



## Knowledge and Practices Regarding Plantar Fasciitis among the General Population in Arar, Saudi Arabia

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**Abstract Background:** Plantar fasciitis has been identified to affect 11-15% of all foot-related problems, globally. Despite its prevalence, knowledge and awareness with regards to plantar fasciitis remain scarce. **Objectives:** This study aims to assess the knowledge and practice towards plantar fasciitis among the general population in Arar, Saudi Arabia. **Methods:** A cross-sectional survey of 260 people in the Northern Border Region of Saudi Arabia used demographic data, knowledge scores consisting of five questions, and practice scores consisting of five questions on PF. Knowledge and practice levels were rated as excellent, good, or inadequate. The chi-square test and ANOVA were used in the evaluation of the relation of demographics with the total scores. **Results:** Mean scores of knowledges ( $7.58 \pm 5.07$  out of 20) and practice ( $9.00 \pm 2.93$  out of 15) were lower, as only 10% and 21.5% of participants respectively had excellence, and 68.5% and 39.6% had inadequate knowledge and practices, respectively. However, only 35.4% of them used supporting shoes, and 29.6% had preventive exercise practices. The educational status of participants had significant association with mean scores of knowledges and practices ( $p = 0.002$ ). **Conclusion:** A lack of understanding about plantar fasciitis, in terms of its prevention, exists in Arar, Saudi Arabia. Education has been identified as the best indicator of understanding and proper practice, indicating the importance of appropriate public health interventions.

**Key Words** Plantar Fasciitis, Heel Pain, Knowledge, Preventive Practices, Convenience Sampling, Arar, Saudi Arabia

### INTRODUCTION

Plantar fasciitis can be described as an inflammatory condition precipitated by degenerative changes and irritation of the plantar fascia's origin, especially where the medial calcaneal tuberosity is located. The plantar fascia is an essential part of foot biomechanics. There are three parts of the plantar fascia that originate from the calcaneus. Its role in the foot biomechanical system is essential in providing arch support and shock absorption upon physical movement. Interestingly, plantar fasciitis is not an inflammatory condition, as confirmed by histological studies that show the absence of inflammatory cells [1].

Plantar fasciitis, a very common and painful condition, has long been linked to standing/walking, middle-aged individuals, excessive physical activity, and contraction of the gastrocnemius muscle [2]. Its development is multifactorial, with excessive mechanical stress being a

primary contributor. The patient complains of sharp, localized pains across the foot, particularly the heel, sometimes accompanied by the presence of a spur within the heel, diagnosed by imaging techniques [3]. Plantar fasciitis, identified as one among the major causes of foot pains, affects huge numbers of individuals annually within the United States. A very large study survey carried out in the US in 2018 among 75,000 subjects indicated that 848, or 1.1%, of the surveyed study subjects were diagnosed with PF [4].

Plantar fasciitis is considered difficult to manage, as standard treatments may not give sufficient relief. Even though non-surgical treatments such as stretching exercises and physiotherapy remain the first line of therapy and are effective in most cases, recurrent pain continues to be a common concern [5,6]. The prevalence of plantar fasciitis in Saudi Arabia is most likely affected by peculiar socio-

cultural as well as environmental factors, including traditional footwear choices, lifestyle habits, and climate conditions. The problem has a significant impact on one's quality of life as it reduces the mobility of the patient as well as his activity levels. Understanding the general population's knowledge and practices toward plantar fasciitis is critical for designing effective public health interventions.

A survey conducted in Qassim region of Saudi Arabia, involving 859 participants revealed a concerning lack of awareness and knowledge about plantar fasciitis despite being a prevalent disease. Many participants demonstrated confusion about this disease and its diagnostic procedure. The research revealed a moderate level of awareness deficiency and a statistical significance between awareness and educational levels.[7] Nevertheless, awareness and factors like gender, age, nationality, and residency were found to have no relation to each other. Based on this finding, this research was designed to assess the knowledge and practice relating to plantar fasciitis present among the population at Arar, KSA.

### Research Objective

This study aims to assess the knowledge and practice regarding plantar fasciitis among the general population in Arar, Saudi Arabia.

## METHODS

### Study Design

This research adopted a cross-sectional design in assessing the awareness and knowledge of the general population in relation to plantar fasciitis and its risk factors for a period of six months in the Northern Border region of Saudi Arabia. This research targeted individuals aged 18 years and above in Arar, Saudi Arabia. A representative sampling of the general community in Arar was adopted using a convenient sampling method.

### Data collection

The study used an online questionnaire to collect data. The questionnaire was developed after a thorough analysis of available literature on the topic based on consultations carried out with experts in the field of orthopedic surgery and public health.

The questionnaire was structured into three main sections:

- Demographic data: Age, gender, education level, employment status.
- Knowledge about plantar fasciitis and its risk factors
- Practices about plantar fasciitis

### Scoring System

The knowledge section consists of 5 questions, with each correct answer scored for points, and 0 points given for any incorrect answers. The result is divided into good knowledge, insufficient knowledge, and excellent

knowledge for 12-15 points, below 12 points, and 16-20 points, respectively.

The practice section also had 5 questions, with points awarded for every correct answer, while 0 points were awarded for incorrect answers. The points could be categorized into excellent: 12-15 points, good: 9-11 points, and insufficient: below 9 points.

The total marks, which included both the knowledge as well as practice, carried a maximum of 35 marks, which were divided into excellent performance (scores ranging from 28 to 35), good performance (scores ranging from 20 to 27), and insufficient performance (scores below 20).

### Data collection procedure

The questionnaire was translated into the Arabic to accommodate individuals who cannot communicate in English. An informed consent form was also incorporated to be responded before the process continue. The consent form outlined the aim of the study, the voluntary nature of participation, confidentiality, and the right to withdraw from the study at any time. The questionnaire was distributed and responses were collected. The data was entered into a statistical software program SPSS version 22 for analysis.

### Data analysis

For data analysis, the software used was SPSS version 22.0. The demographic variables of the subjects were presented using frequencies, proportions, means, and standard deviations. The level of knowledge and practice in plantar fasciitis was presented using similar statistical analysis. The chi-square test was used to determine the relationship between demographic variables (e.g., age, gender, education) and knowledge and practices scores.

### Ethical Considerations

The study protocol was reviewed and approved by the Local Committee of Bioethics at Northern Border University with approval number 55/25/H.

## RESULTS

This cross-sectional study enrolled 260 participants from Saudi Arabia's Northern Border Region to assess plantar fasciitis knowledge and practice. Most participants were males (65%) with a young age group of 66.9%, followed by 36-50-year-old subjects (25%), and others above 51 years (8.1%). The majority of the participants were of high educational levels, with 71.9% having a bachelor's degree, 23.1% having a secondary education degree, and 4.2% having a doctorate degree (Table 1).

### Knowledge Assessment

The average knowledge score was  $7.58 \pm 5.07$  out of 20 points, showing low performance. Few participants, 10.0% ( $n = 26$ ), showed excellent knowledge performance (16-20 points), 21.5% ( $n = 56$ ) showed good knowledge performance (12-15 points), and 68.5% ( $n = 178$ ) showed insufficient (below 12 points) (Table 2).

### Practice Assessment

The practice assessment part, with a weightage score of 15 points, tested the behavior and attitudes of attendees towards plantar fasciitis prevention and care. Overall practice mean was  $9.00 \pm 2.93$  on a total score of 15, reflecting a mediocre practice attitude. Practice categorization revealed that 21.5% ( $n = 56$ ) exhibited excellent practice (12-15 points), 38.8% ( $n = 101$ ) showed good practice (9-11 points), and 39.6% ( $n = 103$ ) demonstrated insufficient practice (below 9 points). Nearly half of participants reported heel or arch pain, with 70% opting for rest and 22.3% seeking healthcare. While 90% would follow treatment, only 35.4% consistently wear supportive footwear and 29.6% regularly stretch (Table 3).

### Overall Performance and Score Distribution

The overall evaluation in terms of both knowledge and practical application, achieved a mean score of  $16.59 \pm 6.08$  on a maximum of 35. This reflects a poor performance. It is pertinent to note here that only 4.6% ( $n = 12$ ) of the participants performed excellently well with a score ranging between 28-35. On the contrary, 26.2% ( $n = 68$ ) performed satisfactorily with scores ranging between 20-27. The majority, comprising of 69.2% ( $n = 180$ ) performed inadequately with scores below 20 points (Table 4).

### Statistical Associations Between Demographics and Knowledge and Practice Score

The Chi-square tests conducted to identify the correlation between demographic and the categories of the total scores showed significant results. The association between the level of education and the total scores was found to have a highly significant value ( $\chi^2 = 24.205$ ,  $p = 0.002$ ), indicating that education has a significant effect on the level of knowledge and practice. The association between the age groups and the total scores was significant ( $\chi^2 = 9.872$ ,  $p = 0.043$ ), suggesting the existence of a variation between the age groups and the level of understanding and practice. On the other hand, neither gender ( $\chi^2 = 2.373$ ,  $p = 0.305$ ) nor employment status ( $\chi^2 = 1.139$ ,  $p = 0.980$ ) showed a significant association with the scores (Table 5).

### ANOVA Analysis: Age Groups and Score Performance

ANOVA testing comparing mean scores across age groups found no statistically significant differences in knowledge, practice, or total scores. The 36-50 age group had slightly higher mean knowledge scores ( $8.43 \pm 4.70$ ) than the 18-35 group ( $7.20 \pm 5.35$ ), but these differences were not statistically significant (Table 6).

Table 1: Sociodemographic Characteristics of Participants (N = 260)

Variable	Category	Frequency (n)	Percentage
Age Group	18-35	174	66.92
	36-50	65	25.00
	51 and above	21	8.08
Gender	Male	169	65.00
	Female	91	35.00
Educational Level	Bachelor's degree	187	71.92
	Secondary education	60	23.08
	Doctorate	11	4.23
	Primary education	1	0.38
	No formal education	1	0.38
Employment Status	Employed	129	49.62
	Student	98	37.69
	Unemployed	31	11.92
	Retired	2	0.77

Table 2: Frequency Distribution of Knowledge Questionnaire Responses (N = 260)

Question	Response	Frequency (n)	Percentage
Q1: Which of the following is a symptom of plantar fasciitis?	Heel pain, especially in the morning	112	43.08
	Pain in the back of the leg	95	36.54
	Numbness in the foot	29	11.15
	Redness and swelling in the toes	24	9.23
Q2: Which of the following is the most common risk factor for developing plantar fasciitis?	Overuse or prolonged standing	79	30.38
	Poor posture while walking	87	33.46
	Wearing high-heeled shoes	76	29.23
	Family history of diabetes	18	6.92
Q3: How is plantar fasciitis typically diagnosed?	Patient history and physical examination	76	29.23
	X-ray	88	33.85
	MRI scan	52	20.00
	Blood test	44	16.92
Q4: Which of the following treatments is commonly recommended for plantar fasciitis?	Rest, ice application and stretching	141	54.23
	Surgery	71	27.31
	Corticosteroids injection only	31	11.92
	Antidepressant	17	6.54
Q5: Which of the following is NOT a common symptom of plantar fasciitis?	Tingling or numbness in the foot	85	32.69
	Pain in the bottom of the foot	81	31.15
	Pain during the first few steps after waking up	61	23.46
	Pain that worsens with prolonged standing	33	12.69

Table 3: Frequency Distribution of Practice Questionnaire Responses (N = 260)

Question	Response	Frequency (n)	Percentage
Q1: Have you ever experienced pain in your heel or arch that may be associated with plantar fasciitis?	Yes	125	48.08
	No	135	51.92
Q2: If you experience foot pain, do you take any of the following steps? (Choose all that apply)	Rest and avoid activities that cause pain	182	70.00
	Apply ice to the foot	103	39.62
	Stretch the foot or calf muscles	69	26.54
	Visit a healthcare provider	58	22.31
	Continue normal activities despite the pain	35	13.46
Q3: Do you wear shoes that provide proper arch support and cushioning?	Yes always	92	35.38
	Sometimes	86	33.08
	Never	82	31.54
Q4: Do you perform exercises or stretches specifically to prevent foot pain or injury?	Regularly	77	29.62
	Occasionally	95	36.54
	Never	88	33.85
Q5: If you had plantar fasciitis, would you follow the recommended treatment (rest, ice, stretching, medical advice)?	Yes	234	90.00
	No	26	10.00

Table 4: Distribution of Participants by Knowledge, Practice and Total Score Categories (N = 260)

Score Type	Category	Frequency (n)	Percentage (%)
Knowledge Score	Excellent (16-20 points)	26	10.00
	Good (12-15 points)	56	21.54
	Insufficient (<12 points)	178	68.46
Practice Score	Excellent (12-15 points)	56	21.54
	Good (9-11 points)	101	38.85
	Insufficient (<9 points)	103	39.62
Total Score	Excellent (28-35 points)	12	4.62
	Good (20-27 points)	68	26.15
	Insufficient (<20 points)	180	69.23

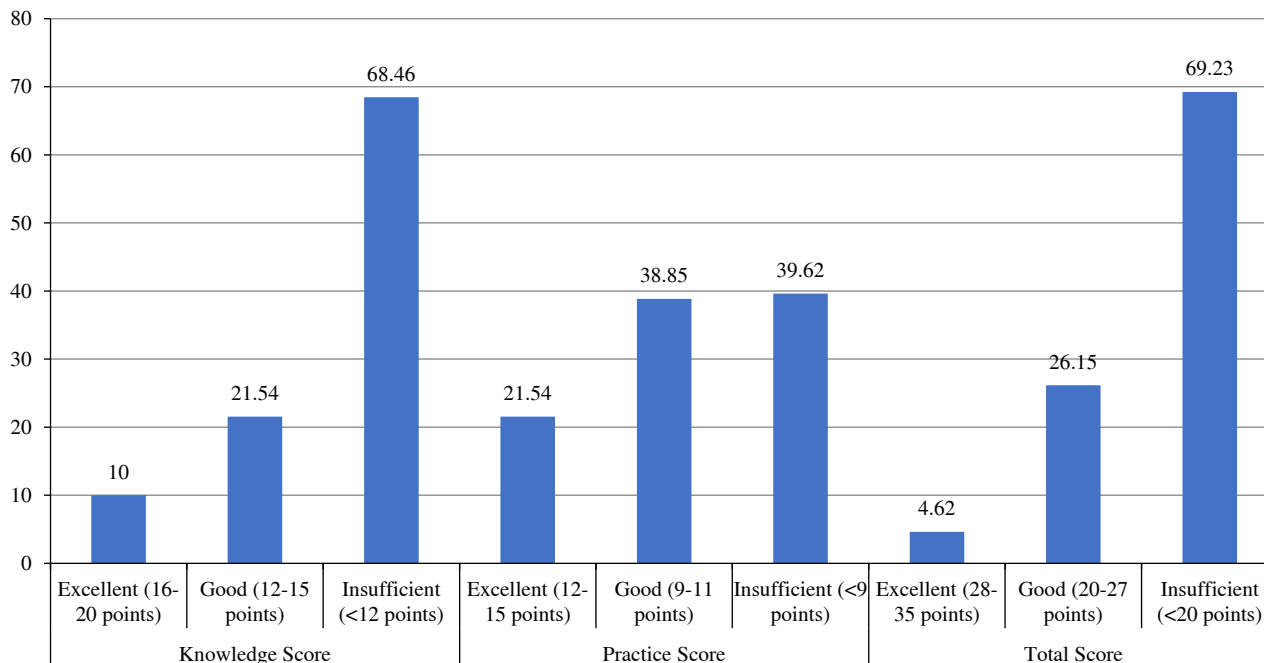


Figure 1: Distribution of Participants by Knowledge, Practice and Total Score Categories (N = 260)

## DISCUSSION

Plantar fasciitis (PF), a prevalent cause of heel pain globally, imposes a substantial burden on both affected individuals and healthcare systems. Surprisingly, the

awareness and knowledge level of the general population about plantar fasciitis (PF) appears to be limited, despite its prevalence. Lack of awareness and knowledge about the disease has become a concern since the disease affects

Table 5: Relation Between Sociodemographic Characteristics and Total Score Categories (N = 260)

Parameter	Category	Knowledge and Practice Score			Total (N = 260)	p-value
		Excellent	Good	Insufficient		
Gender	Male	8	39	122	169	0.3053
		4.7%	23.1%	72.2%	65.0%	
	Female	4	29	58	91	
		4.4%	31.9%	63.7%	35.0%	
Age Group	18-35	11	37	126	174	0.0426
		6.3%	21.3%	72.4%	66.9%	
	36-50	1	25	39	65	
		1.5%	38.5%	60.0%	25.0%	
	51 and above	0	6	15	21	
		0.0%	28.6%	71.4%	8.1%	
Educational Level	Bachelor's degree	2	54	131	187	0.0021
		1.1%	28.9%	70.1%	71.9%	
	Secondary education	8	10	42	60	
		13.3%	16.7%	70.0%	23.1%	
	Doctorate	2	4	5	11	
		18.2%	36.4%	45.5%	4.2%	
	Primary education	0	0	1	1	
		0.0%	0.0%	100.0%	0.4%	
	No formal education	0	0	1	1	
		0.0%	0.0%	100.0%	0.4%	
Employment Status	Employed	5	33	91	129	0.9798
		3.9%	25.6%	70.5%	49.6%	
	Student	5	26	67	98	
		5.1%	26.5%	68.4%	37.7%	
	Unemployed	2	8	21	31	
		6.5%	25.8%	67.7%	11.9%	
	Retired	0	1	1	2	
		0.0%	50.0%	50.0%	0.8%	

p-value was considered significant if &lt;0.05

Table 6: Comparison of Knowledge, Practice and Total Scores Across Age Groups (ANOVA)

Age Group	Number (n)	Knowledge Score (Mean±SD)	Practice Score (Mean±SD)	Total Score (Mean±SD)
18-35	174	7.20±5.35	9.20±2.91	16.39±6.24
36-50	65	8.43±4.70	8.55±3.11	16.98±6.20
51 and above	21	8.19±3.22	8.81±2.48	17.00±4.27
ANOVA F-statistic	-	1.574	1.182	0.276
p-value	-	0.2091	0.3082	0.7588

p-value was considered significant if &lt;0.05

about 10% of the population, with higher rates among active adults [8,9]. A deficit in awareness and knowledge of the disease has also been identified in the current study. Only 10% of participants demonstrated adequate knowledge about PF, while a substantial 68.5% demonstrated inadequate knowledge, which discloses an absence of satisfactory knowledge of the disease amongst the general population. This finding aligns with other studies conducted in Saudi Arabia, including that by Awwad *et al.* who have reported a marked absence of public awareness or confusion regarding PF and its accurate diagnosis [10].

In line with such reports, there were clear deficiencies among the participants of our survey regarding the perception of particular risk factors and diagnostic criteria of PF. Approximately 30% of participants correctly identified “overuse or prolonged standing” as the fundamental risk factor for PF, and less

than a third correctly identified proper clinical diagnostic techniques for it. These findings are consistent with what similar Saudi studies have found, which have found that only fractional percentages of participants correctly identified such risk factors as “prolonged standing” or “excessive exercise” or “inappropriate footwear” among others [8,10]. A study carried out by Khired *et al.* [11] in the city of Jazan revealed profound gaps in understanding the underlying factors of PF, despite it being highly predominant in occupationally active individuals.

Comparing outcomes from data gathered in Saudi Arabia with global data indicates that a trend of lack of public awareness about PF exists. In UK, a prominent study showed that just 10% of elderly individuals were able to describe disabling symptoms of heel pain, failing to provide functional knowledge necessary for the prevention of PF [12]. Support for this global trend of lack of awareness about

PF, risks, and signs of disease among both public and patients is offered by a systematic review carried out by Rhim *et al.* [13].

Less than a third of participants took part in regular preventive foot exercises and/or supportive shoes, while nearly half suffered with frequent pain in heels and/or arches. Despite this, there was 90% willingness to adhere to health instructions for PF. Even among medically educated cohorts, Almogbil *et al.* [14] observed that clinical-phase medical students, despite their overall knowledge, demonstrated weaknesses in practice and management knowledge, suggesting a systemic deficit in nationwide health education. Daily practice and the need for preventive measures remain lacking in Saudi population, despite willingness if formally diagnosed, possibly due to patient education and clinical counseling limitations.

A particularly noteworthy finding observed within our research is the association between higher educational levels and increased scores relevant to PF knowledge and practice. The significance of said association, as observed within our findings and supported by other studies such as Alayed *et al.* [7] and Alyami *et al.* [15] within osteoarthritis awareness studies, accentuates the belief that education could play a crucial role as the biggest modifiable factor improving health literacy within Saudi Arabia. Meanwhile, results failed to show significant differences within gender and employment status regarding said knowledge and practices, consistent with previous findings in comparable Saudi cross-sectional studies.

## CONCLUSIONS

There is a lack of understanding concerning plantar fasciitis and methods of prevention in the Northern Border Region population. Educational level is the best predictor of understanding and healthy practices, indicating the importance of appropriate public health interventions.

## Strengths of the Study

This study provides valuable regional information on plantar fasciitis awareness in Arar, Saudi Arabia, an area with limited prior data. The use of a structured, bilingual questionnaire improved accessibility for participants with diverse linguistic backgrounds. The scoring system allows for comparison of awareness levels and highlights areas for community health education.

## Limitations

The cross-sectional nature of the research limits causal interpretation, and the fact that it was conducted online may mean it is not an entirely representative sample, as people who have access to the internet and possibly higher education may be over-represented. Despite these limitations, the results support the need for public health efforts at improving awareness of PF.

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## Conflict of Interest

The authors certify that this study has no conflicts of interest. Financial, professional, or personal ties had no bearing on how the research was conducted, interpreted, or reported.

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