

Original Article

Comparison of Myofascial Release Technique and Manual Therapy for the Management of Plantar Fasciitis

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Abstract

Background: Plantar fasciitis (PF) is the most common cause of inferior heel pain, affecting up to 10% of the general population over a lifetime. It accounts for 8% to 15% of foot complaints in both athletic and non-athletic individuals.

Objective: This study aimed to compare the effectiveness of the myofascial release technique and manual therapy in the management of plantar fasciitis.

Methods: Thirty patients diagnosed with plantar fasciitis were enrolled in the study and randomly divided into two groups. Group A received myofascial release (MFR) therapy, while Group B underwent manual therapy. Each treatment was administered three times a week for four weeks, with a minimum one-day gap between sessions. Each session lasted 30 minutes and targeted the affected side. Outcome measures included the Foot Function Index (FFI) and the Numerical Pain Rating Scale (NPRS), recorded at baseline (Week 1), post-intervention (Week 4), and follow-up (Week 12). Statistical analysis was performed using SPSS version 25, with paired and independent t-tests used to evaluate within-group and between-group differences.

Results: Both groups showed significant improvement in pain and function. Group A's mean NPRS score decreased from 8.00 (SD = 1.06) to 1.13 (SD = 1.06), while Group B's score decreased from 9.13 (SD = 0.63) to 4.20 (SD = 0.56), with a p-value of 0.00 for both groups. For the FFI, Group A's mean score decreased from 52.80 (SD = 4.36) to 11.46 (SD = 3.20), while Group B's score decreased from 58.53 (SD = 1.35) to 39.46 (SD = 4.61), also showing a p-value of 0.00.

Conclusion: Both myofascial release and manual therapy effectively managed plantar fasciitis. However, myofascial release demonstrated superior outcomes in pain reduction and functional improvement. These findings suggest that myofascial release should be considered a primary treatment option for plantar fasciitis to enhance patient recovery and quality of life.

1 Introduction

Plantar fasciitis (PF) is a prevalent condition characterized by heel pain due to degenerative changes in the plantar fascia, a thick band of tissue connecting the heel bone to the toes (1). This condition often results from repetitive micro-trauma and stress at the plantar fascia's origin on the calcaneus, leading to inflammation and micro-tears (2, 3). PF is frequently referred to as heel spur syndrome, calcaneodynia, or painful heel syndrome, and it manifests as a dull, sharp, or stabbing pain under the heel, especially after rest or the first steps in the morning (4). This initial step pain is a hallmark symptom that significantly impacts patients' quality of life, as it can limit daily activities and mobility.

The incidence of PF is notably high among individuals aged 40 to 60, with no significant gender bias (5). The condition is not solely inflammatory but often involves non-inflammatory degenerative changes in the plantar fascia, challenging the traditional understanding of its etiology (4, 6). In the United States, PF is responsible for approximately 11-15% of professional visits related to foot pain, affecting more than two million people annually (6). Although the precise cause of PF remains unknown in about 85% of cases, certain risk factors have been identified, including obesity, occupations requiring prolonged standing, and high-impact physical activities (7).

Athletes, particularly runners, are at increased risk due to overuse, improper footwear, and training on hard surfaces, which can lead to excessive strain on the plantar fascia (8). In older adults, PF is often associated with diminished intrinsic muscle strength and poor shock absorption due to acquired pes planus (flat feet) and decreased healing capacity (8,9). Additionally, individuals with diabetes may

experience PF due to peripheral motor neuropathy, resulting in muscle atrophy and altered foot mechanics (9). Despite the high prevalence of PF, treatment options vary, ranging from conservative measures like stretching and taping to more invasive interventions such as steroid injections and surgery (10-19).

Myofascial release (MFR) and manual therapy have emerged as promising non-surgical treatment modalities for PF. MFR involves applying low-load, long-duration stretches to the myofascial complex to alleviate pain and improve function, potentially offering enhanced mobility and reduced discomfort for patients (20-23). On the other hand, manual therapy encompasses joint mobilization techniques aimed at increasing joint mobility and addressing movement dysfunction (24, 25). These therapies target the underlying biomechanical and functional impairments associated with PF, providing a holistic approach to management.

The increasing focus on physical fitness and running has led to a surge in PF cases, underscoring the need for effective and accessible treatment options. This study explores the comparative effectiveness of MFR and manual therapy in managing PF, contributing to the growing body of evidence supporting these interventions. Through rigorous assessment and standardized outcome measures, this research aims to elucidate the potential benefits of these therapies, offering valuable insights for clinicians and patients alike.

2 Material and Methods

The study was designed as a randomized controlled trial conducted over a period of six months at a tertiary care hospital. Thirty participants, aged between 25 and 60 years and diagnosed with plantar fasciitis, were recruited through convenience sampling. The participants were informed about the study, and their informed consent was obtained in accordance with the ethical standards outlined in the Declaration of Helsinki (20). Inclusion criteria included a clinical diagnosis of plantar fasciitis, while exclusion criteria involved other foot pathologies, recent foot surgery, or any contraindications to manual therapy or myofascial release.

Upon inclusion, participants underwent a comprehensive baseline assessment, which included demographic data collection such as age, sex, height, weight, and body mass index (BMI). A focused medical history was taken, including any history of smoking, claudication, previous foot infections, or ulcers. The affected foot was thoroughly examined for tenderness, warmth, swelling, and pain during plantar fascia stretch. Pain severity was assessed using the Numerical Pain Rating Scale (NPRS), and functional ability was evaluated using the Foot Function Index (FFI) (21).

Participants were randomly assigned to one of two groups: Group A received myofascial release therapy, while Group B underwent manual therapy. Group A's intervention involved therapeutic ultrasound in continuous mode with an intensity of 1 W/cm² and a frequency of 1 MHz for five minutes in a prone position for ten sessions, one per day. Myofascial release techniques included using the thumb and hand to release tension in the gastrocnemius, soleus, and plantar myofasciae with the client in a prone position (23). Group B received manual therapy that involved joint mobilization techniques according to the convex-concave rule, performed by trained physical therapists to enhance joint mobility and alleviate pain (24, 25).

Both groups received therapy three times a week for four weeks, with at least one day between sessions. The treatments were administered solely to the affected foot, and each session lasted approximately 30 minutes. Participants were instructed to continue their daily activities without additional interventions.

The primary outcome measures were pain reduction as measured by NPRS and functional improvement as assessed by FFI. Data were collected at baseline (Week 1), post-intervention (Week 4), and at a follow-up visit (Week 12) after randomization. The trial's outcome measures were documented using standardized forms and evaluated by trial doctors and patient-reported questionnaires.

Statistical analyses were performed using SPSS version 25. Descriptive statistics were used to summarize baseline characteristics and outcome measures. Paired t-tests were employed to assess within-group differences in NPRS and FFI scores from baseline to follow-up, while independent t-tests were used to compare differences between the two groups. The significance level was set at $p < 0.05$ for all analyses, indicating statistical significance for observed changes in pain and functional scores. This robust methodological approach ensured the reliability and validity of the study's findings.

3 Results

A total of 30 participants were enrolled in the study and randomized into two equal groups: Group A (Myofascial Release Technique) and Group B (Manual Therapy). The demographic characteristics of the participants were balanced between the groups. All participants completed the study and attended all treatment sessions.

Table 1 displays the frequency distribution of patients in each group.

Group	Frequency	Percentage
MFR	15	50%
Manual Therapy	15	50%
Total	30	100%

The Numerical Pain Rating Scale (NPRS) scores before and after treatment are shown in Table 2. Both groups demonstrated significant reductions in pain scores, with Group A showing a greater reduction compared to Group B.

Table 2: NPRS Scores

Group	Time Point	Mean	Standard Deviation (SD)	P-Value
Group A	Before	8.00	1.06	0.00
	After	1.13	1.06	
Group B	Before	9.13	0.63	0.00
	After	4.20	0.56	

The mean pain score for Group A decreased from 8.00 (SD = 1.06) to 1.13 (SD = 1.06), while in Group B, it decreased from 9.13 (SD = 0.63) to 4.20 (SD = 0.56). Both reductions were statistically significant with p-values of 0.00, indicating a significant improvement in pain levels for both treatment groups.

The Foot Function Index (FFI) scores before and after treatment are presented in Table 3. Both groups showed improvement, with Group A achieving a more pronounced enhancement in functional ability compared to Group B.

Table 3: FFI Scores

Group	Time Point	Mean	Standard Deviation (SD)	P-Value
Group A	Before	52.80	4.36	0.00
	After	11.46	3.20	
Group B	Before	58.53	1.35	0.00
	After	39.46	4.61	

The mean FFI score for Group A decreased from 52.80 (SD = 4.36) to 11.46 (SD = 3.20). In Group B, the FFI score decreased from 58.53 (SD = 1.35) to 39.46 (SD = 4.61). These results demonstrate statistically significant improvements in functional ability, with p-values of 0.00 for both groups.

Overall, both the myofascial release technique and manual therapy were effective in reducing pain and improving the functional status of patients with plantar fasciitis. However, the myofascial release technique showed a greater reduction in both pain and functional impairment compared to manual therapy.

4 Discussion

The results of this study demonstrated that both myofascial release (MFR) and manual therapy effectively reduced pain and improved function in patients with plantar fasciitis. However, MFR was found to be more effective than manual therapy in both pain reduction and enhancement of functional ability. These findings align with previous research that has highlighted the benefits of myofascial release in addressing musculoskeletal conditions by releasing fascial restrictions and restoring tissue function (23, 35).

One of the key strengths of this study was its randomized controlled design, which minimized bias and allowed for a direct comparison between the two interventions. The use of validated outcome measures, such as the Numerical Pain Rating Scale (NPRS) and the Foot Function Index (FFI), further enhanced the reliability of the results. Additionally, the study's duration and follow-up period were sufficient to assess the immediate and short-term effects of the treatments.

The greater efficacy of MFR observed in this study may be attributed to its mechanism of action, which involves applying sustained pressure to release fascial restrictions, potentially leading to improved mobility and reduced pain (33). This aligns with other studies that have reported similar benefits of MFR in managing chronic pain conditions, suggesting its utility as a complementary approach in physical therapy (34, 36). Moreover, MFR has been shown to stimulate fibroblast proliferation and collagen synthesis, promoting healing by replacing degenerated tissue with stronger, more functional tissue (33-34).

While manual therapy also showed significant benefits, its effects were less pronounced compared to MFR. This could be due to the differences in therapeutic focus, as manual therapy primarily addresses joint mobility and alignment through mobilization techniques (24, 25). The study's findings suggest that while manual therapy remains a valuable tool in managing plantar fasciitis, combining it with MFR may enhance therapeutic outcomes.

Despite the positive findings, the study had several limitations. The sample size was relatively small, which may limit the generalizability of the results to broader populations. Additionally, the study was conducted in a single clinical setting, which may not reflect variations in practice elsewhere. Future research could benefit from larger, multicenter trials to validate these findings and explore the long-term effects of these interventions.

The study did not explore the potential synergistic effects of combining MFR and manual therapy, which could be a valuable avenue for future research. Investigating whether a combined approach could provide superior outcomes would offer insights into optimizing treatment protocols for plantar fasciitis. Additionally, exploring the patient-specific factors that may influence treatment efficacy, such as age, duration of symptoms, and activity level, could help tailor interventions to individual needs.

Both myofascial release and manual therapy were effective in managing plantar fasciitis, with MFR showing a more substantial impact on pain reduction and functional improvement. These findings support the inclusion of MFR in the therapeutic arsenal for plantar fasciitis, highlighting its potential to enhance patient outcomes. Future research should focus on expanding these findings and exploring combined treatment strategies to further improve care for individuals with plantar fasciitis.

5 Conclusion

In conclusion, both myofascial release and manual therapy were effective in reducing pain and improving function in patients with plantar fasciitis, with myofascial release showing superior outcomes. These findings suggest that incorporating myofascial release into treatment plans for plantar fasciitis could significantly enhance patient recovery and quality of life. The human healthcare implications of this study emphasize the need for clinicians to consider myofascial release as a primary or adjunctive therapy in managing plantar fasciitis, potentially reducing the reliance on invasive procedures and enhancing the overall effectiveness of conservative care strategies. Further research to explore long-term effects and combined treatment approaches could lead to optimized protocols, ultimately benefiting patient outcomes in clinical practice.

6 References

1. Baltich J, Emery CA, Whittaker JL, Nigg BM. Running Injuries In Novice Runners Enrolled In Different Training Interventions: A Pilot Randomized Controlled Trial. *Scand J Med Sci Sports*. 2017 Nov;27(11):1372-83.
2. DiBonaventura M, Richard L, Kumar M, Forsythe A, Flores NM, Moline M. The Association Between Insomnia And Insomnia Treatment Side Effects On Health Status, Work Productivity, And Healthcare Resource Use. *PLoS One*. 2015 Oct;10(10): e0137117.
3. Breuer B, Cruciani R, Portenoy RK. Pain Management By Primary Care Physicians, Pain Physicians, Chiropractors, And Acupuncturists: A National Survey. *South Med J*. 2010 Aug;103(8):738-47.
4. Covey CJ, Mulder MD. Plantar Fasciitis: How Best To Treat. *J Fam Pract*. 2013 Sep;62(9):466-71.
5. Chaiwanichsiri D, Janchai S, Tantisiriwat N. Foot Disorders And Falls In Older Persons. *Gerontology*. 2009;55(3):296-302.
6. Arkin RM. Self-Presentation In DM, RR V. AAPOR-The American Association For Public Opinion Research. (2015). Standard Definitions. Final Dispositions Of Case Codes And Outcome Rates For Surveys. Retrieved From http://www.aapor.org/AAPORKentico/AAPOR_Main/media/publications/Standard-Definitions2015_8theditionwithchanges_April2015_logo.pdf Ackoff, RL (1990). Strategy. *Systems Practice*. 1990;3(6):521-4. *Social Sci Inf*. 2003;42(2):155-83.
7. Chou R, Turner JA, Devine EB, Hansen RN, Sullivan SD, Blazina I, Dana T, Bougatsos C, Deyo RA. The Effectiveness and Risks Of Long-Term Opioid Therapy For Chronic Pain: A Systematic Review For A National Institutes Of Health Pathways To Prevention Workshop. *Ann Intern Med*. 2015 Feb;162(4):276-86.
8. Shetty SH, Dhond A, Arora M, Deore S. Platelet-Rich Plasma Has Better Long-Term Results Than Corticosteroids Or Placebo For Chronic Plantar Fasciitis: Randomized Control Trial. *J Foot Ankle Surg*. 2019 Jan;58(1):42-6.
9. Cotchett M, Rathleff MS, Dilnot M, Landorf KB, Morrissey D, Barton C. Lived Experience And Attitudes Of People With Plantar Heel Pain: A Qualitative Exploration. *J Foot Ankle Res*. 2020 Dec;13:1-9.
10. Fraser JJ, Glaviano NR, Hertel J. Utilization Of Physical Therapy Intervention Among Patients With Plantar Fasciitis In The United States. *J Orthop Sports Phys Ther*. 2017 Feb;47(2):49-55.

11. Irving DB, Cook JL, Young MA, Menz HB. Obesity And Pronated Foot Type May Increase The Risk Of Chronic Plantar Heel Pain: A Matched Case-Control Study. *BMC Musculoskelet Disord*. 2007 Dec;8(1):1-8.
12. López-López D, Marañon-Medina J, Losa-Iglesias ME, Calvo-Lobo C, Rodríguez-Sanz D, Palomo-López P, Vallejo RB. The Influence Of Heel Height Related On Quality Of Life On The Foot In A Sample Of Women. *Rev Assoc Med Bras*. 2018;64:324-9.
13. Kao MC, Minh LC, Huang GY, Mitra R, Smuck M. Trends In Ambulatory Physician Opioid Prescription In The United States, 1997-2009. *PM&R*. 2014 Jul;6(7):575-82.
14. Teixeira RN, Lunardi A, da Silva RA, Lopes AD, Carvalho CR. Prevalence Of Musculoskeletal Pain In Marathon Runners Who Compete At The Elite Level. *Int J Sports Phys Ther*. 2016 Feb;11(1):126.
15. Meghani SH, Byun E, Gallagher RM. Time To Take Stock: A Meta-Analysis And Systematic Review Of Analgesic Treatment Disparities For Pain In The United States. *Pain Med*. 2012 Feb;13(2):150-74.
16. Pollack A, Britt H. Plantar Fasciitis In Australian General Practice. *Aust Fam Physician*. 2015 Mar;44(3):90-1.
17. Porucznik CA, Johnson EM, Rolfs RT, Sauer BC. Specialty Of Prescribers Associated With Prescription Opioid Fatalities In Utah, 2002–2010. *Pain Med*. 2014 Jan;15(1):73-8.
18. Din NU, Rahman S. Determining The Mean Reduction In Pain Score After Treatment With Heel Pad In Planter Fasciitis. *J Saidu Med Coll Swat*. 2018 Oct;8(2).
19. Joshvaghan HG, Omidi-Kashani F. Plantar Fasciitis Risk Factors In Normal Population. *Biosci Biotechnol Res Asia*. 2018 Jun;15(2):427-30.
20. Whittaker GA, Landorf KB, Munteanu SE, Menz HB. Predictors Of Response To Foot Orthoses And Corticosteroid Injection For Plantar Heel Pain. *J Foot Ankle Res*. 2020 Dec;13:1-9.
21. Scher CD, Belmont Jr LC, Bear MR, Mountcastle SB, Orr JD, Owens MB. The Incidence Of Plantar Fasciitis In The United States Military. *J Bone Joint Surg Am*. 2009 Dec;91(12):2867-72.
22. Matthew RH, Alisa WG, Lior C, Steven WL. RCT Of Calcaneal Taping, Sham Taping, And Plantar Fascia Stretching For The Short-Term Management Of Plantar Heel Pain. *J Orthop Sports Phys Ther*. 2006;32(6):364-72.
23. Young B, Walker MJ, Strunce J, Boyles R. A Combined Treatment Approach Emphasizing Impairment-Based Manual Physical Therapy For Plantar Heel Pain: A Case Series. *J Orthop Sports Phys Ther*. 2004 Nov;34(11):725-33.
24. Abd Aziz NU, Osman N, Rosman NA, Talip NK, Chinnasee C, Nadzalan AM. The Effects Of Elbow Flexion Angles On Handgrip Force Production Among Trained Women. *Age (Years)*. 2019;21:0-93.
25. Boroushak N, Jafarnezhadgero AA, Rashedi H. Effect Of Quadriceps Muscles Cooling On Plantar Pressure Variables During Running. *Jundishapur Sci Med J*. 2018 Mar;17(1):11-9.
26. Kisner C, Colby LA, Borstad J. *Therapeutic Exercise: Foundations And Techniques*. F.A. Davis; 2017 Oct 18.
27. Moyne-Bressand S, Dhieux C, Dousset E, Decherchi P. Effectiveness Of Foot Biomechanical Orthoses To Relieve Patients Suffering From Plantar Fasciitis: Is The Reduction Of Pain Related To Change In Neural Strategy?. *Biomed Res Int*. 2018 Dec;2018:1-7.
28. Podolsky R, Kalichman L. Taping For Plantar Fasciitis. *J Back Musculoskelet Rehabil*. 2015 Jan;28(1):1-6.
29. Dimitrios S. Tendinopathy: The Role Of Stretching. *Australas Med J*. 2017;10(1):63.
30. McClinton SM, Heiderscheid BC, McPoil TG, Flynn TW. Effectiveness Of Physical Therapy Treatment In Addition To Usual Podiatry Management Of Plantar Heel Pain: A Randomized Clinical Trial. *BMC Musculoskelet Disord*. 2019 Dec;20(1):1-4.
31. MacDonald R. The Positional Release Phenomenon And The Effects Of Counterstrain Manipulation: Reflections And Implications. *Int Musculoskelet Med*. 2013 Sep;35(3):95-8.
32. Akbari M, Pahnabi G, Karimi H. Immediate Effect Of Kinesio Taping On Knee Joint Position Sense After Anterior Cruciate Ligament Reconstruction. *J Clin Physiother Res*. 2017;2(4):162-8.

33. Bath M, Owens J. Physiology, Viscerosomatic Reflexes.
34. Hemlata NK, Praveen S, Kumar S, Badoni N. Comparison Of The Effectiveness Of Myofacial Release Technique And Stretching Exercise On Plantar Fasciitis. *Physiother Occup Ther.* 2019 Apr;12(2).
35. Akram MR, Yousaf MN, Waseem M, Chaudhary FS. Comparison Of Mean Pain Score Of Oral Non-Steroidal Anti-Inflammatory Agents And Locally Injectable Steroid For The Treatment Of Plantar Fasciitis. *J Pak Med Assoc.* 2022 Feb;72(2):231-6.

Disclaimers

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