



ORIGINAL RESEARCH PAPER

EFFICACY OF MEDIAL ARCH SUPPORT WITH HEEL RAISES COMPARED WITH SOFT MICROCELLULAR POLYMER FOOTWEAR IN INDIVIDUALS WITH PLANTAR FASCIITIS: A COMPARATIVE STUDY

Occupational Therapy

KEY WORDS: Heel Raise, Medial Arch Support, Occupational Therapy, Plantar Fasciitis, PFPS, Soft MCP Footwear, Visual Analogue Scale

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ABSTRACT

Plantar fasciitis is one of the most common causes of chronic heel pain and functional disability, resulting in limitations in walking, prolonged standing, and participation in daily activities. Various conservative treatment approaches have been advocated; however, evidence comparing different footwear modifications remains limited. The present study was undertaken to compare the efficacy of medial arch support with heel raises and soft microcellular polymer (MCP) footwear in combination with Conventional Occupational Therapy in individuals with plantar fasciitis. Twenty participants diagnosed with plantar fasciitis were selected using purposive sampling and randomly allocated into two groups of ten subjects each. A) Group A received soft MCP footwear with Conventional Occupational therapy. B) Group B received medial arch support with heel raises along with Conventional Occupational therapy. Pain and functional disability were assessed using the Visual Analogue Scale (VAS) and Plantar Fasciitis Pain/Disability Scale (PFPS) before and after intervention of four weeks (12 treatment sessions). Statistical analysis was performed using paired and unpaired t tests. Both groups demonstrated statistically significant improvement following treatment ($p < 0.05$); however, participants treated with medial arch support with heel raises exhibited significantly greater reduction in pain and improvement in functional ability than those using soft MCP footwear. The findings suggest that medial arch support with heel raises, when combined with Conventional Occupational Therapy demonstrated superior clinical outcomes for improving pain and functional outcomes in individuals with plantar fasciitis.

INTRODUCTION

Plantar fasciitis is one of the most common causes of plantar heel pain and a frequently encountered musculoskeletal disorder of the foot. It accounts for approximately 11–15% of foot complaints requiring professional care and affects nearly 10% of the population during their lifetime. The condition is commonly seen in middle-aged adults and is associated with prolonged standing, repetitive weight-bearing activities, obesity, excessive walking or running, and inappropriate footwear. Although previously considered an inflammatory disorder, current evidence suggests that chronic plantar fasciitis is primarily a degenerative condition resulting from repetitive microtrauma to the plantar fascia.¹

The plantar fascia is a dense fibrous aponeurosis extending from the medial calcaneal tubercle to the proximal phalanges. It plays a vital role in maintaining the medial longitudinal arch, absorbing shock, and stabilizing the foot during gait through the windlass mechanism. Repetitive mechanical overload and abnormal foot biomechanics increase tensile stress on the plantar fascia, leading to pain, functional limitation, and reduced mobility.²

Conservative management remains the preferred treatment for plantar fasciitis and includes patient education, activity modification, therapeutic exercises, orthotic devices, footwear modifications, and Conventional Occupational Therapy. Foot orthoses are widely used to reduce plantar loading, improve foot alignment, and enhance functional recovery. Soft Microcellular Polymer (MCP) footwear primarily provides cushioning and shock absorption, whereas medial arch support with heel raises offers biomechanical correction by supporting the medial longitudinal arch and reducing stress on the plantar fascia.³

Conventional Occupational Therapy complements these interventions by addressing pain, improving functional mobility, and facilitating participation in daily activities through stretching, strengthening exercises, activity modification, and home-based rehabilitation. Despite the widespread use of both Soft MCP Footwear and Medial Arch Support with Heel Raises, evidence directly comparing their effectiveness when combined with Conventional Occupational Therapy remains limited. Therefore, the present study was undertaken to compare the efficacy of these two

interventions in reducing pain and improving functional ability in individuals with plantar fasciitis.⁴

AIM

To compare the efficacy of medial arch support with heel raises versus Soft MCP footwear in combination with Conventional Occupational Therapy in reducing pain and improving functional ability among individuals with plantar fasciitis.

Biomechanics of the Plantar Fascia

The plantar fascia is a dense fibrous aponeurosis that originates from the medial aspect of the calcaneal tuberosity and extends distally towards the proximal phalanges of the toes. It serves as a passive stabilizing structure that supports the medial longitudinal arch and plays a crucial role in maintaining normal foot mechanics during standing and dynamic activities. In addition to providing structural support, the plantar fascia facilitates efficient distribution of plantar loads and assists in absorbing repetitive stresses generated during weight-bearing movements.

During the gait cycle, the plantar fascia functions through the windlass mechanism, whereby dorsiflexion of the toes increases tension within the fascia, elevates the medial longitudinal arch, and converts the foot into a rigid lever for effective propulsion. This mechanism enhances foot stability during the terminal stance phase while improving the efficiency of force transmission and energy conservation during walking.⁵

Abnormal foot mechanics, including excessive pronation, pes planus, restricted ankle dorsiflexion, obesity, prolonged standing, and inappropriate footwear, increase tensile stress on the plantar fascia and predispose it to repetitive microtrauma. Continued mechanical overload may result in degenerative changes at its calcaneal attachment, leading to plantar fasciitis. Medial arch support with heel raises helps reduce these abnormal stresses by improving foot alignment, supporting the medial longitudinal arch, and redistributing plantar pressure. In contrast, Soft MCP Footwear primarily provides cushioning and shock absorption, reducing impact forces during weight-bearing without substantially correcting the underlying biomechanical abnormalities. These differences in mechanical action may explain the greater improvement in pain and functional ability observed with medial arch support and heel raises in the present study.



Soft MCP Footwear



Medial Arch Support with Heel Raise

MATERIALS AND METHODOLOGY

A sample of 20 individuals diagnosed with plantar fasciitis were taken for the purpose of this study. Participants were selected according to the following criteria:

Inclusion Criteria

1. Adults aged 18 years and above.
2. Clinically diagnosed with plantar fasciitis with symptoms persisting for at least 4 weeks.
3. Both male and female participants.
4. Localized pain and tenderness over the plantar heel (medial calcaneal tubercle).
5. Pain aggravated during the first step in the morning, prolonged standing, or walking.
6. Presence of functional limitations in activities such as prolonged standing, walking, or weight-bearing tasks.
7. Individuals willing to participate and provide written informed consent.

Exclusion Criteria

1. History of foot or ankle trauma or fracture.
2. Previous foot or ankle surgery.
3. Open wounds, ulcers, or skin infections over the affected foot.
4. Peripheral vascular disorders affecting the lower limb.
5. Any neurological or systemic musculoskeletal condition affecting gait or foot function.

The participants were allocated into two groups comprising 10 participants each.

- A) Group A received Soft MCP footwear in combination with Conventional Occupational Therapy
- B) Group B received medial arch support with heel raises in combination with Conventional Occupational Therapy.

The interventions were administered three sessions per week for four weeks (12 sessions). Participants in both groups were

educated regarding proper foot care, activity modification, ergonomic advice, and adherence to the prescribed home exercise programme.

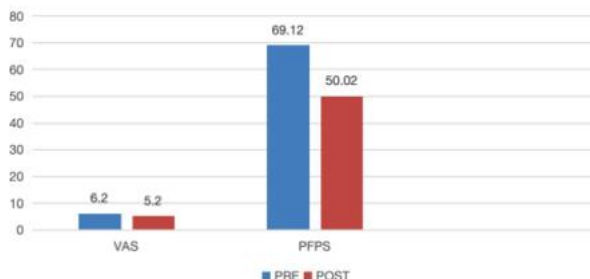
Conventional Occupational Therapy included:

- Plantar fascia stretching
- Gastrocnemius muscle stretching
- Soleus muscle stretching
- Towel stretching exercise
- Toe extension stretching
- Towel curl exercise
- Marble pick-up exercise
- Short foot (intrinsic foot muscle strengthening) exercise
- Heel raise exercise
- Balance and weight-bearing training
- Home exercise programme

Participants allocated to Group A were instructed to wear the Soft MCP footwear during routine weight-bearing activities throughout the intervention period. Participants in Group B were provided with a prefabricated medial longitudinal arch support along with heel raises and were instructed regarding proper fitting and regular use during ambulation and daily functional activities.

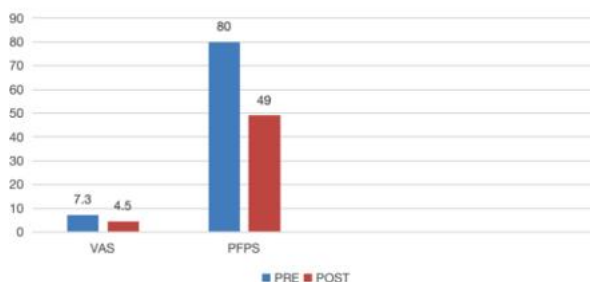
RESULTS

PRE AND POST VAS AND PFPS SCORES IN SOFT MCP FOOTWEAR



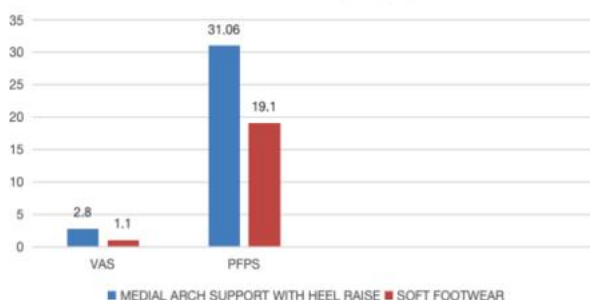
Comparison of PRE and POST VAS and PFPS Scores in Soft MCP Footwear Group

PRE AND POST VAS AND PFPS SCORES IN MEDIAL ARCH SUPPORT WITH HEEL RAISE



Comparison of PRE and POST VAS and PFPS Scores in Medial Arch Support with Heel Raise Group

MEAN DIFFERENCE OF VAS AND PFPS SCORE BETWEEN THE GROUPS



Comparison of VAS and PFPS Scores Between Medial Arch support with Heel Raise Group and Soft MCP Footwear Group

The pre- and post-intervention outcomes were evaluated using the Visual Analogue Scale (VAS) and Plantar Fasciitis Pain/Disability Scale (PFPS). Baseline demographic characteristics were comparable between the two groups.

Participants treated with Soft MCP Footwear combined with Conventional Occupational Therapy showed improvement in mean VAS scores from 6.20 to 5.20 and PFPS scores from 69.00 to 50.00. The Medial Arch Support with Heel Raises group demonstrated greater improvement, with mean VAS scores reducing from 7.30 to 4.50 and PFPS scores from 80.00 to 49.00. Intergroup comparison revealed significantly greater reductions in pain and disability in the Medial Arch Support with Heel Raises group than in the Soft MCP Footwear group ($p < 0.05$).

DISCUSSION

The present study demonstrated significant improvements in pain intensity and functional ability in both intervention groups following four weeks of treatment. However, participants receiving Medial Arch Support with Heel Raises in combination with Conventional Occupational Therapy exhibited greater improvement than those treated with Soft MCP Footwear. These findings are supported by the Heel Pain–Plantar Fasciitis Clinical Practice Guideline by Martin et al., which recommends foot orthoses combined with exercise therapy as an effective conservative approach for reducing pain and improving function in individuals with plantar fasciitis.

The superior outcomes observed in the Medial Arch Support with Heel Raises group may be attributed to improved biomechanical alignment of the foot. Medial arch support helps maintain the medial longitudinal arch, reduces excessive pronation, redistributes plantar pressure, and decreases tensile stress on the plantar fascia during gait. Heel raises further reduce strain within the Achilles tendon–plantar fascia complex, thereby lowering mechanical stress at the calcaneal insertion. These biomechanical mechanisms have been comprehensively described by Buchanan et al. in the StatPearls review of plantar fasciitis.

Although the Soft MCP Footwear group also demonstrated significant improvement, its primary therapeutic effect appears to be shock absorption and reduction of heel impact during weight-bearing activities rather than correction of abnormal foot biomechanics. Consequently, improvements in pain and functional ability were comparatively smaller than those achieved with medial arch support. Similar findings were reported by Whittaker et al., whose systematic review concluded that biomechanical foot orthoses provide greater overall clinical benefit than accommodative cushioning devices in the management of plantar heel pain.⁶

The present study was limited by its relatively small sample size and short duration of follow-up. Future randomized controlled trials with larger study populations and long-term follow-up are required to determine the sustained effectiveness of Medial Arch Support with Heel Raises in the conservative management of plantar fasciitis.

CONCLUSION

Both Soft MCP Footwear and Medial Arch Support with Heel Raises, when combined with Conventional Occupational Therapy, significantly reduced pain and improved functional ability in individuals with plantar fasciitis. However, Medial Arch Support with Heel Raises demonstrated greater improvement in both pain and functional outcomes, suggesting that biomechanical correction of the medial longitudinal arch is more effective than cushioning alone in the conservative management of plantar fasciitis. Further well-designed randomized studies with larger sample sizes are recommended to validate these findings.

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