

## Assessing Quality of Life in Young Athletes with Patellofemoral Pain Syndrome

Manahil Ghulam Mustafa<sup>a</sup>, Abeela Ashraf<sup>a</sup>, Fizza Basit<sup>a</sup><sup>a</sup> Doctor of Physiotherapy at the University of FaisalabadCorrespondence: [manahilmustafa532@gmail.com](mailto:manahilmustafa532@gmail.com)

## ABSTRACT

**Background and Objectives:** Patellofemoral Pain Syndrome (PFPS) is very common among the young adult sports population, which is characterized by pains around the front of the knee. This condition greatly reduces participation in sports, causing constant pain and discomfort, fitness levels to drop, and reflecting general health deterioration. Thus, it is crucial to explore its rate and consequences for QoL to create efficient management plans. The purpose of this research is to evaluate the level of patellar pain in the young people sample and identify the effect this condition has on the subject's quality of life. This research aims at establishing the percentage of young people who are impacted by PFPS alongside evaluating its impact on their health.

**METHODOLOGY:** This study's design was cross-sectional and included 151 participants aged 15 to 30 years old, selected through convenient sampling. Questionnaire data were collected using a standardized questionnaire comprising the Kujala anterior knee pain scale and the numeric rating scale. Descriptive statistics and Pearson correlation were used for the study.

**RESULTS:** The survey examined some ailments common among adults and established that knee pain was more common in young adults with 18-year-olds indicating 11.8% and 27-year-old 9.9% of the sampled population suffering from the ailment. It also reduced with age indicating that, patients with DM had better control and alterations in their activity levels.

**CONCLUSION:** Regarding the research findings, the study reveals that young people experience knee pain which affects their activities and involvement in sporting activities. Therefore, it could be understood that management strategies are crucial to decrease the extent of pain and enhance the quality of life.

**KEYWORDS:** Anterior Knee Pain, Quality of Life Numerical Pain Scale.

## INTRODUCTION

Prepatellar knee pain is another regular problem, particularly among the physically active population, that stems from misalignment of the knee extensor apparatus. This condition mostly develops when there is pressure exerted on the patellofemoral joint, especially during exercises (1). Other elements are patellar pathologies and injuries to the extensor mechanism which hinders proper tracking of the patella during flexion/extension at the knee joint (2). Some people may present with complaints of generalized knee pain while others present with patellar instability, which presents different symptoms and clinical examinations (3). Counselling and detailed clinical assessment shall be done as a way of identifying the causative factors so

that the right treatment can be offered. Hip strength deficits have been reported in 85% of AS patients, especially for quadriceps muscle during eccentric contractions and anterior knee pain has also been identified as a significant finding in AS patients Likewise, recent studies have emphasized biomechanical alterations of tissues as potential sources of patellofemoral pain rather than structural factors (4).

The common manifestations of the condition can be pain, instability, and misalignment during dynamic tasks such as squatting and stair climbing. Position of the patella, muscle imbalance of the quadriceps particularly the vastus medialis and lateralis, and weakness in the hip abductors or flexors also contribute to some

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knee pain (5).

These can be broadly categorized as intrinsic factors like cartilage or subchondral bone healing ability and extrinsic factors like mechanical quadriceps wasting and femoral rotation.

These muscular injuries are common among athletes as they result in anterior knee pain stemming from extensor mechanisms that have been overstressed through use or injury. That is why some pain originates from Hoffa's pad or quadriceps tendon lesions. Optimal clinical assessment focusing on the patient's history, followed by specific imaging and laboratory examination when needed, helps distinguish between various conditions, such as patella alta, and other potential factors (6).

Objectives:

- To determine the incidence and the frequency of anterior knee pain among young athletes with PFPS.
- To evaluate changes in the level of sports participation and physical activity among young athletes following the occurrence of PFPS.
- To establish the correlation between the intensity of knee pain in young athletes with PFPS and the functional impairment in activities during sports and daily life.

Rationale:

By identifying the tasks and sports affected by knee pain, more appropriate interventions can be recommended (7). This study will advance the understanding of pain and ways to minimize it, thus enhancing the quality of life of the affected person (8).

## METHODOLOGY

**Study Design:** Cross-sectional study

**Sample Size:** A sample size of 151 cases was taken

**Duration of study:** The study took 4 months to complete after the approval of the synopsis.

**Sampling Technique:** A non-probability convenient sampling technique was used in the study to conduct the sample.

**Study Setting:** All patients will be chosen from Ali Fatima hospital

Mayo hospital

Jinnah hospital

**Inclusion:**

Participants willing to participate in the study.

Age 15-30 years.

Both Male and Female aged 15-30 years

Athletes with anterior knee pain

Athletes participating in sports activities

Anterior knee pain from at least one month

Prolonged standing from continuous 7 to 8 hours

**Exclusion Criteria:**

- Neuromuscular disorders
- Psychologically disabled people
- Remarkable knee joint inflammation and effusion
- Knee surgery, knee physiotherapy and steroid injection
- Patients with a history of dislocation and direct trauma to the patella

**Enrolment Methods:** Individual participants who fulfilled the inclusion criteria were asked to sign a consent form. Participants received all the information they required regarding the study, its implications, and its goals and objectives. Only those individuals who gained a consent form were taken into the study, and personal information about them was kept confidential and used solely for research purposes.

**Data Collection Methods:** By inclusion or exclusion criteria and using scale (knee injury and osteoarthritis scale)

**Procedure:** The data was collected by using a questionnaire-based survey containing questions regarding musculoskeletal disorders. The permission letter along with the consent form, both in English, was given, and the study process began after the consent was signed by the students.

**Data Collection Tools**

- Standardized Questionnaire for the assessment of anterior knee pain was used for conducting the survey.
- Knee injury and osteoarthritis Questionnaire
- Numeric Pain Rating Scale
- Goniometer

**Statistical analysis tool:** Data will be analyzed by using SPSS version 2023. The numerical data like age will be presented in the form of mean + SD. Categorical data like gender group will be presented in the form of frequency (Percentage). A p-value of less than and equal to 0.05 will be considered significant.

**Ethical Consideration:**

Consent was obtained from the patients, through the assurance that their data will only be used only for research purposes.

The dignity of the participants will be prioritized.

No harm will be subjected to any participants of the research.

## RESULTS

The study included a total of 151 participants, with one missing value. The mean of the participants was 22.6755, with a standard deviation of 4.78546. (Table 1)

Table 1: Number of participants

Number of participants		
N	Valid	151
	Missing	1
Mean		22.6755
Standard Deviation		4.78546

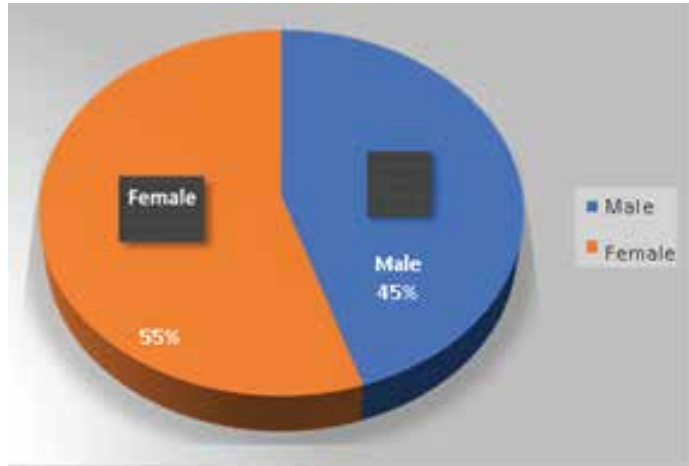


FIGURE 1 Gender distribution of participants

Fig 1 shows that among the participants in the study, 45% were male and 55% were female, with a total of 151 individuals. This indicates a slightly higher representation of female participants, accounting for the majority of the sample. The gender distribution of the participants provides valuable insights into potential gender-specific patterns or considerations when interpreting the study's findings (9).

A descriptive statistical analysis of KOOS questions is reported as follows. It indicates the effect of patellofemoral pain syndrome affecting the quality of life of subjects. A larger value of standard deviation is seen, which means the data is widespread. (Table 4.2)

Table 2: Descriptive statistical analysis

Variables	No. of participants	Mean	Standard Deviation
Level of education of participants	151	2.0795	$\pm 0.79602$
How often is your knee painful?	151	1.9338	$\pm 1.15856$
Pain twisting or pivoting on your knee?	151	1.3775	$\pm 0.64023$
Pain during bending knee fully?	151	1.5702	$\pm 0.67140$
Pain while walking on flat surface?	151	1.2848	$\pm 0.46730$
How severe is your knee stiffness after sitting, lying or resting later?	151	1.8278	$\pm 0.70011$
Do you have swelling in descending in the day?	151	1.7483	$\pm 0.78501$
Do you feel grinding or hear clicking or other noise?	151	1.5762	$\pm 0.79530$
Can you straighten your knee?	151	1.5695	$\pm 0.69771$
Pain while sitting?	151	1.7020	$\pm 0.59771$

Pain while ascending of stairs?	151	2.0066	$\pm 0.66830$
Difficulty in raising from chair?	151	1.9801	$\pm 0.57120$
Difficulty in standing?	151	1.8344	$\pm 0.58230$
Difficulty in bending to floor picking up an object?	151	1.8940	$\pm 0.55561$
Difficulty getting in and out of the car?	151	1.9272	$\pm 0.53040$
How often are your knee problems?	151	1.7682	$\pm 0.64749$
In general, how difficult do you have with your knee?	151	1.9073	$\pm 0.58139$
Pain while going up or down stairs?	151	1.9139	$\pm 0.76542$

1. Level of education of participants:

The mean level of education was 2.0795, with a standard deviation of 0.79602.

2. How often is your knee painful?

Participants reported a mean score of 1.9338, indicating that knee pain is experienced occasionally. The standard deviation was 1.15856, suggesting variability in pain frequency among participants.

3. Pain twisting/pivoting on your knee:

The mean score for pain during twisting or pivoting motions was 1.3775, indicating mild discomfort on average. The standard deviation was 0.64023, suggesting some variability in the severity of pain experienced.

4. Pain bending knee fully:

Participants reported a mean score of 1.5702, indicating mild pain when bending the knee fully. The standard deviation was 0.67140, suggesting some variation in the degree of pain experienced (10).

5. Pain while walking on a flat surface:

Participants reported a mean score of 1.2848, indicating mild pain while walking on flat surfaces. The standard deviation was 0.46730, suggesting relatively low variability in pain levels during walking (11).

6. How severe is your knee stiffness after sitting, lying, or resting later?

Participants reported a mean score of 1.8278, suggesting mild to moderate knee stiffness after periods of inactivity. The standard deviation was 0.70011, indicating some variability in the severity of stiffness experienced.

7. Do you have swelling descending during the day?

The mean score for swelling was 1.7483, indicating mild swelling that descends during the day. The standard deviation was 0.78501, suggesting variability in swelling severity among participants.

8. Do you feel a grin? ding or hear a clicking or other noise

Participants reported a mean score of 1.5762, indicating occasional perception of grinding, clicking, or other noises in the knee. The standard deviation was 0.79530, suggesting variability in the occurrence of

these symptoms.

Can you straighten your knee?

Participants reported a mean score of 1.5695, suggesting mild difficulty in fully straightening the knee. The standard deviation was 0.69771, indicating some variation in the degree of difficulty experienced.

Pain while sitting:

Participants reported a mean score of 1.7020, indicating mild pain while sitting. The standard deviation was 0.59771, suggesting relatively low variability in pain levels during sitting.

Pain while ascending stairs:

Participants reported a mean score of 2.0066, indicating moderate pain when ascending stairs. The standard deviation was 0.66830, suggesting some variability in pain levels during stair climbing.

Difficulty in raising from a chair:

The mean score for difficulty in rising from a chair was 1.9801, suggesting mild difficulty on average. The standard deviation was 0.57120, indicating some variation in the level of difficulty experienced.

Difficulty in standing:

Participants reported a mean score of 1.8344, indicating mild difficulty in standing. The standard deviation was 0.58230, suggesting relatively low variability in the level of difficulty experienced.

Difficulty in bending to the floor to pick up an object:

The mean score for difficulty in bending to the floor and picking up an object was 1.8940, suggesting mild difficulty on average. The standard deviation was 0.55561, indicating some variation in the level of difficulty experienced.

Difficulty getting in and out of the car:

Participants reported a mean score of 1.9272, indicating mild difficulty when getting in and out of the car. The standard deviation was 0.53040, suggesting relatively low variability in the level of difficulty experienced.

How often are your knee problems?

Participants reported a mean score of 1.7682, suggesting occasional knee problems on average. The standard deviation was 0.64749, indicating some variability in the frequency of knee issues among participants.

In general, how difficult do you have with your knee:

The mean score for overall difficulty with the knee was 1.9073, indicating mild difficulty on average. The standard deviation was 0.58139, suggesting some variability in the level of difficulty experienced.

Table 3. presents the correlation between Anterior knee pain scale and knee pain-related quality of life. The results show that there is a positive strong correlation between the aforementioned variables as  $r=0.882$ .  $P\text{-value}<0.05$  shows that the correlation is significant.

Hence it can be deduced that the lower the Anterior knee pain scale score, the worse will be the quality of life and vice versa.

## DISCUSSION

The results of this study suggest that the highest incidence of knee pain was recorded in the participants aged 17 to 20 years, and females had a slightly higher incidence of knee pain as compared to males. The pain was worse during stair climbing and kneeling, and therefore, these are some of the things that can cause difficulties for an individual with PFPS (12). This corresponds with earlier findings indicating that knee pain poses a considerable detrimental effect on the degree of functioning and exercise involvement, which has been more apparent in the younger population. The study also established that people in the youngest age group of 27 years had a slightly lower prevalence rate of knee pain at 9.9%. From these findings, it can be inferred that younger persons are the most likely to experience knee pain perhaps because of the rigorous activities that the age group engage in during adolescence and early adulthood (12)

Besides establishing that there are differences in the prevalence of knee pain among the genders, the study also contributes to the understanding of the effects of knee pain on sports and general mobility (13). Some previous work has demonstrated that women, especially athletes including basketball players, are more prone to develop PFD than men. However, the current study advanced these findings by involving participants who are both athletes and non-athletes, which helped to understand knee pain in various people in the general population (14). This approach helps capture how knee pain impacts people with different activity levels and can contribute to enhancing prevention and treatment strategies.

However, there are some limitations of this study, which have to be noticed: It is important to note that all the participants were selected from Lahore, Pakistan thus this study's results may not be generalized to other regions or with other populations. It is also important to note that this study used a cross-sectional design, which only allows examining relationships rather than proving cause and effect relationships, therefore, more research is needed to understand the factors leading to knee pain. Furthermore, employing self-administered questionnaires opens up the potential for bias, therefore, this might either inflate or deflate the prevalence rates and other associations between knee pain and the identified risk factors. Subsequent research should target more culturally and ethnically diverse samples and employ longitudinal designs to elucidate the longi



tudinal impact of knee pain on physical activity and sports.

## CONCLUSION

In conclusion, the analysis of knee pain prevalence in different age groups has provided valuable insights into the occurrence of knee pain among young adults. The study revealed a prevalence rate of 11.8% for the age group of 18 years and 9.9% for the age group of 27 years. These findings indicate that knee pain can indeed occur in young adults and should not be dismissed as a condition solely associated with older individuals. The results highlight the importance of recognizing and addressing knee pain in younger age groups to ensure early intervention and appropriate management. Further research is warranted to understand the underlying factors contributing to knee pain in young adults and develop targeted prevention and treatment strategies. By recognizing the prevalence of knee pain in this demographic, healthcare professionals can work towards improving the quality of life and overall well-being of young adults affected by knee pain (15-20).

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**Tanzeela Iqbal:** Substantial contributions to the conception and design of the work.

**Mahnoor Tayyab:** Design of the work and the acquisition. Drafting the work. Final approval of the version to be published.

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