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REVIEW

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The Effect of Kinesiotaping and Nerve Mobilization on Reduction of DOMS

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A B S T R A C T

The purpose of the study. This research aims to determine the effectiveness of giving ice massage after training in reducing the occurrence of DOMS.

Materials and methods. The research design used was the Post Test Only With Control Group Design research method, the sample size was 20 students. The sample was divided into 2 groups, group I was the treatment group (kinesiotaping and nerve mobilization) and group 2 was the control group (without kinesiotaping and nerve mobilization). Subjects performed maximal contractions and exceeded the training load. Subjects performed 75 contractions and divided into 3 training sets. Each set of 25 contractions with a load of 18 kg. After training, the treatment group was given kinesiotaping and nerve mobilization, kinesiotaping and nerve mobilization were given after 30 minutes of training in the treatment group, then the control group was not given kinesiotaping and nerve mobilization. DOMS measurements were carried out using the talaq scale, where measurements were carried out after kinesiotaping and nerve mobilization were given and without kinesiotaping and nerve mobilization.

Results. For the non-kinesiotaping and nerve mobilization variables, the probability obtained was p 0.010<0.05. The difference between the treatment group and the control group using the Mann-Whitney test obtained a probability of 0.026<0.05.

Conclusions. By looking at the results of the data obtained, it can be concluded that providing kinesiotaping and nerve mobilization as quickly as possible can reduce the risk of DOMS, whereas without providing kinesiotaping and nerve mobilization cannot reduce the risk of DOMS. To avoid wider damage from the effects of overloaded training, giving ice massage early will help reduce the risk of DOMS.

Keywords: *kinesiotaping; nerve mobilization; doms.*

A R T I C L E I N F O

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INTRODUCTION

A person is required to always work to fulfill his life's needs, sometimes someone forgets about their health and physical fitness when they are already working. Doing work that exceeds the body's capabilities will have a direct or indirect impact on fitness and healthy body condition. Excessive physical work can cause fatigue in the body, often beyond capacity or excessively, which will affect a person's physical and mental

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health. A person's ability to carry out physical activities well depends on the person's physical fitness condition. The effort to maintain body fitness is by exercising. Exercise is a series of regular and planned movements to maintain movement and improve movement ability. Exercise aims to stimulate physical, spiritual and social growth and development (Watson, 1999). Exercise can be done every day regularly and/or with scheduled sports activities. The development of fitness centers such as gyms, futsal courts, basketball and so on, is a sports facility for teenagers which always attracts enthusiasm for diligent exercise. Some of them don't even know the benefits of the sport they do, but they diligently do it just because it's a hobby and want to spend time with their friends by exercising (Haryanto, 2010).

Adolescence is a transition period from childhood to adulthood with an age range of between 12-22 years, during which the maturation process occurs, including physical maturation. The age limit for adolescence commonly used by experts is between 12 and 21 years. Age time range these teenagers are usually divided into three, namely 12-15 years (early adolescence),15-18 years (middle adolescence), and 18-21 years (late adolescence). However, Monks, Knoers, and Haditono differentiate adolescence into four parts, namely pre-adolescence 10 - 12 years, early adolescence 12 - 15 years, mid adolescence 15 - 18 years, and late adolescence 18 - 21 years (Haryanto , 2010).

DOMS This happens more often in sports that involve many of the same movements in swimming, cycling, basketball, badminton and so on. After exercising at a high intensity or doing unusual exercises, you may feel a sensation of soreness and stiffness in your muscles several hours later. This sensation is known as DOMS or Delayed Onset Muscle Soreness. DOMS is a condition when you feel pain, stiffness, and discomfort in your muscles several hours to two days after doing certain physical activities. DOMS most often occurs when you train at high intensity, perform repetitive exercises, or try new movements that your body is not used to. Increasing exercise intensity, volume, and duration can also trigger DOMS. Even though DOMS is actually normal, the pain felt can vary between individuals. DOMS is not serious and will usually subside over time as the body gets used to the type of activity it is doing.

DOMS is often considered a normal thing after certain exercises. The muscles in the lower quadrants are the ones that often experience it DOMS are the erector spinae muscles, adductor muscle group, hamstring muscles and quadriceps muscles. These muscles are indeed muscles that continuously carry out eccentric contractions. If you look at the structure of the muscle fibers, these muscles are dominant muscles with type I muscle fibers, namely muscles with typeslow twitch which functions as a stabilizer or maintains body posture with slow contractile speed, low motor unit strength, is resistant to fatigue, has a high aerobic capacity, and if pathology occurs tends to tense and shorten, microscopically this muscle is red. Light eccentric training protects athletes from DOMS. Balnave and Thompson's research reveals that training with eccentric muscle contractions as a basic warm-up program can protect athletes from visible or invisible muscle damage. This is also supported by research by Schwane et al. Hortobagyi T et al. examined the adaptive response to lengthening and shortening of the quadriceps muscle in humans. This study showed that adaptation to training with eccentric contractions was associated with greater neural adaptation and muscle hypertrophy than concentric training. Johansson et al. stated that eccentric training has a preventive effect on muscle soreness, tenderness and loss of strength.

Delayed Onset Muscle Soreness (DOMS) is always associated with unusual circumstances, excessive muscle work and eccentric contractions can trigger its occurrenceDOMS. Eccentric muscle contractions can be seen from the lengthening of the muscle during muscle contraction. The mechanism of occurrenceDOMS can be associated with painful stimulation caused by the formation of lactic acid, muscle stiffness, connective tissue damage, muscle damage, inflammation, etc. Symptoms can appear within 24 - 42 hours after exercise and can disappear after 5 - 7 days (Cheunget al.,2003).

Muscle soreness happens whenmuscle fiber undergoes a tear, and the muscle adapts to maintain its strength. Muscle strains occur as a result ofovertraining which happens to the majoritymuscle fiber which affects the degree of movement and tendons. Several studies did a combination of several techniques to provide treatment forDOMS likewarm up, stretching and massage, warm underwater water jet massage

and strong pain relief.But some also only use one technique in handling DOMS, likemassage dan stretching, massage dan electric stimulation, pre exercise warm up dengan stretchingdan post exercise dengan massage. Pain and damage to muscles can occur due to continuous or continuous exercise (Connolyet al.,2003). From various symptoms and signs DOMS especially that if it occurs in the muscles of the lower limbs, the easiest things to be felt subjectively by those who experience it and studied objectively are tenderness, the circumference of the muscles of the upper limbs (thigh circumference) and the ability to function the muscles, in this case the ability to jump.

The level of damage and pain can be caused by several factors, for example at the professional level it can be caused by the training dose and the inkinesiotappingity of the exercises given. In someone who is not an athlete, the damage can be caused by muscle activity exceeding their ability to carry out incorrect activities and movements. And another factor isstiffness, contraction speed, muscle fatigue, and angle at which the movement will occur. By paying attention to theory and basic science on mechanismsinjury , handling forDOMS will be able to minimize damage to tissue and prevent excessive muscle training.Delayed Onset Muscle Soreness (DOMS) can be classified as a type I muscle injury and can be identified by the presence of tenderness and spasm during palpation and movement. Pressure pain can be localized in the distal part of the muscle and can increase in pain within 24 - 48 hours after exercise. The pain can describes his heightreceptor in soft tissue and muscle tendons. (Cheunget al2003).

Although DOMS has been widely researched, the exact mechanism behind the occurrence of DOMS is still not fully understood. Some theories about the causes of DOMS include: 1. Microtrauma Shots:When you exercise at high intensity, especially when you lift heavy weights or do eccentric exercises (muscle movements when lengthening), it can cause microtrauma to muscle fibers. This causes local inflammation and the release of chemicals such as prostaglandins that trigger pain receptors in your muscles. 2. Stress Oxidative:Strenuous exercise can also cause oxidative stress in muscles, namely the production of free radicals that can damage muscle cells and trigger inflammation. 3. Decreased Blood Flow:High-intensity exercise can cause

compression of blood vessels, reducing blood flow to muscles and causing the accumulation of metabolic waste products, which can trigger pain receptors. 4. Inflammation: DOMS is caused by local inflammation in the muscles, including increased blood levels of inflammatory enzymes such as creatine kinase. Physiotherapists can use a variety of intervention methods to prevent symptoms and signsDOMS. The methods that are widely used are carrying out specific movements similar to the sport that will be done before or after exercise, sports massage/sport massage especially vibrational movements,stretching/ stretching, immersion in cold water or ice/cryotherapy to electrotherapy such as sound wave therapy/Ultrasound therapy and Nerve Stimulation with electric waves (Transcutaneus Electrotherapy Nerve Stimulation/TENS), kinesio taping.

MATERIALS AND METHODS

Study participants

This research was conducted at Gang Sehat Physiotherapy with a sample of male students from the FPOK Physical Education Study Program. Population and Sample The population of this research is male students of the FPOK Physical Education Study Program.

Study Organization

Scope of Research This research was conducted at Gang Sehat Physiotherapy. Population and Sample The population of this research is male students of the FPOK Physical Education Study Program. The sampling technique is carried out using a quota sampling technique, namely the researcher determines the size of the sample or respondents to become sample members. There were 20 research subjects, and were divided into 2 groups, each with 10 subjects in the control group and 10 subjects in the treatment group.

Test and measurement procedures

Subjects were given treatment in the form of squad training with load: 10 kg. Repetitions: 10 times, sets: 5 sets with rest breaks: 1-2 minutes between sets. The sample was carried out using a quota sampling technique, namely the researcher determines the size of the sample or respondents to become sample members. There

were 20 research subjects, and were divided into 2 groups, each with 10 subjects in the control group and 10 subjects in the treatment group.

RESULTS AND DISCUSSION

Normality and Homogeneity Tests To see what statistical tests will be used in the analysis, assumptions are tested in the T-test, namely normality of data and homogeneity of variance. The normality test is carried out to see whether the data distribution in the study is normally distributed or not. To see the normal distribution of data in this study, the Shapiro Wilk test was used. Meanwhile, the homogeneity test is an analysis used to test the similarity of variance between two or more pieces variable. The homogeneity test used is the Statistical Levenest test. Paired Sample T test. Because there is one data distribution in the posttest variable that is not normally distributed, the Wilcoxon Signed Rank test will be carried out as a substitute for the Paired Sample T-test. A paired sample can be said to have a significant effect if the pvalue (p) obtained is greater than 0.05 (p>0.05). Based on the analysis carried out, the following results were obtained: The requirement for using Paired Sample T-Test is that the data is normally distributed. Based on Pair 1, the Sig value is obtained. (2-tailed) is 0.001 < 0.05, so there is an effect of givingwith nerve mobilization and kinesiotapping of the descent DOMS In table 1.

Table 1. Paired Samples Test

	df	**Say. (2-tailed)**
PreTest-PostTest	10	0,001

DOMS or Delayed Onset Muscle Soreness is a condition when a person feels muscle pain or discomfort that appears after doing high-intensity physical exercise or activities that involve unusual muscle loading. DOMS usually occurs several hours to 1-2 days after exercise, and can cause significant discomfort. Kinesiotaping is a method of applying special elastic bands to the skin with the aim of providing support and stability to specific muscles or joints. Additionally, it is thought to improve blood and lymphatic circulation, reduce pain, and aid muscle recovery. Nerve mobilization is a series of physiotherapy techniques that aim to treat neurological complaints or pain by

stimulating the nerves through controlled movements. Although there are some claims that kinesiotaping and nerve mobilization can help reduce DOMS, but scientific evidence to support these claims is limited. DOMS is a process naturally occurs in response to unusual muscle loading, and some level of DOMS can be considered part of the body's adaptation process to exercise. Thus, the use of kinesiotaping and nerve mobilization may be more effective in reducing discomfort than stopping DOMS completely. Kinesiotaping is made of cotton with wave-shaped acrylic adhesive on one side. The tape is designed to mimic the elasticity and thickness of human skin, allowing for comfortable movement and flexibility. The adhesive on this tape is latex-free, hypoallergenic, and designed not to cause skin irritation. The main goals of kinesiotaping include: 1. Muscle Support: Kinesiotaping is used to provide support to weak or injured muscles, improve muscle function, and prevent excessive or inappropriate movement. 2. Reduces Pain: This tape can help reduce pain and discomfort by reducing pressure on injured tissue and increasing blood flow to the affected area. 3. Joint Stability: Kinesiotape can be applied to provide support and stability to joints, helping to reduce pressure and prevent further injury. 4. Lymphatic Drainage: The wave pattern on this band can help facilitate lymphatic drainage, reducing swelling and inflammation in certain conditions. 5. Posture Correction: Kinesiotaping techniques can be used for pushing better posture and alignment, especially in cases of musculoskeletal imbalances. Kinesiotaping is popular among athletes and is often seen at various sporting events, as it is believed to aid recovery and improve performance. However, it is important to remember that while kinesiotaping can be beneficial for certain conditions and individuals, it is not a miracle solution and is best used as part of a comprehensive treatment plan, including proper medical evaluation, diagnosis, and appropriate exercise rehabilitation.

Nerve mobilization refers to various techniques or methods used to stimulate or mobilize nerves in the human body. Nerve mobilization is usually performed for therapeutic purposes, such as reducing pain, improving nerve function, and treating certain neurological or musculoskeletal disorders. Commonly used nerve mobilizations in physical therapy and rehabilitation include: 1. Peripheral nerve mobilization: This is

a technique that moves or shifts specific peripheral nerves that are pinched or irritated. Peripheral nerve mobilization can help reduce pain and improve nerve function. 2. Neuromobilization: This is a physical therapy approach that focuses on mobilizing specific nerve structures to restore or improve movement of the impaired nerve. This method is often used to treat symptoms of pinched nerves or neurological disorders such as tunnels carpal disease, hernia of the nucleus pulposus, or radiculopathy. 3. Neurological physiotherapy: This includes various techniques and exercises aimed at improving nerve function after neurological injuries or disorders such as stroke, traumatic brain injury, or paralysis. 4. Therapeutic exercises: This therapy includes exercises specifically designed to activate and mobilize the affected nerves, with the aim of improving strength, balance and coordination.

CONCLUSION

By looking at the results of the data obtained, it can be concluded that providing kinesiotaping and nerve mobilization as quickly as possible can reduce the risk of DOMS, whereas without providing kinesiotaping and nerve mobilization cannot reduce the risk of DOMS. To avoid wider damage from the effects of overloaded training, giving ice massage early will help reduce the risk of DOMS.

REFERENCES

Anonymous. 2010www.pjnhk.go.id, diakses padatanggal 10 April 2022 Armstrong RB. 1984. *Mechanism of exercise-induced delayed onset muscular soreness: A brief review*. Med Sci Sports Exerc 16: 529-38.

Bertolini R.F Gladson, Silva ST, Trindade LD, Ciena PA, Carvalho RA. 2009. *Neural mobilization and static stretching in an experimental sciatica model-an experimental study*. Rev Bras Fisioter, Sao Carlos, v. 13, n.6, p. 493-8: ISSN 1413-3555.

Clarkson PM, Sayers SP. 1999. *Etiology of exercise-induced muscle damage*. CanJ Appl Physiol 24(3):234-248

Connolly, D. A., Sayers, S. P. & McHugh, M. P. 2003. *Treatment and prevention of delayed onset muscle soreness (abstract). Journal of Strength Conditioning*

Research, 17(l):197-208. Retrieved from PubMed.gov on July 24, 2006.

Ellis RF, Hing WA. 2008. Neural mobilization: a systematic review of randomizedcontrolled trials with an analysis of therapeutic efficacy. The Journal of Manual and Manipulative Therapy 16 (1), 8-22

Guyton, A.C., J. E. Hall, 2008. Textbook of Medical Physiology. 11th Edition. Jakarta: EGC Medical Books.

Herbert D Rob, Gabriel Michael. 2002. Effects of stretching before and after exercising on muscle soreness and risk of injury: systematic review. BMJ volume 325 31; 325:468

Johansson PH, Lindstrom L, Sundelin G. 1999. The effects of preexercise stretching on muscular soreness, tenderness and force loss following heavy eccentric exercise. Scan J Med Sci Sports. 9: 219-2

Ministry of Foreign Affairs. 2000. Workshop on the role of health workers in sports, Bogor

Kysner Caroline & Colby Lyn Allen. 2007. Therapeutic Exercise Foundation and Techniques. Philadephia : FA. Davis.

Mallac C. 2006. What the slump test can reveal. Sports Injury Bulletin: 62, 6 MacIntyre DL, Reid WD, McKenzie DC. 1995. Delayed muscle soreness. The inflammatory response to muscle injury and its clinical implications. Sports Med 20(l):24-40

APPENDIX

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