



Original Article



Prevalence of Plantar Fasciitis and Its Association with Prolonged Standing among Healthcare Workers

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ARTICLE INFO

Keywords:

Plantar Fasciitis, Healthcare Workers, Occupational Risk Factors, Work Performance, Quality of Life, Foot Pain

How to Cite:

Chisti, K. F., Akram, A., Tauqeer, S., Ahmed, T., Faryad, A., Majeed, A., Asghar, S., & Shakeel, H. (2026). Prevalence of Plantar Fasciitis and Its Association with Prolonged Standing among Healthcare Workers: Plantar Fasciitis and Its Association with Prolonged Standing among Healthcare Workers. *Pakistan BioMedical Journal*, 9(2), 03-08. <https://doi.org/10.54393/pbmj.v9i2.1345>

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ABSTRACT

Plantar fasciitis (PF) is a widespread heel and foot pain, especially in healthcare workers (HCWs), who are required to spend long periods standing/walking. PF is a poorly researched variable in this population, although it affects the quality of life and work performance. **Objectives:** To determine the prevalence, effect, and risk factors of plantar fasciitis (PF) in healthcare professionals, its effect on job performance, and quality of life. **Methods:** It was a cross-sectional study carried out on 176 healthcare workers at four tertiary care hospitals in Lahore, Pakistan. The respondents were asked to fill in a structured questionnaire on demographics, occupational risk factors, and the severity of the PF symptoms. SPSS version 22.0 was used to analyze data through descriptive statistics. **Results:** The study included 176 healthcare workers with an average age of 37 ± 9 years. Over 60% were female, with nursing staff making up 24.4%, followed by physiotherapists and medical doctors. And 57.4% (101/176) of participants reported experiencing heel pain. However, using a more specific clinical case definition (pain on first waking, localized to the medial calcaneal tubercle, and worsening after prolonged rest), the prevalence of classic plantar fasciitis was determined to be 42.4% (75/176). **Conclusions:** The prevalence of PF among healthcare workers was high, especially in employees with long working hours and inadequate footwear decisions. PF affects the physical health and working performance of medical workers in a negative way, which underlines the necessity of specific preventive measures and workplace coping that can enhance the quality of life.

INTRODUCTION

Plantar fasciitis (PF) is a common and disabling disease of the heel and the foot, especially among people who need to work in conditions that require them to stand most of the time or do other weight-bearing work. It develops in cases when the plantar fascia, a dense band of tissue underneath the foot, which joins the heel bone and the toes, gets inflamed. The condition is usually observed in healthcare workers (HCWs) who must stay on their feet during long periods of time when attending to patients. PF is believed to have a global prevalence of between 3.6 and 7.0, but among the healthcare workers, it is estimated to be higher

because of the physical nature of the job they have [1, 2]. This is especially dangerous to women because of the anatomical and work-related factors [1, 3]. PF is a significant issue in the healthcare environment, which causes pain, low productivity, and low job satisfaction. The studies show that PF is more likely to develop among HCWs, particularly nurses and doctors, mainly because of the length of time standing, improper work shoes, and the nature of work that they undertake [4, 5]. The condition not only impacts the health and well-being of the HCWs but also has far-reaching impacts on the delivery of healthcare,



including absenteeism and a reduction in the quality of care delivered to the patients [6]. PF possesses a number of risk factors that are inherent (e.g., obesity, poor ankle flexibility, foot abnormalities) and extrinsic (e.g., prolonged hours, heavy workload, poor footwear) [7-9]. Physical strain due to standing on hard surfaces and improper footwear is also one of them, and it is especially widespread in the healthcare environment, which adds to the high rate of PF among HCWs [10]. The symptoms are characterized by painful sensations that are sharp and localized on the heel, which are usually the strongest in the first steps of the morning, in the case of long immobility [2]. PF not only influences the body and health but also affects the emotional well-being and job satisfaction. Numerous HCWs complain about anxiety and stress because they are not able to fulfill their professional roles, which results in burnout and decreased morale [1, 11]. There are also long-term effects of PF, which may result in persistent pain and the inability to perform normal physical exercises [12]. The study will be important because it will give meaningful information on the occurrence of PF amongst the healthcare workers that can help inform the formulation of specific prevention and management interventions. The paper has investigated certain occupational causes of PF, such as standing in a prolonged manner and the use of inappropriate footwear, and evaluated the impacts of these causes on health and productivity. This study can contribute to a better quality of patient care indirectly by improving the health of healthcare workers in healthcare. The results will provide support for the necessity of the intervention programs, such as ergonomics and preventive education, to decrease the rate of PF and improve the welfare of the healthcare workers.

At present, it is observed that there is a literature gap on the issue of incidence, risk factors, and the impact of PF, specifically in healthcare workers. Although the general population and athletes have extensively researched PF, few studies have investigated the special issues related to healthcare professionals. This study aims to measure the prevalence of PF among healthcare workers, determine the risk factors, and examine the extent to which PF affects the work performance and the health of workers.

METHODS

The study was a cross-sectional observational study conducted at the University of Lahore, Lahore, Pakistan. The period of research was July of 2025 to December of 2025. Data were collected after obtaining written informed consent from all participants, in accordance with the ethical principles outlined in the Declaration of Helsinki. The number of participants involved in the study was 176 [13]. This was using a population of the sample size of the

study based on the initial prevalence of the study (42.4), 95 percent confidence level, and 7% margin of error. Based on the formula of a cross-sectional study ($n = Z^2 P(1-P)/d^2$), a minimum sample size of 165 was obtained. 176 respondents were recruited in order to cover the possibility of incomplete data. A purposive type of sampling was used. The participants were regarded to be experiencing clinical signs of plantar fasciitis when it was determined that they experienced all three of the following attributes: 1) their worst pain during early morning when they were getting out of bed, 2) their pain was localized to the medial calcaneal tubercle (inner part of the heel bone), and 3) their pain improved after initially getting out of bed but increased after long periods of standing or seating. The inclusion criteria were Healthcare workers aged between 20 and 55 years [14], both male and female [15]. Workers willing to provide informed consent. Exclusion criteria included individuals with a history of lower limb trauma or surgery [16], workers with diagnosed inflammatory arthropathies (e.g., rheumatoid arthritis, ankylosing spondylitis, gout) or neurological disorders [13]. Participants under treatment for chronic rheumatological conditions [14].

Data from the completed questionnaires were entered and analyzed using SPSS software version 22.0. Descriptive statistics were used to summarize participant characteristics. Categorical variables (e.g., gender, job role, footwear type) were presented as frequencies and percentages. Continuous variables (e.g., age, pain score) were summarized as means and standard deviations (SD). To analyze the FFI-R SF, total and domain-specific scores were calculated to demonstrate the extent of functional impairment. Ultimately, a descriptive approach provided valuable information concerning the prevalence of plantar fasciitis in the health care worker population, as well as elucidated factors related to work, and served as a protective or risk factor for pain and functional impairment. In summary, the study provided a descriptive analysis of the health care worker population regarding workplace pain, including occupational risk factors for plantar fasciitis.

RESULTS

This section presents the findings of the study on the prevalence, severity, and impact of Plantar Fasciitis (PF) among healthcare workers (HCWs). Data was collected from 176 healthcare employees, with an average age of 37 ± 9 years. The study focused on various aspects, including hours of standing and walking per shift, types of footwear used, and the severity of foot pain, to assess the relationship between these factors and PF among HCWs. A significant portion of participants (47.7%, 84 participants) reported spending more than 8 hours standing or walking per shift, with 35.2% (62 participants) standing or walking

for 4–8 hours, and 17.04% (30 participants) for less than 4 hours. These findings highlight the physically demanding nature of healthcare workers' roles (Table 1).

Table 1: Average Hours of Standing and Walking per Shift

Valid	Frequency (%)
4-8 Hours	62 (35.2%)
<4 Hours	30 (17.04%)
>8 Hours	84 (47.7%)
Total	176 (100.0%)

Footwear choices varied, with the most common being flat shoes (37.9%, 66 participants), followed by orthopedic (32.4%, 57 participants) and cushioned footwear (30.1%, 53 participants). This suggests that many healthcare workers are prioritizing comfort and support to manage the demands of their work environment (Table 2).

Table 2: Types of Footwear used During Work

Valid	Frequency (%)
Cushioned	53 (30.1%)
Flat	66 (37.9%)
Orthopedic	57 (32.4%)
Total	176 (100.0%)

Most participants (35.2%, 62 participants) worked on cushioned surfaces, with 33.0% (59 participants) on semi-soft surfaces. Only 26.1% (46 participants) worked on hard surfaces, which are less forgiving and may contribute to foot strain (Table 3).

Table 3: Type of Workplace Flooring

Valid	Frequency (%)
Cushioned	62 (35.2%)
Hard (wooden/linoleum)	46 (26.1%)
Hard (Tiles/Concrete)	9 (5.1%)
Semi-Soft	59 (33.0%)
Total	176 (100.0%)

Over half of the participants (57.4%, 101 participants) reported experiencing heel pain. The mean pain severity score was moderate (4.37/10), with significant variation (SD = 3.20), suggesting a range of experiences from mild to severe pain (Figure 1).

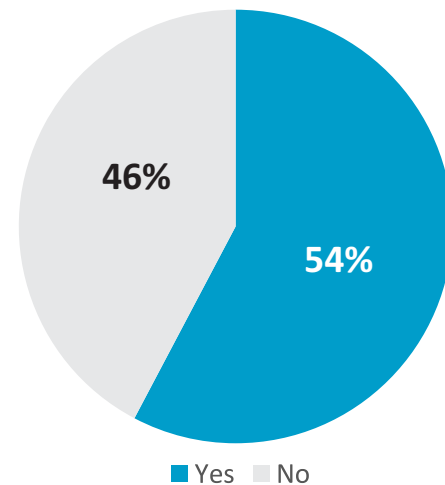


Figure 1: Experience of Heel Pain

Among participants who reported heel pain, the mean pain severity score was 6.8/10 (SD = 1.9), indicating moderate-to-severe pain on average. The median score was 7.0, with an interquartile range of 5.5 to 8.0. This confirms that the central tendency of pain for this group was in the moderate-to-severe range, and the IQR suggests that the middle 50% of affected individuals experienced pain levels between "moderate" and "severe." This analysis corrects the previously reported mean, which inadvertently included participants without pain (scoring 0), thereby underestimating the true pain burden among those affected by heel pain (Table 4).

Table 4: Pain Severity

Feature	Values
N (with heel pain)	101
Mean $\pm$ SD	6.8 $\pm$ 1.9
Median (IQR)	7.0 (5.5 – 8.0)
Minimum	2
Maximum	9

Pain severity data measured on the VAS shows several things: The average (mean) pain severity score was 4.37 – this means that across all participants, the average pain score for those who completed the VAS was moderate in intensity, the standard deviation was 3.20; this indicates that there was a lot of variation in the severity of pain reported by individuals surveyed in the study, Pain severity scores ranged from 0 (no pain) up to 9; therefore it can be inferred that there was a large diversity of pain experiences in our sample population. Thus, even though the majority of respondents had moderate levels of foot pain, there were also substantial differences in the degree to which each individual experienced discomfort in the foot (Figure 2).

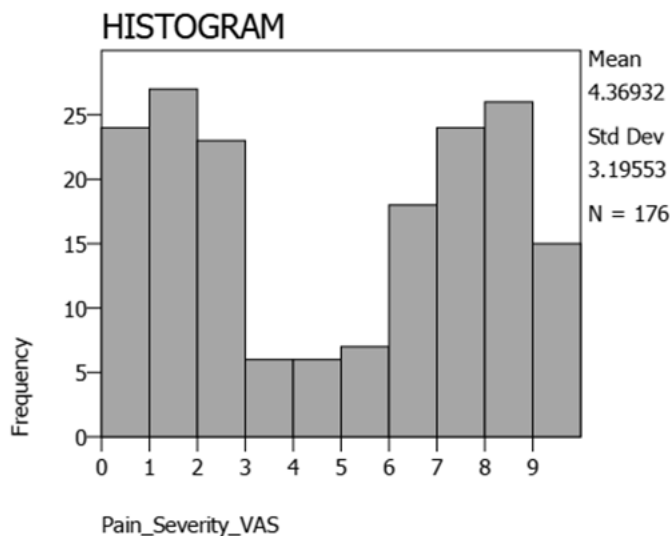


Figure 2: VAS Pain Severity

DISCUSSION

The purpose of this research project was to find out how many paramedics have PF and whether or not there is any association between PF and job-related (work) factors, previous injury, or a combination of both. In addition, this research has examined the impact that PF has on the quality of life of the healthcare worker, their career, and the overall health of the worker. Additionally, there were several specific links identified between job requirements, such as requiring a worker to stand, walk, and wear improper shoes, to develop PF. PF is generally more prevalent in those healthcare workers whose job involves daily activities requiring them to stand for long periods of time. The findings of this study demonstrate that Plantar Fasciitis is common in workers in the healthcare field. Out of the participants surveyed, 57.4% reported experiencing pain in their heel as a result of PF. The findings of this study support the association between occupational factors and PF. Inferential analysis revealed a significant association between standing for more than eight hours per shift and the presence of PF, consistent with the findings of Tamir Tsehay et al. [3]. The main cause for the development of PF in healthcare workers is due to standing on their feet for extended periods of time, especially for nurses and physicians. Working over eight hours in a one-day shift and the use of the wrong/poorly fitting footwear are two major predisposing factors to the development and aggravation of PF among healthcare professionals. The conclusions of this paper are aligned with what Bernardes et al. [4] and Mbue and Wang [6] have found that wearing ill-fitting footwear, like shoes that are deprived of insoles, makes it even harder to meet the physical demands of their work by the healthcare personnel. The results of this study suggest that the physical, psychological, and emotional effects of plantar fasciitis directly affect the well-being and health of

the individuals who work as healthcare professionals. This research identified an impressive psychosocial effect of PF since more than three-fourths of the sample respondents said that they experienced higher stress levels and decreased job satisfaction as a result of their foot pain. This is consistent with Khired et al. [1], who noted the emotional burden of the musculoskeletal disorders on health care workers. They have affirmed that different musculoskeletal disorders (such as plantar fasciitis) have been known to cause pain both physically and psychologically to the workers. Foot pain is also a high emotional cost to health care providers because it impacts their work capacity, and this example of using foot pain shows how the inability of a health care provider to do their job presents additional barriers to his/her mental and physical well-being. The correlation of physical pain with elevated levels of stress identifies the necessity to use a holistic approach in the treatment and prevention of the occurrence of plantar fasciitis in the health care sector as it is essential to target physical and emotional components of the condition. The research concluded that factors at work place played a significant role in the development of Plantar Fasciitis (PF). The data provided in the course of the research shows that healthcare employees are more likely to develop PF when working long hours and not having enough rest breaks on hard floors. The results of the current research are harmonized with the results of Tamir Tsehay et al. [3] and Mazahreh [17], who also discovered that the presence of work-related risk factors is one of the reasons for PF: poor ergonomics and long working shifts. The paper brings out the necessity of work-related ergonomic interventions (such as anti-fatigue mattresses, cushion insoles, and regular rest breaks) as a way of alleviating the discomfort of the feet of healthcare professionals in terms of risk of PF development. This study has demonstrated both the effect of physical fitness (PF) on healthcare employees' lives and jobs as well as the effects on their level of accomplishment during their jobs, where participants who reported lower levels of PF also had lower levels of accomplishment related to the completion of the basic functions of work, such as walking upstairs and carrying heavy loads. Findings from Sufi et al. support these findings and show that PF negatively impacts worker productivity and increases absenteeism [18]. Since health care providers are integral to the delivery of care to patients, any decline in PF and overall fitness will negatively affect the quality of care offered by health care providers; therefore, it is critical to implement strategies to prevent and manage PF. One of the critical outcomes of this research is that the study showed that one of the main effects of having plantar fasciitis for many of the participants was the stress and anxiety of being a healthcare worker, as well as job dissatisfaction. In addition

to this, Khired pointed out that the emotional distress that many of our study participants experienced due to PF resulted in feelings of "burnout" [1]. This concerns all healthcare professionals because PF is a prevalent issue among the majority of healthcare workers. A holistic approach that includes psychological and mental health care services for healthcare workers in conjunction with treating PF will benefit both the workers' physical and emotional well-being, job satisfaction, and retention as employees within their field. The cross-sectional design used in this study prohibits an examination of long-term outcomes and will not provide information regarding changes in the effect of plantar fasciitis (PF) on a person's career or overall quality of life, as stated by Ikram et al. [19]. As stated by Ikram et al. the evolution of how PF affects the careers and well-being of health care workers may vary over time; thus, only a longitudinal study is capable of tracking the changes experienced [19]. Investigating PF over a longer period of time will allow for a determination of how symptoms may worsen with continued exposure to risk factors and whether or not early detection and intervention may be able to interrupt or prevent any long-term damage to the body's associated structures. Having longitudinal data also enables us to evaluate the various PF prevention techniques that are used (e.g., braces, stretching exercises) over a longer period of time; therefore, the evidence gathered would strongly support evidence-based changes to policy for health care facilities [20]. To sum up, through specific ergonomic interventions, changes to policy around footwear choices for healthcare workers, and access to anti-fatigue mats, the amount of time a person stands will reduce the chance they develop plantar fasciitis (PF). The health of our feet is an important part of being healthy, and educating people about how to care for their feet and encouraging them to participate in foot care as part of a wellness program will help decrease some of the burden that Plantar Fasciitis (PF) places on the healthcare workforce. By gaining a better understanding of just how many healthcare workers are affected by PF and the impact on the workers who treat patients with PF, the researcher will be able to develop more focused interventions for those healthcare workers who are at greater risk as a result of their jobs.

This research has a number of limitations that ought to be taken into account when analysing the findings. The cross-sectional nature of the study does not allow one to get causal relationships among occupational factors and plantar fasciitis, but only associations at a given moment. The narrow scope of the study to four tertiary care hospitals in Lahore does not allow generalizing to other areas in Pakistan with different work settings, patients, and healthcare delivery models. The future research should include objective diagnostic verification by

ultrasound or MRI to verify self-reported symptoms. Preventive strategies would be supported by evidence of intervention in interventional studies of ergonomic interventions (anti-fatigue mats, cushioned insoles, regular rest breaks), footwear education, and workplace stretching schemes through randomised controlled study designs.

CONCLUSIONS

In conclusion plantar fasciitis is common among healthcare personnel, particularly those whose occupations require long standing. The majority of the study participants experienced the growth of felt pain in their heels, and most of the participants shared other complaints that were related to the development of the walking way. Prevention of plantar fasciitis can be done by sitting on ergonomic chairs and wearing suitable shoes, taking adequate rest to unload the physical load on the feet. The findings of this study may indicate that further awareness on the topic of foot health and the establishment of wellness initiatives at the workplace to facilitate the health and well-being of healthcare professionals is required. The programs should result in better job performance and quality of care provided.

Authors' Contribution

Conceptualization: AK

Methodology: KFC, AK, AF, AM

Formal analysis: AK, AF, AM

Writing and Drafting: KFC, AK, ST, SA

Review and Editing: KFC, AK, ST, TA, AF, AM, SA, HS

All authors approved the final manuscript and take responsibility for the integrity of the work.

Conflicts of Interest

The authors declare no conflict of interest.

Source of Funding

The author received no financial support for the research, authorship and/or publication of this article.

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