

The Effectiveness of Soft Tissue Release for Healing Lower Limb Injury

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Abstract: Soft tissue release massage has been widely applied for injury rehabilitation. The massage aims to eliminate muscle tension that precedes or follows the injury. It is not yet known how effective it is in healing injuries, especially lower extremity injuries that often occur. With this rationale, this study examines the effectiveness of the massage method in healing lower extremity injuries. The Quasi Experiment Method was used in this study with 20 research subjects with subacute and chronic lower limb injuries. Lower extremity injuries that occur can be caused by strains, ankle sprain, knee sprain, or lower pelvic sprain. Convenience Random Sampling will be used to recruit subjects, which is preceded by the signing of informed consent after being given sufficient explanation. Before and after treatment, all patients would assess the degree of pain with the Visual Analog Scale (VAS) and its level of function with Lower Limb Functional Scale (LLFS). The collected ordinal data is processed by a different non-parametric test after it has been described. The results showed that Soft Tissue Release massage can reduce pain and improve function significantly ($p = 0,000$), with the effectiveness of 61.1% for pain and 24.7% for improvement in lower limb function.

1 INTRODUCTION

Massage has been used for thousands of years throughout the world. Massage is applied to various indications, including preparation of competition, during competitions, assisting recovery, therapy and rehabilitation of injuries.

In 2009, the first book on the Soft Tissue Release (STR) was published by Human Kinetics with Jane Johnson as the author who discussed massage techniques for the whole body. The definition of soft tissue in this case is the fibers of muscles, tendons, and fascia that surround the tissue both on the surface and inside. Basically, this massage technique combines emphasis on certain points (locking) and stretching (stretching) on soft tissue. The advantage of Soft Tissue Release is that it can involve patients actively, so that it will be safer and more comfortable, both for patients and their therapists. Patients are asked to move their joints according to their range of motion (ROM) and with the speed and breadth according to their stiffness and pain. Stretching on STR allows realignment of joints and tendons. Stretching is designed to improve the mobility of soft tissue and further improve ROM by extending the structure that is shortened due to chronic injury due

to lack of movement. When the muscles, tendons, ligaments are stretched, the strength of the strain is transmitted to the muscle fibers through the connective tissue of muscle wrapping around the fibers.

Anatomically, basically, the human skeleton consists of bones that connect to the joints. The joint is lined by ligaments and is strengthened by muscle tendons that attach to the bones, joints and connective tissue that make up the joint capsule. Excessive and / or repetitive movements can lead to disposition of the ligaments, tendons, and even joints. Likewise with a static position that is maintained for a long time. All of that can happen both when working and exercising. These musculoskeletal disorders (bones and muscles) are often complained of by employees and sportsmen. Disorders of the lower extremities are more often complained of because the task is to support body weight.

Massage is one methods of relieving pain and related symptoms. Mechanical pressure in muscle tissue can improve local microcirculation of blood and lymph flow which can further reduce swelling, ischemia or buildup of substances that directly or indirectly cause pain (Vegar, 2016). The benefits of therapeutic massage against muscles include

relieving muscle tone and stiffness, accelerating healing of muscle strains and sprains and ligaments, reducing muscle pain, and restoring range of motion (ROM). Massage is known to stimulate cutaneous receptors so that it can potentially cause local lateral inhibition of pain feedback in the spinal cord. The pull and strength applied to muscle fibers from various massage techniques also activate the Golgi tendon and nerve organs. They are afferents that have large diameters. Activation of large nerve fibers capable of sending nerve impulses quickly can partially block smaller and slower nerve fibers so as to reduce pain.

The role of massage in handling musculoskeletal injuries is strongly related to the duration, type, technique, and time of intervention of massage. Massage techniques, types of manipulations, the duration of treatment used as therapeutic modalities vary so much that there is difficulty comparing one massage study with another massage study. So far, it has not been known to what extent the effectiveness of soft tissue release techniques in curing lower limb injuries, especially in cases of sprain and strain.

2 METHODS

This study is a quasi-experimental study with one group pretest-posttest design. The population in this study includes YSU Physical therapy Clinique patients who suffered lower limb injuries. Samples were obtained with inclusion criteria over the age of 20 years, sub-acute or chronic injury conditions, and willing to be the subject of research indicated by the signing of informed consent. The exclusion criteria were lower extremity injury patients who used anti-pain and anti-inflammatory drugs, had fractures / fractures, and dropped ligaments. Data collection in this study was done using a test technique to assess the scale of lower limb function using a questionnaire that had been adapted from Lower Limb Functional Scale. The data was taken before and after the treatment of massage (pretest and posttest). The data was collected in an ordinal scale. The data analysis in this study used descriptive statistics to describe gender, age, weight, height, duration of injury, level of physical activity and cause of injury. Inferential statistics with a non-parametric difference test for two pairs of groups (different pretest and post-test) with the Wilcoxon test.

3 RESULTS

3.1 Subjects Characteristics

The research subjects amount to 20 people, consisting of 10 women and 10 men. The average age of the subjects was 33.4 years, 164.3 cm in height and 63.3 kg in weight. Based on the causes of injury, from 20 subjects, 12 people (60%) experienced sprain, 5 people (25%) strains and 3 people (15%) experienced delayed onset muscle soreness (DOMS). The level of subject activity, 14 people were in the mild category (70%), 5 people in the moderate category (25%), and 1 person in the heavy category (5%). Meanwhile, the average duration was 12-day personal injury.

3.2 Descriptive Results

3.2.1 Pain Scale

Pain levels before and after the treatment are shown in Table 1.

Table 1: Pain scale

Method	Total	Pretest	Posttest	Δ Mean	%
STR	20	4,75	1,85	2,9	61,1

Based on Table 1, it can be seen that in the STR group there was a decrease in pain level of 61.1%.

3.2.2 Lower Limb Function

Lower limb function before and after treatment is shown in Table 2.

Table 2: Lower limb function.

Method	Total	Pretest	Posttest	Δ Mean	%
STR	20	70,15	87,45	17,3	24,7

Based on Table 2, it appears that the STR method increases the function of lower extremities by 24.7%.

3.3 Statistical Analysis

Different test before and after the treatment with the Wilcoxon Signed Rank Test are shown in Table 3.

Table 3: The level of pain and function of the lower limb before and after treatment.

Method	Variable	Pretest	Posttest	Z	p
STR	Pain	4,75	1,85	-3,938	0,000
	Function	70,15	87,45	-3,928	0,000

In Table 3, it can be seen that the STR method can significantly reduce pain and improve lower limb function ($p = 0.000$).

4 DISCUSSION

Soft tissue release (STR) massage method has been applied to cure lower limb injuries. In this study, the cases handled were sprain, strains, and DOMS in the lower extremities. The STR method can reduce pain levels and improve lower limb function.

The STR method involves stretching fascia and releasing bonds between fascia and skin, muscles, and bones with the aim of relieving pain, increasing ROM and body balance (Namvar et al., 2016). If the pain decreases and the ROM increases, the function will also increase. The results of the study which examined the effects of 3 types of soft tissue manipulations, one of which was the myofascial release technique also showed that this technique could reduce pain and improve ROM in plantar fasciitis cases (Pattanshetty, 2015).

There are at least 3 mechanisms that underlie the effects of massage therapy on chronic pain conditions, namely by increasing vagal activity, reducing the inflammatory process, and reducing P substances. Stimulation of pressure receptors will increase vagal activity and in patients with chronic pain show lower vagal-mediated heart rate variability as indicated by increased vagal activity (Field, 2018).

The principle of handling with the STR method is emphasis on trigger point points, then stretched. The aim of STR is to free fascia and maintain network functions. This technique is used to relieve pressure in connective tissue. Careful myofascial stretching and maintaining a certain amount of time are believed to free the bond, soften and extend the fascia. By freeing the fascia, where the nerves and blood vessels are located, it helps increase the transmission of the circulatory and nerves system. This technique is widely used in chronic conditions to help change the basic viscosity of the substance to a more fluid state which eliminates the fascia pressure on the pain sensitive structure and restores proper alignment (Pattanshetty, 2015).

The advantage of the STR method is the involvement of patients, in other words, patients actively participate in therapy. Methods by involving patient activity are seen as safer, as are therapists. This method is felt to relieve the therapist because there is patient involvement. In addition, lotions or lubricants are not needed so that they can be more practically applied in the field. The effect of relaxation is longer, although the onset of therapy is slower and patient comfort is somewhat lacking.

5 CONCLUSION

The Soft Tissue Release Method is effective in reducing the level of pain in lower extremity injuries. The method of soft tissue release massage is effective in improving the function of the lower limb.

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