



Prevalence and Risk Factors of Plantar Fasciitis Among Middle Aged Male and Female Population - A survey Based Study

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Article History:

Received on: 01 Sep 2020

Revised on: 01 Oct 2020

Accepted on: 05 Oct 2020

Keywords:

Plantar fasciitis,
middle and old age
population,
heel pain,
risk factor

ABSTRACT

Plantar fasciitis (PF) is a commonly reported cause of plantar heel pain. The purpose of this study is to create awareness of the risk factors and/or events that leads to the development of plantar fasciitis. The identification of musculoskeletal factors related to plantar heel pain could lead to the development of intervention strategies and improve clinical outcomes. The aim of the study is to know the prevalence and risk factors of plantar fasciitis among middle-aged male and female population – a survey based study. A self-administered questionnaire containing about 16 questions was prepared and circulated through online survey google forms link. About 129 middle aged people responded to the survey. The responses were collected, tabulated and statistically analysed using SPSS software. Out of which 47.33% were females and 52.67% were males. 45.80% of the total population have a stabbing pain in the heel early in the morning and also with the long-standing while 54.20% of the population do not have this condition. 41.22% of the population experience mild pain early in the morning, 42.75% experience moderate pain, 13.74% experience severe pain and 2.29% experience very severe pain early in the morning. Plantar fasciitis is one of the causes of inferior heel pain in adults. The patient has a gradual occurrence of pain along the medial side of the heel. The pain is worse when arising in the morning, which becomes less severe after a few steps.



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ISSN: 0975-7538

DOI: <https://doi.org/10.26452/ijrps.v11iSPL3.3373>

Production and Hosted by

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INTRODUCTION

Plantar fasciitis, which is also termed as heel pain. It causes tenderness on the heel. Pain, along with the condition of the tenderness of heel, causes the poor health-related quality of life (Landorf, 2015). Heel pain is the most common problem faced by a lot of people among middle age. This condition is more persistent in females than in male due to persistent standing. Most of the people do not take proper medication to overcome this pain. This condition occurs due to inflammation of ligament, which connects the heel and foot to the toe. Most of the people usually experience this pain more, early in the morning. The most common complaint in

foot and ankle practice is heel pain (Liden *et al.*, 2009). Almost 1 in 10 people of the population tend to develop plantar fasciitis during their lifetime (Riddle *et al.*, 2003). Obesity is present in up to 70% of patients with plantar fasciitis. According to the literature, there is a strong association between increased body mass index and plantar fasciitis in a non-athletic population. The evidence suggests that unlike weight, height has no association with plantar fasciitis. More specifically, increased weight is associated with plantar fasciitis, but not necessarily with reduced height. Interestingly there is no correlation between plantar fasciitis and weight, height or body mass index in an athletic population (Irving *et al.*, 2006). Plantar fasciitis, is a common, chronic, musculoskeletal disorder characterised by pain in the region of the plantar fascia. The knife-like pain is present in the most affected area, the enthesis of the fascia, near the medial calcaneal tuberculum (Wearing *et al.*, 2006). The pain typically gets worse after a long period of sitting and it amplifies during weight-bearing activities (Thomson *et al.*, 2005).

In previous research articles, it has been said that older people at the age of above 65 years are getting more affected (Dunn, 2004). This condition called plantar fasciitis can be caused due to increased body mass index (Irving *et al.*, 2007), anxiety and stress (Cotchett *et al.*, 2014) and also due to prolonged standing related to the occupation (Thomas *et al.*, 2019). In some previous literatures, plantar fasciitis is also termed as she will spur syndrome, runners share and calcaneal periostitis (Roxas, 2005). In the study of North American community dwelling residents, about 784 participants responded of 65 years of age, 7% of the population reported tenderness and pain beneath the heel (Dunn, 2004). In another study, the factors which could cause this condition include increased age (Menz *et al.*, 2010), obesity (Cotchett *et al.*, 2014), female gender (Landorf, 2015) and diabetes (Menz *et al.*, 2010). According to a previous research Manchester foot pain and disability index MFPDI was developed. It consists of 19 statements. Forty-five patients attending rheumatology practitioners, 33 patients who were attending general practitioners for a foot related problem and 223 respondents of a population survey of foot disorders were tested (Garrow *et al.*, 2000). According to a previous article, it has been stated that people with hypertension could have plantar fasciitis (Johnson *et al.*, 2020). Micro RNA can be used as biological markers to detect communicable and non-communicable disease (Sekar *et al.*, 2019). The aim of the study is to know the prevalence and risk factors of plantar fasciitis among middle-aged male and

female population a survey based study.

MATERIALS AND METHODS

Study Setting

This study about the prevalence and the risk factors of plantar fasciitis among middle-aged male and female population involves online setting. This study is among the South Indian population of 100 people. Review Board approval needed. A simple random sampling is done. The question it includes demographic data is like name, age, sex and knowledge related data is like prevalence and risk factors of plantar fasciitis. The data includes gender which gets affected the most and their knowledge about the condition and what measures they use to overcome it. The responses are collected as data from the survey. These data are analysed using SPSS software. The results are depicted in a pie chart. The statistics used here is the student's unpaired T-test and the analysis type is chi-square test and correction analysis. Education and technology are some of the independent variables.

RESULTS AND DISCUSSION

In our study, a total of 129 responses were documented. Out of which 47.33% were females and 52.67% were males (Figure 1). On occupation basis of the participants, 0.77% were contractor, 0.77% were pharmacist, 2.29% were employee, 4.58% were engineer, 5.34% were dentist, 5.34% were business persons, 5.34% were manager, 17.56% were homemaker, 26.72% were teachers and 31.30% were IT professionals (Figure 2). 21.37% knew the condition called plantar fasciitis whereas 78.63% were not aware about it (Figure 3). 45.80% of the participants had a stabbing pain in the heel, while 54.20% of the population do not have this condition (Figure 4). 3.82% of the population strongly disagree that overweight is the cause of plantar fasciitis, 31.30% of the population disagree with the statement, 54.96% of the population agreed with the statement and 9.92% strongly agreed with this statement (Figure 5). The time duration of participants having plantar fasciitis are 41.22% for a few months, 25.95% for more than a year and 32.82% for more than two years (Figure 6). 16.03% of the population strongly disagree, 53.44% of the population disagree and 30.53% of the population agree for the concept that plantar fasciitis is hereditary (Figure 7). Based on the severity of pain, 35.88% had mild pain, 49.62% had moderate pain, 13.74% had severe pain and 0.76% had very severe pain (Figure 8). 37.40% answered yes

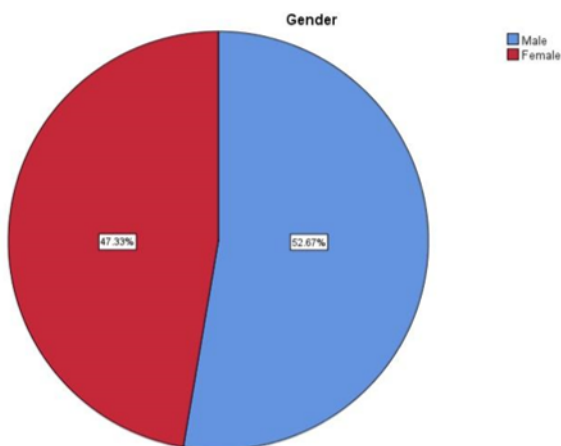


Figure 1: Showing distribution of the percentage of male and female participants.

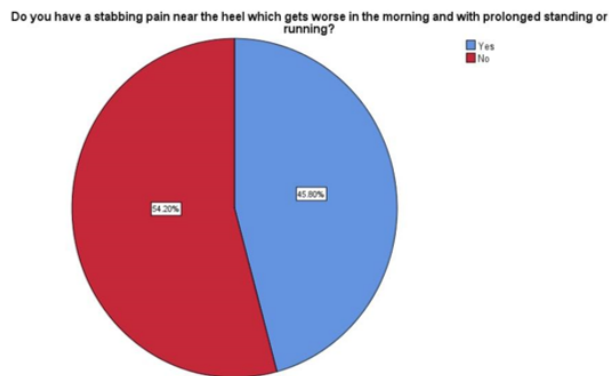


Figure 4: Showing distribution of percentage whether the participants have stabbing pain in the heel in the early morning and also while prolonged standing or running.

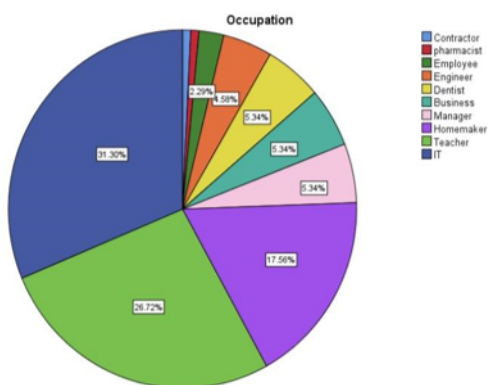


Figure 2: Showing distribution of percentage of occupation details of the participants.

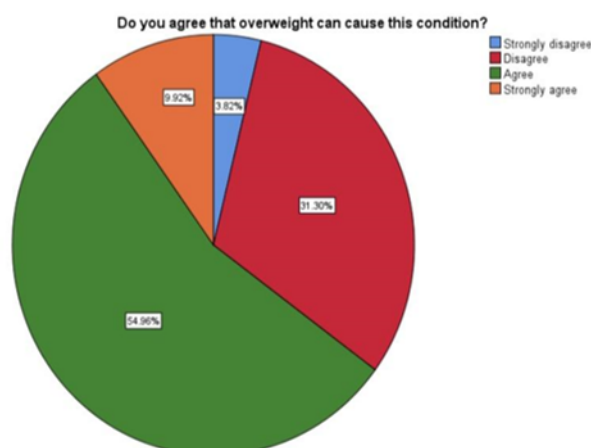


Figure 5: Showing distribution of the percentage of participants agreeing with the statement that overweight could cause plantar fasciitis.

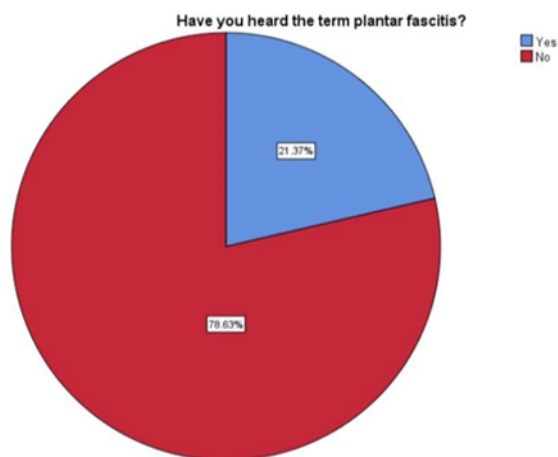


Figure 3: Showing distribution of the percentage of the participants who know the term plantar fasciitis.

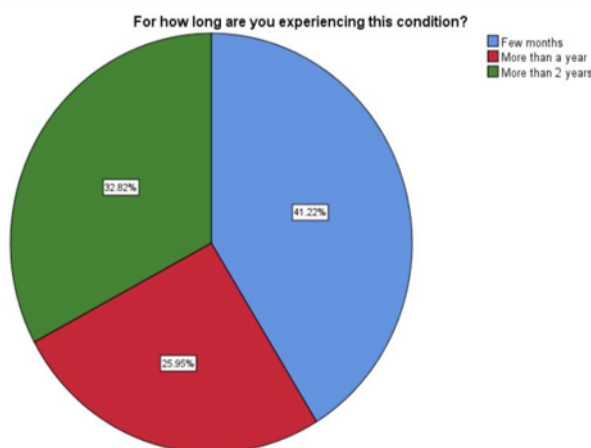


Figure 6: Showing distribution of the percentage of duration they have been experiencing this condition.

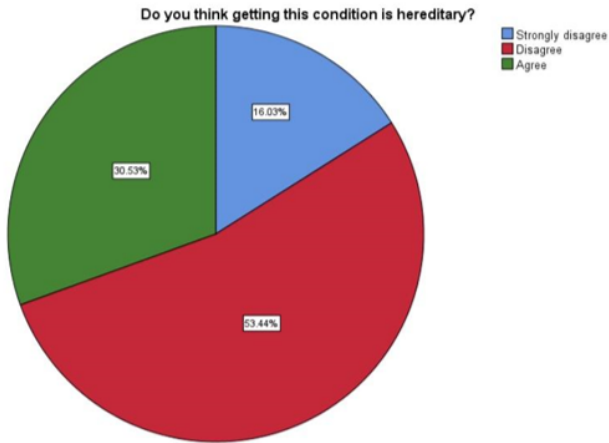


Figure 7: Showing distribution of percentage whether the participants agree with the statement that getting plantar fasciitis is hereditary.

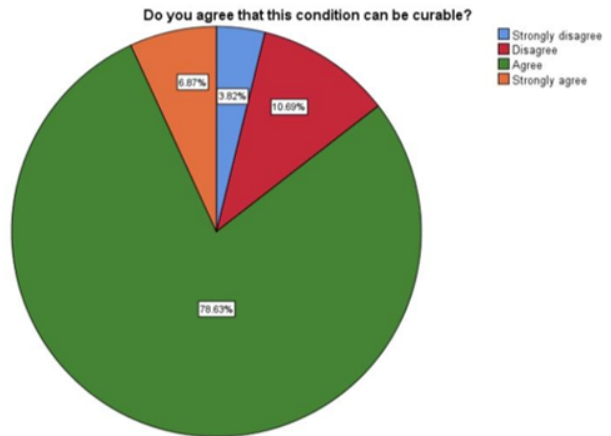


Figure 10: Showing distribution of percentage whether the participants agree with the statement that plantar fasciitis can be cured.

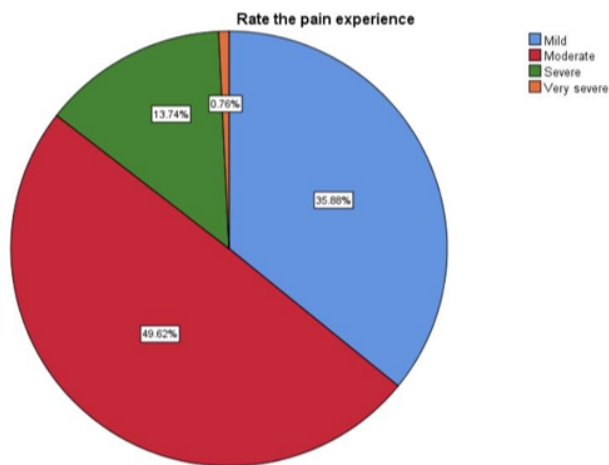


Figure 8: Showing distribution of the percentage of the amount of pain experienced by the participants.

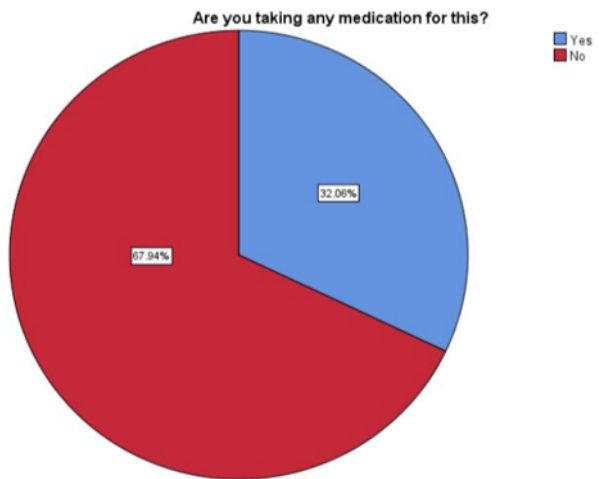


Figure 11: Showing distribution of the percentage of the population who are under medication to cure plantar fasciitis.

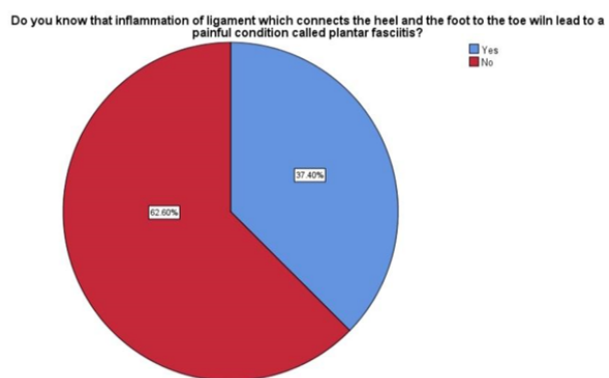


Figure 9: Showing distribution of the percentage of the population who know why they experience this condition called plantar fasciitis.

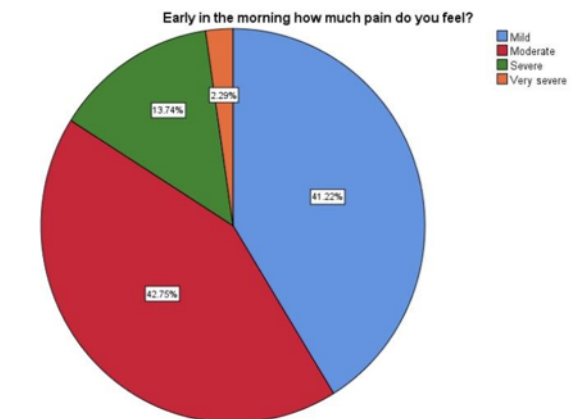


Figure 12: Showing distribution of the percentage of the amount of pain felt by the participants early in the morning.

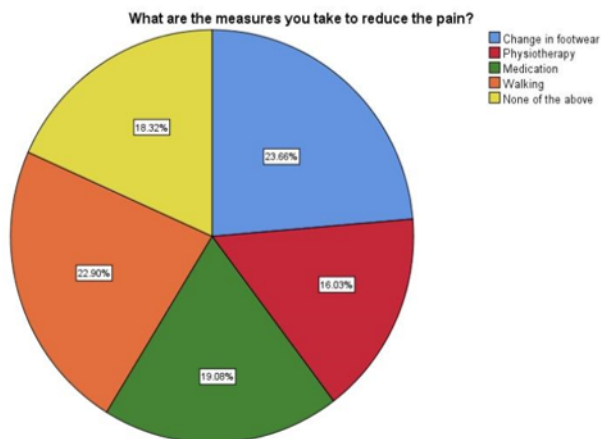


Figure 13: Showing distribution of the percentage of different measures taken by participants to overcome plantar fasciitis.

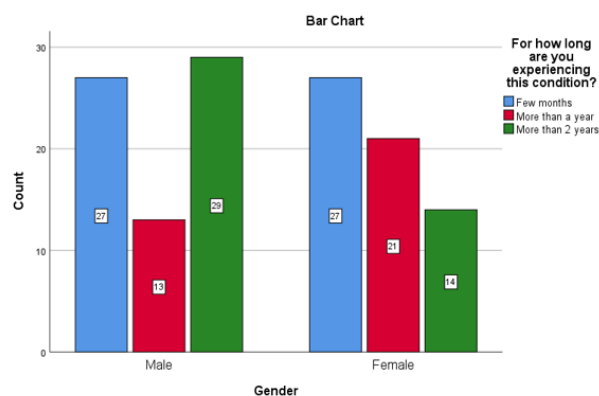


Figure 16: Bar graph showing the correlation between the duration of pain between the two genders.

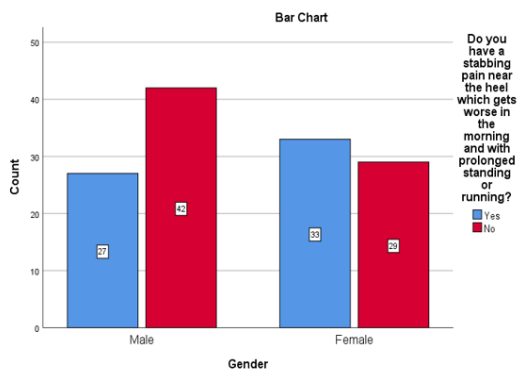


Figure 14: Bar graph showing the correlation between stabbing pain early in the morning and between the two genders.

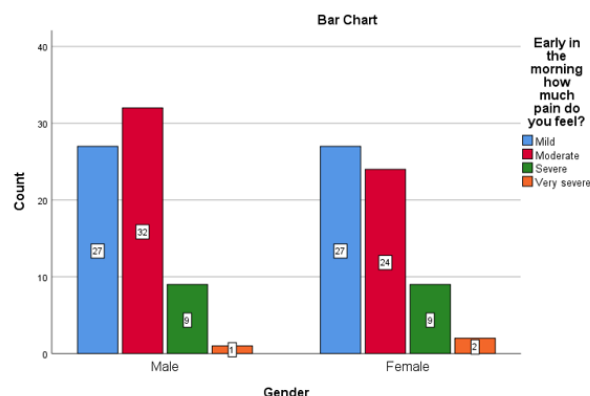


Figure 17: Bar graph showing the correlation between pain early in the morning between the two genders.

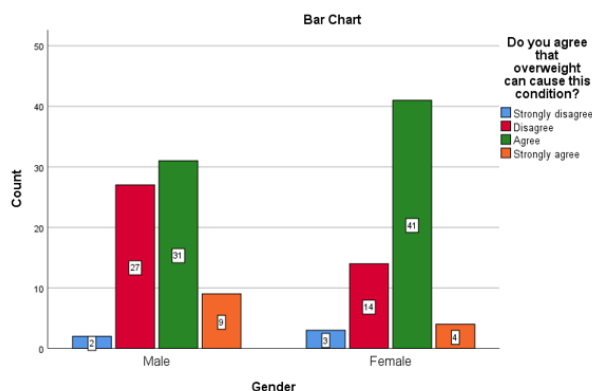


Figure 15: Bar graph showing the correlation between the statement that overweight can cause plantar fasciitis and between the two genders.

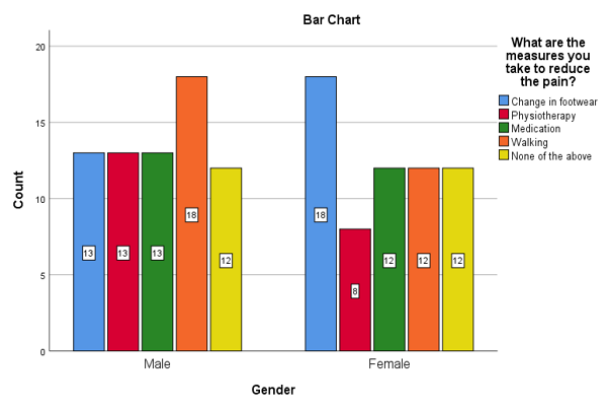


Figure 18: Bar graph showing the correlation between measures taken to reduce pain between the two genders.

and 62.60% answered no for the cause of plantar fasciitis (Figure 9). For the question whether plantar fasciitis can be cured, 3.82% responded strongly disagreed, 10.69% disagreed, 78.63% agreed and 6.87% strongly agreed (Figure 10). 32.06% said yes and 67.94% said no for the question on medications to cure plantar fasciitis (Figure 11). 41.22% had mild pain, 42.75% had moderate, 13.74% had severe pain and 2.29% had very severe pain on the % of amount of pain (Figure 12). When asked for the measures to treat plantar fasciitis 23.66% - change in footwear (Blue color), 16.03% - physiotherapy (Red color), 19.08% - medication (Green color), 22.90% - walking (Orange color) and 18.32% - none of the above (Yellow color) (Figure 13). Chi-square test showing $p=0.106$ ($p>0.05$ indicating statistically not significant) (Figure 14). Chi-square test showing $p=0.063$ ($p<0.05$ indicating statistically not significant) (Figure 15). Chi-square test showing $p=0.034$ ($p<0.05$ indicating statistically significant). Chi-square test showing $p=0.034$ ($p<0.05$ indicating statistically significant) (Figure 16). Chi-square test showing $p=0.776$ ($p>0.05$ indicating statistically not significant) (Figure 17). Chi-square test showing $p=0.580$ ($p>0.05$ indicating statistically not significant) (Figure 18).

In Figure 1 52.67% were male participants (blue color) and 47.33% were female participants (red colour). In Figure 2 0.77% - contractor (Blue color), 0.77% - pharmacist (Red color), 2.29% - employee (Green color), 4.58% - engineer (Orange color), 5.34% - dentist (Yellow color), 5.34% - business (Sea green color), 5.34% - manager (Pink color), 17.56% - homemaker (Violet color), 26.72% - teachers (Light green color) and 31.30% - IT professionals (Dark blue color). In Figure 3 21.37% - said yes (Blue color) and 78.63% - said no (Red color). In Figure 4 45.80% - said yes (Blue color) and 54.20% - said no (Red color). In Figure 5 3.82% - strongly disagrees (Blue color), 31.30% - disagrees (Red color), 54.96% - agrees (Green color) and 9.92% - strongly agrees (Orange color). In Figure 6 41.22% - few months (Blue color), 25.95% - more than a year (Red color) and 32.82% - more than 2 years (Green color). In Figure 7 16.03% - strongly disagree (Blue color), 53.44% - disagree (Red color) and 30.53% - agree (Green color). In Figure 8 35.88% - mild (Blue color), 49.62% - moderate (Red color), 13.74% - severe (Green color) and 0.76% - very severe (Orange color). In Figure 9 37.40% - said yes (Blue color) and 62.60% - said no (Red color). In Figure 10 3.82% - strongly disagree (Blue color), 10.69% - disagree (Red color), 78.63% - agree (Green color) and 6.87% - strongly agree (Orange color). In Figure 11 32.06% - said yes

(Blue color) and 67.94% - said no (Red color). In Figure 12 41.22% - mild (Blue color), 42.75% - moderate (Red color), 13.74% - severe (Green color) and 2.29% - very severe (Orange color).

In previous literature, it has been found that women who wear high-heeled footwear do not have the effect of plantar fasciitis (Thomas *et al.*, 2019). This is because the higher elevation serves as off load (Yu *et al.*, 2016). There seems to be a high prevalence of foot pain in patients with diabetes, osteoporosis and cardiovascular disease (Hill *et al.*, 2008). Another research, it is given that people with multiple chronic diseases have this condition (Garrow *et al.*, 2004). People who are overweight have increased force under their foot while they walk. This could also lead to foot pain (Birtane and Tuna, 2004). According to a previous literature, 3% of the population who are obese and 4% of the population who have flat feet have chronic heel pain (Irving *et al.*, 2007). People with occupation required prolonged weight-bearing have long been considered at risk of plantar fasciitis (Singh *et al.*, 1997). Radiological techniques can be used to see how severe inflammation can be (Krishna and Babu, 2016). A triangle-shaped facet located on the anterolateral side of the lateral condyle of the tibia on its proximal end. This facet acts as a surgical landmark to approach proximal tibia and distal femur (Nandhini *et al.*, 2018).

Various researches can be done to find out the best method to heal plantar fasciitis as it causes problems, especially in areas such as neurosurgery (Subashri and Thenmozhi, 2016). The technology has been developing day to day which is highly useful in the educational as well as research aspect (Thejeswar and Thenmozhi, 2015). In another study, revealing radiographs of 1000 patients found 13.2% had heel spurs, out of these 39% reported a history of subcalcaneal pain (Cornwall and McPoil, 1999). In another study, the patients of plantar fasciitis had tightness of Achilles tendon in almost 80% of patients (Singh *et al.*, 1997). Variation in foramina would help the clinicians for the interpretation of radiographs and for surgical approaches (Hafeez and Thenmozhi, 2016). In another study, shoes should have adequate arch support and cushioning heel. Plantar fasciitis due to lack of proper cushioning is a commonly found problem (Roxas, 2005). For individuals with pes planus, shoes with elongated arch support can help decrease the pain associated with long periods of standing (Young *et al.*, 2001). Females are more affected by plantar fasciitis than males (Sriram *et al.*, 2015). Vision impaired in older age group people (Samuel and Thenmozhi, 2015). Various researches can be done

to find out better medication for plantar fasciitis by testing on rats (Seppan *et al.*, 2018). The diagnosis of PF investigated by imaging or (Mohan *et al.*, 2015) electromyographically (Shah *et al.*, 2016). In our lab, a lot of other researches like, foramen of huschke (Keerthana and Thenmozhi, 2016), meningo orbital foramen (Pratha and Thenmozhi, 2016), condylar foramen (Choudhari and Thenmozhi, 2016), thyroid function (Menon and Thenmozhi, 2016), styloid process (Kannan and Thenmozhi, 2016), etc were done. However, I was interested in plantar fasciitis.

The limitations of the study is that it has a small sample size. It is restricted to a particular region. This is a single sentence study. The future scope of the study is to do it among a larger population. More focus among teachers and homemakers and to create more awareness among the public.

CONCLUSION

Plantar fasciitis is generally regarded as a self-limited condition, with more than 80% of cases resolving within 12 months regardless of therapy. The most prudent approach is to employ conservative techniques first. Plantar fasciitis is one of the causes of inferior heel pain in adults. The patient usually complains of gradual onset of pain along the medial side of the pheel. The pain is worse when arising in the morning, which becomes less severe after a few steps. The diagnosis of PF investigated by imaging or electromyographically.

Conflict of interest

The authors declare that they have no conflict of interest for this study.

Funding support

The authors declare that they have no funding support for this study.

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