ORIGINAL ARTICLE

USE OF MANUAL STRETCHING TECHNIQUES IN THE MANAGEMENT OF PLANTAR FASCIITIS AMONG PHYSIOTHERAPISTS IN KARACHI: A CROSS-SECTIONAL SURVEY

Bhain Devi[1], Saeed Akhter[2], Aftab Ahmed Mirza Baig[3]

Authors' Affiliation

[1] Department of Physiotherapy, Institute of Physiotherapy and Rehabilitation Sciences, Liaquat University of Medical and Health Sciences, Jamshoro

[2,3] Department of Physiotherapy, Sindh Institute of Physical Medicine and Rehabilitation, Karachi

Corresponding Author

Saeed Akhter,
Assistant Professor, Department of Physiotherapy, Sindh Institute of Physical Medicine and Rehabilitation, Karachi
Email:saeed786sipmr@gmail.com

ABSTRACT

Objective: To determine the use of manual stretching techniques in the management of plantar fasciitis among Physiotherapists in Karachi.

Material & Methods: A cross sectional survey study was conducted at Dow University of Health Sciences, Civil Hospital and Jinnah postgraduate medical center. About 153 Physiotherapists filled the self-administered questionnaire after providing informed consent. The self-administered questionnaire was designed to collect data.

Results: The most common frequent use of each therapy was hamstring stretch (50 % by 36 physiotherapists i.e. 28.6%), Soleus Stretch (70 % by 33 physiotherapists i.e. 21.6%), Gastrocnemius Stretch (70 % by 30 physiotherapists i.e. 20.0%), Standing Stretch on Wedge (30% by 36 physiotherapists i.e. 26.7%), Hallux Dorsiflexion to Stretch Plantar Fascia(30 % by 49 physiotherapists i.e. 32.7%), Seated Toe Extension Stretch(20 % by 50 physiotherapists i.e. 37.0%), Seated Great Toe Stretch(20 % by 43 physiotherapists i.e. 31.2%) and Pros etch(20 % by 50 physiotherapists i.e. 43.9%).

Conclusion: The present study concluded that the cure of plantar fasciitis is to facilitate out non-invasive, conservative methods such as manual stretching which is used as the best initial as well as long term therapy. It has shown better results in improving pain and also in complete recovery according to physiotherapists.

Key Words: Exercise, Inflammation, Modalities, Muscle Stretching, Physical Therapy.

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INTRODUCTION

Plantar fasciitis (PF) is the most common cause of lower leg pain.[1] Obesity, old age and stress along with the occupational stress play a role in PF. The ground pressure affects the plantar side, and the foot can reach more than 1.1 times the weight of body and more than 2.9 times the weight of body during running.[1] In normal routine, the plantar fascia plays a role to complete functional tasks without incurring injury and some contributing factors had been identified such as faulty biomechanics of the foot due to morphological abnormalities, degenerative changes related to age, obesity, physical activities errors, and job involving long standing such as teaching staff, labors and construction workers, chefs, medical staffs, combat personnel and sports teaching for elongated distance running events. [2,3]

PF occurs annually in 2 million Americans and 83% of these patients are adults between the ages of 25 and 65.[3] About 11-15% of all these symptoms require professional care. This disorder is present in 7% of the adult population [4, 5] With reference to the author's information; there has been no research on the spread of PF in Pakistan. Based on a survey published in 2000 by APTA, it is suggested that PF is a frequently diagnosed condition in the clinics.[1] The injury considered as an enteropathy, leading to the

morphological changes with component of injury at the spot of connection of a bone, ligaments and muscles. [6, 7] The role of plantar fascia to offer the main stabilizer of the foot against ground reactive forces, which provided a dynamic role in restructuring of the foot into a rigid platform before toe-off.[8,9] Usually pain is the most common key finding when loading activities are involved.[10,11] Multiplication treatment strategies used for the management of PF, about 85% to 90% PF can be handled effectively without surgery. There are many Physical Therapy treatments which are used in general practice. For example; Rest with tapping, Orthosis / Night Silicon heel cups, Therapeutic ultrasound, phonophoresis, iontophoresis, transcutaneous electrical Nerve stimulation, Cryo terapy, Thermotherapy, , Laser, shortwave diathermy, contrast bath and stretching exercises.[2,12]The current recommendation for the conservative treatment of PF is an evidence-based multimedia approach. Initial treatment should include adequate sedation with the use of conservative analgesics over-the-counter NSAIDs are another treatment and nonsurgical treatment is the mainstay of treating diagnosed with PF.[13]

Stretching is a main element of management and effective treatment of PF it should include many techniques Plantar fascia, Hamstring Soleus, Gastrocnemius, Achilles tendon and Calf. The unload and weight bearing plantar fascia stretch and calf stretches are included in the stretching protocol of the PF. [8,14] Authors have concluded that conservative treatment can play an important role to reduce pain in managing the PF. Conservative treatments are manual therapy, ice therapy, rest, ultrasound and muscle stimulation combination, home stretching use of a prefabricated night splint and taping. If these treatments are not efficient than consider use of steroids injections and surgical intervention. [1]

According to authors' knowledge, there is limited evidence regarding the usage of the manual stretching techniques to manage the patients with PF especially among the physiotherapist of Karachi, Pakistan. So the aim of this study is to determine the use of manual stretching techniques in the management of PF among Physiotherapists in Karachi Pakistan.

MATERIAL AND METHODS

An observational, cross sectional study design was used for data collection. The Institutional Review Board of Dow University of Health Sciences approved the research study with the reference number of IRB-625/DUHS/approval/2015/145. The study was conducted at the Institute of Physical Medicine and Rehabilitation, (DUHS), Civil Hospital Karachi and Jinnah Hospital Karachi. The sample size was calculated in pass version 11 with a 95% confidence interval, 80% power of the test, 5% margin of error, and 74% expansion rate. Calculated sample size was 153.[15] Non-probability purposive sampling technique was used for this study. We requested that the study be carried out with the permission of the heads of the corresponding departments. Participants who met the selection criteria received a study information sheet. The study criteria were the qualified physiotherapist, Degree in Physiotherapy at least 6 months' experience and currently in working in the selected hospitals. However, the physiotherapist not in clinical practice and the physiotherapist not in musculoskeletal practice were excluded from the study.[15] The self-administered questionnaire was distributed to the 153 participants who met the inclusion criteria just after explaining the purpose of the study and obtaining form consent.

The freely filled questionnaire consists of mixed closed and open ended questions. A pilot study was conducted to ensure that the participants understood the questions and 10 physiotherapists were recruited based on the physiotherapist's response and the questionnaire was modified. The questionnaire was designed to gather information about the physiotherapist's academic and clinical experience. As part of the project-specific questions, information on use of manual extension options for the management of PF has been collected.[4,15] Consent form was taken from each participant after the enrolment of 153 physiotherapists. The duration of the study was 6-months. The data collection period was 6-weeks. Each questionnaire was completed in a maximum of 10-minutes.

Data was entered and analyzed using the SPSS version 20. All categorical variables are represented in the form of frequencies and percentages.

RESULTS

Mean age of the participants was 27.42 ± 4.58 years. Out of these, majority 87.6% was young and belongs to age less than 30 years. 112 i.e. 73.2% were male whereas remaining 41 i.e. 26.8% were female. 46 physiotherapists i.e. 30.1% were holding a BSPT degree. Although the mean experience of these physiotherapists was 3.29 ± 3.84 years, however, majority (98 i.e. 64.1%) of the participants were having 1-2 years' experience. **(Table 1)**

Most common techniques that are used by 100% of these physiotherapists were Soleus stretch whereas Gastrocnemius Stretch and Hallux Dorsiflexion to Stretch Plantar Fascia were used by 98% physiotherapist in their treatment modalities. The lowest technique used was pro-stretch and hamstring stretch, which was used by 78.4% and 82.4% physiotherapists respectively. Regarding assessment of these therapies as how often they used it, no one physiotherapist is going to use any of these therapies hundred percent. They use each technique according to the requirement of the patients in managing the pain of PF. Most common frequent use of each therapy was hamstring stretch (50 % by 36 physiotherapists i.e. 28.6%), Soleus Stretch (70 % by 33 physiotherapists i.e. 21.6%) , Gastrocnemius Stretch (70 % by 30 physiotherapists i.e. 20.0%), Standing Stretch on Wedge (30 % by 36 physiotherapists i.e. 26.7%), Hallux Dorsiflexion to Stretch Plantar Fascia(30 % by 49 physiotherapists i.e. 32.7%), Seated Toe Extension Stretch (20 % by 50 physiotherapists i.e. 37.0%), Seated Great Toe Stretch (20 % by 43 physiotherapists i.e. 31.2%) and Pro-stretch (20 % by 50 physiotherapists i.e. 43.9%). **(Table 2)**

According to the analysis of the data, majority (135 physiotherapists i.e. 88.2%) hold the stretch for 30 seconds. Similarly, majority (102 i.e.66.7%) of the physiotherapist performed stretch techniques 3 times during one session and with regards to the assessment that how many patients get better improvement by manual stretching techniques, majority (141 i.e.92.2%) said yes. However, all of the participants reported the soleus stretching as manual stretching technique for managing PF. According to participants more than 90% of patients gets better improvement with manual stretching techniques. **(Table 3)**

Table 1: Demographic characteristics of study participants (n=153)

Characteristics	Frequency	Percentage (%)
Age (years)	27.42±4.584*	
22 - 25 Years	64	41.8
26 - 30 Years	70	45.8
> 30 Years	19	12.4
Gender		
Female	41	26.8
Male	112	73.2
Qualification		
TDPT	23	15.0
BSPT	46	30.1
DPT	42	27.5
MSAPT	42	27.5
Experience (years)	3.287±3.83*	
1 - 2 Years	98	64.1
3 - 5 Years	30	19.6
> 5 Years	25	16.3

*Mean±SD, TDPT: transitional Doctor of Physical Therapy, BSPT: Bachelor of Science in Physiotherapy, DPT : Doctor of physiotherapy, MSAPT: Masters in Advanced Physiotherapy

Table 2: Uses of manual stretching techniques in the management of plantar fasciitis and its percentages

Stretch Techniques	Used		Percentages used								
	Yes n (%)	No n (%)	10% n (%)	20% n (%)	30% n (%)	40% n (%)	50% n (%)	60% n (%)	70% n (%)	80% n (%)	90% n (%)
Hamstring Stretch	126 (82.4)	27 (17.6)	3 (2.4)	6 (4.8)	15 (11.9)	24 (19.0)	36 (28.6)	16 (12.7)	26 (20.6)	-	-
Soleus Stretch	153 (100)	-	3 (2.0)	18 (11.8)	15 (9.8)	21 (13.7)	21 (13.7)	30 (19.6)	33 (21.6)	12 (7.8)	-
Gastroc Stretch	150 (98.0)	3 (2.0)	6 (4.0)	15 (10.0)	27 (18.0)	24 (16.0)	18 (12.0)	15 (10.0)	30 (20.0)	15 (10.0)	-
Standing Stretch on Wedge	138 (90.2)	15 (9.8)	6 (4.4)	21 (15.6)	36 (26.7)	24 (17.8)	18 (13.3)	6 (4.4)	9 (6.7)	9 (6.7)	6 (4.4)
Hallux Dorsiflexion	150 (98.0)	3 (2.0)	9 (6.0)	21 (14.0)	49 (32.7)	20 (13.3)	3 (2.0)	18 (12.0)	12 (8.0)	12 (8.0)	6 (4.0)
Seated Toe Extension Stretch	138 (90.2)	15 (9.8)	12 (8.9)	50 (37.0)	24 (17.8)	16 (11.9)	6 (4.4)	9 (6.7)	12 (8.9)	6 (4.4)	-
Seated Great Toe Stretch	135 (88.2)	18 (11.8)	12 (8.7)	43 (31.2)	38 (27.5)	15 (10.9)	9 (6.5)	6 (4.3)	9 (6.5)	6 (4.3)	-
Prostetch	120 (78.4)	33 (21.6)	22 (19.3)	50 (43.9)	21 (18.4)	9 (7.9)	3 (2.6)	3 (2.6)	6 (5.3)	-	-

Table 3: Distribution of time a stretch to be hold, number of time per session and improvement of patients with particular therapy

Distribution	Frequency (%)
Stretch to be hold	
30 sec	135 (88.2)
40 sec	12 (7.8)
50 sec	6 (3.9)
Number of times per session	
3 times	102 (66.7)
4 times	15 (9.8)
5 times	24 (15.7)
6 times	12 (7.8)
Improvement of patients with particular therapy	
Yes	141 (92.2)
No	12 (7.8)

DISCUSSION

The aim of this study was to evaluate use of manual stretching techniques in the management of PF among. Study found that the manual stretching is used as the best initial as well as long term therapy. It has shown better results in improving pain and also in complete recovery according to physiotherapists. A study recommended to begin treatment for PF with a transitory custom foot orthosis for a short phase of time. It is proposed that a transitory custom foot orthosis for two weeks diminishes overall pain and improves functions with PF.[22] A review reported that the use of stretching exercises have been the main stay of treatment.[23] In our findings the use of manual stretching techniques in the management of PF is also a current approach. Two studies found achievement of a Gastrocnemius–Soleus Stretching Program as a therapeutic Treatment of PF.[24, 25,26] In our study most common used techniques was Soleus stretch following Gastrocnemius and Hallux Dorsiflexion. The meta-analysis found that the plantar-fascia specific stretch has been shown to be more efficacious than the isolated Achilles stretching programme.[27] Previous study by Digiovanni BF 2006 favors the findings of current study and found soleus- stretch first line whereas gastro-stretch and hallux dorsiflexion are used as second line techniques mostly.[28]

A study found that the stretch is held for 30 seconds and repeated at least three times in each session for better results. This stretching exercise requires daily application, especially in the morning before standing; and after a period of prolonged sitting.[29] in current study most physiotherapists hold the stretch for 30 seconds. However, some physiotherapists hold stretch for 40-50 seconds. Majority of the physiotherapist performed stretch techniques 3 times during one session. A few number of physiotherapists used it for 4-6 times in one session. Previous studies, [22, 28, 29] have shown favorable outcomes about the management of PF with stretching of the soleus, plantar fascia and gastrocnemius. Drake et al. [22] prescribed a plantar fascia stretch with 4 repetitions over a period of 30 seconds in their conclusion,[22] while Di Giovanni and colleagues recommended 10 repetitions for 10 seconds.[28]

Numbers of author cited in their articles have specified that a low-tension, long-term approach is best for the treatment of PF, indicating 3 sets over a minimum period of 30 seconds.[22,26] A tissue of at least 30 seconds was found to be superior to periods of 10 and 15 seconds.[29] Manual therapy is clearly associated with improved function and also with pain reduction in PF patients. It is recommended that practices consider soft tissue mobilization techniques and joint mobilization in conjunction with stretching and strengthening in the management of PF. The limitations of the study consist that physiotherapists, implementing the proper stretching technique might have been a source of confounding in the treatment of patients achieving relief.

CONCLUSION

The findings of this study concluded that according to physiotherapists the treatment of PF with the help of non-invasive, conservative methods such as manual stretching is the best initial as well as long term therapy. It not only alleviated pain but also showed complete recovery.

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