

The Effectiveness of Massage and Stretching Therapy against Neck Pain and Range of Motion (Rom) in Online Game Players



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ABSTRACT: As is known, massage is a non-pharmacological method that can be beneficial for muscle strength and flexibility. Static positions in playing online games with a long duration play a role in causing neck disorders. This study aims to examine the effectiveness of massage and stretching therapy on healing neck injuries in online game players. This study used a pre-experimental design with one group posttest-pretest design. The population in this study was students who visited Burjo Pamungkas who played online games (3-5 hours) a day. The study sample was 20 people determined by purposive sampling. The data collected were pain scale data with Numeric Rating Scale and ROM measured by Goniometer, both before and after a combination treatment of massage and stretching for 40 minutes. . The analysis technique used is Wilcoxon Signed Rank with a signification level of 5%. The results of this study showed that the combination treatment of massage and stretching can reduce pain scale and increase neck Range of Motion (ROM) significantly ($p < 0.05$). From the calculation of the effectiveness of the treatment, it was found that the effectiveness of reducing the pain scale by 57% and the effectiveness of increasing ROM by an average of 24.01%.

KEYWORDS: Massage, Stretching, Pain, Range of Motion, Online Games.

I. INTRODUCTION

Working with computers and using smartphones for long periods of time can lead to repeated use of certain muscles, which can ultimately lead to muscle injury and cumulative damage from acute trauma to the neck. The use of smartphones is considered to be the most popular portable electronic device, and recent estimates suggest that about 77% of the world's population owns such gadgets. The main reason behind the popularity of smartphone usage globally is for communication and entertainment purposes. The growth of internet technology contributes significantly to progress in various aspects of life. One form of internet technology that is experiencing rapid development is online games (Puspita & Rohedi, 2018). But, keep in mind that a significant increase in gaming does not necessarily bring benefits and can pose risks, especially for vulnerable individuals such as children and those at risk for gaming disorders (King et al., 2019). The negative impact of excessive gaming is recognized, including potential disruptions to mental health, sleep patterns, and physical health (Saunders et al., 2017). One of the negative effects of playing online games for physical health can cause muscle tension in the neck. Neck pain is a common problem experienced by two-thirds of the population worldwide. Specifically, it is estimated that every year, about 16.6% of the adult population experiences discomfort in the neck, and 0.6% of the total sufferers experience severe neck pain (Hasnah et al., 2019).

Playing online games involves the act of sitting for a long time in a fixed position, causing the muscles to constantly work in static conditions. This can result in adaptations in muscle tissue, which in turn leads to tension or shortening of the muscles. This condition can press on the surrounding nerves and eventually cause pain in the area. Online game players often engage in sitting activities in a position that is maintained for more than 3 hours in one playing session. Game players often experience problems with neck pain, which can affect the musculoskeletal system and cause chronic pain and decreased joint locomotion. A common symptom that appears in musculoskeletal problems, which cause restriction of joint space, involves pain. Therefore, pain and Range of Motion (ROM) are closely related in this context.

In this case, an efficient and economical method is needed to overcome problems in the musculoskeletal system. Almost everyone at some point in their lives will experience this difficulty. Disorders of the musculoskeletal system, such as osteoarthritis, rheumatoid arthritis, injuries, and syndromes, can appear as a result of daily activities. The disorder is often caused by several factors, including poor eating habits, which can lead to obesity or malnutrition, as well as spending time in a static work position

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for long hours. But in this case there are several things that can be done to overcome the problem such as physical therapy, exercise therapy, and several other therapies. This physical therapy involves a number of approaches, including manual therapy such as isometric post relaxation and myofascial release, exercise therapy such as stretching, strengthening, stabilization, and endurance training, as well as other methods such as thermotherapy, cryotherapy (Gross et al., 2015), laser therapy, infrared therapy, electrotherapy such as TENS and ultrasound (AM et al., 2010), dry needling (Cerezo-Télez et al., 2016), and acupuncture (Calamita et al., 2018).

In this case, it is necessary to apply economical but effective therapies, including physical therapy using massage therapy and exercise therapy that can be used by all circles of society. Massage therapy, as a self-medication method, can reduce pain levels and improve function compared to the absence of treatment in some musculoskeletal conditions (Bervoets et al., 2015). Swedish-type massage, introduced by Per Hendrik Ling (1776-1839), is the most common style of relaxing massage taught and applied worldwide. This technique uses five basic manual movements, also known as strokes, namely effleurage (gliding movements), petrissage (kneading and lifting), friction (moving layers of tissue under the skin), vibration, and tapotement (percussion) (Elibol & Cavlak, 2019). The manipulation provided is in the form of effleurage, petrissage, and tapotement manipulation.

Exercise therapy, or exercise therapy, is increasingly integrated in the management of chronic diseases through physical exercise programs. Training is a process of developing training skills that combines theory and practice. It involves the application of procedures and provisions derived from a scientific approach, applying organized and planned principles. The goal is to achieve the results of the exercise according to the set time (Nasrulloh et al., 2021, 2020; Nugroho et al., 2021). Stretching is considered an activity that provides health benefits to the musculoskeletal system. It can improve the smoothness of metabolic processes and blood circulation, while the stretching effect creates contractions without causing additional damage to tissues (pumping action effect). As a result, metabolic processes and blood circulation can run more smoothly.

Based on observations made at Burjo Pamungkas, one of the online game players who was playing games at Burjo Pamungkas named Rifqi, 20 years old, 176 cm tall and weighing 69 kg. Playing games for approximately 5 hours per day, so that when you finish playing online games, you feel complaints in the neck that when the neck is moved to turn your head left and right, it will hurt. There has been no treatment for neck pain and ROM done, therefore this study aims to find out whether the combination treatment of massage therapy and stretching is effective to reduce pain levels and increase neck ROM in online game players.

II. METHOD

This research is a type of pre-experimental research using one group pre test and post test design. From the research design described before being given massage and stretching treatment, measurements of pain scales and neck ROM were carried out. After that, then given a massage treatment for 36 minutes and continued with stretching for 4 minutes. Long duration of treatment for 40 minutes. After completion of the massage and stretching treatment, post-test pain scale and post-test ROM are immediately calculated. The population of Burjo Pamungkas visitors who play online games is 50 people. The sample in this study amounted to 20 people with male inclusion criteria, age range 20-27 years, college students, duration/frequency of playing online games 2-6 hours per day, Online game players who experience tension and muscle pain after playing online games, Willing to follow research proven by signing informed consent. And the exclusion criteria for professional online game players, online game players who experience body anatomy abnormalities, burns, or open wounds in the neck area, and shoulders, online game players who experience severe neck muscle tension (unable to move the neck at all) and accompanied by fever.

The pain instrument uses the Numerica Rating Scale (NRS). Neck ROM refers to the ability of the neck joint to move in the direction of flexion, extension, lateral flexion, and rotation. ROM measurements of the neck can be done using a device called a goniometer. The massage therapy used is the manipulation of efflurase, petrissase and tapotement. Efflurase manipulation is given treatment for 10 minutes, then Petrissage manipulation is given treatment for 5 minutes. After that, tapotement manipulation treatment was given, namely beating and clapping. Tapotement beating is done around the shoulder with slow intensity, done 5 times for 2 minutes, while tapotement clapping is also done 5 times for 2 minutes with moderate intensity. The overall massage time is about 36 minutes. The data obtained will then be analyzed with the Wilcoxon signed rank test for ordinal data or data with abnormal distribution with a signification level of 5%. The data is processed with the help of the SPSS 23 program.

III. RESULT

The results of research and discussion will be presented sequentially, including (1) Results; Normality Test with Saphiro Wilk (2) inferential statistical analysis test with Wilcoxon Signed Rank to prove massage therapy and exercise therapy in dealing with

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muscle pain in the neck and ROM (3) Test the effectiveness of massage therapy and exercise therapy in managing pain and ROM. It will be presented comprehensively as follows: Normality Test.

Table 1. Description of Research Subjects

Variable	Lowest (n=20)	Highest (n=20)	Avrg (n=20)
Age	20	27	22.1
Weight (kg)	50	100	64.15
Height (cm)	165	182	170.7
Game play duration (Minute)	120	360	240

Table 1 shows the characteristics of research subjects ranging from age to duration of playing games, for the average age is 22.1 with the youngest age of 20 years and the oldest age of 27 years, then at body weight with an average of 64.15 with a body weight of at least 50 kg and a maximum of 100 kg, next for height has an average of 170.7 cm with the lowest 165 cm and the highest 182 cm, Finally, for the duration of playing games with an average of 240 minutes with the shortest time of 120 minutes and the longest of 360 minutes. With the description of research subject data that has been described above, the following are the results of the research data normality test:

Table 2. Research Data Normality Test Results

Data	N	Mean	SD	Sig.
Pre-Painful	20	6,85	1,49	0,000
Post-Painful	20	2,95	1,19	0,025
Pre-Flexion	20	29,80	10,08	0,013
Post-Flexion	20	39,20	11,91	0,044
Pre-Extension	20	41,75	14,45	0,129
Post-Extension	20	53,20	13,08	0,029
Pre-Lateral-Left	20	32,75	5,43	0,670
Post-Lateral-Left	20	40,35	4,06	0,006
Pre-Lateral-Right	20	32,65	4,75	0,231
Post-Lateral-Right	20	40,25	3,92	0,445
Pre-Rotation-Left	20	42,70	8,62	0,144
Post-Rotation-Left	20	49,80	7,66	0,025
Pre-Rotation-Right	20	40,20	4,07	0,756
Post-Rotation-Right	20	49,05	3,73	0,171

Table 2 shows the normality test results. Data tested for normality include pretest, posttest, Mean, SD, Sig. All observed data are pain and ROM consisting of flexion, extension, lateral, rotation from each treatment group. The normality test results show that there are normally distributed data, and some data are not normally distributed. Based on these results, research data is not feasible to be analyzed using parametric analysis, so data analysis uses non-parametric statistical analysis. The difference test with the Wilcoxon Signed Rank Test was used to compare the pretest and posttest between the treatment group and the control group. The different test results with the Wilcoxon Signed Rank Test are as follows:

Table 3. Pretest and Posttest Difference Test Results with Wilcoxon Signed Rank Test

Data	Z	Asymp. Sig.(2-tailed)
Post Painful-Pre Painful	-3.943	0,000
Post Flexion-Pre Flexion	-3,931	0,000
Post Extension-Pre Extension	-3,829	0,000
Post Lateral Left-Pre Lateral Left	-3,831	0,000

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Post Lateral Right-Pre Lateral Right	-3,928	0,000
Post Rotation Left-Pre Rotation Left	-3,926	0,000
Post Rotation Right-Pre Rotation Right	-3,927	0,000

Table 3 shows the results of the Wilcoxon Signed Rank Test analysis on the data of each treatment group. The results of this test showed a significant difference in data regarding namely pain, flexion, extension, lateral, rotation. From the results of the significance analysis used is 5% or 0.05 significance with the value of all data being <0.05 , it can be concluded that between the data scale of pretest and posttest subjects or with a combination treatment of massage therapy and stretching reduces the degree of neck pain and increases ROM in online game players significantly.

Next, an effectiveness test is carried out with the formula; effectiveness = Pretest – Posttest: Pretest: 100%. For pain effectiveness, data was obtained at 57%, while the percentage value of the effectiveness of increasing ROM in motion, flexion motion was 31.54%, extension motion was 27.42%, left lateral motion was 23.2%, right lateral motion was 23.27%, left rotational motion was 16.62%, and right rotation motion was 22.01%. If taken on average, the percentage value of the effectiveness of increasing ROM in this study was 24.01%.

IV. DISCUSSION

From the results of statistical data analysis shows that there is a significant decrease in the degree of pain and there is a significant increase in ROM both flexion, extension, lateral, and rotational movements in patients with neck injuries. On significant pain changes in data before and after massage and stretching therapy treatment ($p = 0.000$) with effectiveness of 57%. Research conducted by (Hernowo & Ambardini, 2019) indicates that the combination of frirage massage and PNF exercises has a significant impact on pain reduction. Comparison of data before and after treatment showed a significance value ($p < 0.05$), with an effectiveness rate of 51.13%. Next on the results of ROM research (flexion, extension, lateral, and rotation) significantly after massage and stretching therapy treatment, which was shown by a value of ($p = 0.000$ with an effectiveness of 24.01%.

Massage therapy, as one of the oldest forms of therapy, has been shown to provide positive results (Cherkin et al., 2011). This therapy can reduce pain levels and improve the ability of individuals experiencing pathology (Furlan et al., 2010). Its significant health benefits include improved blood circulation, muscle relaxation, and improved nerve function (Sritoomma et al., 2012). Massage Therapy is known as a method that stimulates balance and overall relaxation of the body (Moyer et al., 2004). Massage serves as an effective trigger and potential mechanical stimulus for the pain gate process. Through this way, massage reduces natural discomfort, stimulates the release of opiates more efficiently, and helps achieve more intense pain control without causing any side effects.

Stretching involves the use of manual or mechanical force to extend structures subjected to tightening and hypomobility adaptively (Mahajan et al., 2012). Stretching has an impact in restoring ROM and restoring the original length of the muscle. In addition, stretching also increases muscle torsion and provides an analgesic effect by increasing the pain threshold (Herman & Smith, 2008). The decrease in pain through stretching muscles during stretching exercises is due to reduced muscle spasm and increased blood circulation in vasodilated muscles. In addition, the decrease in pain by stretching muscles is also related to the control gate theory, which states that pain perception can improve if the focus is on the pain, but can be reduced through distractions that distract from the feeling of pain. The neurophysiological response in muscles depends on two main components, namely the muscle spindle and the Golgi Tendon Organ (GTO). The muscle spindle acts as a receptor that detects stimuli in the form of muscle lengthening. GTO is a type of proprioceptor located at the junction between muscles and tendons, tasked with detecting muscle tension when stretching exercises occur. The inhibitory effect of the Golgi Tendon Organ (GTO) causes sudden relaxation of the entire muscle. This inhibition occurs when there is a strong contraction or strain on a tendon during stretching. This state creates an immediate reflex response that inhibits muscle contraction and causes a rapid drop in tension. This reduction in tension acts as a protective mechanism that aims to prevent tearing of the muscle or release of tendons from attachment to the bone. This mechanism automatically contributes to an increase ROM in the neck joint.

V. CONCLUSION

Based on the results of the research that has been obtained, it can be concluded: 1. The combination of massage therapy and stretching can reduce pain levels significantly ($p < 0.05$), with effectiveness by 57%. 2. The combination of massage and stretching therapy can increase ROM significantly ($p < 0.05$) with an average effectiveness of 24.01%.

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