

## Original Article

## Prevalence of Achilles tendinopathy due to prolonged standing among salesperson working in shopping malls of twin cities

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### Abstract

**Objective:** To find out the Prevalence of Achilles tendinopathy due to prolonged standing among salesperson working in shopping malls of twin-cities.

**Study design:** It is a descriptive cross-sectional study design.

**Place and duration of study:** The study was conducted in shopping mall of twin-cities among sales person with in time period of 4 months.

**Material and Methods:** The study was conducted on June 2023 to September 2023. We had 285 participants, both male and female salespersons aged 26 to 45 years old, who spent over 5 hours a day standing in shopping malls in twin-cities. Data was collected using standardized scales, the VISA-A sedentary scale and the LEFS scale. After taking informed consent data was analyzed using SPSS version 26, frequencies and percentages were calculated for individual variables.

**Results:** If LEFS score range from 61-80 and VISA-A score range from 61-100 then this condition is not prevalent among study participants, through that 54.7% participants are not prevailing. Conversely, If LEFS and VISA-A score range from 0-60 then this condition is prevalent among study participants. According to our results the prevalence of Achilles tendinopathy is 44.3% (126) due to prolonged standing among salespersons.

**Conclusion:** Our study concluded that there was an Average alliance of Achilles tendinopathy in salespersons due to prolonged standing in shopping malls of twin-cities.

**Keywords:** Achilles Tendinopathy, Heel pain, Victorian Institute of Sports Academy self-administered - Achilles sedentary scale, Lower extremity functional Scale, Salesperson.

### 1. Introduction

Achilles Tendinopathy (AT) is a medical issue that happens when the Achilles tendon gets hurt, but it doesn't completely rupture, as this usually happens because of using it too much. (Matthews, Ellis, Furness, & Hing, 2021). It is essential to note that this condition is not exclusively limited to athletes, it can also affect general population. <sup>(1)</sup>

The Achilles tendon (At) is well-known for its strength and size, it is located at the back of the heel and plays an important role in connecting the heel bone to the calf

muscles and facilitates essential movements like running, walking, and jumping. <sup>(2)</sup>

The pathophysiology begins with reactive tendinopathy, where there is an increase in tenocyte proliferation, protein production, and thickening of the tendon. As the condition advances, it enters the tendon disrepair stage, characterized by further increases in tenocytes and protein production, along with focal disruption of collagen fibers. The final stage is degenerative tendinopathy, where cell death occurs, and there is significant disorganization of collagen. <sup>(3)</sup>

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Depending upon the location Achilles tendinopathy is classified as: insertional tendinopathy and midportion tendinopathy.<sup>(4)</sup> The usual clinical presentation of Achilles tendinopathy involves the combination of three main symptoms: pain in and around the tendon, swelling, and impaired function, particularly during activities that involve walking, standing and impact exercises. Morning stiffness can also be seen in patients but subsides with activity.<sup>(4)</sup>

Midportion is more common and is located between 2 cm to 6 cm proximal to the insertion site. Insertional Achilles tendinopathy refers to a condition that occurs at the Achilles tendons insertion point on the calcaneus.<sup>(5)</sup>

Achilles tendinopathy can be influenced intrinsically by older age, male sex, poor vascularity, hyper-pronation, biomechanical issues, systemic diseases. Extrinsicly by overuse, repetitive stress, prolonged standing and intense physical activity. Steroidal drugs and fluoroquinolone antibiotics can also cause Achilles tendinopathy.<sup>(6)</sup>

Among athlete's lifetime prevalence of AT is around 24%, In contrast, the general population has prevalence of approximately 6% while in the adult population aged 21 to 60 years, the incidence of AT injuries is approximately 2.35 per 1,000 people, making them quite common.<sup>(7)</sup>

The clinical diagnosis of Achilles tendinopathy primarily relies on patient history, patient-reported pain associated with loading activities, and pain provocation tests. These tests are single leg heel raise, hop test, Thompson test, or Pain on palpation, etc have been suggested in examination.<sup>(8)</sup> Besides tests VISA-A sedentary scale, is a reliable assessment tool. It can be combined with other scales like VAS, FFI, LEFS, or FAOS to help diagnose AT. Among these, LEFS is the best when used alongside the VISA-A scale for diagnosis.<sup>(9)</sup>

ESWT is an interventional approach, involves delivering shock waves directly to the painful area of the tendon. This non-invasive procedure aims to

promote healing and reduce pain in the affected tendon.<sup>(10)</sup> The application of ultrasound waves to the affected area may help reduce inflammation and promote the healing process.<sup>(11)</sup> By applying heat to the affected tendon, blood vessels dilate, and blood flow to the area increases.<sup>(12)</sup> Deep Transverse friction massage (DTFM) is a technique commonly utilized by physiotherapists in the treatment of tendinopathies.<sup>(13)</sup> Some common types of exercises used in the conservative management of AT includes, Eccentric exercises have been shown to be effective in strengthening the tendon and promoting its healing.<sup>(14)</sup> Isometric exercises can help improve tendon strength without placing excessive stress on the tendon.<sup>(15)</sup> NSAIDs are often suggested to treat tendinopathies.<sup>(16)</sup> If conservative treatments for Achilles tendinopathy do not result in significant improvement after six months, surgical intervention may be considered.<sup>(16)</sup>

Our study will help more people know about this condition. It will be good for salespeople to know about their poor foot health during work with prolonged standing. It will also be useful for Physiotherapists and Doctors, they can better understand, assess, and raise awareness about Achilles tendinopathy, especially when it's not just caused by sports but also by long hours of standing on the job.

## 2. Materials & Methods

Cross-sectional descriptive study was done with in time duration of 4 months. Sample size of 285 salesperson was taken by raosoft calculator in this study. Data was collected from Islamabad Safa Gold Mall, Giga Mall, Centaurus Mall and Rawalpindi Malik-Abad Plaza, Rabi Centre, Gulf Centre, Ashiana Centre, Al-Jannat Mall, Butt Mall, Midway Centrum after seeking permission. Non-Probability purposive sampling technique was used for this study. Both male and female, above 25 to 45 years of age salesperson, Salesperson who are standing for more than 5 hours a day were put in the study. Salesperson doing jobs for more than two years were included in this study while Salesperson with any kind of foot deformity, fractures and systemic illness, salesperson who were not falling in our

preselected criteria were excluded from the study. To conduct a thorough evaluation, we integrated the Lower Extremity Functional Scale (LEFS) into our study, in addition to a standardized VISA-A Sedentary questionnaire. The VISA-A sedentary scale comprises a total of 100 points, categorized as follows: 0-30 as very poor, 31-60 as poor, 61-90 as good, and 91-100 as excellent. The LEFS scale consists of a total of 80 points, which are divided into categories as follows: 0-20 for severe functional limitation, 21-40 for moderate functional limitation, 41-60 for mild functional limitation, and 61-80 for normal functioning. If LEFS score range from 61-80 and VISA-A score range from 61-100 then this condition is not prevalent among study participants. Conversely, If LEFS and VISA-A score range from 0-60 then this condition is prevalent among study participants. After taking approval from CASHT Research committee, then we took permission from manager of shops for data collection. After informed consent from salesperson and taking demographics then we applied our assessment tools and gave questionnaire. Data was analyzed by SPSS version 26. Frequency and percentages were taken for each variable. Frequency charts and plots were used for showing the results of qualitative data.

**3. Results**

In this study, the data was obtained from salespersons of twin-cities, the sample size was 285 with mean and standard deviation (143.00 ± 82.417) and the salespersons that were falling in the exclusion criteria were already kept out of the study, so the results obtained was of the salespersons who were suffering from heel pain due to prolonged standing specifically. Salespersons of shopping malls among twin-cities were included. The objective of the study is to find out the Prevalence of Achilles tendinopathy due to prolonged standing.

The results represented 152 salespersons falling in the category of 26-30 age group, 59 salespersons in 31-35 age group, 42 salespersons in 36-40 age group and only 32 salespersons fall in 41-45 age group. Among the total study participants 210 salesperson are male and 75

salespersons are female, the gender distribution of study participants

In the current studies, there were 157 salespersons who were falling in the category of 6-10 hours standing duration per day, 97 in the category of 11-15 hours and 31 in the category of 16-20 hours duration of standing per day of salesperson out of 285 participants.

**Table 1:** Standing hours of salespersons per day

Standing hours per day	Frequency	Percent	Valid Percent	Cumulative Percent
6-10 hours	157	55.1	55.1	55.1
11-15 hours	97	34.0	34.0	89.1
16-20 hours	31	10.9	10.9	100.0
Total	285	100.0	100.0	

The VISA-A sedentary scale comprises a total of 100 points, categorized as follows: 0-30 as very poor, 31-60 as poor, 61-90 as good, and 91-100 as excellent. In this study, which involved a total of 285 participants, only 3 fell into the very poor category, 91 were classified as poor, 173 as good, and 18 scored in the excellent category, as represents in Table-2.

**Table 2:** Final frequency distribution of VISA-A Sedentary Scale

Grading	Frequency	Percent	Valid Percent	Cumulative Percent
0-30=very poor	3	1.1	1.1	1.1
31-60= poor	91	31.9	31.9	33.0
61-90=good	173	60.7	60.7	93.7
91-100=excellent	18	6.3	6.3	100.0
Total	285	100.0	100.0	

The LEFS scale consists of a total of 80 points, which are divided into categories as follows: 0-20 for severe functional limitation, 21-40 for moderate functional limitation, 41-60 for mild functional limitation, and 61-80 for normal functioning. In our study, which involved a total of 285 participants, 35 fell into the category of moderate functional limitation, 124 were categorized as having mild functional limitation, and 126 were classified as having normal functional activity, shown below in Table-3.

**Table 3:** Final frequency distribution of LEFS Scale

LEFS Grading	Frequency	Percent	Valid Percent	Cumulative Percent
21-40=moderate	35	12.3	12.3	12.3
41-60=mild	124	43.5	43.5	55.8
61-80=normal	126	44.2	44.2	100.0
Total	285	100.0	100.0	

Our study aimed to determine how widespread Achilles tendinopathy is among salespeople enduring extended periods of standing in the shopping malls of twin cities. To conduct a thorough evaluation, we integrated the Lower Extremity Functional Scale (LEFS) into our study, in addition to a standardized VISA-A Sedentary questionnaire. Our sample size was 285 sales-person. If LEFS score range from 61-80 and VISA-A score range from 61-100 then this condition is not prevalent among study participants, through which in 54.7% this condition is not prevailing in our study. Conversely, If LEFS and VISA-A score range from 0-60 then this condition is prevalent among study participants. According to our results the prevalence of Achilles tendinopathy is 44.3% (126) due to prolonged standing among salespersons.

**4. Discussion**

This study intends to investigate the prevalence of Achilles tendinopathy due to prolonged standing among salespersons in shopping malls of twin cities. Our inclusion criteria included Both male and female, Salesperson above 25 to 45 years of age, who were standing for more than 5 hours a day, doing jobs for more than two years. Our exclusion criteria included Salesperson below 25 years of age, who had experience of less than two years in this job, who didn't have prolonged standing, Salesperson with any kind of foot deformity, fractures and systemic illness were also excluded.

In a study conducted by Javed and colleagues in 2022, They looked at how often Achilles tendon problems happened in nurses who had to stand for a long time. To check the condition, they used a standard VISA-A scale, The findings revealed interesting insights. Out of

the participants, 35.5% experienced mild pain, 44.5% had moderate pain, and 19.1% reported severe pain. In conclusion, the study suggests that there is indeed a connection between Achilles tendinopathy and prolonged standing among nurses, but it is relatively weak. Most of the population studied fell into the category of experiencing no pain to mild pain.<sup>(17)</sup> Comparatively, in our current study we also examined the impact of prolonged standing using the same VISA-A questionnaire, and our results revealed among the participants, 37.9% reported mild pain, 24.2% experienced moderate pain, and the majority fell into the mild to no pain category. Our research indicates that prolonged standing plays just a role, it may not be the sole factor causing Achilles tendinopathy.

Previous study aimed to determine how widespread Achilles pain is among building construction workers. The primary goal was to assess how severe Achilles tendon pain. The study included workers aged between 22 and 45 years. Researchers utilized VISA-A sedentary questionnaire to evaluate pain and its severity in Achilles tendon. The findings revealed a significant association between building construction workers and Achilles tendon pain because of prolonged standing and strenuous activity. This study also established that Achilles tendon pain is a common issue among building construction workers, pain gets severe with increasing age.<sup>(18)</sup> In the same way, we conducted our research, in which we used scale called VISA-A Sedentary along with LEFS to understand how standing for a long time affects people. We looked at individuals aged 26 to 45, like in the previous study. We found that 44.3% (126 out of 285) of salespeople who stood for a long-time developed AT. Also, we noticed that the risk of getting AT increased as people grew older.

In 2022, a group led by Lewis conducted a study to understand how Achilles Tendinopathy (AT) affects the quality of life. They used questionnaires like Euroqol to measure this., along with VISA-A, FFI and VAS scales. They included 320 patients with AT. Interestingly, they found that patients under 55 with AT had a lower quality of life compared to people of the same age in the general population. In summary, Lewis and their team's study tells us that Achilles Tendinopathy can really affect the quality of life, especially for patients under

55<sup>(19)</sup>Our study had a similar goal; we wanted to understand how Achilles tendinopathy affects the general population, focusing on almost similar age group and involving a comparable number of participants. Like the previous study, we utilized the VISA-A sedentary questionnaire, but instead of the primary outcome measure that was Euroqol, we used LEFS to check functional limitations. Our results found 55.8% (159/285) had reduced functionality that led us to conclude that both of these measurement tools offer valuable insights into how Achilles tendinopathy influences an individual's quality of life in terms of their health.

Our study finds out the prevalence of Achilles tendinopathy due to prolonged standing among salesperson working in shopping malls of twin cities. The VISA-A sedentary and LEFS questionnaire were used to collect data of participants. The total 285 participants, lying between age range of 26-45 years were included in the study. The findings showed 44.3% (126) prevalence of Achilles tendinopathy in our selected population. The reason we found more cases of this condition in our study is because we included both men and women. Also, we had more people with this condition in our study because we included those who stand for long periods (over 5 hours a day) and older individuals. This condition is more common as people get older, so including older participants contributed to the higher numbers. The fact that some people stand for a long time also played a part in finding more cases in our study.

#### **Conclusion:**

Our study aimed to determine how widespread Achilles tendinopathy is among salespeople with prolonged periods of standing working in the shopping malls of twin cities. After thorough evaluation, we concluded that there was an average alliance of 44.3% between AT and prolonged periods of standing in salesperson. Most of the participants were falling in the category of mild pain and moderate functional impairment.

#### **Recommendations:**

This study included a relatively small sample of 285 salespersons. To enhance the study's ability to apply its

findings more broadly, future research should consider using a larger sample size. As current study's sample size was limited, which could affect the range of variations observed in the results. Additionally, this research was conducted exclusively in Islamabad and Rawalpindi. To expand the applicability of the findings globally, efforts should be made to include participants from different regions around the Country. Furthermore, to obtain more meaningful insights into gender-related aspects, future studies should aim to include an equal number of participants from both genders.

#### **Limitations of the study:**

Our study encountered few limitations, like the study was confined to a specific duration because it needed to be aligned with the university's provided timeframe for completing the thesis, the study couldn't include an equal number of both genders because there were limited female staff comparatively males. Also, generalizing the results was challenging due to the study's small sample size of 285 salespeople and findings from a particular area, like the twin cities, may not be widely applicable.

#### **Disclosure & Conflict of Interest:**

The authors declare that there is no conflict of interest.

#### **Funding:**

The present study didn't receive any funding from local or international organization.

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