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Warm Ginger Compress and Static Stretching for The Change of Pain in Gout Arthritis



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Abstract

Gout Arthritis is a joint inflammation resulted from excessive levels of the uric acid in the blood. The characteristic of the symptoms was monoarticular, swollen, reddish, and pain that interferes activity. These conditions need therapy because it could affect the quality of life. The non-pharmacological therapy that can be given was the combination of warm ginger compress and static stretching. The purpose of this research was analyzing the effectiveness of the combination of warm ginger compress and static stretching for change pain in gout arthritis. This research used Randomized Controlled Trial (RCT) method to 30 people with gout arthritis in Tambaksari Surabaya. This research used simple random sampling technique. The respondents were divided into two groups, control and treatment group were also determined randomly. The intervention was given for 15-20 minutes, 6 times in 2 weeks. The data analysis used t-test 2 sample. The result of t-test in the intervention group revealed that there was change pain before and after given intervention while the independent sample showed that there was difference in pain in both groups. The warm ginger compress therapy caused vasodilation blood vessel so as to prevent spasm of the muscles, while static stretching through relaxation muscles so increased physical relaxation. The both intervention were useful as non pharmacology therapy to reduce pain in people with gout arthritis.

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INTRODUCTION

Gout Arthritis was inflammation of the joints resulted from excessive levels of the uric acid in the blood. Gout arthritis symptoms are monoarticular (only occur in certain joint), such as swollen, reddish, pain which emerge suddenly less than 24 hours and disturb activity. If this condition not well treated, the accumulation of uric acid crystal will cause changes in knee anatomical structures. Furthermore, this can cause joint impairment, disability, and quality of life, especially in old people population (Aminah et al., 2022). The number of gout arthritis sufferers in Indonesia was second number after osteoarthritis and its prevalence is increasing as age increases. At over 75 years of age it increased to 18,9% and more women than men. The prevalence in East Java in 2018 shower the most age range 65-74 years and incidence in Surabaya 56,8% (Kemenkes RI, 2018). Gout arthritis resulted from consumption of high purine foodstuff (seafood, heart, duck meat, innards, red meat), alcohol, and several types of medicines (diuretic, anti-hypertension, aspirin). Uric acid is not water soluble and prone to form crystal. This crystal deposit can lead to inflammation process. Chronic condition will rise to synovium fibrosis, cartilage erosion, and ankylosis (joint fusion). This crystal also activated immune system which cause crystal release and pain (Perhimpunan Reumatologi Indonesia, 2018).

The implementation of gout arthritis can be pharmacological therapy using Non-Steroid Anti-Inflammatory (NSAID) drugs and non-pharmacological low purine diet, warm compress, and exercise of movement or joint stretching. Warm compress can increase tissue temperature trigger blood circulation that will inhibit the secretion of metabolic products that can cause pain (Cahyani et al., 2019). The ginger extract has ingredients (gingerol, xanthine oxidase) that can reduce pain, inhibits prostaglandin through the COX and LOX pathways, antioxidant, inhibits the transcription of NF-kB factor (activation of cytokinin and inflammation), actively agonist vanilloid nociceptor

(analgesic) (Rondanelli et al., 2020). Warm ginger compress effective when given as much as 3 times a week, with duration of 15-20 minutes (Cronkleton Emily, 2019).

Another non-pharmacological therapy was static stretching, it was to slowly stretch the muscle/tendon to improved muscle flexibility. Stretching can activate parasympathic nervous system and endorphin hormone that can reduce pain, and increases blood circulation in the muscles (Yetman, 2020). Another advantage of static stretching to increases the speed of transmission of nerve signals that regulate body movements, muscles contraction, and increases the flexibility of the joint to minimize the rigidity of the joint. Optimal results can be achieved by stretching for 10-15 minutes as many as 3 times a week (Rahmaniyah et al., 2022). The combination of warm ginger compress and static stretching in gout arthritis people involves effective non-pharmacological therapy to reduce joint pain.

METHODS

This research was held from December 2022 - January 2023 in Bogen 15F, RT/RW 01/02, Ploso Tambaksari, Surabaya. This research used Randomised Controlled Trial (RCT) method to 30 people with gout arthritis in Tambaksari Surabaya, simple random sampling technique was used, the treatment and control group were also determined randomly. The 30 respondents were divided into two groups, control and treatment. The inclusion criterias were: diagnosed with gout arthritis, experienced joint pain without complication, undergone irregular treatment, participate in at least 3 physical activities. The intervention for treatment group was warm ginger compress and static stretching for 15-20 minutes, three times a week for two consecutive weeks. This research instruments were Standard Operational Procedure (SOP) for warm ginger compress and static stretching, booklet, attendance list, and Numeric Rating Scale (NRS) to measure the pain. To analyzed the data, SPSS 22 software was used, t-test 2 related sample was operated.

RESULTS**Table 1: Frequency Distribution Characteristics of Respondents**

No	Data	Control Group		Intervention Group	
		Frequency	Percent (%)	Frequency	Percent (%)
1.	Age				
a.	26 – 35 years old	0	0	0	0
b.	36 – 45 years old	2	13,3	1	6,7
c.	46 - 59 years old	7	46,7	8	53,3
d.	60 – 74 years old	6	40	6	40
	Amount	15	100	15	100
2.	Gender				
a.	Male	2	13,3	1	6,7
b.	Female	13	86,7	14	93,3
	Amount	15	100	15	100
3.	Work				
a.	Unemployed	7	46,7	7	46,7
b.	Housewife	5	33,3	6	40
b.	Employee	0	0	0	0
c.	Entrepreneur	3	20	2	13,3
	Amount	15	100	15	100
4.	Education				
a.	Elementary school	7	46,7	7	46,7
b.	Junior high school	5	33,3	6	40
c.	Senior high school	3	20	1	6,7
d.	College	0	0	1	6,7
	Amount	15	100	15	100
5.	Long Suffering				
a.	< 1 year	7	46,7	7	46,7
b.	1 – 5 year	5	46,7	6	40
c.	> 5 year	3	20	2	13,3
	Amount	15	100	15	100

Source: Primary Data

Table 1 showed the most age was 46-59 years old in control group 7 people (46,7%) and intervention 8 people (53,3%), female gender in control group 13 people (86,7%) and intervention 14 people (93,3%), not working 7 people (46,7%) in control group and intervention, education level was elementary school 7 people (46,7%) in control group and intervention, and long suffering gout arthritis as many as 7 people (46,7%) in control group and intervention.

Table 2: Pain Scale Changed of Gout Arthritis

No	Pain Scale	Frequency							
		Control Group				Intervention Group			
		Pre		Post		Pre		Post	
		N	%	N	%	N	%	N	%
1	No Pain	0	0	0	0	0	0	0	0
2	Mild Pain	0	0	3	20	0	0	11	73,3
3	Moderate Pain	15	100	12	80	12	80	4	26,7
4	Severe Pain	0	0	0	0	3	20	0	0
	Jumlah	15	100	15	100	15	100	15	100
	P Values*	0,034				0,000			
	P Values**	0,000							

Description * = Paired Sample Test, ** = Independent Sample Test

Table 2 showed the largest proportion in the control group for Pre and Post Test was Moderate Pain. While, the intervention group for Pre test was moderate pain and Post test was Mild pain. Statistical Paired Samples Test results in t-test on pre and post control group were obtained value $p > 0,05$ (0,034), it means there was no reduce in pain scale on gout arthritis and on pre and post intervention group were obtained value $p < 0,05$ (0,000), it means there was reduce the pain scale of the response given the combination of warm ginger compress and static stretching. Statistical Independent Sample Test results were obtained $p < 0,05$ (0,000), it means there was difference in the pain scale of the control group and the intervention group.

DISCUSSION

Changes in The Scale of Pain before Given the Combination of Warm Ginger Compress and Static Stretching

The frequent complaints were joint pain during early wake up, walking and standing too long, and tingling. The respondents age were range from 46-59 years, female, and unemployed. Gout arthritis is a disease which occur in joint as a result of uric acid accumulation crystal in blood. Kidney can not excrete excess uric acid due to high intake of purine foodstuff, which cause hyperuricemia (Madyaningrum et al., 2020). The concentration of uric acid in the blood $> 7,0$ mg/dl causes the accumulation of vascular monosodium crystals. When uric crystalline heaped on the outside of the joint, it will establish clear topos or lump under skin contains crystals vein. This will causes the uric acid stones. The other predisposition factors were age, gender, work or activity, high protein and purin diet, alcohol, and drugs (Arsa, 2021). Pain which experienced by gout arthritis patient was caused by joint structure damage and lead to disability. Based on the theory, the location which affected by gout arthritis are small joints such as foot, knee, hands, and elbow (Madyaningrum et al., 2020). In addition, age > 50 years at the risk of suffering gout arthritis, because when a person becomes older, they will be changes in the metabolic processes in the body. Women's gender is more risk than men, because women have a drop in the esterogenic hormone that works to help of uric acid in the blood out through urine. When the esterogen hormone drops, there is a lack of uric acid, so that uric acid increases. Other than that women are at greater risk of uric acid as they enter the menopause period. The average already entering the older age is more frequently performing activities in heousehold tasks. This limited activity can refer on the occurrence of synovial fluid. It on the joint will decrease will cause pain and rigidity in the joint (Cahyo, 2020). The physical activity can affect levels of uric acid because it will cause an increase in lactic acid. It can reduce the output of uric acid if

urinary acid is not emitted by the kidneys, it builds up uric acid. The accumulation of uric acid causes joint pain. Physical activity is a movement of limbs that causes a essential for physical, mental health care, and maintains quality of life to stay healthy and fit (Naviri, 2019).

Based on the theory above, researchers agree that gout arthritis occurs because of the increased uric acid in the blood that fails into the joints which result in inflammation, swollen, and severe pain. The pain inflicted in accordance to each individual's response. Factors affect respondents experienced gout arthritis in the researh site is age closely associated with a decrease in body function that causes fluid in the joints to decrease and result in pain. The majority of women are at risk of gout arthritis affected of decrease of estrogen hormone that disposal of uric acid in the blood has increased. Work or activity also affects in improving gout arthritis because they most haven't work. This will affect restricted joint movements so that the function becomes rigid and increases of uric acid level.

Changes in The Pain Scale after The Combination of Warm Ginger Compress and Static Stretching was Given

Table 2 showed the most respondents after given intervention in the intervention group had mild pain. The statistical result of Paired t-test obtained p value $< 0,05$ (0,000), it means there was decrease in pain scale given intervention the combination of warm ginger compress and static stretching. The characteristics of respondent were educational level in junior high school, had long suffering under 1 year. The diagnosis of gout arthritis can be performed with pharmacological, non-pharmacological therapy, and education. One of the non-pharmalogical therapies performed is the combination of warm ginger compress and static stretching. Heat stimulation cause different physiological reactions depending on the local response to heat that can cause the expansion of the blood vessels. The warm ginger compress used

the principle of inhibition of pain receptors through large nerve fiber that deliver stimulation so that the pain mechanism that modify pain stimulus to be perceived by the muscle receptors so that pain decreases. Ginger's anti-inflammatory effects can overcome inflammation and reduce the pain sensation caused by uric acid accumulation in the joint. The content in ginger is quite a lot among other gingerol, shangaol, zingerone, aleoresin, and essential oils that act as mediators in reducing joint pain. Warm ginger compress therapy methods usually performed by placing a warm washlap and moist towels on joint areas for 10-15 minutes, three times in one week. This can increase muscle relaxation and reduce pain (Anggraini & Ulfah Ayudytha, 2019). Arthritis care and research explained that static stretching can stimulate increased release of endorphin hormones that role in reducing the sensation of pain in the body. Endorphin hormone role to reduce pain sensation by blocking the release of P substance from sensory neuron so that the transmission of pain impluses in spinalis delayed and reduced pain sensation (Fraenkel et al., 2022). Static stretching can benefit such as improve physical fitness by promoting transportation of the necessary substances and disposal of the substance that the body doesn't use, optimize movement by stalling ligament muscles, tendons and joints so that they can work with optimal, increase physical relaxation by stretching the tense muscles more relaxed and reducing the risk of joint and muscle injury (Yetman, 2020).

There are some factors that affect knowledge, the provision of information, and economic. Knowledge very much connected with several factors such as education. Education is an effort to develop personality and ability. People with higher education will grow in knowledge, but people of inferior education doesn't mean absolute low knowledge. Both giving information can be obtained from formal or unformed education that can have a short-term effect that results in changes and increased knowledge. A low level of education will be followed by a decline in health to less knowledge. Knowledge was so close to education that someone with a higher education is going to have more knowledge. The level of education someone would affect the behaviour, lifestyle and attitude to choose the right action to tackle it. The higher education people, then increases their awareness and care for health. Long of suffering is associated with pain in gout arthritis. People who suffer gout arthritis under 1 year didn't know some information about disease, consumed drugs for decrease the pain and get non-pharmacology therapy

(Umah & Anggreini, 2018).

Based on the theory above, researchers agree that the implementation of gout arthritis can combine warm ginger compress, static stretching, and education. The warm ginger compress is an implementation of pain by given heat through conduction, where it causes dilation of the veins and increased muscle relaxation. Ingredients og ginger such as gingerol and the warm sensation caused can improve circulation so that oxygen supply becomes better and joint pain will be decrease. The static stretching is a muscle stretching activity to improve muscle flexibility by slowly stretching to muscle or tendon. Some benefits of static stretching were increase the rate of neural signal transmission that regulates body movement, facilitates the muscle contraction and relaxation process as well as increases joint flexibility to minimize rigidity.

This study explains the education of given warm ginger compress and static stretching effective to reduce the pain in patients with gout arthritis because they can received the information and applied it as new behaviour. The factor affected they quickly understand the giving of education were the intervention given with demonstration. It can respondents can easily absorption the information and the meaning of the given material. The other factors were level of education, high education affects the change of mindset, easier to receive information and knowledge.

The Different in Pain Scale of Control Group and Intervention Group

Table 2 showed Independent Sample Test result obtained P value < 0,05 (0,000), it means there are differences the change of pain scale between control and intervention group after got the intervention warm ginger compress and static stretching. The other of implementation of gout arthritis was pharmacological therapy for to reduce a pain. The therapy are NSAIDs drug, Kolsikin, Allupurinol. These drugs did't treat inflammation that occurs in the joints but to alleviate pain by blocked the signals in the body that produce pain and persist for 6-8 hours (FitzGerald et al., 2020). The warm ginger compress mechanism barrier receptors pain in large nerve fibers which will lead to the change pain sensations until to the leading to the perception of pain and it will be reduced (Lutfiani & Baidhowy, 2022). The other patient effort was chosen of food and avoid foods with high purine. These are to reduce the level of uric acid in the blood and their pain sensation (Lutfiani & Baidhowy, 2022).

The health behaviour of women showed women more obedient to treatment than men. Women more attention to their health while men often ignore their health and underestimate their physical condition without regularly check. The level of compliance to drug therapy with gout arthritis was disobedience. This condition is viewed by the state of theirself and their family to remind in drug therapy, but those who didn't comply in therapy caused by age factor, level of education or knowledge, and fear that there will be less good side effects on their health in the long-term therapy (Ida Bagus Made Andy Wiraputra, 2019). Then it takes the role of health workers as educator, health service providers and counsellor to listen to complaints and provide solutions, given education and support. It aims to improve the health degree in given support to responders because it can grow and improve motivation in carrying out the treatment (Widyanto, 2014).

Based on the above theory, researchers agree that the implementation of gout arthritis can be with pharmacological and non-pharmacological therapy. In addition to use the therapy viewed to level of compliance to each people. The factor can affect to their compliance were age, gender, level of education, deficit of knowledge about their illness affected they disobedience and ignore their health. But if the patients with good compliance, so they given support from their family. They have good compliance because they understand if they don't run therapy program.

CONCLUSION

There was change in the pain scale between control and intervention group after given the combination of warm ginger compress and static stretching, and there was difference in the change in pain scale between the control group and the intervention group. The results of this study showed that intervention the combination of warm ginger compress and static stretching effective as non-pharmacological therapy that can reduce joint pain in gout athrtitis.

SUGGESTION

Suggestions for further research compare the effectiveness of both intervention by using more the number of samples randomly so that the results valid and reliable.

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CONFLICTS OF INTEREST

This study the researchers explained in detail the purpose of the research and give informed consent to avoid conflicts of interest with respondent. Respondents filled the questionnaire anonymously.

AUTHOR CONTRIBUTIONS

The first author responsible for the research process from creation until publication. The second author assisted in literature search, data collection, and data analysis. The third author also assisted in literature search, data collection, and publication translation.

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