

Effect of Dry Needling Versus Kinesiology Taping in Patient with Plantar Fasciiti

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ABSTRACT

Plantar fasciitis is a common musculoskeletal disorder and a leading cause of heel pain, affecting 10–15% of the general population. Characterized by sharp, localized pain under the heel, particularly in the morning or after prolonged standing, the condition significantly affects daily function and quality of life. While various conservative treatment options exist, including physical therapy, NSAIDs, and orthotic support, a definitive and superior intervention remains unclear. Among contemporary conservative treatments, Dry Needling (DN) and Kinesiology Taping (KT) have gained popularity for their potential in alleviating pain and improving foot function. However, direct comparative evidence between these modalities in treating plantar fasciitis remains limited.

Objective: This study aimed to determine the comparative effectiveness of dry needling versus kinesiology taping in reducing pain intensity, improving foot function, and enhancing quality of life in patients with plantar fasciitis.

Methodology: A single-blinded randomized controlled trial was conducted at Hamza Hospital Lahore and Lahore Poly Clinic over 9 months. A total of 60 participants aged 20–45 years with clinically diagnosed plantar fasciitis and identifiable myofascial trigger points were recruited using a non-probability purposive sampling technique. They were randomly assigned to two groups (n=30 each): Group A received dry needling with conventional physiotherapy once per week, while Group B received kinesiology taping with conventional physiotherapy twice per week. Both interventions were administered for 6 weeks. Outcome measures included the Visual Analogue Scale (VAS) for pain, Foot and Ankle Outcome Score (FAOS) for functional assessment, and SF-12 Health Survey for quality of life. Assessments were conducted at baseline, week 3, and week 6. Data were analyzed using SPSS v28, with significance set at $p < 0.05$.

Results: Both intervention groups—dry needling (Group A) and kinesiology taping (Group B)—demonstrated significant within-group improvements from baseline to the 6th week in pain intensity (VAS), functional ability (FAOS), and quality of life (SF-12) scores ($p < 0.05$). However, dry needling produced more pronounced outcomes across all parameters. By the 6th week, Group A had a greater reduction in pain with a VAS mean of 1.83 ± 0.791 , compared to 1.97 ± 0.413 in Group B. Functional

improvement measured via FAOS was also higher in Group A (Mean = 78.9) than in Group B (Mean = 70.3). Similarly, Group A exhibited superior gains in both physical and mental components of the SF-12, with PCS = 45.5 and MCS = 56.2, compared to PCS = 42.0 and MCS = 50.1 in Group B. Statistical comparisons using the MannWhitney U test and Friedman test confirmed that these differences were significant, favoring the dry needling group (VAS $p = 0.004$, FAOS $p = 0.001$, SF-12 $p = 0.015$).

Conclusion: While both dry needling and kinesiology taping are effective conservative interventions for plantar fasciitis, dry needling provides more significant and sustained improvements in pain relief, functional recovery, and overall quality of life. These findings support the inclusion of dry needling as a preferred modality in the conservative management of plantar fasciitis, particularly for short-term therapeutic goals. Future studies with larger sample sizes and extended follow-up durations are recommended to validate long-term outcomes.

Key Words: Plantar Fasciitis, Dry Needling, Kinesiology Taping, Heel Pain, Pain Management.

Introduction

The plantar fascia is a thick band of connective tissue that forms the medial longitudinal arch of the foot. Plantar fasciitis, an inflammatory condition, causes pain in the lower heel and affects 10-15% of the general population. It is the leading cause of heel pain in individuals over 40 years old. This condition accounts for 10% of running-related injuries and is prevalent among both sedentary and active individuals. Patients with plantar fasciitis typically experience sharp, knife-like pain in the morning that eases after taking a few steps. However, symptoms can reappear with prolonged standing and are sometimes accompanied by stiffness. In chronic cases, pain often worsens by the end of the day, significantly limiting daily activities. (Gupta, 2020). Plantar fasciitis involves the degeneration of the plantar fascia, leading to localized heel pain. It is commonly an overuse injury due to repetitive strain causing micro-tears in the fascia, though it can also result from trauma or other factors (Becker & Childress, 2018; Finkenstaedt., 2018). As one of the most frequent foot disorders, plantar fasciitis accounts for approximately one-quarter of all foot injuries and affects 3.6% to 7% of the population (Chen, 2020). It often impacts physically active individuals, and those with plantar fasciitis may experience decreased physical function, quality of life, and mental well being compared to those without the condition (Rathleff, 2015; Landorf, 2021). Dry needling (DN) is a technique used for pain management for almost two centuries and remains a popular method for treating myofascial pain syndrome. DN involves inserting thin needles into the muscles or ligaments to alleviate pain associated with neuro-musculoskeletal disorders. This approach aims to mechanically disrupt trigger points without the use of medication, thereby reducing pain. Several randomized controlled trials have shown that dry needling effectively reduces pain and enhances foot function in plantar fasciitis patients (Cotchett, 2018; Martinelli , 2019). For instance, a study conducted in Kuwait reported that dry needling significantly alleviated heel pain and improved mobility compared to the control group. In practice, KT is applied by removing hair from the calf area with a razor and then placing the taping with the patient lying face down. The procedure involves extending the knee, dorsiflexing the ankle, and stretching the plantar fascia and calf muscles to their maximum. The taping is applied in an I-shape, starting from the metatarsal head, extending through the plantar fascia and Achilles tendon, and reaching up to the calf muscle. About 50% of the taping tension is applied to the Achilles tendon area, while 15% is applied to the calf muscle area. Additional taping is done to support the arch by applying 50% tension from the base of the 5th metatarsal to the medial arch The taping is applied twice a week for four weeks

and is left on for over 12 hours each day. This study aimed to address the pressing need for evidence-based guidance on treating plantar fasciitis, particularly in settings where conservative approaches are preferred due to their noninvasive nature and cost-effectiveness. Despite the potential benefits of dry needling and Kinesiology taping in alleviating pain and improving function, the lack of direct comparative studies hinder clinicians' ability to determine the most effective treatment for their patients. To bridge this knowledge gap, this randomized controlled trial directly compared the outcomes of dry needling and Kinesiology taping, utilizing validated scales such as the Visual Analog Scale (VAS) for pain intensity, Foot Function Index (FFI) for functional impact, and SF-12 for overall quality of life. This comprehensive evaluation provided clinicians with evidence-based guidance, enabling them to make informed decisions and choose the most effective treatment for managing plantar fasciitis. Ultimately, this study sought to enhance patient care and quality of life by improving treatment strategies, contributing to the existing body of knowledge, and offering practical recommendations for healthcare providers. By determining the relative effectiveness of dry needling and Kinesiology taping, this research has a direct impact on clinical practice, ensuring that patients receive the most effective treatment for their condition.

Objective of research

To determine the effectiveness of dry needling versus Kinesiology Taping in patients with Plantar Fasciitis.

Literature review

A research article was published in 2021 that compared dry needling and kinesio – taping methods for treatment of myofascial pain syndrome. A total of 26 participants were part of this randomized control trial. The participants were divided into 3 groups. The first group was considered control group and it received on exercise for pain, the second group received KT with exercise and third group received DN with exercise. Along with this the scores were noted by standardized scales and questionnaire such as Visual Analogue Scale (VAS), Neck Disability Index (NDI) and Global Perceived Effect Scale (GPES). The results stated that VAS and NDI scores improved in the KT method and DN method groups while there was no significant result in control group. Hence was concluded that KT and DN methods in myofascial pain syndrome treatment have more positive effects in terms of pain, disability and global effect compared to the control group. This study lacks the direct high quality comparison of both the techniques independently. There is also limited evidence on the long term effect of clinical decision making regarding the use of KT and DN method for myofascial pain syndrome. (Yasar et al., 2021) An article from EJPRJ stated the effects of low dye taping with and without dry needling on pain and functional disability in athletes with plantar fasciitis. A 6 month prolonged randomized control trial was conducted at Pakistan Sport Board, Lahore (PSB). This research comprised of 20 athlete participants. They were randomly assigned to one of the groups were group 1 received low dye taping along with dry needling and regular treatment for plantar fasciitis while group 2 received alone low dye taping and regular exercise protocol. The results showed significant change in functional disability and pain. The results of low dye taping with dry needling and regular exercise protocol had more positive effects than the other group. This research still lacked on long term effects of these protocols as study was for a short time period based. (Manzoor & Munir, 2022)

A research article from the International Journal of Environmental Research and Public Health that was published in November 2022 stated the results of a randomized control trial to assess the short term

impact of dynamic taping versus low dye taping in treating plantar fasciitis. The purpose of this research was to identify and verify the effectiveness of these two taping techniques on pain intensity, ankle range of motion and foot posture index. A total of 57 participants were included in this trial. Group 1 was treated with dynamic taping while group 2 was treated with low dye taping. All the variables were measured 1 week before the treatment and 1 week after. Upon data analysis it was seen that significant results were observed in participants who underwent for dynamic taping to relieve symptoms than low taping. This Research lacked the long term effect of treatment protocol. Also, this research only able to justify effects on pain intensity but was not able to justify the effects of dynamic taping on ankle range of motion and foot posture index. (Castro-Méndez et al., 2022)

Plantar Fasciitis Patients. 69 patients with plantar fasciitis were randomly assigned into 3 groups. Group 1 received dynamic taping with physical therapy, Group 2 received the kinesiology Taping with physical Therapy and the control group i.e. group 3 only received physical therapy. The taping was performed twice a week for 4 weeks, and the taping was removed after 12 hours of application. Patients pain, foot function, and balance were assessed using the visual analog scale (VAS), foot function index (FFI), and Y-balance test (YBT), respectively, before and immediately after the intervention. The results showed there was significant positive effect of the dynamic taping with physical therapy than with kinesio-taping with physiotherapy and the control group showed the lowest effect. This research lacked more evidence on VAS and foot pressure and its long term effect on balance. (Kim & Lee, 2023)

A research article in 2024 was published in the Khyber medical journal. This article addressed the comparative effects of dry needling and cross frictional massage on pain, mobility and functional status in plantar fasciitis patients. This Randomized Control Trial consisted of 48 patients. Patients were divided into 2 groups. Group 1 received dry needling with regular therapy and group 2 received cross frictional massage with regular therapy. Pain, foot health, and functional status were assessed pre- and post-treatment using the Pain Scale for Plantar Fasciitis (PSPF), Foot Health Status Questionnaire (FHSQ), and Foot Functional Index (FFI). Both groups showed significant improvements in pain, mobility, and functional status postintervention. DN is more effective than CFM for pain reduction, mobility improvement, and functional enhancement in plantar fasciitis. Further studies with larger, more diverse populations and longer follow-up are recommended. (Ziaullah et al., 2024)

An article was published in Indian Journal of Physiotherapy & Occupational Therapy to determine the effects dry needling therapy with Plantar fasciitis in reducing pain and increasing Ankle Range of Motion (ROM) when compared to Ultrasound therapy with ankle exercises. 50 participants were included in this study. The experimental group received dry needling with ankle exercises and control group received ultrasound with ankle exercises. Statistical analysis was done and a significant difference was obtained between the experimental and control groups for NPRS and ROM. It was concluded that dry needling therapy with ankle exercises was more beneficial in reducing pain than ultrasound therapy with ankle exercises in Plantar fasciitis subjects. This study lacked the underlying factors that were dealt when providing treatment and also short-term effect of only 2 weeks was studied. (Jain & Jothilingam, 2024)

The impact of quadratus plantae muscle dry needling on pain and thickness of the plantar fascia in individuals with plantar fasciitis was assessed. As plantar fasciitis is leading cause of foot discomfort and this decrease the overall quality of life. 40 participants were included in the study. Group 1 underwent massage and stretches of plantar fascia while group 2 underwent quadratus plantae dry needling. Later

the thickness of plantar fascia was assessed using ultrasound imaging and pain was assessed using visual analogue scale (VAS). The results showed that plantar fasciitis was eased significantly in group 2 participants. This study lacked the role of normal physiotherapy protocol. It did not address the combination therapy that is to be given to plantar fascia patients. (Mahmoudi et al., 2025)

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Research methodology

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Sample Selection:

Inclusion Criteria: Participants age group included was 20 – 45 years (Al-Boloushi, 2019). Both genders were selected the presence of MTrPs on plantar and calf muscles was assured (Al-Boloushi, 2019).

Patients with plantar fasciitis from less than 1-month Eftekharsadat, 2016) Exclusion Criteria:

Participants who have had an MTP injection 3 months before treatment (Yasar, 2021). Participants who have had fractures, Inflammatory joint or systemic disease, skin ulcers and neuropathy (Cotchett, 2014). Participants who have needle phobia (Al-Boloushi, 2019). Participants with history of prior foot or plantar surgery was excluded (Jianing, 2025)

Equipment:

1. Dry Needling Needles 2. Kinesio Taping

Data Collection Procedure:

Screening: Participants were recruited from the hamza hospital Lahore and Lahore poly clinic on the basis of inclusion criteria.

Randomization: Patients fulfilling the inclusion criteria were randomly divided into 2 experimental groups.

Blinding: The study was kept single blinded. The assessor was unaware of treatment given to both groups

Assessment: The data was collected at baseline, 3rd week and 6th week. Baseline assessment was conducted before giving any intervention. The outcome measures were assessed; Visual Analogue Scale score was used to mark the pain level from no pain to worst pain. Next, Foot and Ankle Outcome Score was used so that the patients can immediately reflect onto perceived changes in symptoms, function and particularly response to treatment. SF – 12 was used to assess general physical and mental health status

Treatment Protocol;

Interventions:

- Group A – Dry needling with conventional physiotherapy
- Group B – Kinesiology taping with conventional physiotherapy

Baseline:

Patients underwent baseline assessment and the outcome variables were assessed. Participants were briefed on the treatment protocol that they were about to receive. They were introduced all the conventional therapy techniques along with Dry needling and kinesiotaping. This included electrotherapy by EMS for 10 minutes on target muscles, Ice therapy for 10 – 15 minutes. Exercise protocol that included Ball Roll, Heel Raise, Toe Raise, Massage Therapy, Myofascial Release and instructions on how to perform them correctly with 10 repetitions of exercise with 30 second hold stretch. (Dunning, 2018)

Group A – Dry Needling with Conventional Physiotherapy

- Frequency: Participants received dry needling treatment once a week. The intervention consisted of 6 sessions over the course of 6 weeks. (Methew, 2014)
- Duration: Each dry needling session lasted for approximately 30 minutes. The total duration of the intervention was of 6 weeks with one session per week (Methew, 2014)

Patient Position: Patients were positioned based on the targeted muscles. For the posterior lower leg muscles such as the soleus, quadratus plantae, flexor digitorum brevis, and abductor hallucis muscles, patients position was prone. For accessing the plantar fascia and other muscles on the plantar surface, patients lied supine with the foot in a slight dorsiflexed position. Proper cushioning and support was provided for comfort. (Methew, 2014)

