

# Effect of Myofascial Release Technique in Plantar Fasciitis on Pain and Function- An Evidence Based Study

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## ABSTRACT

**Background:** Plantar fasciitis is a common cause of pain in the heel which occurs as a result of inflammation of the plantar aponeurosis at its attachment on the calcaneal tuberosity. Myofascial Release Technique is intended to improve the mobility of soft tissue through application of a slow, controlled mechanical stress directly into a restriction. Pressure is gradually increased or repeated until the mobility of the tissue is felt to improve.

**Purpose:** The purpose is to study the scientific evidences regarding the effect of the myofascial release technique in plantar fasciitis.

**Methodology:** A search for relevant articles was carried out using key words- plantar fasciitis, myofascial release technique, pain and functions and search engines- Google Scholar, PubMed, PEDro, ScienceDirect, ResearchGate and CINAHL. Studies were selected from year 2010-2019. Ten studies were included in which there were 7 RCT, 1 Prospective experimental study, 1 Quasi Experimental study and 1 Pre-post interventional study.

**Results:** 10 studies were reviewed from which 7 studies concluded that MFR is more effective than a control group receiving sham treatment or conventional treatment and 3 studies highlighted MFR to be equally effective to alternative treatments.

**Conclusion:** Based on the analysis of these 10 articles, it can be concluded that MFR is an effective treatment regimen in individuals with Plantar Fasciitis.

**Clinical Implication:** MFR is found to be effective in reducing pain and improving functions in individuals with plantar fasciitis,

therefore MFR technique can be considered as an adjunctive treatment in plantar fasciitis.

**Key Words:** Plantar Fasciitis, Myofascial Release Technique, Pain, Function.

## INTRODUCTION

Plantar fasciitis is a common cause of pain in the heel which occurs as a result of inflammation of the plantar aponeurosis at its attachment on the calcaneal tuberosity. The pain is worst early in the morning, and often improves with activity. [1] Plantar fasciitis is classified as a syndrome that results due to repetitive trauma to the plantar fascia at its origin on the calcaneum. [2]

Approximately 15% of all complaints related to foot requiring the attention of health-care professionals can be attributed to this cause. Also, it accounts for 8% of injuries in athletes involved in running-related sports. The incidence of PF is commonly found in people between the ages 40-60 years without any bias towards either sex. [3] The classic presentation of plantar fasciitis is pain on the sole of the foot at the inferior region of the heel. Pain is particularly bad with the first few steps taken on rising in the morning or after an extended refrain from weight-bearing activity. Often the pain diminishes after a few steps and through the course of the day, but returns if intense or prolonged weight-bearing activity is carried out. Initially the

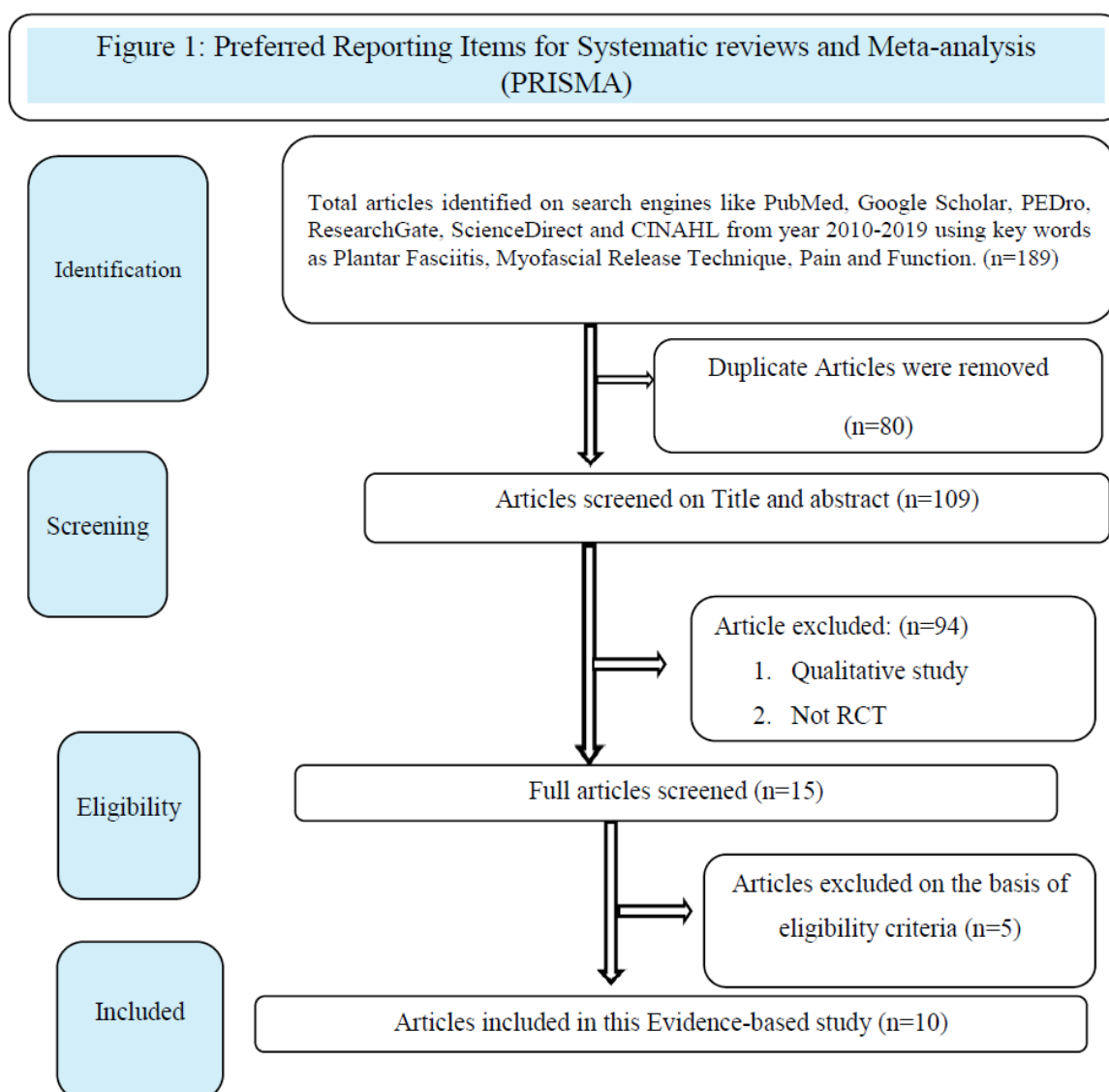
heel pain may be diffuse or migratory; however, with time it usually focuses around the area of the medial tuberosity of calcaneum. [4]

The direct MFR technique is intended to improve the mobility of soft tissue through application of a slow, controlled mechanical stress directly into a restriction and is usually done using fingers, thumb, forearm or elbows. Pressure is gradually increased or repeated until the mobility of the tissue is felt to improve. Indirect techniques are applied similarly, but the amount of force used, compared with that in direct techniques, is lower in intensity and much longer in duration, which gives the tissue an opportunity to “melt” or release. [5]

Myofascial release (MFR) is a soft tissue mobilization technique used for chronic conditions that cause tightness and restriction in soft tissues. Myofascial release technique leads to change in the viscosity of the ground substance to a more fluid state, thus eliminating the fascia’s excessive pressure on the pain sensitive structure and restores proper alignment. Hence this technique is proposed to act as a catalyst in the resolution of PF. [6]

### METHODOLOGY

**Study Type:** This is an Evidence Based Study, conducted according to Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines (Figure 1).



**Search strategy:** The search engines used to find the appropriate articles were: Google Scholar, PubMed, PEDro, ScienceDirect, ResearchGate, CINAHL.

**Key words used for the search were:** Plantar Fasciitis, Myofascial Release Technique, Pain and function.

**Eligibility criteria:** Articles were selected from last 10 years (2010-2019). Total 189 articles were found, out of which 15 articles were relevant. Out of 15 articles, 10 articles were included in the study (Table 1). Other articles were excluded because they used myofascial trigger point therapy and outcome measures were other than pain and function.

**Data Analysis:** All 10 articles were assessed using 2 scales:

**The PEDro scale:** It assesses methodological quality and consists of a checklist of 11 criteria, 10 of which are scored. For each criterion the study met, 1 point was awarded. The points were tallied

and presented as a score out of 10. The scale applies only to experimental studies. For this review, investigations with PEDro scores of 6 to 10 were considered high quality, of 4 to 5 were considered moderate quality, and of 0 to 3 were considered low quality. The PEDro score has demonstrated ‘fair’ to ‘excellent’ inter-rater reliability (Intraclass Correlation Coefficient 0.53-0.91) for randomized controlled trials of physiotherapy interventions. Convergent validity is supported for the PEDro score through correlation with other quality rating scales including: the Jadad scale (0.35) and van Tulder 2003 scale (0.71) for clinical trials of physiotherapy related interventions.<sup>[7]</sup> (Appendix 1)

**The CEBM’s Levels of Evidence scale:** It assesses quality based on study design, which categorize the studies in a scale ranging from 1 to 5 with further subdivision for each. (Appendix 2)

**Characteristics of included studies**

First Author Name And Year	Outcome Measure	Conclusion	Sample Size	PEDro	Level of evidence
A.M Harlapur <sup>[8]</sup> 2010	FFI VAS	Both MFR and PRT along with Ultrasound therapy for chronic plantar fasciitis showed improvement	60	6/10	1b
A.O. Yadav <sup>[9]</sup> 2012	FFI VAS	U.S & MFR technique were found to be effective but MFR technique was more effective than U.S.	60	5/10	1b
M.S. Ajimsha <sup>[10]</sup> 2014	FFI PPT	The MFR was more effective than a control intervention with SUST for the treatment of PHP.	66	8/10	1b
R. Dhillon <sup>[11]</sup> 2015	NPRS	MFR along with calf stretching and ultrasound are more effective in improving pain in plantar fasciitis.	30	5/10	1b
R.B. Pattanshetty <sup>[12]</sup> 2015	VAS Ankle ROM	All three manual techniques i.e. MFR, PRT and Calf stretching with therapeutic ultrasound were effective in immediate relief of pain and improving ankle range of motion in subjects with chronic plantar fasciitis.	60	6/10	1c
Avnee Sarin <sup>[13]</sup> 2015	FFI VAS	The finding of the study support that the MFR and Iontophoresis are effective in reducing pain and functional disability in subjects with plantar Fasciitis.	30	5/10	1b
S. Shenoy <sup>[14]</sup> 2016	VAS Ankle Range of Motion	Myofascial release therapy along with conventional PT treatment was more effective than Cyriax technique along with conventional PT treatment	30	6/10	1b
Viral Chitara <sup>[6]</sup> 2017	VAS FAAM Pressure Algometry	Both MET and MFR techniques are found to be effective on pain, pressure pain threshold and on lower limb functional activity	30	6/10	1b
S.C. Pant <sup>[15]</sup> 2018	FFI VAS	Both MFR and stretching exercises are effective, however MFR is better than stretching in 4 weeks.	30	6/10	1b
Hemlata <sup>[16]</sup> 2019	FFI VAS	The present study concluded that MFR is better than Stretching in patients with plantar fasciitis.	30	5/10	1b

**RESULTS**

Evidences were reviewed and analysis was done on the basis of PEDro score and CEBM’s Level of Evidence Scale.

Articles were selected from last 10 years (2010-2019). Total 189 articles were found, out of which 15 articles were relevant. Out of 15 articles, 10 articles were included in the study

7 studies concluded that MFR is more effective than a control group receiving sham treatment or conventional treatment and 3 studies highlighted MFR to be equally effective to alternative treatments (e.g. PRT, MET or iontophoresis)

## **DISCUSSION**

Ten RCTs covering 487 patients were included. The present study included 7 RCTs, 1 Prospective Experimental Study, 1 Quasi Experimental Study and 1 Pre-post Interventional Study. The sample size varied from 30 to 100. The methodological qualities of the included RCTs were moderate to high.

1 study was with higher methodological quality and the remaining 9 were of moderate quality (according to PEDro). The literature regarding the effectiveness of MFR was mixed both in quality as well as in results. In many RCT's the MFR was adjunctive to other treatments and so the potential specific effect of MFR cannot be judged.

7 studies concluded that MFR is more effective than a control group receiving sham treatment or conventional treatment and 3 studies highlighted MFR to be equally effective to alternative treatments (e.g. PRT, MET or iontophoresis).

5 RCTs and 1 Prospective Experimental Study of moderate to high quality suggest MFR alone or can be adjunct to other conventional treatment provides significant benefits in reducing pain and improving functions.

2 RCTs and 1 Quasi experimental study of moderate quality suggest MFR to be equally effective to alternative treatments.

1 pre-post interventional study suggests MFR alone or can be adjunct to other conventional treatment provides significant benefits in reducing pain and improving functions.

The exact mechanisms of the efficacy of MFR in the management of PHP is unclear, however it may be attributed to a decrease in tension over the plantar fascia or

decrease of risk factors, such as tightness of the gastrocnemii and soleus muscles and restricted ankle ROM.

Meltzer et al. in a study showed that treatment with MFR after repetitive strain injury resulted in normalization in apoptotic rate, cell morphology changes, and reorientation of fibroblasts. It is possible that treatment with MFR in PHP may result in cessation of degenerative process of the plantar fascia by facilitating the healing process.<sup>[17]</sup>

According to Schleip, under normative conditions, fascia and connective tissues tend to move with minimal restrictions. However, injuries due to physical trauma, repetitive strain injury, and inflammation are thought to decrease fascial tissue length and elasticity, resulting in fascial restriction. It may also be possible that pain relief due to MFR is secondary to returning the fascial tissue to its normative length by collagen reorganization.<sup>[18]</sup>

As with any soft tissue manipulation techniques, the analgesics effect of MFR can also be attributed to the stimulation of afferent pathways, which can cause segmental pain modulation in spinal cord as well as modulation through the activation of descending pain suppression system.<sup>[19]</sup>

## **CONCLUSION**

Based on above evidences found from search engines like Google Scholar, PubMed, PEDro, ScienceDirect, ResearchGate and CINAHL from year 2010-2019, 10 out of 15 articles were selected and from its analysis it can be concluded that MFR is an effective treatment regimen in individuals with Plantar Fasciitis.

## **CLINICAL IMPLICATION:**

MFR is found to be effective in reducing pain and improving functions in individuals with plantar fasciitis, therefore MFR technique can be considered as an adjunctive treatment in plantar fasciitis.

## ABBREVIATIONS

**PF:** Plantar Fasciitis, **PHP:** Plantar Heel Pain, **MFR:** Myofascial Release, **VAS:** Visual Analogue Scale, **FFI:** Foot Function Index, **PPT:** Pain Pressure Threshold, **FAAM:** Foot and Ankle Ability Measure, **ROM:** Range of Motion, **ESWT:** Extracorporeal Shock-wave Therapy, **US:** Ultrasound, **PEDro:** Physiotherapy Evidence Database, **CEBM:** Center of Evidence Based Medicine, **CINAHL:** Cumulative Index of Nursing and Allied Health Literature, **RCT:** Randomized Controlled Trial, **PRISMA:** Preferred Reporting Items for systematic reviews and meta-analysis.

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**Ethical Approval:** Ethical approval was not required.

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### APPENDIX 1-PEDro SCALE

No.	Description	Yes/No
1	Eligibility criteria were specified (No points awarded)	
2	Subjects were randomly allocated to groups	
3	Allocation was concealed	
4	The groups were similar at baseline regarding the most important prognostic indicators	
5	There was blinding of all subjects	
6	There was blinding of all therapists who administered the therapy	
7	There was blinding of all assessors who measured at least one key outcome	
8	Measure of at least one key outcome were obtained from more than 85% of the subjects initially allocated to groups	
9	All subjects for whom outcome measures were available received the treatment or control condition as allocated	
10	The result of between group comparisons are reported for at least one key outcome	
11	The study provides both point measures and measures of variability for at least one key outcome	

### APPENDIX 2- CEBM'S LEVEL OF EVIDENCE

Level	Definition
1a	Systematic reviews of randomized controlled trials
1b	Individual randomized controlled trials
1c	All-or-none studies
2a	Systematic reviews of cohort studies
2b	Individual cohort studies or low-quality randomized controlled trials
2c	Outcome research
3a	Systematic reviews of case-control studies
3b	Individual case-control studies
4	Case series, poorly designed cohort or case-control studies
5	Animal and bench research, expert opinion

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