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Prevalence of Plantar Fasciitis Among Police Personnel: A Cross-sectional Study

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ABSTRACT

Introduction: Plantar Fasciitis (PF) is a painful condition characterized by inflammation of the plantar fascia, a fibrous tissue that supports the foot's arch. This condition arises from overstretching the plantar fascia, leading to minute tears where it connects to the heel bone (calcaneum). The findings of this research offer essential insights for developing strategies to prevent and manage plantar fasciitis in high-risk occupational groups, such as police and other military and paramilitary personnel. This study aimed to find out prevalence of plantar fasciitis among police personnel and identify significant contributing factors.

Methods: This cross-sectional study consisted of 161 police staff with posterior heel pain who visited the Orthopedic Outpatient Department of Nepal Police Hospital from January 1, 2024, to December 31, 2024, using a convenient sampling technique. Data analysis was performed utilizing the Statistical Package for Social Science (SPSS) version 20.0.

Results: Among 161 police personnel with a mean age of 33.08 +/- 6.09, underwent the windlass test, and those who tested positive, completed the Foot Function Index (FFI) questionnaire. 42 police personnel demonstrated a positive windlass test, leading to a prevalence of 26.1% for plantar fasciitis within this group. Significant risk factors associated with the onset of PF included high body mass index (BMI), female gender, and prolonged periods of standing, running, and walking. PF was commonly observed in individuals aged 30 to 40 years and in those classified as overweight.

Conclusions: This research identified the prevalence of plantar fasciitis among police personnel experiencing posterior heel pain, with pain being the primary issue. Significant associated risk factors included high BMI, being female, and extended periods of standing or walking. These results highlight the occupational susceptibility of police staff to plantar fasciitis, which can influence their physical performance and overall quality of life.

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INTRODUCTION

Plantar Fasciitis (PF) is characterized by severe inflammation of the plantar fascia, a fibrous tissue band located at the foot's base, which supports the arch.[1] When the plantar fascia becomes overstretched, it results in small tears, especially at the point where it attaches to the heel bone (calcaneus).[1,2] Among foot-related discomfort, PF is the most prevalent cause, responsible for an estimated 11-15% of all complaints necessitating a hospital visit.[2-5] Physically active people, like runners, jumpers, and those engaged in strenuous physical activities, including police officers and middle-aged women (40-60 years) who are overweight, are at higher risk for experiencing plantar heel pain.[6-9] Various studies have indicated the occurrence of plantar fasciitis in certain sports and professional groups, such as runners and soldiers, with prevalence rates ranging from 2.7% to 17.5%.[10-13].In Nepal, there is limited research; however, it was noted that 63.8% of nurses tested positive for plantar fasciitis with a Windlass test, while 36.2% tested negative.[14]

Despite existing international and national data, information on the prevalence of plantar fasciitis among Nepal Police personnel is lacking. Given the physically demanding nature of police duties, which involves activities like running, jumping, and sustained marching, this group is presumed to be at increased risk. Gaining insights into the prevalence and risk factors among the personnel of Nepal Police is essential to devising targeted measures aimed at reducing workplace foot injuries and ensuring the physical readiness of the workforce. The objective of this study was to assess the prevalence of plantar fasciitis among police personnel and identify significant contributing factors.

METHODS

This cross-sectional study aimed to evaluate the prevalence and features of plantar fasciitis among police officers. The research was conducted at the Department of Orthopedics, Nepal Police Hospital, over a one-year timeframe from January 1, 2024, to December 31, 2024.

The study group comprised all police personnel who visited the orthopedic outpatient department and received a diagnosis of plantar fasciitis during the specified period. Those were excluded from the study who had a history of foot fractures, had undergone recent foot surgeries, suffered from musculoskeletal disorders, had comorbid conditions, experienced pathological foot issues, were born with congenital foot deformities, or chose not to give their consent.

The sample size was determined using the equation $n = Z^2 \times p \times q / e^2$, where the prevalence rate (p) was set at 11.83%, the Z-score for a 95% confidence interval was 1.96, and the margin of error (e) was 5%. This calculation resulted in a necessary sample size of 161 individuals.

A convenience sampling method was employed to gather participants who met the criteria during their visits to the orthopedic outpatient clinic. Data were collected through a structured questionnaire, and all pertinent variables were recorded using a formalized Performa.

For the analysis of data, MS Excel was utilized for data entry, while SPSS software (Version 20) was used for conducting statistical analyses. Continuous variables were described using the mean and standard deviation (Mean ± SD), and categorical variables were reported as frequencies and percentages.

The study received ethical approval from the Institutional Review Committee (IRC) of Nepal Police Hospital (Reference No-54). Prior to data collection, informed consent was obtained from all participants.

RESULTS

Patient demographics

The mean age of total participants was 33.08±6.09 years, mean height was 149.99±6.52, mean weight was 56.73±11.60, and mean BMI was 25.15±4.54. (Table 1). Among participants, there were 102 (,63.4 %) female and 59 (36.6 %) male patients. (Table :2)

Table 1: Patient demographics

Variables	Minimum	Maximum	Mean	Std. Deviation
AGE	20	50	33.08	6.09
height(cm)	137.0	164.5	149.99	6.52
weight(kg)	37	80	56.73	11.60
BMI	16.89	38.09	25.15	4.54

Gender distribution

Table 2: Gender distribution

Gender	Frequency	Percent
Female	102	63.4
Male	59	36.6

Among 161 participants 119 police personnel were involved in hard field duty, 32 were in physical training and remaining 10 were office desk worker.

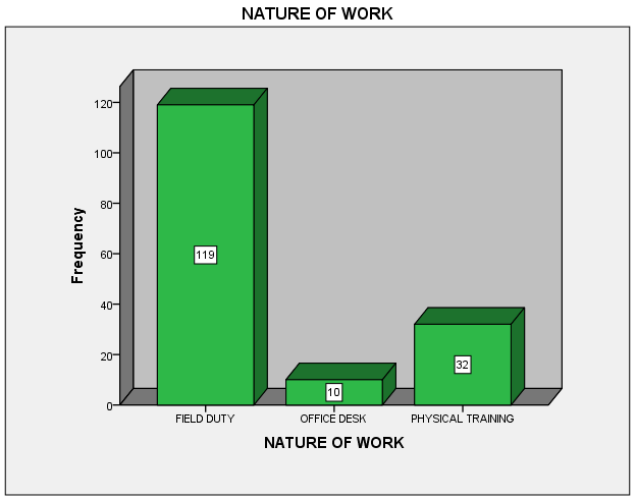

Figure 1: *Nature of work among participants*

Windlass test was positive among 42 (26.1%) participants, and 119 (73.9%) were found negative. (Figure 1). FFI sub-scale frequency showed that pain in 137 (85.1%), followed by activity limitation in 22 (13.7 %) and disability in 2 (1.2 %) patients. (Figure:2)

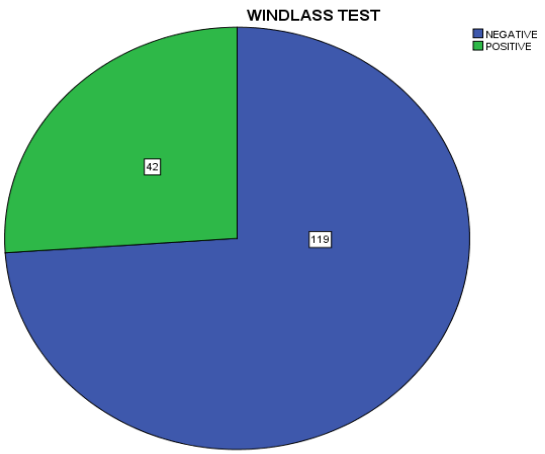

Figure 2: *Windlass's test among participants*

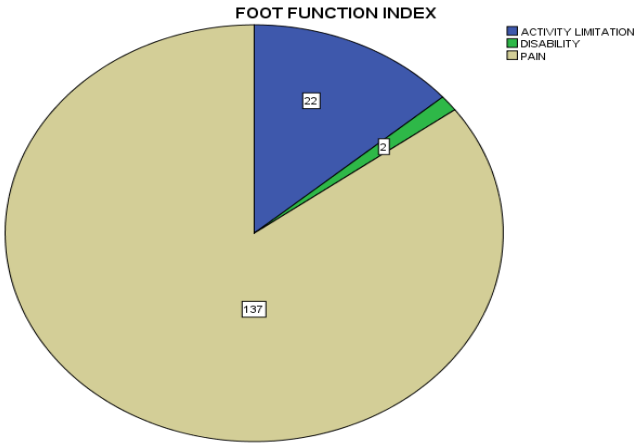

Figure 3: *FFI*

DISCUSSION

The study included 161 police personnel with posterior heel pain, with a mean age of 33.08 ± 6.09 years, a mean height of 149.99 ± 6.52 cm, a mean weight of 56.73 ± 11.60 kg, and a mean BMI of 25.15 ± 4.54. Females comprised 63.4% of the participants, while males made up 36.6%. The windlass test was positive in 26.1% of cases, indicating a plantar fasciitis prevalence of 42 individuals. Analysis of the Foot Function Index subscales showed pain as the most frequent symptom (85.1%), followed by activity limitation (13.7%) and disability (1.2%). These results highlight plantar fasciitis as a significant issue among police personnel, primarily driven by pain-related functional limitations.

This study was conducted to identify the prevalence of plantar fasciitis among police personnel visiting the tertiary care center of a developing country. Patient's comfort and quality of life are impaired by PF, so it is crucial to look into its prevalence and associated risk factors. It is essential to study risk variables because they have an impact on the appropriate professional life to decrease the prevalence of PF. A study done in Nepal by Shrestha M. et al. among Nurses working in Tertiary hospital revealed positive prevalence of windlass test 63.80% [14] This may be due to prolonged standing and walking during duty hour with inappropriate use of footwears. Study conducted Goweda R. et.al showed prevalence of plantar fasciitis among 270 patients was 57.8% majority of them were wearing inappropriate shoes.[15]Similar to our study as police personnel are compulsion to use their long boot with hard sole for longer duration. A study conducted by Khired Z et.al on the Al Jouf region of Saudi Arabia showed that adults aged less than 40 years, with a predominance of females, which was similar to our finding.[16] They concluded that 237 (35.6%) of the participants were employed in the teaching profession, 95 (14.3%) in healthcare, and the least doing other jobs. 237 (35.6%), indicated that their work required them to be standing or walking for 3-6 hours each day, while 250 (37.6%) reported that their work required them to sit for fewer than 3 hours each day. PF was linked to long workdays spent standing or walking, which was similar to our study.[16]

A study done by Ayushi P et. al among 60 participants of the traffic police in India, 14 had positive windlass test, with a 23% prevalence of Plantar fasciitis was found.[17] The traffic police have a standing job for long hours, which causes trauma to the plantar fascia that causes PF similar to police personnel with prolonged field duties in our study. A study done by Shah J. et.al [18] showed that the frequency of plantar fasciitis in Surat Indian traffic police personnel was 24.3 % that is 34 among 150 participants. PF is the result of repetitive stress on the sole, usually brought on by strain and tearing of the plantar fascia. These tensions create microtrauma to the tissue, which in turn promotes inflammation of the lesion area.[19]Irregular eating patterns, bad diet, and lack of exercise have made them obese, with incorrect footwear being are associated risk factor for developing PF. [20]

This research was retrospective and carried out in a single-center environment, which could restrict its applicability to larger police or paramilitary groups. Furthermore, the potential for recall bias and the absence of long-term follow-up may have impacted the precision of the reported risk factors and outcomes.

CONLCUSIONS

These findings underscore the occupational risk of plantar fasciitis in police staff. Workplace wellness programs focusing on weight management and foot care education should be prioritized. Rotating duties and ensuring adequate rest breaks may help reduce repetitive stress on the plantar fascia. Incorporating routine stretching and strengthening exercises into

training can further prevent symptoms. Finally, early screening using tools like the windlass test can enable timely intervention, reducing the burden of plantar fasciitis among high-risk personnel.

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None

CONFLICT OF INTEREST

None

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