

Exercise Cause Patellofemoral Pain among Young Adults: a Cross Sectional Study

Zekra Ali Aziz^{1*} Hardi Bahram Sdeeq², Narin A.Aziz³ Hndren F. khder², Shiraz Sh. Abdullah²

¹Prosthetics and Orthotics Department, Erbil Technical Health and Medical College, Erbil

Polytechnic University, Erbil, Kurdistan Region, Iraq

Email: zekra.aziz@epu.edu.iq

²Department of physiotherapy, Erbil Technical Health and Medical College, Erbil

Polytechnic University, Erbil, Kurdistan Region, Iraq

³Physiotherapy department, Erbil Teaching Hospital, Erbil, Iraq

<https://doi.org/10.59480/phahs.v1i2.31>

Corresponding Author:

Zekra Ali Aziz*

¹Prosthetics and Orthotics Department, Erbil Technical Health and Medical College, Erbil Polytechnic University, Erbil, Kurdistan Region, Iraq Email: zekra.aziz@epu.edu.iq

Received: 03 June 2023

Accepted: 20 October 2023

Published: 30 December 2023

How to cite this article: Zekra Ali Aziz, Hardi Bahram Sdeeq, Narin A.Aziz, Hndren F. khder, Shiraz Sh. Abdullah (2023) Exercise Cause Patellofemoral Pain among Young Adults: a Cross Sectional Study, Pharmacy and applied health Science Journal 2(2): 2-10, <https://phahs.knu.edu.iq/index.php/phahs/article/view/31>, <https://doi.org/10.59480/phahs.v1i2.31>, This is an open access article distributed under the Creative Commons Attribution License: Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0)

Abstract

Patellofemoral pain syndrome (PFPS) is a prevalent musculoskeletal injury affecting both athletes and non-athletes, characterized by anterior knee pain. Diagnosis can be difficult due to similar symptoms with other conditions. Treatment should focus on overall rehabilitation, including strengthening and stretching exercises, rest, ice, bracing and taping. The knee joint is complex and plays an important role in daily activities, but is also one of the most commonly injured joints. This study was conducted at the University of Erbil Technical and Medical Health College to investigate PFPS in college students aged between 20-40 years there were 102 participants. A self-report questionnaire was used to collect data on biographic information. It was found that instead of the knee pain is more among the athletic group but the result statistically insignificant predictor of knee pain among the study participants P-value = 0.823. Finally, our study concluded that athletic and non-athletic developed PFPS, but athletic more than non-athletic, male and female affected by this condition, also types of exercises have effect according to results strengthen and stretching exercise they do for example football, fitness caused PFPS.

Keywords: Patellofemoral pain syndrome (PFPS), Athletic, Non Athletic.

1.Introduction:

Patellofemoral pain syndrome (PFPS) is a common illness has an important influence on community, in which a large portion of general population 22.7% and is especially in youth and pubescent athletes whose engage in pivoting, hopping, and cutting physical exercises [1,2].

PFPS is widespread musculoskeletal injuries notice in clinics of sports medicine consist of 25 % of knee injuries cases [3]. It occurred in both athletes and non-athlete, which affects in both women and men [4,5,6].

Definition of PFPS is recognized by anterior knee pain in peripatellar or retro patellar area without radiation, occasionally intermittent, aggravating by ascending and descending stairs, squatting movements, and after sitting for a long time [7,8,9]. Individuals with PFPS may also explain or experiment crepitus that comes from the PFJ, soreness on palpation of the patella facet and a small effusion [10,11].

It has various names, like "patellofemoral pain disorder, patellar misalignment, runner's knee and chondromalacia" [12,13]. The different diagnosis for a patient with PFPS can be "intra-articular pathology, peripatellar tendinitis or bursitis, plica syndromes, Sinding Larsen's disease, Osgood Schlatter's disease" [14,15,16].

The treatment of PFPS by application the overall program of the rehabilitation is corner stone to convey the person for successful return to athletic and adherence to the plan of the rehabilitation is required for ability for doing competitive activities.

The questionnaire included five parts:

Strengthening and stretching muscles of the hip, hamstring, calf and iliotibial band, flexibility exercises and soft tissue techniques may be beneficial to the person, also rest, ice, bracing, taping, foot orthoses can be uses during management [17&18].

1.1Aim

The purpose of this study is:

- 1.To know the deepen understanding of the PFPS.
- 2.To comparative between people who did an exercise and who didn't do an exercise

2.Methodology

This study was cross-sectional that carried out during the period of (December/2022- January/2023). The study was conducted at university of Erbil Technical and Medical Health College. Participants were chosen from the students of Salahaddin University- Erbil College of physical education and sport science with Erbil Health Technical Medical College. Students of both genders of young adults were aged between 20 and 40 years old who do exercises or not and who had or not knee pain means PFPS were included. While any one had history of knee trauma, use medications for knee pain, developed surgery to knee joint, and had medical condition affected knee joint were excluded.

After taking orally consent form the person's was done the information taken from the participant who they doing exercise and who did not, and who had anterior knee pain or not. This research was depending on same question that asked patient. The numbers of data that we received was 102 people who are college students, but we exclude 11 of them due to the above exclusions criteria.

This study was diagnosed by the self-report questionnaire, each participant will complete a questionnaire which designed by the researchers for collecting data by interviewing the students [19, 20, 21, 22 & 23].

1st part asked about biographic which include {age, gender, height, weight, and occupation}. 2nd part asked about previous diseases or using drugs. 3rd part analyzed the pain, and the exercises were done 4th part analyzed the pain during did activities, and 5th part was about the severity of the pain.

3. Statistical analysis:

The data which collected analyzed with Social Science Statistical Package (SPSS) version 20 and Microsoft Excel database. The results as mean (standard deviation) for continuous variable and frequency (percentage) for discreet variable were used. Proportions were compared using a chi-square test of association. And p- value equal to or less than 0.05 was regarded as statistically significant.

4. Results

That the total sample size were 102 but 11 of the participants were excluded because they had pervious problem in his or her knee joints by that 91 participants were included for data analysis. Mean demographics were as follows: gender 61.5% Male, 38.5% Female; age, 21.78± 2.06 years; Body mass, 22.99± 3.36; as shown in Table1. Also volunteers who experienced to make exercise (Athlete) 57.1%, and non- athlete 42.9% and the athlete participant 78.84% are male and 21.15% female. It is indicated that male more care about themselves than female to making exercise. Also notice mean ± SD of duration of exercise period was 1.09 ± 0.35 hour/day, and 3.94 ± 1.95 day/week.

Frequency of type exercise were experienced by participants also rate of participants for each of these sports activity which has risen in this way to the number and percentage Aerobic: 5 (% 9.61, Football 25 (% 48.07), Running 3 (% 5.76), Fitness 19(% 36.53) which shown in table no. (2). which indicate that most of the participant are making football and fitness less aerobic and running.

Table 1 Demographic characteristics of the overall study sample (No. = 91)

Variables	No.(%) or mean ± SD
Male	56(61.5%)
Female	35(38.5%)
Age	21.78± 2.06
BMI	22.99± 3.36
Athlete	52 (57.1%)
Male	41 (78.84 %)
Female	11 (21.15 %)
Duration of exercise: hour/day	1.09 ± 0.35
Duration of exercise: day/week	3.94 ± 1.95
Non Athlete	39 (42.9 %)

Table 2 Frequency according to types of exercise

Types of exercises	No. (%)
Aerobic	5 (9.61 %)
Football	25 (48.07 %)
Running	3 (5.76 %)
Fitness	19(36.53 %)
Total	52

The results presented in Table 3 provide information on the analysis of knee pain among the 29 participants who reported experiencing knee pain. The table shows the number and percentage of participants who reported experiencing knee pain on the right, left, or both knees, as well as the severity of the pain, categorized as mild, moderate, or severe. Additionally,

the table provides information on the athletic status of participants who reported knee pain.

The data in Table 3 suggest that knee pain is a common issue, with 41.37% of participants reporting pain in both knees. Moreover, 37.93% of participant's report pain in the left knee, while 20.68% report pain in the right knee.

The severity of knee pain was categorized as mild, moderate, or severe, with 68.96% of participants reporting mild pain, 27.59% reporting moderate pain, and only 3.44% reporting severe pain. Regarding the athletic status of participants who reported knee pain, 55.17% of participants were classified as athletic, while 44.83% were classified as non-athletic.

Table 3 Analysis of the knee pain among the 29 participants who have Knee e pain

Knee pain	No. (%)
Right	6 (20.68 %)
Left	11 (37.93 %)
Both	12 (41.37 %)
Athletic /Have knee pain	16 (55.17 %)
Not athletic /Have knee pain	13 (44.83 %)
Severity of the knee pain	
Mild	20 (68.96 %)
Moderate	8 (27.59 %)
Severe	1 (3.44 %)

The results presented in Table 4 provide information the distributions of knee pain based on the activities type and the pain severity among athletes and non-athletes. The data show that kneeling is the most

common activity that causes knee pain (67.85%), followed by heavy household activities (65.51%) and running/jogging (72.41%). Hopping/jumping is the least common activity that causes knee pain (52.38%).

When looking at specific activities and severity of knee pain, the data show that athletes and non-athletes had different experiences. For example, among athletes, running/jogging caused the most severe knee pain (100% of severe cases), while heavy household activities caused the least severe knee pain (50% of severe cases). On the other hand, among non-athletes, kneeling caused the most severe knee pain (100% of severe cases), while heavy household activities caused the least severe knee pain (50% of severe cases).

The results presented in Table 5 provide information about the distributions of knee pain and how it affects the activities of athletes and non-athletes. The table shows the frequency of knee pain experienced after stopping an activity and the extent to which pain limits activities, with data presented for monthly, weekly, and daily durations.

Among the participants who experience knee pain after stopping an activity, 78.57% report daily pain, while only 10.71% report monthly or weekly pain. Interestingly, the percentage of athletes who experience daily knee pain is higher than that of non-athletes, with 66.67% of athletes reporting daily pain compared to 33.33% of non-athletes.

Regarding the extent to which pain limits activities, 45.45% of participants report that knee pain limits their activities, with 36.36% experiencing daily pain. Again, a higher percentage of athletes report that their

pain limits activities compared to non-athletes, with 80% of athletes reporting limitations compared to 20% of non-athletes.

Table 5 Distributions of the knee pain and how it affects the activities with athlete and non-athlete for duration Monthly, Weekly and Daily No. (%).

How frequent	Monthly No.(%)	Weekly No.(%)	Daily No.(%)	Total No.
The effects				
Experience Knee pain after stopping activity	3(10.71%)	3(10.71%)	22(78.57%)	28 (100%)
Athlete	2 (66.67%)	2 (66.67%)	14 (63.64%)	
Non Athlete	1 (33.33%)	1 (33.33%)	8 (36.36%)	
Pain limit the activities	5(45.45%)	2(18.18%)	4(36.36%)	11 (100%)
Athlete	4 (80%)	2 (100%)	4 (100%)	
Non Athlete	1 (20%)			

Table 6 Frequency of exercise doing or not and knee pain or not among the participants

Participants	Have knee pain No (%)	Have not knee pain No (%)	P < 0.05(χ^2)
Athletic	16(55.17%)	26(41.93%)	0.823
Not athletic	13(44.83%)	36(58.07%)	
Total	29(100%)	62(100%)	

5. Discussion

The aim of this study was to analyze the influence of the exercise as a cause for patellofemoral pain syndrome (PFPS) among young adults. The frequency of PFPS still needs to be further explored in the population generally. So our knowledge to be best on the frequency of PFPS, this study was done for the first time in our university. The present study gathered data from a group of young adults and analyzed whether the exercises associated with the frequency of PFPS or not.

Overall, the data suggest that knee pain is a common problem, with athletes being more likely to experience it than non-athletes. The higher percentage of athletic individuals with knee pain suggests that athletes may be increase the risk of developing pain in the knee because their increased physical activity and strain on the knee joint [3,12].

The higher percentage of participants reporting pain in both knees could indicate a more generalized joint issue, rather than a specific injury. This finding suggests that bilateral knee pain is a common occurrence among the participants, and it may have significant implications for their overall quality of life.

The severity of knee pain varies based on the type of activity, and athletes and non-athletes have different experiences with specific activities. Understanding these patterns can help in developing interventions and preventive measures for knee pain in both athletes and non-athletes. The data reveals that kneeling and running/jogging are the most common activities that cause knee pain, while hopping/jumping is the least common activity that causes knee pain [9,11].

In terms of severity, mild pain is the most common across all activities, followed by moderate and severe pain. Extreme pain is the least common, with only one participant reporting it. The higher percentage of participants reporting mild pain could indicate that the knee pain experienced by most participants is manageable and not significantly impacting their daily activities table (3) [4,5].

When looking at the data by athlete status, it is interesting to note that athletes reported knee pain more frequently than non-athletes in most activities, except for squatting and heavy household activities. This could be due to the fact that athletes engage in more strenuous physical activities, leading to more knee injuries and pain according to table (4) [2,7].

The results suggest that knee pain can significantly impact daily activities, with a higher percentage of athletes experiencing daily pain and activity limitations. The findings may have implications for athletes who engage in high-impact activities that place significant stress on their knees. These individuals may benefit from seeking medical advice and engaging in exercises that can help strengthen the muscles around the knee joint depending on table (5) [4].

The results suggest that athletic individuals are more likely to experience knee pain compared to non-athletic individuals. This finding is consistent with previous research that has shown the incidence of knee injuries is higher among athletes due to the repetitive stress placed on the knee joint during physical activities as shown in table (6) [2].

It is significant to mention that this study doesn't establish causality, and other factors such as age, gender, and type of the exercises may also contribute to the development of knee pain. Future research should explore the relationship between exercise and knee pain in more detail, taking into account these potential confounding factors.

Overall, the study provides valuable insights into the relationship between exercise and knee pain and highlights the importance of exercise programs that are tailored to individual needs and abilities to prevent and manage knee pain.

6. Conclusions and Recommendations

6.1. Conclusions:

Finally, our study concluded that athletic and non-athletic caused patellofemoral Pain (PFPS), but athletic more than non-athletic, male and female caused by this condition, also types of exercises have effects according to results strengthen and stretching exercise they do for example football, fitness caused PFPS.

6.2. Recommendations:

At the end of this study, we recommended that those who did exercise should be exercised carefully (with caution) and avoid sudden movements, also do physical therapy such as stretching and strengthening exercise. We recommend future research on this subject should conduct to investigate the type of exercise and its effect on knee cap pain.

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