International Journal of Healthcare Sciences ISSN 2348-5728 (Online)
Vol. 13, Issue 1, pp: (574-578), Month: April 2025 - September 2025, Available at: www.researchpublish.com

EFFECTIVENESS OF MYOFASCIAL RELEASE TECHNIQUE AND KINESIOTAPING TECHNIQUE IN PATIENTS WITH PLANTAR FASCIITIS

[1]Dr.Bharani venkatesan, MPT, [2]Keerthana.M, [3]Dr.Lokesh.R., MPT

[1]Assistant professor, Department of physiotherapy, Adhiparasakthi college of Physiotherapy, Melmaruvathur, Tamilnadu.

[2]BPT Intern, Department of physiotherapy, Adhiparasakthi college of physiotherapy, Melmaruvathur, Tamilnadu.

[3]Associate professor, Research and Development Coordinator, Department of physiotherapy, Adhiparasakthi College of Physiotherapy Melmaruvathur, Tamilnadu.

DOI: https://doi.org/10.5281/zenodo.16894206

Published Date: 18-August-2025

Abstract: **Background: Plantar fasciitis (PF) is a common cause of heel pain which occurs mostly due to weight bearing, standing occupation. Plantar fasciitis has been experienced by 10 % of the population. It is often characterized by progressive pain with weight bearing, especially the first few steps in the morning often persisting for months.**

Aim: The aim of the study is to find the effectiveness of myofascial release technique nd kinesiotaping technique in patients with plantar fasciitis.

Method: The Quasi experimental study included 30 participants with plantar fasciitis. Based on the selection criteria the participants were randomly divided into two groups GROUP A: consists of 15 participants who received myofascial release technique. Intervention for this group was given for 3 days per week for 4 weeks. GROUP B: consists of 15 participants who received kinesiotaping technique. Intervention for this group was given for 3 days per week for 4 weeks. Numerical pain rating scale, Foot function index, Universal goniometer were taken as outcome measures.

Results: There was a considerable difference in pre and post score of Numerical pain rating scale, Foot function index and Universal goniometer.

Conclusion: Study concludes that the Myofascial release technique is more effective than Kinesiotaping technique in reducing the pain, improving the function and range of motion in patients with plantar fasciitis.

Keywords: **Plantar fasciitis, Myofascial release, Kinesiotaping, FFI, NPRS, Universal goniometer.**

1. INTRODUCTION

Plantar fasciitis (PF) is a common cause of heel pain which occurs mostly due to weight bearing, standing occupation. It is often characterized by progressive pain with weight bearing, especially the first few steps in the morning often persisting for months[(4)].It is an aseptic inflammation of the plantar fascia at its origin at the calcaneum . It causes pain in the foot anterior to the attachment of plantar fascia[(15)]. It commonly occurs in sports persons like athletes and occupations like teachers, waiters, maids, kitchen workers, nurses and factory workers. The prevalence of plantar fasciitis is 10 %[(4)]. Studies report that, faulty biomechanics is a major cause of plantar fasciitis. Subjects having either a lower or higher arched foot can experience plantar fasciitis. Patients with lower arches have too much motion, whereas patients with higher arches have too little motion, both leading to the pathology of Plantar fascia[(2)].

Plantar fascia is a thick connective tissue that functions to support and protect the underlying vital structures of the foot. The fascia is thick centrally, known as aponeurosis and is thin along the sides. The fascia consists of three parts medial,

lateral and central part respectively. The aponeurosis is triangular in shape. The central portion is attached to the medial tubercle of the calcaneum , proximal to the attachment of the Flexor Digitorum Brevis and it divides into five processes, near the head of the metatarsal bones, one for each of the toes. Each of these processes further divides opposite to the MTP articulation into two strata, superficial and deep[16]. The windlass mechanism is a mechanical model that explains how the plantar fascia supports the foot when bearing weight. It also provides information about the biomechanical stresses on the plantar fascia[17].

Kinesiotape has been evolving as a unique treatment tool for trainers, medical practitioners and physical therapists since its creation by chiropractor Dr kenzo kase in early 1970s. It is a thin porous cotton fabric flexible tape with a medical grade acrylic adhesive. It can be stretched upto 140% of original length. It was developed to aid muscle movement and enhance athletic performance. The basic functions and effects of k taping are improvement of muscle function, pain reduction ,support of joint functions , elimination of circulatory impairments. [20]

MFR is a myofascial release technique used to increase the mobility of the soft tissue by the application of slow and controlled mechanical stress on the affected area. This pressure is given by the fingers, thumb, elbow of the physiotherapist . The purpose of the myofascial release technique is to regain the original length, decrease pain and increase the mobility of the affected part. It is superimposed that the affected fascia of one part of the body affects the fascia of another part of the body due to the connectivity between them .So due to tension , fascia compresses the nerve and blood vessels, the excessive pressure on the painful structure can be relieved by regaining the length and mobility of the fascia. [2]

OBJECTIVE OF THE STUDY:

To evaluate the effects of Myofascial release technique on pain, range of motion, functional disability in patients with plantar fasciitis.

To evaluate the effects of Kinesiotaping technique on pain, range of motion, functional disability in patients with plantar fasciitis.

To compare the effects of Myofascial release technique and Kinesiotaping technique on Pain, Range of motion, Functional disability in patients with plantar fasciitis.

2. REVIEW OF LITERATURE

MT Garcia-martinez et al., 2024 concludes that kinesiotaping technique is effective in reducing pain in patients with plantar fasciitis**.**

FS Syed Et al., 2023 concludes that myofascial release technique is found to be more effective in diminishing pain and enhancing foot function index as compared to the control therapies in lowering pain and increasing foot function index.

Karishma et al., 2022 concludes that kinesiotaping technique is found to be more effective than ultrasound therapy for treating plantar fasciitis.

A Javed , A Nadeem et al ., 2021 concluded that myofascial technique showed efficacy in reducing the pain intensity and increasing the foot function in chronic plantar fasciitis patients .

STUDY DESIGN:

This study was designed as an quasi experimental study conducted in the Physiotherapy Outpatient Department of Adhiparasakthi College of Physiotherapy located in Melmaruvathur. A convenient sampling method was employed to select participants. The data collection was carried out over a period of four weeks with three sessions per week.

INCLUSION CRITERIA:

Individuals aged between 20 and 50 years, including both males and females, with subacute and chronic foot pain with the NPRS scoring 4 to 8 and

FFI Scoring 30% to 60% and a positive windlass test.

EXCLUSION CRITERIA:

Patients with dermatitis, recent foot surgeries, severe limitation of passive ROM, severe foot deformity, chronic venous insufficiency

3. METHODOLOGY

A total of 30 subjects were chosen from APCOPT and assigned to two groups, namely Myofascial release technique(n=15) and the kinesioaping technique(n=15), based on inclusion and exclusion criteria.

Numerical Pain Rating Scale (NPRS), Foot Function index (FFI), Range of motion were taken as a oucome measure.

TREATMENT TECHNIQUE:

1. Myofascial Release technique
2. Kinesiotaping technique

GROUP A : MYOFASCIAL RELEASE

STAGE 1: MFR APPLICATION ON SUPERFICIAL LAYER

The patient is in supine lying and the therapist sat in front of the patient's leg. The ankle was dorsiflexed during the application of MFR. The therapist used her dorsum of the hand. MFR was applied with the dorsal part of the hand and pressure was given over the superficial layer by sliding towards the calcaneus from the affected area

STAGE 2- MFR APPLICATION FOR PLANTAR APONEUROSIS

It is done for deep tissue release. The patient is in prone lying with the knee flexed position and the therapist was in a standing position beside the bed. The ankle was in a normal position. The therapist holds the posterior part of the ankle by hand and with another forearm applied the myofascial technique and gives pressure towards the affected side for plantar aponeurosis.

STAGE 3-MFR APPLICATION FOR ACHILLES TENDON

Patient position: prone lying, where a small role is placed under the ankle or foot is off the edge of the table. so that foot and ankle are in plantar flexion. Myofascial release is applied over the Achilles tendon.

STAGE 4 – MFR TO GASTROCNEMIUS

Patient position: prone lying and the therapist stand at the side of the patient's leg. The therapist used both hands in a cross-hand pattern and apply MFR over the gastrocnemius muscle.

GROUP B: KINESIOTAPING TECHNIQUE

TAPING ON THE GASTROCNEMIUS MUSCLE

The reference points are marked on the skin of the posterior leg. Origin site for taping is marked on the achilles tendon at the level of medial and lateral malleoli. The two end sites of taping were marked on both medial and lateral heads of gastrocnemius muscle

Patient position: prone lying on a table with feet placed outside the edge of table. Procedure of "Y" shaped taping is used. The origin end of the tape is firmly adhered to the achilles tendon and then stretched proximally to stick the two ends of bivalve tape on the two gastrocnemius end .The original length of tape was about 2/3 rd of the leg length measured from fibular head to lateral malleolus. The tape was stretched to 1/3 rd of original length to give negative tension to muscle.

TAPING ON THE PLANTAR FASCIA

Reference point for taping is marked on the foot. Origin site is on the posterior margin of calcaneal bone. The four end sites of taping are marked on the metatarsal joints of the first to fifth toes. **Patient position:** prone lying. Procedure of " PALM" shaped taping is applied to plantar fascia. The origin end of tape is firmly adhered to the calcaneal bone and stretched distally to stick the four ends of tape on forefoot. The tape was stretched 1/3 rd of original length to give a negative tension to plantar fascia.

OUTCOME MEASURES

In this study primary oucome measures are Numerical pain rating scale,Foot function index and Goniometer. Numerical pain rating scale**:** It is a subjective measure in which individuals rate their pain on 11 point numerical scale.Foot function index: It is a self administered questionnaire that consists of 3 dimensions Pain subscale consists of 5 items with each score of 10, Disability subscale consists of 9 items with each score of 10,Activity limitation subscale consists of 3 items with each score of 10**,**Goniometry: It is the most commonly used tool for measuring range of motions

4. RESULT

Data analysis was performed using statistical software SPSS v26.0 applying paired sample t-tests to compare pre- and post-intervention outcomes within both groups. In Group A (Myofascial release technique), the Numerical pain rating scale (NPRS) showed a significant reduction in pain levels, with a pre-test mean of 6.000 decreasing to 2.9333post-test(t =25.947, p=.000), indicating a statistically significant improvement. Similarly, Foot function index (FFI) improved markedly from a mean of 40.4000 pre-test to 22.8000 post test (t = 20.446, p

= .000), showing a substantial decrease functional disability.Similarly goniometer showed a in dorsiflexion ROM with a pre test mean of 12.000 increasing to 17.2667 post test . similarly plantar flexion from a mean of 37.4667 to 41.5333 post test. In Group B (kinesiotaping technique),NPRS scores also demonstrated statistically significant reduction from 5.8667 to 3.6000(t = 19.179, p = .000), while FFI from 39.2000 to 25.3333(t = 45.236, p = .000).

Similarly goniometer showed a in dorsiflexion ROM with a pre test mean of 11.9333 increasing to 14.2000 post test . similarly plantar flexion from a mean of 37.6000 to 40.0669 post test. Although both interventions produced statistically significant reduction in pain and functional disability and improved rom Group A exhibited greater post-test improvements in NPRS and FFI and ROM, suggesting that Myofascial therapy is more effective than Kinesiotaping for patients with Plantar fasciitis.

5. DISCUSSION

30 Plantar fasciitis samples were included in this study to find the effectiveness of myofascial release technique and Kinesiotaping technique in reducing pain and disability and improving range of motion.

The purpose of the study is to analyse the effects of myofascial release technique and Kinesiotaping technique in reducing pain and improving foot function among plantar fasciitis patient. This study has done the treatment technique for 4 weeks . 30 samples were divided into 2 groups each consists of 15 participants. Group A received myofascial release technique and Group B received Kinesiotaping technique. This two techniques gives good result in reducing pain and disability and improving range of motion.

6. CONCLUSION

The statistical analysis shows significant effect in reducing pain and improve their functional independence and range of motion for both groups. Thus both the Myofascial release and Kinesiotaping are effective in treatment of plantar fasciitis. when comparing the mean values of group A and group B of NPRS , FFI , Range of motion along with data analysis shows highly significant effect on reducing pain and improvement in foot function and range of motion in Group A than Group B in patients with plantar fasciitis. Both the Myofascial release technique and Kinesiotaping technique is effective in treatment of plantar fasciitis but Myofascial release technique is more effective than Kinesiotaping technique in 4 week intervention.

7. LIMITATIONS

The limitations of the study were conducted on a small sample size, Duration of the study was less, this study was conducted only with particular age group.

8. SUGGESTIONS

Long term follow up is needed to evaluate whether there occurs any sustained or carry over effect after treatment to establish greater efficacy of the treatment, the study should be undertaken in large scale, for more reliability and validity, the long term study must be carried out.

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