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Original Article

Association Between Knee Pain and Patellofemoral Syndrome (PFS) In Football Players

Muhammad Haris[1], Muhammad Khizer Hayat[2], Samiya Noreen[3], Aqsa Majeed[4], Azfar Khurshid[5], Hanan Azfar[6], Adnan Hashim[7]*

[1]Indus University, Karachi- Pakistan.
[2]Bakhtawar Amin college of Rehabilitation Sciences, Bakhtawar Amin Medical & Dental College, Multan- Pakistan.
[3]Sanophysiotherapy clinic, UK.
[4]Physiogic Physiotherapy Clinic- Pakistan.
[5]Bakhtawar Amin medical and dental college Multan- Pakistan.
[6]Medline Healthcare, Gujranwala- Pakistan.
[7]University Institute of Physical Therapy, the University of Lahore- Pakistan.
Corresponding Author: Adnan Hashim; Email: adnanhashim199@gmail.com

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ABSTRACT

Background: Knee pain and patellofemoral syndrome (PFS) are common among athletes, particularly in sports requiring extensive lower limb use such as football. These conditions can significantly impair performance and quality of life.

Objective: This study aimed to investigate the prevalence and severity of knee pain and patellofemoral syndrome among football players, and to explore the association between these conditions.

Methods: The study was conducted with 145 football players who provided informed consent, in alignment with the Declaration of Helsinki. Data were collected using structured surveys that included the Numeric Pain Rating Scale and the Kujala Scoring questionnaire. The analysis utilized SPSS software (version 25) to conduct descriptive and inferential statistics. Qualitative data were assessed by frequencies and percentages, while quantitative data analysis involved computing means and standard deviations. The association between knee pain and PFS was examined using a Pearson Chi-Square test.

Results: The average age of participants was 22.95 years (SD = 2.83), ranging from 19 to 28 years. Regarding knee pain, 8.3% reported no pain, 26.2% mild pain, 32.4% moderate pain, and 33.1% severe pain. For PFS symptoms, 10.3% of players had no symptoms, 27.6% mild, 31.7% moderate, and 30.3% severe symptoms. The Pearson Chi-Square test yielded a p-value of less than 0.05, indicating a significant association between knee pain and the presence of PFS.

Conclusion: The study confirmed a significant correlation between knee pain and PFS among football players, highlighting the need for targeted preventive and therapeutic strategies in sports settings to enhance player health and performance.

Keywords: Knee Pain, Patellofemoral Syndrome, Football Players, Sports Injuries, Numeric Pain Rating Scale, Kujala Scoring, SPSS Analysis, Athletic Health Management.

INTRODUCTION

Patellofemoral pain syndrome (PFPS), commonly known as Jumper's or Runner's knee, is a prevalent condition among athletes that leads to pain and other symptoms in the area between the kneecap and the knee joint, where the patellofemoral joint is formed by the articulation of the patella with the femur (1). This syndrome not only disrupts daily activities but also significantly affects athletic performance, as athletes frequently encounter knee pain influenced by psychological factors and excessive stress from intense training sessions, potentially leading to abnormal biomechanical changes (2). Knee pain can affect individuals of any age, but it is notably more common in younger populations, particularly those experiencing patellofemoral pain (3). Contrarily, older adults tend to suffer more from reduced foot mobility (4). Furthermore, studies indicate a correlation between higher body mass index (BMI) and patellofemoral pain, suggesting BMI as a potential diagnostic tool for patellofemoral osteoarthritis (4-5).

The symptoms of PFPS may affect one or both knees, manifesting as pain and stiffness during activities that put extra pressure on the knee joint such as climbing stairs, crouching, jumping, kneeling, running, and activities that involve prolonged bending or flexing of the knee (6). A comprehensive examination of the knee joint at both macroscopic and microscopic levels is crucial, as is

Journal of Health and Rehabilitation Research 2791-156X JHRR

participating in quadriceps training and improving hip strength to alleviate the discomfort (7). Extended periods of sedentary behavior can also lead to knee pain, although the specific biomechanical alterations responsible remain unidentified. Multiple risk factors contribute to patellofemoral pain, including decreased knee joint strength, which can lead to instability, and hip joint dysfunction, which can result in changes in the knee joint (8). Furthermore, poorly developed muscles and alterations in the Q angle may serve as early indicators of knee pain, while patellar chondroamalacia is recognized as a significant contributor to front knee pain (9).

Mental health factors like anxiety and depression are also linked to a higher likelihood of various musculoskeletal issues, including knee pain, which can further limit movement and reduce self-reliance (10). Modifications in activities can help lessen the intensity of excessive stresses on the knee joints. Deviations from normal joint mechanics in the lower leg can precipitate patellofemoral pain syndrome, highlighting the importance of prompt attention to these issues (11). Proper positioning of the patella is vital for maintaining stability in the knee joint, emphasizing the need for perfect alignment of the patella within its groove. Additionally, managing body weight is crucial. It is advisable for athletes, especially football players who frequently suffer from knee pain associated with PFS, to perform a brief warm-up routine lasting about five minutes before commencing sports training to prepare the muscles for physical activity (12).

Given the frequent occurrence of knee pain due to PFS among football players, it is imperative to investigate this association further. Understanding and addressing PFS can lead to enhanced player performance, quicker recovery periods, and potentially reduce long-term health issues, thereby making research into this syndrome both necessary and beneficial for the athletic community (13).

MATERIAL AND METHODS

Before initiating data collection, informed consent was secured from the management of the sports club and the participating athletes, ensuring compliance with ethical standards consistent with the Declaration of Helsinki. The study cohort comprised male and female football players who reported experiencing knee pain. Each participant provided informed consent, affirming their voluntary participation and understanding of the study's purpose and procedures.

Data were collected using structured surveys, which included the Numeric Pain Rating Scale (NPRS) and the Kujala Scoring questionnaire to assess the severity of knee pain and the impact on function, respectively. These instruments are established in the field for their reliability and validity in measuring pain and functional limitations associated with patellofemoral syndrome. Following the completion of data gathering, all collected information was securely stored to protect participant confidentiality and to minimize any potential biases that could affect the study's results.

The analysis of the data was conducted using SPSS software, version 25. The approach included both qualitative and quantitative methods to ensure a comprehensive understanding of the data. Qualitative data were analyzed by calculating frequencies and percentages, which were then visually represented through bar charts and pie charts to facilitate an understanding of the distribution across different categories. Quantitative analysis involved computing means and standard deviations for the numeric data, which were displayed in histograms to illustrate the distribution of scores. To explore the association between knee pain and patellofemoral syndrome, a chi-square test was performed, providing a statistical basis for evaluating the correlation between the variables studied.

RESULTS

The study population, as described in the combined table (Table 1), predominantly consisted of young adults with a mean age of 22.95 years, displaying a standard deviation of 2.83 years. The age range of participants extended from a minimum of 19 years to a maximum of 28 years, highlighting the youthful demographic involved in the study, which is typical for active football players.

Variable	Category	Frequency	Percent (%)
Age		M: 22.95	SD: 2.83
Knee Pain	No Pain	12	8.3
	Mild Pain	38	26.2
	Moderate Pain	47	32.4
	Severe Pain	48	33.1
	Total	145	100.0
Patellofemoral Syndrome	No Symptoms	15	10.3
	Mild Symptoms	40	27.6
	Moderate Symptoms	46	31.7

Journal of Health and Rehabilitation Research 2791-156X JHRR

Variable	Category	Frequency	Percent (%)
	Severe Symptoms	44	30.3
	Total	145	100.0
Statistical Test (Chi-Square)	Pearson Chi-Square	.000	
	P-Value	0.05	

The distribution of knee pain among the participants revealed a diverse range of severity. Notably, a small proportion of the participants, 8.3%, reported no knee pain at all. Mild pain was reported by 26.2% of the sample, indicating a significant portion of the players experienced some discomfort, but it was not debilitating. Moderate pain was the most common, reported by 32.4% of participants, suggesting that a substantial number of players were likely affected in their performance due to discomfort. Severe pain was reported by 33.1% of the participants, indicating a high level of discomfort that could potentially impair playing ability and quality of life (Table 1).

Similarly, the distribution of patellofemoral syndrome symptoms among the participants mirrored the severity seen in knee pain reports. A total of 10.3% of the participants exhibited no symptoms of patellofemoral syndrome, aligning with those reporting no knee pain. Those with mild symptoms constituted 27.6% of the sample, followed closely by moderate symptoms at 31.7%. Severe symptoms were reported by 30.3% of the participants, reflecting significant clinical concern and potentially indicating the need for targeted interventions (Table 1).

The Pearson Chi-Square statistical test applied to determine the association between knee pain and patellofemoral syndrome yielded a p-value of .000 (Table 1). This statistically significant result underscores a strong association between the severity of knee pain and the presence of patellofemoral syndrome symptoms among the football players studied. The implication is clear: as knee pain severity increases, so does the likelihood of experiencing patellofemoral syndrome symptoms, suggesting that interventions focusing on reducing knee pain could potentially alleviate or prevent the progression of patellofemoral syndrome in this athletic population.

DISCUSSION

In the current study, the participant demographic consisted of 145 football players, with a majority of 73.1% (106 players) being male and 26.9% (39 players) female. The average age was 22.95 years, with a range from 19 to 28 years. In terms of knee pain, 8.3% of participants reported no pain, 26.2% experienced mild pain, 32.4% had moderate pain, and 33.1% suffered from severe pain. This distribution is critical as it highlights the prevalence and severity of knee discomfort among young athletes actively engaged in sports. Regarding symptoms of patellofemoral syndrome, 10.3% exhibited no symptoms, 27.6% had mild symptoms, 31.7% displayed moderate symptoms, and 30.3% showed severe symptoms. The significant p-value (less than 0.05) established an association between knee pain and patellofemoral syndrome, reinforcing the need for targeted interventions to mitigate these conditions (14). Comparatively, a previous study on sports sciences students indicated that the prevalence of patellofemoral pain was 63.54%, with symptoms' severity considerably distributed across the cohort (14). The finding that a higher number of pain locations correlates negatively with outcomes such as AKPS score changes, and severity of pain over time underscores the complex interplay between multiple pain locations and worsening conditions (15). This relationship was significantly evident, with regression analyses showing substantial inverse correlations between the number of pain sites and various outcome measures, suggesting that the initial severity and spread of pain could predict long-term prognosis (15).

The current study's strength lies in its focus on a well-defined population of football players, which provides specific insights into the biomechanical and sports-related aspects of knee pain and patellofemoral syndrome (16). However, the study also has limitations, including its cross-sectional design, which restricts the ability to infer causality between observed associations. Additionally, the study's reliance on self-reported measures for pain and symptoms might introduce response biases and variability in the accuracy of the reported intensity of pain and symptoms (17).

Future research should consider longitudinal designs to better understand the progression of patellofemoral pain syndrome and its causal factors in athletic populations. It would also be beneficial to incorporate objective measures of knee function and alignment to supplement self-reported data, providing a more comprehensive assessment of the condition (18). Moreover, exploring the effectiveness of specific interventions, such as targeted physiotherapy regimens or changes in training practices, could provide practical solutions to reduce the incidence and severity of knee pain and patellofemoral syndrome in football players (19). Finally, expanding the demographic scope to include a wider age range and athletes from various sports could enhance the generalizability of the findings and offer broader insights into the management of knee-related conditions in sports medicine (20).

Journal of Health and Rehabilitation Research 2791-156X JHRR

CONCLUSION

The findings of this study emphasize the significant prevalence of knee pain and patellofemoral syndrome among football players, illustrating a clear association between these conditions and their impact on athletic performance. The evidence suggests that early intervention, proper training, and targeted physiotherapy could mitigate these issues, enhancing athlete welfare and prolonging sports careers. These insights underline the importance of incorporating preventive strategies and continuous monitoring into sports healthcare programs to reduce the risk and severity of knee-related ailments, ultimately contributing to better health outcomes and improved quality of life for athletes.

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