International Journal of Health Sciences and Research
[Indexed, Peer-Reviewed Journal]
Volume 15; Issue: 4; April 2025
Website: www.ijhsr.org
Original Research Article *ISSN: 2249-9571*

Association between Footwear Type and Impact of Daily Footwear Duration on Heel Pain among Young Adults across Ahmedabad City

Dr. Bhakti Shaileshbhai Patel[1], Dr. Amit M. Patel[2]

[1]1st Year MPT student (Orthopaedics), [2]Senior Lecturer and PG Guide (Orthopaedics),
JG College of Physiotherapy, Gujarat University, Ahmedabad, India.

Corresponding Author: Dr. Bhakti Shaileshbhai Patel

DOI: https://doi.org/10.52403/ijhsr.20250441

ABSTRACT

BACKGROUND AND NEED OF RESEARCH: Heel pain is a common issue among young adult women often linked to improper footwear choices and prolonged daily use. Prolonged use of improper footwear can alter gait mechanics, affect weight distribution and contribute to chronic pain or foot deformities. Additionally, many individuals do not seek medical attention for heel pain until it becomes severe, leading to increased healthcare costs and reduced quality of life. This study aims to correlate between Footwear choices and duration of use on heel pain.

METHOD: A cross-sectional study was conducted among young adult women aged 18-35 years residing in Ahmedabad city. A total of 142 participants were included in this study. Data were collected through Google Form survey, which gathered information on footwear type, daily duration of footwear use, and presence and severity of heel pain.

RESULTS: Chi-Square analysis showed a significant association between footwear type and heel pain ($\chi^2 = 18.54$, $p = 0.005$) and daily footwear duration and heel pain ($\chi^2(6) = 16.964$, $p = 0.009$). Post-hoc analysis revealed: Heels < 3 inches had higher heel pain (Adjusted Residual: 5.0). Sneakers/Shoes had lower heel pain (Adjusted Residual: -4.3).Wearing footwear for 6-8 hours increased heel pain risk (Adjusted Residual: 3.5), while 4-6 hours was associated with lower risk (Adjusted Residual: -3.1).

CONCLUSION: These findings emphasize importance of choosing appropriate footwear and managing daily usage duration to mitigate heel pain risk.

Keywords: Heel pain, Footwear Type, Daily Footwear Duration, Young Adult Women, Ahmedabad City

INTRODUCTION

Plantar heel pain is a frequently encountered musculoskeletal issue involving the lower limb, affecting individuals regardless of their activity level.[1]

This condition is often linked to limitations in mobility, weakened leg strength, and a heightened likelihood of falls.[2] Inappropriate or poorly fitting footwear may aggravate these issues by contributing to increased discomfort, instability, and delays in the rehabilitation process. Over time, it may also result in structural foot deformities and the development of thickened skin lesions such as hyperkeratosis.[2]

Footwear plays a vital role in both protection and function however, poorly fitted footwear often contribute to biomechanical imbalance and the onset of foot disorders such as hallux valgus, toe deformities, corns and calluses.[3]

Footwear fitting is acknowledged as a critical factor because function is often governed by fit.[3]

If footwear does not align properly to the three dimensional morphology of the foot, it cannot fulfill its intended purpose.[3]

The footwear industry faces challenges in designing shoes that cater to the diverse morphology of feet, due to variability in individual foot shapes and limited variety in footwear construction.[3]

In addition, footwear selection is not solely based on quantitative measurements like size, but is also influenced by qualitative factors such as comfort, aesthetics, and social identity.[3]

Limitations in footwear choices can negatively affect an individual's self-image, social participation, and emotional well-being, particularly in women.[4]

Emotional relationships with shoes, influenced by fashion and personal identity, often take precedence over therapeutic needs.[5][6]

Prolonged use of improper footwear can alter gait mechanics, affect weight distribution and contribute to chronic pain or foot deformities.

Additionally, many individuals do not seek medical attention for heel pain until it becomes severe, leading to increased healthcare costs and reduced quality of life.

This study aims to examine the relationship between footwear type and the duration of daily use on heel pain, as well as to raise awareness about the importance of selecting proper footwear to prevent long-term musculoskeletal issues.

AIM: Aim of the study is to find association between footwear type and impact of daily footwear duration on heel pain among young adult across Ahmedabad city.

OBJECTIVES:

- To find association between footwear type and heel pain.
- To find association between footwear type and heel pain severity.
- To find association between daily footwear duration and heel pain
- To find association between daily footwear duration and heel pain severity.

MATERIALS & METHODS

A cross-sectional study was conducted after obtaining ethical clearance from the Institutional Ethical Committee. The study included young adult women aged 20-35 years residing in Ahmedabad city. The sample size was determined using a Cochran's sample size formula, resulting in a total of 120 participants. To account for potential non-responses and exclusions, 160 responses were initially collected. After applying exclusion criteria, a total of 142 participants were included in final analysis. Participants were selected based on predefined Inclusion criteria and Exclusion criteria.

Inclusion criteria:

1. Young adult women age between 20- 35 residing in Ahmedabad city.
2. Participants who have been using the same footwear type on a daily basis.
3. Participants without severe medical conditions affecting gait or foot structure.
4. Willingness to participate in the study.

Exclusion criteria:

1. Individuals with musculoskeletal, neurological or systemic diseases affecting foot health.
2. Participants having History of foot ankle, or lower limb surgery in the past months.
3. Participants using medical orthotics, insoles, or sports specific shoes.
4. Participants who are unwilling to complete the study questionnaire.

A pre-designed and pre-tested structured Google Form questionnaire was used to

examine footwear type, daily duration of footwear use, and presence and severity of heel pain.

Footwear Type:
Heels>3 inches
Heels<3 inches
Sneakers/Shoes
Sandals/Slippers

Daily Footwear Duration:
<2 hours
2-4 hours
4-6 hours
6-8 hours

STATISTICAL ANALYSIS

Data were analysed using SPSS version.20. The Chi-square test was employed to assess the association between categorical variables, and post- hoc analysis was conducted. Statistical significance was set at $p<0.05$. The test was used to find association between:

1. Footwear Type and Heel Pain
2. Footwear Type and Heel Pain Severity
3. Daily Footwear Duration and Heel Pain
4. Daily Footwear Duration and Heel Pain Severity

RESULT

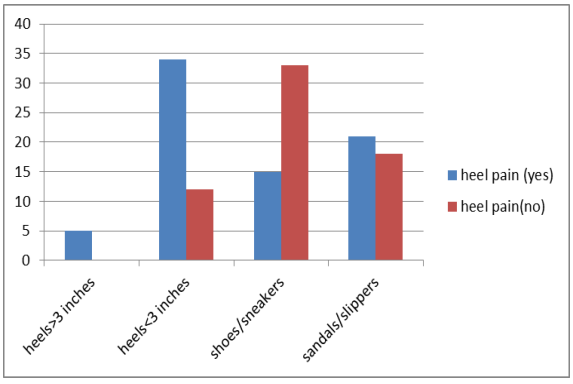
Chi-Square analysis showed a significant association between footwear type and heel pain ($\chi^2 = 18.54$, $p = 0.005$) and daily footwear duration and heel pain ($\chi^2(6) = 16.964$, $p = 0.009$).

VARIABLE	CHI-SQUARE	p-value	Interpretation
Footwear type and heel pain	$\chi^2 = 18.54$	0.005	Significant
Footwear type and heel pain severity	$\chi^2 = 61.714$	0.00	Significant
Footwear duration and heel pain	$\chi^2 = 16.94$	0.009	Significant
Footwear duration and heel pain severity	$\chi^2 = 29.615$	0.001	Significant

Table 1 Shows association between footwear type, daily footwear duration, heel pain and heel pain severity.

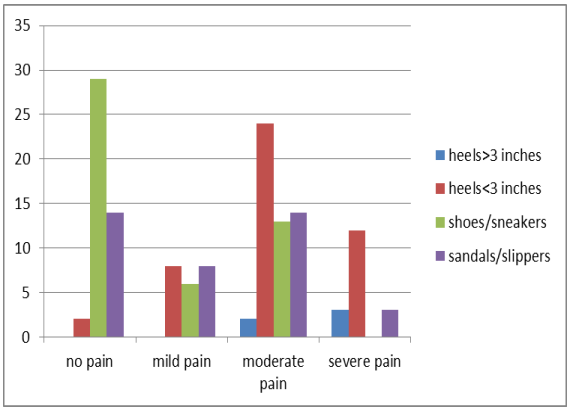
1. Footwear Type and Heel Pain:

A significant association was found between footwear type and heel pain. (Table-1)
Higher heel pain was reported among women wearing heels < 3 inches.
Lower heel pain was observed among women using sneakers/shoes.
Heels >3 inches and sandals/slippers did not show a strong association.



Graph:1 Footwear type and heel pain

A significant association was also found between footwear type and pain severity. (Table-1)
Sneakers/shoes were linked to lower pain levels.
Heels<3 inches and sandals/slippers were associated with moderate to severe pain.
Heels> inches did not exhibit a strong association with severity.



Graph:2 Footwear type and heel pain severity

2. Footwear Type and Heel Pain Severity

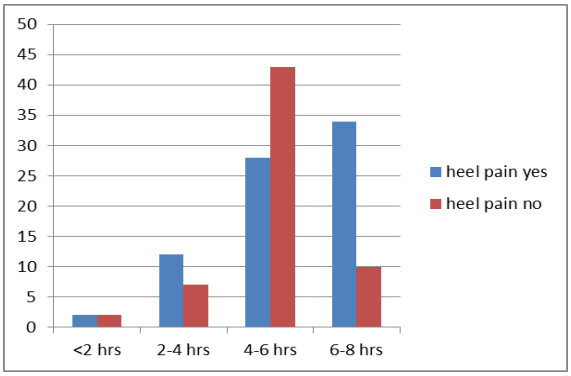
3. Impact of daily footwear duration and heel pain

A significant association was found between daily footwear duration and heel pain. (Table-1)

Wearing Footwear for 6-8 hours increased the risk of heel pain.

Wearing footwear for 4-6 hours resulted in lower pain occurrence.

2-4 hours and less than 2 hours of usage did not show a strong association.



Graph:3 Footwear Duration and heel pain

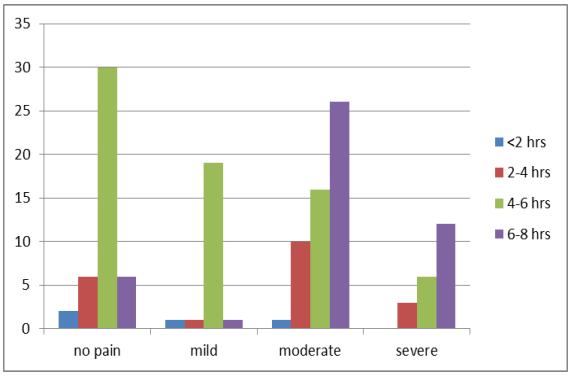
4. Impact of daily footwear duration and heel pain severity

A significant association was observed between daily footwear duration and heel pain severity. (Table-1)

6-8 hours of use resulted in more cases of moderate to severe pain.

4-6 hours had a higher occurrence of no pain.

2-4 hours and less than 2 hours did not show a strong association.



Graph:4 Footwear duration and pain severity

DISCUSSION

This study highlights the significant influence of footwear type and duration of use on heel pain among young adult women. The findings suggest that sneakers/shoes are protective against heel pain, whereas heels and prolonged footwear duration (6-8 hours) contribute to discomfort and increased pain severity.

These findings align with previous research by Menz HB and Lord SR (2000), who reported that inappropriate footwear, especially those lacking support and cushioning, increases plantar pressure and contributes to heel pain in older adults. Although their study focused on an elderly population, similar biomechanics implications may be relevant for younger individuals as well.[7]

Buldt and Menz (2018) also highlighted that poor footwear it contributes to altered foot posture and plantar loading, supporting the notion that design and type of footwear are critical in preventing foot-related musculoskeletal issues.[3]

In contrast, Chiu and Wang (2007) evaluated professional footwear for nurses and found that footwear design significantly influences comfort during prolonged standing and walking. Their research focused on occupational footwear ergonomics, supporting the present study's emphasis on how duration of wear impacts foot health even outside of professional settings.[8]

While most previous studies have focused primarily on structural aspects like fit, arch support, and heel height, the current study adds a behavioural dimension-daily duration of wear-as a contributing factor. This provides a more comprehensive understanding of how prolonged exposure to biomechanically unsuitable footwear can gradually lead to pain, even among younger populations. In summary, the present study contributes to the growing body of literature by emphasizing not only the structural type of footwear but also the significance of wear duration, offering a more holistic approach

to understanding and preventing heel pain among young adult women.

This study had a limited sample size and population, which may affect the generalizability of the findings. There was also an unequal distribution of footwear types among participants, potentially influencing the outcomes. Additionally, the study lacked clinical assessments that could have provided deeper insights into the biomechanical effects.

CONCLUSION

The study establishes a significant association between footwear type, daily footwear duration, and heel pain among young adult women. Encouraging proper footwear choices and regulating usage duration can help mitigate foot discomfort and prevent long-term musculoskeletal complications. Healthcare professionals, including physiotherapists and orthopaedic specialists, should emphasize proper footwear selection as part of preventive strategies. Educational initiatives targeting young women can help promote healthier footwear habits, potentially reducing the long-term risk of musculoskeletal complications. Additionally future studies with larger sample sizes and objective gait analysis may further validate these findings and contribute to improve clinical guidelines or footwear recommendations.

Declaration by Authors

Ethical Approval: Approved

Acknowledgement: None

Source of Funding: None

Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

1. Thomas MJ, Whittle R, Menz HB, Rathod-Mistry T, Marshall M, Roddy E. Plantar heel pain in middle-aged and older adults: population prevalence, associations with health status and lifestyle factors, and frequency of healthcare use. BMC musculoskeletal disorders. 2019 Dec;20:1-8.
2. McRitchie M, Branthwaite H, Chockalingam N. Footwear choices for painful feet–an observational study exploring footwear and foot problems in women. Journal of foot and ankle research. 2018 Dec; 11:1-7.
3. Buldt AK, Menz HB. Incorrectly fitted footwear, foot pain and foot disorders: a systematic search and narrative review of the literature. Journal of foot and ankle research. 2018;11(1):43.
4. Sullivan J, Pappas E, Adams R, Crosbie J, Burns J. Determinants of footwear difficulties in people with plantar heel pain. Journal of Foot and Ankle Research. 2015 Dec; 8:1-7.
5. Soares MM, Jacobs K, Seferin M, Van der Linden J. Protection or pleasure: female footwear. Work. 2012 Mar;41(S1):290-4.
6. Silvester RN, Williams AE, Dalbeth N, Rome K. 'Choosing shoes': a preliminary study into the challenges facing clinicians in assessing footwear for rheumatoid patients. Journal of Foot and Ankle Research. 2010 Dec; 3:1-8.
7. Menz HB, Lord SR. Footwear and postural stability in older people. Journal of the American Podiatric Medical Association. 1999 Jul 1;89(7):346-57.
8. Chiu MC, Wang MJ. Professional footwear evaluation for clinical nurses. Applied ergonomics. 2007 Mar 1;38(2):133-41.

How to cite this article: Bhakti Shaileshbhai Patel, Amit M. Patel. Association between footwear type and impact of daily footwear duration on heel pain among young adults across Ahmedabad city. *Int J Health Sci Res.* 2025; 15(4):285-289.
DOI: *https://doi.org/10.52403/ijhsr.20250441*

******