

## Factors Associated with Heel Pain in Young Professional

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### ABSTRACT

**Background:** Heel pain is a common condition that affects people with all age groups but mostly it is found in young and middle age groups. Different factors are thought to be associated with heel pain such as age, body mass index, height, weight, %age of sitting and standing during most part of the day.

**Aim:** To identify the factors associated with heel pain and to measure the frequency of heel pain in young professionals.

**Methodology:** It was an Observational cross sectional study design which was conducted in the different office and hospital setting of Lahore. 266 participants were taken after meeting inclusion criteria. Data was collected using a standardized questionnaire. SPSS version 26 was used for data analysis.

**Results:** there were 266 participants in current study of which 166(62.4%) reported heel pain. Heel pain was reported majorly by females (77.8%). Among young professionals, heel pain was found to be maximum among the lecturers/Teachers (42.2%), nurses (21.7%), doctors and Physiotherapist (6%) and office workers (24.1%). 44.6% participants found effect of heel pain on their quality of work to some extent and 30.1% have strong impact on their QOW.

**Conclusions:** From above results it is concluded that heel pain is common among young professionals including lecturers, nurses, teachers and physiotherapist. The main factors associated with heel pain was age, gender, percentage of standing and sitting, job nature are associated with heel pain. The factor that can be modified for decreased incidence of heel pain is percentage of standing and if prolonged standing is required according to job nature then it is suggested to change their pressure on heels i.e. by incorporating some walk or sitting interval between hours of continuous weight bearing on feet.

**Keywords:** young professional, heel pain, BMI, planter fasciitis, Long working hours, nature of job

### INTRODUCTION

Heel pain is a common problem found in all age groups but mostly in young and middle age groups. Person who suffers from this pain usually complains of pain beneath the heel or the point behind heel. Structure of human heel is designed so that it provides a support for the body weight. Planter fasciitis is found to be the most common diagnosis of heel pain. It is found in people with age from 8 to 80 but mostly in middle aged women and male runners<sup>1,2</sup>.

Heel pain, also known as planter fasciitis, is a major cause of pain and disability in the community. With a frequency between 3.6 and 6.9%<sup>3,4</sup>. It is distinguished by severe discomfort that is aggravated by extended periods of standing and walking<sup>5</sup> and is noticeable after periods of rest when one bears weight. From a pathological standpoint, thicker planter fascia, perifascial swelling, and calcaneal oedema are frequently indicators of planter heel pain<sup>6</sup>. Mobility restrictions and a considerable decline in overall and foot-specific health-related quality of life are common in people with planter heel discomfort<sup>6</sup>. The community is also financially burdened by planter heel pain<sup>3</sup>.

Heel pain is thought to be one of the major causes of physician visits annually in the USA<sup>6</sup>, which has increased the economic burden US\$284 million annually<sup>7</sup>. Heel discomfort was mentioned in 7.5% of all musculoskeletal foot and ankle visits in primary care in the UK in 2006, with 12.1% of those mentioning planter fasciitis<sup>8</sup>. People experiencing planter heel pain frequently seek the advice of allied health experts. In Australia, 10% of patients complained of heel pain after visiting a metropolitan university podiatry clinic<sup>9</sup>, but in the USA, 7.1% of patients with planter heel pain are referred to a physical therapist<sup>10</sup>.

Young professionals most frequently experience planter fasciitis, Achilles tendinopathy, and calcaneal stress fractures as the sources of their heel pain<sup>11</sup>. The thick band of tissue that

connects the heel bone to the toes, the planter fascia, becomes inflamed and causes the common ailment known as planter fasciitis. The common symptom is a sudden, intense pain in the heel that is greater in the morning and after standing or walking for a long time. According to studies, people who spend a lot of time standing or walking, such as retail and healthcare professionals, are more likely to develop planter fasciitis<sup>12,13,14</sup>.

Those people who spend more time in standing during their working hours are more liable to develop heel pain. The likelihood of developing heel pain increases with a decrease in foot dorsiflexion. Individuals with BMI more than 30kg/m<sup>2</sup> are at greatest risk of having heel pain. Other risk factors include obesity, nature of job, decreased planter flexion, type of footwear, sedentary life style and heel spurs<sup>15,16</sup>.

According to one long-term follow-up study, after one year, around 80% of planter fasciitis cases can resolve on their own<sup>17</sup>. While conservative treatment had shown most promising results in majority of individuals<sup>18</sup>.

This study aimed to assess the frequency of heel pain in young professionals and to determine the factors which are found more associated with the heel pain so that by identification of these factors health-related quality of life and work can be improved.

### MATERIALS AND METHODS

**Study design:** Observational cross sectional study design.

**Settings:** Data was collected from different hospitals, educational Institutes and office settings of Lahore.

**Sampling technique:** Non-probability Convenient sampling technique was used

**Sample size:** Sample of 266 participants was included in the study. It was calculated from Epitool Sample size calculator at 95% CI and 5% margin of Error

**Inclusion criteria:**

Individuals engaged in a profession with age from 20 to 40 years both males and females.

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Individuals with more than 5 working hours in any indoor or outdoor setting.

#### Exclusion criteria

Individuals with age < 20 and >40 years.

Individuals with foot or ankle pain or instability.

Individuals with history of trauma

Individuals with systemic diseases i.e. cancer, diabetes mellitus etc.

**Methodology:** 266 participants were taken after meeting inclusion criteria. Participants were collected from different hospitals, educational and offices in Lahore. Basic Demographic history (name, age, gender) and contact details of participants were taken. After taking consent from participants, data was recorded on the standard questionnaire. This was entered into SPSS and analyzed properly.

**Data analysis:** Data was analyzed by using SPSS version 22. Frequency distribution was given in the form of different graphs and charts. Numeric data was presented in the form of mean±S.D. Data was analyzed by using standard statistical test of chi-square.

## RESULTS

Off 266 sample size, the heel pain was reported by 166(62.4%) individuals, while the rest 100(37.6%) didn't have heel pain. While 95(57.3%) of those having heel pain reported to have pain underneath the heel while 14(8.4%) individuals had pain below arch and behind heel. 58(35%) had pain from 5-7 months while 69(41.6%) had pain from 10-12 months while least individuals reported pain from 8-10 months., while majority (89.9%) of the individuals had pain in both feet and about 78.2% reported that their pain aggravated in the evening (Table 1).

Table 1: Frequency of heel pain, area and duration of heel pain, foot involved and time when pain is worse

	Yes	No
<b>Heel</b>		
Frequency	166	100
%age	62.4	37.6
<b>Area of the Heel Pain</b>		
N/A	0	100 (100)
Underneath the heel	95(57.3%)	0
Under the arch	14(8.4%)	0
Under the heel and arch	43(25.9%)	0
Behind the heel	14(8.4%)	0
<b>Duration of Heel Pain</b>		
N/A	0	100
2-4 months	22(13.2%)	0
5-7 months	58(35%)	0
8-10 months	17(10.2%)	0
10-12 months	69(41.6%)	0
<b>Feet Involved</b>		
N/A	0	100
Only one Foot	17(10.2%)	0
Both Feet	149(89.8%)	0
<b>Time When Pain Is Worse</b>		
N/A	0	100
In morning	8(4.8%)	0
In evening	130(78.2%)	0
All the day	28(17%)	0

The age was classified into 3 groups, Out of 166 who reported heel pain participants 40(24%) individuals belonged 22-27 years, 46(27.7%) belonged to 28-33 years and 48.3% (80) belonged to 34-40 years category. The gender distribution in those with heel pain in the study there were 37(22.2%) male and 129(77.8%) female. Of which 26(15.6%) underweight participants, 30(18%) were normal, 40(24%) overweight and the remaining 70(42.4%) were obese (Table 2).

57.9% of those individuals who has heel pain worked for 5-8 hours per day while 36.1% worked for 9-12 hours. 48.8% individuals reported that they spent only 10-30% sitting while 49.4% spent 40-70% of their time sitting during working hours. While those who had pain spent 40-70% of their time in standing position. Furthermore they most of the individuals reported that their heel pain had affected their quality of pain to some extent (Table 3).

50.6% of those having pain didn't had any specific diagnosis of their heel pain while from the rest majority were diagnosed with planter fasciitis (21.7%) and heel spur (15.1%). there were 42.8% individuals who didn't visited doctor for their heel pain, while from the rest majority visited physiotherapist (22.3%) and orthopedics (21.1%). and 42.2% preferred to change their shoe wear to cope up with their pain while 24.1% preferred physiotherapy treatment and rest (Table 4).

Table 2: Demographic Data of heel pain

	Yes (n=166)	No (n=100)
<b>Age</b>		
22-27 Years	40(24%)	50(50%)
28-33 Years	46(27.7%)	30(30%)
34-40 Years	80(48.3%)	20(20%)
<b>Gender</b>		
Male	37(22.2%)	40(40%)
Female	129(77.8%)	40(60%)
<b>Body Mass Index (BMI)</b>		
Underweight	26(15.6%)	20(20%)
Normal weight	30(18%)	40(40%)
Overweight	40(24%)	25(25%)
Obese	70(42.4%)	15(15%)
<b>Type of Job</b>		
Lecturers	70(42.2%)	100
Doctors	10(6%)	0
Nurses	36(21.7%)	0
Physiotherapist	10(6%)	0
Office workers	40(24.1%)	0

Table 3: Frequency of working hours, %age of sitting and standing per day and effect of pain on quality of work

	HEEL Pain	
	Yes (n=166)	No (n=100)
<b>Working Hours per day</b>		
5-8 hours	96(57.9%)	62(62%)
9-12 hours	60(36.1%)	34(34%)
13-17 hours	10(6%)	4(4%)
<b>%age of sitting during working hours</b>		
10%-30%	81(48.8%)	6(6%)
40%-70%	82(49.4%)	62(62%)
80%-100%	3(1.8%)	32(32%)
<b>%age of Standing during working hours</b>		
10%-30%	10(6%)	55(55%)
40%-70%	108(65%)	43(43%)
80%-100%	48(29%)	2(2%)
<b>Effect of pain on Quality of Work</b>		
No	50(30.1%)	100
Yes	42(25.3%)	0
Somewhat	74(44.6%)	0

Table 4: Diagnosis and Treatment Options for Heel Pain

	HEEL Pain	
	Yes (n=166)	No (n=100)
<b>Diagnosis of Heel Pain</b>		
No	84(50.6%)	100
Planter Fasciitis	36(21.7%)	0
Heel Spur	25(15.1%)	0
Achilles Tendinitis	15(9%)	0
Others	6(3.6%)	0
<b>Visit to Doctor</b>		
None	71(42.8%)	100
General Physician	23(13.8%)	0
Orthopedic	35(21.1%)	0
Physiotherapist	37(22.3%)	0
<b>Type of Treatment Received</b>		
Medicines	36(21.7%)	100
Medicine + rest+Phyiotherapy	10(6%)	0
Physiotherapy+rest	40(24.1%)	0
Use of Orthosis	10(6%)	0
Change of Shoe wear	70(42.2%)	0
<b>Effectiveness of Treatment Received</b>		
No	50(30.1%)	100
Yes	42(25.3%)	0
Somewhat	74(44.6%)	0

Chi square analysis showed that relation between heel pain and area and duration of pain, feet involved, time when pain is worse, Age, gender, BMI, working hours per day, percentage of sitting and standing during working hours, effect of pain on quality of work, diagnosis, visit to doctor, type and effectiveness of

treatment received was significant because the p-value for each was below level of significance i.e. 0.05 (Table 5).

Table 5: Chi Square analysis

Characteristics	Chi-square	p-value
Area of heel pain * heel pain	264.00	0.000
Duration of pain * heel pain	266.00	0.000
Feet involved * heel pain	266.00	0.000
Time When Pain Is Worse* heel pain	266.00	0.000
Age * heel pain	42.707	0.001
Gender * heel pain	9.517	0.002
BMI * heel pain	148.618	0.000
Working hours per day * heel pain	23.044	0.002
%age of sitting in working hours * heel pain	103.878	0.000
%age of standing during working hours *heel pain	109.042	0.000
Effect of pain on quality of work * heel pain	123.131	0.000
Diagnosis of pain * heel pain	71.412	0.000
Visit to the doctor * heel pain	89.024	0.000
Type of Treatment Received* heel pain	266.00	0.000
Effectiveness of treatment Received *heel pain	186.296	0.000

**DISCUSSION**

This study was conducted on young working community in Lahore. Current study included participants from 20 to 40 years of age and both males and females who were working in an office setting for atleast 5 hours. Results showed that heel pain was present among 62.4% of participants and was most found among participants(48.3%) belonged to 34-40 years of age groups. Majority of heel pain participants are found to be young professionals. While a study reports that heel pain is prevalent in 3.6% of Australian population (4). And results of another study conducted in united states show that 10% of people present with heel pain and 83% of them are from 25 to 65 years of age and working adults<sup>19</sup>.

According to gender wise distribution, heel pain was found to be more prevalent in females than males (77.8%) and most commonly encountered painful area was underneath the heel (57.3%). This result comes in accordance with a study that found that 50% of young urban women have heel pain and area that was affected more (49%) was under the heel<sup>20</sup>.

In the current study there was a significant association between heel pain and age of individuals and BMI as p-value for both was below 0.05 which is in contrast with a study observing the effect of BMI and age on heel pain treatment by physiotherapy shows that no association between age and BMI as predictors and individuals with higher BMI also recovered successfully by treatment<sup>21</sup>. While the results of present study were supported by a Hendry et al in 2018 which also showed significant relationship among foot pain ,BMI, Gender and Age having p-value less than 0.05<sup>22</sup>.

A study conducted by Alqahtan in 2020 among school teachers of Saudia Arabia showed that majority of the teachers had heel pain as their primary complain and those who had pain were obese and reported to have prolonged standing hours at work and those who worked for more than 10 years had severe pain as compared to those having less experience<sup>23</sup>. The results are coherent with the current study which showed that among individuals who had heel pain, 42.4%were obese, 57.9% worked for 5-8 hours per day 65% individuals spent 40-70% of their time in standing position.

Heel pain is offered different treatments from anti inflammatory medicines to manual therapy, stretching of calf muscles to orthosis and night splints<sup>24,25</sup>. Another study showed that use of shoe inserts causes decrease in pressure that can cause heel pain<sup>26</sup>. While in our study similar results were obtained where 42.2% individuals having heel pain preferred to use shoe inserts to treat their pain while 24.1% individuals preferred physiotherapy treatment for their pain.

While results of our study showed that only 30.1% heel pain participants found heel pain as a disturbing factor for their work performance and was not able to perform their duties while 44.6% heel pain participants had little effect of heel pain on their quality of work. This result came in accordance to the results of a study that shows that increased BMI and disabling posterior heel pain are strongly associated<sup>27</sup>.

**CONCLUSION**

The study concluded that heel pain is a common complain among those young professionals who stand for long hours at work like teacher, nurses and office workers and more the 8 working hours. While increased BMI, age, nature of job and high percentage of standing and low percentage of sitting all are contributing factors for heel pain among young professionals

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