

Original Article

Frequency of Plantar Heel Pain among Hospital Staff of Memon Medical Institute Hospital

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Conflict of Interest: None.

Abbasi MA., et al. (2023). 3(2): DOI: <https://doi.org/10.61919/jhrr.v3i2.213>

ABSTRACT

Background: Plantar heel pain (PHP) is recognized as a widespread issue among adults, particularly affecting those with occupations necessitating prolonged standing. This condition not only causes severe pain but also leads to significant disability and impairment in daily activities. Prior research has indicated a higher incidence of PHP among specific demographics and job functions within hospital settings.

Objective: The primary objective of this study was to assess the prevalence and contributory occupational factors of plantar heel pain among the staff at Memon Medical Institute Hospital, Karachi.

Methods: Employing a cross-sectional study design, data was collected over a three-month period at MMIH. Participants were informed of the voluntary nature of the study and their right to withdraw at any time. A semi-structured questionnaire was administered to a sample of the medical staff to gather data on the incidence of PHP and related factors.

Results: The study included 203 participants, with a gender distribution of 48.8% female (n=99) and 51.2% male (n=104). The prevalence of diagnosed heel pain was 14% among males and 25% among females. Professional breakdown revealed the highest incidence of foot pain in nurses, followed by doctors, radiographers, CCTs, NAs, URs, and physiotherapists, respectively.

Conclusion: A substantial portion of the hospital staff reported experiencing heel and mid-foot pain, primarily due to the extensive standing inherent in their jobs. The lack of diagnosis and treatment, mainly attributable to a lack of awareness, suggests an urgent need for educational interventions and workplace ergonomic assessments to prevent the progression to plantar fasciitis.

Keywords: Heel pain, Hospital staff, Occupational health, Plantar fasciitis, Prevalence

INTRODUCTION

Plantar heel pain (PHP), previously known as plantar fasciitis or fasciopathy, has emerged as a significant concern in medical research due to its prevalence and impact on daily activities(1). This condition, affecting an estimated 11-15% of adults seeking foot care, presents unique challenges in both diagnosis and treatment(2). Characterized by a stabbing, non-radiating ache, particularly noticeable in the morning on the proximal medio plantar surface of the foot, PHP often intensifies towards the end of the day (3). The primary symptom is tenderness at the proximal plantar fascial insertion on the anteromedial calcaneus, typically observed during physical examination(4).

The onset of PHP is often linked to the biomechanical stresses placed upon the plantar fascia, a dense connective tissue extending from the medial tubercle of the calcaneus to the metatarsal heads(5). This structure supports the medial longitudinal arch of the foot and faces twisting forces during gait propulsion and load-bearing activities (6). Excessive strain can lead to micro-tears in the fascia, culminating in plantar fasciitis. Notably, this condition is prevalent among runners and individuals whose occupations involve prolonged standing(7).

A deeper understanding of PHP's etiology remains elusive, contributing to the difficulty in establishing effective treatment protocols(8). The condition has been associated with heel pain, falls, reduced quality of life, and disability. Particularly, those suffering from plantar fasciitis report difficulties in running and, to a lesser extent, walking-related activities (9). Under normal circumstances, the plantar fascia functions as a biomechanical shock absorber. However, when the strain exceeds the tissue's tolerance, it can lead

to the aforementioned micro-tears(10). This degenerative confusion of the plantar sash is especially common in middle-aged (40–60 years) obese females and highly active individuals such as runners (2).

The initial assessment of plantar fascia typically occurs in primary care settings. While diagnosis is usually straightforward, a comprehensive list of differential diagnoses must be considered(11, 12). Effective treatment relies on modifying risk factors and implementing an evidence-based approach, with most patients experiencing symptom relief within 12-18 months (13). Diagnostic imaging is not generally required for initial assessment but can be useful in differential diagnosis, with direct radiographs aiding in distinguishing conditions such as calcaneal stress fractures, calcaneal apophysitis, and spondyloarthropathies(14, 15).

Treatment strategies for PHP primarily focus on reducing pain and inflammation. Initial measures include rest, activity modification, medication, and the use of orthotics(16, 17). Further interventions might encompass stretching of the plantar fascia, ice massage, nonsteroidal anti-inflammatory drugs, and physical therapy (3). Despite being perceived clinically as a trivial condition, due to its benign and self-limiting nature, the lack of consensus regarding plantar fasciitis's etiology complicates treatment, underscoring the importance of understanding risk factors for preventive efforts (18). The prognosis for plantar fasciitis is generally positive, with most individuals responding well to conservative treatment, particularly when initiated promptly after the onset of symptoms(19, 20).

MATERIAL AND METHOD

In this cross-sectional study, conducted over a span of three months at Memon Medical Institute Hospital, Karachi, researchers meticulously gathered and analyzed data to understand the prevalence and characteristics of plantar heel pain (PHP) among hospital staff. Institutional ethical approval was secured for the study, with the ethical committee of the institute granting permission under the reference number IRB/MMIH/2021/28. This step ensured the adherence to ethical standards and the integrity of the research process(9).

The study targeted a specific population: staff members of the Memon Medical Institute Hospital. The inclusion criteria were carefully defined to ensure a focused and relevant sample. Participants were selected based on factors such as prolonged standing hours, age, Body Mass Index (BMI), and foot biomechanics, variables known to influence the incidence of PHP. This selection aimed to create a representative sample of individuals potentially at higher risk for developing plantar heel pain(21).

Data collection was executed through face-to-face interviews, a method chosen for its ability to yield detailed and nuanced information. These interviews allowed for a comprehensive collection of data, including subjective experiences and objective measures related to PHP. The use of SPSS version 21 for data analysis underscored the study's commitment to utilizing robust and reliable statistical methods. This software enabled the researchers to perform a thorough examination of the collected data, facilitating the extraction of meaningful insights and patterns(22).

Throughout the study, participants were informed that their involvement was entirely voluntary. This assurance was crucial in maintaining ethical standards and respecting the autonomy of the contributors. Participants were also made aware of their right to withdraw from the study at any point without hesitation or consequence, further emphasizing the ethical considerations underpinning the research(23).

RESULT

Table 1 Gender Distribution

| | Frequency | Percent |
|--------|-----------|---------|
| Female | 99 | 48.8 |
| Male | 104 | 51.2 |
| | | 100.0 |

Table 2 Diagnosed with heel pain among male and female participants

| | | Are you Diagnosed | | Total |
|--------|--------|-------------------|-----|-------|
| | | Yes | No | |
| Gender | Male | 14 | 85 | 99 |
| | Female | 26 | 78 | 104 |
| Total | | 40 | 163 | 203 |

Table 2 provides a detailed breakdown of heel pain diagnoses among the study's 203 participants, differentiated by gender. Out of the total, 99 were male, among whom 14 reported a diagnosis of heel pain. In contrast, the study included 104 female participants, with a higher incidence of heel pain, as evidenced by 26 females receiving a diagnosis. This table underscores a notable gender disparity in the prevalence of heel pain, with females exhibiting a higher rate of diagnosis compared to their male counterparts. The data collectively reveal important insights into the gender-specific impact of heel pain in the hospital staff population.

Table 3 Chi-Square test value for diagnosis of foot pain

| Chi-Square Tests | | | | | | |
|--|--------|----|-----------------------|----------------------|----------------------|--|
| | Value | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) | |
| Pearson Chi-Square | 3.780a | 1 | .052 | | | |
| Continuity Correction^b | 3.125 | 1 | .077 | | | |
| Likelihood Ratio | 3.834 | 1 | .050 | | | |
| Fisher's Exact Test | | | | .055 | .038 | |
| N of Valid Cases | 203 | | | | | |

Table 3 displays the results of Chi-Square tests conducted to assess the association between foot pain diagnoses and different medical professions among the 203 valid cases studied. The Pearson Chi-Square test yielded a value of 3.780 with a significance level of .052 (2-sided), while the Continuity Correction indicated a value of 3.125 with a significance level of .077 (2-sided). The Likelihood Ratio stood at 3.834 with a significance level of .050 (2-sided). Fisher's Exact Test provided more precise significance levels of .055 (2-sided) and .038 (1-sided). These results suggest a borderline statistical significance, indicating a potential association between medical professions and the diagnosis of foot pain, though this association is not definitively conclusive given the p-values are marginally above the conventional threshold of .05.

Table 4 Age Values

| | | Frequency | Percent |
|--------------|-------|-----------|---------|
| Valid | 1.0 | 134 | 66.0 |
| | 2.0 | 57 | 28.1 |
| | 3.0 | 6 | 3.0 |
| | 4.0 | 6 | 3.0 |
| | Total | 203 | 100.0 |

Table 4 categorizes the prevalence of foot pain among the study participants, classified by age groups represented by factors 1.0 to 4.0. The table encompasses a total of 203 participants, accounting for 100% of the study sample. Within this distribution, the largest age group, factor 1.0, comprises 134 individuals, equating to 66.0% of the total. This is followed by factor 2.0, encompassing 57 participants or 28.1% of the sample. The remaining participants are divided almost equally between factors 3.0 and 4.0, each contributing 3.0% (6 individuals each) to the total. Cumulatively, these figures present a comprehensive overview of foot pain prevalence across different age segments within the study population.

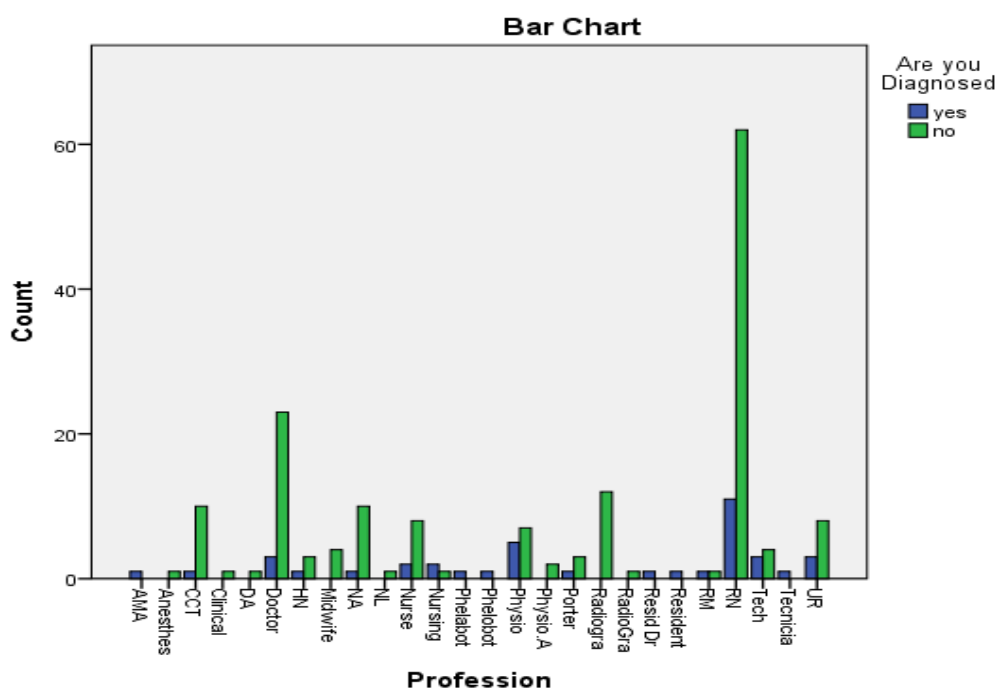


Figure 1 Diagnosis of foot pain by profession

Graph 1 illustrates the frequency of foot pain diagnoses across various professions within a hospital setting. The bar chart clearly indicates that nursing staff report the highest incidence of foot pain, which could be attributed to factors such as extended periods of standing, insufficient ergonomic education, and the use of inappropriate footwear. Following nurses, doctors exhibit the second-highest prevalence, suggesting that demanding work schedules may also affect this group significantly. A descending order of prevalence is

observed among other professional categories, including radiographers, CCTs, NAs, URs, and physiotherapists. Notably, the lowest incidences of foot pain are reported among porters, RMs, technicians, resident doctors, HNs, NLs, anesthesiologists, and AMAs. This graph provides a visual representation of the disparities in foot pain prevalence across different hospital-based occupational roles.

DISCUSSIONS

The cross-sectional study conducted at Memon Medical Institute Hospital, Karachi, over three months, aimed to illuminate the prevalence of plantar fasciitis among hospital staff and examine its correlation with various factors such as work activity, gender, age, and profession. This study's significance lies in its focus on a healthcare setting, where staff, particularly those with prolonged standing hours, are prone to developing foot pain(2, 24).

The findings of this study highlighted a pronounced prevalence of heel and foot pain among hospital staff, with a notable predominance among female nursing staff. This aligns with the data from the National Health and Wellness Survey (2013), which utilized a self-administered, internet-based questionnaire completed by a substantial sample (n=75000). The survey, employing quota sampling stratified by age, sex, and race, found that the overall prevalence of diagnosed plantar fasciitis with current pain was 0.85%, being lowest in the 18-44 age group (0.53%) and highest in individuals aged 45-64 (1.33%). Notably, females were found to be 2.5 times more likely to report plantar fasciitis than males (6).

Corroborating these findings, Richard L Nahin's 2018 study at the National Center for Complementary and Integrative Health in Maryland reported similar gender disparities. This extensive internet panel survey, designed to approximate the adult U.S. population, estimated that 0.85% of the population reported diagnosed plantar fasciitis with pain in the last month, with a higher prevalence in females (1.19%) compared to males (0.47%) (9). These studies collectively suggest a gendered pattern in the prevalence of plantar fasciitis, underscoring the need for gender-specific preventive and treatment strategies.

The current study also delineated the prevalence of foot pain among various professional groups within the hospital setting. Following nursing staff, doctors reported the highest prevalence, with decreasing ratios observed among radiographers, CCTs, NAs, URs, physiotherapists, porters, RMs, technicians, resident doctors, HNs, NLs, anesthesiologists, and AMAs. This gradient of prevalence highlights the importance of occupation-specific risk factors and ergonomic considerations in the development of plantar fasciitis(25).

Supporting this occupation-based perspective, a study by Robert A. Werner, Nancy Gell (2010), focused on assembly plant workers, revealed that ergonomic factors, shoe type, medical history, foot biomechanics, and pain range significantly influenced the onset of plantar fasciitis. The study found that forefoot pronation, high metatarsal strain during gait, prolonged standing on hard surfaces, extensive walking, and frequent getting in and out of vehicles increased the risk of plantar fasciitis. Conversely, rotating shoes during

the workweek and increased managerial support appeared to reduce the risk. The study suggested that shoe rotation and the use of orthoses with an adequate longitudinal arch and metatarsal cushion could be effective in preventing or treating plantar fasciitis (18).

The strengths of the current study include its focus on a specific, high-risk population (hospital staff) and the use of a detailed, face-to-face data collection method. However, its limitations are notable. The cross-sectional design precludes establishing causality, and the study's setting in a single hospital may limit the generalizability of the findings. Moreover, the reliance on self-reported data could introduce response bias (26).

The study underscores the significant prevalence of plantar fasciitis among hospital staff, particularly in professions involving prolonged standing. The gender disparity in prevalence, with a higher incidence in females, calls for tailored preventive and treatment strategies. These findings, alongside those from other studies, suggest that workplace ergonomics, shoe choices, and occupation-specific risks are critical factors in the development of plantar fasciitis. Future research should aim to explore these relationships in diverse settings and populations, using longitudinal designs to establish causality and further our understanding of this common yet often overlooked condition (27).

CONCLUSION

The study revealed that a significant portion of hospital staff, due to prolonged standing hours associated with their job roles, frequently suffer from heel pain, as well as discomfort in the mid and outer areas of the foot. This pain, often undiagnosed and untreated, predominantly stems from a lack of awareness about its potential severity. Consequently, this neglect can lead to the development of plantar fasciitis, a condition that could otherwise be preventable or managed with early intervention.

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