



## PREVALENCE OF PLANTAR FASCIITIS IN BUS CONDUCTORS

## Physiotherapy

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## ABSTRACT

Most common cause of the heel pain is Plantar fasciitis, there is inflammation of a thick band of the tissue which lies at the bottom of the foot and connects heel to toes. Plantar Fasciitis is considered as overuse injury. There are various causes responsible for Plantar fasciitis like prolong standing, wearing inappropriate foot wear, malalignment of lower limb, foot structure, etc. Bus Conductors of the city buses have prolong standing job, so they are more prone of getting plantar fasciitis. Subjects were selected according to the inclusion and exclusion criteria. To assess Windlass test was performed and to check their physical function Foot and Ankle Ability Measure (FAAM) scale was taken. Population size was 100 out of which 23 got positive, 73 got negative for windlass test. High score of FAAM represents good physical function of foot and ankle and lesser score represents poor physical function of foot and ankle.

## KEYWORDS

Plantar fasciitis, windlass test, heel pain, Foot and Ankle Ability Measure Scale (FAAM)

## INTRODUCTION:

Plantar Fasciitis is considered as most common cause of heel pain which involves inflammation of thick band of tissue which is present at the bottom of the foot and connects heels to toes.<sup>1</sup>

Plantar Fasciitis is mostly known as overuse injury. There are various causes responsible for development of plantar fasciitis such as walking on uneven surfaces, improper foot wear, reduced flexibility of plantar flexors, malalignment of lower extremity. Pain and tenderness are sometimes extended to medial arch.<sup>2</sup>

Type of mostly is burning, aching, and lancinating type. Also there is pain when taking few steps in the morning and it worsens while weight bearing.<sup>3</sup>

During the first 15% of the gait cycle, the foot is supported by the structures such as bones and ligaments alone, as the intrinsic muscles work only in 30% of the gait cycle. Therefore the maximum stress of the body weight falls on the ligaments and plantar fascia. Significant stress falls on the plantar fascia to stabilize the foot from heel raise to the toe off i.e. swing phase of the gait cycle.<sup>4</sup>

The FAAM (Foot and Ankle Ability measure scale) is reliable, responsive and valid measure of physical function for the individuals with broad range of musculoskeletal disorders of the lower leg, foot and ankle.<sup>5-6</sup>

Bus Conductors of city buses have prolong standing job. They need to travel for more than 6-7 hours daily standing. They also have to continuously move in a bus for giving tickets, which causes more stress on the musculoskeletal structures of the lower limb especially on the foot. According to the increase frequency of buses they have to be there and work for prolong hours and get very shorter breaks for the rest. These factors may lead to increased risk of getting Plantar Fasciitis in this population. Plantar fasciitis has been reported to be more prevalent in the occupations involving continual standing or walking, the proportion of time, standing on hard surfaces and walking is associated with an increased risk of plantar fasciitis.<sup>7</sup> Bus conductors get exposed to all these above mentioned factors which may lead to significant stress on plantar fascia, hence finding prevalence of Plantar Fasciitis is required. Windlass test and FAAM Scale are valid and reliable measure to find prevalence.

## OBJECTIVES

To find the prevalence of Plantar fasciitis in Bus conductors by using windlass test.

To assess physical function of the foot and ankle by Foot and Ankle ability measure scale (FAAM)

## MATERIALS AND METHODS

**Type Of Study:** Observational.

**Sampling Method:** Convenient sampling.

**Study Population:** Bus conductors.

**Materials:** Pen, FAAM Scale

**Sample Size:** 100

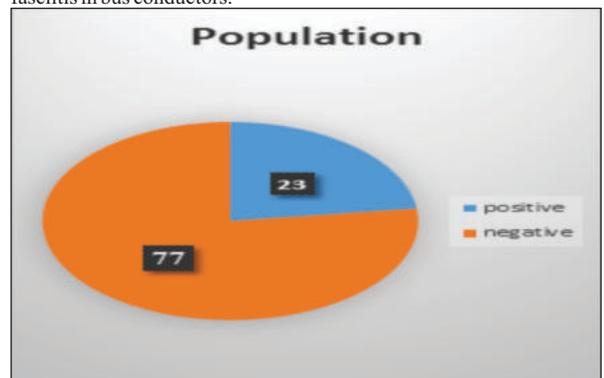
**Study Setting:** Pune Mahanagar Parivahan Mahamandal Limited (PMPML) Bus Depot of Pune area.

## METHODOLOGY

Male conductors working for the duration of 6-7 hours daily age group (25-55 years) were included in the study. Subjects with previous trauma to the heel, fracture to the foot, foot deformities, diagnosis of neuropathy of lower extremity, any vascular disease were excluded in the study. After ethical clearance, consent of the subjects was taken. 100 subjects were selected by convenient sampling. Windlass test was performed and FAAM scale was explained to the subjects. Data was collected with the help of FAAM scale and windlass test result. Score was given according to the questions answered by the subjects. Thus prevalence was calculated.

## RESULT

A study was carried out among bus conductors, 100 subjects were taken according to inclusion and exclusion criteria. Windlass test was performed and FAAM scale was taken. Out of 100 subjects 23 tested positive and 77 tested negative on performing windlass test. FAAM score was higher in subjects who tested negative and lower in subjects who tested positive. A higher score represents a higher level of physical function and lower score represents lower level of physical function. Subjects who tested positive for windlass test and got lower score in FAAM. Subjects who tested negative were not wearing shoes initially but started wearing later. Thus there is 23% of prevalence of plantar fasciitis in bus conductors.



**Fig.1** Results Of Windlass Test In The Subjects Out Of 100 Subjects

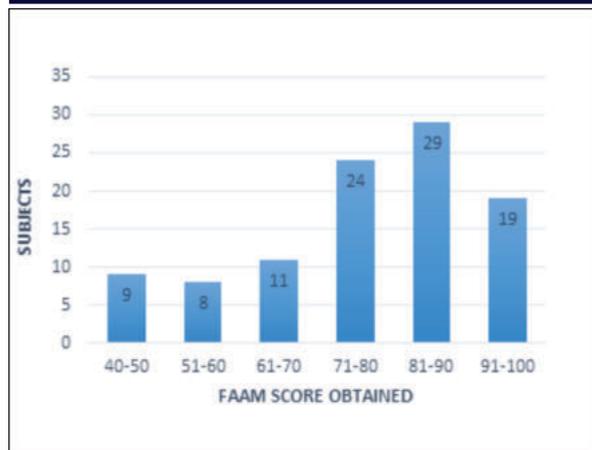


Fig 2. FAAM Score Of The Subjects.

## DISCUSSION

This study was designed to find the prevalence of plantar fasciitis in Male bus conductors, between the age group of 25-55 years. Study has found 23% prevalence of plantar fasciitis in bus conductors. Few subjects were tested positive for windlass test and the possible cause behind getting this result can be a prolong standing job which causes excessive tension on plantar fascia. More years of work experience and more workload. Wearing inappropriate footwear. These factors could have caused Excessive tension and tissue irritation over plantar fascia as well as to its origin at the medial calcaneal tubercle. Plantar fasciitis has been reported to be more prevalent in the occupations involving continual standing or walking. According to a systemic review, the proportion of time, standing on hard surfaces and walking is associated with an increased risk of plantar fasciitis. Other Subjects were tested negative for windlass test and did not show any symptoms of plantar fasciitis. Possible reason behind getting this result can be Wearing appropriate /well fitting footwear, Having less work load due to lesser frequency of buses because of pandemic situation. And also some subjects reported that they were performing regular exercises-like lower limb stretching and mobility exercises which helps them to relieve tension over plantar fascia and feet. As the sample size of the study was small due to pandemic situations, the study group could not represent a larger population of conductors. Conductors were having less work load and they could take longer breaks for sitting, due to the lesser frequency of buses and therefore the overall workload was reduced, which can contribute to the results of prevalence of plantar fasciitis in bus conductors.

Biomechanically, from beginning to the end of the stance phase of gait, tension on the plantar aponeurosis increases, with maximum tension averaging **96% of body weight** as force is transmitted from the Achilles tendon to the forefoot.<sup>7</sup>

In one of the experiments performed using radiographic fluoroscopy have shown that the plantar aponeurosis deforms or stretches, 9% to 12% from its original size, during the stance phase of the gait.<sup>8</sup>

As conductors not only have continuous standing work but also they have to move in a bus to give tickets thus causing more tension on plantar fascia. This leads to repetitive stress over plantar fascia causing its inflammation and pain.

Although the precise cause of plantar fasciitis remains still unclear, the most common theory is repetitive partial tearing and chronic inflammation of the plantar fascia at its insertion on the medial tubercle of the calcaneus.<sup>9</sup> The findings of the present study indirectly support the study by Furay JG is that prolonged weight-bearing at work, play an important role in the aetiology of plantar fasciitis.<sup>9</sup>

Similar Study was carried out among nurses and prevalence rate of plantar fasciitis found to be 13.11%. Prolong walking, standing, and excess physical activity, were the factors responsible for higher risk of plantar fasciitis in them.<sup>10</sup>

## CONCLUSION

This study concludes, that there is 23% prevalence of plantar fasciitis in bus conductors.

## LIMITATIONS

- 1) Less sample size.
- 2) Lesser availability of the subjects because of their different working hours.

## RECOMMENDATIONS AND FUTURE SCOPE

- 1) Study can be performed in larger sample size.
- 2) Assessment of gait and posture can also be done in these population, to find its correlation to plantar fasciitis.
- 3) The effect of shoe modifications on the plantar fascia can be assessed in individuals suffering from Plantar Fascia.
- 4) Appropriate footwear and workstation exercises can be introduced in this population to prevent plantar fasciitis and other foot problems in them.

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