. This linear scale visually describes the gradation of pain levels that a patient may experience. The pain range is represented as a 10 cm line, with or without markings for each centimeter. Next is construction validation. An instrument that has construction validity if the instrument can be used to measure symptoms according to what is defined. The construct validity in this study was carried out on instruments for performing massage techniques and foot exercises on respondents. The procedure for action has been consulted with a physiotherapist in Cilacap Regency. The duration of the action was measured with a stopwatch (a standard tool). The action instrument has validated the previous comparison criteria by comparing the technique with other scientific references.

Analysis of the level of reliability data from the massage action test, foot exercises, and ginger oil compresses (procedurally) designed by researchers obtained information that the reliability level of these action tests in the elderly is in the very good category in the range of 0.88 - 1.00 with a reliability coefficient of 0.97 which is declared "reliable". So it can be concluded that the reliability level of the leg exercise test is at a very good level. To find the reliability of a test, the testee must carry out the first day's test and the second day's test at different times but with the same situation. Reliability refers to the consistency of scores achieved by the same person when they are retested with the same test on different occasions. The way to analyze reliability data is using the test-retest method which is in the product moment formula

contained in the following table.

Table 1.
Reliability Test Results

Korelasi	α	Rh
Ry.1	0.05	0.97

Table 2.
Limitation of Reliability Value

Reliability Limits	Information
0.00 – 0.67	Worthless
0.68 – 0.77	Weak-Enough
0.78 – 0.87	Acceptable
0.88 – 1.00	Very good

According to Arsil in Mardela (2017: 158), "Numbers from 0 to +1 indicate the level of reliability. In the statistical analysis of the reliability coefficient of the test, the more trusted the test is to use. Conversely, the lower the reliability coefficient of the test, the less reliable the test is. Based on this opinion, it can be understood that reliability is the consistency of the test used to measure a set of skills and knowledge when the same test is carried out at different times. If a test can be consistent in measuring what it wants to measure, then the data from the measurement results are not obtained by chance. So that the data can be analyzed and produce the correct conclusions. The conclusion can indeed describe the correct information from what is measured. Limitation of Reliability Value.

RESULTS

The sample from the research conducted in Tritih Kulon Cilacap Village, Central Java, March-May 2021, consisted of 20 elderly peoples. The distribution of the data showing the characteristics of the sample is explained in the tables below and the following explanation.

Table 3.
Characteristics of Respondents Based on Age and Gender (n=20)

Respondent characteristics	f	%
Age		
50-60 Year	9	45
60-70 Year	1	5
>70 Year	10	50
Gender		
Female	15	70
Male	5	30

Table 3 shows that there are two characteristics of the respondents observed, which are related to age and gender. Respondent characteristics based on age were more dominant at ages >70 years (50%) and at ages 50-60 years (45).

Table 4.

Statistical Paired Sample Test Results (Pain Scale)

Variable	Sampel	Mean	Correlation	t hitung	t tabel	Df
Pain scale before and after massage, ginger oil compresses and leg exercises	20	0,947	9,886	2,045	19	0,000

Table 4 using a confidence level of 95% (α=0.05) and degrees of greatness df=29, a t table of 2.045 is obtained, while the results of the calculations produce a t count of pain scale of 9.886. Thus the tcount value is more than the ttable value for the pain scale (9.886> 2.045).

DISCUSSION
The discussion on characteristic factors consists of two topics, namely age and gender factors. The aging factor is the strongest factor affecting the occurrence of joint pain in the elderly, but keep in mind that joint pain is not the result of aging alone but changes in the function of joint cartilage are also one of the causes. As for gender characteristics, the results show that elderly women have a greater risk of experiencing joint pain. Female respondents have a percentage of 70%. Women are more often affected by joint pain than men. At the age of 50 years (after menopause) the frequency of osteoarthritis is more in women than men. This suggests a hormonal role in the pathogenesis of osteoarthritis (Mistry et al., 2022). Another factor is gender. Women have a greater risk of joint pain than men (J. R. Kim & Kim, 2020). In a population-based study of osteoarthritis (OA) in Johnston Country, North Carolina, females were 30.8% more likely than males to have radiographic knee OA, while females were 38.5% more likely to have symptomatic knee OA. In both the Japanese and Korean cohorts, this tendency to have more symptomatic than radiographic OA was also seen in females (I. Kim et al., 2010).

The results showed that massage techniques, foot exercises and ginger oil compresses were beneficial in reducing joint pain in the elderly. So it can be concluded that the results of the study are in accordance with previous studies. Several previous studies include the following. Ten Percent Red Ginger Gel Relieves Knee Joint Pain on the Elderly with Osteoarthritis. The control group's pre-and post-test results were identical (p = 0.16 > 0.05), according to the findings. The intervention group's pre-and post-test results were significantly different (p = 0.001 0.05). (Rusmini et al., 2022). Besides that research with the title "Effects of aromatherapy massage on pain, functional state, and quality of life in an elderly individual with knee osteoarthritis". In elderly patients with knee osteoarthritis, aromatherapy massage reduced pain, improved functional status, and improved quality of life. The results from week 8 showed that aromatherapy has more positive effects and lasts longer than massage. (Pehlivan & Karadakovan, 2019). Massage therapy is recommended as an effective intervention for these patients to reduce symptoms of knee osteoarthritis (morning dryness, stiffness, and swelling) due to the effect of massage on reducing these symptoms in elderly women with osteoarthritis (Abbasi et al., 2021).

Apart from this research, there are other studies related to giving ginger to reduce joint pain. Among other things is research with the title "Application of Red Ginger Decorative Compress to Reduce Joint Pain in Osteoarthritis Patients in the Work Area Perumnas Public Health Center Lubuklinggau" (Lukman et al., 2022). Results of the study: Compresses containing red ginger decoction are able to alleviate joint inflammation and provide a reassuring sensation during application. In osteoarthritis patients, applying red ginger boiled compresses can alleviate joint pain.
Skeletal muscle massage is a non-pharmacological method used to reduce joint pain. Pain

impulses carried by small diameter nerves cause the control gate of the spinal cord to open and the impulses are transmitted to the cerebral cortex so that they will cause pain. However, these pain impulses can be blocked by providing stimulation to large-diameter nerves that cause the control gate to be closed and pain stimuli cannot be passed on to the cerebral cortex. To prevent further inflammatory processes, you can use ginger because it contains gingerol which can be used as an anti-inflammatory drug. The hot feeling caused by ginger can cause the muscles to experience vasodilation so that the spasming muscles relax. And when combined with skeletal muscle massage, the results will be more optimal for reducing joint pain in the elderly (Pehlivan & Karadakovan, 2019).

Massage is proven to reduce pain scores in clients who experience muscle pain. This is explained through Melzack & Wall's gate control theory in (Perrot, 2015). Which explains how harmless stimuli such as stroking or rubbing on the skin can provide pain relief. Signals in thick nerve fibers are produced by swiping which can inhibit signal transmission by nociceptive neurons (hypoalgesia). It also explains how the brain exerts control over the transmission of nociceptive signals to the spinal cord through pathways from the brainstem to the spinal cord (Aryanti et al., 2019; Efe Arslan et al., 2019; Perlman et al., 2019). The results of this study are in accordance with the results of research conducted by Yepi, et al (2018) concerning the effectiveness of warm compress therapy of ginger decoction with cold compresses on the pain level of elderly people who experience osteoarthritis, which in this study stated that after being given ginger compress therapy there was a difference in the average pain scale in osteoarthritis patients. This is due to the stimulation used to reduce joint pain by using warm ginger compresses (Yepi, Rosyidah I, 2018).

There are many opinions that ginger is often used as the first choice for reducing joint pain in the elderly with osteoarthritis because apart from having no side effects on health, this drug is also easy to consume, easily affordable in terms of the economy, and also not heavy to consume. Ginger has a warm, bitter, and aromatic content from operations such as zingerone, and gingerol. By compressing ginger on joints that experience pain due to osteoarthritis with the warm nature it causes, ginger is able to open blood vessels and improve blood circulation so that the supply of food and oxygen is better and joint pain is reduced (Nursipa et al., 2022).

According to the researchers' assumption that red ginger compresses have advantages in reducing joint pain compared to warm compresses because, besides the warm feeling that is felt when the compress is done, red ginger contains many chemical substances that can reduce pain, as well as the spicy taste and aroma of red ginger felt by the elderly can make relaxation so feel more comfortable. Red ginger compress is one of the herbal therapies that are useful for reducing joint pain in the elderly with osteoarthritis by using compresses which of course everyone can do, the basic ingredients for making this therapy are also easy to obtain, namely red ginger which can be purchased at traditional markets, besides that This red ginger compress also serves to reduce the number of dependence on generic drugs which will cause side effects with continued use (Widiyantoro a, Aris A, 2020).

CONCLUSION
Based on the results of the research from hypothesis testing and discussion, the result is that t count > t table, namely t count 9.886 and t table 2.045, it is concluded that Ho is rejected and Ha is accepted. This means that there are benefits of skeletal muscle massage and ginger compresses for joint pain in the elderly in the Tritih Kulon Village, North Cilacap District, Cilacap Regency.

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