

Conservative physiotherapy interventions for subacromial pain syndrome: a systematic review of current evidence

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Abstract

Introduction. Subacromial pain syndrome (SAPS) is one of the most common causes of shoulder pain and functional limitation in adults. Conservative physiotherapy management includes exercise therapy, manual therapy, patient education, and electrotherapy. This systematic review aimed to summarise and evaluate current evidence on conservative physiotherapy-based treatment approaches for SAPS, with particular focus on pain reduction and functional improvement.

Methods. A comprehensive search of PubMed, Web of Science, and Google Scholar was performed for studies published between 2020 and 2025. The last database search was conducted on January 15, 2026. Eligible studies included randomised controlled trials, systematic reviews, meta-analyses, and study protocols investigating conservative, non-surgical physiotherapy interventions in adults with SAPS. Primary outcomes included pain, shoulder function, disability, and range of motion.

Results. Twenty-two studies met the inclusion criteria, including 14 randomised controlled trials, 7 systematic reviews/meta-analyses, and 1 randomised study protocol. Exercise-based treatment consistently showed significant improvements in pain and functional outcomes. Methodological quality of randomised controlled trials ranged from 6 to 8 out of 10 on the PEDro (Physiotherapy Evidence Database) scale. According to AMSTAR-2 (A Measurement Tool to Assess systematic Reviews), two systematic reviews were rated as of high quality, four as of moderate quality, and one as of low quality. Progressive exercise protocols that targeted the rotator cuff and scapular muscles were associated with superior clinical improvements compared to generalised exercise programmes. Scapular stabilisation and motor control exercises demonstrated moderate effectiveness in improving shoulder pain and disability index (SPADI) and range of motion outcomes. Manual therapy provided short-term benefits when combined with exercise.

Conclusions. Current evidence supports exercise-based physiotherapy for SAPS, with individualised loading and education improving outcomes.

Key words: subacromial pain syndrome, shoulder pain, conservative treatment, physiotherapy, exercise therapy, manual therapy

Introduction

Subacromial pain syndrome (SAPS), also known as subacromial impingement syndrome, is one of the most common causes of shoulder pain in adults and is often associated with limitations in activities of daily living [1]. It is characterised by pain during active arm elevation, reduced range of motion, and decreased muscle strength of the rotator cuff and periscapular muscles, leading to significant limitations in daily activities and work performance [2]. The prevalence and persistence of SAPS contribute significantly to healthcare utilisation and increased socio-economic burden worldwide [3]. Medical management of SAPS may include analgesics, nonsteroidal anti-inflammatory drugs (NSAIDs), corticosteroid injections, and activity modification aimed at reducing pain and inflammation [4]. However, due to concerns regarding long-term effectiveness and recurrence of symptoms, conservative physiotherapy interventions are commonly recommended as first-line management strategies [4].

Conservative management is widely recommended as the first-line treatment for SAPS while physiotherapy plays a key role in reducing symptoms and restoring function. Conservative physiotherapy management includes a range of non-surgical interventions such as therapeutic exercise, manual therapy, patient education, activity modification, taping, and

selected physical modalities (e.g., electrotherapy) [5]. These approaches aim to reduce pain, improve shoulder function, and restore participation in daily activities. Although exercise-based rehabilitation remains the most extensively investigated intervention, conservative management may also incorporate adjunctive modalities based on individual patient needs [6].

Despite the growing body of research, the literature on conservative treatment for SAPS remains heterogeneous in terms of intervention protocols, treatment duration, and outcome measures [7]. Previous systematic reviews have reported no clinically meaningful long-term differences between surgical and conservative management for SAPS, highlighting the importance of optimising nonsurgical treatment strategies [8]. Furthermore, several earlier reviews have been limited by methodological variability or have not included recently published clinical studies.

Moreover, recent evidence comparing specific physiotherapy strategies and their clinical effectiveness has not been comprehensively synthesised. Therefore, the aim of this systematic review was to summarise and evaluate the current evidence regarding conservative physiotherapy-based treatment approaches for SAPS, with particular focus on pain reduction, functional improvement, and clinical applicability of different rehabilitation strategies.

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Subjects and methods

Study selection

This systematic review was conducted and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement [9]. This review was not prospectively registered in PROSPERO, OSF, or any other review registry. A systematic search of the literature was performed using the PubMed, Google Scholar, and Web of Science databases by six independent authors (AK, BH, TV, YS, MJ, DG) for studies published between January 2020 and January 2026. The last database search was conducted on January 15, 2026.

The following search strategy was applied: “(subacromial pain syndrome OR shoulder impingement syndrome OR rotator cuff-related shoulder pain) NOT (shoulder fracture OR shoulder dislocation) AND (conservative treatment OR physiotherapy OR physical therapy OR exercise therapy OR manual therapy) NOT (surgical treatment OR surgery)”. Detailed search strategies for each database are provided as Supplementary material.

The search was restricted to studies published in the last five (5) years (2020–2025). This timeframe restriction was applied to prioritise contemporary evidence and recent developments in conservative physiotherapy management for Subacromial Pain Syndrome (SAPS). Given the objective of

providing a comprehensive overview of conservative physiotherapy interventions for Subacromial Pain Syndrome (SAPS), evidence from randomised controlled trials, systematic reviews, and meta-analyses was included. This approach was adopted to synthesise both primary and higher-level evidence regarding exercise therapy, manual therapy, and related physiotherapy interventions. The inclusion of multiple study designs was intended to provide a comprehensive overview of the available evidence. To minimise the influence of overlapping evidence, findings from systematic reviews and meta-analyses were interpreted alongside primary studies and were not quantitatively combined. Potential overlap of evidence was considered during interpretation of findings. The study selection progress followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram including identification, screening, eligibility and inclusion phases (Figure 1).

From each included original article, a standardised extraction form was used to collect relevant information, including the number of participants, average age at treatment, gender distribution, type of conservative intervention, duration of symptoms based on treatment, duration of the interventions, outcome measures, and follow up period and year of publications.

The methodological quality of the included studies was independently assessed by six reviewers (BH, AK, TV, YS, MJ, DG). Any disagreements regarding study selection, data extraction, or quality assessment were resolved by consensus.

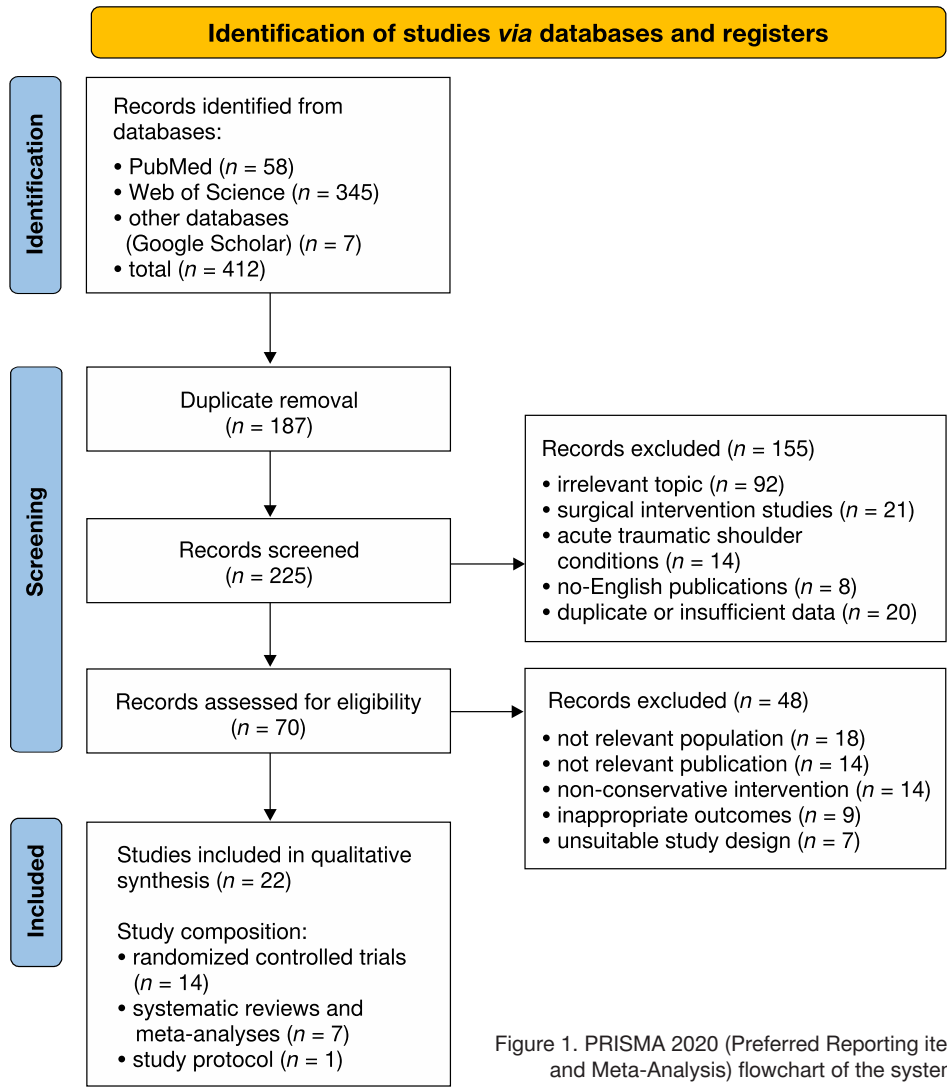


Figure 1. PRISMA 2020 (Preferred Reporting items for Systematic Reviews and Meta-Analysis) flowchart of the systematic literature review

Inclusion and exclusion criteria

Eligible studies for the present systematic review included studies published within the last five (5) year range that investigated conservative treatment approach for SAPS. Initial title and abstract screening was performed accordingly to predefined inclusion criteria: conservative treatment consisting of physiotherapy-based interventions (including exercise therapy, manual therapy, and physical modalities) without surgical intervention, adult participants (≥ 18 years), symptom duration of at least 6 weeks, and a minimum average follow-up of 6 weeks. Primary outcomes included pain intensity, shoulder function/disability, range of motion (ROM), and muscle strength. Commonly reported outcome measures included the shoulder pain and disability index (SPADI), Disabilities of the Arm, Shoulder and Hand questionnaire (DASH/Quick-DASH), and visual analog scale (VAS).

Exclusion criteria included studies involving primary or secondary surgical treatment, acute traumatic shoulder conditions, symptom duration of less than 6 weeks, and animal studies. Studies not published in English, articles without accessible abstracts, and duplicate records were also excluded. On the other hand, systematic reviews, meta-analyses, randomised controlled trials, and other clinical studies investigating conservative treatment approaches for subacromial pain syndrome were eligible for inclusion. Additionally, abstracts, case reports, conference presentations, editorials, narrative reviews, and expert opinions were excluded. Reference lists of all included articles were manually screened to identify additional relevant studies.

Data synthesis

A narrative synthesis was undertaken to summarise the included evidence. Findings were grouped according to study design and intervention type, and were synthesised descriptively with emphasis on pain intensity, shoulder function, disability, range of motion, and muscle strength outcomes.

Methodological quality assessment

The methodological quality of randomised controlled trials was assessed using the PEDro scale. Systematic reviews and meta-analyses were evaluated using the AMSTAR-2 (A Measurement Tool to Assess Systematic Reviews) instrument. Study protocols were not formally assessed, as no validated quality assessment tool is available for this study design.

Results

A total of 412 articles were identified through database searching. After excluding duplicates, 225 articles remained for screening. After the first screening of titles and abstracts and following the previously described selection criteria, 70 articles were eligible for full-text reading. Finally, after full-text screening and reference list evaluation, 22 studies [10–31] were included. These consisted of 14 randomised controlled trials (RCTs), 7 systematic reviews/meta-analyses, and 1 randomised study protocol investigating conservative physiotherapy interventions for SAPS. The study selection process is presented in the PRISMA flow diagram (Figure 1).

Methodological quality

The methodological quality of the included randomised controlled trials was assessed using the PEDro scale. PEDro

scores ranged from 6 to 8 out of 10, indicating moderate-to-high methodological quality, as presented in Table 1A. According to the AMSTAR-2 assessment, two systematic reviews were rated as of high quality, four as of moderate quality, and one as of low quality. Detailed AMSTAR-2 ratings for the included systematic reviews and meta-analyses are presented in Table 1B.

Randomised controlled trials

Pain and functional outcomes

Most randomised controlled trials demonstrated clinically meaningful improvements in pain and functional outcomes following exercise-based rehabilitation [10, 11, 16, 19, 23, 26, 29–31]. Individualised and progressive loading strategies targeting the rotator cuff and scapular musculature consistently showed superior outcomes compared to generalised exercise programmes. Momeni *et al.* [30] reported greater reductions in pain and disability with individualised exercise therapy, documenting superior SPADI improvements compared to general exercise protocols. Similarly, Gutiérrez-Espinoza *et al.* [16] demonstrated significant improvements favouring specific exercise interventions over general exercise programmes ($p < 0.001$).

Regarding exercise dosage and progression, Malliaras *et al.* [23] observed faster strength gains with high-dose exercise protocols, although Clausen *et al.* [14] did not identify statistically significant between-group differences when additional strengthening dosage was added to standard care. Cavaggion *et al.* [26] and Kjær *et al.* [27] demonstrated that exercising into pain resulted in clinically meaningful improvements without significant disadvantages compared to pain-free exercise protocols. Furthermore, Littlewood *et al.* [31] found that self-managed loaded exercise produced outcomes comparable to usual physiotherapy care at 3 months.

Scapular stabilisation, manual therapy, and range of motion

Several RCTs explored scapular stabilisation and manual therapy interventions [11, 17, 19, 20, 29]. These interventions were generally associated with improvements in pain, shoulder mobility, and functional capacity. Tauqeer *et al.* [11] demonstrated that adding manual therapy to stretching and strengthening exercises improved functional capacity and scapular movement compared to exercise alone. Similarly, Sharma *et al.* [19] reported significant improvements in strength following progressive resistance exercise combined with manual therapy in overhead athletes.

Hotta *et al.* [29] and Yuksel and Yesilyaprak [17] documented significant reductions in pain and disability following scapular stabilisation-focused rehabilitation programmes. Conversely, Letafatkar *et al.* [20] concluded that while exercise was superior to no intervention, the addition of kinesiotaping did not provide clinically meaningful additional benefit.

Motor control and patient education

Motor control strategies and patient education were investigated in several studies [15–28]. Dubé *et al.* [15] reported no clinically meaningful differences between motor control exercises, strengthening exercises, and education alone. However, Zadro *et al.* [28] demonstrated that pain-science education significantly reduced the perceived need for surgery among individuals with rotator cuff-related shoulder pain.

Table 1A. Randomised controlled trials included in the review

Author (year)	Mean age	Groups (n)	Experimental intervention	Control intervention	Outcomes / measurement instruments	Main findings	PEDro Score
Buccioli <i>et al.</i> (2025) [10]	adults	70	strengthening exercises combined with proprioceptive training	strengthening exercises alone	SPADI, pain intensity, proprioception, muscle strength, kinesiophobia, self-efficacy	No significant between-group differences were observed. Inclusion of proprioceptive exercises did not provide additional benefit beyond strengthening exercises alone.	8/10
Tauqeer <i>et al.</i> (2024) [11]	35–42	32	manual therapy combined with stretching and strengthening exercises	stretching and strengthening exercises alone	ROM, pain, functional capacity	Manual therapy combined with exercise significantly improved scapular ROM, pain, and functional capacity compared with exercise alone ($p < 0.05$).	8/10
Clausen <i>et al.</i> (2021) [14]	18–65	200	high-dose shoulder strengthening programme	standard care exercise programme	Strength, pain, SPADI, ROM	Addition of high-dose strengthening did not result in statistically significant differences compared with standard care despite strength improvements.	8/10
Dubé <i>et al.</i> (2023) [15]	18–65	123	education, motor control exercise, and strengthening exercise programmes	comparison among intervention groups	QuickDASH, symptoms, pain self-efficacy	No clinically meaningful differences were observed between education, motor control, or strengthening exercise groups in QuickDASH outcomes.	8/10
Gutiérrez-Espinoza <i>et al.</i> (2023) [16]	adults	52	specific exercise programme	general exercise programme	SPADI, DASH, VAS, TSK	Specific exercise programmes demonstrated significantly greater improvements in SPADI, DASH, pain, and kinesiophobia scores compared with general exercise ($p < 0.001$).	8/10
Yuksel and Yesilyaprak (2024) [17]	adults	64	scapular stabilisation exercise programme	conventional exercise programme	VAS, SPADI, muscle strength	Scapular stabilisation exercises significantly reduced pain and disability while improving scapular muscle performance and strength.	6/10
Liu <i>et al.</i> (2024) [18]	16–37	105	Yi Jin Bang exercise programme	conventional exercise therapy	SPADI, pain, mobility, strength, quality of life	Both interventions improved pain and function, with no significant superiority of Yi Jin Bang exercise over conventional exercise therapy.	7/10
Sharma <i>et al.</i> (2021) [19]	adults	80	progressive resistance exercise combined with manual therapy	motor control exercise programme	isometric strength, pain	Progressive resistance exercise combined with manual therapy significantly improved isometric shoulder strength and pain levels compared with motor control exercises ($p < 0.05$).	6/10
Letafatkar <i>et al.</i> (2021) [20]	37–43	120	therapeutic exercise combined with kinesio-taping	exercise alone or no intervention	pain, disability, scapular kinematics	Therapeutic exercise combined with kinesio-taping produced greater improvements in pain, disability, and scapular kinematics than exercise alone or no intervention.	8/10
Cavaggion <i>et al.</i> (2024) [26]	18–65	43	exercising into pain	pain-free exercise	SPADI, pain, strength, ROM, quality of life	Exercising into pain was not superior to pain-free exercise; both approaches resulted in similar improvements in pain and function.	8/10
Zadro <i>et al.</i> (2024) [28]	adults	2237	best-practice education intervention	pain science education intervention	reassurance, activity safety beliefs, management intentions	Best-practice education significantly improved reassurance and confidence to continue daily activities; pain science messages provided only a small additional benefit.	7/10
Hotta <i>et al.</i> (2020) [29]	adults	60	scapular stabilisation exercises combined with progressive strengthening	progressive periscapular strengthening programme	SPADI, pain, disability, ROM, muscle strength	Inclusion of scapular stabilisation exercises did not provide additional benefits beyond progressive periscapular strengthening.	8/10
Momeni <i>et al.</i> (2025) [30]	≥ 18	74	individualised movement-fault control exercise programme	general scapular stabilisation exercise programme	VAS, SPADI, DASH	Individualised exercise therapy resulted in greater reductions in pain and disability compared with general scapular stabilisation exercises.	8/10
Littlewood <i>et al.</i> (2014) [31]	adults	24	self-managed loaded exercise programme	usual physiotherapy care	SPADI, SF-36, pain, function	Self-managed loaded exercise produced comparable improvements in pain and function to usual physiotherapy care at 3-month follow-up.	6/10

DASH – Disabilities of the Arm, Shoulder and Hand, PEDro – Physiotherapy Evidence Database, QuickDASH – Quick Disabilities of the Arm, Shoulder and Hand, ROM – range of motion, SF-36 – 36-Item Short Form Health Survey, SPADI – Shoulder Pain and Disability Index, TSK – Tampa Scale for Kinesiophobia, VAS – visual analog scale

Table 1B. Systematic reviews and meta-analyses included in the review

Author (year)	Type of evidence	Main focus	Main findings	Effect estimate	AMSTAR-2
Zhong <i>et al.</i> (2024) [12]	systematic review and meta-analysis	scapular stabilisation exercises	Significant pain reduction and improvement in shoulder function (SPADI) compared with conventional physiotherapy; no significant ROM improvement	VAS: <i>WMD</i> = −0.94 (95% <i>CI</i> −1.23 to −0.65) SPADI: <i>WMD</i> = −10.10 (95% <i>CI</i> −18.87 to −1.33)	moderate
Lafrance <i>et al.</i> (2024) [13]	systematic review and meta-analysis	FITT-based exercise therapy	Motor control exercise programmes were slightly superior to nonspecific exercise programmes for disability outcomes, but not for pain	disability (short-term): <i>SMD</i> = −0.29 (95% <i>CI</i> −0.51 to −0.07) disability (medium-term): <i>SMD</i> = −0.33 (95% <i>CI</i> −0.57 to −0.09) pain: <i>SMD</i> = −0.19 (95% <i>CI</i> −0.41 to 0.03)	high
Singh <i>et al.</i> (2022) [21]	systematic review	proprioceptive-based interventions	Proprioceptive-based interventions demonstrated positive effects on pain, ROM, proprioception, and shoulder function	not applicable (no quantitative meta-analysis performed)	low
Paraskevopoulos <i>et al.</i> (2023) [22]	systematic review and meta-analysis	manual therapy combined with exercise	Adding manual therapy to exercise did not provide additional clinically meaningful benefits compared with exercise alone	pain with movement: <i>SMD</i> = −0.15 (95% <i>CI</i> −0.41 to 0.12) pain at rest: <i>SMD</i> = 0.47 (95% <i>CI</i> 0.04 to 0.89) function (short-term): <i>SMD</i> = 0.23 (95% <i>CI</i> −0.22 to 0.69) function (long-term): <i>SMD</i> = −0.02 (95% <i>CI</i> −0.21 to 0.16)	moderate
Malliaras <i>et al.</i> (2020) [23]	systematic review	higher-dose exercise therapy	Conflicting evidence regarding the effectiveness of higher exercise doses in rotator cuff tendinopathy	function: <i>MD</i> = 20 points (95% <i>CI</i> 12–28) on a 0–100 scale	high
Ortega-Castillo <i>et al.</i> (2022) [24]	systematic review and meta-analysis	progressive therapeutic exercise	Progressive exercise demonstrated beneficial effects on pain and function in upper limb tendinopathies	pain: Cohen's <i>d</i> = 0.29 function: Cohen's <i>d</i> = 0.33	moderate
Kucksdorf <i>et al.</i> (2024) [25]	systematic review	reproducibility of exercise interventions	Exercise intervention reporting was frequently incomplete, limiting reproducibility and translation into clinical practice	not applicable (reporting-quality review; TIDieR mean = 5.27/12; CERT mean = 5.09/16)	moderate

AMSTAR-2 – A Measurement Tool to Assess Systematic Reviews 2, CERT – Consensus on Exercise Reporting Template, *CI* – confidence interval, Cohen's *d* – standardised effect size (Cohen's *d*), FITT – frequency, intensity, time, and type, *MD* – mean difference, ROM – range of motion, *SMD* – standardised mean difference, SPADI – Shoulder Pain and Disability Index, TIDieR – Template for Intervention Description and Replication, VAS – visual analog scale, *WMD* – weighted mean difference

Table 1C. Additional evidence

Authors (year)	Study type	Main focus	Main findings
Kjær <i>et al.</i> (2024) [27]	randomised study protocol	pain during rehabilitation exercises	study protocol investigating exercise tolerance strategies

Systematic reviews and meta-analyses

Systematic reviews and meta-analyses consistently supported exercise-based physiotherapy interventions for SAPS, particularly progressive strengthening, scapular stabilisation, and combined exercise-manual therapy approaches [12, 13, 21, 22, 24, 25]. Zhong *et al.* [12] reported significant pain reduction and SPADI improvement following scapular stabilisation exercises. Lafrance *et al.* [13] identified small-to-moder-

ate improvements in pain and function associated with motor control and FITT-based (Frequency, Intensity, Time, Type-Based) exercise programmes. Paraskevopoulos *et al.* [22] demonstrated that combined manual therapy and exercise produced greater short-term improvements in pain and range of motion compared to exercise alone. Ortega-Castillo *et al.* [24] further supported the effectiveness of progressive therapeutic exercise for pain reduction in upper limb tendinopathies. Additionally, Kucksdorf

et al. [25] highlighted substantial variability and lack of standardised reporting of exercise dosage and progression parameters across studies.

Additional evidence

Additional evidence from study protocols emphasised the importance of exercise dosage, pain monitoring, and progression strategies during rehabilitation [27] (Table 1C).

Methodological quality of systematic reviews and meta-analyses was assessed using the AMSTAR-2 tool. Where available, pooled effect estimates (*SMD*, *MD*, *WMD*, or Cohen's *d*) are reported to improve interpretation of the quantitative findings. Studies without quantitative synthesis are indicated as not applicable.

Discussion

The findings of this systematic review show that conservative physiotherapy-based interventions are efficient in reducing pain, improving shoulder range of motion, and enhancing functional outcomes in patients with the subacromial pain syndrome (SAPS). In all included studies, exercise-based rehabilitation consistently emerged as the core component of successful conservative management.

Pain reduction was a commonly reported outcome, with most studies showing clinically important improvements following structured exercise programmes. Evidence from randomised controlled trials indicates that targeted exercise protocols – especially those emphasising rotator cuff strengthening and scapular stabilisation – achieve greater pain reduction in comparison to general exercise approaches [10, 16, 30]. These findings are in agreement with recent systematic reviews and meta-analyses suggesting that exercise-based physiotherapy produces moderate-to-large reductions in pain in individuals with rotator cuff-related shoulder pain [1, 13].

Moreover, significant gains in shoulder mobility (flexion, abduction, and external rotation) were consistently observed. These improvements appear to be mediated by interventions focused on scapular stabilisation and motor control, which help restore optimal movement patterns and alleviate mechanical stress on the subacromial structures. Meta-analytic evidence supports the effectiveness of scapular stabilisation exercises in improving range of motion and functional scores such as SPADI [12]. Similarly, randomised trials combining strengthening with manual therapy reported greater short-term gains in range of motion compared to exercise alone [11, 22].

Functional improvement, most frequently measured using SPADI or DASH, was another consistent outcome. Individualised and progressive loading protocols resulted in greater functional gains compared to generalised programmes, reinforcing the importance of tailoring exercise dosage and progression to the patient's tolerance and clinical presentation [23, 30]. However, several studies showed that different exercise modalities yielded comparable functional improvements, suggesting that adherence and progressive loading may be more critical than the specific exercise type [15, 31]. Although effect sizes were not consistently reported across the included studies, most interventions demonstrated clinically meaningful improvements in pain and functional outcomes.

The role of standard physiotherapy procedures, such as manual therapy and electrotherapy, remains secondary. While manual therapy can provide additional short-term benefits when combined with exercise, evidence suggests that it does not outperform exercise-based rehabilitation as a standalone

intervention [19, 22]. Conversely, modalities such as kinesio-taping do not appear to confer meaningful additional benefits beyond exercise alone [20]. Emerging evidence also highlights the importance of patient education and pain science-informed communication in reducing fear-avoidance beliefs and perceived need for surgery [28].

Overall, the findings of this review align with contemporary evidence demonstrating that conservative management should prioritise progressive, exercise-based rehabilitation as the first-line treatment for SAPS. Although heterogeneity in intervention protocols and outcome reporting limits direct comparison across studies, the consistency of positive outcomes supports the effectiveness of physiotherapy-led conservative care. Future research should focus on standardising exercise reporting (FITT principles) and identifying optimal loading parameters to further enhance clinical decision-making and reproducibility.

Limitations

This systematic review has certain limitations. Although the search strategy followed PRISMA guidelines and included multiple databases, the review was limited to studies published within the last five years and to English-language publications. This could have excluded potentially relevant earlier or non-English studies.

Furthermore, some heterogeneity existed among the included studies in terms of intervention protocols and outcome measures, which could limit direct comparability.

Additionally, the inclusion of different study designs may have introduced overlap of evidence, particularly between randomised controlled trials and systematic reviews/meta-analyses. However, this approach allowed for a broader synthesis of contemporary evidence regarding conservative physiotherapy management of SAPS. Nevertheless, despite these variations, the overall findings were consistent in supporting exercise-based conservative management for SAPS.

Conclusions

Subacromial pain syndrome (SAPS) is a common musculoskeletal disorder for which a variety of conservative treatment approaches have been proposed. The findings of this systematic review suggest that exercise-based physiotherapy is an effective intervention for improving pain and shoulder function in individuals with SAPS. Progressive and individualised exercise programmes targeting the rotator cuff and scapular musculature were generally associated with favourable clinical outcomes, although considerable variability existed across intervention protocols and outcome measures.

Manual therapy and other adjunctive interventions may provide additional short-term benefits in selected patients; however, current evidence does not consistently demonstrate superiority over exercise-based rehabilitation alone. Overall, exercise-based conservative management, combined with patient education and individualised loading strategies, should be considered a primary treatment approach for SAPS. Further high-quality randomised controlled trials are needed to establish optimal exercise parameters and rehabilitation protocols.

Use of artificial intelligence

The authors used artificial intelligence (AI) tools solely for language editing and improvement of clarity. The authors take full responsibility for the content of the manuscript.

Ethical approval

The conducted research is not related to either human or animal use.

Disclosure statement

No author has any financial interest or received any financial benefit from this research.

Conflict of interest

The authors state no conflict of interest.

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