Prevalence of Plantar Fasciitis in Academic Physical Therapists of Khyber Medical University affiliated Institutes and Clinical Physical Therapists in Tertiary Care Hospitals: A Cross Sectional Study

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ABSTRACT

Background: Plantar fasciitis (PF) is the most common cause of heel pain affecting both academic and clinical physical therapists. Risk factors for developing PF are; prolong standing, BMI >40, age, gender and inappropriate footwear. Its symptoms particularly aggravates in the morning while taking few steps. This study sought to determine the frequency of plantar fasciitis and the factors associated with it among practicing and academic physical therapists.

Methods: This cross sectional study was conducted in affiliated Institutes of Khyber Medical University and different tertiary care hospitals of Peshawar. This was carried out in duration of six months from June to November 2023. A total of 197 physical therapists were examined for plantar fasciitis by Pain Scale for Plantar fasciitis (PFPS) tool for plantar fasciitis pain. Plantar fasciitis Pain Scale questionnaire was filled by physical therapists for checking plantar fasciitis pain in physical therapists. The results were analyzed through SPSS-22 using chi-square test.

Results: Among total 197, 102 (53%) females and 92 (47%) males were likely to develop plantar fasciitis. A total of 28.9% of people with plantar fasciitis felt pain at the bottom of the heel. The chi-square test findings showed that the two varia
bles had a significant positive association ($p < 0.05$) ($p = 0.00$). Academic and clinical PT's were associated with Visual Analogue Scale (VAS), moderate pain was 58.9% as they are more exposed to weight bearing so, there are more chances of plantar fasciitis development.

Conclusion: Plantar fasciitis was mostly found among clinical physical therapists commonly affecting bottom sole area of the foot. Plantar fasciitis was positively associated with age, gender; however, PFPS was not associated with it.

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INTRODUCTION

The well-known, triangular, central aponeurotic band is a fundamental structural and functional element of the plantar fascia.[1] It is strong and most important tissue, which maintains the strength and stability of a medial longitudinal arch.[2] Plantar fascia is a subcutaneous structure that consists of three broad bands of dense, fibrous connective tissue. It provides a windlass effect, holds the medial arch and during stance phase foot absorbs all the forces up to twice the body weight.[3] Foot biomechanical structure is directly related to the foot pathology i-e: Plantar fasciitis (PF). It develops heel pain. This pain occur either due overuse, degeneration, prolong weight bearing or due to repetitive micro tears which cause inflammation of fascia and secondarily calcaneal spurs can also be developed due to calcification.[4] It is an umbrella term that encompasses a wide range of heel related conditions such as bursitis, neuritis, subcalcaneal spurs and plantar fasciitis but plantar fasciitis is the most typical cause of heel pain.[5] Plantar heel pain (PHP) was previously known as plantar fasciitis or fasciopathy.[6] Plantar fasciitis was first published in 1812 by Wood et al.,. The anatomical configuration plays a crucial role in the pathophysiology of plantar fasciitis.[7] Plantar fasciitis is developed at the proximal end.[8] It is a musculoskeletal disorder, because of an irritation of plantar fascia; plantar fasciitis is developed that affects the fascial enthesis.[9] About 40-95% academic teachers, they report prevalence of musculoskeletal disease especially, Plantar fasciitis.[10] It usually affect male and female equally of all ages but peaking between 40 and 60years of age.[11] The patient's history usually indicates a confluence of extrinsic and intrinsic elements that contributed to the injury's development. Intrinsic risk factors of plantar fasciitis are foot abnormalities i-e: pes cavus, pes planus, limited dorsiflexion, also plantar flexor and intrinsic muscle weakness and their reduced flexibility, limb

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length discrepancy, BMI >40kg and walking bare foot on hard surface. Extrinsic factors are inappropriate footwear, weight bearing for extended period of time, ill-fitted shoes, deficient stretching, walking barefoot on hard surface and de-conditioning.[12] Some other causes can also lead to plantar fasciitis which includes; Tibial, Calcaneal or Baxter's nerve (also called Inferior calcaneal nerve which arises from lateral plantar nerve at various levels), neuropathy which results in tingling, numbness and radiating pain in the dermatome of a nerve (area where nerve has its supply) also, fat pad atrophy give pain while standing or walking.[13] In order to identify the exact patient's discomfort area and to ensure the correct diagnosis of plantar fasciitis, meticulous probing is required during physical examination and by accurately diagnosing the condition we can enhance the patient's foot health and improve their quality of life by providing requisite treatment.[14] Plantar fasciitis occurs due to its mechanical origin that affects the foot health requiring professional care in adults about 10-15% of all the foot related symptoms worldwide. In the US, plantar fasciitis affects about a million individuals annually. It is more common in those workers who stand for extended period of time i-e: teachers, Physical therapists, nurses, guards and athletes.[15] Bilateral plantar fasciitis may develop in one-third of the total population.[16] Among adults of age >18years especially teachers with heel pain have prevalence of 17-24%.[13] Majority of the cases of plantar fasciitis in Lapidus and Guidotti's, involve those employees which require prolong standing or walking such as housekeeping, teaching, physical therapists, waitresses.[17] It was discovered that plantar fasciitis become more prevalent when people spent most of their time in standing.[18] A study that had been done in Peshawar in 2019 reveals that age between 31-40years have 36.8% prevalence of plantar fasciitis. Frequently, physical therapists who stand for prolong period developed plantar fasciitis about 80% of the total population.[19] The risk of developing plantar fasciitis is more common in people with age between 45 and 65years.[20] Feet play an important role in walking and maintaining posture and it has been reported that prevalence of foot pathologies ranges between 61-79%, which contributes to negative impact on quality of life.[21] According to an evidence-based review, there is a positive association of workplace factors with plantar fasciitis also, obesity, postural malalignment, other foot deformities and improper footwear leads to plantar fasciitis. Reviews and studies decided that people with BMI i-e: >25kg/m2are more likely to develop plantar fasciitis.[22] Therefore, as BMI increases, chances of problems related to foot also increases. Plantar heel pain has been associated with being over-weight, anxiety, physical and mental distress.[23] On a physical examination, physical therapist notes the limited ankle dorsiflexion and by palpating the medial calcaneal tubercle there will be tenderness, which confirms the diagnosis of the plantar fasciitis.[20] To decrease the occupational injuries, there is a need to improve the working conditions, more support and implementation of preventive measures.[24] Regardless of the course of treatment, 80% of people with plantar fasciitis recover on their own.[25] In 85-90% of cases of plantar fasciitis, a method that is more efficient, predominant, prevalent and most preferred is the non-operative treatment, which successfully manage the plantar fasciitis. Rest, ice, activity modification and NSAID's or acetomorphine are the patient-directed treatments for relieving the heel discomfort.[26] Patients should be informed that their symptoms might resolve in 6-12months. In persistent cases when conservative measures have failed, surgery might be recommended. In majority of the cases, surgery results in good functional outcomes.[27] Finding the frequency of plantar fasciitis and its correlation in academic and clinical physical therapists was the purpose of this investigation.

MATERIAL AND METHODS

The KMU-affiliated institutes and tertiary care hospitals served as the study's sites of investigation. The study was completed within six months from June to November 2023. The study included 197 participants through non-probability convenient sampling technique. Individuals who have plantar heel pain, Age 20 to 50 years, duration of symptoms >3 weeks, male, female, any race or ethnicity, minimum 1year experience were excluded from the study. Individuals with heel spurs, previous foot trauma, previous treatment of foot, Individuals who have other issues related to foot i.e: metabolic, neurological, osseous and other inflammatory condition, individuals who were given corticosteroid injection during past 3 months were excluded. After informing all willing participants of the study's goal and methodology, data was gathered. Before starting the trial, the Mahboob Medical Institute management gave its ethical permission.

The individuals who have consented were vetted using inclusion and exclusion criteria. The following data collecting technology was used to get the data: PFPS Pain Scale for Plantar Fasciitis. It has a number of important questions on PF symptoms and control issues. A visual analogue scale and questions are also included to gauge how the pain affects everyday activities. There are 19 questions in all.

The Statistical Package for Social Sciences, version 22, was used to further analyze all of the data once it had been gathered and input into Microsoft Excel 2020 (SPSS-22).Tables containing frequencies and percentages of the data were displayed. The chi-square test was used to look for correlation. Any P-value below 0.05 was deemed statistically significant.

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RESULTS

A total of 197 participants were included in the study. The mean age of the participants (n=197) was 20-50 years and their mean and standard deviation was 29.9+5.68. The mean age of participants who were prone to plantar fasciitis was in the range of 25-28 years age. Out of 197 participants, 105 were females with percentage of 53.3% and 92 were males with percentage of 46.7% (Table 1 & 2).

Table 1: Age determination of participants

Parameter	Number	Mean	Std. Deviation
Age	197	29.9	5.68

Table 2: Gender-wise distribution of participants

Gender	Frequency	Percentage
Female	105	53.3
Male	92	46.7
Total	197	100

The frequency of Plantar fasciitis were obtained in which 73.6% (n=145) were reported with Plantar fasciitis disorder while negative for 26.3% (n=52). Frequency of foot pain location in people with PF is highest in bottom of the heel with 28.9%, followed by bootom of heel with 28.9%, mid sole with 20.3%, 13.7% in toes, and ball of foot (10.7%)(Table 3 & 4).

Table 3: Frequency of Plantar fasciitis among participants

Plantar fasciitis	Frequency	Percentage
Yes	145	73.6
No	52	26.3
Total	197	100

Table 4: Frequency of pain region among participants

Pain region	Frequency	Percentage
Toes	27	13.7
Ball of foot	21	10.7
Mid sole	40	20.3
Bottom of heel	57	28.9
Not applicable	52	26.4
Toes	27	13.7

The chi-square test was used to analyze the relationship between academic and clinical physical therapy. The chi-square test findings showed that there is a significant positive correlation ($p < 0.05$) between the two variables and that the frequency of the moderate type of pain, or 116 (58.9%), was the greatest percentage (Table 5).

Table 5: Academic and clinical PT's with Visual Analogue Scale (pain severity)

Visual Analogue Scale	Frequency	Percentage	P-value
No pain	2	1.0	0.00
Mild	6	3.0	
Moderate	116	58.9	
Severe	21	10.7	
Not applicable	52	26.4	

DISCUSSION

Plantar fasciitis is a common orthopedic syndrome. Although the cause of pain is multi-factorial but, inflammation and degeneration of the plantar fascia are the main culprits. It is the most typical cause of heel pain in individuals globally.[15] The purpose of this study was to determine how common PF is among clinical and academic PTs. The main goal was to determine the average age of the population that had a higher risk of developing PF. A study conducted in Sialkot College Physical therapy (SCPT) in 2018, had total of 150 participants enrolled in their study whose mean age was 30 years. According to this study, PF was developed mostly in the middle aged individuals.[3] On the other hand, a research by Umm Al-Qura University medical students in Makkah indicates that individuals in their 40s and 60s were frequently impacted.[11] The current study revealed that individuals of mean age 25-28 years were more prone to develop PF.

Gender is also a factor that can lead to develop PF. A study was conducted in Makkah kingdom of Saudi Arabia, the male respondents were 88 (56.4%) and the female respondents were 104 (66.7%) out of 192 participants because of their improper footwear, high BMI and long standing hours while performing their duties with efficiency.[28] According to the recent study conducted, out of 197, 102 (53%) females and 92 (47%) males were likely to develop PF. According to the study conducted by Umar et al., in 2022 claims that, people with PF about 73.3% complained of the pain felt at the bottom of the heel.[20] It is similar to the current study which showed that, about 28.9% of people with PF felt pain at the bottom of the heel.

According to the current study; regarding the relation between academic PT's, clinical PT's and VAS, data was gathered from PT's in the institutes and hospitals. The chi-square test was used to assess the outcomes. The chi-square test findings showed that the two variables had a significant positive association ($p < 0.05$) ($p = 0.00$). When academic and clinical PT's were associated with VAS, for both the percentage of moderate pain was 58.9% as they are more exposed to weight bearing so, there are more chances of PF development. In comparison to a study done in Saudi Arabia in 2022 conducted that reported cases of moderate pain were 54.2%, a percentage higher than mild and severe cases.[28]

CONCLUSION

Plantar fasciitis was mostly found among clinical physical therapists commonly affecting bottom sole area of the foot. PF was positively associated with age, gender; however, PFPS was not associated with it. PF is a disabling condition which affects quality of life.

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