



Original Article

Frequency of Foot Pain and Assessment of Foot Function Associated with Wearing Point Shoes in Students and Faculty Members of Fashion Designing Schools

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ABSTRACT

Pointed footwear inclines to remain trendy in the field of fashion design and causes discomfort and difficulty with daily activities. **Objective:** To determine and evaluate frequency of foot pain and assessment of foot function associated with wearing pointed shoes in students and faculty members of fashion designing schools. **Methods:** This cross-sectional study was conducted on fashion designing students and faculty members from December 2022 to May 2023 in Lahore, Pakistan. 396 participants between the ages of 18 and 50, of both genders with a minimum of 3 hours to a maximum of 8 hours wearing pointed shoes were included. Those with foot deformities or previous foot trauma were excluded. Foot and Ankle Ability Measure (FAAM) and Visual Analogue Scale (VAS) of pain were used. SPSS 25 was used for data analysis. **Results:** 51.52% reported moderate pain in their feet on Visual Analogue Scale, 30.81% people reported mild pain. 7.32% had no pain and 10.35% complained of severe foot pain. Chi-square test resulted in (110.859) and p-value of less than 0.05. **Conclusions:** The study concludes that wearing pointed shoes causes mild to moderate foot pain whereas significant impact was observed in their activities of daily living.

INTRODUCTION

Healthcare for the feet lags far behind health care for the heart, eyes, teeth, skincare, and nutrition. Even though leg pain and related problems are highly prevalent, particularly in the elderly, the epidemiological literature has received small attention. One of the most prevalent and primary musculoskeletal problems addressed by physiotherapists is foot discomfort. Foot pain or discomfort can be felt at any part of the foot, specially brought on by prolonged standing in shoes [1-3]. According to the Cheshire Random Community Based Survey (2004), 10% of individuals between the ages of 18 and 80 in Australia reported having "disabling" foot pain, with females reporting it more

frequently than males. Additionally, a random sample of Danish citizens between the ages of 18 and 80 from 2010 showed a prevalence rate of 30.4% for foot pain. In a group of Asians, young urban working women experienced non-traumatic foot discomfort 50% of the time, and 68.4% thought their work shoes contributed to the pain [4]. Foot discomfort can be caused by a variety of variables, including: advancing age, gender, poorly fitting footwear, obesity, and chronic degenerative disorders [3]. It can impair walking, increase the risk of falling, and cause functional incapacity [5]. The causes of foot discomfort are frequently multifaceted. In various people pain,

neuropathy, and deformities, musculoskeletal pathologies, vascular diseases, and neurological illnesses, bunions, big metatarsal heads, and abnormal medial arch structure are the frequent typical orthopedic related abnormalities that cause foot pain and discomfort [5, 6]. Due to the wide variety of footwear styles, particularly among female footwear, the biomechanics of the foot change significantly. Long heels and narrow toe box shoes were typically the two types of footwear that the majority of females wore [7, 8]. Similar to high heels, the form and volume of a shoe's toe box can have negative consequences on the health of the foot. Footwear with a squeezed toe box greatly increase the pressure in the heel region of medial side. Shoes with a narrow toe box have been linked to a large 43% increase in hallux valgus (bunion formation) [9]. Cramping of the toes is brought on by a smaller toe box, which has been associated to forefoot lesions, joint diseases, and foot deformities. Increased forefoot plantar pressure has also been linked to the development of metatarsalgia, callus formation, and a greater risk of ulceration under metatarsal heads [10]. According to biomechanics, a higher heel height greatly reduces the trunk's flexion angle and raises the body's center of gravity [7]. The common summertime footwear, flip-flops, is known to contribute to diseases such overuse injuries of the Tibialis anterior muscle and toes [11]. For the diagnosis; Conventional radiography, which permits examination of any suspected bone abnormalities, is typically the initial imaging modality used. The best imaging technique for assessing possible soft-tissue impingement is magnetic resonance imaging (MRI). Additionally, ultrasonography can assess related ligament injuries, diagnose flesh tissue collision injury in the anterior and lateral portion of the foot ankle joint and distinguish between illness and bone impingement [12, 13]. Physical therapy has been proven to be beneficial in a wide variety of foot pathologies. Therapists examine posture, weight distribution, and center of mass distribution while evaluating the kinetic chain. Manual techniques are employed to strengthen proprioception and enhance balance. Calf muscle stretching can help relieve forefoot pressure. Toe powering PT to strengthen the foot muscles, strengthen arch, enhance toe-off phase of gait, and improve balance when walking. Moreover, they also examine and modify the footwear [14, 15]. The trend of wearing pointed shoes in fashion designers is enhancing day by day. This has not been addressed previously among this population. Due to ill fitted shoes, the balance of a person can be distorted; our research also enlightens this aspect of pointed shoes and signifies the importance of footwear in daily life. This research is conducted for the purpose of assessment of foot function and frequency of

foot pain and discomfort associated with wearing pointed shoes in students and faculty members of fashion design schools, which in turn will lead to raised awareness about the correct footwear and its effect on foot pain.

METHODS

Approval for this cross-sectional study was obtained from the institutional review board under letter number REC-042-2023. This observational study was conducted at various Fashion Designing Schools of Lahore from December 2022 to May 2023. Non-probability convenient sampling technique was used. The sample size of 396 was calculated from this formula;

$$n = \frac{Z^2_{1-\alpha/2} P(1-P)}{d^2}$$

with Epitool at 95% confidence interval, with $p=50$, $d=5\%$ [16]. Individuals wearing pointed shoes aged between 18 and 50, of both genders, students and faculty with a minimum 3, and maximum 8 hours of daily standing were included [16, 17]. Those with foot deformities, previous foot trauma, abnormal gait and wearing other footwear were excluded [16]. For data collection, a Foot and Ankle Ability Measure (FAAM) [18] that assesses a patient's ability to carry out everyday activities (ADLs) and a Visual Analogue Scale (VAS) [19] to rate their pain on a scale of zero to ten were used. Written consent was taken from the participants before filling the questionnaires and the significance of study was explained. Data were entered and analyzed using IBM SPSS 25.0. Frequencies with percentages were calculated for categorical variables. Linear Regression was calculated between Pain and ADLs. Pearson Correlation was established among all variables, p -value < 0.05 was considered significant.

RESULTS

There were 396 participants with a mean age of 22 years ± 3.666 . 93 (23.48%) were males and 303 (76.52%) were females. There were 354 (89.39%) students and 42 (10.61%) faculty members. There were 216 (54.55%) participants with a standing time above 5 hours and 180 (45.45%) below five hours. Out of 396 respondents who wear pointed shoes, 204 participants (51.52%) reported moderate pain in their feet on visual analogue scale (VAS), whereas 122 (30.81%) people reported mild pain. A smaller group of 29 respondents (7.32%) had no pain. However, 41 participants (10.35%) had severe foot pain (Figure 1).

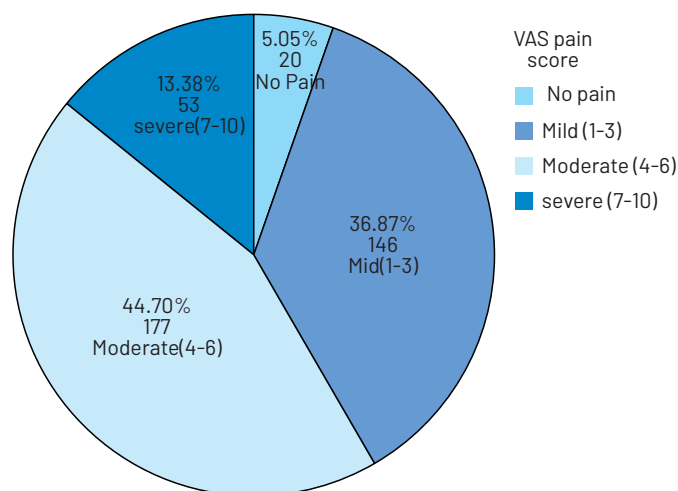


Figure 1: Descriptive statistics for pain intensity on Visual Analogue Scale

Table 1 shows the calculated value of chi-square (110.859) and p-value of less than 0.05 indicate that there is a significant association between foot pain and difficulties during activities of daily living due to wearing pointed shoes.

Table 1: Descriptive statistics for Chi-Square association between foot pain and difficulty in ADLs, Cross-tabulation

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	110.859 ^a	9	.000
Likelihood Ratio	101.793	9	.000
Linear-by-Linear Association	71.347	1	.000
N of Valid Cases	396		

Table 2 shows the severity of foot pain and its effects on activities of daily life. 179 (45.20%) of the participants had normal status of ADLs and showed no impact of wearing pointed shoes. Another 159 (40.15%) respondents had mildly affected ADLs, 48 (12.12%) participants reported moderately affected ADLs. A very smaller proportion of 2.53% (10 persons) had their ADLs severely affected.

Table 2: Descriptive statistics for ADL Range with foot pain

Foot Pain	ADL Range ^a				Total
	Severely affected of ADLs (0-25%)	Moderately affected ADLs (25-50%)	Mildly Affected ADLs (50-75%)	Normal status of ADLs (75-100%)	
No Pain	0	0	4	25	29
Mild Pain	2	3	37	80	122
Moderate Pain	2	31	108	63	204
Severe Pain	6	14	10	11	41
Total	10	48	159	179	396

^aADLs: Activities of daily living

DISCUSSION

This current cross sectional study mainly focused on prevalence of foot pain and assessment of foot functional among faculty members and students of fashion designing

schools. Moreover, it included assessment of foot function associated with wearing pointed shoes, discomfort caused by pointed footwear and relationship between pointed shoes and pain on foot. The results of this research showed mild to moderate impact on activities of daily living associated with wearing pointed shoes. Jabbar et al., conducted a study on female teachers and students of a university in 2020, and found 72.5% of the females wearing high heels for up to 6 hours a day, and 27.5% of them wore it for over 6 hours. Visual Analog Scale was used to measure their foot pain. 54.5% had mild to moderate pain followed by 29% with severe and 4% with the worst pain. Only 12.5% of them had no pain in their feet [20]. In another study of 174 females wearing high heels, a majority of 63% wore wedge-type footwear for more than 4 hours a day. They found a majority of women (39%) to have moderate pain caused by their footwear, while 34% had moderate pain followed by only 8% of them reporting severe pain. 19% of the women, however, felt no pain in their feet [17]. These previous researches go in line with the current research. Majority (51.52%) of the participants in this research reported moderate pain in their feet whereas 30.81% felt mild pain followed by 10.35% feeling severe pain. Only 7.32% of them felt no pain. Güren et al., found no significant relationship between physical activity levels of 40 women wearing high-heeled shoes and pain level ($p > 0.05$). Women who wore high heels were found to experience foot and low back pain both at rest and while moving, but there was no correlation between the degree of physical activity and the severity of the pain [21]. In contrast to this, the current study found a significant association ($p=0.001$) between foot pain and difficulties during activities of daily living due to wearing pointed shoes. The results of the current study supported the results of a study by Janisse, which suggested that females from 20 to 60 years with no relevant past medical history 88% wore shoes that were not properly fitted. As a consequence, 76 percent of these women had foot ailments and associated pain [22]. Thus, according to these results the null hypothesis of this study is rejected which says that there is no relationship between foot pain and disability associated with wearing pointed shoes. The limitation of this research is that it does not give information regarding the possible deformities caused by wearing pointed shoes or explains the altered biomechanics caused by the constrictive toe box shoes.

CONCLUSIONS

The study concludes that wearing pointed shoes causes mild to moderate foot pain in students and faculty of fashion designing. There is a significant association between foot pain and difficulties during activities of daily living due to wearing pointed shoes amongst them.

Authors Contribution

Conceptualization: RM, SZ

Methodology: MAA

Formal analysis: MW

Writing-review and editing: MS

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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