Original Article

Prevalence and Risk Factors of Plantar Fasciitis Among Farmers: A Cross-Sectional Study

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Abstract

Objective: This study aimed to determine the prevalence of plantar fasciitis and its associated risk factors among farmers.

Study Design: A cross-sectional study was conducted.

Place and duration of study: A cross sectional study was conducted involving 139 farmers residing in Jatoi, Muzaffargarh.

Material and Methods: This cross-sectional study recruited 139 farmers using non-probability convenience sampling. Pain intensity was assessed via the Visual Analogue Scale (VAS) and Plantar Fasciitis Pain Scale (PFPS). Data were analyzed using SPSS version 23; the chi-square test was applied to examine associations between study variables.

Results: Participants aged 18–60 years had a mean weight of 72.66 ± 9.65 kg and mean height of 168.45 ± 5.35 cm. Overall, 65 (46.76%) participants had plantar fasciitis, while 74 (53.23%) were unaffected. The sample comprised 124 (89.20%) males and 15 (10.79%) females. Of those affected, 28 reported mild pain, 24 moderate pain, and 13 severe pain per VAS scoring. Significant associations ($P < 0.05$) were observed between plantar fasciitis and gender, age, BMI, shoe type, and working hours.

Conclusion: Plantar fasciitis shows a high prevalence (46.76%) among farmers and adversely affects daily life. Female gender, advancing age, higher BMI, inappropriate footwear, and prolonged working hours are significant associated factors; height and weight also contribute to the condition.

Keywords: Plantar Fasciitis, Farmers, Prevalence, Body Mass Index, Sex Factors.

1. Introduction

Plantar fascia is a well-known triangular, central APO neurotic band that is essential to the foot's structure and function. Three wide bands of thick, fibrous connective tissue make up this subcutaneous structure. It is the most vital and robust tissue that keeps the medial longitudinal arch stable and power. [1] A common musculoskeletal disorder called plantar fasciitis is characterized by heel pain and inflammation. The plantar fascia, a broad band of connective tissue that supports the arch of the foot and acts as a shock absorber while bearing weight, is frequently impacted. [2] Plantar fasciitis can affect individuals of any age; however, it is most prevalent in middle aged adults, with rare occurrence in late childhood. Common in adults whose age is within the middle-age bracket, especially women. It is frequently associated with something that is too stressful on the foot and the heel area. High-impact activities, like running, ballet and aerobics, etc. The factors that contribute to the occurrence of plantar fasciitis and accordingly, the following Poor foot mechanics such as high arches, low arches and unusual walking patterns . [3] At the heel's medial calcaneal tuberosity, this is a degenerative irritation. In the plantar area of the heel pad, people usually complain of acute, localized soreness . [4] This illness affects about 10% of the population annually, mostly people between the ages of 18 and 65. Long-term disability and significant functional restrictions are possible outcomes for those who suffer from this illness. [5] Plantar fasciitis and subsequent central to medial heel pain are caused by inflammation and degenerative alterations of the plantar fascia due to recurrent stress and damage.

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Although injection can bring short-term relief, it was not effective with a six months follow-up benefit in long-term good (Rachit sharma, 2023). (6) Possible risk factors include over pronation or flat feet and over pronation, high arches Gastrocnemius tightness, leg length inequality, exercise excessively and long-standing hours of walking and poor locomotion (Ruben Montes-sales, Gomez-Carrion, Gomez-Aguilar, Camunas-Nieves, & Castillo-Lopez). (7)

There are numerous elements that fall into the categories of intrinsic and extrinsic causes; however, the etiology of plantar fasciitis is not well recognized. Age, body mass index, height, weight, gender, and other biological and anatomical traits represent key intrinsic individual characteristics. Conversely, sedentary lifestyle, working hours, and shoe type are external influences (Syed Zain Ul Abiden, december 2019). (9) Pain in the morning is frequent in this disease. When waking up, stiffness and discomfort are common, but they usually go away when you move or walk. However, pain may recur following periods of inactivity . [(9)]

This disorder has many underlying causes, including a mechanically overloaded reaction to recurrent micro-trauma . [(10)] When this band of tissue is overstretched, microscopic tears in the fascia's fibers at its attachment to the calcaneus occur . [(11)] Age, a high body mass index, prolonged weight-bearing, abrupt increases in activity, hard surfaces, inappropriate footwear, and tight Achilles tendon tendencies all likely to make it worse . [(2)] Every PF case is concluded in 80 to 90 percent within a period of ten months. Non-surgical management like non steroid anti-inflammatory (NSAIDs), shoe inserts and stretching exercises, or extracorporeal shockwave therapy is the initial line therapy of PF, which has done well in up to Steroid as an injection (SI) in 90 percent of cases. Therapy is conventionally practiced in case of a failure of non-operative treatment.it is successful due to ant-inflammatory activities.

2. Materials & Methods

Selection and Description of Participants

A cross sectional study was conducted involving 139 farmers. Following approval from the ethics review committee, tomographic data collection was initiated. Demographic information, including name, age, and gender, was obtained from the participants. Quantitative parameters such as weight, height, shoe type, working hours, and body mass index (BMI) were also recorded. Data were collected only from individuals who satisfied the inclusion and exclusion criteria, and willing participants were accordingly enrolled in the study. Exclusion criteria included individuals with foot injuries and calcaneal fractures. Patients presenting with pes planus, pes cavus, and pregnant women were also excluded. Data on the prevalence of plantar fasciitis were collected from farmers residing in Jatoi, Muzaffargarh. Data were gathered using the Plantar Fasciitis Pain Scale via physical handout distribution. Qualitative data were also obtained through a self-developed questionnaire. The questionnaire was first explained in detail to participants, who then completed it accordingly. Inclusion criteria comprised adult farmers aged 18–60 years residing in Jatoi, Muzaffargarh, engaged in regular agricultural work, willing to participate voluntarily, capable of understanding the questionnaire, and free from major lower limb injury or neurological foot disorders.

Technical information

Plantar fasciitis pain scale was used as an outcome measure which Contained questions to assess how pain affected common physical activities of farmers. The scoring was considered on the basis of symptoms. Intensity and the results will be concluded using the statistical tool SPSS software PFPS is an effective tool in diagnosis and

assessment of pain unique to PF.A number of questions about pain and PF control are included in the PFPS questionnaire. The visual analogue scale (VAS) is a component of PFPS as well. On a scale of 1 to 100, the VAS scores pain was used to rate the intensity of the pain. The standard VAS pain intensity cut-off values are defined as: no pain (0–4 mm), mild pain (5–44 mm), moderate pain (45–74 mm), and severe pain (75–100 mm). Heel discomfort from PF is deemed to have a PFPS score of more than 35 points. The PFPS contained questions to assess how pain affected common physical activities.

Statistics

Data were entered and analyzed Through a statistical software, Statistical Package for Social Sciences (SPSS) version 24. For descriptive analysis, mean and standard deviation were calculated for quantitative variables whereas frequency and percentages were used for qualitative variables. The chi-square test was applied for inferential statistics to determine statistical significance. All results were calculated at 95% confidence interval and p-value ≤ 0.05 were considered as a significant value.

3. Results

This study was conducted to find out the prevalence of plantar fasciitis and contributing factors in farmers living in Jatoi Muzaffargarh. Chi square test and value significance was used to derive result. There are five age groups as shown in (Fig 1), the prevalence of plantar fasciitis among participants aged 18–28 years was 25.2%. The prevalence was 31.7% in the 29–38 years age group, 30.2% in the 39–48 years group, and 12.2% in the 49–58 years age group. The 59–65 years age group recorded the lowest prevalence at 0.7%.

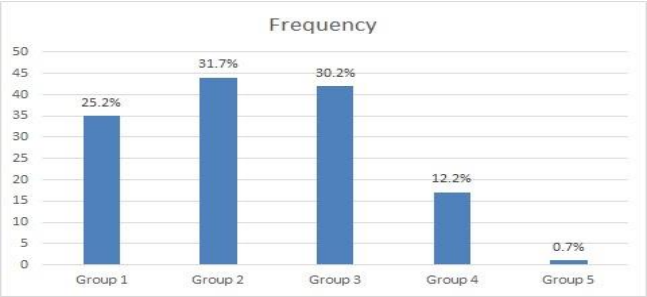

Fig 1. Age distribution of the participants.

The gender distribution is shown in (Fig 2). 9.4% shows the percentage of females in the total sample while 90.6% shows the percentage of males. Of the total participants, 15 were female, and 124 were male.

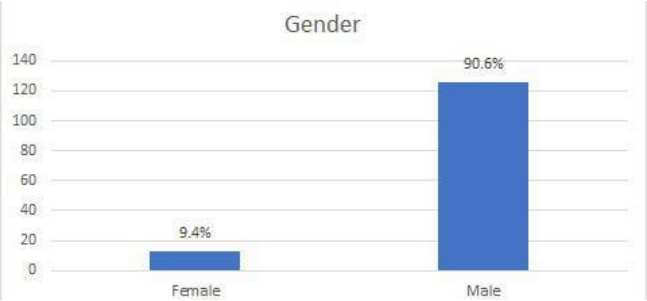

Fig 2. Gender distribution

The percentage of population wearing 4 different types of shoes are shown in (Fig 3). There were 64% wearing slippers, 5.8% were wearing boots, 10.1% were wearing sandals and 20.1% were wearing khussa.

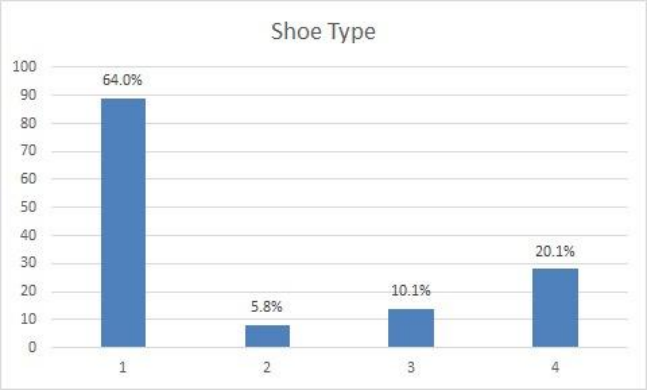

Fig 3. The percentage of population wearing different types of shoes

The histogram represented in (Fig 4) shows how the sample population (N = 139) is distributed with height. Mean height is about 168.45 cm and it has a standard deviation of about 5.352 cm as is evident on the graph.

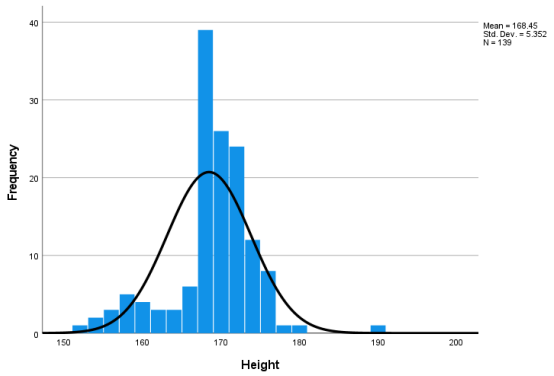

Fig 4. Histogram of population height

The pattern of weight in the sample population (N = 139) are shown in (Fig 5). The means weight obtained is 72.66kg and the standard deviation is 9.652 kg.

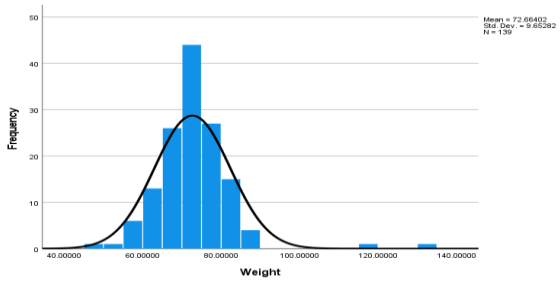

Fig 5. The pattern of weight in the sample population

Based on the graph appearance, we can note that the distribution is relatively biased to the right of the graph since some participants have greater weights and this brings the tail of the distribution to the heavier part. Nevertheless, the data is the more normal with most of the values focused closer to the mean.

VARIABLE		FREQUENCY
VISUAL ANALOGUE SCALE	MILD PAIN	28
	MODERATE PAIN	24
	SEVERE PAIN	13
PLANTAR FASCIITIS SCALE	<35-NORMAL FOOT	74
	>35 –PLANTAR FASCIITIS	65
TOTAL		139

Table 1: Participant distribution based on the Plantar Fasciitis Scale (PFS) for diagnostic classification and the Visual Analogue Scale (VAS) for pain severity

The participant distribution based on the Plantar Fasciitis Scale (PFS) for diagnostic classification and the Visual Analogue Scale (VAS) for pain severity is summarized in (Table 1). The study involved 139 participants in all. The Visual Analogue Scale showed that 13 participants reported experiencing severe pain, while the majority of participants (n = 28) reported mild pain, followed by moderate discomfort (n = 24). This suggests that the majority of individuals did not suffer severe pain, but rather discomfort of low to moderate intensity. Participants were divided into two groups according to the Plantar Fasciitis Scale: those with a normal foot (score < 35) and those with a plantar fasciitis diagnosis (score > 35).

Of the total sample of 139 participants, 65 individuals (46.76%) presented with plantar fasciitis, while 74 participants (53.24%) had normal foot morphology. These results imply that plantar fasciitis is somewhat common in the study population. Additionally, the Visual Analogue Scale's pattern of pain severity matches the Plantar Fasciitis Scale's diagnostic results, suggesting that

those with higher pain ratings were more likely to be placed in the plantar fasciitis group. The prevalence of plantar fasciitis among the individual summarized in (Table 2).

Risk.	CAT.	Plantar Fasciitis (YES)	Plantar Fasciitis (NO)	CHI SQ	P-Value
Gender	MALE	52(41.9%)	72(58.1%)	10.75	.001
	FEMALE	13(86.7%)	2 (13.3%)		
Age	>30 YEARS	2(4.7%)	41(95.3%)	60.31	<0.001
	31-45 years	35(52.2%)	32(47.8%)		
	46-60 years	28(96.6%)	1(3.4%)		
	SLIPPER	36(40.4%)	53(59.6%)		
Shoe Type	BOOTS	3(3.75%	5(62.5%)	14.941	0.02
	SANDAL	4(28.6%)	10(71.4%)		
	KHUSSA	22(78.6%)	6(21.4%)		
Working Hours	>8 HOURS	40	60	6.547	0.01
	<8 HOURS	25	14		
BMI	>or equal to 25	6	52	55.048	<.001
	<25	60	21		

Table 2. The prevalence of plantar fasciitis among the individual

This study revealed that plantar fasciitis was significantly influenced by various demographic and behavioral factors including gender, age, shoe type, working hours, and Body Mass Index (BMI).

Gender was strongly associated with the prevalence of plantar fasciitis. Among the participants, 86.7% of females (13 out of 15) suffered from the condition compared to 41.9% of males (52 out of 124). This Association was statistically significant with a chi-square value of 10.75 and a p-value of 0.001. Age also showed a significant relationship with plantar fasciitis. The lowest prevalence (4.7%) was observed in participants aged below 30 years (2 out of 43). In contrast, the prevalence was 52.2% (35 out of 67) among those aged 31–45 years, and an alarming 96.6% (28 out of 29) in the 46–60 years age group. The chi-square value for age was 60.31, with a highly significant p-value of less than 0.001.

Shoe type emerged as one of the most influential risk factors. The highest prevalence was found among users of traditional Khussa shoes, with 78.6% (22 out of 28) reporting symptoms. Slipper users had a prevalence of 40.4% (36 out of 89), while sandal wearers showed a lower rate of 28.6% (4 out of 14). The lowest prevalence was among those who wore boots (3.75%, or 3 out of 8). This relationship was statistically significant (chi-square = 14.941, p = 0.02). Working hours also played a significant role. Among participants working more than 8 hours a day, 25 out of 39 (64.1%) reported plantar fasciitis. In contrast, among those working 8 hours or less, only 40 out of 100 (40%) were affected. The chi-square value was 6.547 with a p-value of 0.01. BMI was significantly associated with the occurrence of plantar fasciitis. Participants with a BMI of 25 or above showed a lower prevalence of plantar fasciitis, with only 6 out of 58 individuals (10.3%) affected. In contrast, among participants with a BMI below 25, 60 out of 81 individuals (74.1%) presented with the condition. This association was highly significant (chi-square = 55.048, $p < 0.001$).

4. Discussion

Using the Visual Analogue Scale (VAS) to measure pain severity and the Plantar Fasciitis Scale (PFS) to score for diagnosis, 53.2% of individuals had normal feet and 46.8% had plantar fasciitis. The majority of individuals reported mild to moderate pain, and there was a significant ($p < 0.05$) correlation between plantar fasciitis and pain severity according to the Chi-square test. This suggests that the presence of the disorder is directly linked to increased pain intensity, which supports the study's overall conclusions. The available data has shown that plantar fasciitis is clearly multifactorial condition that largely deends on interplay of demographic and behavioral risk factors. The prevalence of plantar fasciitis was significantly higher among females (86.7%) compared with males (41.9%), with a statistically significant association ($p = 0.001$). This disparity suggests that gender-based variations in anatomical features, lifestyle-related susceptibility, footwear habits, prolonged standing, and hormonal differences may act as contributing factors. However, this interpretation is limited by substantial gender imbalance in the sample (15 females vs. 124 males), which introduces sampling bias and restricts the generalizability of these findings. Age showed a clear association with the prevalence of plantar fasciitis. Only 4.7% of participants aged under 30 years were affected, while the prevalence rose to 52.2% in the 31–45 years age group. The highest prevalence of 96.6% was observed among participants aged 46–60 years. These findings indicate that advancing age is strongly linked to an increased likelihood of developing plantar fasciitis, likely due to cumulative occupational workload, age-related degenerative changes in foot soft tissues, and prolonged exposure to physical strain among farmer. The correlation between plantar fasciitis and age was very significant ($p < 0.001$) which may be attributed to aging related degeneration, lack of flexibility, and slow healing of tissues

Another highlighting factor was working hours. Workers who cover a total of over 8 hours per day had a prevalence of 64.1%, which is notably more than the 40% prevalence of the workers who cover a total of 8 hours or lesser per day and the average p-value of 0.01 is significantly low. This follows the enhanced mechanical pressure and stress in the plantar fascia that occurs when one tends to stand or walk longer. Although the correlation between BMI and plantar fasciitis was weak, a notable finding showed that prevalence was considerably higher (74.1%) among participants with a BMI ≤ 25, compared to those with a BMI ≥ 25 (10.3%), with a p-value of 0.03. This implies that although body weight could serve as a source of stress in the plantar fascia, a more direct effect could be caused by such aspects as the level of activity and footwear. One of the strongest variables was the footwear type. Among wearers of Khussa, prevalence reached the maximum rate (78.6% among 28 interviewed), as 22 of them suffered it. On the contrary, only 28.6 percent of persons wearing the sandals (4/14) experienced symptoms. The use of slippers was 40.4 percent (36 out of 89), and users of boot were in relatively low figures of 37.5 percent (3 out of 8). Such disparities indicate the absence of paddings and arch supports in flat run-of-the-mill shoes such as Khussa, which wears out the plantar fascia, but structured sandals and boots might prove more supportive and supportive.

There was also a difference on the severity of pain among the participants. On the scale of Visual Analogue Scale (VAS), 53.2 % displayed mild or no pain, 32.2 % displayed moderate pain, and 14.5 % displayed severe pain, which shows that despite clinical judgement via the Windlass Test, the symptom is variable. In general, 46.8 percent of the people in the study had been diagnosed positive with the Windlass Test, supporting the fact that a high clinical burden of plantar fasciitis exists. These results highlight the need of screening early, preventive measures, and lifestyle changes especially among those groups that are at risk, including middle-aged adults, women, and long occupation individuals. Reduction of the effects and advancement of plantar fasciitis in the general population can highly be reduced through workplace ergonomics and effective use of supportive footwear as well as regular clinical examinations.

Conclusion

Farmers' quality of life is negatively impacted by the disable illness known as plantar fasciitis. Gender, age, high BMI, shoes type and long period of standing are linked to an increased chance of plantar fasciitis. Weight and height are the other contributing factors. The prevalence found through this study is 46.76%.

Limitations

This study has several key limitations. Its cross-sectional design prevents establishing causal relationships. Convenience sampling may introduce selection bias, while reliance on self-reported data carries measurement bias. The use of a self-developed questionnaire lacks formal validity. Further limitations include a small sample size, single-location recruitment in Jatoi, and marked gender imbalance, all of which restrict generalizability. Future studies should employ larger balanced samples, multicenter settings, validated tools, and longitudinal designs to address these shortcomings.

Future Recommendations

Future studies should include a larger and more diverse sample to improve the validity and generalizability of the findings. Extending the duration of the research would allow better observation of long-term trends and outcomes related to plantar fasciitis. Additionally, ensuring balanced gender representation among participants would provide more accurate and representative results.

Disclosure /Conflict of interest:

Authors declare no conflict of interest.

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