



## Current Physiotherapy Approaches for Patellofemoral Pain Syndrome: A systematic review

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### Abstract

**Background** PFPS is a common knee-flexion-induced pain among young people who attend physiotherapy. **Significant** This study focused on PT management on PFPS. **Methods** The papers were retrieved via an electronic search of year-round databases. The McMaster Critical Review Form for Quantitative Research and the Cochrane (EPOC) were utilised for quality and risk assessments. **Limitations** Small evidence on Blood flow restrictions, kinesiophobia, and patient education could be due to lack of investigation. **Findings** More trials on the effect of various types of PFPS intervention. **Implications** Physiotherapy improves pain, physical function, and kinesiophobia, but further research is needed for clinical applicability.

Keywords: physiotherapy; patellofemoral pain; physical functions; kinesiophobia

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### 1.0 Introduction

Patellofemoral pain Syndrome (PFPS) affects athletes and youth. Exercise lowers PFPS pain and improves physical function 12 months after treatment, although 30% of patients still have problems due to kinesiophobia and insufficient education (Pollatos et al., 2021). Kinesiophobia, low Quality of Life (QoL), and reduced physical function from PFPS enhance the risk of quitting sports.

Physiotherapists are also optimistic about Blood Flow Restrictions (BFR). BFR and physiotherapy management have been proven to improve knee discomfort (Giles et al., 2017; Schwiete et al., 2021), but their effects on PFPS are uncertain.

Pollatos et al. (2021) recommended patient education and kinesiophobia prevention to improve PFPS but more was needed about how physiotherapy manages patient education. This study also examined if combining physiotherapy management with education and reducing kinesiophobia will improve PFPS treatment. Two objectives were devised for this study 1) to identify current physiotherapy management for PFPS and 2) to find the best practice for PFPS based on evidence to give the newest evidence about the clinical evaluation, outcome measures, and guidelines for PFPS treatment.

### 2.0 Literature Review

#### 2.1 Physiotherapy management

##### 2.1.1 Therapeutic Exercise in the Rehabilitation of PFPS

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Tan et al. (2020) found that decreased weight-bearing ankle dorsiflexion range increased knee pain, Anterior Knee Pain Score (AKPS), and maximum knee pain during stair ambulation, worsening disability. Although minor, higher Foot Posture Index (FPI) scores imply overly pronated foot posture and midfoot mobility connected to fewer single step-ups and double-leg sit-to-stands to knee discomfort. Shorter weight-bearing ankle dorsiflexion, pronated foot posture, and midfoot mobility exacerbated knee pain and impairment. These weak linkages impede foot and ankle mobility and cause PFPS knee discomfort and function. This hypothesis suggests improving foot position to prevent knee pain and disability.

Capin & Snyder-Mackler (2018) and Nielsen et al. (2020) disagreed with Tan (2020) and recommended open and closed kinetic chain exercises for hip and knee strengthening in physiotherapy. Nielsen et al. (2020) advise physiotherapists to provide 18-year-olds gluteus medius and hamstring workouts. 78% of patients improved their NRPS and AKPS after a year. All authors agreed that therapeutic exercises and other therapies improve PFPS discomfort and function.

#### 2.1.2 Therapeutic Strengthening for Quadriceps

Previous research has focused on actively strengthening the quadriceps vastus medialis oblique (VMO) coupled with manual treatment, tape patella realignment, stretching, and therapeutic exercise (Willy et al., 2019). However, despite the need for quadriceps exercises, numerous interventions focusing on single muscle strengthening have failed with their theoretical rationale (Albornoz-Cabello et al., 2021) because the patients need to understand their condition, and the importance of strengthening exercises is unknown. Therefore, it is a need for a patient's know the value of therapeutic strengthening in curing their conditions; if not, the strengthening could fail.

#### 2.1.3 Core training

The lumbo-pelvic-hip complex muscle core training has improved PFPS's pain intensity and dynamic balance (Halabchi et al., 2017). Chevidikunnan, Al Saif, Gaowgzeh, and Mamdouh (2016) hypothesised that lumbo-pelvic-hip complex muscle weakening causes PFJ tension and anterior knee pain. According to this notion, core strength reduces PFJ stress. Chevidikunnan et al. (2016) assessed 20 female PFPS patients aged 16–40 using Visual Analogue Scale and Star Excursion Balance Test and treated them with physiotherapy and core muscle training for four weeks. They improved pain intensity, dynamic balance, and spine stability, proving that core strengthening in PFPS treatment works.

#### 2.1.4 Stretching

Lee et al. (2021) and Willy et al. (2019) reported that quadriceps stretching improved hip and quadriceps muscle pain and function in PFPS. Lee et al. (2021) evaluated 20 static and 24 dynamic stretchers using VAS and anterior knee pain which the Quadriceps length is measured by prone knee flexion angle. Quadriceps flexibility, strength, muscle activation time, and patient-reported knee outcomes improved significantly in the static stretching group (quadriceps flexibility):  $109 \pm 9.7$  vs  $128 \pm 2.6$ ,  $P= 0.00$ ; Strength:  $94 \pm 40$  vs  $165 \pm 49.1$ ,  $P= 0.00$ ; muscle activation time:  $65 \pm 17$  vs  $52 \pm 14.4$ ,  $P= 0.007$ ; VAS score:  $5 \pm 0.9$  vs  $3 \pm 1.0$ ,  $P= 0.00$ ; and AKPS score:  $48 \pm 6.1$  vs  $70 \pm 6.8$ ,  $P= 0.00$ . In the dynamic stretching group, quadriceps flexibility, strength, muscle activation time, and patient-reported outcomes increased considerably in the affected knees. (quadriceps flexibility:  $104 \pm 9.2$  vs  $126 \pm 7.9$ ,  $P= 0.00$ ; strength:  $93 \pm 37.6$  vs  $183 \pm 46.5$ ,  $P= 0.00$ ; muscle activation time:  $67 \pm 16.7$  vs  $50 \pm 16.4$ ,  $P= 0.00$ ; VAS score:  $5 \pm 1.1$  vs  $2 \pm 1.0$ ,  $P= 0.00$ ; and AKPS score:  $51 \pm 5.8$  vs  $74 \pm 8.4$ ,  $P= 0.00$ ). This study suggested quadriceps stretching to improve pain, muscle activation, and strength; thus, stretching the quadriceps is recommended in PFPS management.

#### 2.2 Blood flow restrictions training

BFR improved quadriceps strength, fatigue resistance, and muscle growth in two studies (Giles et al., 2017; Schwiete, 2021). Giles et al. (2017) randomised 79 individuals to standard or low-load BFRs. Both groups conducted leg extensions and press at 70% and 30% 1RM for eight weeks. The study was measured with repeated-measures analysis of variance that compared with the Kujala Patellofemoral Score, Visual Analogue Scale for "worst pain," knee extensor torque (Newton-meter), and quadriceps muscle thickness therapy (cm). Sixty-nine (87%) finished the experiment ( $n=34$  standard,  $n=35$  BFR). BFR reduced ADL discomfort by 93% ( $p=0.03$ ) and increased knee extensor torque in 39 uncomfortable knee extension resistance patients ( $p=0.01$ ). After eight weeks, low-load BFR reduced PFPS patients' daily discomfort more than quadriceps training. BFR outperformed exercise for PFPS.

Schwiete et al. (2021) results show that maximum strength ( $p < 0.001$ ), fatigue resistance ( $p < 0.001$ ), muscle thickness ( $p < 0.001$ ), and girth ( $p = 0.008$ ) increased in both groups over time with no differences between groups ( $p > 0.05$ ). During the intervention, the rBFR group was exposed to significantly lower perceived pain and exertion values than cBFR ( $p < 0.05$ ). This study concluded that resting blood-flow restriction training led to similar gains in strength, fatigue resistance, and muscle hypertrophy.

#### 2.3 Education

All PFPS management and therapy studies concentrated on therapeutic effects and passive care, neglecting patient education and essential information on physiotherapy management and preventing kinesiophobia, which can lead to treatment failure (Pollatos et al., 2021). Barber et al. (2022) revealed that PFPS patients demand a diagnosis, individualised interventions, and appropriate education to improve their experience and outcomes.

The Biopsychosocial (BPS) model recommends educating patients about their illness, reducing kinesiophobia, and improving QoL. Vicenzino et al. (2019) advised management to focus on individuals rather than painful joints. Most therapists and physicians treat pathophysiologically despite patients' worries about pain influencing QoL.

#### 2.4 Preventing Kinesiophobia with knee exercises.

De Oliveira Silva et al. (2019) reported PFPS-related kinesiophobia and knee extension weakness in women. Kinesiophobia and knee extension weakness slow cadence and increase knee flexion during stair ascending, increasing PFJ loading. Three-dimensional

kinematic analyses during stair descent, knee extensor isokinetic dynamometry (isometric, concentric, and eccentric), and the Tampa scale for kinesiophobia were used to examine 40 women with PFPS. The Pearson coefficients for Kinesiophobia, cadence, and peak knee flexion are 0.62 and 0.76, respectively. Kinematics and kinesiophobia did not affect knee extensor strength ( $p > 0.05$ ). Selçuk & Karakoyun (2020) found 85.7% of osteoarthritis patients have high-level kinesiophobia. They suggested that persons with knee osteoarthritis cannot overcome kinesiophobia with pain-only rehabilitation. Patients should learn about kinesiophobia and exercise.

### 3.0 Methodology

#### 3.1 Search strategies

The purpose of the investigation was determined using population, intervention, comparison, and outcome (PICO) procedures. In addition, PICO was utilised to set this study's eligibility criteria.

Population: Patellofemoral pain

Intervention: Physiotherapy management

Comparison: Pre- and post-intervention

Outcome: Numerical Pain Rating, Koos-PF, Tampa Scale, Handheld dynamometer, Knee muscle performance test, real-time ultrasounds

The search strategies were performed through the following online database: Google Scholar, ScienceDirect, PubMed and manual searches. The study focused on articles from the year 2013- 2023.

The keywords "Physiotherapy management PFPS," "Outcome measure PFPS," "Therapeutic Exercise in the Rehabilitation of Patellofemoral Pain," "Therapeutic Exercise for Quadriceps," "Core training in PFPS," "Stretching," "Dry needling" "Blood flow restriction training," "Powerplate Vibration," "PFPS Kinesiophobia" and "Patient education" were used to search each database (table 1) the studies were manually excluded from determining eligibility. The search engine found research by title, design, methodology, interventions, and demographics. Inclusion criteria were based on Patellofemoral syndrome physiotherapy. The National Health and Medical Research Council's hierarchy of evidence rated all studies (NHMRC) as PRISMA-compliant (figure 1). The included articles met the following criteria: (1) Any study except systematic reviews. (2) Experimental studies on PFPS were chosen based on the inclusion criteria. The exclusion criteria were (1) abstract, (2) title keywords unrelated to research topics, unclear articles, (3) non-English paper

Table 1: Example of literature searching using the search strategy.

SEARCH ID	SEARCH TERM	RESULTS OF ARTICLE (Science Direct)	RESULTS OF ARTICLE (Google Scholar)	RESULTS OF ARTICLE (Pubmed)
1.	Physiotherapy management PFPS	164	418	8
2.	Outcome measure PFPS	683	679	10
3.	Therapeutic Exercise in the Rehabilitation of Patellofemoral Pain	239	3770	173
4.	Therapeutic Exercise for Quadriceps	1271	457	1050
5.	Core training in PFPS	148	210	4
6.	Stretching in PFPS	319	312	4
7.	Dry needling in PFPS	151	91	0
8.	Blood flow restriction training in PFPS	19	1140	5
9.	Powerplate Vibration in PFPS	0	1	1
10.	PFPS Kinesiophobia	54	489	0
11.	Patient Education in PFPS	218	368	2

#### 3.2 Study Selection and data extraction

Search engines selected the studies based on the study's title, study design, methodology, results, discussion, and conclusion. Studies that did not match the criteria for inclusion were excluded. The language and abstracts of the found papers also assessed the research. If there was no abstract or it was uncertain if the study should be included, the full-text articles were retrieved to decide inclusion or exclusion. The material has been written in English to ensure understandings.

#### 3.3 Risk of bias

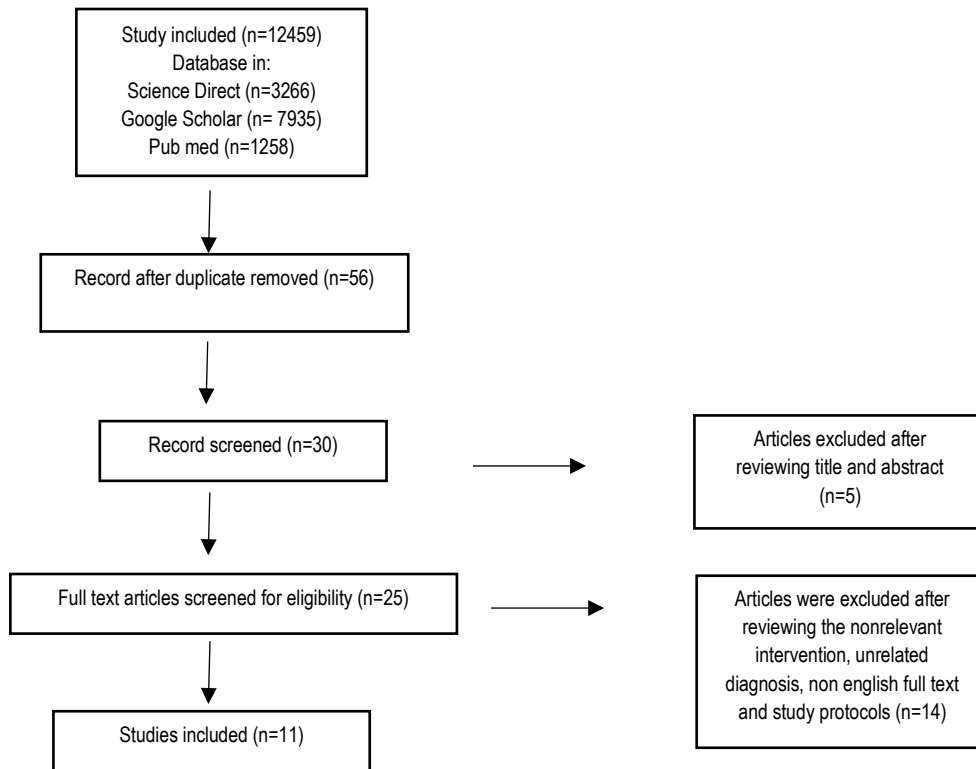
The Cochrane Effective Practice and Organisation of Care (EPOC) assessed the study's bias. The nine assessment criteria were random sequence generation, allocation concealment, similar baseline outcomes and characteristics, incomplete outcome data, knowledge of allocated interventions adequately prevented during the study, contamination protection, selective outcome reporting, and another bias risk. Each criterion was graded high-risk, low-risk, or bias-undetermined.

#### 3.4 Methodological quality

Every study was ranked by the National Health and Medical Research Council's (NHMRC) hierarchy of evidence. The McMaster Critical Review Form for Quantitative Studies assessed this study. This critical evaluation method was chosen to assess quantitative evidence's methodological quality. The McMaster Critical Review Form for Quantitative Studies has strong inter-rater reliability. The study's objectives, literature review, design, sample, outcomes, intervention, results, and conclusions are evaluated in 16 yes/no

responses. 0 points are assigned as no. The total score is 16, categorised as excellent, with scores of 15 to 16, very good; 13 to 14, good; 11 to 12, fair; 9 to 10, and poor; less than 9 points.

Figure 1: PRISMA flow diagram



## 4.0 Results

### 4.1 Selection of Studies

The literature search revealed 11 publications, of which three were cross-sectional, one quasi-experimental study and 5 RCTs, one parallel research, and one qualitative study. The trend of evidence shows one article scored "Excellent" (15/16), six scored "Very good quality" (13-14/16), three scored "Good" (11-12/16), and one scored "Poor" (10/16) as demonstrated in table 2

Table 2: Trends in evidence of the retrieved articles

References	Study Design	Hierarchy level	McMaster Score	Quality	Statistical Precision
Tan et al., 2020	Cross-sectional	II	11/16	Good	p > 0.05
Nielsen et al., 2020	RCT	I	13/16	Very good	p < 0.01
Chang et al., 2015	Cross-sectional	II	13/16	Very good	p > 0.05
Lee et al., 2021	RCT	I	14/16	Very Good	p > 0.05
Faisal Chevidikunnan et al., 2016	Quasi-experimental study	II	12/16	Good	p > 0.05
Ma et al., 2020	RCT	I	14/16	Very Good	p < 0.05
Giles et al., 2017	Cross-sectional	II	15/16	Excellent	p < 0.001
Schwiete et al., 2021)	Parallel research	III	10/16	Poor	p < 0.05
Yañez-Álvarez et al. (2020)	RCT	I	13/16	Very Good	p < 0.001
(Barber et al., 2022)	Qualitative	II	14/16	Very Good	p < 0.001
(de Oliveira Silva et al., 2019)	RCT	I	12/16	Good	p < 0.001)

Table 3: Evidence of Current Physiotherapy Management for PFPS

STUDIES	Age	STUDY DESIGN	PHYSIOTHERAPY MANAGEMENT	OUTCOME MEASURES	CONCLUSION
Tan et al., 2020	59±7	Cross-sectional	Open kinetic chain exercises include straight leg raises with ankle weights to make them harder, short arc quadriceps strengthening, knee	<ul style="list-style-type: none"> <li>Foot Posture Index</li> <li>Foot Measurement Platform</li> </ul>	Lower weight-bearing ankle dorsiflexion range of motion, more pronated foot posture, and greater midfoot mobility were all linked in a small way to worse

			<p>extensions, side-lying hip abduction, straight leg raise, and clamshells.</p> <p>Closed kinetic chain workouts include wall sits, single-leg and double-leg squats, lateral step-ups, and leg presses.</p>	<ul style="list-style-type: none"> <li>• 100 mm visual analogue scales</li> <li>• Anterior Knee Pain Scale</li> <li>• Knee injury and Osteoarthritis Outcome Score Repeated single step-ups and double-leg sit-to-stand to knee pain onset</li> </ul>	<p>knee pain and more disability in people with PFOA. Given how small these links are, it is unlikely that interventions focusing only on foot and ankle mobility will significantly impact knee symptoms and function in this group.</p>
Nielsen et al., 2020	18	RCT	<p>Weight-bearing (resisted squats)</p> <p>Non-weight-bearing knee exercises work (resisted knee extension).</p> <p>Hip-targeted exercise may be favoured in early PFPS treatment. PFPS sufferers prefer hip and knee workouts over knee therapy.</p>	<ul style="list-style-type: none"> <li>• Anterior Knee Pain Scale</li> <li>• Physical performance measures</li> <li>• Physical impairment measures</li> </ul>	<p>Combining hip and knee exercises can reduce discomfort and enhance patient-reported outcomes and functional performance—target posterolateral hip muscles.</p>
Chang et al., 2015	21.1 9±0.68	Cross-sectional	<p>Sling-based exercises.</p> <ul style="list-style-type: none"> <li>• Sling-Based Open Kinetic Knee Extension Exercise</li> <li>• Sling-Based Closed Kinetic Knee Extension Exercise</li> <li>• Sling-Based Hip Adduction Exercise</li> </ul>	<ul style="list-style-type: none"> <li>• E.M.G.</li> <li>• Electro goniometer</li> </ul>	<p>Most VMO activation came from the closed kinetic knee extension exercise with a sling. It also had the right VMO: VL ratio, like sling-based hip adduction exercise, and helped PFPS.</p>
Lee et al., 2021	26.5 ± 6.8	RCT	<p>static and dynamic stretching exercises</p>	<ul style="list-style-type: none"> <li>• Quadriceps Flexibility Test (the Ely Test)</li> <li>• Isokinetic Muscle Performance Test</li> </ul>	<p>Static and dynamic quadriceps stretching did not significantly affect quadriceps flexibility, strength, muscle activation time, or patient-reported outcomes in PFPS patients with inflexible quadriceps.</p>
Faisal Chevidikunnan et al., 2016	21.4 ± 1.8	Quasi-experimental study	<p>core muscle strengthening exercises thrice weekly for four weeks, in addition to the conventional physical therapy program.</p>	<ul style="list-style-type: none"> <li>• Visual Analog Scale (VAS) and Star Excursion Balance Test (SEBT).</li> </ul>	<p>Adding a core muscle-strengthening programme to traditional physiotherapy management improves pain and dynamic balance in female patients with PFPS</p>
Ma et al., 2020	22.4 8±2.40	R.C.T.	<p>TrP-DN at the quadriceps combined with stretch</p>	<ul style="list-style-type: none"> <li>• Visual analogue scale (VAS)</li> <li>• Kujala questionnaire</li> </ul>	<p>TrP-DN at the quadriceps paired with stretch reduces pain and improves clinical symptoms, function, VMO/VL ratio, and VMO/VL coordination in PFPS patients.</p>
Giles et al., 2017	24-37	Cross-sectional	<p>Blood Flow Restriction</p>	<ul style="list-style-type: none"> <li>• Kujala Score</li> </ul>	<p>Compared to conventional quadriceps training, low-load BFR reduced everyday discomfort in PFP patients after eight weeks. Pain and Kujala improved. BFR increased quadriceps strength in the knee extension-pain subgroup.</p>
(Schwiete et al., 2021)	2.8 ± 1.8	Parallel research	<p>Blood Flow Restriction</p>	<ul style="list-style-type: none"> <li>• Maximal Strength</li> <li>• Fatigue test</li> <li>• Muscle thickness of the M. rectus femoris was measured using a B-mode transversal plane ultrasound (model Acuson X300)</li> <li>• BORG scale</li> </ul>	<p>Resting blood-flow restriction training led to similar gains in strength, fatigue resistance, and muscle hypertrophy</p>
Yañez-Álvarez et al. (2020)	30-65	RCT	<p>Powerplate Vibration</p>	<ul style="list-style-type: none"> <li>• VAS</li> <li>• Knee flexion-extension range of movement (ROM)-Goniometer</li> <li>• The Spanish version of the Lower Extremity Functional Scale (LEFS.)</li> <li>• Kujala score</li> </ul>	<p>A four-week whole-body vibration exercise programme helps people with patellofemoral discomfort to feel less pain and use their lower limbs more effectively than exercise alone (Yaez-Ivarez et al., 2020). It reduced pain and improved lower limb function more than exercise alone.</p>
(Barber et al., 2022)	>40	Qualitative	<p>Patient Education</p>	<ul style="list-style-type: none"> <li>• a one-to-one interview with a single investigator (P.B.) using Zoom video</li> </ul>	<p>Three topics wanted personalised care. PFP patients seek a diagnosis to explain their pain, individualised therapies, and education to improve their experience and outcomes.</p>
(de Oliveira Silva et al., 2019)	18-35	R.C.T.	<p>Kinesiophobia Prevention</p>	<ul style="list-style-type: none"> <li>• VAS</li> <li>• Tampa Scale</li> </ul>	<p>Combining evidence-based knee strengthening exercises with education, graded exposure for kinesiophobia and gait retraining for knee movement patterns may yield further benefits.</p>

## 5.0 Discussion

### 5.1 Current physiotherapy management for PFPS

PFPS Physiotherapy includes therapeutic strengthening, stretching, core muscle strengthening, TrP-DN at the quadriceps with stretch, therapeutic exercises with BFR, lower limb exercises with Powerplate vibration, education, and kinesiophobia (Table 3).

#### 5.1.1 Therapeutic exercises

Therapeutic exercise in physiotherapy is effective in seven studies (Tan et al., 2020; Nielsen et al., 2020; Chang et al., 2015; Lee et al., 2021; Faisal Chevidikunnan et al., 2016; de Oliveira Silva et al., 2019) which all the results show consistent findings with Willy et al., (2019). It is agreeable that therapeutic exercises can improve muscle strength and reduce pain in PFPS.

#### 5.1.2 Blood flow restriction, kinesiophobia, and patient education

Giles et al. (2017) and Schwiete et al. (2021) compared traditional quadriceps exercise to BFR and found strength and pain reduction in both studies. Joint pain can cause kinesiophobia, but solid evidence is needed to prevent it by strengthening and educating patients (de Oliveira Silva et al., 2019).

### 5.2 The best practice for PFPS

#### 5.2.1 Combined therapy

Eleven studies show that combined therapies improve pain and physical function, and all demonstrated how to improve PFPS (Tan et al., 2020; Nielsen et al., 2020; Chang et al., 2015; Lee et al., 2021; Chevidikunnan et al., 2016; Ma et al., 2020; Giles et al., 2017; Schwiete et al., 2021; Yañez-Álvarez et al., 2020; Barber et al., 2022; de Oliveira Silva et al., 2019).

#### 5.2.2 Strengthening exercises.

Only one study found that strengthening exercising reduces kinesiophobia in knee conditions (de Oliveira Silva et al., 2019). The researcher assumed that the most effective method of physiotherapy should involve the BFR (Giles et al., 2017) in conjunction with the strengthening of the core, quadriceps (Chevidikunnan et al., 2016), hamstrings flexibility (Lee et al., 2021), kinesiophobia prevention (de Oliveira Silva et al., 2019), and patient's education (Barber et al., 2022) (Table 3) However, many combinations may require additional tests to determine their benefits.

#### 5.2.3 Flexibility

Two studies on quadriceps flexibility found that it affects PFPS (Lee et al., 2021; Ma et al., 2020); however, Ma et al. (2020) study found that TrP-DN, quadriceps flexibility, in combination with quadriceps strengthening, improved PFPS better than quadriceps stretching alone.

#### 5.2.4 education

In a previous study, the researchers employed various strengthening exercises and concentrated too much on therapeutic strengthening instead of muscle flexibility, range of motion, neuromuscular control, and joint proprioception (Tan et al., 2020) but not in education. High exercise adherence with education who attend over 75% of sessions improves patients' deficits. It was recommended to evaluate each exercise programme with personalised and scientifically based workout routines (Collado-Mateo et al., 2021).

In conclusion, the effects of therapeutic exercises, BFR, patient education, and kinesiophobia on pain, physical functioning, daily activities, and quality of life have rarely been studied. So, high-quality experiments are needed to evaluate each exercise's PFPS benefits and compare findings.

### 5.3 Strengths of the study

This study is the first to use a systemic review approach to PFPS management, including blood flow restrictions, kinesiophobia prevention, and patient education that were searched independently. The McMaster Critical Review Form for Quantitative Research and the Cochrane (EPOC) were utilised for quality and risk assessments.

### 5.4 Limitations of the Studies

There are limitations to this systematic review. First, fewer studies were reviewed, resulting in insufficient evidence to support the study. One article had a low McMaster quality score (Schwiete et al., 2021), which can affect the mean score of all articles, resulting in a low overall quality of the study.

### 5.5 Clinical implications

Physiotherapists and general practitioners treat PFPS as one of the most common knee pain conditions. This condition needs precise, prompt, and efficient treatment. This systematic review does not support treating PFPS with therapeutic exercise alone.

### 5.6 Future Recommendations

All previous research demonstrates successful management of the PFPS, but some areas remain unexplored. Thus, it is recommended that future clinical trials combine all the interventions discussed in this paper.

## 6.0 Conclusion

This systematic review found that combined interventions improve PFPS patients' pain, physical function, and kinesiophobia. BFR and strengthening may improve PFPS symptoms and function—poor patient education. The prior study managed PFPS successfully but had significant shortcomings. So, this report recommends a further experimental investigation of all interventions.

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## Paper Contribution to Related Field of Study

This paper provides current evidence of physiotherapy care for PFPS in clinical settings.

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