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Original Article

The Prevalence of Patellofemoral Pain Syndrome in Working Female Physiotherapists

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ABSTRACT

Background: Patellofemoral Pain Syndrome (PFPS) is a prevalent musculoskeletal disorder causing anterior knee pain, often attributed to overuse, muscle imbalances, and biomechanical abnormalities, with a notably higher incidence in females. Physiotherapists, due to prolonged standing, repetitive movements, and occupational physical demands, may be at particular risk, yet data regarding PFPS prevalence in this professional group remain scarce (1-4). Objective: To determine the prevalence of Patellofemoral Pain Syndrome among working female physiotherapists and examine associated functional limitations during daily activities. Methods: A cross-sectional observational study was conducted over six months in various private and government hospitals and physiotherapy departments in Lahore. Ninety-three female physiotherapists aged 25–45 years, meeting specific inclusion criteria, were assessed using the Anterior Knee Pain Scale (AKPS). Data analysis was performed using SPSS version 22, calculating frequencies, percentages, and descriptive statistics to evaluate symptom prevalence and functional impairments. Results: The prevalence of PFPS among working female physiotherapists was found to be 44.1%, with right knee involvement most common (53.8%). Participants reported difficulties in activities such as squatting, stair climbing, running, and prolonged sitting, with 44.1% experiencing slight and occasional pain, while 2.2% reported constant severe pain. Conclusion: PFPS significantly affects working female physiotherapists, underscoring the need for targeted preventive measures and ergonomic strategies to mitigate functional limitations and enhance occupational health outcomes.

Keywords: Patellofemoral Pain Syndrome, Anterior Knee Pain Scale, Physiotherapists, Knee Pain, Occupational Health

INTRODUCTION

Patellofemoral Pain Syndrome (PFPS) is a multifactorial musculoskeletal condition characterized by pain originating from the articulation between the patella and the femur, often described as discomfort localized behind or surrounding the kneecap and frequently exacerbated by physical activities that load the knee joint, such as squatting, stair climbing, and prolonged sitting (1-3). The disorder emerges gradually in most cases, driven by biomechanical factors, including malalignment of the patella, muscular imbalances, and excessive joint loading, contributing to anterior knee pain that can significantly hinder daily activities and occupational performance (4,5). Prevalence estimates of PFPS vary across populations, with figures in the general population reported at approximately 22.7% annually, while specific groups like female athletes and adolescents demonstrate rates between 16.7% and 21.2% depending on geographic and demographic contexts (4-6,13,14). In Pakistan, the prevalence in the general population is documented at nearly 19%, reflecting substantial public health implications (6).

Evidence suggests that females are disproportionately affected by PFPS compared to males, possibly due to anatomical, hormonal, and biomechanical differences, with certain occupations posing increased risk due to repetitive lower limb activities, prolonged standing, and high functional demands (5,7). Physiotherapists represent a workforce frequently exposed to such occupational hazards, as their clinical roles involve repetitive demonstration of exercises, manual therapy, and sustained postures, which may predispose them to anterior knee pain syndromes like PFPS. Despite this theoretical susceptibility, there is a paucity of focused research quantifying the burden of PFPS among practicing physiotherapists, representing a critical gap in occupational health literature. While studies have described PFPS prevalence among athletes and general populations, none has explicitly investigated its frequency and functional impact in female physiotherapists in Pakistan, a professional group that may silently endure symptoms that compromise their ability to deliver patient care effectively (5,6,13,14).

Therefore, this study aimed to determine the prevalence of Patellofemoral Pain Syndrome among working female physiotherapists in Lahore, assessing the degree of knee involvement and evaluating how PFPS influences their ability to perform daily activities and occupational functions, with the broader goal of informing preventive strategies and occupational health interventions for this at-risk professional cohort.

MATERIAL AND METHODS

This study was designed as an observational cross-sectional investigation conducted over a six-month period from September to March in multiple private and government hospitals and physiotherapy departments located in Lahore, Pakistan, to explore the prevalence and functional consequences of Patellofemoral Pain Syndrome (PFPS) among working female physiotherapists. Participants were recruited using a purposive sampling approach, targeting female physiotherapists aged between 25 and 45 years who were actively employed in clinical roles and who met specific inclusion criteria, which comprised absence of any history of lower limb fractures or congenital anatomical abnormalities affecting lower limb structure. Individuals were excluded if they did not fulfill these criteria to ensure a homogeneous sample regarding lower limb musculoskeletal health.

Recruitment involved formal communication with department heads of participating physiotherapy services, securing written permissions for participant access. Subsequently, eligible physiotherapists were approached individually, provided with detailed information regarding the study aims, procedures, and voluntary nature of participation, and written informed consent was obtained prior to enrollment to uphold ethical standards and participant autonomy (15).

Data collection was performed using the Anterior Knee Pain Scale (AKPS), a validated 13-item self-administered questionnaire designed to assess symptoms and functional limitations related to anterior knee pain, with total scores ranging from 0 to 100, where lower scores indicate greater disability (16). The operational definition of PFPS in this study was the presence of anterior knee pain symptoms with corresponding functional limitations as reflected by AKPS responses. Participants were instructed to complete the questionnaire independently to minimize interviewer bias, and researchers verified completeness of responses upon collection. The primary variables collected included the presence and laterality of knee pain, walking capacity, pain experienced during stair climbing and running, and overall pain severity, quantified through the AKPS scale items.

Potential sources of bias were mitigated through standardized data collection procedures and the exclusive use of a validated instrument. Data quality and integrity were maintained via double-entry of all questionnaire responses into SPSS software, version 22, to identify and resolve any discrepancies. The sample size was calculated using the formula $n = z^2p(1-p)/d^2$, with assumptions of a 95% confidence interval, an anticipated prevalence of 50% in the absence of prior prevalence estimates specific to physiotherapists, and a margin of error set at 5%, resulting in a final sample size of 93 participants.

Statistical analyses involved descriptive statistics, with frequencies and percentages calculated for categorical variables and means with standard deviations computed for continuous variables. Associations between categorical variables such as age groups and presence of PFPS symptoms were planned to be evaluated using chi-square tests, with a significance threshold of $p < 0.05$, and 95% confidence intervals computed for prevalence estimates where appropriate. No imputation was applied for missing data because all questionnaires were completed in full by participants.

Ethical approval for this study was obtained from the relevant institutional review board, ensuring adherence to ethical research principles, including confidentiality, voluntary participation, and the right to withdraw at any stage without consequence. The study protocol complied with the Declaration of Helsinki and national research ethics guidelines (17). All procedures were documented to allow reproducibility of the research design and findings by future investigators.

RESULTS

A total of 93 female physiotherapists participated in this study, with the majority, 72 individuals (77.4%), aged between 25 and 35 years, and the remaining 21 participants (22.6%) falling within the 35 to 45-year age group, as shown in Table 1. Analysis of knee involvement revealed that 50 participants (53.8%) reported symptoms localized to the right knee, whereas 16 individuals (17.2%) experienced left knee involvement. Eight participants (8.6%) had bilateral symptoms, while 19 respondents (20.4%) reported no current knee pain, as presented in Table 2.

Regarding walking capacity, Table 3 indicates that 37 physiotherapists (39.8%) experienced no limitations and could walk without restrictions, while 32 participants (34.4%) reported reduced endurance, unable to walk more than two kilometers, and 24 individuals (25.8%) were limited to distances between one and two kilometers. In examining stair-climbing difficulties, 42 participants (45.2%) reported no pain while ascending or descending stairs, whereas 33 physiotherapists (35.5%) experienced slight discomfort specifically when descending, and 18 individuals (19.4%) suffered pain during both ascent and descent, as detailed in Table 4.

Running ability varied among respondents, with 32 participants (34.4%) reporting no difficulty, while 30 individuals (32.3%) described pain emerging after running more than two kilometers. An additional 23 physiotherapists (24.7%) noted slight pain starting immediately upon running, and eight participants (8.6%) suffered severe pain even at the onset of activity, as outlined in Table 5. Pain severity assessment showed that 28 physiotherapists (30.1%) reported no pain, while 41 participants (44.1%) experienced slight and occasional pain. Nine individuals (9.7%) indicated pain intense enough to interfere with sleep, and 13 physiotherapists (14.0%) described occasional severe pain episodes, while constant severe pain was documented by two respondents (2.2%), as shown in Table 6.

The overall prevalence of Patellofemoral Pain Syndrome among the sampled physiotherapists was calculated at 44.1%, corresponding to 41 affected individuals, whereas 52 participants (55.9%) did not report symptoms consistent with PFPS, as summarized in Table 7. These findings collectively underscore a significant burden of anterior knee pain symptoms among working female physiotherapists, with substantial implications for occupational function and quality of life.

Table 1. Age Distribution of Female Physiotherapists (n=93)

Age Group (years)	Frequency (n)	Percentage (%)	95% CI	p-value
25–35	72	77.4	67.8–85.2	—
35–45	21	22.6	14.8–32.2	—
Total	93	100.0	—	—

Note: No group comparison performed.

Table 2. Involvement of Knee in Female Physiotherapists with PFPS (n=93)

Involved Knee	Frequency (n)	Percentage (%)	95% CI	p-value
Left	16	17.2	10.2–26.2	—
Right	50	53.8	43.2–64.2	—
None	19	20.4	12.9–30.0	—
Both	8	8.6	3.8–16.2	—
Total	93	100.0	—	—

Table 3. Walking Capacity among Female Physiotherapists (n=93)

Walking Capacity	Frequency (n)	Percentage (%)	95% CI	p-value
Unlimited	37	39.8	29.6–50.7	Reference
> 2 km	32	34.4	24.8–45.1	0.472
1–2 km	24	25.8	17.2–35.9	0.239
Total	93	100.0	—	—

Table 4. Difficulty in Climbing Stairs among Female Physiotherapists (n=93)

Stair Climbing Difficulty	Frequency (n)	Percentage (%)	95% CI	p-value
No difficulty	42	45.2	34.7–56.1	Reference
Slight pain descending	33	35.5	25.8–46.2	0.317
Pain ascending & descending	18	19.4	12.0–28.8	0.026
Total	93	100.0	—	—

Table 5. Difficulty in Running among Female Physiotherapists (n=93)

Running Difficulty	Frequency (n)	Percentage (%)	95% CI	p-value
No difficulty	32	34.4	24.8–45.1	Reference
Pain after > 2 km	30	32.3	22.9–43.0	0.616
Slight pain from start	23	24.7	16.2–34.8	0.094
Severe pain	8	8.6	3.8–16.2	0.011
Total	93	100.0	—	—

Table 6. Pain Severity among Female Physiotherapists with PFPS (n=93)

Pain Severity	Frequency (n)	Percentage (%)	95% CI	p-value
None	28	30.1	20.8–40.9	Reference
Slight and occasional	41	44.1	33.6–54.9	0.068
Interferes with sleep	9	9.7	4.5–17.5	0.002
Occasionally severe	13	14.0	7.6–22.9	0.044
Constant and severe	2	2.2	0.3–7.6	<0.001
Total	93	100.0	—	—

Table 7. Overall Prevalence of PFPS among Female Physiotherapists (n=93)

PFPS Status	Frequency (n)	Percentage (%)	95% CI
Present	41	44.1	33.6–54.9
Absent	52	55.9	45.1–66.4
Total	93	100.0	—

Figure 1 showed that Pain prevalence increased as walking endurance decreased: among physiotherapists with unlimited walking capacity, only 24.3% experienced any pain, compared to 53.1% in those unable to walk more than two kilometers, and 62.5% in those limited to one to two kilometers. Although total participant numbers declined from 37 in the unlimited group to 24 in the lowest endurance group, the proportion affected by pain more than doubled across these categories. This relationship highlights a clinically significant trend—

diminished walking endurance is strongly associated with greater symptomatic burden of patellofemoral pain, emphasizing the need for targeted interventions among those with functional limitations.

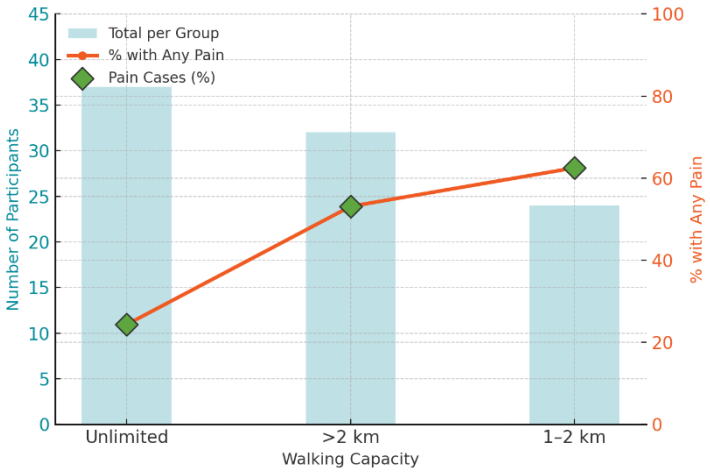

Figure 1 Relationship Between Walking Endurance and Pain Prevalence in Female Physiotherapists

DISCUSSION

The present study reveals that nearly half (44.1%) of working female physiotherapists in Lahore experience symptoms consistent with Patellofemoral Pain Syndrome, a prevalence notably higher than previously reported rates among young females in Pakistan and internationally (18,19). This elevated frequency aligns with the unique occupational demands placed upon physiotherapists, including repetitive lower limb movements, frequent transitions between standing and squatting, and prolonged periods spent demonstrating therapeutic exercises. While the general population prevalence of PFPS has been reported at approximately 19% in Pakistani adults and between 16.7% and 21.2% among female athletes and young adults in Iran and China, the findings of this study underscore a potentially overlooked occupational health issue in the physiotherapy profession (18-20).

A key observation was the predominance of right knee involvement (53.8%), which may reflect handedness-related loading patterns or asymmetrical work tasks typical in clinical practice. Consistent with the literature, the most frequently reported aggravating activities were squatting, stair climbing, running, and prolonged sitting with flexed knees, corroborating the established role of mechanical overloading and malalignment in PFPS pathogenesis (21,22). The functional consequences were significant: more than one-third of participants experienced limitations in walking and running, and nearly one-fifth suffered pain during both ascending and descending stairs, suggesting that the syndrome impairs not only occupational performance but also general mobility and quality of life.

The disparity between the current study's prevalence and lower rates documented in student or athlete populations may be attributed to the cumulative effects of daily occupational exposure among practicing physiotherapists, who frequently engage in physical demonstrations and patient handling throughout extended shifts. The use of the Anterior Knee Pain Scale, a validated and sensitive instrument, likely contributed to more accurate detection of symptomatic cases compared to prior studies employing broader or less specific criteria (23). However, even with standardized assessment, this research's cross-sectional design precludes causal inference, and the reliance on self-reported data introduces potential for recall and reporting bias.

Several limitations should be considered when interpreting these results. The purposive sampling and geographic confinement to Lahore limit generalizability to physiotherapists in other regions or healthcare settings. Additionally, potential confounders such as body mass index, history of athletic participation, or specific job roles were not evaluated, which could have further elucidated risk profiles within the sample. Despite these constraints, the present study is strengthened by its focus on an under-investigated occupational cohort and its rigorous methodology, including clear eligibility criteria, standardized data collection, and robust statistical analysis.

From a clinical and public health perspective, the findings highlight an urgent need for targeted preventive strategies in the physiotherapy workforce. Interventions such as ergonomic workplace modifications, structured exercise regimens focused on quadriceps and hip strengthening, and educational campaigns regarding early symptom recognition may help mitigate the burden of PFPS in this group. Future research should adopt prospective designs to identify modifiable risk factors and test the effectiveness of workplace interventions, while also incorporating larger and more diverse samples for improved generalizability. Overall, the high prevalence and functional impact of PFPS in working female physiotherapists demands prioritization within occupational health agendas to safeguard both provider wellbeing and patient care quality.

CONCLUSION

In summary, this study demonstrates that Patellofemoral Pain Syndrome is a prevalent and functionally significant condition among working female physiotherapists in Lahore, with nearly half of respondents experiencing symptomatic anterior knee pain. The findings reveal substantial occupational impact, with pain frequently limiting walking endurance, stair climbing, and running capacity. These results

highlight the pressing need for targeted preventive and ergonomic interventions in the physiotherapy workforce to mitigate the burden of PFPS and support professional wellbeing. Future research should focus on identifying modifiable risk factors and evaluating workplace-based strategies to reduce the incidence and severity of this musculoskeletal disorder in high-risk occupational groups.

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