Journal of Emerging Data Intelligence (JEDI)

Homepage https://journal.vu.edu.pk/JEDI

ISSN No | (Online): 3106-924X| (Print): 3106-9231

Prevalence of Patellar Tendinopathy and its Association with Quality of Life among Football Players

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Abstract

Patellar tendinopathy is a common overuse condition in athletes, but its burden among university football players in Pakistan has been underexplored. This cross-sectional study assessed its prevalence and examined its association with functional status and quality of life. A total of 131 university football players in Lahore (mean age 23.4 ± 3.27 years) completed the VISA-P and SF-36v2 questionnaires. The prevalence of patellar tendinopathy was 62.6%. Mean VISA-P and SF-36 scores were 48 ± 17.94 and 84.9 ± 9.6, respectively. Older players reported significantly lower VISA-P and SF-36 scores, while no significant gender differences were observed. Although the correlation between VISA-P and SF-36 was modest, the findings indicate that patellar tendinopathy is highly prevalent and has measurable implications for both physical function and overall well-being among university football players.

Keywords: Patellar tendinopathy; Quality of life; Football players; Knee injuries; Pain

1. Introduction

Patellar tendinopathy is an overuse disorder characterized by localized pain at the inferior pole of the patella during activities that place mechanical load on the tendon (Challoumas et al., 2021). It is particularly common among young athletes who perform frequent jumping or activities requiring repetitive knee extensor force (Chen et al., 2019). Globally, athletic injuries remain a major concern, and football continues to be one of the most widely played sports (Golman et al., 2020). Studies from European football leagues consistently report a high incidence of lower-limb injuries including hamstring strains, ankle sprains, and knee-related disorders among players (Sprague et al., 2019). Similar trends have been observed in South America, although the distribution of injury types varies slightly across regions.

Players in football who must jump and land repeatedly, especially forward players and mid fielders are at higher risk of developing patellar tendinopathy compared to defenders and goal keepers (van Rijn et al., 2019). In symptomatic athletes, movement analysis will frequently give certain biomechanical patterns during the injury moments, including hip extension, knee extension, ankle dorsiflexion, and foot pronation (Mizutani et al., 2023). The condition is caused by repeated tensile overloading on patellar tendon that leads to microtears and further structural alteration on tendon fibers. The sudden changes in the training load, incorrect movement technique, and anatomical differences (flat feet or maltracking of the patella) also increase susceptibility (Forsythe et al., 2022).

The patellar tendon, anatomically, is the key component of lower-limb mechanics, which connects the patella to the tibia and serves as a significant pathway of force produced by the muscles of the quadriceps. It is critical in terms of integrity to such important movements in football as sprinting, jumping, or kicking (Horan et al., 2022; Kerin et al., 2022). Although some anatomists refer to it as the patellar ligament due to its bone-to-bone connection (Carlesso et al., 2019), its functional demands in sport remain well established. While patellar tendinopathy is widely recognized as a predominant overuse injury in sports involving repetitive jumping, its epidemiology, impact on functional status, and influence on quality of life among football players remain insufficiently explored especially in low- and middle-income countries (LMICs). Most existing studies originate from Europe, Australia, and North America (Hutchison et al., 2019; Cristi Sánchez et al., 2019), and therefore may not reflect differences in training conditions, playing surfaces, athlete workload, or healthcare resources in South Asian contexts. Recent literature has emphasized the importance of generating region-specific epidemiological data to guide prevention and rehabilitation strategies tailored to local athlete populations (Nguyen et al., 2023; Ahmed et al., 2022).

More serious complications, including rupture of the patellar tendon, may be a career-ending condition in competitive athletes, and the available evidence proves that it significantly affects the rate of returns to sport and performance (Nguyen et al., 2020). Tendon-loading exercise programs are emphasized as an effective intervention in the current management approaches, though their effectiveness depends greatly on the right load progression and adherence (Agergaard et al., 2021). Although there is increased awareness about patellar tendinopathy as a significant clinical condition, there is no epidemiological research to determine its prevalence, severity, and overall health consequences among football players in the country. Especially athletes at university level are a valuable but poorly studied population, since they have high training loads and may not receive specialized sports medicine care.

The gaps are filled in this study in three significant ways. It offers first, local epidemiological evidence by considering patellar tendinopathy in a particular population refers to football players playing at the university level in Pakistan a population on which there are practically no data. Second, it not only assesses the prevalence of the condition but also its effect on health-related quality of life, which is more comprehensive than studies based on symptoms. Third, by integrating the VISA-P questionnaire with the SF-36 health survey, the study combines tendon-specific assessment with a broader evaluation of physical and mental well-being, producing a comprehensive profile of how patellar tendinopathy affects functional capacity and general health in this population.

2. Materials and Methods

It was a Cross- Sectional Study design and data was collected from footballers of Lahore. Sample size of the study was 131 calculated by Epitool. A convenience sampling approach was used to recruit participants from university football teams in Lahore. The aim of the study was to determine Prevalence of patellar tendinopathy and its association with quality of life among football players. Inclusion criteria based on previous studies was participants having knee pain more than 3 months including both Males and females from Age 20 to 38 years and Participants with more than two years of experience as football player. Participants who had ACL reconstruction surgery in previous years or History of low back pain and any Gait abnormality were excluded from the study. Participants who met the criteria were selected after taking informed written consent. After consent, data was collected through Standardized Victorian Institute of Sport Assessment of patellar tendinopathy (VISA-P) questionnaire was used in the study and Standardized SF-36V-2 Health Survey. The data was analyzed using the Statistical Package for Social Sciences 24.0v (SPSS-24) for Windows. Descriptive statistics (mean ± SD, frequencies, and percentages) were computed for all variables. The point prevalence was estimated overall and across subgroups (sex, age group, and training experience), along with 95 % CIs. Group differences were tested using the chi-square test. Associations between VISA-P and SF-36 scores were assessed by Pearson and Spearman correlation coefficients. Multivariable linear regression examined predictors of SF-36 total scores, while logistic regression assessed the odds of low quality of life (SF-36 < 80) in participants with patellar tendinopathy.

3. Results

3.1 Participant Characteristics

Before presenting the detailed characteristics, a descriptive summary of the sample is provided. Table 1 shows the demographic and training-related characteristics of the 131 football players. Overall,

participants were young adults with moderate training exposure. Males had slightly greater training experience and higher VISA-P scores compared with females, whereas older age groups generally demonstrated lower VISA-P and SF-36 scores, indicating poorer tendon function and reduced quality of life. Prior knee injury was more common in the older age group (30–38 years).

Table 1. Participant Characteristics by Sex and Age Group (n = 131)

Variable	Total (n=131)	Males (n=81)	Females (n=50)	20–24 yrs (n=77)	25–29 yrs (n=38)	30–38 yrs (n=16)
Age (years), mean ± SD	23.4 ± 3.3	23.6 ± 3.1	23.1 ± 3.6	21.9 ± 1.2	26.2 ± 1.2	32.4 ± 1.7
Training experience (years)	5.8 ± 2.3	6.1 ± 2.5	5.3 ± 2.0	4.7 ± 1.6	6.3 ± 1.9	7.5 ± 2.1
Weekly training sessions (n)	4.6 ± 1.2	4.8 ± 1.1	4.3 ± 1.2	4.4 ± 1.1	4.7 ± 1.3	4.9 ± 1.2
VISA-P Score (mean ± SD)	48.0 ± 17.9	49.5 ± 17.2	45.6 ± 18.9	52.1 ± 16.7	46.2 ± 18.3	39.4 ± 14.8
SF-36 Total (mean ± SD)	84.9 ± 9.6	85.7 ± 9.4	83.7 ± 9.9	87.1 ± 8.4	83.2 ± 10.1	78.4 ± 9.3
Prior knee injury n (%)	36 (27.5%)	23 (28.4%)	13 (26.0%)	17 (22.1%)	12 (31.6%)	7 (43.8%)

3.2 Prevalence of Patellar Tendinopathy

Table 2 presents the overall and subgroup-specific prevalence of patellar tendinopathy. More than half of the participants (62.6%) met the criteria for patellar tendinopathy. Although females showed a higher prevalence than males, the difference was not statistically significant ($p = 0.094$). Age showed a significant trend ($p = 0.013$), with the prevalence increasing progressively from 20–24 years to 30–38 years, indicating that older players were more likely to have tendinopathy.

Table 2. Prevalence of Patellar Tendinopathy Overall and by Subgroups

Subgroup	n (%) Cases	Prevalence % (95% CI)	χ^2 (p-value)
Overall	82	62.6 (54.0–70.6)	–

Males	47	58.0 (46.6–68.7)	2.81 (0.094)
Females	35	70.0 (55.4–81.6)	
Age 20–24	42	54.5 (42.7–65.9)	8.72 (0.013*)
Age 25–29	27	71.1 (54.1–83.9)	
Age 30–38	13	81.3 (56.9–93.4)	

3.3 Bivariate Associations between VISA-P and Quality of Life

To understand how tendon health relates to quality of life, correlations between VISA-P scores and SF-36 domains were examined (Table 3). VISA-P showed small but statistically significant positive correlations with SF-36 Total and SF-36 PCS scores, suggesting that better tendon function is associated with better overall and physical quality of life. No significant association was observed with mental health (SF-36 MCS), indicating that patellar tendinopathy affects physical functioning more than psychological well-being.

Table 3. Bivariate Associations between VISA-P and Quality-of-Life Scores

Outcome Measures	Pearson r (95% CI)	p-value	Spearman ρ (95% CI)	p-value
SF-36 Total	0.21 (0.04–0.37)	0.019*	0.24 (0.07–0.39)	0.011*
SF-36 PCS	0.31 (0.15–0.46)	0.001**	0.34 (0.18–0.48)	<0.001**
SF-36 MCS	0.09 (–0.08–0.25)	0.304	0.11 (–0.05–0.27)	0.231

3.4 Adjusted Models for Predictors of Quality of Life

Table 4 summarizes the regression models evaluating the independent association between VISA-P scores and quality of life after adjusting for age, sex, training experience, and prior knee injury. In the linear model, VISA-P remained a significant positive predictor of SF-36 Total Score, while age and prior knee injury showed negative associations. The logistic regression model similarly demonstrated that low VISA-P scores significantly increased the odds of having low quality of life (SF-36 < 80). Age also emerged as an independent risk factor for poor QoL, whereas sex and prior injury were not statistically significant predictors.

Table 4. Adjusted Models for Association between VISA-P and Quality of Life

(a) Linear Regression – Dependent Variable: SF-36 Total Score

Predictor Variables	β Coefficient (95% CI)	p-value
Intercept	68.21 (58.2–78.3)	<0.001
VISA-P (per 10 points)	+2.3 (0.6–4.1)	0.008*
Age (years)	–0.41 (–0.74—0.09)	0.013*
Sex (male=1)	+1.8 (–1.9–5.5)	0.331
Training experience	+0.26 (–0.42–0.93)	0.452
Prior knee injury	–3.9 (–7.3—0.4)	0.029*

Adjusted $R^2 = 0.19$; $F(5,125) = 6.12$, $p < 0.001$

(b) Logistic Regression – Dependent Variable: Low QoL (SF-36 < 80)

Predictor	Odds Ratio (95% CI)	p-value
VISA-P ≤ 80 (case)	3.26 (1.41–7.52)	0.006*
Age (years)	1.10 (1.01–1.21)	0.027*
Sex (male)	0.81 (0.38–1.72)	0.585
Prior knee injury	2.17 (0.92–5.09)	0.076

Model $\chi^2 = 17.8$, $p = 0.001$; Nagelkerke $R^2 = 0.18$; AUC = 0.74

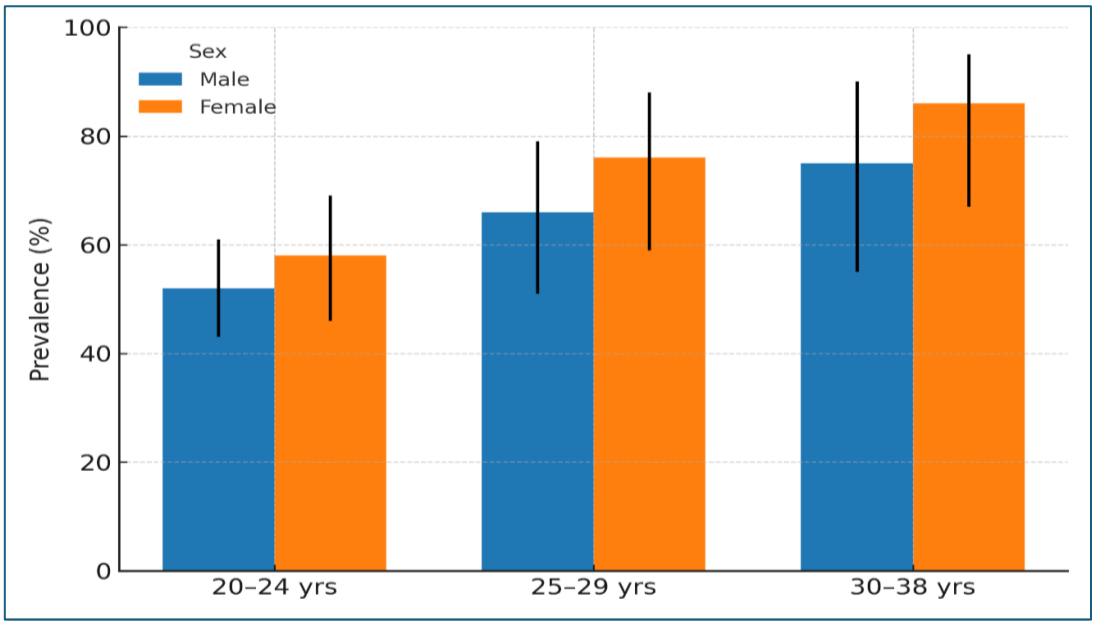

Figure 1. Prevalence of Patellar Tendinopathy (95% CIs) by Subgroup

Clustered bar chart showing prevalence (%) with 95% CI error bars by subgroup. Overall: 62.6%; Male: 58.0%; Female: 70.0%; 20–24 yrs: 54.5%; 25–29 yrs: 71.1%; 30–38 yrs: 81.3%. Older age groups showed significantly higher prevalence (p=0.013).

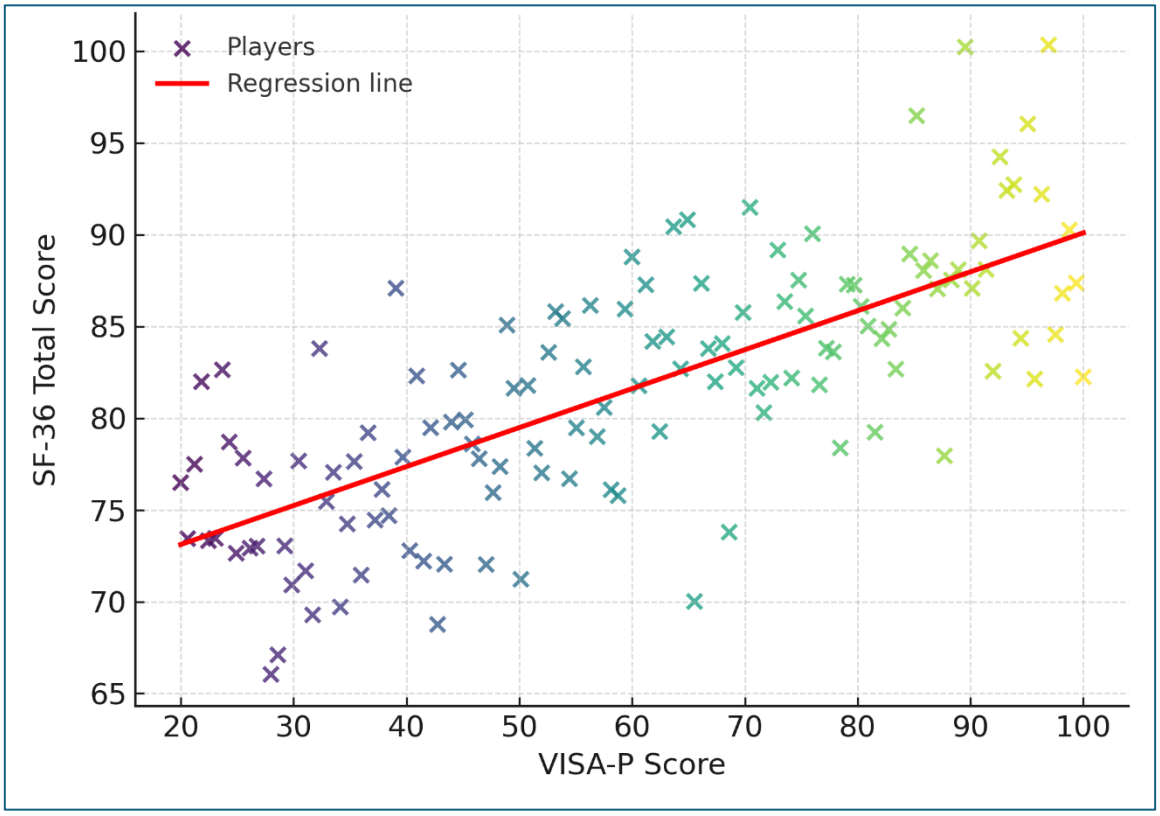

Figure 2. Scatterplot of VISA-P and SF-36 Scores with 95% CI Fit Line

Scatter plot illustrates positive relationship between VISA-P and SF-36 total (r=0.21, p=0.019). Fitted regression line (solid) with 95% CI band (shaded) shows higher tendon function corresponds to better quality of life.

4. Discussion

The present study aimed to determine the prevalence of patellar tendinopathy among university-level football players in Pakistan and to explore its association with quality of life. The findings indicate that patellar tendinopathy is highly prevalent in this population, with more than 60% of players reporting symptoms. This aligns with international data but highlights an especially high burden within local university sports. When comparing our results with existing literature, both similarities and differences emerge. Harris et al. (2021), for example, reported a lower prevalence of 39% among adolescent athletes, who trained for significantly more hours per week than those in our study. This indicates that training organization, competition, and age disparity could be some of the factors that cause different prevalence levels among populations.

A high level of functional impairment was also exhibited in our sample with an average VISA-P score of 48 + 17.9. This compares to intervention reports in other studies like Agergaard et al. (2021) which found that structured training, including heavy slow resistance and moderate slow resistance training, significantly improved symptoms in the long term. In contrast to those studies based on interventions, our study recorded the severity of symptoms of athletes who did not receive specific rehabilitation. This contrast indicates that numerous players of the university in Pakistan might continue to play even though they experience serious signs and lack of formal treatment and load management advice.

In line with the study by Alshabanat et al. (2022), we also discovered that VISA-P scores and SF-36 scores showed significant correlations, which means that perceived quality of life is connected to lower tendon functioning. Though the correlations in our study were fewer, these still confirm the general picture, that the patellar tendinopathy is not only an issue of physical performance but also general well-being. Moreover, we showed that age was also an important factor in relation to both VISA-P and SF-36 scores and thus, age related factors are important in tendon health.

Among the interesting observations was that patellar tendinopathy was more prevalent among older players. The concept behind this tendency might be described as cumulative tendon loading during the number of years, which can lead to microstructural degeneration, the decrease in the repair capacity, and the gradual functional deterioration. The older athletes often possess a prior history of training, previous injuries, and may be less optimally trained, which can serve as additional stress factors in tendons and make them more susceptible. On the contrary, they did not find any significant gender difference in the prevalence of symptoms or functional scores. This indicates that the important factors contributing to the overload in patellar tendon like the training volume, playing position, and the biomechanical demands are common amongst the male and female players in the university.

As we place our findings in the context of the previous studies, more similarities are brought up. Proprioceptive deficits in athletes with patellar tendinopathy were also reported by Torres et al. (2017), and even though in our study, proprioception was not directly measured, our mean VISA-P scores demonstrated similar functional limitations. In general, the findings support the growing body of research implicating patellar tendinopathy with physical functioning and the quality-of-life deficiency and the necessity of prevention and specific management in the athletic population. In spite of these insights, there are several limitations that need to be mentioned. The cross-sectional design does not allow any causal conclusions on the relationship between symptoms, training factors and quality of life. The sample size and characteristics of the study, which is limited to football players of universities, should not be generalized to other sports, which can have different loading patterns and risk factors. Further, self-

reported results may introduce bias to the results, and there is no imaging or biomechanical data to provide a more in-depth insight into structural or motion-related causes of the symptoms.

Future research directions need to focus more on longitudinal studies to investigate the development of tendon symptoms with time and identify the causation of the relationship between training load, biomechanics, and functional outcomes. The Pakistani athletic environment requires intervention studies in particular and it is necessary to determine the performance of eccentric exercises, heavy slow resistance training, neuromuscular conditioning, and landing-mechanics retraining. Adding athletes of various sports, the use of objective load-monitoring devices, and biomechanical testing would also enhance the knowledge on the varying risk factors that are modifiable. This type of work might help in the formulation of specific preventive and treatment measures to alleviate the burden of patellar tendinopathy among university sports.

5. Conclusion

Patellar tendinopathy is highly prevalent among university-level football players in Lahore, with older athletes demonstrating a markedly higher likelihood of symptoms. Players with tendinopathy not only exhibit reduced tendon function but also report lower overall quality of life, indicating that the condition affects both performance and daily well-being. The consistent association between VISA-P and SF-36 scores highlights the value of routine tendon health assessments in athletic populations. Pragmatically, the findings underline the importance of regular screening programs especially through instrument like the VISA-P questionnaire of determining the early functional impairment before the symptoms are disabling. The trainers and sport clinicians too are expected to keep track of the progression of training loads, verifying that there is gradual increase in intensity, recovery between training sessions and timely modification in situations of overload or fatigue. Evidence-based preventive measures like eccentric or heavy-slow resistance training, neuromuscular and safe landing-mechanics training can help to decrease the tendency of tendon overload in high-jump and high-demand activities (such as forwards and midfielders). The study will be useful in the literature of sports medicine because it will provide one of the first epidemiological studies of patellar tendinopathy among university athletes in Pakistan. The knowledge of the local prevalence of the condition and its effects on the quality of life of players can be used to develop context-specific prevention, screening, and rehabilitation interventions in university athletic departments. Enhancing such systems would eventually aid in safeguarding the health of the athletes, increasing their playing lives and improving their long-term performance.

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