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EFFECTIVENESS OF USE OF KINESIOTAPPING IN THE CONDITION OF PAIN PLANTAR FASCIITIS

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Abstract

Plantar Fasciitis is heel pain caused by inflammation of the muscle membrane of the soles of the feet called the plantaris fascia. The plantar fascia is located on the surface of the sole of the foot, extending from the calcaneus towards the toes. The condition of plantar fasciitis is caused by excessive use of the plantar fascia, increased physical activity and age. Excessive stretching or over stretching of the plantar fascia can cause tears which will cause inflammation of the plantar fascia, specifically affecting the posterior part of the calcaneus which can sometimes also occur in the anteromedial part of the tuberosity of the calcaneus. Problems that arise due to pain in Plantar Fascitis can be given Kinesiotapping intervention. The aim of this research is aimed at plantar fascitis sufferers to reduce pain using kinesiotapping. Method: This research is an experimental study with a pre and post test group design by comparing the previous and subsequent pain levels as measured by the Numerical Rating Scale (NRS) measuring tool, with the use of kinesiotapping in plantar fasciitis conditions for 4 weeks. Results: Analysis of the test for different pain scores using the Numerical Rating Scale (NRS) in the sample group with a significance value of p = 0.0001 which shows < 0.05, which means there is an influence on the effectiveness of kinesiotapping in the condition of plantar fasciitis in reducing pain.

Keywords: Plantar Fascitis, Kinesiotapping, Numerical Rating Scale.

1. INTRODUCTION

Plantar Fasciitis is heel pain caused by inflammation of the muscle membrane of the soles of the feet called the plantaris fascia. The plantar fascia is located on the surface of the sole of the foot, extending from the calcaneus towards the toes. The condition of plantar fasciitis is caused by excessive use of the plantar fascia, increased physical activity and age (Fahmil Haris et al., 2023; Handayani & Komaini, 2020; Sepdanius et al., 2023). Excessive stretching or overstretching of the plantar fascia can cause tears which will cause inflammation of the plantar fascia, specifically affecting the posterior part of the calcaneus which can sometimes also occur in the anteromedial part of the tuberosity of the calcaneus (Einstein et al., 2022; Orchard et al., 2018). Plantar Fasciitis is often characterized by sharp pain when taking the first steps in the morning, usually the pain decreases when walking(Renee & Salvo, 2019). However, it may come back after getting up from a sitting or standing position for a long time. Pain can be felt in the front or back of the sole of the foot(Chinn & Hertel, 2010; Glucklich, 2001). Apart from pain in the heel, plantar fasciitis also causes pain in the sole of the foot, this is because the plantar fascia stretches along the sole of the foot (Kiebzak et al., 2009). Pain in the soles of the feet is usually caused by using inappropriate footwear and continuously pressing the fascia, which will cause inflammation(Pete Moncado, 2020).

The plantar fascia is a thick band of fibrous tissue aponeurosis that attaches from the heel to the toes originating on the medial calcaneular tubercle, and helps support the

arch of the foot. During the stretch, there is repeated pulling over a long period of time, thereby reducing pain and inflammation in the plantar fascia in the heel. Curvature due to the shape of the foot, unsupportive footwear or increased activity, presses on the fascia, causing changes in the aponeurosis and causing swelling and inflammation (Marder & Lian, 2012; Norris, 2015).

Plantar fasciitis is a common strain that causes overuse injuries that occur due to repetitive traction on the plantar fascia area beneath the distal calcaneus. 80% of these overuse foot injuries are due to plantar pain and 8-10% are injuries due to running. This also often occurs in people who don't sit well and athletes, and is considered a fatal consequence of a sedentary lifestyle or strenuous exercise(Jackson, 2004; Kirschenbaum, 2013). Current literature suggests that plantar fasciitis is more appropriately called fasciosis because of the chronicity of the disease and evidence of degeneration rather than inflammation. Treatment is often difficult because the mechanisms are poorly understood, relating the body to healing chronic degeneration rather than acute inflammation(Karlsson et al., 2012; Pasek et al., 2007; Schulze, 2006). However, in acute conditions it can cause problems with the feet, knees, hips and back (Aprilialdasari et al., 2023; SEPTRI et al., n.d.; Suwirman et al., 2019).

Kinesiotapping is the newest method of installing taping which aims to prevent or rehabilitate athletes who suffer sports injuries{Citation}, where kinesiotaping is made from 100% cotton, elastic fiber and latex free so it very rarely causes allergies to the skin(Wang et al., 2018). Apart from that, according to Zain, the kinesio taping material is able to withstand water so it can be used for 3-5 days depending on certain conditions. Kinesio taping is a rehabilitative technique used to facilitate the body's natural healing process while providing support and stability to muscles and joints(Cury\lo et al., 2016; Donec & Kubilius, 2020; Starczyńska et al., 2011), without limiting their range of motion. Kim also reported that kinesio taping can be used in various musculoskeletal and musculoskeletal problems developed by Kenzo Kase, by combining kinesiology with chiropractic methods based on the use of special elastic strips, which mimic the density and elasticity of human skin(Du Toit, 2014; Venter, 2014; Yelverton, n.d.).

Based on the existing background on the condition of plantar fascitis, efforts that can be made include: improvement (promotive), prevention (preventive), healing (curative) and recovery (rehabilitative). Physiotherapy techniques, apart from using physiotherapy modalities, manual therapy techniques such as exercises or kinesiotapping can also be used in plantar fascitis conditions. Researchers tried to administer kinesiotapping to reduce pain using a numerical rating scale in the condition of plantar fasciitis.

2. METHOD

This research design uses an experimental one group pre and post test group design which aims to determine the effect of kinesiotapping in reducing pain in plantar fascitis(Kiebzak et al., 2009). This research was conducted at the Physiotherapy Laboratory, Faculty of Sports Science, Padang City. The approach method in this research uses a pre-test and post-test design to determine how much Kinesiotapping affects the reduction of pain in the condition of plantar fasciitis. The data obtained used the SPSS Version 23 ANOVA method(Kaufmann & Schering, 2007). The sample criteria used were patients who experienced pain in the soles of the feet, did not

experience a broken heel and had surgery on the ankle. The number of samples in this study was 10 people who experienced shoulder pain due to plantar fascitis. The research stages carried out were:

a. Sample collection and explanation to the sample regarding the research to be carried out, if the sample is willing then the sample will fill in the conset informant.

b. Pretest using a pain measuring instrument, namely using a numerical rating scale before the intervention/exercise is carried out

c. The samples were given intervention for 4 weeks with meetings 3 times a week

d. Then a post test was carried out by measuring the level of pain again using the numerical rating scale (NRS) at the first intervention meeting and at the last intervention.

e. After the data is obtained, the data is analyzed via ANOVA

3. RESULTS

1. Research Description

Table 1: Characteristics of research subjects

	N	Mean±Std. Deviation	Std. Error
Age	10	25.3± 1.89	0.59
Height	10	154.7± 10.56	3.34
Weight	10	56.6±8.35	2.64
BMI	10	24.57±3.16	1

Based on the table above, the data resulting from the research description based on age obtained a mean and standard deviation of 25.3±1.89, which means that age (age) in this condition is dominated by 23 years old with 1 person, 24 years old with 2 people, 25 years old with 4 people, 26 years old with 2 people and 30 years old with number of 1 person. For height, the mean and standard deviation were found to be 154.7±10.56, where the patient's height range starts from 130 cm-169 cm. Body weight with a mean value and standard deviation of 56.6±8.35, which is the range of body weight from 43 kg to 70 kg. Meanwhile, the BMI value was found to have a mean and standard deviation of 24.57±3.16.

Table 2: Test Paired Sample t test

Test Method	Group	P Value
Paired sample t test	NRS (Pretest-Posttest)	0,000*

Before using kinesiotapping for plantar fascitis, this method uses a pretest and after that a final test (posttest) measures pain in the soles of the feet for plantar fascitis using a numerical rating scale (nrs). In the initial and final tests of 10 samples, a significant value was obtained, namely p = 0.0001 with a significance level of 0.005, which means that there is an effect of the effectiveness of kinesiotapping on reducing pain in the condition of plantar fasciitis.

4. DISCUSSION OF RESULTS

Kinesio taping is a type of tape-shaped adhesive plaster made from latex. This tape has a thickness and elasticity that resembles human skin. So, the area of movement will not be limited and will not cause excessive pressure on the adhesive area when used. Using kinesio taping can be effective for up to 3-5 days. Kinesio taping consists

of elastic strands of polymer wrapped in 100% cotton fiber. These cotton fibers then experience evaporation of sweat on the body and are able to dry quickly, are waterproof, and can also lengthen 100% of their original length. Kinesio taping is widely used to increase muscle strength, relax muscles, and improve balance, postural stability(Yelverton, n.d.). Kinesio taping is designed for several purposes, such as preventing injury, improving muscle function, and relaxing over-contracted muscles, each with different application and stretching techniques. For light strains, kinesio taping is applied with a stretch of 0-15%, 15-25% for sufficient stretch, 50% for medium stretch, 75% for strong stretch, and 100% for full stretch. Kinesio taping can be applied using the I strip, Y strip, X strip, fan and donut methods. The Y strip and I strip methods are often used, because the Y strip method is able to relax muscles that are experiencing more contraction. Meanwhile, the I strip method is used to relieve swelling and reduce pain. To relax the muscle, kinesio taping is applied from origin to insertion with a stretch of 15-25% of the initial stretch. Meanwhile, to increase muscle strength, kinesio taping is applied from the insertion to the origin with a stretch of 25-50%(Akinoglu et al., 2019). Kinesio taping works by stretching or pulling elastic which has an effect on the neuromuscular system in activating the performance of nerves and muscles when performing functional movements. Apart from that, kinesio taping can reduce excessive muscle tension. Kinesio taping itself will provide a comfortable feeling in the taped area, making movement more efficient(Yelverton, n.d.)

The results of this research were carried out in the condition of plantar fascitis pain, with a sample size of 10 people who were given intervention using Kinesiotapping. Obtained test resultsPaired sample t testwith a statistical value of $p<0.0001$ where $p<0.05$, so it can be concluded that providing Kinesiotapping intervention can reduce foot pain in plantar fasciitis conditions

5. CONCLUSION

Based on the research analysis that has been carried out and the discussion, it can be concluded that the effective implementation of kinesiotapping can reduce shoulder pain in the condition of plantar fasciitis. With a frequency of 3 times a week for 4 weeks, intervention is carried out. Provides influence on changes in pain reduction scores in the research sample.

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