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Comparison of the effectiveness Tepurak therapy with deep tissue massage and stretching in treating non-specific low back pain injuries

Porównanie skuteczności terapii Tepurak z masażem rozciągającym tkanek głębokich w leczeniu niespecyficznego urazu dolnego odcinka kręgosłupa

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Abstract

This study aimed to determine: (1) The effectiveness of Tepurak therapy (press, hit, motion) in treating non-specific Low Back Pain (LBP) injuries. (2) The effectiveness of a combined Deep Tissue Massage with stretching (DTMS) in treating non-specific LBP injuries. (3) A comparison of the effectiveness between Tepurak therapy and the combination of Deep Tissue Massage with stretching in treating non-specific LBP injuries.

Recovery indicators included pain level and range of motion (ROM). This pre-experimental research used two distinct sample groups with different treatments. The sample comprised 42 individuals with non-specific LBP injuries, who were randomly divided into two groups of 21. Group A underwent Tepurak therapy (press, hit, motion), while Group B received combined Deep Tissue Massage and stretching (DTMS). Each treatment session lasted 30 minutes.

Pain levels were measured using the Visual Analogue Scale (VAS), while ROM was assessed with the modified Schober Test and the Fingertip-to-Floor instruments. The data analysis employed various tests, including the Paired t-test, Wilcoxon, independent t-test, and Mann-Whitney.

The findings revealed that Tepurak therapy reduced pain and significantly enhanced ROM ($p < 0.05$). Similarly, the Deep Tissue Massage combined with stretching notably diminished pain and improved ROM ($p < 0.05$). Comparing the pretest and posttest data between Tepurak therapy and the Deep Tissue Massage with stretching on pain and ROM indicators yielded a p -value > 0.05 . This suggests that there was no significant difference in the effectiveness of the two therapy types.

Based on this study, it's recommended that either Tepurak therapy or the combination of Deep Tissue Massage with stretching can be employed to treat individuals with non-specific LBP. The choice should depend on the specific situation and conditions, taking into account the pros and cons of each therapy type.

Keywords:

tepurak, deep tissue massage, stretching, non-specific low back pain

Streszczenie

To badanie miało na celu ustalenie: 1. Skuteczności terapii Tepurak (nacisk, uderzenie, ruch) w leczeniu niespecyficznego urazu dolnego odcinka kręgosłupa.

2. Skuteczności połączonego masażu głębokich tkanek ze stretchingiem (DTMS) w leczeniu niespecyficznego urazu dolnego odcinka kręgosłupa.

3. Porównania skuteczności między terapią Tepurak a połączeniem masażu głębokich tkanek ze stretchingiem w leczeniu niespecyficznego urazu dolnego odcinka kręgosłupa.

Wskaźnikami powrotu do zdrowia były poziom bólu i zakres ruchu (ROM). To przedeksperymentalne badanie wykorzystywało dwie różne grupy próbne z różnymi zabiegami. Próbkę składała się z 42 osób z niespecyficznego urazu dolnego odcinka kręgosłupa, które zostały losowo podzielone na dwie grupy po 21 osób. Grupa A przeszła terapię Tepurak (nacisk, uderzenie, ruch), podczas gdy Grupa B otrzymała połączony masaż głębokich tkanek ze stretchingiem (DTMS). Każda sesja leczenia trwała 30 minut.

Poziomy ból mierzono za pomocą Skali Wizualnej Analogowej (VAS), natomiast ROM oceniano za pomocą zmodyfikowanego testu Schobera i narzędzi Fingertip-to-Floor. Analiza danych polegała na zastosowaniu różnych testów, w tym testu sparowanego t-test, Wilcoxon, niezależnego t-test i Mann-Whitney.

Wyniki wykazały, że terapia Tepurak zmniejszała ból i znacząco zwiększała ROM ($p < 0,05$). Podobnie, masaż głębokich tkanek połączony ze stretchingiem znacząco zmniejszył ból i poprawił ROM ($p < 0,05$). Porównując dane przedtestowe i potestowe między terapią Tepurak a masażem głębokich tkanek ze stretchingiem wskazujące na ból i wskaźniki ROM uzyskano wartość $p > 0,05$. Sugeruje to, że nie było istotnej różnicy w skuteczności obu typów terapii.

Na podstawie tego badania zaleca się stosowanie terapii Tepurak lub połączenia masażu głębokich tkanek ze stretchingiem w leczeniu osób z niespecyficznym bólem dolnego odcinka kręgosłupa. Wybór powinien zależeć od konkretnej sytuacji i warunków, uwzględniając zalety i wady każdego rodzaju terapii.

Słowa kluczowe:

Tepurak, masaż tkanek głębokich, rozciąganie, niespecyficzny ból dolnego odcinka kręgosłupa

Introduction

Low Back Pain (LBP) is a case of musculoskeletal injury that is often experienced by people, especially workers. WHO data shows that in industrialized countries 2-5% of workers experience Low Back Pain each year [1]. Cases in Indonesia reach a percentage of 7.6-37% [2]. The age group that often experiences Low Back Pain injuries is the age range of 20-59 years [3]. Observations were made at the Manipulative Therapy and Rehabilitative Injury Clinic Health and Sport Center, Faculty of Sports and Health Sciences, Yogyakarta State University from June 2021-January 2022, the total number of patients treated was 2,185. A total of 265 or (12.13%) patients complained of injuries to the lower back. Based on the data above, it can be concluded that Low Back Pain injuries often occur and are felt as a serious health problem that can interfere with work productivity [4].

Disorders felt by sufferers of Low Back Pain are pain in the lumbar area, stiffness in the back muscles, decreased ROM, and reduced strength of the driving muscles in the back [5]. The emergence of complex disorders can be caused by several reasons, namely specific and non-specific causes [6]. Specific causes are types of Low Back Pain whose causes are known with certainty, for example due to infection, tumors, fractures, and herniated nucleus pulposus (HNP) [7]. Meanwhile, non-specific Low Back Pain is a condition that is not known for certain causes of injury and is not related to a specific pathology [8]. Keep in mind that Low Back Pain is a symptom not a diagnosis so it is very important to know the cause of low back pain to get the right treatment [9]. Low back pain that is known for its cause makes the treatment carried out more targeted according to the cause. In contrast to low back pain, the cause for which is not known for certain or is referred to as non-specific, so that treatment is still not directed. Therefore, proper treatment is needed to treat non-specific Low Back Pain injuries.

Handling and treatment of non-specific Low Back Pain injuries can be carried out by pharmacological and non-pharmacological methods [10]. Pharmacological treatment can be done by consuming NSID (Non-steroidal Anti-Inflammatory Drugs), muscle relaxants, opioids, and antidepressant drugs [2]. Another way is to use non-pharmacological treatment which can be done with massage therapy and exercise therapy [11]. The side effects caused by drug consumption make many people choose non-pharmacological alternative treatments. Many previous studies on non-pharmacological treatment in the form of massage and exercise therapy in Low Back Pain injuries. As research who researched the use of massage to reduce pain in the lower back, and found that massage can reduce pain in Low Back Pain injuries [12]. A study regarding exercise therapy in Low Back Pain injuries in the form of giving stretching to increase ROM and reduce pain in lower back injuries shows that stretching can reduce pain and increase ROM [13]. This shows that there are many types of therapy that can be applied to treat this injury but it is necessary to compare which method of therapy is more effective.

The Manipulative Therapy Clinic and Rehabilitative Health and Sport Center, Faculty of Sports and Health Sciences, Yogyakarta State University is one of the health service business entities belonging to the Faculty of Sports and Health Sciences, Yogyakarta State University which offers a variety of therapies to treat injury cases using massage and exercise therapy. Massage

is used to relax the muscles that are experiencing spasm so that it will be easy to reposition the joints. The massage techniques used vary depending on the situation and condition of the patient. The techniques used include pressure using the trigger point technique, tapotement, and deep strong stroking or known as Deep Tissue Massage. While exercise therapy is applied using stretching techniques that function to reposition joints.

The therapy model used to treat non-specific cases of Low Back Pain is the Tepurak massage method which combines three techniques at once in the form of pressing, hitting, and moving. The pressure technique uses the trigger point method which is done by pressing on the central points of pain. The next technique is punching with the tapotement technique which aims to stimulate endorphins so that it can relieve pain. The third technique is movement which will use passive stretching techniques assisted by a therapist which aims to increase flexibility and also to reposition joints [14]. The advantages of the Tepurak technique are that it can be done outdoors because the patient is still wearing clothes, does not use lotion, and the time is fast. However, this technique has the disadvantage that the patient will feel uncomfortable due to strong pain due to strong pressure on the pain center. Another therapy that is commonly applied is the Deep Tissue Massage therapy technique. The deep and thorough caressing technique relaxes the muscles, reducing muscle tension and reducing pain. This technique has a comforting effect on the patient compared to the tepurak technique which puts pressure on the center of pain directly which causes a strong painful effect. The Deep Tissue Massage technique is also combined with stretching which aims to stretch muscles and reposition joints.

Based on the background described above, the various types of therapy applied have their respective advantages and disadvantages. so it is necessary to have research that compares which therapy is more effective to apply especially in cases of nonspecific Low Back Pain injuries. This prompted researcher to examine the comparison of the effectiveness of Tepurak therapy with a combination of Deep Tissue Massage and stretching for the healing of non-specific Low Back Pain injuries. The recovery criteria that will be examined are the level of pain and ROM in the lumbar region of patients with non-specific Low Back Pain injuries.

Materials and methods

Study design

This research is a pre-experimental using a pretest-posttest design. This study uses two different sample groups. In this study, an initial test will be carried out before treatment to obtain pretest data and measurements will be carried out again after treatment to obtain posttest data.

Participants

The research sample was non-specific Low Back Pain injury sufferers. The sample is 42 people with incidental sampling method which is divided into two groups randomly totaling 21 people. All participating samples had signed a willingness to be sampled before undergoing the initial examination. This study used a purposive sampling technique, namely determining the sample with certain considerations based on inclusion and exclusion criteria. Patients with low back pain nonspecific acute, sub acute, and chronic, willing to be responders, male sex, aged 20-60 years, and

experienced decreased movement function, range of motion, and felt pain in the lower back. While the exclusion criteria included fractures, open wounds, a history of kidney disease, tumors, pancreatitis, and peptic ulcer.

Instruments

The variables to be measured are pain and ROM. The measuring instrument used in this study was the VAS (Visual Analogue Scale) to measure pain. The scale used uses the range 0-100. Vas has a validity value of $r = 0.941$ and ICC reliability = 0.97 [15]. The ROM measured was flexion, extension, right side flexion, and left side flexion. The measurement tool used is the Modified-modified Scober Test to measure flexion and extension which has a product-moment correlation test-retest coefficient of 0.78-0.89 for flexion and 0.69-0.91 for extension. Flexion reliability coefficient value 0.72 and extension 0.76 [16]. Measurement of right and left side flexion using the Fingertip to Floor instrument. This instrument has a validity value of $r = 0.96$ and ICC reliability = 0.99 [17].

treatment

The treatment for sample group A used the Tepurak massage method which is a combined massage technique in the form of pressing, hitting and moving techniques. The pressure technique is applied using the trigger point technique, namely by pressing the central points of pain in the injured part. The next manipulation is using the punch technique or commonly referred to as tapotement. This punching technique aims to stimulate endorphins so that they can relieve pain. Emphasis is placed on the trigger points on the quadriceps, hamstring, gluteus, and muscle groups at the waist, then the tapotement technique is performed. Manipulation was carried out in one treatment with a duration of 30 minutes. The last treatment is motion, this technique uses exercise therapy in the form of passive stretching movements assisted by a therapist so as to increase flexibility. The treatment for group B used the Deep Tissue Massage method which is a massage technique by doing deep and slow rubbing movements following the direction of the muscle fibers. The technique is intended to provide relaxation to muscles that experience tension (tightness), stiffness (stiffness), or spasm. Doing massage encourages the production of endorphins which can make you feel happy, comfortable and relaxed. With this can help reduce the pain that is felt. The muscles that will be treated are the quadriceps, hamstring, gluteus, lumbar and abdominal muscle groups. This therapy is carried out once

treatment with a duration of 30 minutes and then continued stretching. Stretching which will be combined with Deep Tissue Massage therapy uses active stretching techniques. Probandus will actively perform stretching exercise therapy without the help of a therapist so that the stiff muscles and joints can become flexible again.

Statistics analysis

Data processing uses the SPSS data processing application version 25. The normality test is one of the prerequisite tests in data analysis. The normality test aims to determine whether the data is normally distributed or not. The normality test is important to determine the next calculation process. Before carrying out the different data test, it is necessary to analyze whether the data is normally distributed or not. If in the normality test the data is normally distributed, the calculation uses parametric calculations. If the data is not normally distributed, the calculation uses non-parametric. The data is said to be normally distributed if the p value > 0.05 and if the p value < 0.05 then the data is not normally distributed. The different test analysis uses the Paired t -test and Wilcoxon different test with a significance level of the different test which is 0.05. The t -test will produce t values and probability values (p) which can be used to prove whether or not there is a significant difference between pretest and posttest at a level of 5%. How to see the significant level by looking at the p -value. If $p < 0.05$ then there is a significant difference, if $p > 0.05$ then there is no significant difference.

Results

The results of the study will present sequentially the normality test results for the Tepurak and DTMS data, the homogeneity test results, the different test results in the Tepurak treatment group, the different test results in the DTMS treatment group, and the different test results to compare Tepurak and DTMS data. The indicators to be measured were pain, flexion ROM, extension ROM, right side flexion ROM, and left side flexion ROM. The following are the results of the normality test for Tepurak and DTMS data.

Table 1 showed the results of the data normality test in the Tepurak and DTMS treatments. The data tested included differences in pretest and posttest pain data, flexion ROM,

Table 1. Normality Test of Tepurak and DTMS data using Shapiro-Wilk.

Data	Tepurak (n = 21)		DTMS (n = 21)	
	Sig.	Information	Sig.	Information
Painful	0.783	Normal	0.641	Normal
Flexion	0.086	Normal	0.343	Normal
Extension	0.628	Normal	0.424	Normal
Right Side Flexion	0.000	Abnormal	0.784	Normal
Left Side Flexion	0.000	Abnormal	0.124	Normal

extension ROM, right side flexion ROM, and left side flexion ROM. In the Tepurak treatment, data on pain, flexion and extension were normally distributed so that parametric analysis was used, while data on the right and left side flexion were not normally distributed until using nonparametric analysis. In the

DTMS treatment, all data is normally distributed so that it uses parametric analysis.

Based on table 2 it can be seen that the significance value of each indicator has a value of $p > 0.05$. If the p value > 0.05 , it can be concluded that the data is homogeneous.

Table 2. Tepurak and DTMS data homogeneity tests

Indicator	Levene Statistics	df 1	df 2	Sig. (n = 42)
Painful	0.599	1	40	0.443
Flexion	0.522	1	40	0.474
Extension	0.010	1	40	0.919
Right Side Flexion	1,719	1	40	0.197
Left Side Flexion	2,279	1	40	0.139

Table 3 shows the results of the different test on the Tepurak treatment showing the significance value of each indicator of $0.000 < 0.05$. Based on these results, it can be understood that

there is a significant difference between the pretest and posttest data in the Tepurak treatment group.

Table 3. Tepurak Data Difference Test Results

Indicator	Analysis	Sig. (n = 21)	Information
Painful	Paired t-test	0.000	Significant
Flexion	Paired t-test	0.000	Significant
Extension	Paired t-test	0.000	Significant
Right Side Flexion	Wilcoxon	0.000	Significant
Left Side Flexion	Wilcoxon	0.000	Significant

Table 4 shows a different test on the Deep Tissue Massage combined stretching (DTMS) treatment indicator obtained a significance value of 0.000 on the indicators of pain, flexion,

extension, and right side flexion. On the left side flexion indicator, a significance value of 0.001 is obtained. Both values are less than 0.05 so it can be concluded that there are significant

Table 4. DTMS Data Difference Test Results

Indicator	Analysis	Sig. (n = 21)	Information
Painful	Paired t-test	0.000	Significant
Flexion	Paired t-test	0.000	Significant
Extension	Paired t-test	0.000	Significant
Right Side Flexion	Paired t-test	0.000	Significant
Left Side Flexion	Paired t-test	0.001	Significant

differences in each indicator of the deep tissue massage combination stretching (DTMS) treatment.

Based on table 5, it can be seen that each indicator of the Tepurak treatment compared to the value of each indicator of the

Deep Tissue Massage treatment combined with stretching has a significance value of $p > 0.05$. So it can be concluded that there is no significant difference in the Tepurak and Deep Tissue Massage treatments combined with stretching.

Table 5. The results of the different test for Tepurak and DTMS data

Indicator	Analysis	Sig. (n = 42)	Information
Painful	Independent t-test	0.074	Not significant
Flexion	Independent t-test	0.089	Not significant
Extension	Independent t-test	0.911	Not significant
Right Side Flexion	Mann-Whitney	0.907	Not significant
Left Side Flexion	Mann-Whitney	0.875	Not significant

Discussion

Tepurak massage was a massage that combines several combinations of manipulation and stretching exercises. Tepurak is an abbreviated term for press, hit and move. This massage has the benefits of relaxing muscles, reducing pain, and repositioning joints [18]. The pressure technique in this case uses the trigger point pressure technique, which is a massage technique by pressing directly on the center of the pain. The second technique is punching or in massage terms it is called the tapotement technique. Then the last technique is by doing passive stretching movements assisted by other people in doing so so that the maximum joint reach effect can be obtained. The Tepurak method of therapy has advantages, including that it can be done anywhere because you don't need to take off your clothes, you don't need lubricant, so it's suitable for emergencies. However, this method has a weakness, namely it will leave a painful effect because it uses a trigger point technique that presses directly on the center of pain so that people tend to be uncomfortable.

Another therapy is giving Deep Tissue Massage combined with active stretching. Deep Tissue Massage is a massage method by gently pressing deep tissue so that it can give maximum muscle relaxation effect. This manipulation is combined with active stretching movements that are carried out independently. Stretching independently can be done according to the ability of the injured person so that there are no forced movements. This method has advantages, including providing a comfortable effect due to overall pressure and stretching without forced movements, thorough and deep emphasis will provide an overall muscle relaxation effect, and stretching movements are easy to do. The weakness of this method is that it cannot be done anywhere because you have to take off your clothes and use a lubricant. The advantages and disadvantages of the two methods need to be considered in their management. Based on the research results, both methods are effective in healing Low Back Pain injuries so they can be done according to the situation and conditions.

Massage therapy has a good physiological effect used for healing in cases of injury. Trigger point technique massage has the benefit of reducing muscle tension so that the muscles will experience relaxation [19]. Relaxing these muscles will cause the range of motion of the joints to increase and the pain you feel will gradually subside [20]. Trigger points can be found in fascia, tendons, ligaments, and muscles which are tight points of muscles which when pressed can cause different pain sensations [21]. Emphasis that is done right on the center of pain causes excessive pain so that other manipulations are needed to disguise the pain by providing manipulation of tapotement. The technique aims to increase arterial blood circulation, especially in muscle tissue, causing muscle contractions (idiomuscular) which can help expedite the exchange of substances in the body so as to relieve the pain that is felt [22].

Another massage treatment is using Deep Tissue Massage therapy which is done slowly and with deep pressure. Deep Tissue Massage is a type of massage therapy that focuses on deep tissue in various layers of the body, especially muscles, fascia and connective tissue [23]. This can provide a pain relief effect which is explained based on the gate control theory. Receptors that are stimulated during the massage treatment will send signals faster than the pain experienced so that the pain will be disguised [24].

The last treatment in this study was to apply a stretching exercise program that aims to increase flexibility [25]. Injured muscles and joints will respond with stiffness or muscle spasms. This causes the muscles to feel sore, less elastic so that ROM is limited and function is disrupted. Physiological stretching exercises will increase blood circulation so that more oxygen will be supplied to the cells which causes reduced pain, increases range of motion or ROM [26]. So stretching can be combined with massage in order to obtain maximum healing results in Low Back Pain injuries. The combination of massage therapy and coupled with stretching movements will give a better muscle relaxation effect than just giving massage therapy alone [27].

Low Back Pain injuries which are indicated by symptoms of pain and decreased ROM can be treated with healing therapy using

the Tepurak massage method or a combination of Deep Tissue Massage and stretching. Both of these therapy methods have a significant effect on reducing pain and increasing ROM in non-specific Low Back Pain injuries. The use of these two methods needs to be considered according to the situation and conditions considering that the Tepurak massage method and the Deep Tissue Massage combination of stretching have their respective strengths and weaknesses.

Conclusions

After conducting a series of studies, it can finally be concluded that the administration of the Tepurak method of therapy is effective in reducing pain and increasing ROM in patients with Low Back Pain injuries. Deep Tissue Massage therapy combined with stretching is effective in reducing pain and increasing ROM in patients with Low Back Pain injuries. There

is no difference in the effectiveness of the Tepurak method and Deep Tissue Massage Combination of stretching in reducing pain and increasing ROM in patients with Low Back Pain injuries. Based on the results of the study, it is suggested that the use of the Tepurak method of therapy with a combination of Deep Tissue Massage and stretching can be applied to non-specific Low Back Pain sufferers according to the situation and conditions by considering the advantages and disadvantages of both types of therapy.

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