



## Effect of Myofascial Release Therapy In Addition To K-Tape on Chronic Plantar Fasciitis

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**Abstract:** Plantar fasciitis is one of the most common cause of heel pain. Injury to the plantar fascia results in loss of normally resilient in fascia. Fascia becomes stiffened and prone to re-injury, which resulting in a vicious cycle of persistent pain and inflammation. Though many therapies would produce better results, there was less exploration on fascial release therapy and k-tape. The purpose of the study is to identify the effect of MFR in addition to K-tape on chronic plantar fasciitis. This is a Quasi-experimental study with 48 participants. The ethical approval was obtained and the study was conducted in multiple physiotherapy centers in Namakkal district, Tamil Nadu. All the participants were selected based on selection criteria mainly those who fulfil any of the three from below, 1) Heel pain increases in the morning with first few steps following prolonged bed rest 2) Pain localized to the inferior heel 3) Pain decreases with activity such as walking or moving 4) Pain score is between 3—7 cms in 10 cm VAS. 24 participants in the experimental group receive myofascial release therapy along with k-tape for 6 weeks, 24 participants in the control group receive stretching along with k-tape for 6 weeks. The outcome measures used in this study are pain and foot function by numerical pain scale and foot function index respectively. Results were analyzed using SPSS 20.0, the results show that there were significant differences obtained between the myofascial release therapy with the k-tape group when compared to k-tape only group. There was a pain score of  $10.82 \pm 0.196$  ( $p < 0.001$ ) and foot function index score of  $10.6 \pm 3.85$  ( $p < 0.001$ ). This study concluded that the use of Myofascial release therapy with K-tape reduces pain scores and improves foot function in plantar fasciitis.

**Keywords:** Plantar fasciitis, Myofascial release therapy, K-tape, Pain, Foot function index, Numerical pain rating scale.

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## I. INTRODUCTION

Plantar fasciitis is one of the common causes of inferior heel pain, 8—15% of heel pain found in the athletic and non-athletic individuals.<sup>1</sup> It involves inflammation of the plantar fascia, fascia is a thick band of fibrous tissues that run across the bottom of the foot which connects the heel to the metatarsals.<sup>2</sup> Repetitive loading on the abnormal fascial structures augments the injury to the fascia results in plantar fasciitis.<sup>3</sup> Abnormal mechanics of the foot may cause risk of injury,<sup>4</sup> Poor biomechanics of the foot also cause overstretching of the fascia result in the reduction of extensibility of the plantar fascia, in addition to it repetitive stress over the overstretched fascia results in plantar fasciitis.<sup>5</sup> Various physiotherapy interventions are available in the management of plantar fasciitis including rest, taping, orthosis, night splint, heel cup, MCR rubbers, shoe inserts, as well as modalities like ultrasound, laser, microwave diathermy, cryotherapy, contrast bath and iontophoresis.<sup>2</sup> All the modalities have equal positive and negative effects.<sup>6,7</sup> There were fewer studies pertaining to the myofascial release therapy and taping method. Myofascial release therapy (MFR) is a soft tissue mobilization technique. While applying a low load, long-duration stretch to the fascial complex of the body produces restoration of the optimal length of the tissues, reduces pain and improves function. It changes the viscosity of the ground substance to a more fluid state which eliminates the fascia's excessive pressure on the pain and restores the normal alignment.<sup>8</sup> K-tape (Kinesio tape) is one of the best tapes used in sports medicine, it is a nonrestrictive elastic adhesive tape, hypoallergenic and it stretches like human skin and provides a multitude of protections.<sup>2</sup> It possesses unique elastic properties that allow it to provide dynamic support, protects the joints and allows free and safer movements. It not only enhances muscle function but also accelerates the healing process.<sup>9</sup> The present study was done to identify the role of MFR and K-tape on plantar fasciitis. K-tape was also found to be a successful method in managing plantar fasciitis whereas on the other hand MFR act as a catalyst in the resolution of chronic plantar fasciitis.<sup>10</sup> The purpose of the study is to identify the effect of MFR in addition to K-tape versus K-tape with stretching on several functions in plantar fasciitis.

## 2. MATERIALS AND METHODS

A quasi-experimental study with 48 participants involved in the study. Once the ethical approval from the

Institutional ethical committee was received the study was begun. The study was conducted at multiple physiotherapy centers in the Namakkal district, Tamil Nadu, India. Notice was displayed in the clinics and those who volunteered were registered and a token number is given. Participants were advised to visit the clinic on a given date and through evaluation was made by the assessor. The assessor selected the participants who are eligible for the study. 56 participants were selected initially and during the study, it came down to 48, due to the withdrawal of participants. The participants were selected based on the age group of 30—45 years, BMI below 22, having complaints of unilateral heel pain for at least 4 months, Not on any pharmacological support, No foot or leg deformities, and those who fulfil any of the three from below, 1) Heel pain increases in the morning with first few steps following prolonged bed rest 2) Pain localized to the inferior heel 3) Pain decreases with activity such as walking or moving 4) Pain score is between 3—7 cms in 10 cm VAS. All are randomly assigned into two groups by computer-assisted randomization process. 24 participants in the experimental group receive myofascial release therapy along with k-tape for 6 weeks, 24 participants in the control group receive stretching along with k-tape for 6 weeks. Both groups receive treatment for the same duration. MFR applied over the gastrocnemius, soleus, and plantar fascia as described by Ajimsha et al.,<sup>11</sup> techniques applied for 30 mins followed by K-tape which was described by Tsai et al.,<sup>12</sup> Passive stretching was applied for the gastrocnemius, soleus and plantar fascia for 30 mins followed by K-tape. The tape was allowed to be fixed in the foot till the next visit (48 hrs as maximal timing). Treatment was applied on alternative days. The outcome measures used in the study are pain using numerical pain scale and foot function by foot function index.

## 3. STATISTICAL ANALYSIS

The data were analyzed using statistical software, the statistical package for social sciences (SPSS 20.0) with  $p < 0.001$  was considered to be statistically significant.

## 4. RESULTS

Table I shows the demographical data of the participants. The mean age of participants was 36 years, and male participants are 29 and female participants are 19. Table II & Table III show the difference between the test values and their mean. Paired 't' test used to analyze within the group and unpaired 't' test was used to analyze between the groups.

Table I : Demographic data			
	MFR & K-tape	K-tape	p-value
Age	36.33 ± 4.61	36.54 ± 4.77	0.001
Gender	Male 37.79 ± 4.92	Male 36.27 ± 5.2	0.001
	Female 34.30 ± 3.4	Female 37 ± 4.21	0.001

Table II Numerical Pain scale						
	S. N	Mean	S.D	Paired 't' value	Unpaired 't' value	p-value
Group A	Pre	6.08	0.72	34.21 ± 0.158	10.82 ± 0.196	p ≤ 0.001
	Post	0.67	0.56			
Group B	Pre	6.05	0.75	15.43 ± 0.211		
	Post	2.79	0.78			

Table II shows the difference of the values for the pain scales, based on these values it was found that MFR and K-tape would produce a significant reduction in pain values when compared with K-tape and stretching.

Table III Foot Functional Index						
	S.N	Mean	S.D	Paired 't' value	Unpaired 't' value	p-value
Group A	Pre	88.29	1.85	49.24 ± 1.21	10.6 ± 3.85	p ≤ 0.001
	Post	28.79	5.88			
Group B	Pre	88.58	2.10	16.88 ± 0.933		
	Post	72.83	4.07			

Table III shows the difference of the values for the Foot function Index, based on these values it was found that MFR and K- tape would produce a significant reduction in foot function when compared with K-tape and stretching.

## 5. DISCUSSION

The purpose of the study was to identify the effect of Myofascial release therapy in addition to K-tape on chronic plantar fasciitis. Plantar fasciitis is caused by inflammation of the plantar fascia which is due to repetitive loading to the fascia which could lead to microtears that enhances the inflammation and degeneration of the connective tissues in the fascia.<sup>13,14</sup> Repeated injury to the fascia results in a reduction of elasticity and inhibits the normal repair process of the injured fascia. In addition to that collagen destruction and perifascial odema formation are common in the plantar fasciitis.<sup>15</sup> MFR application would stimulate fibroblast proliferation which leads to collagen synthesis that would promote healing of plantar fascia by replacing degenerative tissues with stronger and functional tissues.<sup>16</sup> MFR aids in halting the degenerative process in the plantar fascia by facilitating the healing process and the fascial architectures<sup>17,18</sup>. MFR relieves pressure in the fibrous bands of the connective tissues or fascia. Gentle and sustained stretch applied over the fascia believed to reduce the adhesion and, soften and lengthens the fascia.<sup>19</sup> MFR reduces pain in the fasciitis is by stimulation of afferent pathways and thereby excitation of afferent A-delta fibers, which can cause segmental pain modulations, as well as modulation through the activation of descending pain inhibiting systems.<sup>11</sup> Application of the direct MFR helps in effective reduction of pain in plantar fasciitis and also helps in quicker recovery, it also helps the structures to elongate and also facilitate the movements in the fascia by removing the adhesions. Many studies supported that MFR produces significant improvement in the plantar fasciitis.<sup>10, 19-20</sup> Kinesio tape or K-Tape wore for a day or two helps in correcting the intrinsic muscles and correct the imbalances in the foot, it also aids in correcting the functions of the fascia, improves blood circulation and reduces the pain.<sup>21, 22</sup> Application of the K-tape reduces the distance between the plantar fascia muscles thereby relieves the strain and tensile forces during weight-bearing. This allows the tissues to heal naturally and becomes less painful.<sup>2</sup> Pain reduction could also hypothesize that application of the K-tape could stimulate the proprioceptive A-beta fibers where it reduces the effect of nociceptive C fibers and helps in reducing pain perception.<sup>23</sup> Multiple research work conducted on the k-tape has found a pronounced effect on the plantar fascia. It plays a major role in reducing pain as well as improving functions in plantar fasciitis<sup>24, 25,26</sup> Passive stretching is applied as a measure in the control group, it helps in elongation of the contracted plantar flexors and may positively influence functional activities.

Stretching of gastrocnemius has produced an effect on the windlass mechanism which reduces the excessive loads on plantar fascia muscle which help to limit microtrauma and facilitates the healing process.<sup>27</sup> Stretching reduces the tension in the fascia which becomes tight in plantar fasciitis, windlass mechanisms limit repetitive microtrauma and associated inflammation by performing exercises.<sup>28</sup> The statistical analysis in this study revealed that there were very significant differences in the pain scales in both groups. Group A was more efficient in reducing the pain scores (p=0.0001) than Group B post-treatment. The statistical analysis in this study revealed that there were very significant differences in the Foot function index in both groups. Group A was more efficient in reducing the foot function index (p=0.0001) than Group B post-treatment. The result from the statistical analysis of this study supported the alternative hypothesis and rejected the null hypothesis, which stated that there will be a beneficial effect to the participants treated with Myofascial release therapy with K-tape on reducing the pain and improving the foot function index scores. This study has limitations includes small sample size, long term follow-up was not made and only two parameters were identified.

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## 6. CONCLUSION

Various recent approaches are used in treating subjects of plantar fasciitis, but this study was conducted to compare the effect of Myofascial release therapy with K-tape versus KT-tape in plantar fasciitis. The present study provides evidence to support the use of Myofascial release therapy with K-tape in reducing VAS score and decreased FFI score in subjects with plantar fasciitis. Thus, the null hypothesis is disproved.

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## 8. AUTHORS CONTRIBUTION STATEMENT

Tamil Nidhi, Arun and Anandhan contributed to the study concept and design. Anantharaj and Anadhan helped in data acquisition and prepared the first draft of the paper. Tamil Nidhi and Arun revised the manuscript and collected the reviews for the study. All the authors read and approved the final manuscripts.

## 9. CONFLICT OF INTEREST

Conflict of interest declared none.

## 10. REFERENCES

- 1) Bartold SJ. The plantar fascia as a source of pain—biomechanics, presentation and treatment. *J Bodyw Mov Ther.* 2004;8(3):214-26.
- 2) Tulasi Ratna S, Dowle PV, Paruchuri R. Effect Of Kinesio Taping In Adjunct To Conventional Therapy In Reducing Pain And Improving Functional Ability In Individuals With Plantar Fasciitis A Randomized Controlled Trial. *Int J Physiother.* 2015;2(4):587-93. doi: 10.15621/ijphy/2015/v2i4/67737.
- 3) Young CC, Rutherford DS, Niedfeldt MW. Treatment of plantar fasciitis. *Am Fam Phys.* 2001; Feb 1;63(3):467-74, 477. PMID 11272297.
- 4) Williams DS, McClay IS, Hamill J. Arch structure and injury patterns in runners. *Clin Biomech.* 2001;16(4):341-7. doi: 10.1016/s0268-0033(01)00005-5, PMID 11358622.
- 5) Yadav L, Sarkar B, Kumar P, Kumar A. Effect of calcaneal taping on pain, pressure pain threshold & function in subjects with chronic plantar fasciitis: a randomized clinical trial. *Int J Health Sci Res.* 2019;9(8):124-31.
- 6) Roxas M. Plantar fasciitis: diagnosis and Therapeutic Considerations. *Altern Med Rev.* 2005;10(2):83-93. PMID 15989378.
- 7) Chitara V. To Compare the Effectiveness of Muscle Energy Technique versus Myofacial Release in Pain and Lower Limb Functional Activity in Subjects Having Planter fasciitis - A Randomized Control Trial. *Int J Sci Res.* 2017;6(3):2095-99.
- 8) Kuhar S, Subhash K, Chitra J. Effectiveness of myofascial Release in treatment of plantar fasciitis. *Indian J Physiother Occup Ther.* 2007;1(3):221-5.
- 9) Thelen MD, Dauber JA, Stoneman PD. The clinical efficacy of kinesio tape for shoulder pain: a randomized, double-blinded, clinical trial. *J Orthop Sports Phys Ther.* 2008;38(7):389-95. doi: 10.2519/jospt.2008.2791, PMID 18591761.
- 10) Shinde S, Patil PAA. Effectiveness of myofascial release technique vs therapeutic ultrasound in the management of plantar fasciitis. *Int J Allied Sci Clin Res.* 2019;7(2):586-91.
- 11) Ajimsha MS, Binsu D, Chithra S. Effectiveness of myofascial release in the management of plantar heel pain: A randomized controlled trial. *Foot (Edinb).* 2014;24(2):66-71. doi: 10.1016/j.foot.2014.03.005, PMID 24703512.
- 12) Tsai C, Chang W, Lee J. Effects of short-term treatment with Kinesiotaping for plantar fasciitis. *J Musculoskelet Pain.* 2010;18(1):71-80. doi: 10.3109/10582450903495882.
- 13) Lemont H, Ammirati KM, Usen N. Plantar fasciitis: a degenerative process (fasciosis) without inflammation. *J Am Podiatr Med Assoc.* 2003;93(3):234-7. doi: 10.7547/87507315-93-3-234, PMID 12756315.
- 14) Bolgla LA, Malone TR. Plantar fasciitis and the windlass mechanism: a biomechanical link to clinical practice. *J Athl Train.* 2004;39(1):77-82.
- 15) Hyland MR, Webber-Gaffney A, Cohen L, Lichtman PT. Randomized controlled trial of calcaneal taping, sham taping, and plantar fascia stretching for the short-term management of plantar heel pain. *J Orthop Sports Phys Ther.* 2006;36(6):364-71. doi: 10.2519/jospt.2006.2078, PMID 16776486.
- 16) Joshua D. Evidence based treatment for plantar fasciitis, sports therapy. 2007;1(4):26-34.
- 17) Meltzer KR, Cao TV, Schad JF, King H, Stoll ST, Standley PR. In vitro modeling of repetitive motion injury and myofascial release. *J Bodyw Mov Ther.* 2010;14(2):162-71. doi: 10.1016/j.jbmt.2010.01.002, PMID 20226363.
- 18) Schleip R. Fascial plasticity – a new neurobiological explanation: Part. *J Bodyw Mov Ther.* 2003;7(1):11-9. doi: 10.1016/S1360-8592(02)00067-0.
- 19) Patil SS, Gaigole R. Effectiveness of myofascial release technique and taping technique on pain and disability in patients with chronic plantar fasciitis: Randomized Clinical trial. *Int J Ther Rehabil Res.* 2016;5(1):61-5. doi: 10.5455/ijtrr.000000117.
- 20) Harlapur MA, Vijay B. Comparison of myofascial release techniques and positional release therapy in plantar fasciitis – A clinical trial *IJPOT.* 2007;4(4):256-65.
- 21) O'Sullivan D, Bird SP. Utilization of Kinesio taping for fascia unloading. *Int J Athl Ther Train.* 2011;16(4):21-7. doi: 10.1123/ijatt.16.4.21.
- 22) Kase K, Wallis J, Kase T. Clinical therapeutic applications of the kinesio taping method. Tokyo, Japan: Ken Ikai Co Ltd; 2003.
- 23) Arya A, Nijhawan MA. Comparative effectiveness of Kinesiotaping and low dye taping in improving pain and disability in subjects with plantar fasciitis. *Int J Health Sci Res.* 2019;9(9):26-32.
- 24) Radford JA, Landorf KB, Buchbinder R, Cook C. Effectiveness of low-Dye taping for the short-term treatment of plantar heel pain: a randomised trial. *BMC Musculoskelet Disord.* 2006;7(64):64. doi: 10.1186/1471-2474-7-64, PMID 16895612.
- 25) Lukhi J, Pawar A, Warude T, Bathia K. Effect of mulligan's calcaneal taping versus Kinesio taping in plantar fasciitis. *Innovare J Health Sci.* 2018;6(1):6-9.
- 26) Hyland MR, Webber-Gaffney A, Cohen L, Lichtman PT. Randomized controlled trial of calcaneal taping, sham taping, and plantar fascia stretching for the short-term management of plantar heel pain. *J Orthop Sports Phys Ther.* 2006;36(6):364-71. doi: 10.2519/jospt.2006.2078, PMID 16776486.
- 27) DiGiovanni BF, Nawoczenski DA, Malay DP, Graci PA, Williams TT, Wilding GE, Baumhauer JF. Plantar fascia-specific stretching exercise improves outcomes in patients with chronic plantar fasciitis. A prospective clinical trial with two-year follow-up. *J Bone Joint Surg.* 2006;88(8):1775-81. doi: 10.2106/JBJS.E.01281, PMID 16882901.
- 28) DiGiovanni BF, Nawoczenski DA, Lintal ME, Moore EA, Murray JC, Wilding GE, Baumhauer JF. Tissue-specific plantar fascia-stretching exercise enhances outcomes in patients with chronic heel pain. A prospective, randomized study. *J Bone Joint Surg Am.* 2003; Jul;85(7):1270-77. doi: 10.2106/00004623-200307000-00013, PMID 12851352.