

## Prevalence Of Heel Pain And Its Impact On Daily Activities Among Female Teaching Staff At Universities Of Dera Ismail Khan

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### Abstract

**Background:** Heel pain is a common musculoskeletal complaint that significantly affects daily activities and quality of life. Teaching professionals, particularly females, are at high risk due to prolonged standing and walking during work hours. However, limited epidemiological data exists for this population in Dera Ismail Khan, Pakistan.

**Objective:** To determine the prevalence of heel pain and its impact on daily activities among female teaching staff at universities in Dera Ismail Khan.

**Methods:** A cross-sectional study was conducted among 125 female teaching staff from Gomal University, Agriculture University, and Qurtuba University, Dera Ismail Khan. Non-probability convenient sampling was used. Data were collected using a structured demographic form and the Modified Foot Function Index (FFI-16) questionnaire. Statistical analysis was performed using IBM SPSS.

**Results:** The overall prevalence of heel pain was 65.6%, with 32.8% reporting mild pain, 20.0% moderate pain, and 12.8% severe to extreme pain. Significant associations were found between pain severity and BMI ( $p = .001$ ), footwear type ( $p = .015$ ), systemic disorders ( $p = .000$ ), and age ( $p = .024$ ). No significant association

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was found with years of teaching experience ( $p = .694$ ). Strong positive correlations were observed between pain and functional difficulty ( $r = 0.665$ ,  $p = .000$ ), and between pain and activity limitation ( $r = 0.546$ ,  $p = .000$ ).

**Conclusion:** Heel pain is highly prevalent among female teaching staff in Dera Ismail Khan, affecting nearly two-thirds of the population. BMI, footwear type, systemic disorders, and age are important associated factors. Regular screening, appropriate footwear education, weight management programs, and early physiotherapy interventions are recommended.

## Introduction

The human foot is a complex anatomical and biomechanical structure specifically designed to provide support, stability, shock absorption, and propulsion during static and dynamic activities (1). It serves as the foundation of the body and acts as the primary interface between the musculoskeletal system and the ground (2). Structurally, the foot consists of 26 bones, 33 joints, numerous ligaments, tendons, intrinsic and extrinsic muscles, and neurovascular structures that work in coordination to maintain posture and facilitate efficient locomotion (3). Proper alignment and synchronized function of these components are essential for maintaining normal gait mechanics and distributing mechanical loads effectively across the lower extremity kinetic chain (4). Any disturbance within this integrated system may result in pain, impaired biomechanics, compensatory movements, altered posture, reduced endurance, and long-term functional limitations that affect both occupational and daily activities (5). Biomechanically, the foot is divided into the hindfoot, midfoot, and forefoot, each contributing uniquely to weight transmission and movement efficiency (6). The hindfoot, composed of the talus and calcaneus, plays a primary role in shock absorption and adaptability during ground contact (7). The midfoot forms the structural arch system, providing stability and elastic recoil, while the forefoot assists in propulsion during terminal stance and push-off phases of gait (8). The integrity of the medial longitudinal arch is particularly essential for maintaining balanced load distribution (9). Disruption in arch mechanics, whether due to structural deformity or soft tissue dysfunction, increases localized stress on the heel region and predisposes individuals to pain syndromes (10).

Among the anatomical components of the foot, the heel occupies a particularly significant position due to its weight-bearing role (11). The heel forms the posterior aspect of the foot and is primarily composed of the calcaneus, the largest and strongest tarsal bone (12). The calcaneus functions as the posterior pillar of the medial longitudinal arch and plays a vital role in transmitting body weight from the tibia to the ground during standing and ambulation (13). During the initial contact phase of gait, it absorbs substantial ground reaction forces, sometimes equivalent to several times body weight, and contributes significantly to shock attenuation (14). Furthermore, it acts as a lever arm for the gastrocnemius-soleus complex during push-off, thereby assisting in forward propulsion and maintaining walking efficiency (15). Because of its continuous involvement in weight-bearing and locomotor activities, the heel is highly susceptible to mechanical overload, repetitive microtrauma, and degenerative changes (21). Heel pain is one of the most common musculoskeletal complaints encountered in orthopedic and physiotherapy practice (22). It accounts for approximately 10-15% of all foot-related clinical consultations worldwide and represents a significant proportion of lower limb musculoskeletal disorders (23). Epidemiological data suggest that nearly one in ten individuals experience heel pain during their lifetime (24). The condition is particularly prevalent among adults aged 40-60 years, individuals with prolonged standing occupations, athletes, and those with increased body mass index (BMI) (1).

Plantar heel pain is one of the most common and economically burdensome foot disorders in adults, resulting in millions of healthcare visits and substantial medical expenditures annually (25). It is estimated that up to two million individuals seek professional treatment each year, with a lifetime risk approximating 10% (26). Clinically, plantar heel pain varies in presentation, including differences in anatomical location, severity, duration, and aggravating factors (29). Symptoms commonly intensify during the first steps after prolonged rest, prolonged standing, stair climbing, or walking on hard surfaces (31). Such limitations significantly restrict essential daily activities including ambulation, occupational tasks, household responsibilities, and participation in social or recreational activities (32). Consequently, persistent heel pain adversely affects mobility, independence, productivity, and overall quality of life (21).

Teaching is an occupation inherently characterized by prolonged standing, frequent classroom ambulation, repetitive stair negotiation, and sustained static postures (2). These occupational demands generate continuous mechanical stress on the heel and plantar structures (4). Teachers often stand for more than four to six hours daily, particularly in higher education settings where lecture durations are extended (7). Repeated exposure to such conditions predisposes teaching staff to cumulative trauma disorders affecting the lower extremities (11). Female teaching staff may be especially vulnerable due to additional domestic workload, hormonal variations, and footwear choices that may not provide adequate biomechanical support (2). In the universities of Dera Ismail Khan, female teaching staff represent a substantial segment of the academic workforce. Despite their important role, region-specific data regarding the prevalence and functional consequences of heel pain remain limited (4). Therefore, this study aims to determine the prevalence of heel pain and assess its impact on daily activities among female teaching staff in universities of Dera Ismail Khan (461).

## **LITERATURE REVIEW**

Heel pain is a prevalent and often debilitating musculoskeletal complaint that can arise from a wide range of osseous or soft-tissue disorders. These conditions are typically classified based on their anatomical origin and the specific location of the pain to better understand the clinical presentation and underlying pathology. Contemporary research indicates that heel pain affects approximately 10% of the general population during their lifetime, significantly impacting mobility and overall quality of life. Common etiologies identified in clinical practice include plantar fascial lesions such as chronic fasciitis or acute rupture, tendinous lesions like Achilles tendinitis, and various osseous lesions, including stress fractures or bone bruises. Additionally, bursal lesions, tarsal tunnel syndrome, and degenerative abnormalities of the heel's plantar fat pad are frequently identified as major contributing factors to chronic discomfort (1, 2).

Plantar heel pain, most diagnosed as plantar fasciitis, typically manifests as sharp, stabbing pain or a persistent burning sensation in the plantar aspect of the heel, which may extend along the medial arch. This condition results in substantial physical disability and a significantly diminished health-related quality of life. Epidemiological studies demonstrate that plantar heel pain is particularly prevalent among active athletes, especially runners, and individuals engaged in occupations that require prolonged weight-bearing or standing on hard surfaces. While skeletal issues like calcaneal stress fractures, apophysitis, or inflammatory arthropathy can cause localized discomfort, soft tissue pathologies such as age-related fat pad atrophy and degenerative plantar fasciosis remain the primary clinical concerns for healthcare providers (3, 4, 5).

The complex anatomy of the foot plays a critical role in the development of these conditions, as the intrinsic and extrinsic muscles responsible for posture, strength, and structural stability are intricately linked through the plantar fascia. This dense

connective tissue acts as a shock absorber and supports the longitudinal arch of the foot. Any biomechanical imbalance, such as overpronation or repetitive overuse, leads to micro-tears and tissue dysfunction, which eventually result in chronic inflammation and pain (7). Research suggests that individuals exposed to prolonged standing in their daily routines are at a significantly higher risk of developing these complications, which ultimately interfere with their ability to perform household responsibilities and maintain professional productivity. Data from global clinical studies indicate that a large percentage of patients suffering from plantar heel pain actively seek relief through specialised stretching exercises for the plantar fascia and the gastrocnemius-soleus complex to mitigate morning stiffness and pain (6, 8).

From an occupational health perspective, careers characterised by long periods of static standing and frequent ambulation, such as nursing, industrial work, and teaching, show a strong and consistent correlation with work-related musculoskeletal disorders (WMSDs). Teaching is recognised worldwide as a high-demand profession that involves not only continuous physical activity but also sustained static postures during lectures. Elevated rates of musculoskeletal pain among school and university teachers are often attributed to a combination of improper ergonomic posture, high psychological work pressure, and a lack of institutional support for physical health. In developing regions, these factors are often exacerbated by inadequate classroom environments and footwear that does not provide sufficient arch support or cushioning (9, 11).

Furthermore, the chronicity of heel pain often leads to compensatory movements as individuals attempt to offload the painful area. This shift in weight distribution can result in secondary pain in the ankle, knee, and lower back, creating a cycle of musculoskeletal dysfunction. Advanced diagnostic tools, particularly magnetic resonance (MR) imaging, have become invaluable for clinicians when planning surgical interventions or when seeking precise localisation of soft tissue lesions that do not respond to initial treatment. However, the literature consistently emphasizes that most heel pain cases can be effectively managed through early intervention and conservative measures. These include targeted physical therapy, the use of orthotic inserts, and modifications to footwear that reduce the mechanical load on the calcaneal tuberosity (1, 10, 14).

The social and psychological impact of persistent heel pain is also a significant theme in recent literature. Chronic pain is often associated with increased stress levels, reduced motivation for physical activity, and a decline in social engagement due to limited mobility. For female professionals, who often balance demanding work schedules with domestic duties, the cumulative mechanical strain is even more pronounced. Understanding these multi-dimensional factors—, ranging from biomechanical stressors to occupational demands, is essential for developing holistic management strategies. By addressing the specific needs of high-risk groups, such as the female teaching staff in Dera Ismail Khan, researchers and physiotherapists can better implement preventive measures that address both the symptoms and the root causes of heel pain within the local academic community (2, 4, 17).

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## **METHODOLOGY**

### **Study Design and Setting**

A cross-sectional study was conducted at three universities in Dera Ismail Khan: Gomal University, Agriculture University, and Qurtuba University. The study duration was six months after approval from the Advance Studies Research Board (ASRB) committee.

### Participants and Sample Size

A total of 125 female teaching staff participated in this study. The entire accessible population was included to obtain generalized results. Non-probability convenience sampling was used. The sample consisted of female teachers from departments including Physical Therapy, Allied Health Sciences, and other teaching faculties.

### Inclusion and Exclusion Criteria

Inclusion criteria included female teaching faculty employed at the participating universities, teaching for at least three consecutive hours on their feet daily, and a minimum of one year of teaching experience. Exclusion criteria included male participants, recent trauma or prior foot injury/surgery, less than one year of teaching experience, non-consenting participants, and any physical disability.

### Data Collection Tool

A structured questionnaire was used to collect data, consisting of a demographic information form (age, BMI, footwear type, systemic disorders, teaching experience) and the Modified Foot Function Index (FFI-16) questionnaire. The FFI-16 uses a 5-point Likert scale (0–4) and has shown high internal consistency ( $\alpha \approx 0.88$ – $0.94$ ), good test-retest reliability ( $ICC \approx 0.70$ – $0.83$ ), and acceptable construct validity. The questionnaire has three sections: Section 1 – Pain (6 items), Section 2 – Disability/Difficulty (6 items), and Section 3 – Activity Limitation (4 items).

### Data Collection Procedure

After obtaining approval from the Advance Studies Research Board (ASRB) of the DPT Department, informed consent was obtained from each participant. The questionnaire was explained properly to each participant and was provided in simple English, along with an oral explanation in Urdu to ensure better understanding.

### Ethical Considerations

Permission was obtained from the research supervisor and Chairperson of the DPT Department, FAHS, Gomal University. The study followed the ethical guidelines of the Higher Education Commission (HEC) and Gomal University. Participants were informed about the study's aims, objectives, and procedures through an information sheet and written consent form. Data was collected confidentially, and participants' information was kept anonymous.

### Statistical Analysis

IBM SPSS Statistics version 26 was used to analyze the data. Descriptive statistics (frequencies, percentages, mean, and standard deviation) were calculated. The chi-square test and Fisher's Exact Test were used to test the relationship between heel pain and demographic variables. Pearson correlation and ANOVA were used to examine relationships between pain, difficulty, and limitation. The level of statistical significance was set at  $p < 0.05$ .

## RESULTS

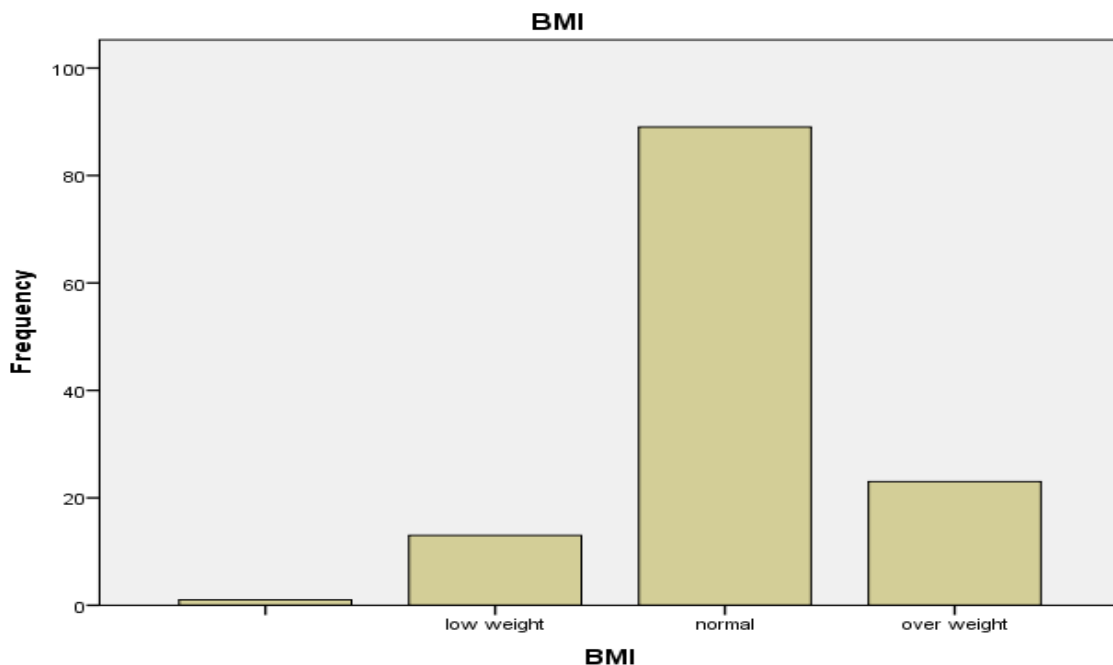
### Statistics

		BMI	FOOT WEAR TYPE	age group	experience group
N	Valid	125	125	125	125
	Missing	0	0	0	0

### BMI

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	0	0	
low weight	13	10.3	10.3	11.1
normal	89	70.6	70.6	81.7
over weight	23	18.3	18.3	100.0
Total	125	100.0	100.0	

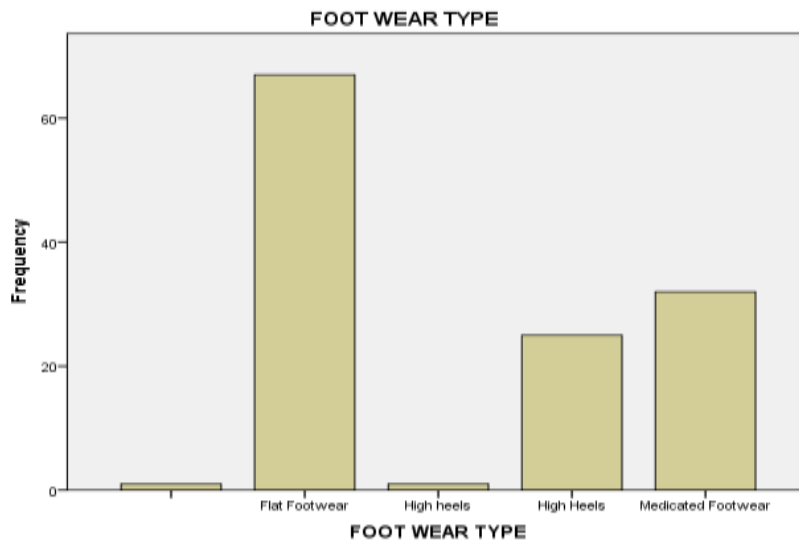
This table shows the BMI distribution of the 125 participants. The majority of the female teaching staff have a normal BMI (70.6%, n=89). A significant portion are overweight (18.3%, n=23), while 10.3% (n=13) are classified as low weight. This distribution is important for later analysis as higher BMI is a known risk factor for heel pain.



### FOOT WEAR TYPE

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	0	0	0
Flat Footwear	67	53.2	53.2	54.0
High Heels	25	19.8	19.8	74.6
Medicated Footwear	32	25.4	25.4	100.0
Total	125	100.0	100.0	

This table illustrates the types of footwear commonly worn by the participants. More than half (53.2%, n=67) reported wearing flat footwear. A considerable number use medicated footwear (25.4%, n=32), which may indicate pre-existing foot problems. High heels are worn by 19.8% (n=25) of the participants.

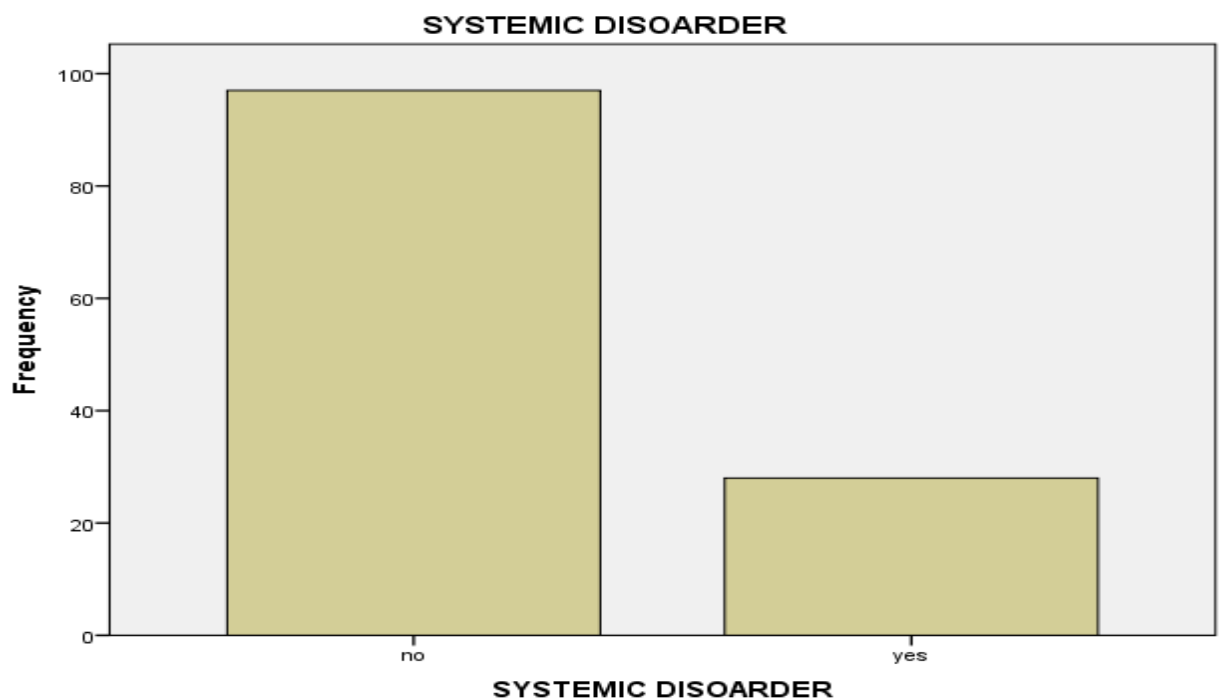


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**Table 1**  
**SYSTEMIC DISOARDER**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid no	97	77.6	77.6	77.6
yes	28	22.4	22.4	100.0
Total	125	100.0	100.0	

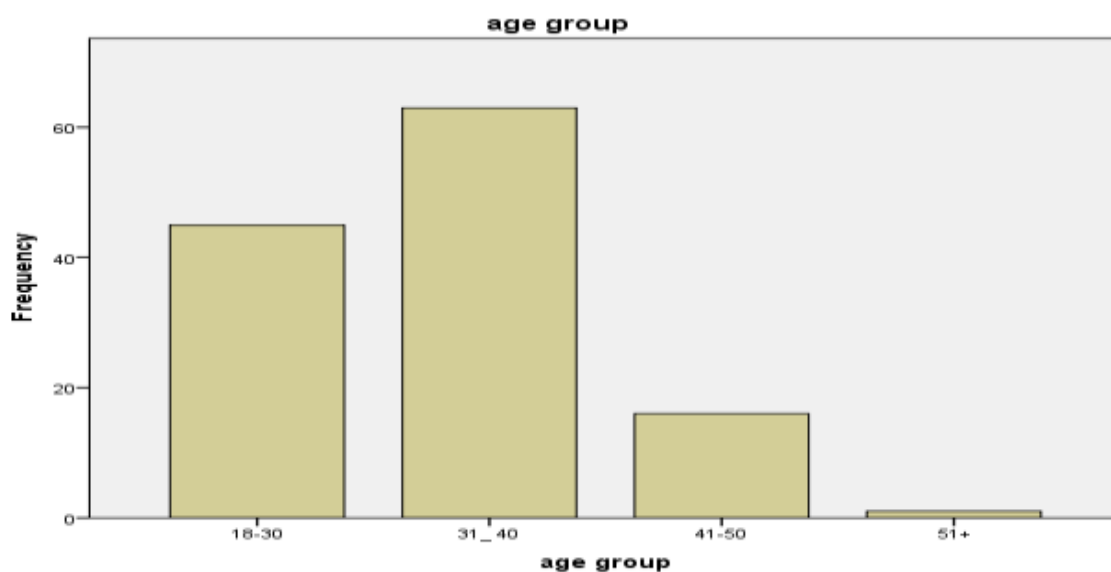
This table shows that the majority of the participants (77.6%, n=97) reported having no systemic disorders (such as diabetes, kidney problems, etc.). However, 22.4% (n=28) of the teaching staff reported having a systemic illness, which could be a contributing factor to their foot health.



age group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-30	45	35.7	36.0	36.0
	31_40	63	50.0	50.4	86.4
	41-50	16	12.7	12.8	99.2
	51+	1	.8	.8	100.0
	Total	125	99.2	100.0	
Missing	System				
Total		125	100.0		

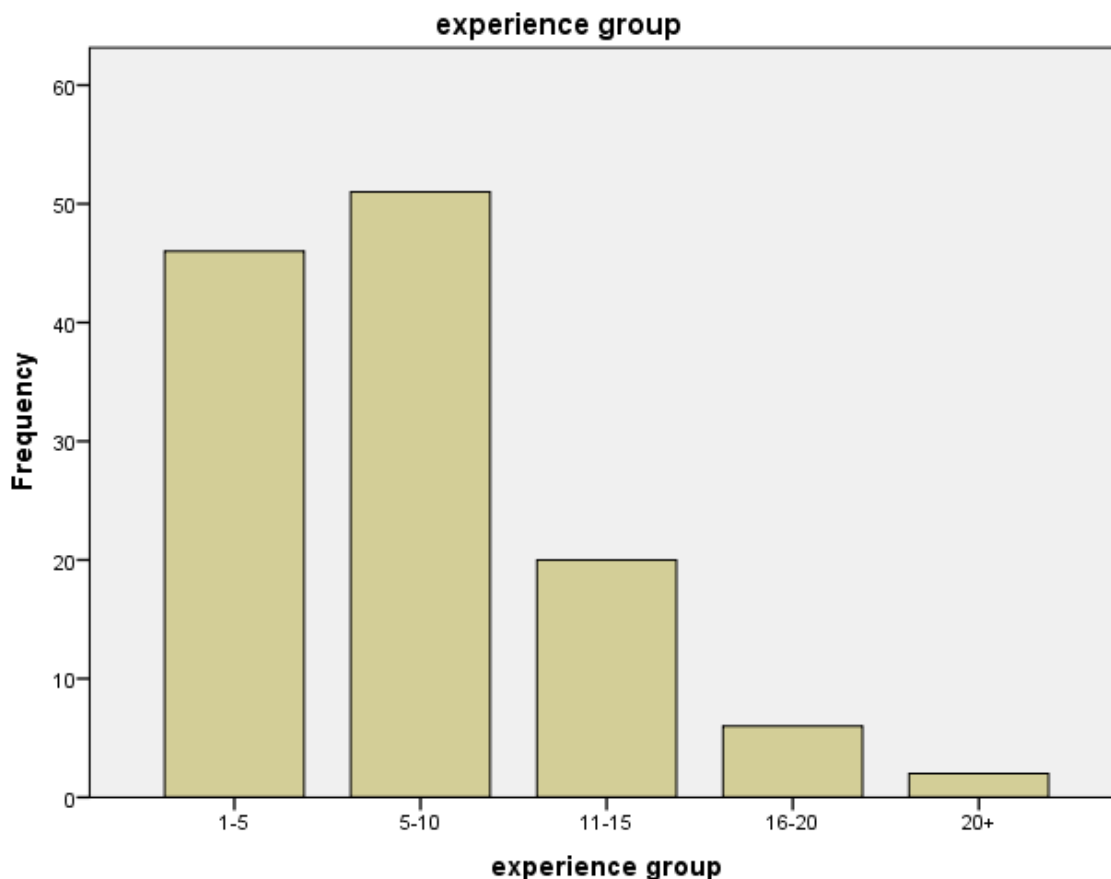
The largest group of participants is aged between 31-40 years (50.0%, n=63), followed by the 18-30 age group (35.7%, n=45). This indicates that the study population consists primarily of young and middle-aged adults, which is the demographic where heel pain is most prevalent.



**Table 2**  
**Experience group**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-5	46	36.5	36.8	36.8
	5-10	51	40.5	40.8	77.6
	11-15	20	15.9	16.0	93.6
	16-20	6	4.8	4.8	98.4
	20+	2	1.6	1.6	100.0
	Total	125	99.2	100.0	
Missing	System				
Total		125	100.0		

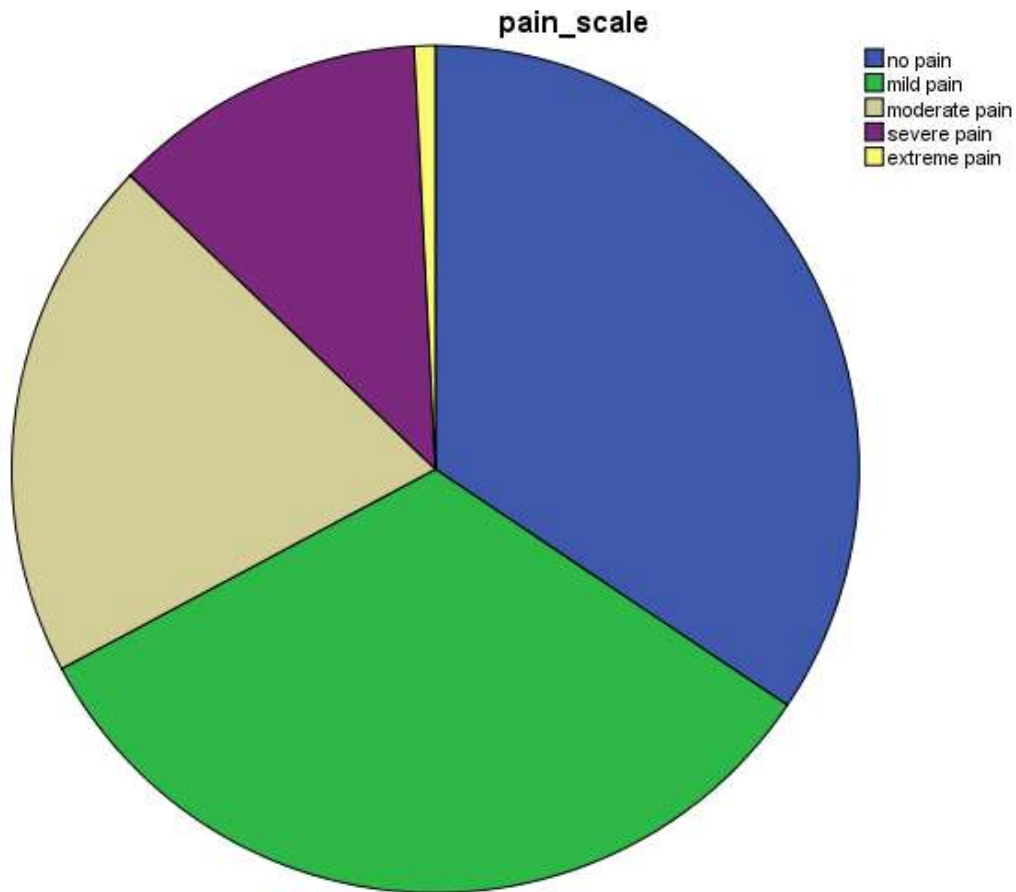
The teaching experience of the participants is well-distributed, with the largest groups having 5-10 years (40.5%, n=51) and 1-5 years (36.5%, n=46) of experience. This variation allows for analysis of whether pain is associated with cumulative years of occupational standing.



**pain\_scale**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid no pain	43	34.1	34.4	34.4
mild pain	41	32.5	32.8	67.2
moderate pain	25	19.8	20.0	87.2
severe pain	15	11.9	12.0	99.2
extreme pain	1	.8	.8	100.0
Total	125	99.2	100.0	
Missing System	1	.8		
Total	126	100.0		

This is a key finding of the study. The results show that the overall prevalence of heel pain is 65.6% (combining mild to extreme pain categories). Specifically, 32.8% (n=41) reported mild pain, 20.0% (n=25) moderate pain, and 12.8% (n=16) severe to extreme pain. This confirms that heel pain is a highly prevalent issue in this population.

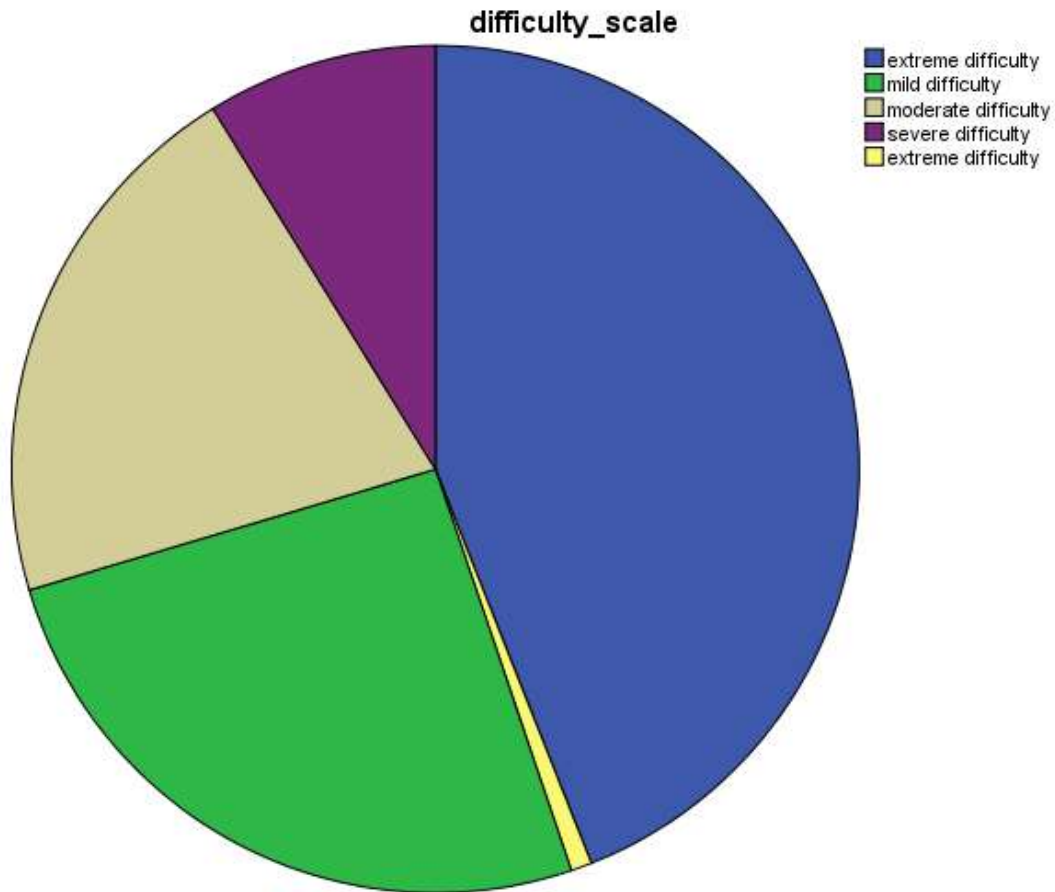


**Figure 1**  
**Table 3**

**difficulty\_scale**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	extreme difficulty	55	43.7	44.0	44.0
	mild difficulty	32	25.4	25.6	69.6
	moderate difficulty	26	20.6	20.8	90.4
	severe difficulty	11	8.7	8.8	99.2
	extreme difficulty				
	Total	125	99.2	100.0	
Missing	System				
Total		125	100.0		

This table shows the level of difficulty participants face in performing daily activities due to their foot problem. A significant 44.0% (n=55) reported "extreme difficulty." This seems high and may be influenced by the phrasing of the questions or suggests that even mild pain can translate to significant perceived difficulty in specific tasks like standing or climbing stairs.



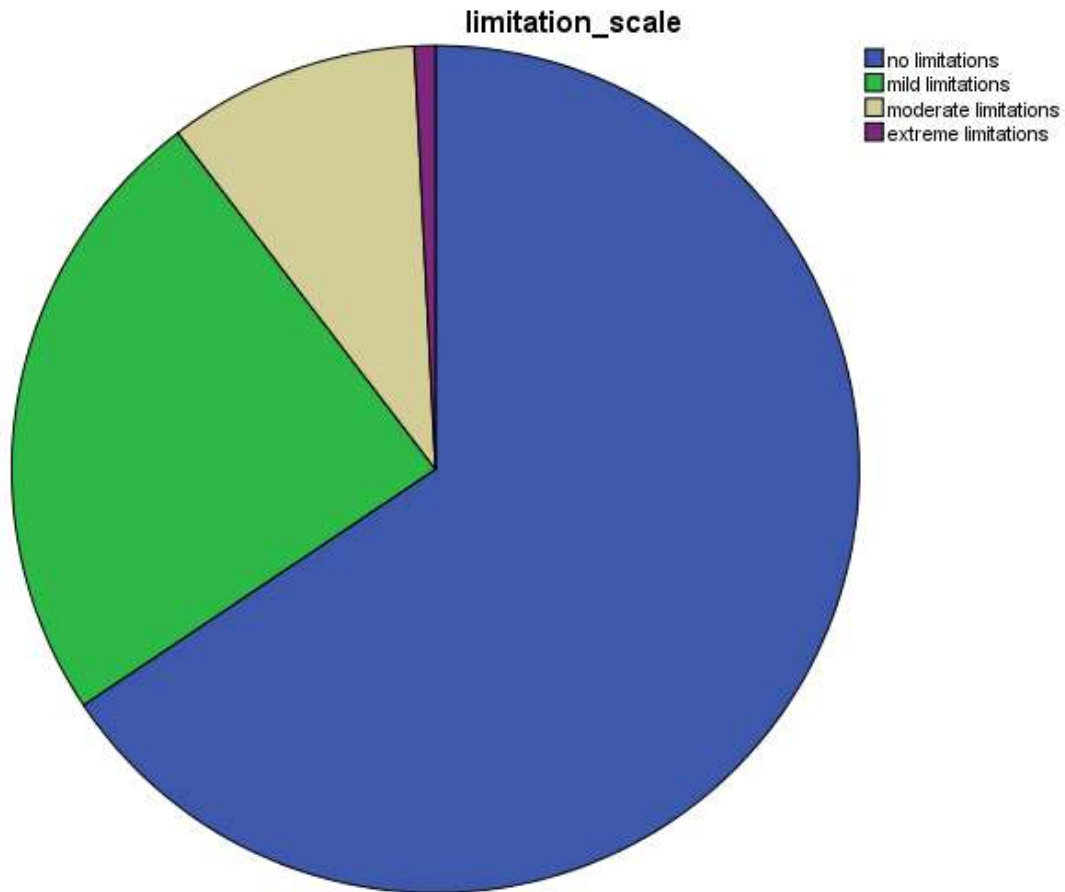
**Figure 2**

**Table 4**

**limitation\_scale**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no limitations	82	65.1	65.6	65.6
	mild limitations	30	23.8	24.0	89.6
	moderate limitations	12	9.5	9.6	99.2
	extreme limitations	1	.8	.8	100.0
	Total	125	99.2	100.0	
Missing	System				
Total		125	100.0		

In contrast to the difficulty scale, most participants (65.6%, n=82) reported "no limitations" in their activities. This suggests that while many experience pain and find certain tasks difficult, they are still able to perform their daily routines and work, possibly by adapting their movements or persevering through discomfort.



**Figure 3**

**CROSS TABULATION**

This section explores the relationships between heel pain and other variables.

**BMI \* pain\_scale Crosstabulation**

Count

		pain_scale					Total
		no pain	mild pain	moderate pain	severe pain	extreme pain	
BMI	low weight	6	5	1	1	0	13
	normal	33	34	15	6	1	89
	over weight	4	2	9	8	0	23
Total		43	41	25	15	1	125

**Table 5**

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	25.874 <sup>a</sup>	8	.001	.001
Likelihood Ratio	24.603	8	.002	.002
Fisher's Exact Test	24.032			.001
N of Valid Cases	125			

a. 9 cells (60.0%) have expected count less than 5. The minimum expected count is .10.

The cross-tabulation shows a clear pattern. Participants with normal BMI mostly report "no pain" or "mild pain." In contrast, overweight participants have a higher proportion of "moderate" and "severe" pain. The Chi-Square test is highly significant ( $p = .001$ ), confirming a statistically significant association between higher BMI and greater heel pain severity. This supports the biomechanical theory that increased body weight places more stress on the heel structures.

**Table 6**  
**FOOT WEAR TYPE \* pain\_scale Crosstabulation**

Count

		pain_scale					Total
		no pain	mild pain	moderate pain	severe pain	extreme pain	
FOOT WEAR TYPE	Flat Footwear	32	20	8	7	0	67
	High Heels	7	9	7	1	1	25
	Medicated Footwear	4	11	10	7	0	32
Total		43	41	25	15	1	125

**Table 7**

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	23.626 <sup>a</sup>	12	.023	.015
Likelihood Ratio	24.062	12	.020	.006
Fisher's Exact Test	26.501			.004
N of Valid Cases	125			

a. 10 cells (50.0%) have expected count less than 5. The minimum expected count is .01.

The results are significant ( $p = .015$ ). Most flat footwear users report "no pain," while high heel and medicated footwear users report more pain. The finding that medicated footwear users have high pain levels is likely due to reverse causation individuals with pre-existing pain seek out medicated footwear for relief. The significant p-value indicates a real association, but the direction of cause and effect for medicated footwear needs careful interpretation in the discussion.

**Table 8**  
**SYSTEMIC DISOARDER \* pain\_scale Crosstabulation**

Count

		pain_scale				Total
		no pain	mild pain	moderate pain	severe pain	

SYSTEMIC DISORDER	no	42	35	14	5	1	97
	yes	1	6	11	10	0	28
Total		43	41	25	15	1	125

**Table 9**  
**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	35.300 <sup>a</sup>	4	.000	.000
Likelihood Ratio	35.953	4	.000	.000
Fisher's Exact Test	34.337			.000
N of Valid Cases	125			

a. 3 cells (30.0%) have expected count less than 5. The minimum expected count is .22.

This is a very strong and highly significant finding ( $p = .000$ ). While the majority of those without systemic disorders have no or mild pain, participants with systemic disorders report disproportionately high levels of moderate (39.3%) and severe (35.7%) pain. This indicates that the presence of a systemic illness like diabetes or arthritis is a powerful risk factor for more severe heel pain.

**Table 10**  
**experience group \* pain\_scale Crosstabulation**

Count

		pain_scale					Total
		no pain	mild pain	moderate pain	severe pain	extreme pain	
experience group	1.00	15	17	8	5	1	46
	2.00	18	18	11	4	0	51
	3.00	6	5	4	5	0	20
	4.00	3	1	2	0	0	6
	5.00	1	0	0	1	0	2
Total		43	41	25	15	1	125

**Table 11**

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	12.172 <sup>a</sup>	16	.732	. <sup>b</sup>		
Likelihood Ratio	12.564	16	.704	.722		
Fisher's Exact Test	14.937			.694		
Linear-by-Linear Association	.134 <sup>c</sup>	1	.715	.748	.372	.034

N of Valid Cases	125					
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- a. 15 cells (60.0%) have expected count less than 5. The minimum expected count is .02.
- b. Cannot be computed because there is insufficient memory.
- c. The standardized statistic is .366.

The Fisher's Exact Test is not significant ( $p = .694$ ). This suggests that years of teaching experience alone is not a significant predictor of pain severity in this group. Other factors like daily standing hours, individual biomechanics, and BMI are likely more influential

**Table 12**  
**age group \* pain\_scale Crosstabulation**

		pain_scale					Total
		no pain	mild pain	moderate pain	severe pain	extreme pain	
age group	1.00	17	19	6	2	1	45
	2.00	22	20	14	7	0	63
	3.00	4	2	5	5	0	16
	4.00	0	0	0	1	0	1
Total		43	41	25	15	1	125

**Table 13**

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	22.209 <sup>a</sup>	12	.035	.024		
Likelihood Ratio	19.074	12	.087	.039		
Fisher's Exact Test	21.958			.029		
Linear-by-Linear Association	7.667 <sup>b</sup>	1	.006	.006	.003	.001
N of Valid Cases	125					

- a. 10 cells (50.0%) have expected count less than 5. The minimum expected count is .01.
- b. The standardized statistic is 2.769.

The data shows a trend where older age groups (41-50 and 51+) have a higher percentage of individuals reporting moderate to severe pain. This aligns with the literature that the peak incidence for plantar fasciitis is between 40-60 years, due to age-related degenerative changes.

**Table 14**  
**difficulty\_scale \* pain\_scale Crosstabulation**

		pain_scale					Total
		no pain	mild pain	moderate pain	severe pain	extreme pain	
difficulty_scale	extreme difficulty	37	16	2	0	0	55

	mild difficulty	6	16	6	4	0	32
	moderate difficulty	0	6	10	9	1	26
	severe difficulty	0	3	6	2	0	11
	extreme difficulty	0	0	1	0	0	1
Total		43	41	25	15	1	125

**Table 15**

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	80.474 <sup>a</sup>	16	.000	. <sup>b</sup>		
Likelihood Ratio	91.616	16	.000	. <sup>b</sup>		
Fisher's Exact Test	. <sup>b</sup>			. <sup>b</sup>		
Linear-by-Linear Association	54.854 <sup>c</sup>	1	.000	.000	.000	.000
N of Valid Cases	125					

- a. 15 cells (60.0%) have expected count less than 5. The minimum expected count is .01.
- b. Cannot be computed because there is insufficient memory.
- c. The standardized statistic is 7.406.

The result is highly significant ( $p = .000$ ). As expected, participants with "no pain" almost exclusively report "extreme difficulty," while those with "moderate" and "severe" pain report higher levels of "moderate" and "severe" difficulty. This validates that the FFI questionnaire is effectively measuring the impact of pain on function.

**Table 16**

**limitation\_scale \* pain\_scale Crosstabulation**

Count

		pain_scale					Total
		no pain	mild pain	moderate pain	severe pain	extreme pain	
limitation_scale	no limitations	39	28	13	2	0	82
	mild limitations	4	12	6	7	1	30
	moderate limitations	0	1	6	5	0	12
	extreme limitations	0	0	0	1	0	1

Total	43	41	25	15	1	125
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Table 17

### Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	49.692 <sup>a</sup>	12	.000	.008		
Likelihood Ratio	49.395	12	.000	.000		
Fisher's Exact Test	49.680			.000		
Linear-by-Linear Association	37.023 <sup>b</sup>	1	.000	.000	.000	.000
N of Valid Cases	125					

a. 13 cells (65.0%) have expected count less than 5. The minimum expected count is .01.

b. The standardized statistic is 6.085.

This is also highly significant ( $p = .000$ ). A clear gradient is visible: as pain severity increases from "no pain" to "severe pain," the proportion of participants reporting "no limitations" decreases, and those reporting "mild" and "moderate limitations" increases. This confirms that higher pain levels lead to greater activity restriction.

### Correlation

#### ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
difficulty_scale	Between Groups	65.526	4	16.382	28.762	.000
	Within Groups	68.346	120	.570		
	Total	133.872	124			
limitation_scale	Between Groups	21.601	4	5.400	14.246	.000
	Within Groups	45.487	120	.379		
	Total	67.088	124			

Table 25  
Correlation

### Correlations

		pain_scale	difficulty_scale	limitation_scale
pain_scale	Pearson Correlation	1	.665**	.546**
	Sig. (2-tailed)		.000	.000
	N	125	125	125
difficulty_scale	Pearson Correlation	.665**	1	.526**

	Sig. (2-tailed)	.000		.000
	N	125	125	125
limitation_scales	Pearson	.546**	.526**	1
	Correlation			
	Sig. (2-tailed)	.000	.000	
	N	125	125	125

\*\* . Correlation is significant at the 0.01 level (2-tailed).

The ANOVA tests are highly significant ( $p = .000$ ) for both difficulty and limitation. This confirms that the differences in the average scores for difficulty and limitation across the five pain groups (no, mild, moderate, severe, extreme) are statistically significant and not due to chance.

## DISCUSSION

The primary objective of this study was to determine the prevalence of heel pain and its subsequent impact on the daily activities of female teaching staff at universities in Dera Ismail Khan. Out of the 125 participants, the findings revealed a high overall prevalence of 65.6%, with symptoms ranging from mild to extreme pain. These results align with previous regional research, such as the study by Arshad et al. (2025), which reported a 68.3% prevalence among female school teachers in Pakistan. This high rate underscores the occupational risk associated with teaching, which inherently demands prolonged periods of weight-bearing and standing.

A significant correlation was observed between Body Mass Index (BMI) and pain severity ( $p = .001$ ), with overweight participants reporting more intense pain than those with a normal BMI. This reinforces the understanding that increased body mass elevates the mechanical load on the plantar fascia and calcaneal structures. Furthermore, footwear choice played a critical role; individuals wearing flat shoes generally reported lower pain levels compared to those utilizing medicated or specialized footwear, which many participants likely adopted after the onset of symptoms.

The study also identified systemic health and age as vital contributing factors. A highly significant association ( $p = .000$ ) was found between systemic disorders such as diabetes and hypertension and heightened pain levels. This may be due to microvascular changes or inflammatory processes that exacerbate foot pathologies. Additionally, older participants (aged 41–50 and above) reported more severe pain, which is consistent with age-related degenerative changes, including the thinning of the protective heel fat pad.

Interestingly, the data showed no statistically significant relationship between years of teaching experience and pain severity ( $p = .694$ ). This suggests that factors such as daily standing hours and individual biomechanics are more influential than cumulative professional tenure. The "healthy worker effect" may also play a role here, as those with unbearable pain might have already left the profession.

Finally, the correlation analysis confirmed that as heel pain increases, there is a proportional rise in functional difficulty ( $r = 0.665$ ) and activity limitation ( $r = 0.546$ ). While many teachers continue to work despite their discomfort, these findings highlight a significant burden on their quality of life. The high prevalence identified in this specific cohort emphasizes the urgent need for occupational health interventions, such as ergonomic footwear education and regular musculoskeletal screenings, to prevent long-term disability in this academic workforce.

## CONCLUSION

This study was conducted to determine the prevalence of heel pain and its impact on daily activities among female teaching staff at universities in Dera Ismail Khan. A total of 125 female teachers participated in this cross-sectional study.

The findings revealed that heel pain is highly prevalent (65.6%) among female teaching staff. BMI showed a significant association with pain severity ( $p = .001$ ), footwear type was significantly associated ( $p = .015$ ), systemic disorders demonstrated a strong association ( $p = .000$ ), and age showed a significant relationship ( $p = .024$ ). Teaching experience was not significantly associated ( $p = .694$ ). Strong positive correlations were found between pain and functional difficulty ( $r = 0.665$ ) and pain and activity limitation ( $r = 0.546$ ).

In conclusion, heel pain is a common and functionally important problem among female teaching staff in Dera Ismail Khan. Clinical recommendations include regular foot assessment, education on supportive footwear, weight management programs, workplace ergonomics, and early physiotherapy intervention. Future research should include larger sample sizes and longitudinal studies.

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