KnE Medicine

ICMEDH
2nd International Conference on Medical Health Science
Volume 2023

Knowledge E
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Research Article

Comparison Between the Effectiveness of Static Stretching and Effleurage Massage for Pain Reduction in Myofascial Neck Pain

Zidni Imanurrohmah Lubis*, Nurul Izzah Al-Islamiyah, and Atika Yulianti

Department of Physiotherapy, Faculty of Health Science, University of Muhammadiyah Malang, Indonesia

ORCID
Zidni Imanurrohmah Lubis: https://orcid.org/0000-0002-5325-1909

Abstract.
Myofascial neck pain is a musculoskeletal complaint that occurs due to hypersensitivity in one or more muscles. Static stretching is one of the techniques that can reduce the risk of injury. Static stretching can lengthen muscles and tendons in a fixed position, thereby increasing flexibility and relaxation, reducing spasms and decreasing pain. Effleurage massage is a massage technique with strokes to smooth and increase blood flow which can also reduce pain and spasms. This study aimed to compare the effectiveness of two interventions for myofascial neck pain. The research design was pre-experimental with two groups of pretest-postest design. A total of 30 female cigarette-rolling workers were sampled in this study, and they met the research criteria. Respondents received static stretching exercises with effleurage massage 3 times a week for 4 weeks. The visual Analogue Scale was used to measure the pain felt by the respondent. The results showed that both interventions in each group had an effect on reducing myofascial neck pain in cigarette rolling workers ($p<0.05$). The results of the comparison test of the effect of giving Static Stretching with Effleurage Massage showed a p-value of 0.00 ($p <0.05$), which means that H1 is accepted or there is a difference in the effect of Static Stretching and effleurage massage on reducing myofascial neck pain in cigarette rolling workers. Based on the average decrease, the group with Static Stretching had a greater effect of reduced myofascial neck pain.

Keywords: cigarette laborer, exercise, muscle lengthening, muscle relaxation, muscle pain

Corresponding Author: Zidni Imanurrohmah Lubis; email: zidnilubis@umm.ac.id

Published 8 March 2023

Publishing services provided by Knowledge E

Selection and Peer-review under the responsibility of the ICMEDH Conference Committee.

1. INTRODUCTION

Cigarette rolling workers experience neck flexion and extension in a static position for a long time so that health problems can occur, one of which is neck pain. Rolling cigarettes does not pay attention to good work posture to maintain good health. Cigarette rolling employees who work with their heads down while sitting can cause musculoskeletal disorders through repetitive activities and overstretching of muscles (1).

Myofascial neck pain is a musculoskeletal complaint that occurs due to hypersensitivity to one or more muscles. Myofascial neck pain can cause complaints of pain

and muscle tension so that it can interfere with joint (2). The upper trapezius is the neck muscle that most often experiences myofascial pain. The pain can occures from myofascial trigger points that very sensitive area referred to motor phenomena in muscle (3)(4).

Neck pain is one of the most common problems for people who sit with their heads down for long periods of time. The prevalence of neck pain was 24.7%. The prevalence of neck pain in Indonesia is 19.1% in North Sumatra. The prevalence of neck pain complaints in adults reaches 16.6%, with 0.6 due to severe neck pain (5).

The effects of neck pain in daily life are neck pain and stiffness that interfere with work. One of the jobs that is often occupied is the work of housewives (IRT). There are also personal factors such as age, gender and attitude towards work (6).

Special treatment is needed to relieve pain in the form of pharmacological and non-pharmacological therapy. This is the most common cause of incorrect worker posture during activities and non-ergonomic postures, stationary postures at work, and frequently bent postures. Causes neck muscle problems, shortening and stiffness. Can cause and can be achieved by stretching and heat therapy(7). Static stretching is an exercise that aims to stretch muscles and other muscle groups to reduce the risk of injury. Stretching muscles is a way to stretch muscles and tendons so that they can increase muscle flexibility and muscle relaxation resulting in reduced spasm so that there is a decrease in pain (8). Static stretching when done correctly in a relatively short time can increase muscle elasticity, reduce muscle tension, relax muscles, and improve muscle structure (9).

Effleurage Massage is done to launch and increase blood flow, pressure and relax muscles Effleurage is a massage technique with gentle, slow, long and continuous strokes. Effleurage can inhibit pain by stimulating tactile fibers. Massage is a method that can reduce pain and decrease pain where the muscles are relaxed so that there can be a decrease in pain due to reduced spasm (10)(11).

Based on the results of research studies on cigarette rollers who work in the Wagir area, 5 out of 6 people experience pain in the neck. Due to the position of the cigarette rolling workers in a less ergonomic position and takes a long time to bend the neck. Thus, a study was conducted using Static Stretching and Effleurage Massage which had never been studied before. Static stretching aims to increase and maintain the elasticity of the muscles to be stretched, while effleurage massage aims to reduce pain. Therefore, we will conduct a study entitled ”Comparison of the Effect of Static Stretching with Effleurage Massage on Reducing Cigarette Rolling Pain with Myofascial Neck Pain”.

2. MATERIALS AND METHODS

This study used a pre-experimental method, a two-group pretest-posttest design, by comparing the results of the pretest and posttest in the treatment group. Where in the treatment group was given static stretching and effleurage massage. The result to be obtained is to compare the effect of giving static stretching with effleurage massage to the reduction of cigarette rolling pain with myofascial neck pain in the treatment group.

Data collection was carried out 3 times a week for 4 weeks and static stretching treatment was carried out 3 times with repetitions per session and effleurage massage was carried out for 5 minutes per session in February 2022. The research sample included all cigarette rolling workers at the Wagir Cigarette factory, Malang. The number of respondents was 30 people with the overall information being female. Pre-test and post-test were carried out before and after the intervention. Examination of pain is first calculated based on the results of the Visual Analog Scale (VAS).

Data analysis was carried out using SPSS software. In this study, the results of the normality test using Shapiro-Wilk were not normally distributed which were used to determine the distribution of the data. Then continued with the Wilcoxon test and to find out the hypothesis test using the Mann-Whitney Test with the aim of comparing the effect of static stretching with effleurage massage on reducing cigarette rolling pain with myofascial neck pain. Then for the characteristics of respondents based on age, years of service, average scores before and after the intervention using the Visual Analog Scale (VAS).

3. RESULTS

3.1. Characteristics of Respondents

The results of the study based on the characteristics of the respondents can be seen in Table 1. Research respondents who are cigarette rolling workers in Wagir have the characteristics of 26-35 years old (early adulthood) and 36-45 years old (late adulthood) with the same percentage of 50%. Based on the period of service, the cigarette rolling workers in Wagir have the characteristics of working 1-5 years as many as 21 people (70%) and working years >5 years as many as 9 people (30%), so that respondents are dominated by working years under 5 years.

Data regarding the characteristics of respondents based on pain before and after being given Static Stretching and Effleurage Massage interventions with measurement

values using VAS can be seen in Table 2. The average VAS value before the static stretching intervention was 5.4 and after the intervention the average VAS value for static stretching was 4.2. The results of the average VAS value before the effleurage massage intervention was 5.8 and after the intervention the average VAS effleurage massage value was 4.5.

The results of the study based on average pain score of respondents can be seen in Table 2. From the comparison of the difference in averages values, it can be seen that the decrease in pain in the effleurage massage group was 0.1 points more.

Table 1: Characteristics of Respondents.

Characteristics	N	Type	Percentage
Age	30	Early Adulthood	50%
		Late Adulthood	50%
Work period	30	<5 years	30%
		>5 years	70%

Table 2: The Average of Pain Score in Static Stretching and Effleurage Massage Group.

Group	N	Pre	Post	Difference
Static Stretching	15	5,4	4,2	1,2
Effleurage Massage	15	5,8	4,5	1,3

3.2. Corelation Analysis

Based on the results of the Wilcoxon test, the significance value of the Static Stretching intervention is 0.001 and the Effleurage Massage is 0.00 ($p < 0.05$), which means that there is an effect of both interventions on reducing pain in cigarette rolling with myofascial neck pain. From the comparison test results obtained p value 0.000 ($p < 0.05$) which means that there is a difference in the effect of static stretching with effleurage massage on reducing cigarette rolling pain with myofascial neck pain.

Table 3: Results of the Effect of Static Stretching with Effleurage Massage on Reduction of Cigarette Rolling Pain with Myofascial Neck Pain

Group	N	α	p
Static Stretching	15	0,05	0,001*
Effleurage Massage	15	0,05	0,000*

4. DISCUSSION

Table 4: Comparative Results of the Effect of Static Stretching with Effleurage Massage on Reduction of Cigarette Rolling Pain with Myofascial Neck Pain.

Group	N	α	p
Static Stretching	15	0,05	0,000*
Effleurage Massage	15		

4.1. Effect of Static Stretching on Pain Reduction With Myofascial Neck Pain

Static stretching exercise that is done properly and correctly in a relatively long time will increase muscle elasticity, reduce muscle tension, relax muscles and improve muscle structure. Increased muscle elasticity also has the effect of increasing muscle endurance against changes in movement or loading statically and dynamically. The effect of static stretching can be felt after stretching the muscles, which can stimulate the muscle spindles and Golgi Tendon Organs. Muscle spindles are stimulated when stretching is performed by fast, primary and secondary afferents from intrafrusal muscle fibers via alpha motor neurons in the spinal cord. This can activate the stretch reflex and muscles experience tension (12). Adhesion in the muscle structure that occurs results in fascia and myofilaments in the sarcomeral link band, hence there is an abnormally increased concentration of acetylcholine in the end plate link band. The taut band is a localized contracture in the muscle belly without activation of the motor end plates and the resulting stiffness is not complete in a muscle. Band link in this muscle will result in a decrease in the level of extensibility and flexibility of the muscle (13).

The application of static stretching exercises that aim to stretch or lengthen the myofascial layer and muscles. The effect of stretching can release adhesion so that it can decrease and increase tissue mobility and normal joint function. Static stretching can play a role in providing static stretches to muscle and fascia structures with the aim of removing adhesion or adhesions, reducing pain with gate control theory, restoring the quality of lubricating fluid from fascial tissue, tissue mobility and normal joint function (14).

4.2. Effect of Effleurage Massage on Pain Reduction with Myofascial Neck Pain

The effleurage massage technique is given with an action of pressing the hands rhythmically and lightly and slowly on the muscle tissue and fascia without causing changes or shifts in the position of the joints, so that the effect of this effleurage

massage can relax and increase circulation in the blood flow. In general, the fascia system functions as support, stability and cushioning as well as a dynamic movement and flexibility system that builds muscle. Fascial stretching is a protective response mechanism to trauma. When the fascia loses flexibility and becomes constricted, it is a source of tension throughout the body. The ground substance freezes, collagen becomes dense and fibrous, and elastin loses its resilience(15). These adhesions have an impact on decreasing blood circulation so that the need for nutrients and oxygen in the link band area is reduced. The impact is the occurrence of muscle cell hypercontraction which will affect the increase in local metabolism and activation of sympathetic nerves which results in vasoconstriction of capillary blood vessels(13).

Giving effleurage massage has a mechanical effect, namely the technique of pressing and pushing rhythmically causing the emptying and filling of the veins. The reflective effect, namely massage, causes a race on the nerves, blood circulation which causes a process of vasoconstriction followed by local vasodilation so as to facilitate blood circulation. While the chemical effect causes the release of a substance similar to histamine which has a dilating effect on capillary blood vessels(16).

Effleurage is a massage technique in the form of soft, slow, and long or unbroken strokes. Effleurage is a form of massage using the palms of the hands that apply gentle pressure to the surface of the body in a circular direction repeatedly which aims to increase blood circulation, apply pressure and increase physical and mental relaxation (17). Effleurage Massage is performed on the upper trapezius muscle, the main purpose is for relaxation. There is a mechanical effect on massage, namely a technique where there is a rhythmic pressure and pushing that causes the emptying and filling of the veins. Furthermore, there is a reflective effect on massage, namely massage can cause a race on the nerves, blood circulation which causes a process of vasoconstriction followed by local vasodilation, so that the process can accelerate blood circulation. And finally, there is a chemical effect on massage that can cause histamine to be released which has a dilating effect on capillary blood vessels (16).

The limitation of motion in the neck is due to pain and can be reduced by providing massage manipulation. The effleurage massage technique is able to inhibit pain delivery. This technique can also increase the delivery of blood flow to the muscles so as to minimize pain. The existence of effleurage massage will enhance muscle relaxation which aims to facilitate movement or when repositioning the neck joints will be carried out(11).

4.3. Differences in the Effect of Static Stretching and Effleurage Massage Interventions on Pain Reduction in Myofascial Neck Pain Cases

The results of the analysis showed that there was a difference in the effect of the intervention of static stretching and effleurage massage on reducing pain in myofascial neck pain cases, the average value of the difference between static stretching and effleurage massage also showed a significant difference. According to theoretical studies, the two interventions theoretically both produce the effect of reducing pain, increasing joint range of motion, increasing flexibility, and can eliminate trigger points, but the two interventions have different mechanisms of action and effects. In the static stretching exercise, the muscle is stretched for at least seven seconds, this is because the typing of the muscle proprioceptor on the stretched muscle spindle will produce an impulse signal that makes the muscle contract to fight the resistance of the stretch. Holding the movement for seven seconds will activate the Golgy tendon organ which will further inhibit the reaction of the muscle spindle and provide a relaxing effect so that the muscle can be stretched further (18).

According to research by Maruli et al (2013)(19), static stretching will stimulate the Golgi tendon organ which can help relax the muscles after contraction. The relaxation process followed by maximum expiration will facilitate the acquisition of muscle relaxation. With the stretching component, the length of the muscle can be restored by activating the Golgi tendon organ so that relaxation can be achieved because pain due to muscle tension can be reduced.

Effleurage Massage technique is a deep or shallow stroking movement, effleurage is generally used to help restore the content of lymph and blood vessels in the extremity. This technique is used as a movement to examine and evaluate areas of spasm and irregularity in soft tissue or stretch specific muscle groups (20). Effleurage Massage has an effect on helping blood circulation and spleen fluid, which helps drain blood into veins so that it quickly returns to the heart, so the effleurage movement always goes towards the heart because the heart is the center of blood circulation. The speed of blood returning to the heart can accelerate the stage of removing combustion residues that originate from all over the body (21).

So it can be concluded that these two interventions are equally influential but from the results of research and literature more support the static stretching intervention. Static stretching reduces pain more quickly because of stretching or exposing the myofascial layer and muscles, thereby reducing muscle spasm and increasing blood

flow. In effleurage massage it is slower to reduce pain because it does not use muscle stretches but a sedative effect, which is calming and helps blood flow.

5. CONCLUSION

Based on the results of research that has been carried out by researchers, it can be concluded that static stretching and effleurage massage both are effective reduce pain in myofascial neck pain, but static stretching have better in decreasing pain.

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