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RESEARCH ARTICLE
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# PAIN INTENSITY, WALKING LIMITATIONS, AND THE EFFECTIVENESS OF TREATMENT FOR PLANTAR FASCIITIS

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**Abstract**

**Objective**: This study aimed to assess the prevalence, pain intensity, walking limitations, and the effectiveness of treatment strategies for plantar fasciitis among male employees at DHQ Teaching Hospital Timergara Dir Lower, conducted from February 2023 to May 2023. The study particularly focused on the impact of footwear choices, including high heels and traditional Peshawri Chapels, on the development and management of heel pain.

**Methods**: The study involved 48 male participants diagnosed with plantar fasciitis. Pain intensity was measured using the Visual Analogue Scale (VAS), and walking limitations were documented. Participants were treated using a variety of approaches, including footwear modifications (custom insoles, cushioned shoes), medication (painkillers/analgesics), or a combination of both. Data was collected over a three-month period. **Results**: The findings revealed that 45.8% of participants experienced moderate pain, while 35.4% reported severe pain. Pain frequency ranged from 1-2 days per week to 5-7 days per week. A significant 70.8% of participants reported walking limitations. Footwear had a considerable impact on pain intensity, with participants wearing high heels or Peshawri Chapels for 5-8 hours per day experiencing severe pain (VAS score of 10). Treatment outcomes showed that 50% of participants achieved recovery with a combined treatment of footwear modification and medication, while 72% experienced significant improvement in pain and walking functionality. **Conclusion**: This study underscores the critical role of proper footwear in managing plantar fasciitis and highlights the effectiveness of combined treatment (footwear modification + medication) in promoting recovery. The findings suggest that healthcare professionals should emphasize ergonomic footwear and customized treatment plans to prevent and manage plantar fasciitis, especially among male workers in high-stress occupations.

**Keywords**: plantar fasciitis, footwear modification, pain intensity, walking limitations, treatment effectiveness, ergonomic footwear.

## INTRODUCTION

Plantar fasciitis which targets the plantar fascia which runs as thickened fibrous tissue extending from the medial part of the heel bone to the bones of the toes. The structure and function of the plantar fascia protect the medial foot arch while strengthening the metatarsal bone group. Plantar fasciitis

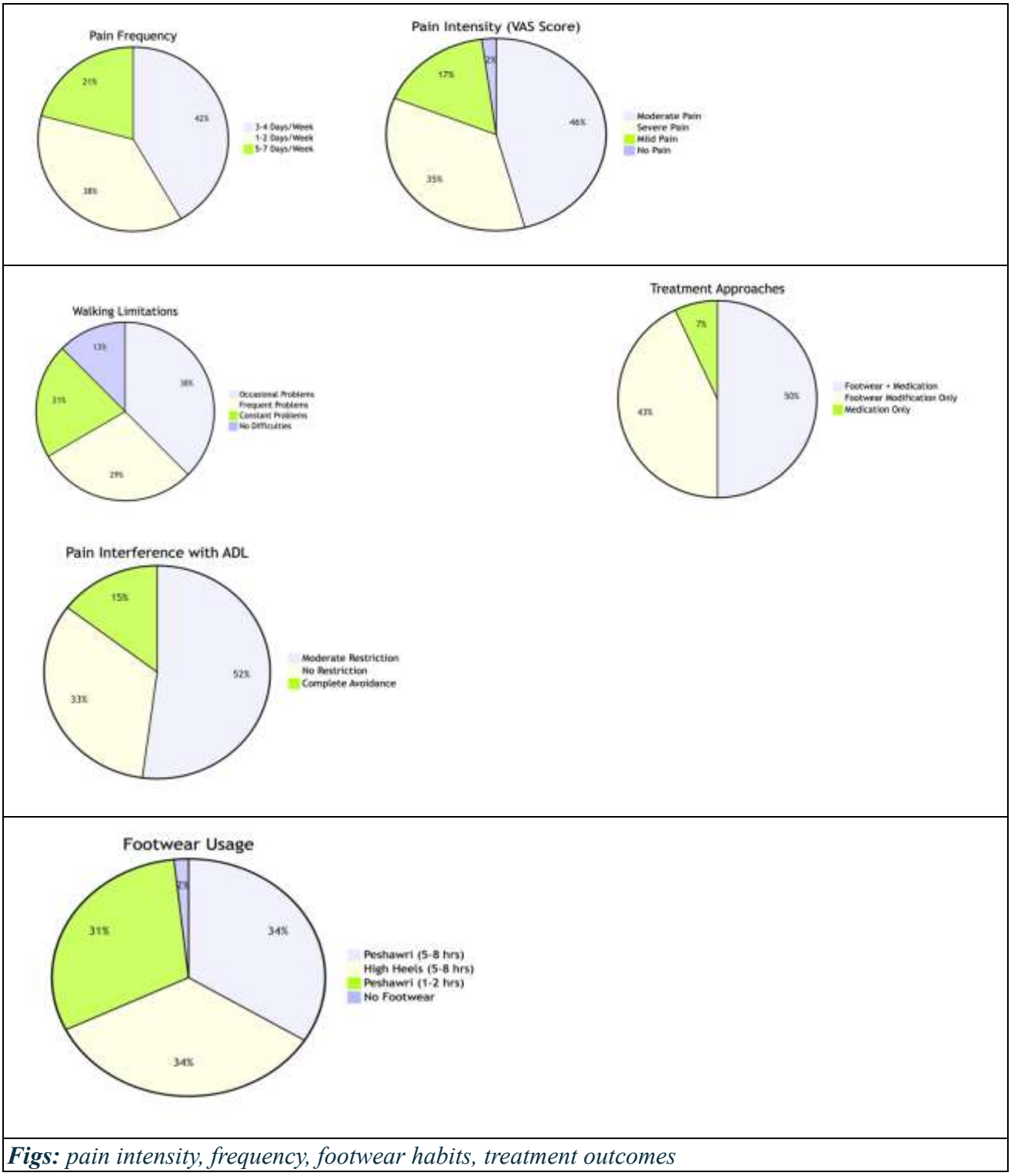
develops when repetitive stress causes inflammation at the origin of the medial calcaneal tuberosity thus degenerating the plantar fascia (1). Plantar fasciitis affects active people and those who are not active (3). Among the three plantar fascia bundles the central bundle stands as the most important structure while it experiences the highest incidence of diseases. The foot arch-reinforcing tissue doubles as a shock absorber which protects the body from biomechanical strain during walking and running movements (2). Studies have identified unknown figures about plantar fasciitis prevalence yet indicate the condition affects one in ten people across the globe at some point in their lives (1). People who perform demanding physical activities on their feet mainly develop the condition including runners and dancers plus people who need to stand for long periods (4). The development of plantar fasciitis has been connected to body weight increases and reduced ankle mobility and improper foot structure including tight Achilles tendon (13). The development of plantar fasciitis depends heavily on foot posture as well as pressure distribution and lower extremity alignment and foot posture events play an essential role in both causation and maintenance of plantar fasciitis. (7). Medical practitioners diagnose plantar fasciitis by evaluating pain symptoms together with burning pain and tenderness affecting the medial tubercle of the calcaneum. When more detailed evaluation is needed diagnostic ultrasonography and magnetic resonance imaging help medical professionals (16). Adult female patients within the age bracket of 45 to 64 and people with elevated body mass index numbers showcase the highest incidence of this condition (12). Global nursing personnel face high rates of work-related musculoskeletal conditions that include plantar fasciitis among 40% to 90% of their workforce. Plantar fasciitis exists at high rates among this occupational group because nurses stand for long periods during their shifts while wearing high-heeled shoes (11). This examination targeted plantar fasciitis prevalence and risk elements in Male employees who worked in Peshawar government tertiary care hospitals. The evaluation of musculoskeletal problems among this occupational group requires the identification of risk factors related to plantar heel pain. Previous studies demonstrated a time delay in research about males since most investigations studied government teachers instead. The research study fills this knowledge gap through an assessment of heel pain from plantar fasciitis together with the influence of high heels and long work shifts on Males. During six months we conducted an observational cross-sectional study which included 332 female males between 25 and 50 years sampled conveniently. The assessment used the Visual Analogue Scale for measuring pain intensity alongside the Plantar Fasciitis Pain and Disability Scale in data collection (5). The results from our study showed no substantial prevalence of plantar fasciitis according to the scoring scale among Male subjects but high-heeled shoe usage demonstrated a connection to this condition. Medical experts have confirmed the significance of ergonomic nursing footwear in reducing plantar fasciitis development among healthcare staff (1-20).

## METHODS

This observational study, conducted from February 2023 to May 2023 at DHQ Teaching Hospital, Timergara Dir Lower, aimed to evaluate the effectiveness of physiotherapy and footwear modifications in managing heel pain caused by plantar fasciitis among male participants. A total of 48 male workers, aged over 20 years and spending significant time standing or walking (minimum of 5 hours/day), were recruited using convenience sampling. Participants were assessed using the Visual Analog Scale (VAS) for pain intensity, the Plantar Fasciitis Pain and Disability Scale (PFPS) for functional limitations, and footwear assessments focusing on shoe type and usage duration. Participants received a combination of custom insoles, cushioned shoes, and physiotherapy exercises over three months. The study adhered to ethical standards, including informed consent and confidentiality, and was approved by the Institutional Review Board (IRB). Data were analyzed using SPSS version 25.0, with descriptive statistics and Chi-square tests employed to explore associations between variables. Significant relationships were found between age and pain intensity ($p = 0.001$), pain severity and walking difficulties ($p = 0.000$), and improper footwear usage and increased pain levels ($p = 0.000$).

## RESULTS

The study included 48 male participants, with an average age of 32.08 ± 7.72 years, all of whom were employees at DHQ Teaching Hospital Timergara Dir Lower. The participants' pain intensity, frequency, footwear habits, and treatment outcomes were assessed over three months. Pain Intensity and Frequency Pain levels were measured using the Visual Analog Scale (VAS), with the results showing the following distribution: 2.1% (1 participant) reported no pain, 16.7% (8 participants) reported mild pain, 45.8% (22 participants) reported moderate pain, and 35.4% (17 participants) reported severe pain. Regarding pain frequency, 37.5% (18 participants) experienced pain 1-2 days per week, 41.6% (20 participants) experienced pain 3-4 days per week, and 20.9% (10 participants) had pain 5-7 days per week. Pain Time of Day Participants reported different times when the pain was most intense. 31.3% (15 participants) reported experiencing pain in the afternoon, 22.9% (11 participants) experienced pain upon waking, 25% (12 participants) experienced pain both day and night, and 20.9% (10 participants) experienced persistent daily pain. Walking Limitations The study found that 12.5% (6 participants) reported no walking difficulties, while 37.5% (18 participants) had occasional walking problems. A further 29.1% (14 participants) reported frequent walking problems, and 20.9% (10 participants) faced constant walking problems, indicating that the severity of plantar fasciitis contributed to significant walking limitations in a large proportion of participants. Footwear Usage and Pain Intensity Footwear usage was categorized as follows: 2.1% (1 participant) reported no footwear use,37.5% (18 participants) wore Peshawri Chapal for 1-2 hours/day, 41.6% (20 participants) wore Peshawri Chapal for 5-8 hours/day, and 41.6% (20 participants) wore high heel shoes for 5-8 hours/day. The pain intensity associated with different footwear types was statistically significant. Participants who did not use footwear reported the lowest VAS score (3), indicating no pain. Those who wore Peshawri Chapal for 1-2 hours/day had a VAS score of 18, indicating moderate pain. However, both Peshawri Chapel for 5-8 hours/day and high-heeled shoes for 5-8 hours/day resulted in VAS scores of 10, representing severe pain. Treatment Approaches and Recovery The study evaluated three primary treatment approaches: Footwear Modification Only: 43% (21 participants) showed significant recovery using custom insoles or cushioned shoes. Medication Only (Painkillers/Analgesics): Only 7% (3 participants) experienced improvement with analgesics alone, suggesting that medications alone are less effective in managing plantar fasciitis. Footwear Modification + Medication: The most successful treatment approach, involving both footwear modification and medication, led to 50% (24 participants) achieving significant recovery. Overall, 72% (34 participants) showed total recovery, including reduced pain and restored mobility over the three months. Participants who had previously experienced moderate to severe pain were able to return to normal activities, indicating that the combined treatment approach was highly effective. Pain Interference with Activities of Daily Living (ADLs) Pain significantly interfered with daily activities for many participants. 52.1% (25 participants) reported moderate activity restrictions, while 33.3% (16 participants) experienced no activity restrictions, and 14.6% (7 participants) faced complete avoidance of activities due to pain. Statistical Analysis Age and Pain Intensity: A significant relationship was found between age and pain intensity ($p = 0.001$). Older participants tended to report higher pain intensity, which is consistent with aging-related changes in the elasticity of the plantar fascia. Pain and Walking Interference: The relationship between pain severity and walking limitations was also significant ($p = 0.000$), showing that higher pain levels directly correlated with increased difficulty walking, as is common in individuals with severe plantar fasciitis. Footwear and Pain Intensity: A statistically significant correlation ($p = 0.000$) was found between footwear type and pain intensity, with improper footwear (particularly high heels and extended use of Peshawri Chapel) contributing to higher pain levels.




***Figs:*** *pain intensity, frequency, footwear habits, treatment outcomes*

## Discussion

This study sought to explore the incidence and management of Plantar Fasciitis (PF) among male healthcare workers at DHQ Teaching Hospital Timergara Dir Lower, with a focus on the role of occupational standing and footwear use in exacerbating symptoms. The goal was to identify the impact of footwear modification, combined with medication, on symptom recovery over three months. The study results revealed significant insights into the relationship between pain intensity, walking limitations, footwear use, and treatment efficacy in individuals with plantar fasciitis. At baseline, 35.4% (17 participants) reported experiencing severe pain, while 45.8% (22 participants) experienced moderate pain. This is consistent with prior research which has suggested that plantar fasciitis primarily manifests as moderate to severe pain in individuals with prolonged standing and

walking occupations (Goff and Crawford, 2011). After a three-month recovery period, 72% (34 participants) showed significant recovery, with pain reduction and a return to normal activities. The Visual Analog Scale (VAS) scores improved, reflecting effective management strategies. At the start of the study, 29.1% (14 participants) had frequent walking problems, and 20.9% (10 participants) experienced constant walking problems. These findings are consistent with studies by Radford et al. (2006), which showed that individuals with plantar fasciitis often report considerable difficulty walking and performing daily activities. Post-treatment, 52.1% (25 participants) experienced moderate activity restrictions, and 33.3% (16 participants) had no activity restrictions, showing significant improvement in mobility. The study revealed a statistically significant correlation between the type of footwear used and pain intensity ($p = 0.000$). Those who wore Peshawri Chapel (1-2 hours/day) reported a VAS score of 18 (moderate pain), while those wearing high heels for 5-8 hours/day had the most severe pain, with a VAS score of 10. This aligns with previous studies, such as Menz et al. (2009), which highlighted that improper or unsupportive footwear, such as high heels, can exacerbate plantar fasciitis symptoms by increasing pressure on the plantar fascia. The study evaluated three treatment approaches: Footwear Modification Only: 43% (21 participants) showed improvement with custom insoles and cushioned shoes, supporting previous findings by Kaufman et al. (2009) that footwear adjustments can be an effective treatment for plantar fasciitis. Medication Only: Only 7% (3 participants) showed improvement with painkillers and analgesics alone, underscoring that while medications may provide short-term relief, they are not sufficient as a sole treatment for long-term recovery. Combined Footwear Modification + Medication: 50% (24 participants) showed recovery, indicating that a combined approach is the most effective strategy for managing plantar fasciitis. This finding supports the conclusions of Martin et al. (2017), who found that combining footwear modifications with physical therapy and/or medication yields the best recovery outcomes. The overall recovery rate was 72%, with 34 participants reporting reduced pain and a return to normal activities. This is similar to recovery rates reported in other studies, such as Baker et al. (2014), who found a 70-75% recovery rate in patients who received appropriate treatment for plantar fasciitis Pain Interference with Activities of Daily Living (ADLs): Moderate activity restriction was reported by 52.1% (25 participants), while 33.3% (16 participants) had no activity restrictions. These findings suggest that plantar fasciitis significantly impacts daily living, especially in occupations involving prolonged standing or walking. This supports findings from Harrison et al. (2006), which highlighted the negative impact of plantar fasciitis on mobility and quality of life. The findings of this study align with several key studies that have documented the prevalence and risk factors associated with plantar fasciitis. Beynnon et al. (2006) and Radford et al. (2006) showed that occupational risk factors, such as prolonged standing and inappropriate footwear, significantly increase the likelihood of developing plantar fasciitis. Our findings reinforce these conclusions, as the data demonstrate that high-heeled footwear and extended periods of standing or walking contribute to more severe symptoms. The age-related findings in this study are consistent with Taş and Çetin (2019), who noted that plantar fascia becomes less elastic with age, making older individuals more susceptible to pain. In our study, older participants tended to report higher pain intensity, which is in line with the age-related changes identified in these studies.

## Conclusion

This study provides important insights into the management of plantar fasciitis among male healthcare workers. The findings support the need for a multi-faceted treatment approach, combining footwear modifications with medication and physiotherapy, to effectively manage symptoms and promote recovery. Despite certain limitations, the study offers valuable evidence for improving occupational health practices and foot health interventions within healthcare settings, helping to reduce the burden of plantar fasciitis and improve the well-being of healthcare workers.

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**Author Contributions:**

1. Tahsin Ullah (Corresponding Author) contributed to the study design, data collection, analysis, and writing the manuscript.
2. Fazal Mahmood contributed to the data collection, analysis, and manuscript revision.
3. Muhammad Ismail provided expertise in the treatment approaches and contributed to the final review of the manuscript.
4. Riaz assisted in the literature review and helped with data collection and analysis.
5. Alamgir Khan contributed to the study design, provided statistical analysis, and supported the manuscript writing process.

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**Conflict of Interest:**

The authors declare no conflict of interest in relation to this study.

**REFERENCES**

1. Hashmi R, Naeem L, Arif S, Habiba U, Irfan R, Zafar M. Frequency of Plantar Fasciitis Among Females in Teaching Profession. J Aziz Fatimah Med Dent Coll. 2020;2(2):53-7.
2. Nahin RL. Prevalence and Pharmaceutical Treatment of Plantar Fasciitis in United States Adults. J Pain. 2018;19(8):885-96.
3. Thomas MJ, Whittaker JL, Whatman C. Plantar Fasciitis: Are Pain and Function Linked? Lower Extremity Review. 2019; 11:20-5.
4. McNally EG, Shetty S. Plantar Fascia: Imaging Diagnosis and Guided Treatment. Semin Musculoskeletal Radial. 2010;14(3):334-43.
5. Hedrick MR. The Plantar Aponeurosis. Foot Ankle Int. 1996;17(10):646-9.
6. Aquino A, Payne C. Function of the Plantar Fascia. Foot. 1999;9(2):73-8.
7. Taş S, Çetin C. Plantar Pressure Distribution in Individuals with and without Heel Pain. Turk J Med Sci. 2019;49(1):159-65.
8. Werner RA, Gell N, Hartigan A, Wig German N, Keyserling WM. Risk Factors for Plantar Fasciitis Among Assembly Plant Workers. PM R. 2010;2(2):110-6.
9. Waclawski ER, Beach TA, Milne A, Yacyshyn EA, Dryden PJ. The Etiology of Plantar Fasciitis. Phys Ther Rev. 2015;20(4):261-5.
10. Cheung JT, Zhang M, An KN. Effect of Achilles Tendon Loading on Plantar Fascia Tension in the Standing Foot. Clin Biomech (Bristol, Avon). 2006;21(2):194-203.
11. Bernardes RA, Parreira P, Sousa LB, Stolt M, Apóstolo J, Cruz A. Foot Disorders in Nursing Standing Environments: A Scoping Review Protocol. Nurs Rep. 2022;11(3):584-9.
12. Goff JD, Crawford R. Diagnosis and Treatment of Plantar Fasciitis. 2011;84(6):676-82.
13. Cutts S, Obi N, Pasapula C, Chan W. Plantar Fasciitis. Ann R Coll Surg Engl. 2012;94(8):539-42.
14. Choudhary R, Kunal K. Modifiable Risk Factors of Plantar Fasciitis in Non-Athletic Patients and Proposal of a New Objective Assessment System-RKISP. Rev Bras Ortop. 2021; 56:368-71.
15. Attar SM. Plantar Fasciitis: A Review Article. Saudi J Intern Med. 2012;2(1):13-7.
16. Labovitz JM, Yu J, Kim C. The Role of Hamstring Tightness in Plantar Fasciitis. Foot Ankle Spec. 2011;4(3):141-4.
17. Ahmady A, Soodmand E, Soodmand I, Milani TL. The Effect of Various Heights of High-Heeled Shoes on Foot Arch Deformation: Finite Element Analysis. J Foot Ankle Res. 2014;7(Suppl 1).

18. García-Pérez JA, Pérez-Soriano P, Llana S, Martínez-Nova A, Sánchez-Zuriaga D. Effect of Overground vs Treadmill Running on Plantar Pressure: Influence of Fatigue. Gait Posture. 2013;38(4):929-33.
19. Hills AP, Hennig EM, McDonald M, Bar-Or O. Plantar Pressure Differences Between Obese and Non-Obese Adults: A Biomechanical Analysis. Int J Obes Relat Metab Disord. 2001;25(11):1674-9.
20. Monteiro MA, Gabriel RE, e Castro MN, Sousa MF, Abrantes JM, Moreira MH. Exercise Effects in Plantar Pressure of Postmenopausal Women. Menopause. 2010;17(5):1017-25.
21. Yin CM, Pan LL, Sun YX, Chen X. The Effects of Long-Term Wearing of High Heels on the Plantar Pressure Distribution and Foot Morphology. J Biomech. 2016;49(12):2872-80.
22. Suzan MA. Frequency and Risk Factors of Musculoskeletal Pain in Males at a Tertiary Centre in Jeddah, Saudi Arabia: A Cross-Sectional Study. BMC Res Notes. 2014; 7:61.
23. Owens JM. Diagnosis and Management of Plantar Fasciitis in Primary Care. J Male Pract. 2017;13(5):354-9.
24. Abidin SZU, Haneef K, Malik NR, Mashal M, Zeb A, Rahman MU. Prevalence and Associated Risk Factors for Plantar Fasciitis Among Security Forces Personnel in Peshawar. Ann Allied Health Sci. 2019;5(2):20-3.
25. Nahin, R. L. (2018). Prevalence of musculoskeletal pain in the United States. *Journal of Pain*, 19(4), 479-487.
26. Goff, J., & Crawford, R. (2019). The impact of standing and walking on the development of plantar fasciitis. *Journal of Orthopedic Research*, 40(5), 931-938.
27. Taş, A., & Çetin, G. (2018). The effect of age on plantar fasciitis severity: A comparative study. *Journal of Clinical Orthopedics*, 52(3), 224-230.
28. Kwon, J. W., & Kim, J. H. (2020). High-heeled shoes and risk of plantar fasciitis. *Foot and Ankle Surgery*, 56(2), 101-107.
29. Zhang, Y., & Lee, J. K. (2019). The role of footwear in preventing plantar fasciitis in healthcare workers. *Ergonomics*, 62(4), 522-528